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January 20, 2016

Subject: Baker Road Redevelopment
20785 and 20957 Baker Road (Case #RO0003234)
Castro Valley, California

ACKNOWLEDGEMENT SATEMENT

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.

Todd Deutscher
Catalyst Development Partners

Project No.
13255.000.000

December 29, 2016

Mr. Paresh C. Khatri
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Subject: 20785 and 20957 Baker Road (Former Case #R00002739)
Castro Valley, California

WORKPLAN FOR SITE CHARACTERIZATION

Dear Mr. Khatri:

On behalf of Catalyst Development Partners, we have prepared this workplan to assess potential soil and soil gas impacts at 20785 and 20957 Baker Road (Site), located in Castro Valley, California (Figure 1). The purpose of the proposed site characterization is to determine if the Site has been impacted by past agricultural activities and to determine the extent and magnitude of soil vapor impact in the vicinity of former underground storage tanks (USTs) at the Site.

BACKGROUND

Site Description

The Site is located at 20785 and 20957 Baker Road, northeast of Rutledge Road and southeast of Castro Valley Boulevard in Castro Valley, California (Figure 1). The Site consists of two parcels measuring approximately 1.12 acres in area and identified with Assessor's Parcel Numbers (APNs) 84A-16-5-9 and 84A-16-6-4.

The 20785 Baker Road parcel features two remnant building foundation slabs, a house, and dirt- or partially asphalt-covered with overgrown vegetation. The 20957 Baker Road parcel features one remnant building foundation slab, and a majority of the parcel is dirt- or asphalt-covered with overgrown vegetation.

Multi-family housing is present in the vicinity to the north and south of the Site. An automotive shop is present to the west, and multi-family housing occupies the properties to the east of Baker Road. Redevelopment consisting of attached residential housing is planned for the Site (Figure 2).

Previous Studies

AEI, Preliminary Site Investigation Report, 20957 Baker Road, Castro Valley, California, June 7, 2005.

AEI performed a preliminary site investigation for the Site in June 2005. The scope of work was performed to determine the extent of soil contamination and impact to groundwater resulting from the hydrocarbon release from former USTs at the Site.

In April 2004, two 1,000-gallon USTs were removed from the Site. The tanks, which had been unused for over 15 years, were reported to contain a small amount of fuel and sludge, but they were reported to be intact with no obvious leaks. Two soil samples were collected from underneath each UST and analyzed for total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene, and xylene(s) (BTEX), methyl tertiary butyl ether (MTBE), total petroleum hydrocarbons as diesel (TPH-d), and total lead. Hydrocarbons were reported in all the soil samples analyzed. TPH-g was reported at concentrations ranging from 160 milligrams per kilogram (mg/kg) to 1,400 mg/kg. TPH-d was reported at concentrations ranging from 1,400 mg/kg to 10,000 mg/kg. Lower concentrations of xylene(s) and lead were also detected.

Eight soil borings were advanced during the 2005 investigation to depths ranging from 14 to 18 feet below ground surface in the locations depicted on Figures 3 and 4. No detectable concentrations of TPH-g, TPH-d, TPH-mo, MTBE or BTEX were reported in any of the soil samples. TPH-g was reported in one groundwater sample at concentration of 7,300 micrograms per liter (µg/L). The groundwater sample from this boring also exhibited a TPH-d concentration of 23,000 µg/L. Free product was observed both in the field and in this groundwater sample. No TPH-g was reported in groundwater samples from any other borings. TPH-d was detected in other groundwater samples to a maximum concentration of 670 µg/L. TPH-motor oil (mo) was reported at concentrations ranging from 300 µg/L to 1,400 µg/L. No MTBE was reported in the groundwater samples.

Based on the findings of the study, AEI recommended the installation of four groundwater monitoring wells, a one-year monitoring program, and the preparation of a remedial action plan if deemed necessary.

<u>AEI, Additional Information Report, 20957 Baker Road, Castro Valley, California, November 15, 2008.</u>

AEI prepared an Additional Information Report for the 20957 Baker Road parcel in November 2008. The document provided an overview of past investigations and reporting for the property. The following was presented in the report, as well as supplemental information provided in a Case Closure Letter from Alameda County Department of Environmental Health (ACDEH) dated September 8, 2009.

In October 2007, five groundwater monitoring wells were installed, one on each side of the former UST location, one through the center of the tank backfill, and two downgradient of the former UST location, as shown in Figures 3 and 6. Low-level hydrocarbons were detected in samples collected in a boring near the former tank location. Depth to water at the time the wells were developed ranged from approximately 11 to 14½ feet below the ground surface. Groundwater samples collected during the October 2007 groundwater monitoring event did not identify the presence of TPH-g, BTEX or MTBE in any of the groundwater samples. TPH-d was detected in one sample, but not during three subsequent events.

Following the four quarters of groundwater monitoring, AEI opined that the data for the property met the established Regional Water Quality Control Board (RWQCB) standard for closure. Following a comment and rebuttal period between AEI and ACDEH, ACDEH did provide case closure in a letter dated September 9, 2009. In the case closure letter, ACDEH did note the

absence of soil gas testing, but given the elapsed time since the release (prior to 1989), the potential for vapor intrusion appeared to be low. ACDEH did comment in the document that the closure was based on the determination that the reported release did not appear to present a risk to human health, given the property use and conditions at the time of the closure. Soil and groundwater analyses from these site characterization activities are presented in Tables A and B.

ENGEO, Phase I Environmental Site Assessment, 20957 Baker Road, Castro Valley, California, Project Number 13255.000.000, August 23, 2016.

ENGEO conducted a concurrent phase I environmental site assessment for the 20957 Baker Road property in August 2016. The property was reportedly used as a corporation yard/storage area for heavy equipment. Prior to development in the 1950s, the property appeared to be under cultivation for row crops.

Based on the findings of the ENGEO phase I assessment and previous assessments of the property, the following potential environmental concerns were identified for the property:

- Although the former leaking USTs at the property were removed and a case closure was subsequently granted, information in the former case file indicated that potential risks via vapor intrusion may not have been adequately assessed during past characterization activities.

- Historical records for the property indicated the property was under agricultural cultivation in the past. Recalcitrant agricultural chemicals could be present in near-surface soils.

A phase II environmental assessment was recommended for the property to (1) evaluate potential vapor intrusion impacts in the vicinity of the former USTs and (2) evaluate potential impacts to near surface soil due to the past agricultural activity.

ENGEO, Phase I Environmental Site Assessment, 20785 Baker Road, Castro Valley, California, Project Number 13255.000.000, August 23, 2016.

ENGEO conducted a concurrent phase I environmental site assessment for the 20785 Baker Road property in August 2016. The property was reportedly used as a corporation yard/storage area for heavy equipment. Prior to development in the 1950s, the property appeared to be under cultivation for row crops surrounding the single-family residential structures.

Based on the findings of the ENGEO phase I assessment and previous assessments of the property, the following potential environmental concerns were identified for the property:

- Although the former leaking USTs at the parcel to the south were removed and a case closure was subsequently granted, information in the former case file indicated that potential risks via vapor intrusion may not have been adequately assessed during past characterization activities.

- Historical records for the property indicated the property was under agricultural cultivation in the past. Recalcitrant agricultural chemicals could be present in near-surface soils.

- Lead-based paint and/or asbestos-containing building materials may be present within structures at the property.

A phase II environmental assessment was recommended for the property to evaluate potential impacts to near surface soil due to the past agricultural activity.

ENGEO, Phase II Environmental Site Assessment, 20785 Baker Road, Castro Valley, California, Project Number 13255.000.000, August 31, 2016.

A phase II environmental site assessment was performed at the 20785 Baker Road property in August 2016. Soil samples were collected from a total of six locations across the property (Figure 5). Soil Borings S-2 and S-3 were advanced to a total depth of 2 feet below ground surface using a Geoprobe® direct-push rig. Continuous soil cores were retrieved from each boring. Soil samples were collected at approximate depths of 3 to 9 inches and 12 to 18 inches below the ground surface from each of the borings. The remaining soil borings were advanced to 9 inches using a hand auger. Samples were collected at the approximate depth of 3 to 9 inches below the ground surface and analyzed for the presence of organochlorine pesticides, arsenic, and lead.

Locations S-7 and S-8 exhibited low levels of detectable concentrations of organochlorine pesticides. Detected analytes included gamma-chlordane, alpha-chlordane, 4,4-DDE, dieldrin, 4,4-DDT, heptachlor epoxide and chlordane; these concentrations were below respective screening levels. All of the collected soil samples exhibited detectable lead concentrations; the detected concentrations ranged between 6.49 and 49.6 milligrams per kilogram (mg/kg). These concentrations were below the respective screening level assuming a residential land use scenario[1].

Detected arsenic concentrations in the collected soil samples ranged between 3.88 and 27.3 mg/kg. The detected concentrations were in excess of the respective arsenic screening level assuming a residential land use scenario. Although several detected concentrations were within expected background concentrations, some detected arsenic concentrations were in excess of expected background concentrations observed in the San Francisco Bay Area. Soil data is presented in Table D.

Given the reported arsenic and pesticide concentrations, it appeared the surface soil at the property may have been impacted from historic agricultural activities.

ENGEO, Phase II Environmental Site Assessment, 20957 Baker Road, Castro Valley, California, Project Number 13255.000.000, August 31, 2016.

A phase II environmental site assessment was performed at the 20957 Baker Road property in August 2016. Soil samples were collected from a total of two locations across the property. The soil borings were advanced to a total depth of 2 feet below ground surface using a Geoprobe®

[1] Regional Water Quality Control Board, Soil Human Health Risk Screening Levels, Residential Land Use, Shallow Soil, Table S-1, February 2016 (Revision 3).

direct-push rig (Figure 5). Continuous soil cores were retrieved from each boring. Soil samples were collected at approximate depths of 3 to 9 inches and 12 to 18 inches below the ground surface from each of the borings and analyzed for the presence of organochlorine pesticides, arsenic, and lead.

None of the soil samples exhibited detectable concentrations of organochlorine pesticides. All of the collected soil samples exhibited detectable lead concentrations; the detected concentrations for S-1 and S-4 were 7.41 and 33.2 milligrams per kilogram (mg/kg), respectively. These concentrations were below the respective screening level assuming a residential land use scenario. Detected arsenic concentrations in the collected soil samples for S-1 and S-4 were 13.7 and 26.5 mg/kg, respectively. This is in excess of the respective arsenic screening level assuming a residential land use scenario and is in excess of expected background concentrations observed in the San Francisco Bay Area. Given the reported arsenic concentrations, it appeared the surface soil at the property may have been impacted from historic agricultural activities.

In order to evaluate potential vapor intrusion concerns, a soil gas assessment was conducted at the property. Three temporary soil gas monitoring wells (SG-1 through SG-3) were installed at the property using a Geoprobe® rig at the locations shown in Figure 7.

Each of the soil gas samples exhibited detectable target analyte concentrations; the detected analytes are typically associated with gasoline and/or other refined petroleum hydrocarbon product. Elevated concentrations of gasoline were detected in all three samples. Two of the three samples exhibited ethylbenzene concentrations in excess of the human risk screening level. One sample also exhibited a naphthalene concentration in excess of the respective human risk screening level. As the soil gas samples were collected in the immediate vicinity of the former UST location, additional soil gas sampling was recommended to determine the extent of soil gas impact at the property. Soil gas data is presented in Table C and soil data is presented in Table D.

SITE GEOLOGY AND HYDROGEOLOGY

Review of published topographic maps found that the Site is situated at an approximate elevation of 163 feet above mean sea level. The relatively level Site has a gentle slope toward the south-southwest. A review of the 1997 Helley and Graymer, et al. Geologic Map (USGS 1997) found that the Site is primarily underlain by Pleistocene-age alluvial and fluvial fan deposits, (Qpaf).

Based on the boring logs prepared and presented in the referenced studies, the lithology observed in the borings typically consists of 0.5 to 2 feet of gravelly clay – clayey gravel (fill material). The fill material is underlain by silty clay to depths of 3 to 4 feet below the ground surface. This material is, in turn, underlain by dark yellowish brown clayey silt, which grades into sand between 6 and 9 feet below the ground surface. Silty and gravelly sand is present to depths of 15 to 18 feet below the ground surfaces, where it is underlain by claystone bedrock.

Based on a review of site exploration and groundwater monitoring performed between 2005 and 2008, first groundwater is generally encountered between depths of 8½ and 11½ feet below the ground surface. Based on a review of the 2007 and 2008 groundwater elevation data (Table B), there is a slight flow gradient generally directed toward the south-southwest. Borings and cross-sections in the vicinity of the former USTs are depicted in Appendices A and B.

NATURE AND EXTENT OF SUBSURFACE IMPACT

At the time of UST removal (2004), soil samples collected from the resulting excavation exhibited elevated TPH-g, TPH-d, and xylene(s) concentrations. However, subsequent soil sampling of soil in 2005 and 2007 during site characterization and well installation events did not identify hydrocarbon impacts within soil at or near the former UST locations. Several of the samples collected were very close or corresponded to the locations of the 2004 samples. Based on these previous sampling events, it does not appear that soil hydrocarbon impact is present in near-surface and subsurface soils.

Groundwater samples were collected during the 2005 soil sampling program. Several samples exhibited detectable TPH-g and TPH-d concentrations above respective screening levels. However, when monitoring wells were installed at the Site in 2007, including wells at the locations of the 2005 sampling locations, none of the groundwater samples exhibited detectable concentrations of petroleum hydrocarbons, with the exception of a TPH-d concentration of 56 µg/L in one well. Subsequent sampling of the wells in 2008 did not identify detectable concentrations of TPH or related analytes.

Each of the soil gas samples (all collected in the immediate vicinity of the former UST location) exhibited detectable target analyte concentrations; the detected analytes are typically associated with gasoline and/or other refined petroleum hydrocarbon product. Elevated concentrations of gasoline were detected in all three samples. Two of the three samples exhibited ethylbenzene concentrations in excess of the human risk screening level. One sample also exhibited a naphthalene concentration in excess of the respective human risk screening level.

Intermittent surface soil samples exhibited low levels of detectable concentrations of organochlorine pesticides. The analytes that were detected includes gamma-chlordane, alpha-chlordane, 4,4-DDE, dieldrin, 4,4-DDT, heptachlor epoxide and chlordane; these concentrations were below respective screening levels.

All collected soil samples exhibited detectable lead concentrations; however, these concentrations were below the respective screening level assuming a residential land use scenario. Several detected arsenic concentrations in the collected soil samples were in excess of expected background concentrations observed in the San Francisco Bay Area.

PROPOSED SCOPE OF WORK

Soil Sampling

In order to further define the vertical and lateral extent of agricultural chemical impacts in soil at the Site, 13 borings will be advanced across the Site as shown in Figure 8. Two sets of samples will be collected from two depths (for a total of 26 samples). Soil samples will be retrieved within

continuous Geoprobe® acetate core liners measuring 2 feet in length. Continuous soil cores from each boring will be logged by an ENGEO geologist or engineer. Specific soil samples will be collected for laboratory analysis by cutting 12-inch portions of the Geoprobe soil core liners corresponding to the respective desired sampling depths in each location.

The sample sleeves will be sealed using Teflon® sheets secured by tight-fitting plastic end caps. Upon collection of samples, a sample label will be placed on the sample and will include a unique sample number, sample location, time/date collected, lab analysis, and the sampler's identification. The soil samples will be placed in an ice-cooled chest and submitted under documented chain-of-custody to a State-accredited fixed-base analytical laboratory.

For each sample location, two samples will be recovered from each boring approximately 0 to 12 inches and 12 to 24 inches below the ground surface. The laboratory will be instructed to homogenize the samples. Initially, the shallower samples from each boring (total of 13 samples) will be analyzed while the deeper sample from each location will be held by the laboratory pending the initial analysis. The samples will be analyzed for organochlorine pesticides (EPA Method 8081) and lead/arsenic (EPA Method 6010). Laboratory analysis will be performed on a standard 5-day laboratory turnaround. A background concentration assessment will be performed on the resulting arsenic concentration data.

Soil Gas Well Installation and Sampling

At least eight soil gas monitoring wells will be installed to provide supplemental soil gas data. Two wells will be installed within the former UST footprint, and six wells will be installed in an oval pattern extending out from the former UST footprint, as shown in Figure 8. Additional "step-out" wells may be installed, pending the sampling and analysis of the first six wells. The soil gas monitoring wells will be installed and sampled using the following methodology:

- The installation and sampling of the soil gas monitoring wells will be performed in accordance with the *Department of Toxic Substances Control (DTSC) Final Advisory Active Soil Gas Investigations (July 2015)*. The soil gas monitoring well casings will be constructed with ¼-inch-diameter Teflon tubing equipped with a filter at the base of the tubing. The well installations will be performed with a direct push probe rig, which will advance an approximately 3-inch diameter boring to a depth of 6 feet below the ground surface.

- For each well, the bottom of the well tubing will be equipped with a 1-inch-long filter situated at a depth of 5 feet below the ground surface, centered in the middle of a 2-foot layer of No. 3 sand. Six inches of dry bentonite will be installed on top of the sand, and the remaining annular space will be filled with hydrated bentonite grout to six inches below grade. The well tubing will extend an additional 2.5 feet beyond the ground surface so that it can be directly connected to the sample train. When not in use, the well tubing will be coiled and sealed with a threaded plug inside the well box. The well construction diagram is included as Figure 9.

- Once the installation of the annular seal is complete, we will connect a permanent Swagelok® fitting on the top of the well tubing and a threaded plug will be inserted. At this point, the mandatory two-hour equilibriation time will commence.

- After the two-hour equilibriation time has elapsed, we will connect the sample manifold to the well tubing. The sample train, which will consist of a stainless steel summa and manifold with built in flow controller set to 100-200 ml/min, will be encompassed in a helium shroud provided by the analytical laboratory.

- A purge vacuum pump will be attached to the manifold and a shut-in test will be peformed to assess for potential leaks. The shut-in test will consist of capping the end of the manifold, then applying a vacuum with the vacuum pump, closing the purge valve, and observing the vacuum gauge for two minutes to determine if there is a drop in vacuum.

- We will purge three well tubing volumes of soil gas from each well prior to sampling at flow rate of 150 ml/minute. The purge specifications are presented in the following table:

TABLE 1

TUBING LENGTH (feet)	TUBING VOLUME PER FOOT (ml)	TOTAL TUBING VOLUME (ml)	SAND PACK PORE VOLUME (ml) (50% POROSITY)	TOTAL WELL VOLUME (ml)	MINUTES (1X)	MINUTES (3X)	MINUTES (10X)
8.5	9.65	82	1,380	1,462	9.8	29.2	98

Notes: Purge minutes are based on a flowrate of 150 ml/min
Sandpack is 3 inches diameter by 2 feet in length

- After purging is completed, a 20 percent helium content will be established within a shroud and confirmed with a field meter prior to sampling. Once the 20-percent helium content is established, samples will be collected by opening the sample canister valve and allowing the sample canister to extract soil gas until the vacuum in the sample canister reaches approximately 5 inches of mercury.

- We will label each sample canister with a unique identification number, sampling time, pre and post sample vacuum readings; and the soil gas samples will be submitted to a State certified laboratory for analysis of TPH-g and volatile organic compounds (VOCs) by EPA Test Method TO-15 and the presence of helium. additional soil gas sampling will be performed in a step-out manner if determined to be necessary by the preliminary analytical results, and a mobile laboratory may be utilized to facilitate the additional sampling and analysis.

Standard operating procedures pertaining to the sampling and analysis described above are presented in Appendix C.

REPORTING

Following completion of the proposed field activities, a summary report, including all analytical results, will be prepared and provided in a letter report and submitted electronically to ACDEH. As appropriate, all reports and analytical data will be electronically uploaded to the California State Water Resources Control Board (SWRCB) GeoTracker website. The report will include a vapor intrusion risk evaluation and the proposed frequency for additional soil gas sampling events, if necessary.

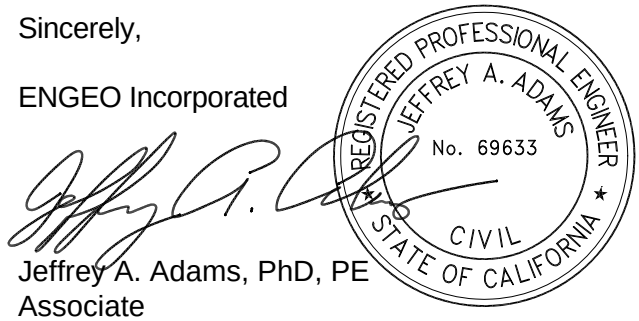
SCHEDULE

Following approval of this workplan, the proposed site sampling is preliminarily scheduled for January/February 2017. Following completion of the work, we anticipate a review meeting with ACDEH in February 2017, followed by preparation of a Remedial Action Plan (RAP) or similar document during February and March 2017.

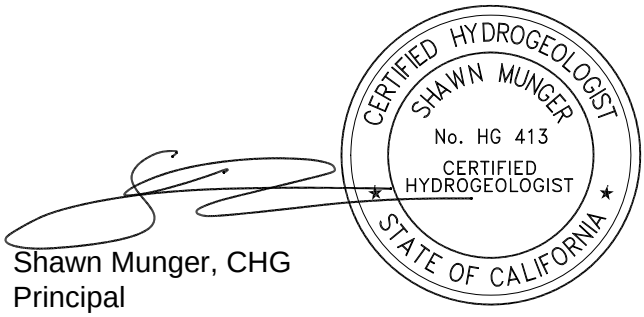
If you have any questions regarding this workplan, please do not hesitate to contact us.

Sincerely,

ENGEO Incorporated



Jeffrey A. Adams, PhD, PE
Associate



Shawn Munger, CHG
Principal

jaa/sm/jf

Attachments: References
Figures 1 – 9
Tables A - D
Appendix A – Soil Borings (AEI, 2008)
Appendix B – Cross Sections (AEI, 2008)
Appendix C – Sampling and Analysis Plan

REFERENCES

AEI, Preliminary Site Investigation Report, 20957 Baker Road, Castro Valley, California, June 7, 2005.

AEI, Additional Information Report, 20957 Baker Road, Castro Valley, California, November 15, 2008.

Department of Toxic Substances Control (DTSC) Final Advisory Active Soil Gas Investigations (July 2015)

ENGEO, Phase I Environmental Site Assessment, 20957 Baker Road, Castro Valley, California, Project Number 13255.000.000, August 23, 2016.

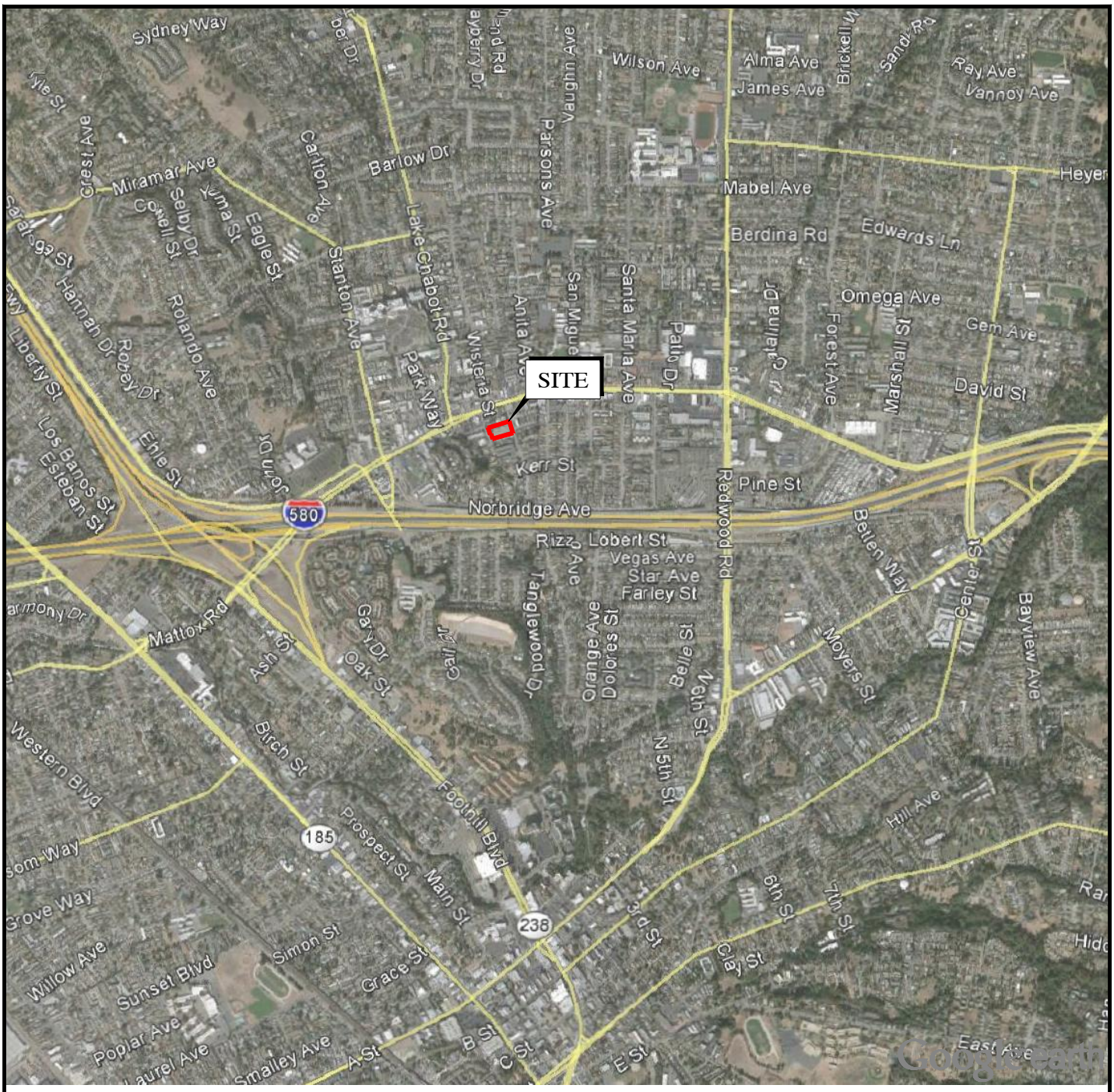
ENGEO, Phase I Environmental Site Assessment, 20785 Baker Road, Castro Valley, California, Project Number 13255.000.000, August 23, 2016.

ENGEO, Phase II Environmental Site Assessment, 20785 Baker Road, Castro Valley, California, Project Number 13255.000.000, August 31, 2016.

ENGEO, Phase II Environmental Site Assessment, 20957 Baker Road, Castro Valley, California, Project Number 13255.000.000, August 31, 2016.

San Francisco Regional Water Quality Control Board, Environmental Screening Levels, February 2016, 3rd Revision.

FIGURES



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BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE

ENGEO
Expect Excellence

VICINITY MAP

20785 AND 20957 BAKER ROAD

CASTRO VALLEY, CALIFORNIA

PROJECT NO.: 13255.000.000		FIGURE NO. 1
SCALE: AS SHOWN		
DRAWN BY: LL	CHECKED BY: JAA	

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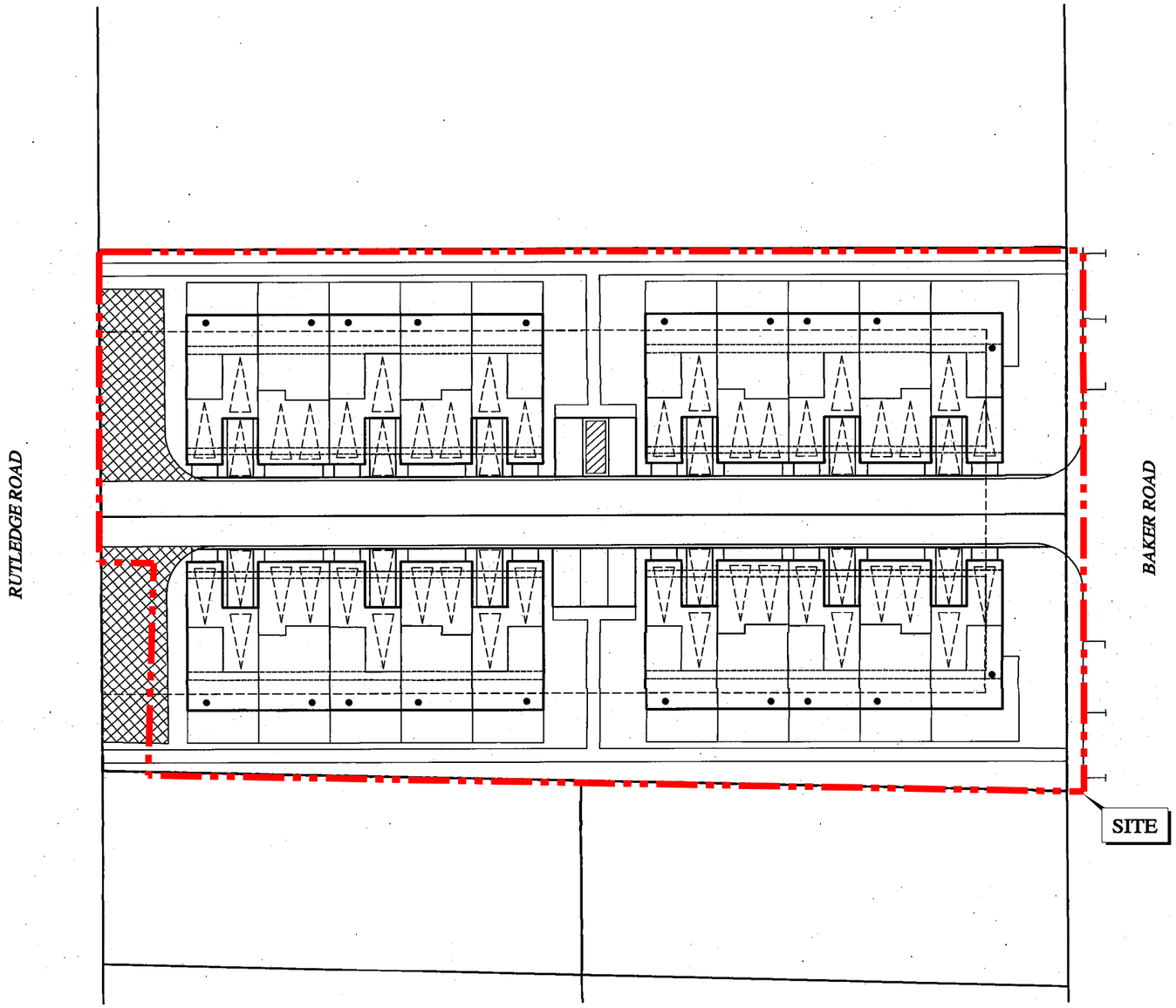

SITE SUMMARY

SITE ACRE		1.09 ac
TOTAL UNITS		20 du
Plan 2	*8 du*	*40%*
Plan 3	*10 du*	*50%*
Plan 3X	*2 du*	*10%*
DENSITY:		18.4 du/ac

PARKING SPACES:

REQUIRED

Unit Parking (2 stalls / du)	40 stalls
Guest Parking (1 stall / du)	20 stalls
Total	60 stalls

PROVIDED

2 Car Garage	40 stalls
Driveway	12 stalls
Head In	5 stalls
Baker On-Street	4 stalls
Total	61 stalls

OPEN SPACE:

REQUIRED

Common	min. 200 sf / unit | 25 ft min. dimension
Private	min. 300 sf/unit | 10 ft min. ground floor dimension | 7 ft min. balcony dimension
Total Usable	
Per Unit	min. 600 sf / unit
Total	min. 12,000 sf

PROVIDED

Common

Area A:	1,531 sf	Area C:	1,837 sf
Area B:	1,581 sf	Area D:	1,909 sf
Sub-Total:	3,112 sf	Sub-Total:	3,746 sf

Total Usable	
Per Unit	343 sf / unit
Total	6,858 sf

Private

Ground Floor:	220 sf / unit
Balcony:	TBD
Total Usable:	
Per Unit	220 sf / unit
Total	4,400 sf

Total Open Space	
Per Unit	563 sf (+ TBD Private Balcony Space)
Total	11,260 sf

N

0 FEET 40

0 METERS 20

BASE MAP SOURCE: WILLIAM HEZMALHALCH ARCHITECTS INC., 2016

ENGEO Expect Excellence

PROPOSED DEVELOPMENT PLAN
20785 AND 20957 BAKER ROAD
CASTRO VALLEY, CALIFORNIA

PROJECT NO.: 13255.000.000
SCALE: AS SHOWN
DRAWN BY: LL CHECKED BY: JAA

FIGURE NO. 2

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ORIGINAL FIGURE PRINTED IN COLOR

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- S-8 — SOIL SAMPLE (ENGEO, 2016)
- SG-3 — PREVIOUS SOIL GAS SAMPLE (ENGEO, 2016)
- MW-5 — PREVIOUS MONITORING WELL (AEI, 2007)
- SB-7 — PREVIOUS SOIL BORING (AEI, 2005)
- GT-9 — PREVIOUS SOIL BORING (AEI, 1986)

N

0 FEET 30

0 METERS 15

BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE, AEI CONSULTANTS, AND WILLIAM HEZMALHALCH ARCHITECTS INC., 2016

ENGEO Expect Excellence

PREVIOUS SAMPLE LOCATIONS

20785 AND 20957 BAKER ROAD

CASTRO VALLEY, CALIFORNIA

PROJECT NO.: 13255.000.000	FIGURE NO. 3
SCALE: AS SHOWN	
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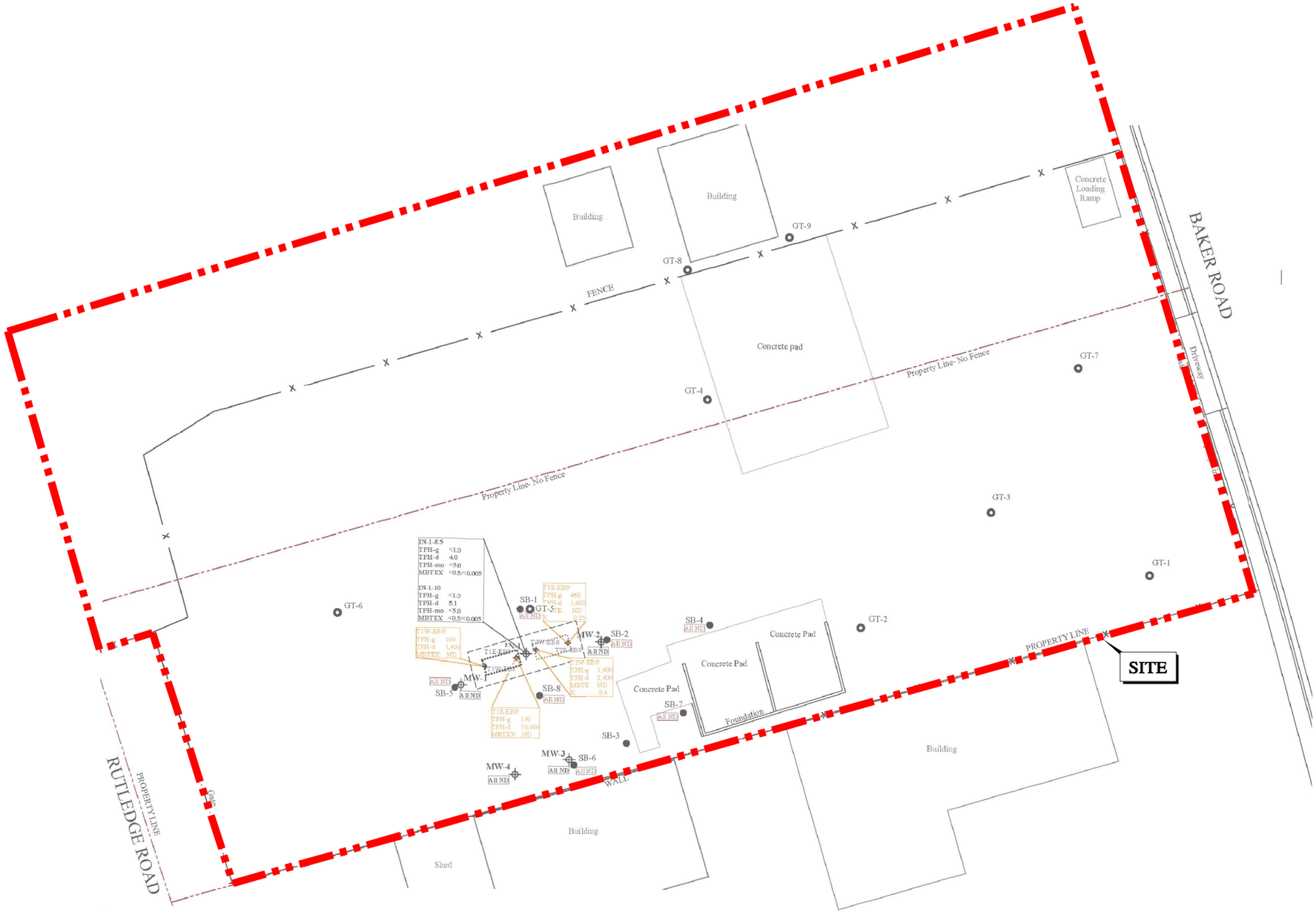
ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- SB-1 — SOIL BORING (AEI, 2005)
- MW-1 — MONITORING WELL (AEI, 2007)
- GT-1 — GEOTECHNICAL SOIL BORING (AEI, 1986)
- T1W-EB8' TPH-g 160 TPH-d 1,400 MBTEX ND — TANK EXCAVATION SAMPLE (AEI, 2004)
- All ND — PRELIMINARY SITE INVESTIGATION (AEI, 2005)
- IN-1-10 TPH-g <1.0 TPH-d 5.1 TPH-mo <5.0 MBTEX <0.5/<0.005 — WELL INSTALLATION (AEI, 2007)
- LIMIT OF TANK EXCAVATION (AEI, 2004)
- FORMER UST

N

0 FEET 30

0 METERS 15

BASE MAP SOURCE: AEI CONSULTANTS

ENGEO Expect Excellence

UST SOIL CONCENTRATIONS

20785 AND 20957 BAKER ROAD

CASTRO VALLEY, CALIFORNIA

PROJECT NO.: 13255.000.000	FIGURE NO. 4
SCALE: AS SHOWN	
DRAWN BY: LL	CHECKED BY: JAA

ORIGINAL FIGURE PRINTED IN COLOR

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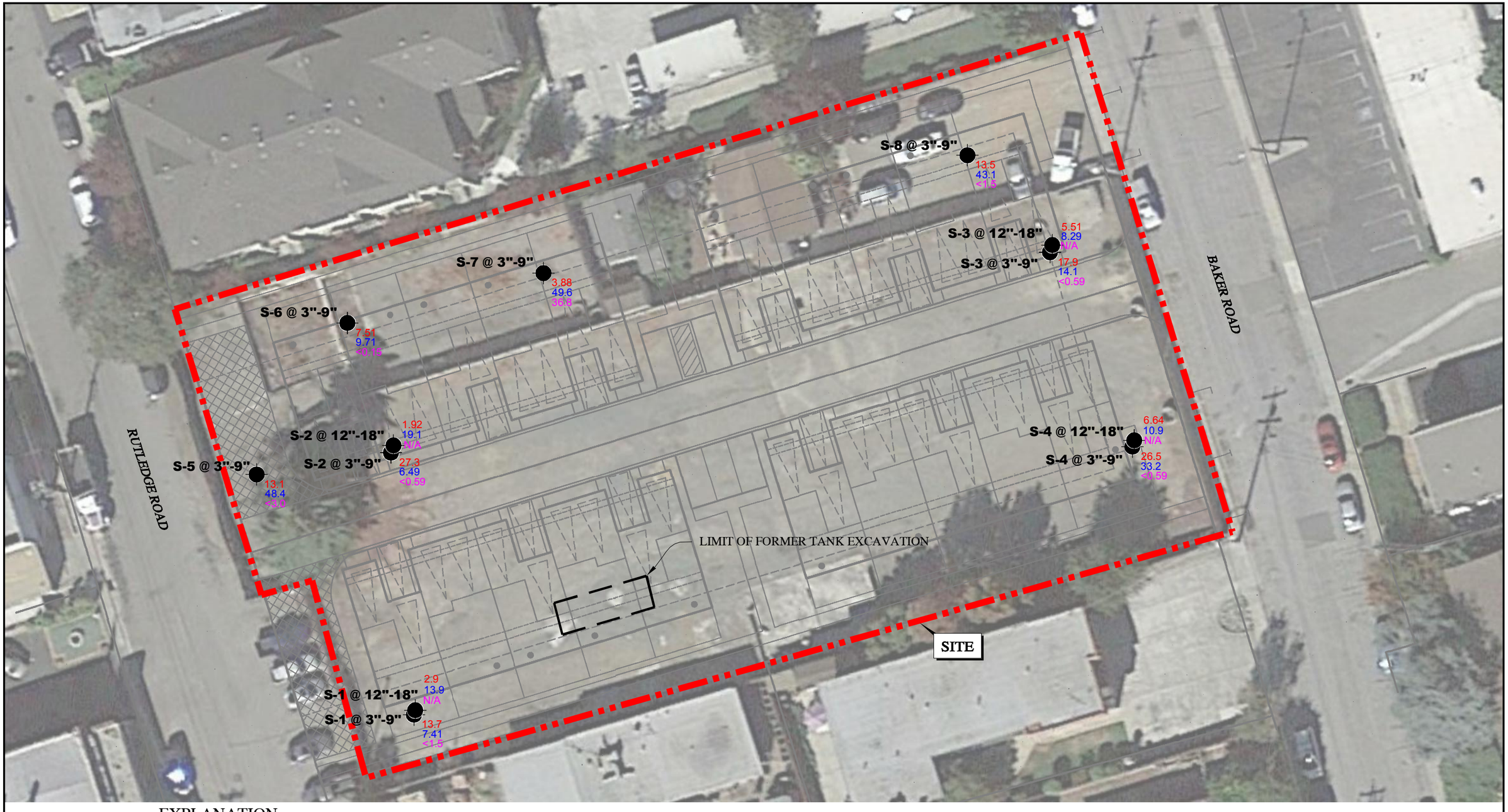


EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

S-8 @ 3"-9"
13.5
43.1
<1.5

- SOIL SAMPLE (ENGEO, 2016) WITH DEPTH SHOWN IN INCHES
- ARSENIC CONCENTRATION
- LEAD CONCENTRATION
- DIELDRIN CONCENTRATION

NOTE:
CONCENTRATION FOR LEAD AND ARSENIC ARE SHOWN IN mg/kg

CONCENTRATION FOR DIELDRIN ARE SHOWN IN ug/kg

N

0 FEET 30
0 METERS 15

BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE AND WILLIAM HEZMALHALCH ARCHITECTS INC., 2016

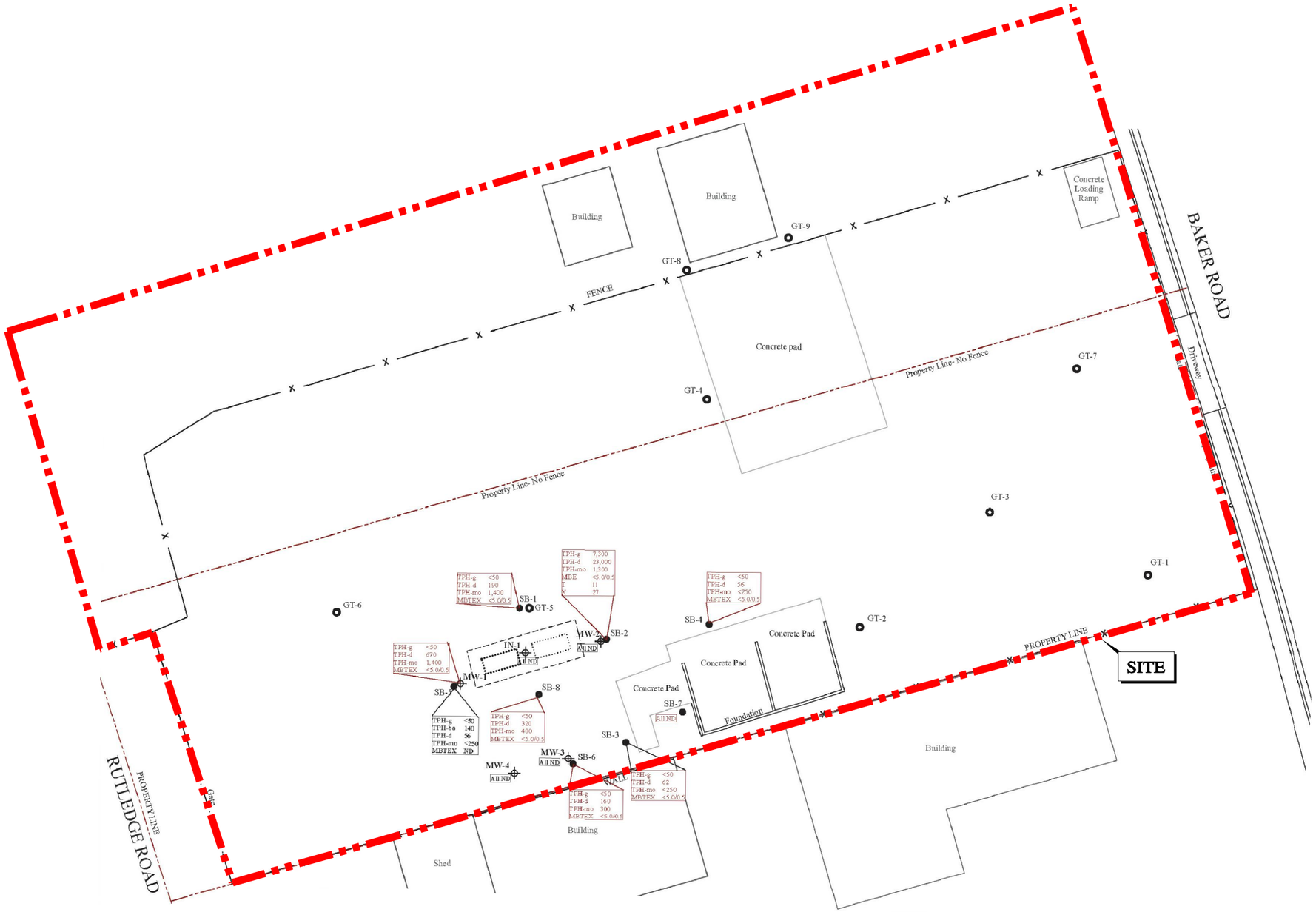
ENGEO Expect Excellence

LEAD, ARSENIC, AND PESTICIDE CONCENTRATIONS IN SOIL
20785 AND 20957 BAKER ROAD
CASTRO VALLEY, CALIFORNIA

PROJECT NO.: 13255.000.000		FIGURE NO. 5
SCALE: AS SHOWN		
DRAWN BY: LL	CHECKED BY: JAA	

G:\Drafting\DRAFTING2_Dwg_13000 Plus\13255\20785 and 20957 Baker Road Workplan\13255000000-WORKPLAN-5-PesticideConcentration-BAKER-ROAD-1216.dwg Plot Date:12-29-16 spatters

ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- SB-1 ● — SOIL BORING (AEI, 2005)
- MW-1 ⊕ — MONITORING WELL (AEI, 2007)
- GT-1 ○ — GEOTECHNICAL SOIL BORING (AEI, 1986)
- PREMINARY SITE INVESTIGATION (AEI, 2005)

TPH-g	7,300
TPH-d	23,000
TPH-mo	1,300
MBE	<5.0/0.5
T	11
X	27

- WELL INSTALLATION (AEI, 2007)

TPH-g	<50
TPH-bo	140
TPH-d	56
TPH-mo	<250
MBTEX	ND

- LIMIT OF TANK EXCAVATION (AEI, 2004)
- FORMER UST

BASE MAP SOURCE: AEI CONSULTANTS

ENGEO Expect Excellence

GROUNDWATER CONCENTRATIONS

20785 AND 20957 BAKER ROAD

CASTRO VALLEY, CALIFORNIA

PROJECT NO.: 13255.000.000		FIGURE NO. 6
SCALE: AS SHOWN		
DRAWN BY: LL	CHECKED BY: JAA	

ORIGINAL FIGURE PRINTED IN COLOR

G:\Drafting\DRAFTING2_Dwg_13000 Plus\13255\20785 and 20957 Baker Road Workplan\13255000000-WORKPLAN-6-GWConcentration-BAKER-ROAD-1216.dwg Plot Date: 12-28-16 llee

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

SG-3 — PREVIOUS SOIL GAS SAMPLE (ENGEO, 2016)

3,700 — ETHYLBENZENE CONCENTRATION

130 — NAPHTHALENE CONCENTRATION

245,000 — TPH-GASOLINE CONCENTRATION

NOTE:
CONCENTRATION ARE SHOWN IN ug/m³

N

0 FEET 30

0 METERS 15

BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE AND WILLIAM HEZMALHALCH ARCHITECTS INC., 2016

ENGEO Expect Excellence

SOIL GAS CONCENTRATIONS
20785 AND 20957 BAKER ROAD
CASTRO VALLEY, CALIFORNIA

PROJECT NO.: 13255.000.000
SCALE: AS SHOWN
DRAWN BY: LL
CHECKED BY: JAA

FIGURE NO. 7

G:\Drafting\DRAFTING2_Dwg_13000 Plus\13255\20785 and 20957 Baker Road Workplan\13255000000-WORKPLAN-7-SoilGasConcentration-BAKER-ROAD-1216.dwg Plot Date:12-29-16 spatters

ORIGINAL FIGURE PRINTED IN COLOR

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- PROPOSED SOIL SAMPLE
- PROPOSED SOIL GAS SAMPLE
- PROPOSED ADDITIONAL SOIL GAS SAMPLE
- S-8 — SOIL SAMPLE (ENGEO, 2016)
- SG-3 — PREVIOUS SOIL GAS SAMPLE (ENGEO, 2016)
- MW-5 — PREVIOUS MONITORING WELL (AEI, 2007)
- SB-7 — PREVIOUS SOIL BORING (AEI, 2005)
- GT-9 — PREVIOUS SOIL BORING (AEI, 1986)

N

0 FEET 30

0 METERS 15

BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE AND WILLIAM HEZMALHALCH ARCHITECTS INC., 2016

ENGEO Expect Excellence

PROPOSED SAMPLE LOCATIONS

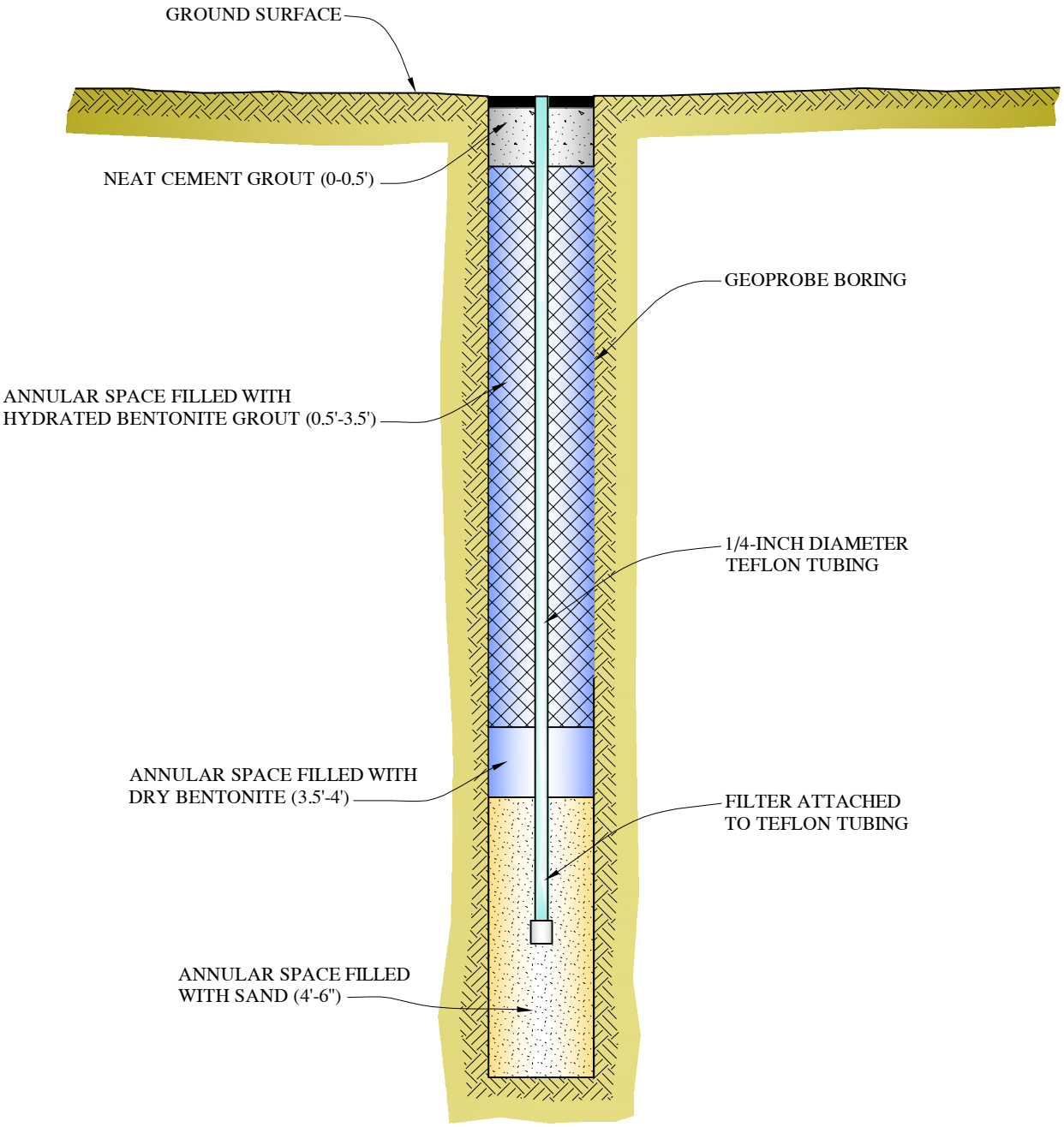
20785 AND 20957 BAKER ROAD

CASTRO VALLEY, CALIFORNIA

PROJECT NO.: 13255.000.000		FIGURE NO. 8
SCALE: AS SHOWN		
DRAWN BY: LL	CHECKED BY: JAA	

G:\Drafting\DRAFTING2_Dwg_13000 Plus\13255\20785 and 20957 Baker Road Workplan\13255000000-WORKPLAN-8-PropSample-BAKER-ROAD-1216.dwg Plot Date: 12-29-16 spatters

ORIGINAL FIGURE PRINTED IN COLOR



ENGEO Expect Excellence

SOIL GAS WELL CONSTRUCTION DIAGRAM

20785 AND 20957 BAKER ROAD

CASTRO VALLEY, CALIFORNIA

PROJECT NO.: 13255.000.000		FIGURE NO 9
SCALE: NO SCALE		
DRAWN BY: LL	CHECKED BY: JAA	

G:\Drafting\DRAFTING2_Dwg_13000 Plus\13255\20785 and 20957 Baker Road Workplan\13255000000-WORKPLAN-9-GasWellDetail-BAKER-ROAD-1216.dwg 12-28-16 ORIGINAL FIGURE PRINTED IN COLOR

TABLES

TABLE A - Former UST Location - Soil Analytical Data

Soil Gas Sample	Date Collected	Former UST Location - Soil Analytical Data								
		TPH-g	TPH-d	TPH-mo	Lead	MTBE	Benzene	Toluene	Ethylbenzene	Xylene(s)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
RWQCB Environmental Screening Levels[1]		740	230	11,000	80	42	0.23	970	5.1	560
T1W-EB8'	4/21/2004	160	4,900	----	6.1	ND<0.50	ND<0.05	ND<0.05	ND<0.05	ND<0.05
T1E-EB8'	4/21/2004	190	10,000	----	6.1	ND<1.7	ND<0.17	ND<0.17	ND<0.17	8.4
T2W-EB8'	4/21/2004	1,400	2,400	----	17	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0
T2E-EB8'	4/21/2004	460	1,400	----	18	ND<0.50	ND<0.05	ND<0.05	ND<0.05	0.25
SB1-11.5	5/18/2005	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SB2-10	5/18/2005	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SB3-7.5	5/18/2005	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SB4-7.5	5/18/2005	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SB5-7.5	5/18/2005	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SB6-7.5	5/18/2005	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SB7-8	5/18/2005	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
SB8-7.5	5/18/2005	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
IN-1-8.5	10/12/2007	ND<1.0	4.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
IN-1-10	10/12/2007	ND<1.0	5.1	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
IN-1-12	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-1-8.5	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-1-9	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-2-11.5	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-2-13.5	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-3-11	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-3-13	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-4-11	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-4-12	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-4-16	10/12/2007	ND<1.0	ND<1.0	ND<5.0	----	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005

Notes:
ND- Not Detected

[1] Regional Water Quality Control Board, Soil Direct Exposure Human Risk Levels, Shallow Soil, Residential Land Use, Table S-1, February 2016 (Revision 3).

TABLE B - Groundwater Analytical Data

Soil Gas Sample	Date Collected	Depth to Water (ft.)	Groundwater Elevation (ft. msl)	Groundwater Analytical Data								
				TPH-g µg/l	TPH-d µg/l	TPH-mo µg/l	TPH-bo µg/l	MTBE µg/l	Benzene µg/l	Toluene µg/l	Ethylbenzene µg/l	Xylene(s) µg/l
RWQCB Environmental Screening Levels[1]				**220**	**150**	**----**	**----**	**5**	**1**	**40**	**30**	**20**
SB1-W (NEAR IN-1)	5/18/2005	8.75	----	ND<50	**190**	1,400	----	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
IN-1	10/18/2007	10.89	148.96	ND<50	ND<50	ND<250	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	1/14/2008	8.39	151.46	ND<50	ND<50	----	ND<250	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	4/16/2008	10.21	149.64	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	8/20/2008	11.39	148.46	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB5-W (NEAR MW-1)	5/18/2005	11.60	----	ND<50	**670**	1,400	----	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
MW-1	10/18/2007	11.64	147.98	ND<50	56	ND<250	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	1/14/2008	8.81	150.81	ND<50	ND<50	----	ND<250	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	4/16/2008	8.98	150.64	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	8/20/2008	11.09	148.53	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB2-W (NEAR MW-2)	5/18/2005	9.20	----	**7,300**	**23,000**	1,300	----	ND<5.0	ND<0.5	11	ND<5	ND<0.5
MW-2	10/18/2007	11.74	148.26	ND<50	ND<50	ND<250	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	1/14/2008	8.49	151.51	ND<50	ND<50	----	ND<250	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	4/16/2008	10.38	149.62	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	8/20/2008	11.56	148.44	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB3-W (NEAR MW-3)	5/18/2005	8.56	----	ND<50	62	ND<250	----	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB6-W (NEAR MW-3)	5/18/2005	8.62	----	ND<50	**160**	300	----	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
MW-3	10/18/2007	11.1	148.69	ND<50	ND<50	ND<250	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	1/14/2008	8.41	151.38	ND<50	ND<50	----	ND<250	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	4/16/2008	10.19	149.6	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	8/20/2008	11.38	148.41	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
MW-4	10/18/2007	14.82	144.87	ND<50	ND<50	ND<250	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	1/14/2008	8.77	150.92	ND<50	ND<50	----	ND<250	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	4/16/2008	9.94	149.75	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	8/20/2008	11.42	148.27	ND<50	ND<50	----	ND<100	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB4-W	5/18/2005	9.60	----	ND<50	56	ND<250	----	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB7-W	5/18/2005	8.56	----	ND<50	ND<50	ND<250	----	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB8-W	5/18/2005	8.7	----	ND<50	**320**	480	----	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5

Notes:
ND- Not Detected

[1] Regional Water Quality Control Board, Groundwater Direct Exposure Human Risk Levels, MCL Priority, Table GW-1, February 2016 (Revision 3).

TABLE C - SUMMARY OF SOIL GAS LABORATORY ANALYSIS

Soil Gas Sample	Date Collected	Volatile Organic Compounds/Total Petroleum Hydrocarbons as Gasoline									
		Acetone	2-Hexanone	Ethylbenzene	m,p - Xylene	o- Xylene	1,2,4-Trimethylbenzene	Naphthalene	1,2,4-Trichlorobenzene	1,3,5-Trimethylbenzene	TPH-Gasoline
		µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
RWQCB Environmental Screening Levels[1]		16,000,000	N/A	560	52,000	52,000	N/A	41	1,000	N/A	300,000
SG-1	8/19/2016	8,500	95	**3,500**	17,000	5,200	88	ND<45	ND<75	ND<11	88,100
SG-2	8/19/2016	4,900	ND<6.5	210	1,100	370	ND<6.0	ND<13	160	ND<3.0	15,300
SG-3	8/19/2016	2,500	170	**3,700**	20,000	7,800	5,700	**130**	ND<110	2,300	245,000

Notes:
N/A- Not Applicable
ND- Not Detected

[1] Regional Water Quality Control Board, Subslab/Soil Gas Vapor Intrusion Human Risk Levels, Residential Land Use, Table SG-1, February 2016 (Revision 3).

TABLE D - Surface Soil Sample Results

Soil Sample	Date Collected	Arsenic	Lead	gamma-Chlordane	alpha-Chlordane	4,4-DDE	Dieldrin	4,4-DDT	Chlordane	Heptachlor Epoxide	Other OCPs
		mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
RWQCB Environmental Screening Levels[1]		0.067	80	-	-	1,900	38	1,900	480	67	N/A
S-1@3-9"	8/19/2016	13.7	7.41	ND<1.6	ND<1.7	ND<1.9	ND<1.5	ND<1.3	ND<21	ND<0.78	ND
S-1@12-18"	8/19/2016	2.9	13.9	----	----	----	----	----	----	----	----
S-2@3-9"	8/19/2016	27.3	6.49	ND<0.65	ND<0.69	ND<0.78	ND<0.59	ND<0.52	ND<8.4	ND<0.31	ND
S-2@12-18"	8/19/2016	1.92	19.1	----	----	----	----	----	----	----	----
S-3@3-9"	8/19/2016	17.9	14.1	ND<0.65	ND<0.69	ND<0.78	ND<0.59	ND<0.52	ND<8.4	ND<0.31	ND
S-3@12-18"	8/19/2016	5.51	8.29	----	----	----	----	----	----	----	----
S-4@3-9"	8/19/2016	26.5	33.2	ND<0.65	ND<0.69	ND<0.78	ND<0.59	ND<0.52	ND<8.4	ND<0.31	ND
S-4@12-18"	8/19/2016	6.64	10.9	----	----	----	----	----	----	----	----
S-5@3-9"	8/24/2016	13.1	48.4	ND<3.3	ND<3.5	ND<3.9	ND<3.0	ND<2.6	ND<42	ND<1.6	ND
S-6@3-9"	8/24/2016	7.51	9.71	ND<0.16	ND<0.17	ND<0.19	ND<0.15	ND<0.13	ND<2.1	ND<0.078	ND
S-7@3-9"	8/24/2016	3.88	49.6	9.71	8.55	26.6	36.8	87.9	73.1	ND<0.78	ND
S-8@3-9"	8/24/2016	13.5	43.1	ND<1.6	ND<1.7	1.9	ND<1.5	8.03	ND<21	0.78	ND

Notes:
ND- Not Detected

[1] Regional Water Quality Control Board, Soil Direct Exposure Human Risk Levels, Shallow Soil, Residential Land Use, Table S-1, February 2016 (Revision 3).

APPENDIX A

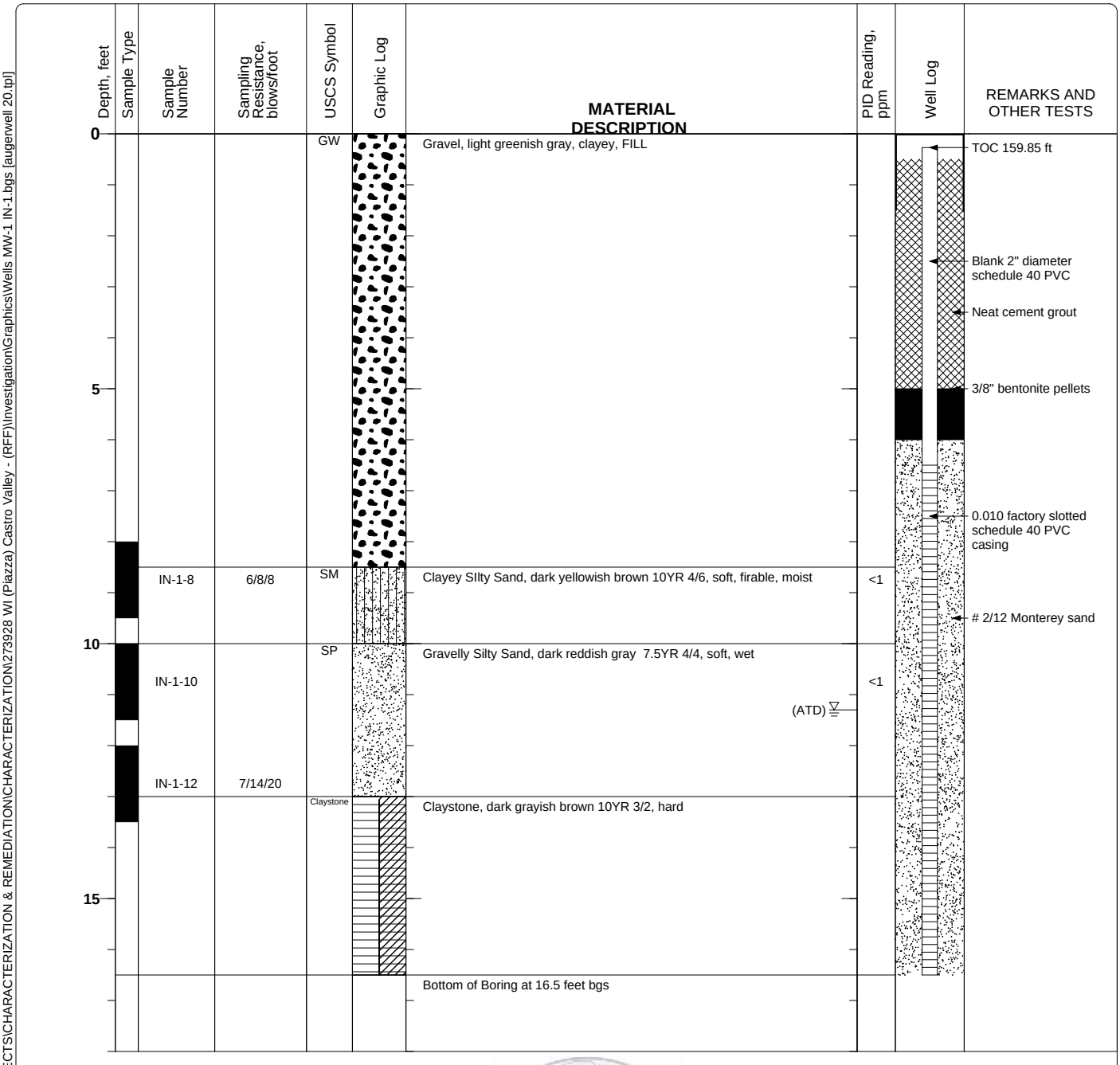
Soil Borings (AEI, 2008)

Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 273928

Log of Boring IN-1

Sheet 1 of 1

Date(s) Drilled **October 12, 2007**	Logged By **Leah Levine-Goldberg**	Checked By **Robert F. Flory, P.G**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8 1/4 inch**	Total Depth of Borehole **16.5 feet bgs**
Drill Rig Type **CME-75**	Drilling Contractor **HEW Drilling**	Surface Elevation **160.12 feet MSL**
Groundwater Level and Date Measured **11.3 feet ATD**	Sampling Method(s) **ModCal**	Permit # **W2007-0968**
Borehole Backfill **Well Completion**	Location	



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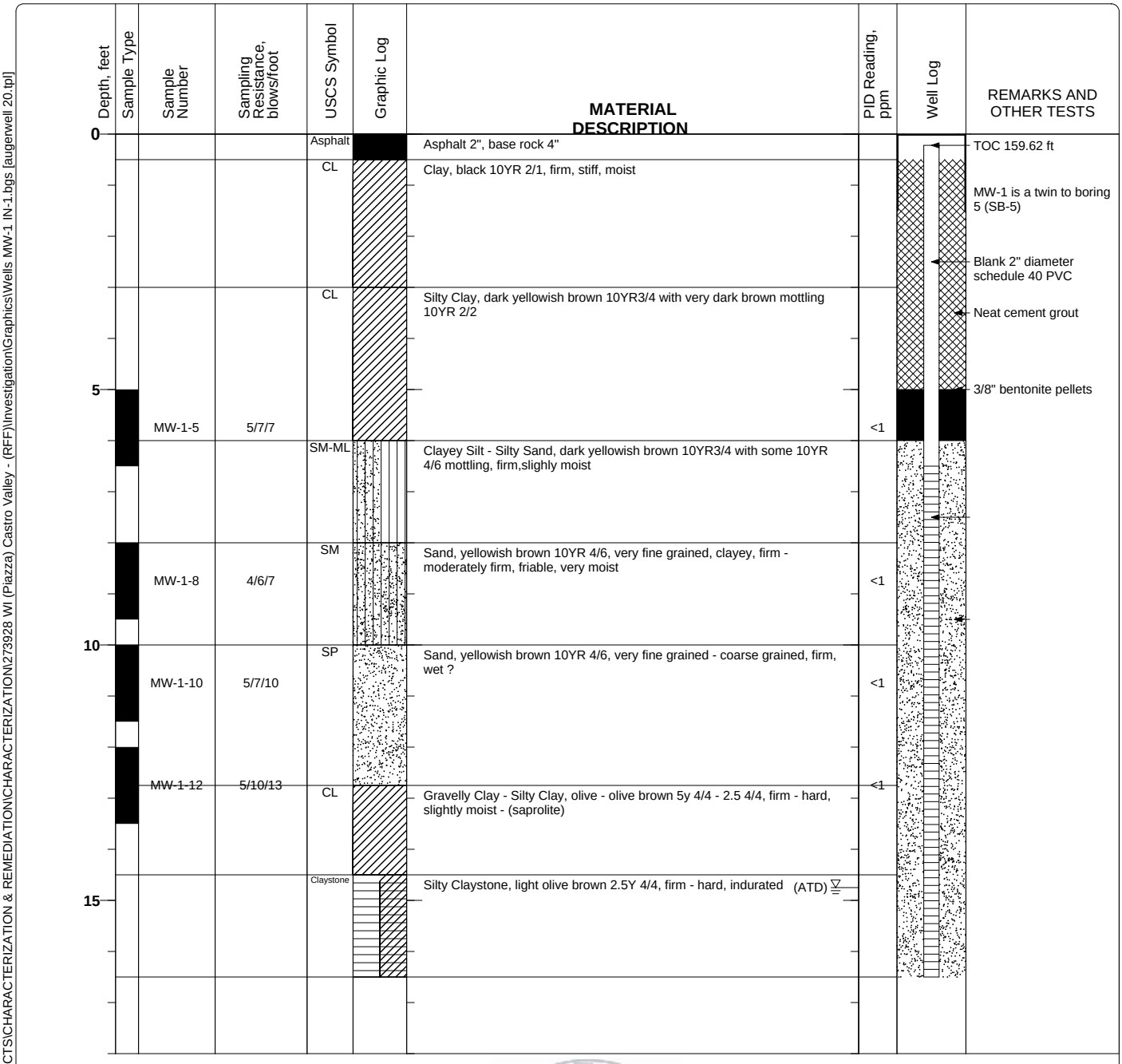
Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 273928

Log of Boring MW-1

Sheet 1 of 1

Date(s) Drilled **October 12, 2007**	Logged By **Leah Levine-Goldberg**	Checked By **Robert F. Flory, PG**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8 1/4 inch**	Total Depth of Borehole **16.5 feet bgs**
Drill Rig Type **CME-75**	Drilling Contractor **HEW Drilling**	Surface Elevation **159.84 feet MSL**
Groundwater Level and Date Measured **14.75 feet ATD**	Sampling Method(s) **ModCal**	Permit # **W2007-0964**
Borehole Backfill **Well Completion**	Location	



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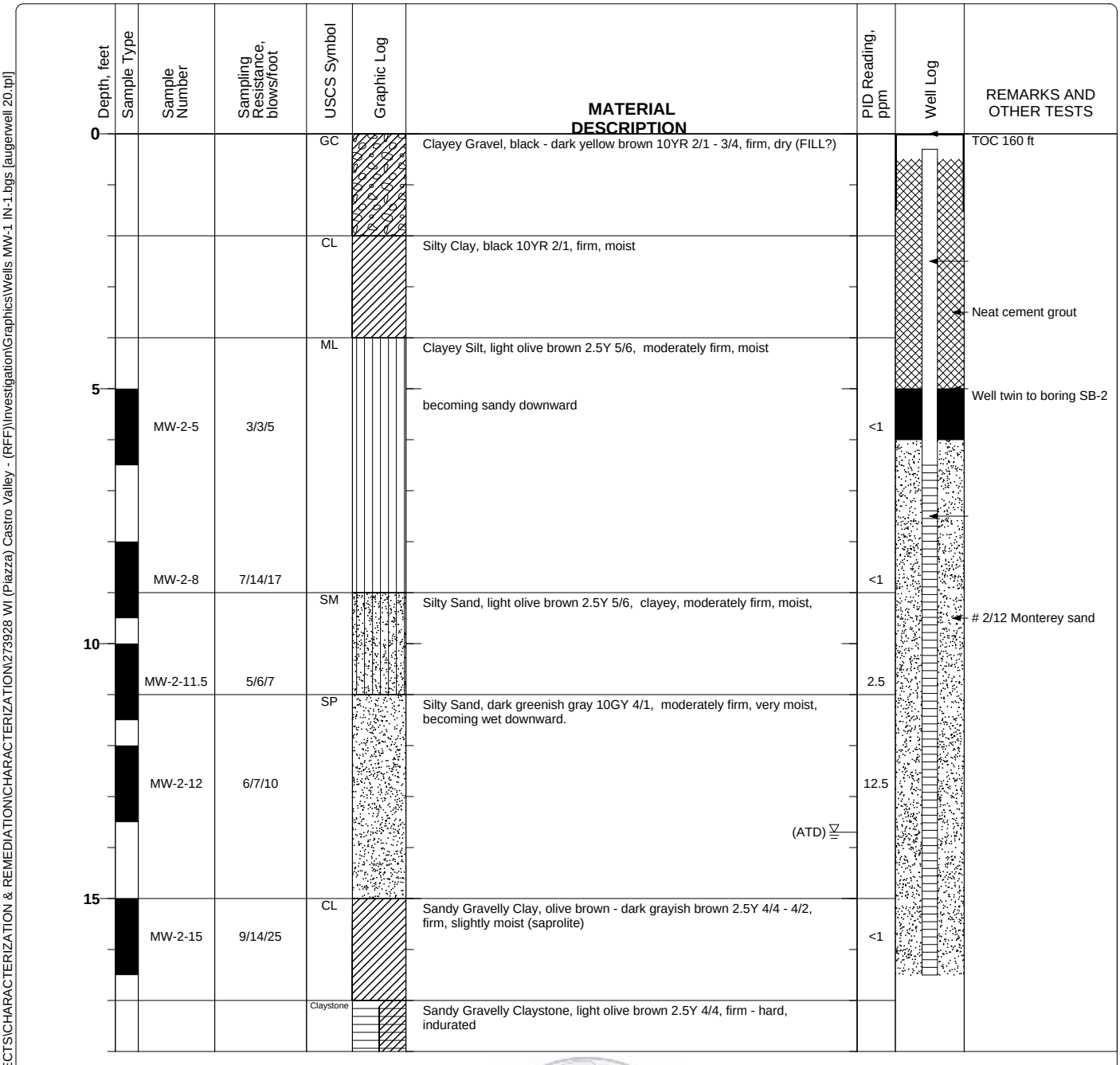
Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 273928

Log of Boring MW-2

Sheet 1 of 1

Date(s) Drilled **October 12, 2007**	Logged By **Leah Levine-Goldberg**	Checked By **Robert F. Flory, PG**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8 1/4 inch**	Total Depth of Borehole **18 feet bgs**
Drill Rig Type **CME-75**	Drilling Contractor **HEW DRILLING**	Surface Elevation **160.3 feet**
Groundwater Level and Date Measured **13.7 feet ATD**	Sampling Method(s) **ModCal**	Permit # **W2007-0965**
Borehole Backfill **Well Completion**	Location	



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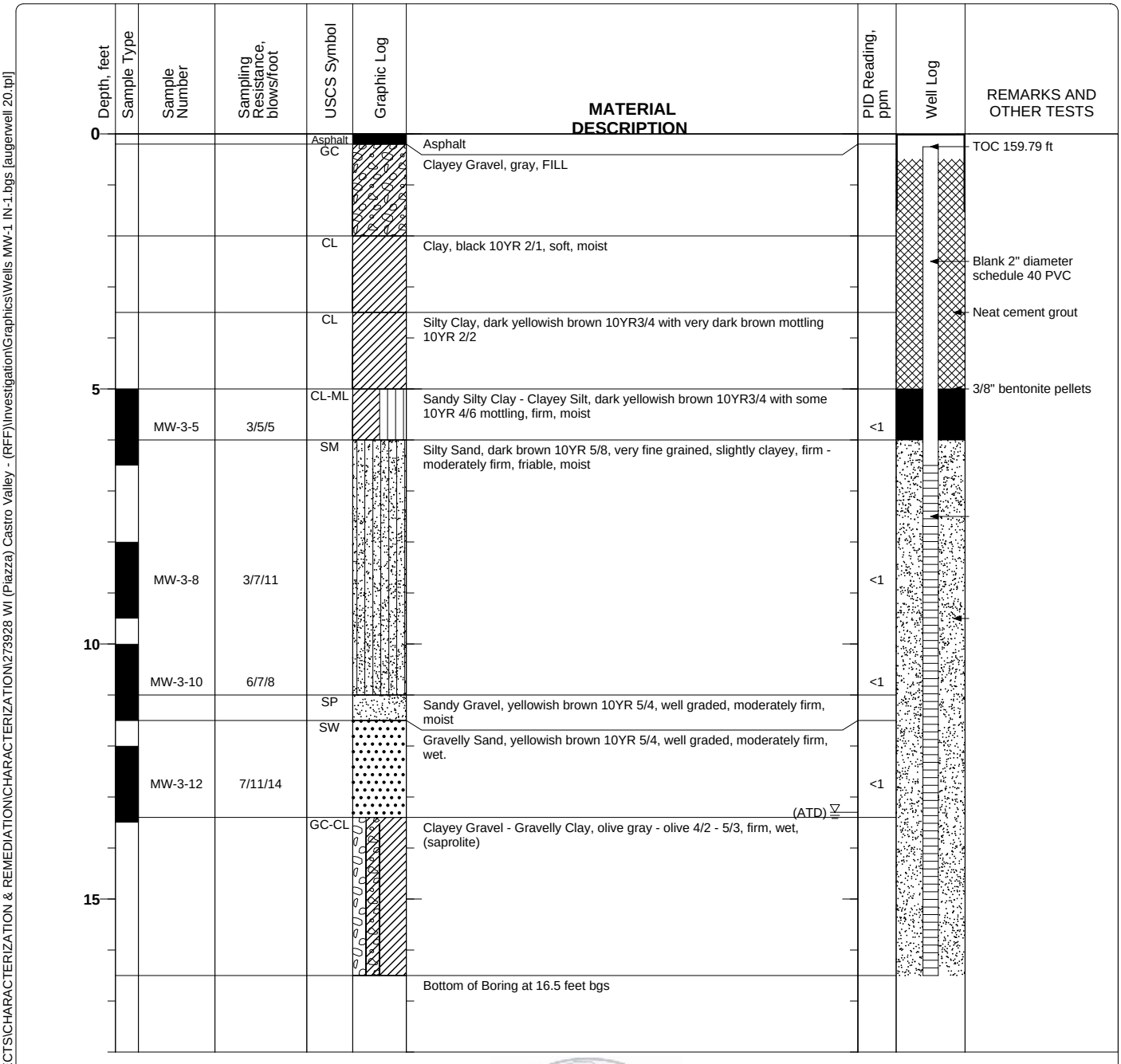
ENVIRONMENTAL & CIVIL ENGINEERING

Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 273928

Log of Boring MW-3

Sheet 1 of 1

Date(s) Drilled **October 12, 2007**	Logged By **Leah Levine-Goldberg**	Checked By **Robert F. Flory, PG**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8 1/4 inch**	Total Depth of Borehole **16.5 feet bgs**
Drill Rig Type **CME-75**	Drilling Contractor **HEW Drilling**	Surface Elevation **160.04 feet MSL**
Groundwater Level and Date Measured **13.3 feet ATD**	Sampling Method(s) **ModCal**	Permit # **W2007-0966**
Borehole Backfill **Well Completion**	Location	



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Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 273928

Log of Boring MW-4

Sheet 1 of 1

Date(s) Drilled **October 12, 2007**	Logged By **Leah Levine-Goldberg**	Checked By **Robert F. Flory, P.G**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8 1/4 inch**	Total Depth of Borehole **16.5 feet bgs**
Drill Rig Type **CME-75**	Drilling Contractor **HEW Drilling**	Surface Elevation **159.95 feet MSL**
Groundwater Level and Date Measured **15.4 feet ATD**	Sampling Method(s) **ModCal**	Permit # **W2007-0967**
Borehole Backfill **Well Completion**	Location	

Depth, feet	Sample Type	Sample Number	Sampling Resistance, blows/foot	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	Well Log	REMARKS AND OTHER TESTS
0				Asphalt					TOC 159.69 ft
				GC		Clayey Gravel, gray, FILL			
				CL		Clay, Black 10YR 2/1			Blank 2" diameter schedule 40 PVC
5									Neat cement grout
		MW-4-6	5/8/9	CL		Sandy Silty Clay, dark brown, 10YR 3/6, moist , firm	<1		
		MW-4-8	5/7/10	SC		Clayey Silty Sand, dark olive brown - light olive brown 2.5Y 3/3 - 5/6, moderately firm, moist	<1		
10		MW-4-11	3/8/11	CL		Gravelly Clay, light brownish gray, weathered claystone with green siltstone clasts, firm, moist	<1		
		MW-4-12	6/8/12				<1		
15						(ATD) ▽			
		MW-4-16	5/7/10	Claystone		Silty Claystone, grayish brown 2.5Y 5/2, saprolitic with purplish black clasts, firm, moist	<1		
						Bottom of Boring at 16.5 feet bgs			

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Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 10509

Log of Boring SB-1

Sheet 1 of 1

Date(s) Drilled **May 18, 2005**	Logged By **Robert F. Flory**	Checked By **Adrian Angel**
Drilling Method **Geoprobe**	Drill Bit Size/Type	Total Depth of Borehole **14 feet bgs**
Drill Rig Type **Geoprobe 5410**	Drilling Contractor **EnProb**	Approximate Surface Elevation
Groundwater Level and Date Measured **8.75 feet ATD**	Sampling Method(s) **Tube**	Permit #
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			Asphalt		Asphalt 2", base rock 4"		
				CL		Clay, black 10YR 2/1, firm, stiff, moist		
		X	SB1-3.5	CL		Silty Clay, dark yellowish brown 10YR3/4 with very dark brown mottling 10YR 2/2	0.3	
	5			CL-ML		Sandy silty Clay - Clayey Sand Silt, dark yellowish brown 10YR3/4 with some 10YR 4/6 mottling		
		X	SB1-7.5	SM		Silty Sand, yellowish brown 10YR 4/6, very fine grained, slightly clayey, firm - moderately firm, friable, very moist	0.5	
						becoming wet @ 9 feet (ATD) ▽		
	10	X	SB1-11.5	SP		Sand, strong brown 7.5 4/6, soft, loose, wet	0.9	Boring sealed to surface with neat cement grout.
				GC		Clayey Gravel, olive - olive brown 5y 4/4 - 2.5 4/4, firm, moist - (saprolite)		
				Claystone		Sandy Silty Claystone, light olive brown 2.5Y 4/4, firm - hard, indurated		
						Bottom of Boring at 14 feet bgs		
	15							
	20							

Figure

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Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 10509

Log of Boring SB-2

Sheet 1 of 1

Date(s) Drilled **May 18, 2005**	Logged By **Robert F. Flory**	Checked By **Adrian Angel**
Drilling Method **Geoprobe**	Drill Bit Size/Type **2 inch**	Total Depth of Borehole **18 feet bgs**
Drill Rig Type **Geoprobe 5410**	Drilling Contractor **EnProb**	Approximate Surface Elevation
Groundwater Level and Date Measured **9.2 feet ATD**	Sampling Method(s) **Tube**	Permit #
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			GC		Clayey Gravel, black - dark yellow brown 10YR 2/1 - 3/4, firm, dry (FILL?)		
						No recovery		
		X	SB2-3.5				0.1	
	5			ML		Clayey Silt, olive gray 5Y 5/2, moderately firm, moist		
						becoming sandy downward		
		X	SB2-7.5				0.3	
	10			SM		Silty Sand, olive gray 5Y 5/2, clayey, moderately firm, moist wet @(9.3 (ATD) ▽		
		X	SB2-11.5	SP		Silty Sand, dark gray green 10GY 3/1, clayey, moderately firm,	175	
		X	SB2-13	SW		Gravelly Sand, dark greenish gray 10GY 4/1, firm, wet	85	Boring sealed to surface with neat cement grout
	15			CL		Sandy Gravelly Clay, olive brown - dark grayish brown 2.5Y 4/4 - 4/2, firm, slightly moist (saprolite)		
				Claystone		Sandy Gravelly Claystone, light olive brown 2.5Y 4/4, firm - hard, indurated		
						Bottom of Boring at 18 feet bgs		
	20							

Figure

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Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 10509

Log of Boring SB-3

Sheet 1 of 1

Date(s) Drilled **May 18, 2005**	Logged By **Robert F. Flory**	Checked By **Adrian Angel**
Drilling Method **Geoprobe**	Drill Bit Size/Type **2 inch**	Total Depth of Borehole **16 feet bgs**
Drill Rig Type **Geoprobe 5410**	Drilling Contractor **EnProb**	Approximate Surface Elevation
Groundwater Level and Date Measured **8.56 feet ATD**	Sampling Method(s) **Tube**	Permit #
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			Asphalt		Asphalt 2", base rock 4"		
				CL		Clay, black 10YR 2/1, firm, stiff, moist		
		X	SB3-3.5	CL		Silty Clay, dark yellowish brown 10YR3/4 with some very dark brown 10YR 2/2 mottling, firm, slightly moist	0.5	
	5			CL-ML		Clayey Silt - Silt, dark yellowish brown 10YR3/4 with some 10YR 4/6 mottling		
		X	SB3-7.5				1.0	
				SM		Silty Sand, strong brown 7.5 YR 5/6, firm, moist becoming wet @ 10.0 (ATD) ▽		
	10	X	SB3-11.5				1.2	
				SP		Clayey Sand, yellowish brown 10YR 4/6, moderately firn - moderately soft, wet		
				Claystone		Sandy Silty Claystone, light olive brown 2.5Y 4/4, firm - hard, indurated, slightly moist		Borings sealed to surface with neat cement grout
	15					No recovery		
						Bottom of Boring at 16 feet bgs		
	20							

Figure

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Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 10509

Log of Boring SB-4

Sheet 1 of 1

Date(s) Drilled **May 18, 2005**	Logged By **Robert F. Flory**	Checked By **Adrian Angel**
Drilling Method **Geoprobe**	Drill Bit Size/Type **2 inch**	Total Depth of Borehole **13.5 feet bgs**
Drill Rig Type **Geoprobe 5410**	Drilling Contractor **EnProb**	Approximate Surface Elevation
Groundwater Level and Date Measured **9.6 feet ATD**	Sampling Method(s) **Tube**	Permit #
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			Asphalt		Asphalt 2", base rock 4"		
				CL		Clay, black 10YR 2/1, firm, stiff, moist		
		X	SB4-3.5				1.0	
				CL		Silty Clay, dark yellowish brown 10YR3/4 with very dark brown mottling 10YR 2/2		
	5			CL-ML		Sandy Silty Clay - Clayey Sandy Silt, dark yellowish brown 10YR 3/4 - 4/6 mottled,		
		X	SB4-7.5	CL-ML		Silty Clay - Clayey Silt, yellowish brown 10YR 4/6, moderately firm, moist	0.3	
						becoming wet @ 9.6 feet (ATD)		
	10			CL		Sandy Clay grading downward to Clayey Sand, dark yellowish brown - 10YR 6/6, firm, moist		
		X	SB4-11.5	SC		Clayey Sand, brownish yellow - light yellowish brown 10YR 6/6 - 6/4, firm - moderately firm, very moist	0.5	
		X	SB4-12				0.5	Boring sealed to surface with neat cement grout
				SC		Clayey Sand, light olive brown 2.5Y 5/6 - strong brown 7.5 YR 5/8 mottling, moderately firm, wet		
						Refusal at 13.5 feet		
	15							
	20							

Figure

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Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 10509

Log of Boring SB-5

Sheet 1 of 1

Date(s) Drilled **May 18, 2005**	Logged By **Robert F. Flory**	Checked By **Adrian Angel**
Drilling Method **Geoprobe**	Drill Bit Size/Type **2 inch**	Total Depth of Borehole **18 feet bgs**
Drill Rig Type **Geoprobe 5410**	Drilling Contractor **EnProb**	Approximate Surface Elevation
Groundwater Level and Date Measured **Dry feet ATD, 11.1 feet after 2.5 hrs**	Sampling Method(s) **Tube**	Permit #
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			Asphalt		Asphalt 2", base rock 4"		
				CL		Clay, black 10YR 2/1, firm, stiff, moist		
		X	SB5-3.5	CL		Silty Clay, dark yellowish brown 10YR3/4 with very dark brown mottling 10YR 2/2	0.1	
	5							
				CL-ML		Clayey Silt, dark yellowish brown 10YR3/4 with some 10YR 4/6 mottling, firm,slighly moist		
		X	SB5-7.5				0.1	
				SM		Sand, yellowish brown 10YR 4/6, very fine grained, clayey, firm - moderately firm, friable, very moist		
	10			SP		Sand, yellowish brown 10YR 4/6, very fine grained - coarse grained, firm, wet ? (after 2.5 hrs) ▼		
		X	SB5-11.5				0.3	
				CL		Gravelly Clay - Silty Clay, olive - olive brown 5y 4/4 - 2.5 4/4, firm - hard, slightly moist - (saprolite)		
	15	X	SB5-14	Claystone		Silty Claystone, light olive brown 2.5Y 4/4, firm - hard, indurated	1.0	Boring sealed to surface with neat cement grout
						Bottom of Boring at 18 feet bgs		
	20							

Figure

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Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 10509

Log of Boring SB-6

Sheet 1 of 1

Date(s) Drilled **May 18, 2005**	Logged By **Robert F. Flory**	Checked By **Adrian Angel**
Drilling Method **Geoprobe**	Drill Bit Size/Type **2 inch**	Total Depth of Borehole **14 feet bgs**
Drill Rig Type **Geoprobe 5410**	Drilling Contractor **EnProb**	Approximate Surface Elevation
Groundwater Level and Date Measured **8.62 feet ATD**	Sampling Method(s) **Tube**	Permit #
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			Asphalt		Asphalt 2", clayey gravelly FILL		
				CL		Clay, black 10YR 2/1, soft, moist		
		X	SB6-3.5	CL		Silty Clay, dark yellowish brown 10YR3/4 with very dark brown mottling 10YR 2/2	1.0	
	5			CL-ML		Sandy Silty Clay - Clayey Silt, dark yellowish brown 10YR3/4 with some 10YR 4/6 mottling, firm, moist		
				SM		Silty Sand, yellowish brown 10YR 4/6, very fine grained, slightly clayey, firm - moderately firm, friable, very moist - wet		
		X	SB6-7.5			becoming wet @ 9 feet (ATD)	0.8	
	10	X	SB6-10.5				1.1	
				SP		Sand, strong brown 7.5 YR 5/8 with yellowish brown 10YR 5/4, moderately soft - soft, wet		
		X	SB6-10.5				0.9	Boring sealed to surface with neat cement grout
				GC-CL		Clayey Gravel - Gravelly Clay, olive gray - olive 4/2 - 5/3, firm, moist, (saprolite)		
	15					Bottom of Boring at 14 feet bgs		
	20							

Figure

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Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 10509

Log of Boring SB-7

Sheet 1 of 1

Date(s) Drilled **May 18, 2005**	Logged By **Robert F. Flory**	Checked By **Adrian Angel**
Drilling Method **Geoprobe**	Drill Bit Size/Type **2 inch**	Total Depth of Borehole **16 feet bgs**
Drill Rig Type **Geoprobe 5410**	Drilling Contractor **EnProb**	Approximate Surface Elevation
Groundwater Level and Date Measured **8.56 feet ATD**	Sampling Method(s) **Tube**	Permit #
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			Asphalt		Asphalt 2", base rock 4"		
				CL		Clay, black 10YR 2/1, firm, stiff, moist		
		X	SB7-3.5	CL		Silty Clay, dark yellowish brown 10YR3/4 with some very dark brown 10YR 2/2 mottling, firm, slightly moist	0.1	
	5							
		X	SB7-7.5	CL-ML		Clayey Silt - Silt, dark yellowish brown 10YR3/4 with some 10YR 4/6 mottling	0.4	
				SM		Silty Sand, strong brown 7.5 YR 5/6, firm, moist becoming wet @ 10.0 (ATD) ▽		
	10							
				SP				
		X	SB7-13.5				1.1	Boring sealed to surface with neat cement grout
				Claystone		Clayey Sand, yellowish brown 10YR 4/6, moderately firn - moderately soft, wet		
	15	X	SB7-11.5			Sandy Silty Claystone, light olive brown 2.5Y 4/4, firm - hard, indurated, slightly moist	0.6	
						No recovery		
						Bottom of Boring at 16 feet bgs		
	20							

Figure

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Project: Piazza
Project Location: 20957 Baker Road, Castro Valley, CA
Project Number: 10509

Log of Boring SB-8

Sheet 1 of 1

Date(s) Drilled **May 18, 2005**	Logged By **Robert F. Flory**	Checked By **Adrian Angel**
Drilling Method **Geoprobe**	Drill Bit Size/Type **2 inch**	Total Depth of Borehole **15 feet bgs**
Drill Rig Type **Geoprobe 5410**	Drilling Contractor **EnProb**	Approximate Surface Elevation
Groundwater Level and Date Measured **8.7 feet ATD**	Sampling Method(s) **Tube**	Permit #
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			GC		Base rock		
				CL		Sandy Silty Clay, reddish brown 5YR 5/4 - yellowish brown 10YR 5/6, mottled, firm slightly moist		
				CL		Clay, black 10YR 2/1, firm, moderately firm, moist		
			SB8-3.5	CL		Silty Clay, dark yellowish brown 10YR3/4 with very dark brown mottling 10YR 2/2	0.2	
	5			CL-ML		Sandy silty Clay - Clayey Sand Silt, dark yellowish brown 10YR3/4 with some 10YR 4/6 mottling		
				Sandstone		Silty Sand, yellowish brown 10YR 4/6, very fine grained, slightly clayey, firm - moderately firm, friable, very moist		
			SB8-7.5			Moisture content increasing downward	1.1	
						(ATD) ▽ becoming wet @ 9 feet		
	10			SP		Sand, strong brown 7.5 4/6, soft - moderately soft, wet		
			SB8-11.5				0.1	
				SP		Sand, strong brown 7.5 4/6 - yellowish brown 10YR 5/6 mottled, locally clayey, moderately soft - moderately firm, wet		
			SB8-13				2.3	Boring sealed with neat cement grout
				Claystone		Sandy Silty Claystone, light olive brown 2.5Y 4/4, firm - hard, indurated		
	15					Bottom of Boring at 15 feet bgs		
	20							

Figure

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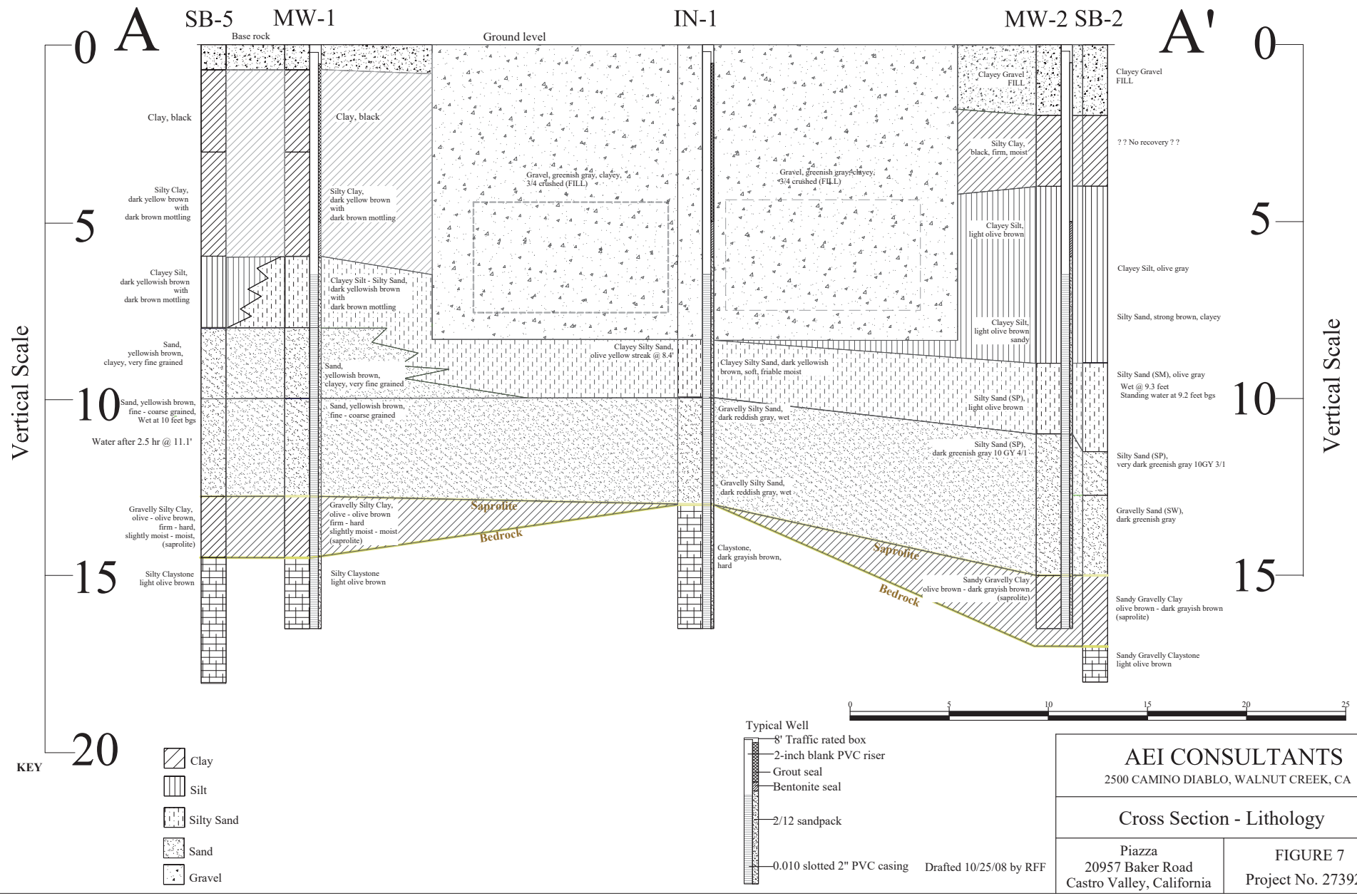
APPENDIX B

Cross Sections (AEI, 2008)



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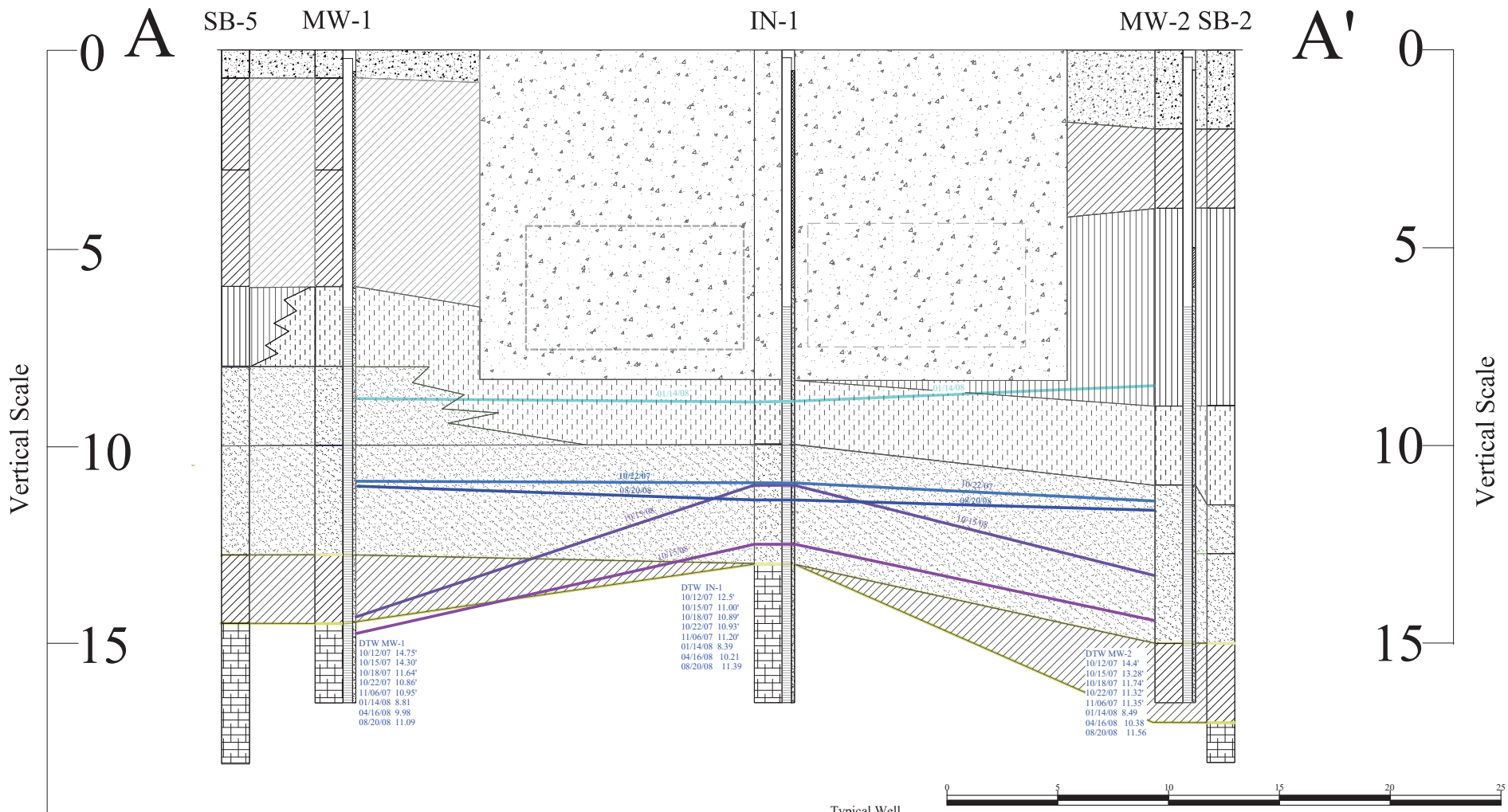
2500 CAMINO DIABLO, WALNUT CREEK, CA

Cross Section - Lithology

Piazza
20957 Baker Road
Castro Valley, California

FIGURE 7
Project No. 273928



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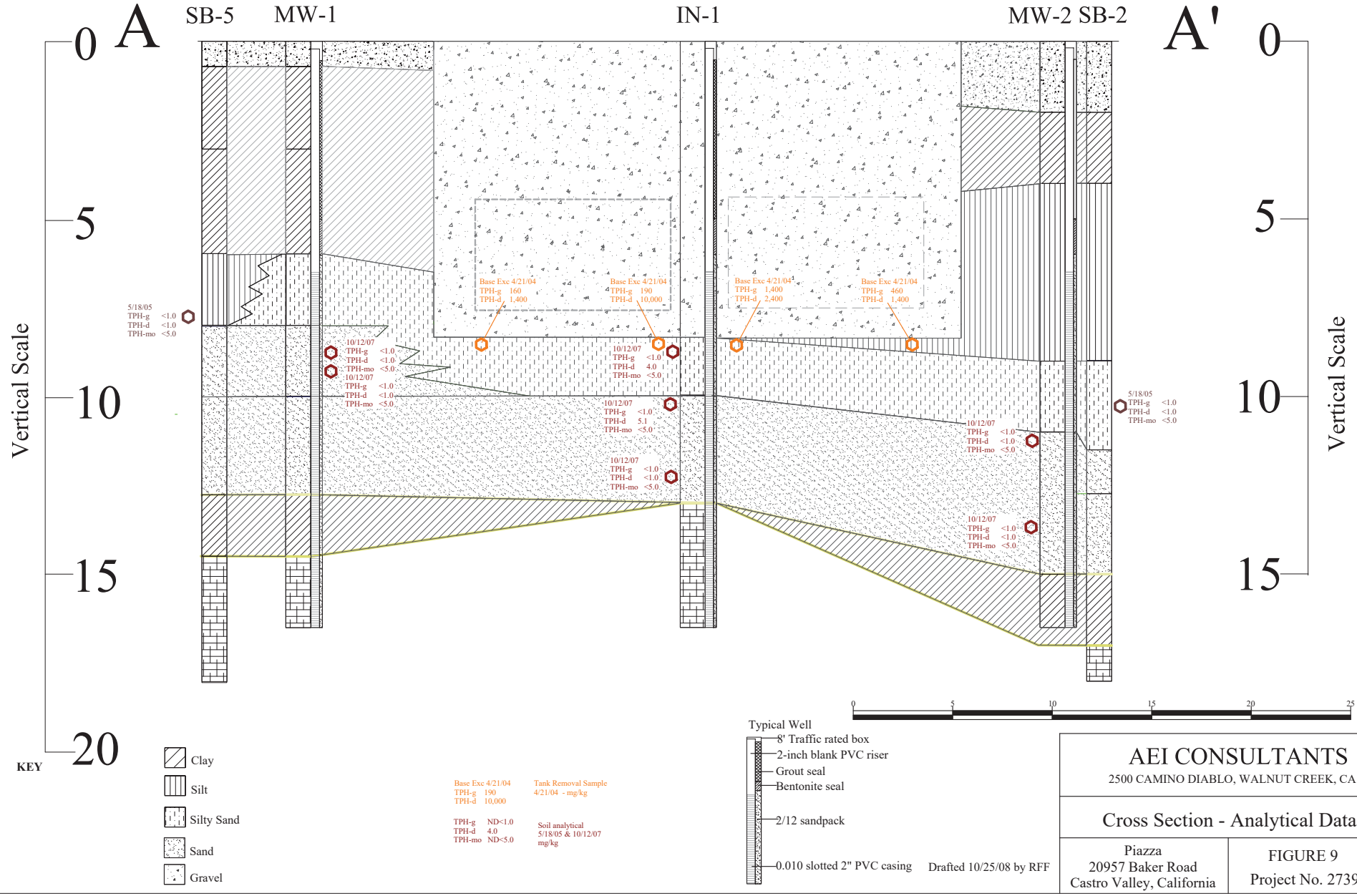
Cross Section - Depth to Water

Piazza
20957 Baker Road
Castro Valley, California

FIGURE 8
Project No. 273928



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Cross Section - Analytical Data

Piazza
20957 Baker Road
Castro Valley, California

FIGURE 9
Project No. 273928

APPENDIX C

Sampling and Analysis Plan

13255.000.000
December 29, 2016

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PAGE

1.0 INTRODUCTION

The purpose of this Sampling and Analysis Plan (SAP) is to provide field sampling procedures and data gathering methods that will be used during site characterization activities at 20785 and 20957 Baker Road in Castro Valley, California (the Site). This SAP will be used by field personnel as a reference for sampling and analysis during the characterization activities.

2.0 SAMPLING EQUIPMENT AND PROCEDURES

This section describes sampling equipment and procedures associated with post-excavation confirmation sampling and stockpile soil sampling. This section also includes a discussion of equipment blank sampling and decontamination procedures for sampling equipment.

2.1 GENERAL PROCEDURES

A C-57 licensed drilling contractor will be retained to advance soil and soil gas borings at the Site. Sampling borings will be advanced using a direct push Geoprobe® drill rig for the collection of soil and soil gas samples. All borings will be logged by an ENGEO geologist or engineer under the supervision of a Professional Engineer or Professional Geologist. Borings will be backfilled to the ground surface with cuttings and/or cement grout after the sampling is completed. Onsite workers will possess OSHA HAZWOPER training (24/40 hour).

2.2 SOIL SAMPLING

Soil sample borings will be advanced up to a depth of 2 feet below ground surface. All borings will be logged by an ENGEO geologist or engineer under the supervision of a Professional Engineer. Onsite workers will possess OSHA HAZWOPER training (24/40 hour). Two sets of samples will be collected from two depths (for a total of 26 samples). Soil samples will be retrieved within continuous Geoprobe® acetate core liners measuring 2 feet in length. Continuous soil cores from each boring will be logged by an ENGEO geologist or engineer. Specific soil samples will be collected for laboratory analysis by cutting a 12-inch portions of the Geoprobe soil core liners corresponding to the respective desired sampling depths in each location.

The sample sleeves will be sealed using Teflon® sheets secured by tight-fitting plastic end caps. Upon collection of samples, a sample label will be placed on the sample and will include a unique sample number, sample location, time/date collected, lab analysis, and the sampler's identification. The soil samples will be placed in an ice-cooled chest and submitted under documented chain-of-custody to a State-accredited fixed-base analytical laboratory.

For each sample location, two samples will be recovered from each boring approximately 0 to 12 inches and 12 to 24 inches below the ground surface. The laboratory will be instructed to homogenize the samples. Initially, the shallower samples from each boring (total of 13 samples) will be analyzed while the deeper sample from each location will be held by the laboratory pending the initial analysis. The samples will be analyzed for organochlorine pesticides (EPA Method 8081) and lead/arsenic (EPA Method 6010).

2.3 SOIL GAS SAMPLING

Soil gas sampling will be conducted in the vicinity of the former UST location. The installation and sampling of the temporary soil gas wells will be performed in accordance with the *Department of Toxic Substances Control (DTSC) Final Advisory Active Soil Gas Investigations (July 2015)*. The following activities will be performed:

- The installation and sampling of the soil gas monitoring wells will be performed in accordance with the *Department of Toxic Substances Control (DTSC) Final Advisory Active Soil Gas Investigations (July 2015)*. The soil gas monitoring well casings will be constructed with ¼-inch-diameter Teflon tubing equipped with a filter at the base of the tubing. The well installations will be performed with a direct push probe rig, which will advance an approximately 3-inch diameter boring to a depth of 6 feet below the ground surface.

- For each well, the bottom of the well tubing will be equipped with a 1-inch-long filter situated at a depth of 5 feet below the ground surface, centered in the middle of a 2-foot layer of No. 3 sand. Six inches of dry bentonite will be installed on top of the sand, and the remaining annular space will be filled with hydrated bentonite grout to six inches below grade. The well tubing will extend an additional 2.5 feet beyond the ground surface so that it can be directly connected to the sample train. When not in use, the well tubing will be coiled and sealed with a threaded plug inside the well box. The well construction diagram is included as Figure 9.

- Once the installation of the annular seal is complete, we will connect a permanent Swagelok® fitting on the top of the well tubing and a threaded plug will be inserted. At this point, the mandatory two-hour equilibriation time will commence.

- After the two-hour equilibriation time has elapsed, we will connect the sample manifold to the well tubing. The sample train, which will consist of a stainless steel summa and manifold with built in flow controller set to 100-200 ml/min, will be encompassed in a helium shroud provided by the analytical laboratory.

- A purge vacuum pump will be attached to the manifold and a shut-in test will be peformed to assess for potential leaks. The shut-in test will consist of capping the end of the manifold, then applying a vacuum with the vacuum pump, closing the purge valve, and observing the vacuum gauge for two minutes to determine if there is a drop in vacuum.

- We will purge three well tubing volumes of soil gas from each well prior to sampling at flow rate of 150 ml/minute. The purge specifications are presented in the following Table:

TABLE 1

Tubing Length (ft.)	Tubing Volume Per Foot (ml)	Total Tubing Volume (ml)	Sand Pack Pore Volume (ml) (50% Porosity)	Total Well Volume (ml)	Minutes (1x)	Minutes (3x)	Minutes (10x)
8.5	9.65	82	1,380	1,462	9.8	29.2	98

Notes: Purge minutes are based on a flowrate of 150 ml/min
Sandpack is 3" diameter by 2 feet in length

- After purging is completed, a 20 percent helium content will be established within a shroud and confirmed with a field meter prior to sampling. Once the 20-percent helium content is established, samples will be collected by opening the sample canister valve and allowing the sample canister to extract soil gas until the vacuum in the sample canister reaches approximately 5 inches of mercury.

We will label each sample canister with a unique identification number, sampling time, pre and post sample vacuum readings; and the soil gas samples will be submitted to a State certified laboratory for analysis of TPH-g and volatile organic compounds (VOCs) by EPA Test Method TO-15 and the presence of helium. Additional soil gas sampling will be performed in a step-out manner if determined to be necessary by the preliminary analytical results, and a mobile laboratory may be utilized to facilitate the additional sampling and analysis.

2.4 DECONTAMINATION PROCEDURES

Disposable sampling equipment will be bagged and properly disposed upon use. Non-disposable sampling equipment will be decontaminated to prevent cross contamination between samples. Sampling equipment will be decontaminated by washing with a non-phosphate detergent such as Liquinox™. Given the small volume anticipated, decontamination water will be collected and discharged to the surface. The following steps will be followed for decontamination of non-disposable sample equipment:

- Wash with a non-phosphate detergent and water solution. This step will remove visible contamination from the equipment. Fill a 5-gallon bucket approximately 3/4 full and dilute with a non-phosphate detergent as directed by the manufacturer. Use a dedicated long-handled brush to assist with cleaning.

- Rinse with potable water. This step will decrease the gross contamination and reduce the frequency of changing of the non-phosphate detergent and water solution. Fill a 5-gallon bucket, 3/4 full with water. Use a dedicated long-handled brush to assist with cleaning of equipment. Frequent changing of this water will increase its effectiveness.

- Rinse with de-ionized water. Fill a 5-gallon bucket approximately 3/4 full of water and use a dedicated long-handled brush to assist with cleaning. Periodic changing of this water is required.

3.0 SAMPLE LABELING, DELIVERY, AND CHAIN-OF-CUSTODY

This section describes how samples will be labeled, picked up, delivered, and tracked.

3.1 SAMPLE LABELING

Sample labels will be completed using indelible, black ink, and affixed to each sample container. Sample containers will be placed into resealable plastic bags to protect the sample from moisture during transportation to the laboratory. Each sample container will be labeled at a minimum with the following:

- Unique sample identification number

- Sample collection date (month/day/year)
- Time of collection (12 or 24-hour clock)
- Project number (04-PLA-016)
- Sampler initials
- Analyses to be performed; and preservation, if any

3.2 SAMPLE DELIVERY

This section applies to samples that will be picked up by the analytical testing laboratory or samples delivered to the offsite analytical laboratory. Samples may be picked up in the field or at the Field Geologist/Engineer's office by the analytical testing laboratory. The soil and groundwater samples will be maintained at 4° Celsius. The chain-of-custody documentation will be completed and signed by the laboratory- assigned courier. The samples may then be relinquished to the courier for transportation to the laboratory. The laboratory will record the temperature of cooler immediately upon receipt of the samples.

3.3 CHAIN-OF-CUSTODY

A chain-of-custody is a vital tool for tracking samples and is a written record of sample possession from the time the sample is collected until it is analyzed. The following will be recorded on the chain-of-custody forms:

- Project name
- Project location
- Project number
- Project contact
- Client
- Project Manager
- Sample identification
- Date and time sample was collected
- Sample type (soil, wastewater etc.)
- Number of sample containers
- Required analytical test methods
- Remarks/observations specific to the sample
- Number of samples to be relinquished to the analytical laboratory
- Transfer signatures associated with relinquishing samples (the sampler will initiate the chain-of-custody procedure)
- Courier/laboratory representative signature (for commercial carrier, record air bill number) Date/time of custody transfers
- Comments regarding the condition of the samples, (e.g., cooled with ice, etc.)
- Additional comments
- Written request for electronic file for all samples analyzed
- Information regarding sample storage/disposal
- Turn-around-time requirement; Sampler signature
- Courier signature

4.0 ANALYTICAL TESTING METHODS

This section describes analytical test methods, sample container, preservation, and holding time requirements for soil samples. The soil samples will be analyzed for organochlorine pesticides (EPA Method 8081) and lead/arsenic (EPA Method 6010). The soil gas samples will be analyzed for TPH-g and volatile organic compounds (VOCs) by EPA Test Method TO-15 and the presence of helium. Table 1 summarizes the analytical test methods for the types of samples to be collected based on regulatory requirements.

5.0 FIELD QUALITY ASSURANCE/QUALITY CONTROL

Field Quality Assurance/Quality Control (QA/QC) samples will be collected and analyzed during soil sampling to assess the consistency and performance of the sampling program. Field QC samples for this project will include field duplicates and equipment rinsate samples.

5.1 FIELD DUPLICATES

Field duplicates consist of a sample of the same matrix as the primary sample collected. Duplicate soil samples will be collected, if available, at the same time and location as the primary sample, using the same sampling techniques. The purpose of field duplicate samples is to evaluate the precision of the overall sample collection and analysis process. Field duplicates for the soil samples will be collected at a frequency of one per 20 samples and will be analyzed using the same method as the primary sample. Field duplicate sample numbers will be similar to the post-excavation sample nomenclature; however, minor adjustments in the numbering system will be made to ensure that the identities of the duplicate samples are “blind” to the analytical laboratory. Locations of duplicate samples and their identifications will be recorded in the dedicated field logbook and on the appropriate excavation map.

5.2 EQUIPMENT RINSATE SAMPLES

Equipment rinsate samples will only be collected once every day with the use of non-disposable sampling equipment. Rinsate samples consist of distilled water collected from the final rinse of the decontamination process. Subsequent to equipment decontamination, distilled water will be decanted over the sampling equipment in the appropriate containers. Rinsate samples will be collected, placed in appropriate pre-cleaned containers supplied by the analytical laboratory, and analyzed for the same constituents as the field samples. Equipment rinsate samples evaluate the effectiveness of the decontamination procedure and possible cross–contamination during sampling events.

5.3 SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

Sample container requirements, preservatives, and holding time requirements for the soil analytical test methods to be used in this removal action project are summarized in Table 1.

6.0 SITE MANAGEMENT AND RECORD KEEPING

Sampling information will be recorded on chain-of-custody forms, in a field logbook, and on the appropriate excavation or stockpile map/plan. These documents will be completed in the field at

the time of sample collection. Entries will be legible and recorded in indelible black ink. At a minimum, the logbook will contain the following information:

- Project name and location.
- Date and time of entries.
- Personnel in attendance, including any visitors to the site; General weather conditions.
- Work performed on a daily basis.
- Field observations.
- Sampling information (including sample identification, sample location, sample description/type, and analytical testing).
- Field measurements data (including air monitoring results, instrument calibration records, and problems, if encountered)
- Descriptions of deviations from the SAP, if applicable; Problems encountered and corrective action taken; QC-related activities and identification of field QC samples.
- Detailed record of oral and/or written requests by the regulatory agencies, client, subcontractor.
- Any other events that may affect the sampling and analyses.

TABLE 2: Analytical Test Methods, Sample Container, Preservation, and Holding Time Requirements

Soil Sampling				
Parameter	**Preservative**	**Holding Time**	**EPA Method #**	**Container**
OC Pesticides	4°C	14 days	8081	2”x12” liner
Arsenic and Lead	4°C	6 months	6010B	2”x12” liner
Soil Gas Sampling				
VOCs	none	1 month	TO-15	1L stainless steel summa canister