ENVIRONMENTAL ENGINEERING, INC
6620 Owens Drive, Suite A • Pleasanton, CA 94588-3334
TEL (925) 734-6400 • FAX (925) 734-6401

November 15, 2006

Mr. Don Hwang
Alameda County
Department of Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: Fuel Leak Case No. RO0000317-5725 Thornhill Drive, Oakland, CA

Dear Don:

SOMA's "Supplemental Workplan" for the subject site has been uploaded to the State's GeoTracker database for your review.

Thank you for your time in reviewing our workplan. If you have any questions or comments, please call me at (925) 734-6400.

Sincerely,

Mansour Sepehr, Ph.D.,PE
Principal Hydrogeologist

Enclosure

cc: Mr. Mo Mashhoon

REGISTERED PROFESSIONAL ENGINEER
MANSOUR SEPEHR
No. C042928
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

ENVIRONMENTAL ENGINEERING, INC
6620 Owens Drive, Suite A • Pleasanton, CA 94588-3334
TEL (925)734-6400 • FAX(925)734-6401

SUPPLEMENTAL WORKPLAN

5725 Thornhill Drive
Oakland, California

November 15, 2006

Project 2830

Prepared for

Mr. Mo Mashhoon
1721 Jefferson Street
Oakland, California

Prepared by

SOMA Environmental Engineering, Inc.
6620 Owens Drive, Suite A
Pleasanton, California

CERTIFICATION

This report has been prepared by SOMA Environmental Engineering, Inc., (SOMA) on behalf of Mr. Mo Mashhoon, the former property owner of 5725 Thornhill Drive, Oakland, California. This report was prepared in response to the Alameda County Health Care Services' request dated August 15, 2006.

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

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1.0 INTRODUCTION

This report has been prepared by SOMA Environmental Engineering, Inc. (SOMA) on behalf of Mr. Mo Mashhoon, the former property owner of 5725 Thornhill Drive, Oakland, California (the "Site"). As shown in Figure 1, the Site is bordered on the northwest by residential property, on the northeast by commercial property, on the southeast by Thornhill Drive, and on the southwest by church property. The Site has been a gasoline service station since the 1950s.

This workplan has been prepared to comply with the Alameda County Health Care Services' (ACHCS') request dated August 15, 2006.

1.1 Previous Activities

In November 1998, Penn Environmental removed a 550-gallon steel underground waste oil tank (WOT) from the Site. Soil samples collected from the WOT excavation contained up to 1,100,000 μg/Kg of total petroleum hydrocarbons as gasoline (TPH-g), 2,700,000 μg/Kg of total petroleum hydrocarbons as diesel (TPH-d), and 4,200,000 μg/Kg of total petroleum hydrocarbons as motor oil (TPH-Mo).

On February 4, 1999, Penn Environmental over-excavated the contaminated soil surrounding the former WOT. Aqua Science Engineers, Inc., (ASE) collected confirmation soil samples from two sidewalls of the excavation. The only compound detected in one of these two soil samples was methyl tertiary butyl ether (MtBE) at 40 μg/Kg.

In July 1999, ASE drilled borehole BH-A in the vicinity of the former WOT. The only compounds that were detected at concentrations above the California

Department of Health Services' (DHS') maximum contaminant levels (MCLs) for drinking water were MtBE and cadmium. On September 6, 2000, ASE drilled two more soil borings: BH-B and BH-C. On October 23, 2000, ASE drilled soil boreholes BH-D and BH-E. ASE also collected water samples from Temescal Creek. No hydrocarbons were detected in the water sample collected from Temescal Creek. The results of the laboratory analysis on the groundwater samples collected from BH-B, BH-C and BH-D showed elevated levels of TPH-g, TPH-d, TPH-mo and MtBE. For instance, a groundwater sample collected from BH-D contained 16,000 μg/L of MtBE. The groundwater sample collected from boring BH-C, which is in close proximity of Temescal Creek, contained 5,300 μg/L of MtBE.

On March 1 and 2, 2004, SOMA oversaw the drilling of nine temporary well boreholes: HP-1 through HP-7, HP-9, and HP-10. Due to the excessive traffic hazards and the disruption of local traffic flow posed by advancing HP-8 in the middle of the street, this borehole was not drilled. Groundwater samples were collected following the completion of each temporary well borehole. The locations of the "HP" and the previously drilled "BH" boreholes are shown in Figure 2, and soil and groundwater analytical data from these boreholes are presented in Tables 1, 2, 3 and 3a. The results of SOMA's investigation did not show elevated levels of MtBE in the groundwater samples collected from the "HP" sampling locations. For instance, the maximum concentration of MtBE was detected at 1,100 μg/L in HP-10, which is located midway between BH-B and BH-C. ASE reported higher MtBE concentrations in the "BH" borings, which are located in the area of underground utility conduits and are shallower than the "HP" sampling depths.

The results of SOMA's investigation showed elevated levels of TPH-g, TPH-d and TPH-mo in the soil and groundwater in the vicinity of the former underground

storage tanks (USTs). This finding is consistent with ASE's investigation conducted in 1999 and 2000.

During the site investigation activities, SOMA oversaw the decommissioning of the three existing tank pit wells: MW-1, MW-2 and MW-3. On March 12, 2004, SOMA oversaw the installation of three new monitoring wells: SOMA-1, SOMA-2 and SOMA-3. Figure 2 shows the locations of the monitoring wells.

On April 25, 2005, SOMA conducted a sensitive receptor survey to identify any water bodies or domestic, irrigation or water supply wells within a quarter mile radius of the Site. Based on the State Department of Water Resources and Alameda County Public Works Agency's records, no drinking water, domestic or irrigation wells were within a quarter-mile radius of the Site.

In May 2005, CPT/MIP boreholes (CPT-1 through CPT-5 and CPT-7 through CPT-11) were advanced under the supervision of SOMA. CPT-6 could not be drilled due to physical constraints and obstruction of local traffic. Ten boreholes, designated as GS-1 through GS-5 and GS-7 through GS-11, were advanced at their corresponding CPT borehole locations. Monitoring well SOMA-4 was also installed. Figure 2 shows the locations of the CPT boreholes and SOMA-4.

The results of the May 2005 site investigation and well installation are presented in SOMA's report entitled "Additional Soil and Groundwater Investigation and Monitoring Well Installation Report at 5725 Thornhill Drive, Oakland, California," dated June 13, 2005.

1.2 Regional Geology

The U.S. Geologic Survey (USGS) mapped the Site within the San Antonio Formation. The USGS (Radbruch, 1969) described the upper member of the

San Antonio Formation as clay, silt, sand, and gravel, and the lower member of the unit as gravel with a silty clay matrix.

In developed urban areas such as the Bay Area, earthwork construction often involves the emplacement of artificial fill derived from nearby cuts or quarries. Artificial fill is emplaced over native earth materials to provide level building pads and base rock for roadways.

1.3 Re-evaluation of Preferential Pathways

A new storm and sewer map was obtained from the City of Oakland Public Works Department. This map was used in SOMA's re-evaluation of the preferential flow pathways located in close proximity of the Site. Figure 2 shows the storm and sewer utility flow lines, their diameter and flow direction. Upon careful review of the information, it was concluded that the depth to the utility lines range between approximately 9 to 10.5 feet bgs near to the Site, and between 14 to 15.5 feet bgs near the Temescal Creek culvert. Based on the fact that groundwater is encountered at the Site between 6 and 16 feet bgs, the existing utility trench can potentially act as a preferential flow pathway.

The revised geologic cross-sections and soil boring logs for BH-A through BH-E are included as Appendix A.

2.0 Scope of Work

Based on the results of previous investigations and the August 15, 2006 ACHCS directive, the following proposed work at the Site is directed toward providing a more thorough understanding of the subsurface stratigraphy and the nature and extent of the soil and groundwater contamination. Due to the fact that new information detailing the utility specifications in close proximity of the Site supports the notion that there is a potential for a preferential flow pathway,

SOMA proposes conducting a utility sampling survey directly up gradient from the Site.

In this investigation SOMA will attempt to advance a boring in the area of formerly proposed CPT-6, using an alternative drilling technology, as well as characterize the extent of the soil contamination near the former waste oil tank, and verify the location and contribution to the off-site plume migration of the preferential pathways. As such, the focus provided in this workplan will consist of validating and verifying the current off-site extent of the MtBE plume in the groundwater, and characterize the vertical extent of the soil contamination in the unsaturated zone around the source area, near the former waste oil UST pit.

In light of the existing data in connection with the soil and groundwater contamination, the scope of work will include the following:

Task 1: Acquire Permits, Preparation of a Site Health and Safety Plan, and Utility Clearance
Task 2: Drilling Continuous-Core Boreholes
Task 3: Drilling DPT/HSA Borehole
Task 4: Drilling Utility Sampling Borehole
Task 5: Laboratory Analysis
Task 6: Prepare a Technical Report

2.1 Acquire Permits, Preparation of a Site Health and Safety Plan, and Utility Clearance

Prior to commencing field activities, SOMA will obtain the necessary drilling permits from the ACHCS and the City of Oakland Public Works Agency Office of Planning and Building and Transportation Services Division.

A site-specific health and safety plan (HASP) will be prepared by SOMA. The HASP is designed to address safety provisions during field activities. It provides procedures to protect the field crew from physical and chemical hazards resulting from drilling as well as soil and groundwater sampling. The HASP establishes personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures and emergency action plans.

SOMA will contact Underground Service Alert (USA) to clear the drilling areas of underground utilities. Following USA clearance, a private utility locator will survey the drilling areas to locate any additional subsurface conduits.

2.2 Drilling Continuous-Core Boreholes

To delineate the vertical extent of soil contamination in the area of the former waste oil UST, SOMA proposes advancing three additional on-site borings (shown in Figure 3) utilizing direct push technology (DPT). DPT is an efficient method of collecting continuous soil cores involving hydraulically hammering a set of steel rods into the subsurface with the lead section consisting of a polyethylene lined sampler. After pushing the drilling rods to the desired depth, the rods will be withdrawn from the borehole and the soil-filled liner will be retrieved. To prevent cross-contamination between the Upper and Lower water-bearing zones, boreholes will not be advanced into the Lower water-bearing zone (encountered at approximately 35 feet below ground surface (bgs)). Therefore, based on the existing cross-sections, SOMA proposes drilling the boreholes to a total depth of approximately 30 to 33 feet bgs. Figure 3 shows the locations of the proposed borings (DPT-1 through DPT-3).

2.2.1 Collecting Soil Samples from the DPT Boreholes

SOMA's field geologist will log the continuous soil cores from each boring location, characterizing the content of each soil-filled tube using the Unified Soil Classification System. Encountered subsurface lithologies will be recorded on the geologic borehole logs. At each interval of depth discrete soil sampling, the direct-push drilling rig will obtain a 4-foot soil core sample. The contents of each sediment-filled tube will be screened using a photo-ionization detector (PID). Vapors from the soil core sample(s) will be screened for volatile compounds and will be documented on geologic borehole logs.

SOMA proposes that soil samples be collected at the depths where PID readings indicate the presence of significant soil contamination. In addition, one soil sample will be collected in the vadose zone at the soil–groundwater interface. Based on field observations and the occurrence of where the soil–groundwater interface is observed, SOMA's field geologist will select and cut sections of the soil-filled tubes into 6-inch long sections and cap each end of the samples with a Teflon liner and polyethylene end caps. The samples will be labeled and immediately placed into a chilled ice chest for transportation to a California state-certified environmental laboratory for analysis.

Upon completing the field activities, these boreholes will be grouted to surface grade.

2.3 Utilizing Hollow Stem Auger Drilling Technology in Conjunction with Direct Push Technology

To delineate the vertical extent of the soil and groundwater contamination near Temescal Creek, in the area of the unsuccessfully attempted CPT-6 location, which is near boring BH-C, SOMA proposes advancing one borehole in close proximity of boring BH-C, utilizing a DPT with capability to convert to Hollow

Steam Auger (HSA) technology. Figure 3 shows the proposed location of the above boring (DPT/HSA-6). In HSA mode, the auger column rotates as it drills into the ground and is designed to push soil up and out of the borehole along the outside of the auger. The auger itself is driven either mechanically or by a hydraulically-powered drill rig.

The borehole will be hand cleared to approximately 5 feet bgs or to where the anticipated shallow refusal is encountered. HSA technology will be used to advance through the obstruction, and once cleared, the rig will be converted from the HSA mode to the direct push mode, and the advancement of the boring will resume.

SOMA will combine the results of the soil and groundwater sampling from the above location with the CPT/MIP results to define the vertical and horizontal extent of the groundwater contamination and further characterize the subsurface stratigraphy of the site investigation area. The new data will be used to update the Site Conceptual Model (SCM).

Prior to commencing the drilling activities, SOMA will contact the City of Oakland Public Works department and inquire about the possibility of a concrete slab covering some underground conduits in the area of the shallow refusal. Although combination of HSA and DPT methodologies will allow drilling through unconsolidated materials such as, gravel, sand, silt and clay matrices, if the shallow obstruction encountered during the previous CPT investigation is part of an extensive concrete slab or construction debris, the proposed attempt might also be unsuccessful, and therefore will have to be abandoned altogether.

2.3.1 Collecting Soil and Groundwater Samples from the DPT/Hollow Stem Auger Borehole

Using the combination HSA and DPT methodologies, the borehole will be continuously sampled to approximately 35 feet bgs, with continuous logging commencing at approximately 5 feet bgs.

Soil samples will be collected at the field identified depth intervals using assumptions and methodology described in Section 2.2.1.

To collect the groundwater samples at the field identified depth intervals, a Dual Tube groundwater profiler will be used. It is designed for discrete groundwater sampling without cross-contaminating water-bearing zones at different depth intervals. The dual-walled sampler involves hydraulically driving or hammering a cased set of rods into the ground with the lead rod section consisting of a hollow acetate-lined sampler. After pushing the cased rods to the desired depth, the 1-inch diameter drilling rods were withdrawn from within the 2.125-inch diameter outer casing to insert the screened sampler.

After collecting the first encountered groundwater, the drilling crew will advance the cased sampler to collect discrete groundwater samples from the Upper and Lower water-bearing zones, if any. Based on previous experience, groundwater will be collected from the temporary borehole the same day it is advanced. The field crew will use disposable bailers or a Watera ^{TM} sampler fitted into plastic tubing to collect grab groundwater samples. The samples will be transferred into 1-liter containers and 40-mL vials, and placed into an ice chest. Upon completing the field activities, the borehole will be grouted to surface grade.

2.4 Drilling Utility Sampling Borehole

To determine whether the MtBE plume has been entering and traveling through the sewer-main utility trench as a preferential pathway from an up gradient source, and to verify the vertical positioning of the above utility trench, SOMA proposes drilling and sampling one borehole (USB-1), which will be located adjacent to the sewer line immediately up gradient from the Site. As shown in Figure 4, this borehole will be located adjacent to the sewer main on the west side of Thornhill Drive.

An “Air Knife” rig will be used to drill and sample the borehole. An “Air Knife” is essentially a high-powered vacuum mounted onto a lance-shaped head of a PVC pipe. The sharp-lanced end of this drilling device will loosen the gravel and allow the vacuum to remove the loosened material without rupturing the underground utilities.

The drilling crew will advance the borehole by first cutting the asphalt with a concrete cutter to remove a 6-inch by 3-foot slot oriented orthogonal to the marked location of the sewer-main. After removing the asphalt and exposing the underlying base material, the field crew will loosen and vacuum the base material through a PVC casing with the “Air Knife” rig. As the trench backfill is removed, the casing will be advanced downward to the bottom of the utility trench. A SOMA geologist will collect a water sample from the trench with a disposable bailer and decant the water sample into VOA vials and one liter amber bottles. The samples will immediately be labeled and placed into a chilled cooler with ice, pending delivery to the laboratory with chain of custody (COC) documentation.

SOMA’s field personnel will also collect a soil sample from the trench bottom with a sleeved slide-hammer sampler. The soil-filled sleeve from the sampling shoe, which is covered on both ends of the sample with Teflon tape and capped on

both ends with plastic end caps, will be extracted. The sample will be properly labeled and placed into a chilled cooler with ice, pending delivery to the laboratory with COC documentation.

2.5 Laboratory Analysis

Soil and grab groundwater samples will be submitted to a state-certified laboratory. The samples will be analyzed for TPH-g, TPH-d and TPH-Mo using EPA Method 8015B; BTEX, MtBE, tert-Butyl Alcohol (TBA), Isopropyl Ether (DIPE), Ethyl tert-Butyl Ether (ETBE), Methyl tert-Amyl Ether (TAME), 1,2-Dichloroethane, 1,2- Dibromoethane (collectively referred to as the gas oxygenates) and Ethanol using EPA Method 8260B.

2.6 Technical Report Preparation

Upon completion of the above-mentioned tasks, SOMA will prepare a technical report containing a detailed description of the procedures and the results of the field investigation. The written report will include tables, figures, lithologic logs, and revised geologic cross-sections, and a site specific Site Conceptual Model (SCM).

The SCM will include a concise summary of the Site's history, constituents of concern, their representative concentrations and distribution, and site physical characteristics (geology and hydrogeology). It will also clearly illustrate the relationship between the source area, transport pathways, and potential receptors, and identify data gaps. The SCM will be used as a guideline for future assessments and will be updated and refined as new data becomes available.

The report will also include a discussion of our recommendations for further studies, if warranted.

3.0 REFERENCES

Alameda County Health Care Services, October 13, 2004. "Fuel Leak Case No. RO0000317; Mash Petroleum, 5725 Thornhill Drive, Oakland, California 94611."

Aqua Science Engineers, Inc., March 22, 2002. "Workplan for Soil and Groundwater Assessment at 5725 Thornhill Drive, Oakland, California."

Radbruch, Dorothy H., 1969, Geologic Quadrangle Maps of the United States Arial and Engineering Geology of the East Quadrangle California: Department of the Interior United States Geologic. Published by the U.S. Geological Survey, Washington, D.C.

SOMA Environmental Engineering, Inc., April 16, 2004. "Soil and Groundwater Investigation and Monitoring Well Installation Report."

SOMA Environmental Engineering, Inc., June 13, 2005. "Additional Soil and Groundwater Investigation and Monitoring Well Installation Report."

Tables

TABLE 1
Soil Analytical Data
5725 Thornhill Drive Oakland, CA

Temporary Well Borehole Field ID	Date Sampled	TPH-Gasoline (µg/kg)	TPH-Diesel (µg/kg)	TPH-Motor Oil (µg/kg)	MtBE (µg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethyl benzene (µg/kg)	Total Xylenes (µg/kg)
ESL <9.8 ft*		100,000	100,000	500,000	23.00	44.00	2,900	3,300	2,300
ESL >9.8 ft*		100,000	100,000	1,000,000	23.00	44.00	2,900	3,300	2,300
*ESL** <9.8 ft*		100,000	100,000	500,000	2,000	180.00	9,300	32,000	11,000
*ESL** >9.8 ft*		400,000	500,000	1,000,000	2,000	180.00	9,300	32,000	11,000
HP1- (5-5.5')	03/01/04	<930	7,800[HY]	62,000	<4.5	<4.5	<4.5	<4.5	<4.5
HP1- (9-9.5')	03/01/04	16,000[Y]	6,000[HY]	17,000	<4.7	<4.7	<4.7	<4.7	<4.7
HP1- (14.5-15')	03/01/04	<1,100	5,400[HY]	19,000	<4.9	<4.9	<4.9	<4.9	<4.9
HP1- (19.5-20')	03/01/04	<970	2,000[Y]	<5,000	<4.5	<4.5	<4.5	<4.5	<4.5
HP1- (24.5-25')	03/01/04	<1,000	1,500[Y]	<5,000	<4.6	<4.6	<4.6	<4.6	<4.6
HP2- (4-4.5')	03/01/04	<1,100	3,500[HY]	51,000	<4.7	<4.7	<4.7	<4.7	<4.7
HP2- (9-9.5')	03/01/04	<1,100	210,000[HY]	910,000	<4.3	<4.3	<4.3	<4.3	<4.3
HP2- (14-14.5')	03/01/04	<1,100	5,200[HY]	34,000	6.3	<4.6	<4.6	<4.6	<4.6
HP2- (19-19.5')	03/01/04	<970	10,000[HY]	59,000	<4.4	<4.4	<4.4	<4.4	<4.4
HP2- (25-25.5')	03/01/04	<950	6,500[HY]	39,000	4.7	<4.3	<4.3	<4.3	<4.3
HP3- (5.5-6')	03/01/04	<950	23,000[HY]	78,000	<4.8	<4.8	<4.8	<4.8	<4.8
HP3- (10-10.5')	03/01/04	<1,000	22,000[HY]	65,000	<5.0	<5.0	<5.0	<5.0	<5.0
HP3- (16-16.5')	03/01/04	<930	17,000[HY]	77,000	<4.7	<4.7	<4.7	<4.7	<4.7
HP3- (21-21.5')	03/01/04	<1,100	11,000[HY]	60,000	<4.5	<4.5	<4.5	<4.5	<4.5
HP3- (26-26.5')	03/01/04	<980	8,300[HY]	39,000	<4.2	<4.2	<4.2	<4.2	<4.2
HP4- (4-4.5')	03/01/04	<1.0	3,000[HY]	17,000	<4.6	<4.6	<4.6	<4.6	<4.6
HP4- (9-9.5')	03/01/04	<0.92	<1,000	<5,000	<4.7	<4.7	<4.7	<4.7	<4.7
HP4- (14-14.5')	03/01/04	<1,000	1,100[HY]	11,000	<4.9	<4.9	<4.9	<4.9	<4.9
HP4- (19-19.5')	03/01/04	<910	1,100[Y]	<5,000	<4.8	<4.8	<4.8	<4.8	<4.8
HP4- (24-24.5')	03/01/04	<960	5,000[HY]	42,000[H]	<4.7	<4.7	<4.7	<4.7	<4.7
HP5- (5-5.5')	03/01/04	<1,000	22,000[HY]	140,000	17	<4.4	<4.4	<4.4	<4.4
HP5- (10-10.5')	03/01/04	<1,100	<1,000	<5,000	10	<4.3	<4.3	<4.3	<4.3
HP5- (15.5-16')	03/01/04	2,600[HY]	6,100[HY]	33,000	24	<4.5	<4.5	<4.5	<4.5
HP5- (19.5-20')	03/01/04	<1,100	1,700[Y]	<5,000	<4.6	<4.6	<4.6	<4.6	<4.6
HP5- (27-27.5')	03/01/04	9,100[HY]	2,800[Y]	<5,000	11	<4.9	<4.9	<4.9	<4.9
HP6- (4-4.5')	03/01/04	<1,100	<1,000	<5,000	<4.3	<4.3	<4.3	<4.3	<4.3
HP6- (9-9.5')	03/01/04	<960	5,400[HY]	30,000	<4.3	<4.3	<4.3	<4.3	<4.3
HP6- (14-14.5')	03/01/04	<910	2,200[HY]	16,000	<4.6	<4.6	<4.6	<4.6	<4.6
HP6- (19-19.5')	03/01/04	<910	2,500[HY]	8,100	4.9	<4.5	<4.5	<4.5	<4.5
HP6- (23.5-24')	03/01/04	<960	3,200[HY]	19,000	<4.6	<4.6	<4.6	<4.6	<4.6

TABLE 1
Soil Analytical Data
5725 Thornhill Drive Oakland, CA

Temporary Well Borehole Field ID	Date Sampled	TPH-Gasoline (µg/kg)	TPH-Diesel (µg/kg)	TPH-Motor Oil (µg/kg)	MtBE (µg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethyl benzene (µg/kg)	Total Xylenes (µg/kg)
ESL* <9.8 ft		**100,000**	**100,000**	**500,000**	**23.00**	**44.00**	**2,900**	**3,300**	**2,300**
ESL* >9.8 ft		**100,000**	**100,000**	**1,000,000**	**23.00**	**44.00**	**2,900**	**3,300**	**2,300**
ESL** <9.8 ft		**100,000**	**100,000**	**500,000**	**2,000**	**180.00**	**9,300**	**32,000**	**11,000**
ESL** >9.8 ft		**400,000**	**500,000**	**1,000,000**	**2,000**	**180.00**	**9,300**	**32,000**	**11,000**
HP6- (27.5-28')	03/01/04	<1,000	**2,200^{Y}**	<5,000	**7.0**	<4.7	<4.7	<4.7	<4.7
HP7- (6-6.5')	03/02/04	<970	**6,300^{HY}**	**16,000**	<4.7	<4.7	<4.7	<4.7	<4.7
HP7- (11.5-12')	03/02/04	<1,000	**2,000^{HY}**	**6,400^{HY}**	<4.8	<4.8	<4.8	<4.8	<4.8
HP7- (16.5-17')	03/02/04	<930	**3,700^{Y}**	<5,000	<4.7	<4.7	<4.7	<4.7	<4.7
HP7- (22-22.5')	03/02/04	<920	<1,000	<5,000	<5.0	<5.0	<5.0	<5.0	<5.0
HP7- (26.5-27')	03/02/04	<970	**11,000^{HY}**	**15,000**	<5.0	<5.0	<5.0	<5.0	<5.0
HP9- (7-7.5')	03/02/04	<1,100	**1,900^{Y}**	<5,000	<4.4	<4.4	<4.4	<4.4	<4.4
HP9- (11.5-12')	03/02/04	<960	**4,300^{HY}**	**53,000^{H}**	<4.8	<4.8	<4.8	<4.8	<4.8
HP9- (16-16.5')	03/02/04	<990	**5,300^{HY}**	**52,000^{H}**	<4.6	<4.6	<4.6	<4.6	<4.6
HP9- (21.5-22')	03/02/04	<980	<1,000	**5,600**	**28**	<5.0	<5.0	<5.0	<5.0
HP9- (26.5-27')	03/02/04	<1,100	<990	<5,000	**36**	<4.4	<4.4	<4.4	<4.4
HP10- (6-6.5')	03/02/04	<940	**5,700^{HY}**	**72,000**	<4.7	<4.7	<4.7	<4.7	<4.7
HP10- (11.5-12')	03/02/04	**16,000^{Y}**	**16,000^{LY}**	<5,000	**94**	<5.0	<5.0	<5.0	<5.0
HP10- (18.5-19')	03/02/04	**130,000^{Y}**	**58,000^{HLY}**	**16,000**	**270**	<5.0	<5.0	<5.0	<5.0
HP10- (19.5-20')	03/02/04	<920	<990	<5,000	**11**	<4.8	<4.8	<4.8	<4.8
HP10- (22.5-23')	03/02/04	**3,700^{Y}**	**8,000^{HY}**	**22,000**	<4.9	<4.9	<4.9	<4.9	<4.9
SOMA 4 (11.5-12')	05/27/05	**62,900**	**63,000**	**18,000**	<30	**1,540**	**6,360**	**497**	**1,847**

Notes:
(1) µg/kg= micrograms per kilogram
(2) <= Not detected at or above the laboratory reporting limit
(3) ^{H} Heavier hydrocarbons contributed to the quantification
(4) ^{L} Lighter hydrocarbons contributed to the quantification
(5) ^{Y} Sample exhibits chromatographic pattern which does not resemble standard
* Residential land use, Groundwater is current or potential drinking water source
** Residential land use, Groundwater is not current or potential drinking water source
Environmental Screening Levels (ESL) residential scenario, >9 ft bgs, groundwater is current of potential drinking water source, California Regional Water Quality Control Board, February 2005

Table 2
Groundwater Analytical Results
5725 Thornhill Drive
Oakland, California

Groundwater Sampling Borehole (Sample Interval)	TPH-g (µg/L)	TPH-d (µg/L)	TPH-Mo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)
Upper Water-Bearing Zone (May 2005 Investigation)									
GS-1(16-18)	<200	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-2(19-21)	**11,400**	**8,900^{LY}**	**300^{LY}**	**1.11**	**2.29**	**1.68**	**3.98**	**36.1**	<10.0
GS-3(22-26)	<200	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-4(24-28)	<200	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-5(24-28)	<200	**180^{LY}**	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-8(20-24)	<200	**2,800^{LY}**	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-9(24-28)	<200	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-10(22-26)	<200	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-11(23-27)	<200	**60^{Y}**	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
Lower Water-Bearing Zone (May 2005 Investigation)									
GS-1(30-34)	<200	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-3(36-40)	<200	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-4(35-39)	<200	<50	<300	<0.5	<0.5	<0.5	<1.0	**5.59**	<10.0
GS-7(29-33)	<200	**190^{Y}**	<300	<0.5	<0.5	<0.5	<1.0	**164**	<10.0
GS-8(35-39)	<200	**220^{LY}**	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-9(36-38)	<200	**53^{Y}**	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
GS-11(35-39)	<200	**51^{Y}**	<300	<0.5	<0.5	<0.5	<1.0	<0.5	<10.0
Upper Water-Bearing Zone (March 2004 Investigation)									
HP-1	**4,200^{Y}**	**5,900^{HLY}**	**11,000**	<0.5	<0.5	<0.5	<0.5	**11**	<10.0
HP-2	**360^{Y}**	**10,000^{HY}**	**58,000**	<0.5	<0.5	<0.5	<0.5	**20**	<10.0
HP-3	<50	**3,500^{HY}**	**5,700**	<0.5	<0.5	<0.5	<0.5	<5	<10.0
HP-4	<50	**740^{HY}**	**6,300^{H}**	<0.5	<0.5	<0.5	<0.5	<5	<10.0
HP-5	**6,700^{Y}**	**3,600^{HLY}**	**650**	<0.5	<0.5	<0.5	**0.7**	**33**	<10.0
HP-6	**250^{HY}**	**370^{HY}**	**730**	<0.5	**1.5**	<0.5	**2.5**	**8.1**	<10.0
HP-7	<50	**1,600^{HY}**	**1,400**	<0.5	<0.5	<0.5	<0.5	<0.5	<10.0
HP-9	<50	**160^{HY}**	**1,700**	<1.3	<1.3	<1.3	<0.5	**440**	<10.0
HP-10	**9,700^{Y}**	**21,000^{HLY}**	**5,700**	<3.6	<3.6	<3.6	<0.5	**1,100**	<10.0

Table 2
Groundwater Analytical Results
5725 Thornhill Drive
Oakland, California

Groundwater Sampling Borehole (Sample Interval)	TPH-g (µg/L)	TPH-d (µg/L)	TPH-Mo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)
Groundwater Monitoring Data Third Quarter 2006									
SOMA-1	<50	<50	<250	<0.5	<2.0	<0.5	<1.0	4.52	<10
SOMA-2	3,580	286 [A,B]	<250	0.8	0.7	2.65	0.7	44.8	32.4
SOMA-3	<50	60 [A,Y]	<250	<0.5	<0.5	<0.5	<1.0	8.05	<10
SOMA-4	4,340	357 [A,B]	<250	<0.5	0.52	<0.5	0.52	34.2	216
Abandoned Monitoring Wells (March 2004)									
MW-1	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	NA
MW-2	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	NA
MW-3	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	NA
ESL*	100	100	100	1	40	30	20	5	12
ESL**	500	640	640	46	130	290	100	1,800	930

NOTES

[1] Total petroleum hydrocarbons as gasoline (TPH-g), TPH-d, and TPH-Mo using EPA Method 8015B (May 2005 Investigation)

[2] BTEX, MtBE, DIPE, ETBE, TAME, TBA, and Ethanol using EPA Method 8260B (May 2005 Investigation)

[L] Lighter hydrocarbons contributed to the quantitation

[H] Heavier hydrocarbons contributed to the quantitation

[Y] Sample exhibits chromatographic pattern that does not resemble standard

NS – Not Sampled

A To reduce matrix interference , the sample extract has undergone silica-gel clean-up, method 3630, which is specific to polar compound contamination, diesel 2Q06.

B Unidentified hydrocarbons C9-C16, diesel 2Q06..

* Environmental Screening Levels (ESL) residential scenario, >9 ft bgs, groundwater is current of potential drinking water source, California Regional Water Quality Control Board, February 2005

** Environmental Screening Levels (ESL) residential scenario, >9 ft bgs, groundwater is not current of potential drinking water source, California Regional Water Quality Control Board, February 2005

Table 3
ASE Soil Analytical Data
5725 Thornhill Drive, Oakland, CA (1999-2000)

Borehole ID and sampled depth	Date Sampled	TPH-g (ug/kg)	TPH-d (ug/kg)	TPH-mo (ug/kg)	MtBE (ug/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl benzene (ug/kg)	Total Xylenes (ug/kg)
BH-A @ 8'	23-Jul-99	NA	NA	NA	NA	NA	NA	NA	NA
BH-B @ 8'	6-Sep-00	**240,000**	**370,000**	<200,000	<20	**43.00**	<20	**130**	<20
BH-C @ 8'	6-Sep-00	<1000	<1000	<1000	<5	<5	<5	<5	<5
BH-D @ 11'	23-Oct-00	<1000	<1000	<1000	**330.00**	<5	<5	**7.4**	**23.0**
BH-E @ 9.5'	23-Oct-00	<1000	<1000	<1000	**37.00**	<5	<5	<5	<5
ESL* <9.8 ft		**100,000**	**100,000**	**500,000**	**23.00**	**44.00**	**2,900**	**3,300**	**2,300**
ESL* >9.8 ft		**100,000**	**100,000**	**1,000,000**	**23.00**	**44.00**	**2,900**	**3,300**	**2,300**
ESL** <9.8 ft		**100,000**	**100,000**	**500,000**	**2,000**	**180.00**	**9,300**	**32,000**	**11,000**
ESL** >9.8 ft		**400,000**	**500,000**	**1,000,000**	**2,000**	**180.00**	**9,300**	**32,000**	**11,000**

* Environmental Screening Levels (ESL) residential scenario, groundwater is current of potential drinking water source, California Regional Water Quality Control Board, February 2005

** Environmental Screening Levels (ESL) residential scenario, groundwater is not current of potential drinking water source, California Regional Water Quality Control Board, February 2005

Environmental Screening Levels (ESL) residential scenario,
Regional Water Quality Control Board, February 2005

Table 3a
ASE Groundwater Analytical Data
5725 Thornhill Drive, Oakland, CA (1999-2000)

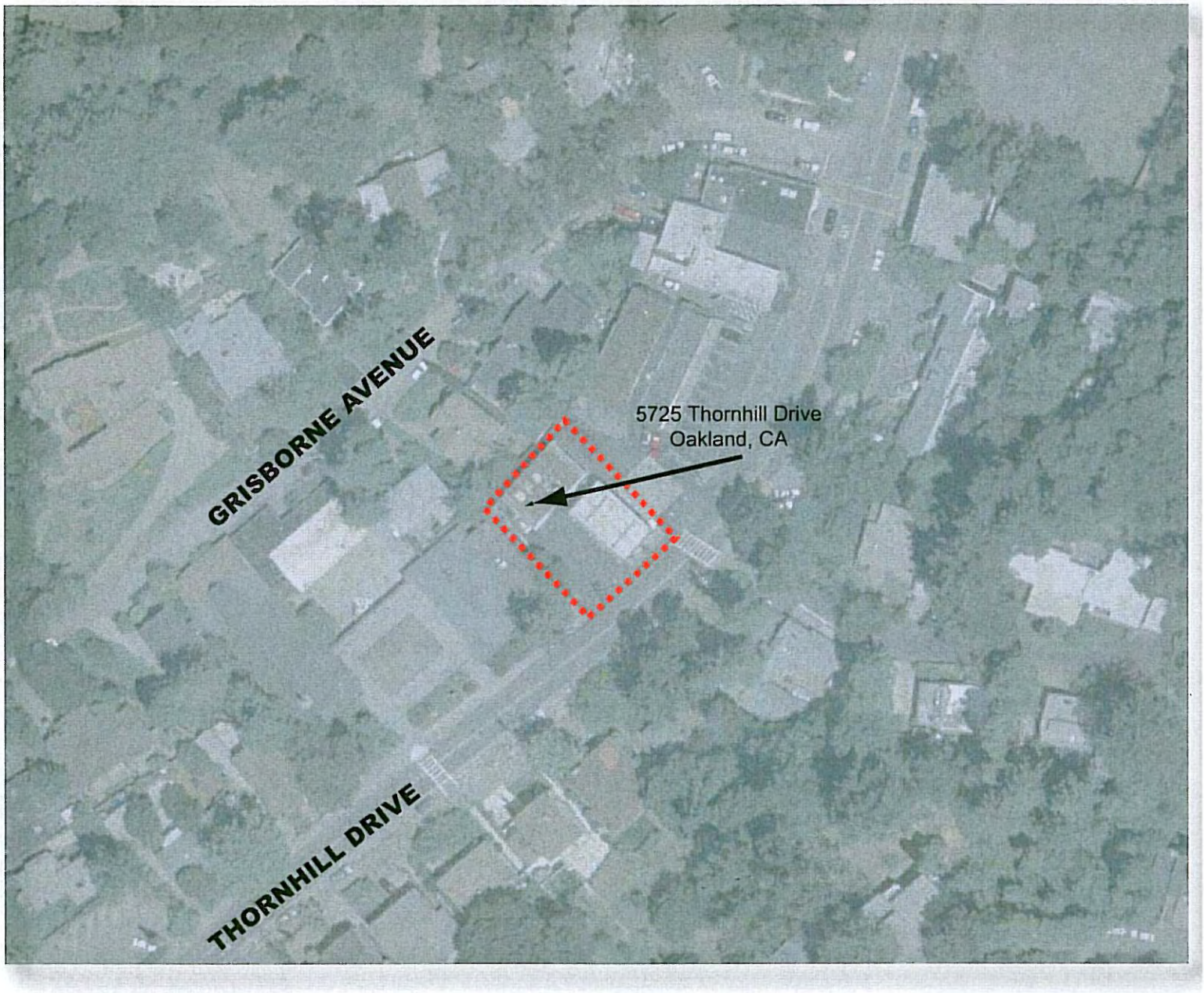
Borehole ID	Date Sampled	TPH-g (ug/L)	TPH-d (ug/L)	TPH-mo (ug/L)	MtBE (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl benzene (ug/L)	Total Xylenes (ug/L)
BH-A	Aug-99	**1,700**	**10,000**	**4,700**	NA	NA	NA	NA	NA
BH-B	6-Sep-00	**12,000**	**11,000**	**420**	**4,300**	**44**	NA	**360**	**49**
BH-C	6-Sep-00	**7,300**	**25,000**	**620**	**5,300**	NA	NA	NA	NA
BH-D	23-Oct-00	**13,000**	**110,000**	**18,000**	**16,000**	**180**	NA	**490**	**1,000**
BH-E	23-Oct-00	NA	NA	NA	730	NA	**0.95**	NA	**1.8**
ESL*		**100**	**100**	**100**	**5**	**1**	**40**	**30**	**20**
ESL**		**500**	**640**	**640**	**1,800**	**46**	**130**	**290**	**100**

Notes

* Environmental Screening Levels (ESL) residential scenario, >9 ft bgs, groundwater is current of potential drinking water source, California Regional Water Quality Control Board, February 2005

** Environmental Screening Levels (ESL) residential scenario, >9 ft bgs, groundwater is not current of potential drinking water source, California Regional Water Quality Control Board, February 2005

Figures



N

approximate scale in feet

0 100 200

Figure 1: Site vicinity map.

ENVIRONMENTAL ENGINEERING, INC.

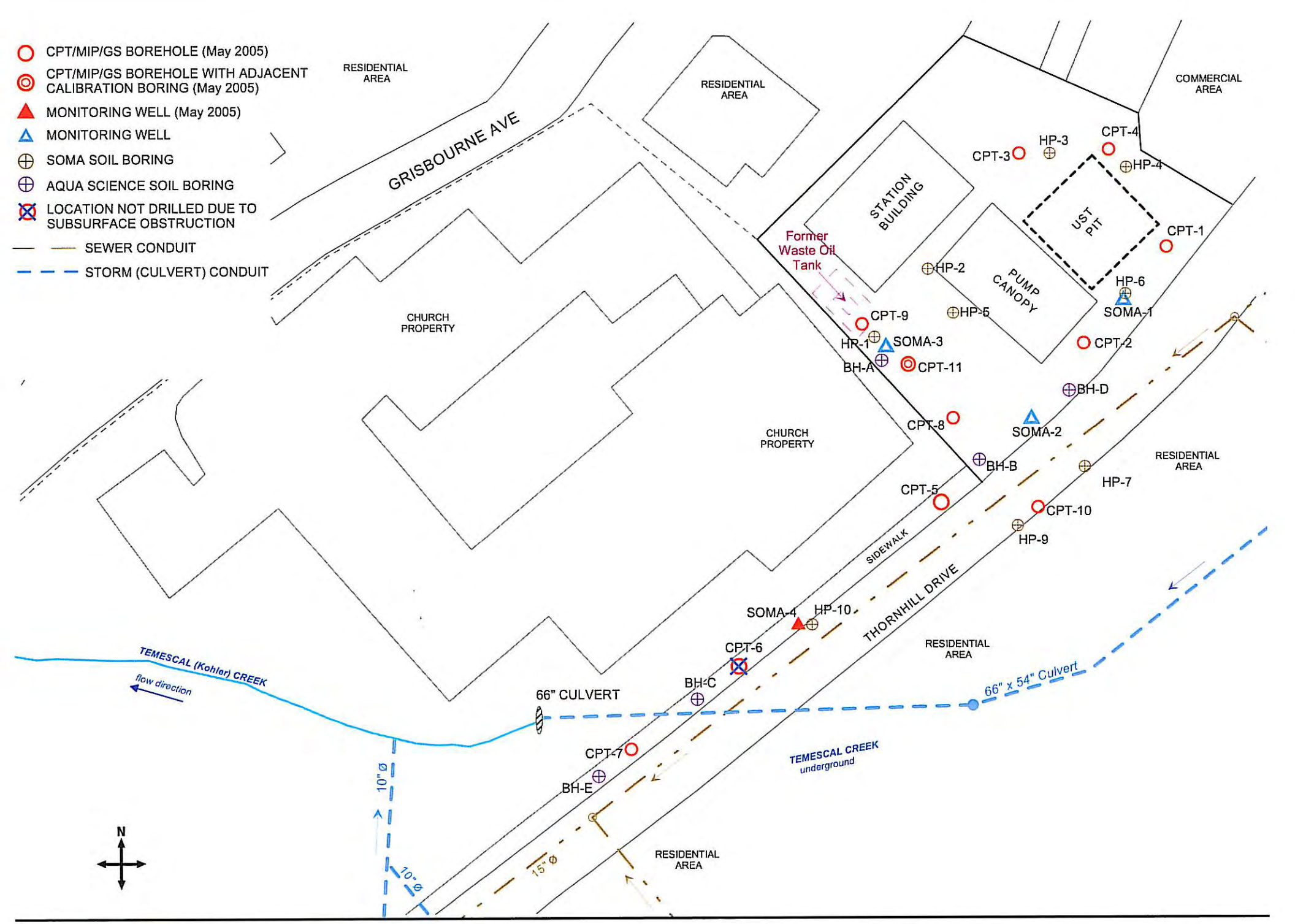


Figure 2: Locations of Previously Drilled Soil Borings and Installed Monitoring Wells

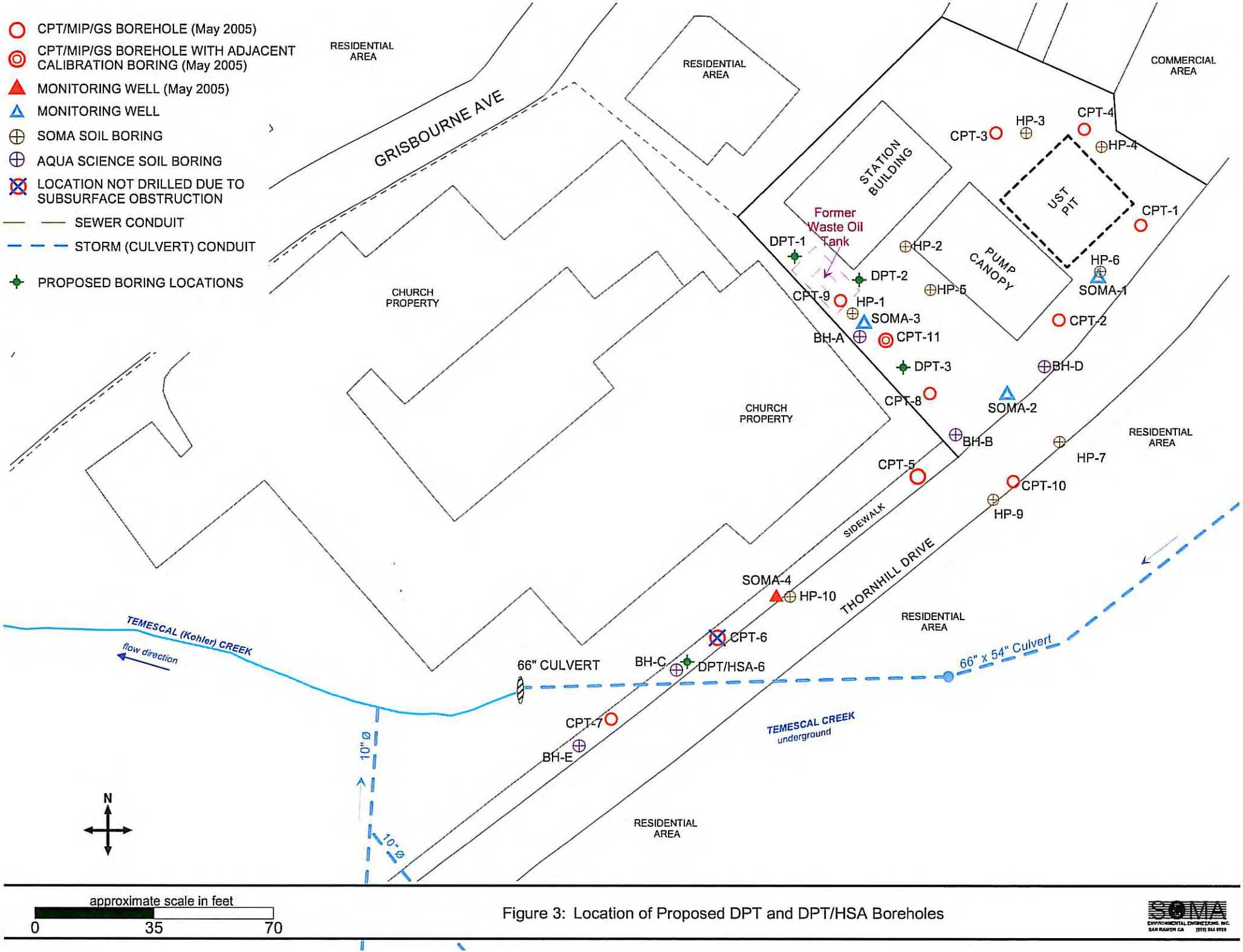


Figure 3: Location of Proposed DPT and DPT/HSA Boreholes

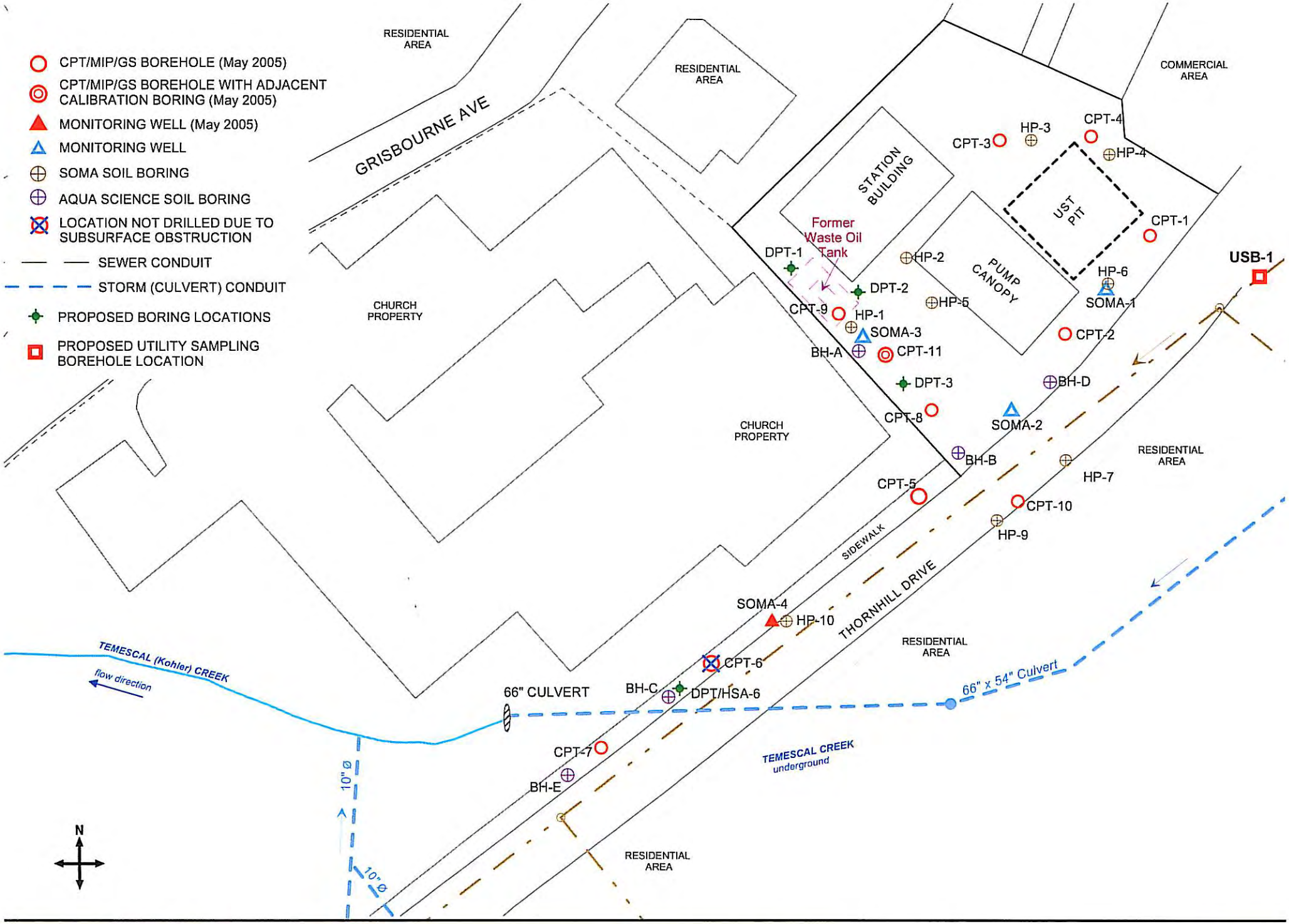


Figure 4: Location of Proposed Utility Sampling Borehole

Appendix A

Revised Geologic Cross-Sections

Soil Boring Logs BH-A through BH-E

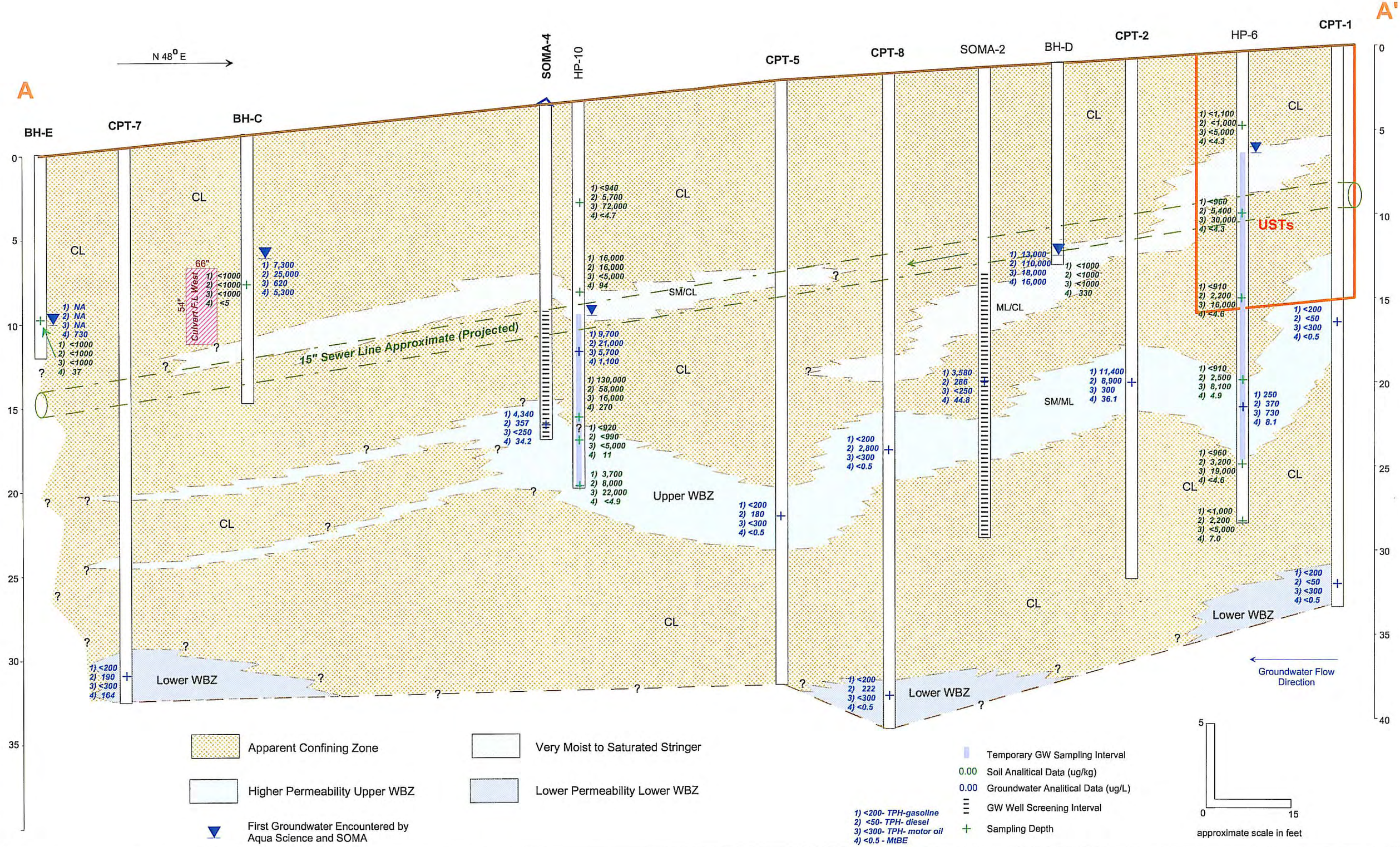


Figure 4: Geologic Cross Section A-A'.

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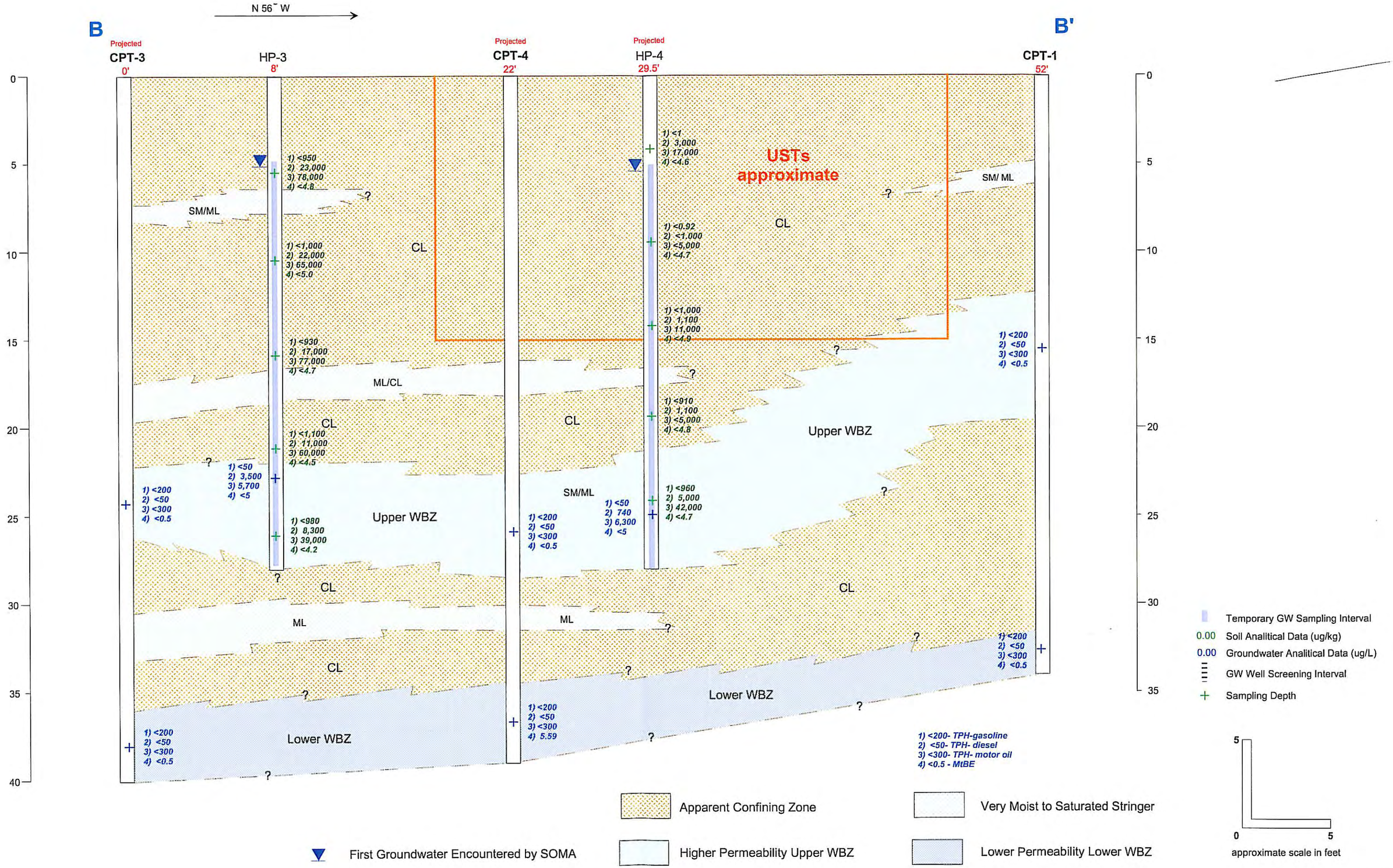
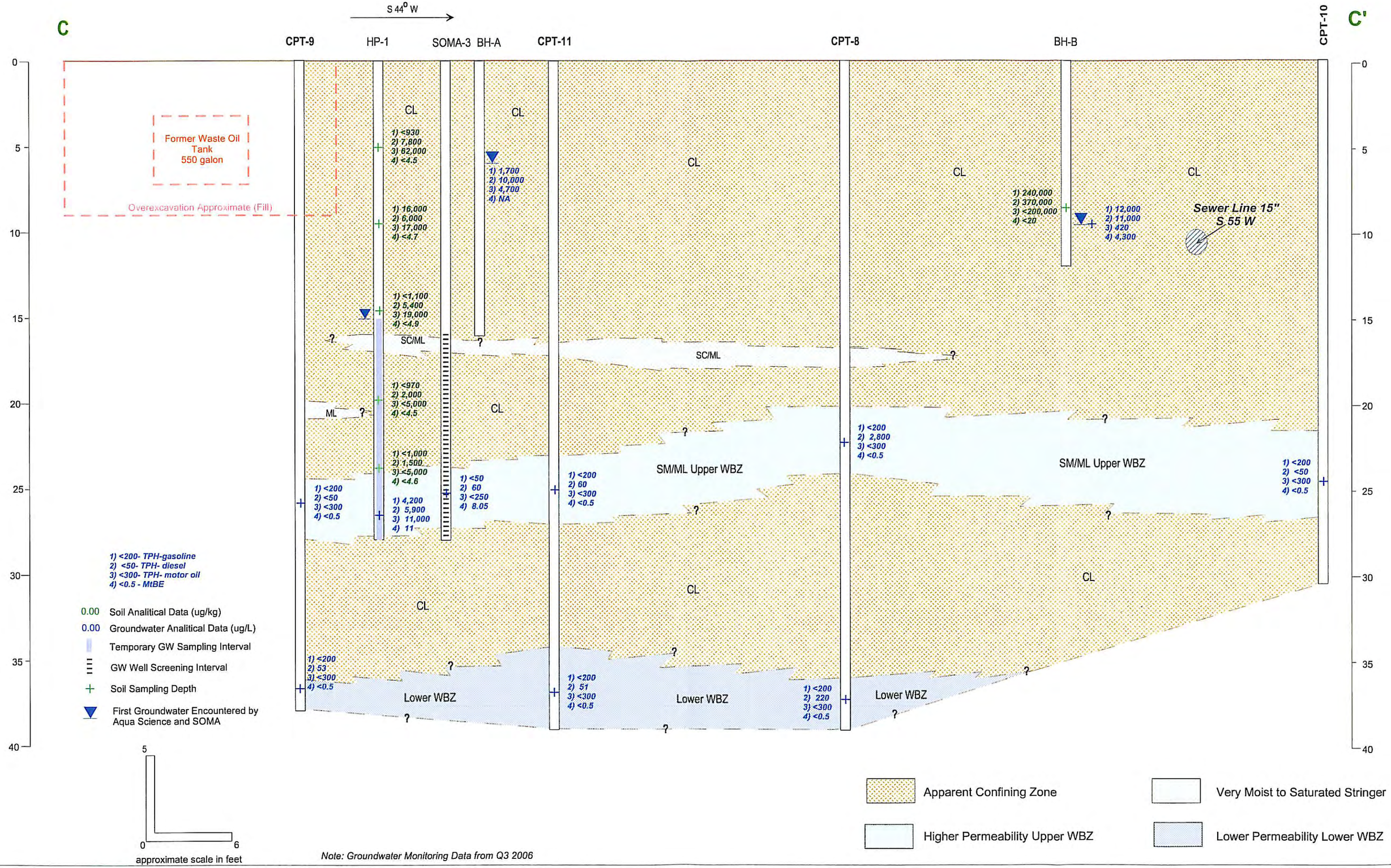


Figure 5: Geologic Cross Section B-B'.

SOMA
ENVIRONMENTAL ENGINEERING, INC.
SAN RAMON CA (925) 344 0600

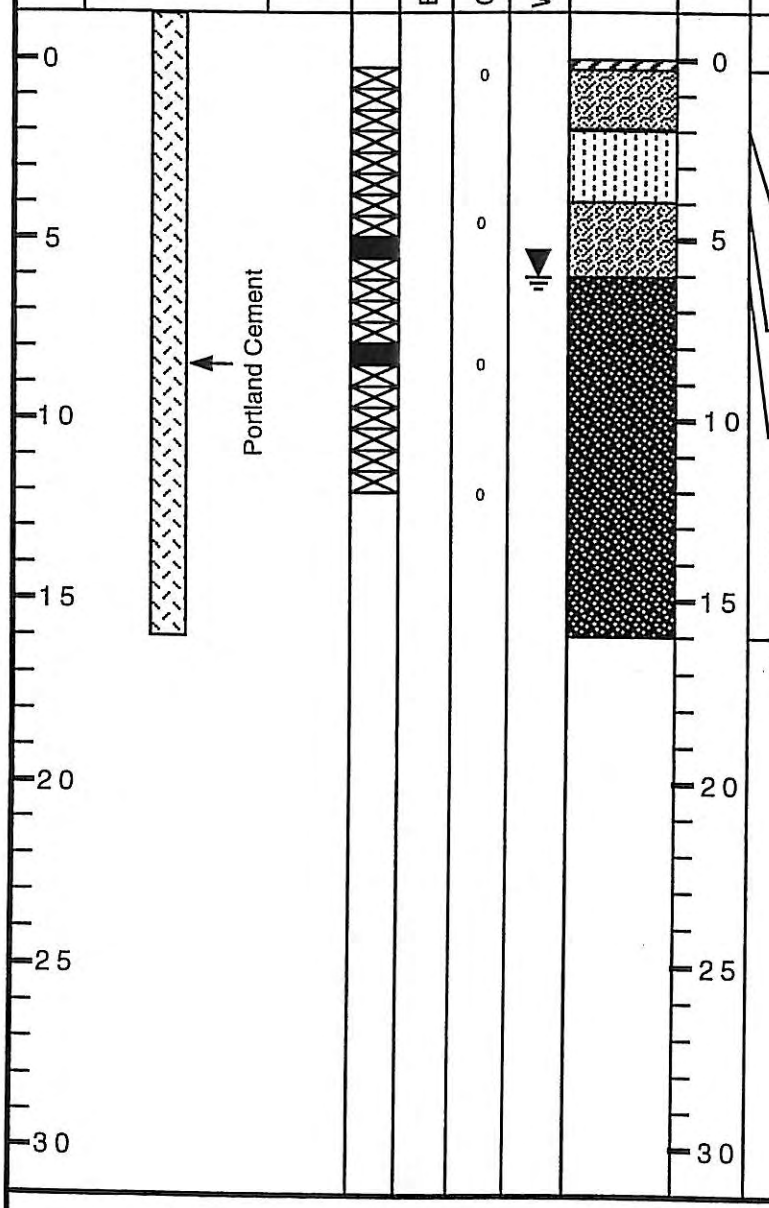


Note: Groundwater Monitoring Data from Q3 2006

Figure 6: Geologic Cross Section C-C'.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Boring: BH-A
Project Name: Mashhoon-Thornhill	Project Location: 5725 Thornhill Drive, Oakland, CA	Page 1 of 1
Driller: Vironex	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Robert E. Kitay, R.G.	Date Drilled: July 22, 1999	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 6.0'	Total Depth of Well Completed: NA
	Well Screen Type and Diameter: NA
Static Depth of Water in Well: NA	Well Screen Slot Size: NA
Total Depth of Boring: 16'	Type and Size of Soil Sampler: 2.0" I.D. Macro Sampler



DESCRIPTION OF LITHOLOGY
standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
Asphalt
Sandy SILT (ML); dark yellow brown; medium stiff; damp; 80% silt; 15% fine sand; 5% subangular gravel to 0.2" diameter; non-plastic; medium estimated K; no odor
Sandy GRAVEL (GW); gray; medium dense; damp; 60-90% angular gravel to 2" diameter; 10-40% fine sand and silt; non-plastic; high estimated K; no odor
Sandy SILT (ML); brown; medium stiff; damp; 80% silt; 20% fine sand; trace clay; low plasticity; low estimated K; no odor
Clayey SILT (MH); brown; stiff; wet; 70% silt; 30% clay; high plasticity; very low estimated K; slight hydrocarbon odor gray mottling at 8'
End of boring at 16'

AQUA SCIENCE ENGINEERS, INC.

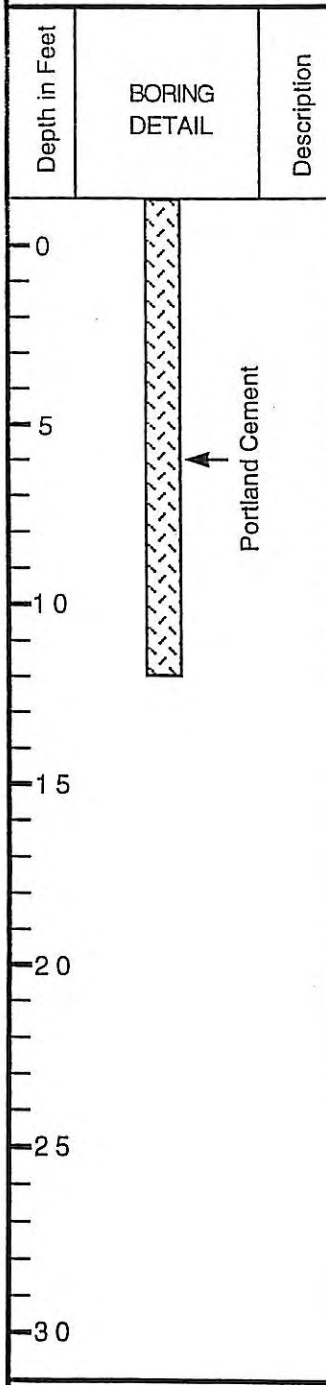
SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS

Boring: BH-B

Project Name: Mashhoon-Thornhill	Project Location: 5725 Thornhill Drive, Oakland, CA	Page 1 of 1
Driller: Vironex	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Ian T. Reed	Date Drilled: September 6, 2000	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA

Depth of Water First Encountered: 8.0'	Total Depth of Well Completed: NA
Static Depth of Water in Well: NA	Well Screen Type and Diameter: NA
Total Depth of Boring: 12'	Well Screen Slot Size: NA
	Type and Size of Soil Sampler: 2.0" I.D. Macro Sampler



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

Asphalt

Sandy SILT (ML); dark brown; medium stiff; damp; 60% silt; 40% fine to coarse sand; trace gravel to 0.5" diameter; non-plastic, medium estimated K; no odor

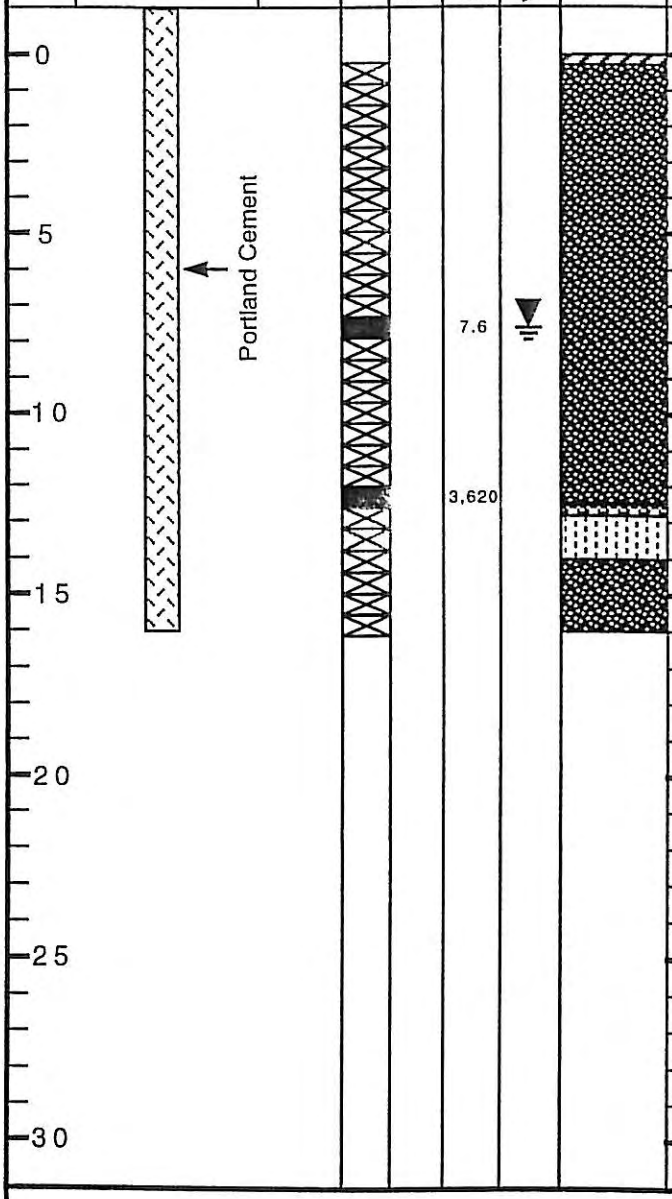
gray; moist to wet; 60% silt; 30% fine to coarse sand; 10% gravel to 1.0" diameter; moderate hydrocarbon odor
wet at 8'

End of boring at 12'

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Boring: BH-C
Project Name: Mashhoon-Thornhill	Project Location: 5725 Thornhill Drive, Oakland, CA	Page 1 of 1
Driller: Vironex	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Ian T. Reed	Date Drilled: September 6, 2000	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 8.7'	Total Depth of Well Completed: NA
Static Depth of Water in Well: NA	Well Screen Type and Diameter: NA
Total Depth of Boring: 16'	Well Screen Slot Size: NA
	Type and Size of Soil Sampler: 2.0" I.D. Macro Sampler

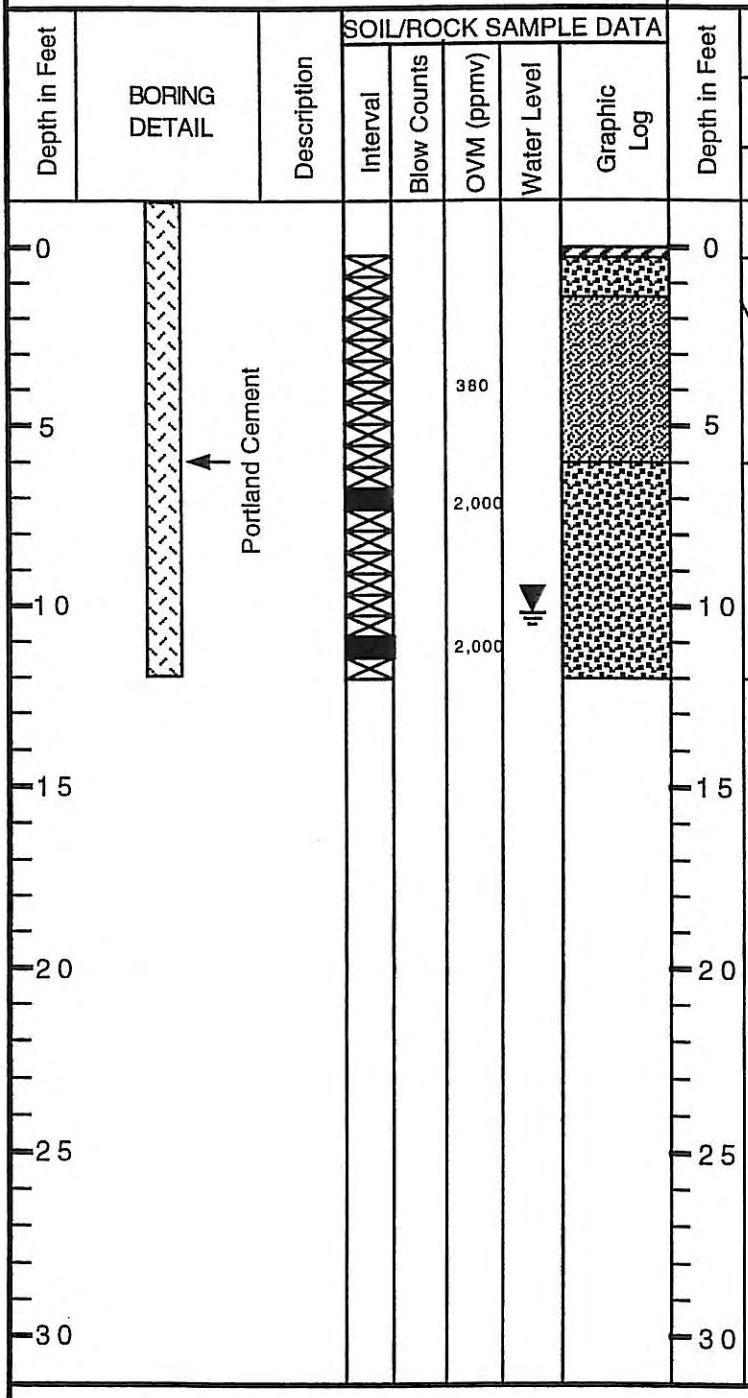


Depth in Feet	DESCRIPTION OF LITHOLOGY standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0	Concrete
0	Sandy SILT (ML); light brown to brown; damp to moist; medium stiff; 60% silt; 30% fine to coarse sand; 10% gravel to 1.0" diameter; non-plastic; medium estimated K; no odor [FILL]
10	wet at 8.7'
10	green to black; trace clay; moderate hydrocarbon odor
	gravel zone at 11.5'
15	Sandy GRAVEL (GM); gray to black; wet; stiff; 60% gravel; 40% fine to coarse sand; trace silt; non-plastic; medium estimated K; strong hydrocarbon odor
	Sandy SILT (ML); gray to black; wet; stiff; 60% silt; 30% fine to coarse sand; 10% clay; strong hydrocarbon odor
	End of boring at 16'

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Boring: BH-D
Project Name: Mashhoon-Thornhill	Project Location: 5725 Thornhill Drive, Oakland, CA	Page 1 of 1
Driller: Vironex	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Ian T. Reed	Date Drilled: September 6, 2000	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 10'	Total Depth of Well Completed: NA
Static Depth of Water in Well: NA	Well Screen Type and Diameter: NA
Total Depth of Boring: 12'	Well Screen Slot Size: NA
	Type and Size of Soil Sampler: 2.0" I.D. Macro Sampler

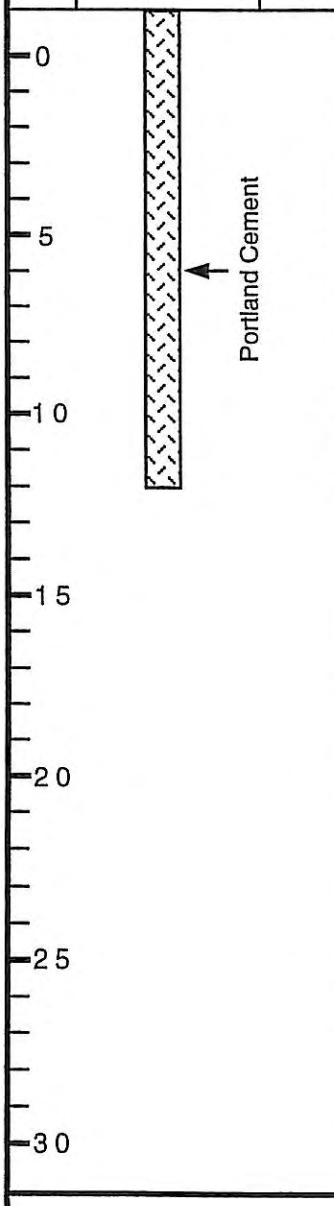


Depth in Feet	DESCRIPTION OF LITHOLOGY standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0	Asphalt
	Gravely SILT (ML); grey to light brown; medium stiff; moist; 70% silt; 20% gravel to 0.3" diameter; 10% fine sand; non-plastic, medium estimated K; no odor
5	Sandy SILT (ML); dark grey; medium stiff; moist; 80% silt; 20% fine sand; non-plastic, low estimated K; moderate hydrocarbon odor
10	Gravely SILT (ML); dark grey; stiff; moist; 60% silt; 30% gravel to 0.3" diameter; 10% fine to coarse sand; non-plastic, medium estimated K; strong hydrocarbon odor
	End of boring at 12'

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Boring: BH-E
Project Name: Mashhoon-Thornhill	Project Location: 5725 Thornhill Drive, Oakland, CA	Page 1 of 1
Driller: Vironex	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Ian T. Reed	Date Drilled: October 23, 2000	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 10'	Total Depth of Well Completed: NA
Static Depth of Water in Well: NA	Well Screen Type and Diameter: NA
Total Depth of Boring: 12'	Well Screen Slot Size: NA
	Type and Size of Soil Sampler: 2.0" I.D. Macro Sampler



Depth in Feet	DESCRIPTION OF LITHOLOGY standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0	Concrete
	Sandy SILT (ML); light brown; moist;medium stiff; 70% silt; 30% fine to coarse sand; trace gravel to 0.5" diameter; non-plastic; medium estimated K; no odor
	@ 3'; dark brown; 70% silt; 30% fine sand; trace clay; slight plasticity; low estimated K; no odor
5	@ 6'; stiff; 80% silt; 10% fine sand; 10% clay; low plasticity; very low estimated K; no odor
	wet at 8.7'
10	@ 10'; grey to dark brown; wet; trace organics; slight hydrocarbon odor
	End of boring at 12'
15	
20	
25	
30	