

October 26, 1987
SCI 209.005

Mr. Tak Hirahara
C&H Development Company
3744 Mt. Diablo Boulevard, #301
Lafayette, California 94549

**Preliminary Geotechnical Services
re. Soil Contamination
150th Avenue and East 14th Street
San Leandro, California**

Dear Mr. Hirahara:

This letter presents the results of our preliminary investigation at a site located near the northeastern corner of the intersection of East 14th Street and 150th Avenue in San Leandro. The purpose of the study was to explore shallow soil conditions near an excavation where petroleum hydrocarbon contamination was discovered. The scope of our services included drilling 6 test borings, collecting soil samples, and performing analytical tests.

We understand that a PG&E work crew made an excavation in the sidewalk along 150th Avenue as part of a utility pole relocation. The location of the excavation is shown on the attached Site Plan. The excavation was approximately 2 feet square and 4 feet deep. Strong petroleum product odors were noted by the workers in the excavation. Mr. Larry Seto of the Alameda County Environmental Health Department reports that analyses performed indicated that the cuttings from the excavation contained 45000 mg/kg of oil and grease; fuel hydrocarbons were not detected.

The purpose of this preliminary investigation was to characterize the problem and develop recommendations regarding further studies that may be appropriate and/or remedial actions.

Field Exploration

Subsurface conditions were explored by drilling 6 test borings ranging from 9.5 to 13.5 feet deep. Boring 6 was drilled adjacent to the PG&E excavation. The remaining borings were drilled at varying distances from the excavation to evaluate the

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lateral extent of contamination. Boring locations are shown on the Site Plan. The borings were drilled with truck-mounted, solid flight auger drilling equipment. In addition, a soil sample was obtained from the side of the PG&E excavation, approximately 3 feet below the sidewalk.

Our geologist observed drilling operations, obtained undisturbed samples of materials encountered and prepared a log of each test boring. The boring logs are presented on Plates 2 through 4. Soils are classified in accordance with the Unified Soil Classification System, Plate 5. Undisturbed soil samples were obtained with a California Drive Sampler having an outside diameter of 2.5 inches and an inside diameter of 2.0 inches. The sampler was driven with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the final 12 inches of an 18-inch penetration was recorded and is presented on the Boring Logs.

The augers, sampling equipment and sample liners were steam-cleaned prior to their initial use. To minimize the likelihood of cross-contamination between samples and/or test borings, the equipment was steam-cleaned again prior to each subsequent use.

The soil samples were retained in 2.0-inch-diameter brass liners. The sample ends were covered with teflon sheeting. Plastic caps were placed over the teflon sheeting and sealed with plastic tape. The samples were placed in an ice chest immediately following collection and remained under refrigeration until delivery to the analytical laboratory. Samples delivered to the laboratory were accompanied by Chain of Custody records, copies of which are attached.

Subsurface Conditions

The test borings indicate that the area investigated is underlain by interbedded clayey sands and silty clays to the depths explored. The upper 4 to 5 feet of soil consists of black silty clay. Below this layer, the soils are gray to gray green in color and consist of clayey sands and sandy clays.

Groundwater was encountered in Test Borings 5 and 6 at depths of 11.5 and 12 feet, respectively, during drilling. The other test borings did not penetrate the groundwater table.

Petroleum/organic product odors were noted in the borings during drilling. The strongest odors were encountered in the upper 8 feet of Boring 6 and the upper 5 feet of Boring 1. Below these depths only very slight petroleum product odors were noted. The odors in these borings were very similar to those which we

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associate with waste oils. The oily odors were not noted in the other test borings. However, very slight gasoline odors were noted in the soils within 5 feet or so of the groundwater table. Detectable concentrations were found in Borings 1 and 3.

Analytical Testing

Selected soil samples were transmitted to the Brown and Caldwell Laboratory, a laboratory certified by the Department of Health Services (DHS) for complete analysis of hazardous wastes. Because the soils were judged to be contaminated by petroleum products, the samples were analyzed for total light and heavy petroleum hydrocarbons using EPA approved methods. In addition, one sample from Test Boring 6 at a depth of 5 feet was analyzed for purgeable organics, e.g. solvents, in accordance with the EPA 8240 test method.

The results of the chemical analyses are summarized in the attached Table 1. Laboratory test reports are attached.

Discussion and Conclusions

The results of our preliminary investigation indicate that heavy petroleum hydrocarbons (oils), as well as purgeable organic chemicals (solvents), exist in the soils at concentrations which will likely require cleanup. The lateral and vertical extent of heavy petroleum hydrocarbon contamination in the soil appears to be limited to a localized area near the previous PG&E excavation. → The lateral and vertical extent of solvent contamination has not yet been confirmed by analytical testing. However, assuming that the solvents and hydrocarbons are associated with the same release or a series of releases into the soil, we judge that they too may also be concentrated in the area where heavy petroleum hydrocarbon contamination exists. However, this should be confirmed by further analytical testing. Gasoline was also encountered in two of the samples analyzed (Test Borings 1 and 3).

The area contaminated by heavy petroleum hydrocarbons (HPH) appears to be situated between Borings 2, 3, 4 and 5, as shown schematically on the Site Plan. Accordingly, we estimate that the contaminated area could be up to approximately 10 by 25 feet in plan.

The depth of HPH contamination appears to be limited to the soil in the upper 5 feet or so. Below this depth, HPH was not encountered at concentrations above the laboratory detection limit.

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Three organic solvents (PCE, TCE and trans 1, 2 DCE) were encountered in a soil sample analyzed from Boring 6 at a depth of 5 feet. Concentrations ranged from 6.6 to 15.0 mg/kg. Neither HPH nor gasoline were detected in the soil sample. At this time, we suspect that solvents were discharged onto the ground surface in the area at some time in the past, and have migrated downward into the soil. Because only one analysis has been performed to date, we are uncertain of (1) the lateral and vertical extent of solvent contamination, and (2) whether groundwater in the area has been impacted. Further study is required to address these issues more confidently.

Gasoline was encountered at a concentration of 320 mg/kg in Boring 3 at a depth of 8.5 feet and at a concentration of 72 mg/kg in Boring 1 at a depth of 4 feet. Gasoline contamination at detectable concentrations does not appear to be widespread. Based on available data, we suspect that it exists primarily within the zone of seasonable groundwater level variation. Gasoline may also exist in soil in isolated areas well above the groundwater table. We are currently uncertain of the source of gasoline. However, it could have also been discharged onto the ground surface in the area.

Regulatory Criteria

A brief summary of regulatory criteria governing petroleum hydrocarbon and organic chemical remediation is summarized below.

The San Francisco Regional Water Quality Control Board (RWQCB) Guidelines for Addressing Fuel Leaks, September, 1985, provides the following general guidelines for evaluating both total and light petroleum hydrocarbon releases in soil.

<u>Guidelines</u>	<u>Recommended Action</u>
10 - 100 ppm ¹	No action
100 - 1000 ppm	Investigate groundwater impact and groundwater criteria application
> 1000 ppm	Implement remedial action

The concentration of heavy petroleum hydrocarbons (8000 mg/kg) in the sample from the PG&E excavation clearly exceeds the RWQCB guidelines for soil cleanup. The other HPH and gasoline

¹ ppm = parts per million or mg/kg

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concentrations fall within the middle category where mitigation requirements will depend heavily on local groundwater quality and usage in the area.

Soil cleanup guidelines for organic chemicals in soil are presented in the California State Mitigation Decision Tree (California DHS Toxic Substances Control Division, Alternative Technology and Policy Development Section, June 1985. The recommended acceptable concentrations of chemicals in soil are referred to as the recommended soil cleanup level (RSCL). The RSCL can be determined by multiplying the DHS drinking water standard or action level by 1000. Accordingly, the individual RSCL values for the organic chemicals detected at the site are summarized below.

<u>Chemical</u>	<u>RSCL (mg/kg)</u>	<u>Actual Soil Concentration (mg/kg)</u>
Tetrachloroethylene (PCE)	4.0	6.6
Trichloroethylene (TCE)	5.0	15.0
Trans 1-2 Dichloroethylene (Trans 1, 2, DCE)	16.0	8.0

As indicated above, the RSCL values are exceeded by both PCE and TCE. On this basis, we believe that some soil cleanup will likely be required because of solvent contamination.

Recommendations

Based on our preliminary study, we conclude that some soil cleanup will likely be required. The actual extent and scope of the remedial action should be negotiated with the Alameda County Environmental Health Department, the RWQCB, and the Department of Health Services (DHS).

Because of your desire to mitigate the soil contamination problem as quickly as possible, we believe that the most appropriate method of soil remediation will be to excavate the contaminated soils and have them properly disposed of. Prior to soil removal, we recommend that additional soil samples be obtained and analyzed for purgeable organic compounds so that the extent of solvent contamination can be more accurately defined prior to excavation.

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It is possible that groundwater in the area has been impacted. For this reason, we believe that the regulatory agencies involved will require that groundwater monitoring wells be installed, and that water samples be obtained and analyzed.

If you have any questions regarding our conclusions or services to date, please call.

Yours very truly,

Subsurface Consultants, Inc.



James P. Bowers
Geotechnical Engineer 157 (expires 3/31/91)

JPB:ch

Attachments: Table 1 - Summary of Chemical Analyses
Plate 1 - Site Plan
Plate 2 through 4 - Log of Borings 1 through 6
Plate 5 - Unified Soil Classification System
Analytical Test Reports
Chain of Custody Documents

3 copies submitted

cc: Mr. Larry Seto (4)
Alameda County Environmental Health Department

Table 1. Summary of Chemical Analyses

Boring	Depth (Feet)	(mg/kg) ¹	(mg/kg)	Purgeable Organics ³ (mg/kg)
1	4.0'	72	200	NT ²
1	8.6'	<10	<50	NT
2	2.6'	<10	<50	NT
2	7.1'	<10	<50	NT
3	5.0'	<10	<50	NT
3	8.5'	320	<50	NT
4	4.5'	<10	<50	NT
4	10.5'	<10	<50	NT
5	4.0'	<10	<50	NT
5	8.0'	<10	<50	NT
6	5.0'	<10	<50	NT
6	9.1'	<10	<50	NT
PG&E Excavation @ 3'		NT	8000	NT
6	5.0	Tetrachloroethylene (PCE) Trichloroethylene (TCE) Trans 1-2 Dichloroethylene (Trans 1, 2 DCE)		6.6 15.0 8.0

¹ mg/kg = milligrams per kilogram

² NT = not tested, analysis was not performed

³ EPA 8240 includes the 31 purgeable organic chemicals listed on the test reports

-  TEST BORING
-  PG&E EXCAVATION
-  TELEPHONE POLE



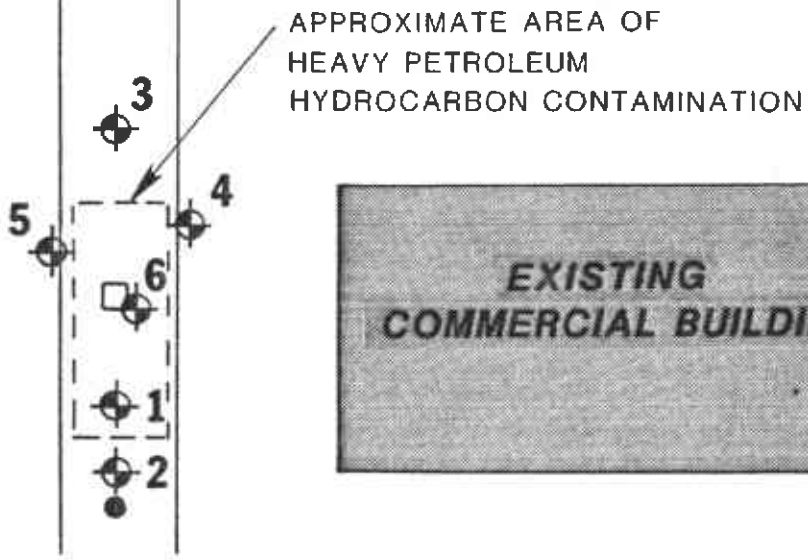
VICINITY MAP



E. 14th STREET

150th AVENUE

SIDEWALK




**EXISTING
COMMERCIAL BUILDING**

APPROXIMATE SCALE (feet)



SITE PLAN

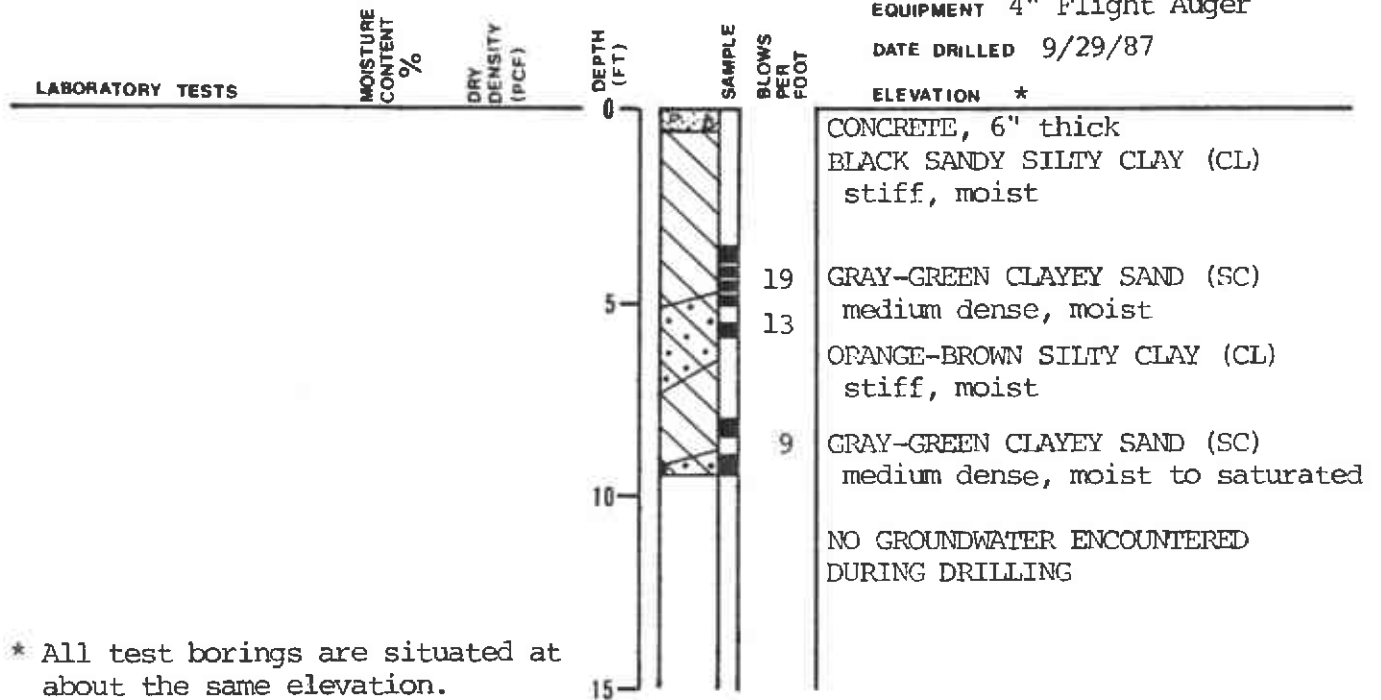
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150th & E.14th STREETS - SAN LEANDRO, CA		PLATE
JOB NUMBER	DATE	APPROVED
209.005	10/13/87	

1

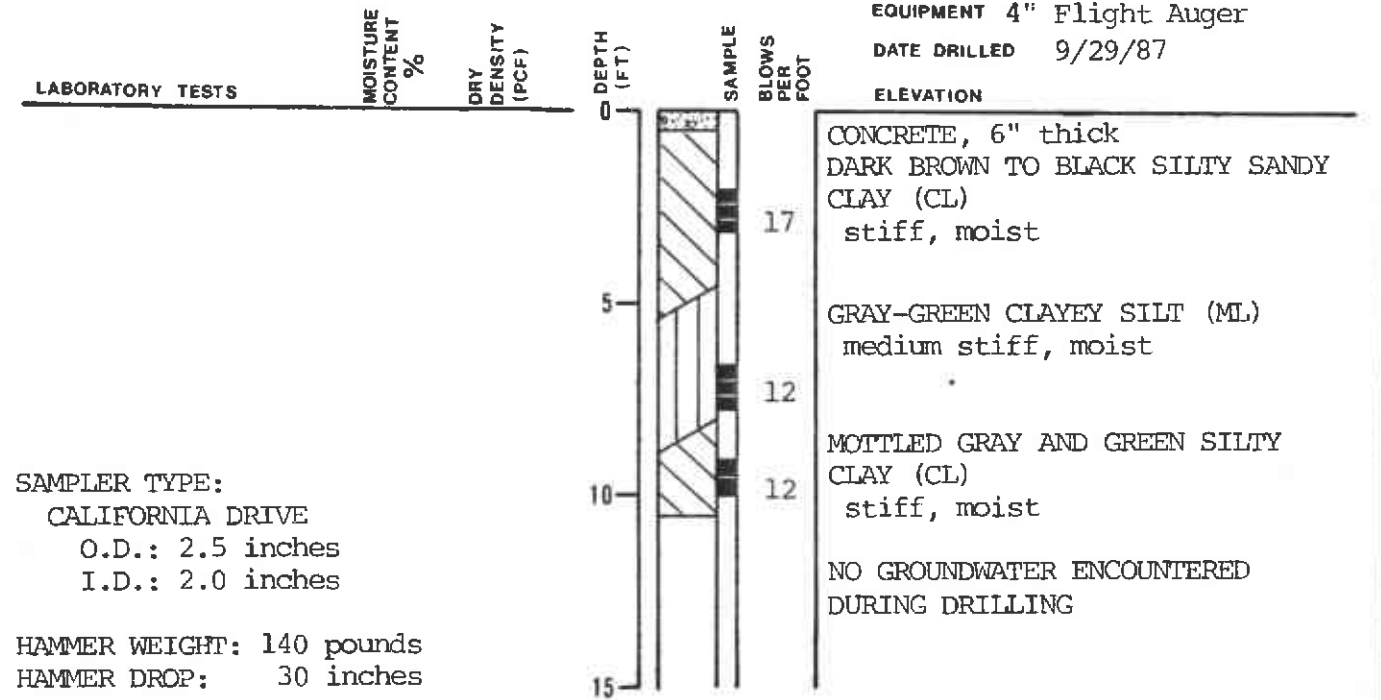
LOG OF TEST BORING 1

EQUIPMENT 4" Flight Auger
 DATE DRILLED 9/29/87
 ELEVATION *



LOG OF TEST BORING 2

EQUIPMENT 4" Flight Auger
 DATE DRILLED 9/29/87
 ELEVATION



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150th & E.14th STREETS - SAN LEANDRO, CA

JOB NUMBER
 209.005

DATE
 10/13/87

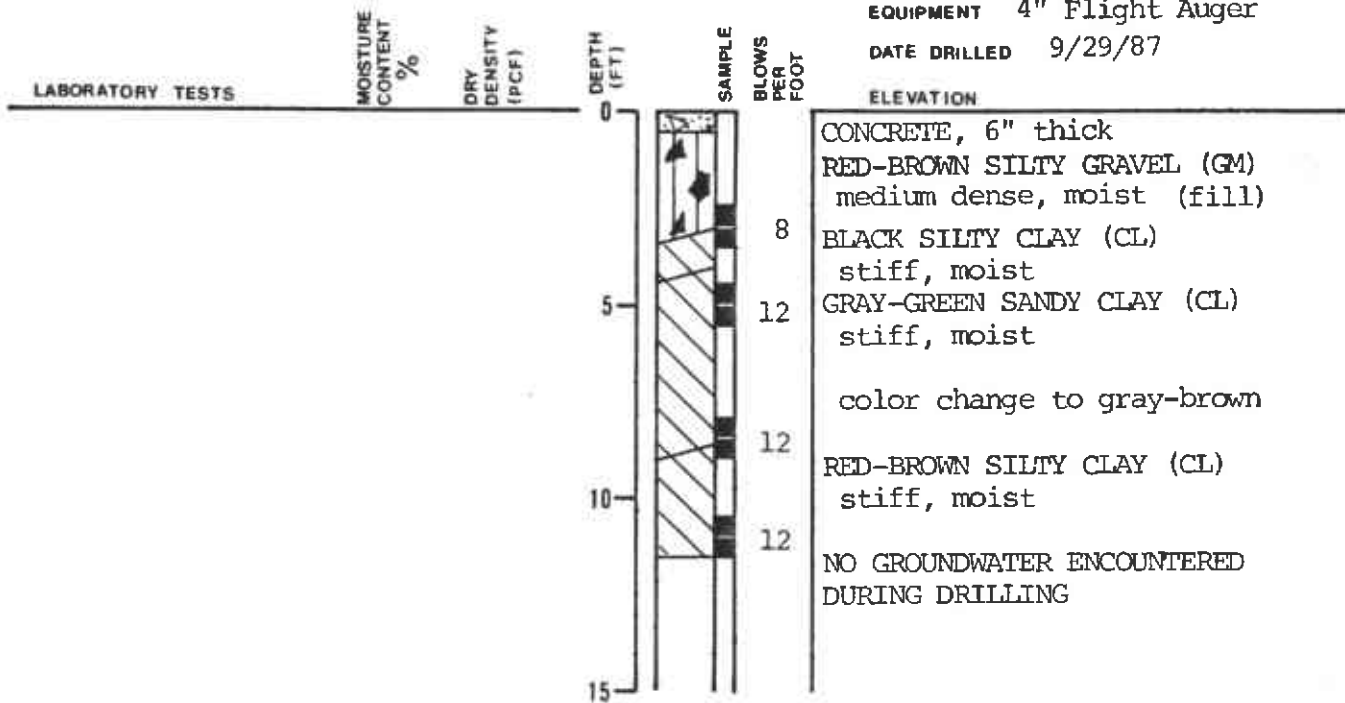
APPROVED

PLATE

2

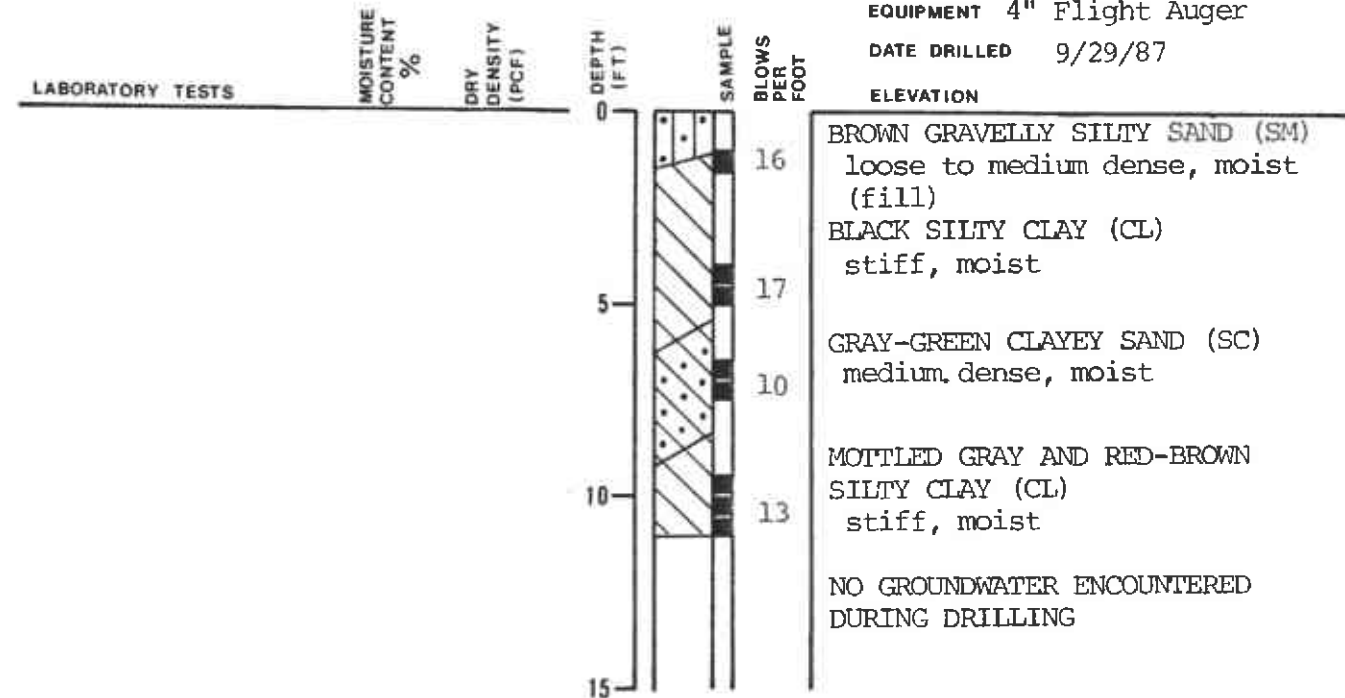
LOG OF TEST BORING 3

EQUIPMENT 4" Flight Auger
 DATE DRILLED 9/29/87



LOG OF TEST BORING 4

EQUIPMENT 4" Flight Auger
 DATE DRILLED 9/29/87



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150th & E.14th STREETS--SAN LEANDRO, CA

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LOG OF TEST BORING 5

LABORATORY TESTS

MOISTURE CONTENT %
DRY DENSITY (PCF)

DEPTH (FT)

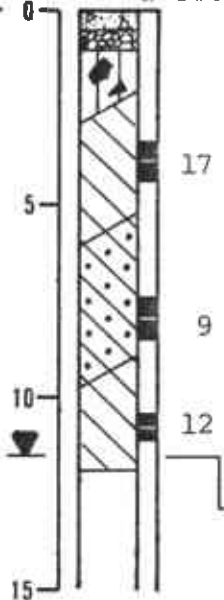
SAMPLE

BLOWS PER FOOT

EQUIPMENT 4" Flight Auger

DATE DRILLED 9/29/87

ELEVATION



CONCRETE, 6" thick
BASEROCK, 6" thick
BROWN SILTY GRAVEL (GM)
medium dense, moist (fill)
17 DARK BROWN TO BLACK SILTY CLAY (CL)
stiff, moist
9 GRAY-GREEN CLAYEY SAND (SC)
medium dense, moist
12 MOTTLED GRAY AND BROWN SILTY CLAY (CL)
stiff, moist
GROUNDWATER LEVEL 9/29/87

LOG OF TEST BORING 6

LABORATORY TESTS

MOISTURE CONTENT %
DRY DENSITY (PCF)

DEPTH (FT)

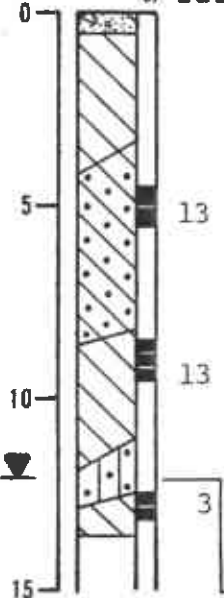
SAMPLE

BLOWS PER FOOT

EQUIPMENT 4" Flight Auger

DATE DRILLED 9/29/87

ELEVATION



CONCRETE, 6" thick
BLACK SILTY CLAY (CL)
stiff, moist
13 GRAY-GREEN CLAYEY SAND (SC)
medium dense, moist
13 GRAY-GREEN SILTY CLAY (CL)
stiff, moist
3 GRAY SILTY SAND (SM)
loose, saturated
GRAY SILTY CLAY (CL)
soft, saturated
GROUNDWATER LEVEL 9/29/87

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209.005

DATE

10/13/87

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PLATE

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GENERAL SOIL CATEGORIES			SYMBOLS	TYPICAL SOIL TYPES	
COARSE GRAINED SOILS More than half is larger than No. 200 sieve	GRAVEL More than half coarse fraction is larger than No. 4 sieve size	Clean Gravel with little or no fines	GW	Well Graded Gravel, Gravel-Sand Mixtures	
		Gravel with more than 12% fines	GP	Poorly Graded Gravel, Gravel-Sand Mixtures	
		SAND More than half coarse fraction is smaller than No. 4 sieve size	Clean sand with little or no fines	GM	Silty Gravel, Poorly Graded Gravel-Sand-Silt Mixtures
			Gravel with more than 12% fines	GC	Clayey Gravel, Poorly Graded Gravel-Sand-Clay Mixtures
	FINE GRAINED SOILS More than half is smaller than No. 200 sieve	SILT AND CLAY Liquid Limit Less than 50%	Clean sand with little or no fines	SW	Well Graded Sand, Gravelly Sand
			Sand with more than 12% fines	SP	Poorly Graded Sand, Gravelly Sand
		SILT AND CLAY Liquid Limit Greater than 50%	Sand with more than 12% fines	SM	Silty Sand, Poorly Graded Sand-Silt Mixtures
			HIGHLY ORGANIC SOILS	ML	Inorganic Silt and Very Fine Sand, Rock Flour, Silty or Clayey Fine Sand, or Clayey Silt with Slight Plasticity
				CL	Inorganic Clay of Low to Medium Plasticity, Gravelly Clay, Sandy Clay, Silty Clay, Lean Clay
				OL	Organic Clay and Organic Silty Clay of Low Plasticity
HIGHLY ORGANIC SOILS	MH	Inorganic Silt, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silt			
	CH	Inorganic Clay of High Plasticity, Fat Clay			
HIGHLY ORGANIC SOILS	OH	Organic Clay of Medium to High Plasticity, Organic Silt			
	PT	Peat and Other Highly Organic Soils			

UNIFIED SOIL CLASSIFICATION SYSTEM

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209.005

DATE
10/13/87

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PLATE

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BROWN AND CALDWELL LABORATORIES

1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-10-282

RECEIVED

Received: 13 OCT 87
Reported: 20 OCT 87

OCT 22 1987

Mr. James P. Bowers
Subsurface Consultants, Inc.
171 12th Street, Suite 201
Oakland, California 94607

AM
7, 8, 9, 10, 11, 12, 1, 2, 3, 4, 5, 6
PM

Project: SC1 209.005

REPORT OF ANALYTICAL RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-282-1	N. Wall Trench @3 Degrees	13 OCT 87
10-282-2	1 @ 4.0	29 SEP 87
10-282-3	1 @ 8.6	29 SEP 87
10-282-4	2 @ 2.6	29 SEP 87
10-282-5	2 @ 7.1	29 SEP 87

PARAMETER	10-282-1	10-282-2	10-282-3	10-282-4	10-282-5
Hydrocarbons by IR, mg/kg	8000	200	<50	<50	<50

4/8.1

6/2/93

Daniel Mew, BTC Labs

could be C1HC
Gas
O+G

polar + non polar
etc.



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Project: SC1 209.005

REPORT OF ANALYTICAL RESULTS

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED		
10-282-11	5 @ 8.0	29 SEP 87		
10-282-12	6 @ 9.1	29 SEP 87		
10-282-13	6 @ 5.0	29 SEP 87		
PARAMETER		10-282-11	10-282-12	10-282-13
Hydrocarbons by IR, mg/kg		<50	<50	<50

D. A. McLean, Laboratory Director



LOG NO: E87-10-053

Received: 02 OCT 87

Reported: 14 OCT 87

Mr. James P. Bowers
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171 12th Street, Suite 201
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Project: C+H DEVELOPMENT

REPORT OF ANALYTICAL RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-053-1	1 @ 4.0	29 SEP 87
10-053-2	1 @ 8.6	29 SEP 87
10-053-3	2 @ 2.6	29 SEP 87
10-053-4	2 @ 7.1	29 SEP 87
10-053-5	3 @ 5.0	29 SEP 87

PARAMETER	10-053-2	10-053-3	10-053-4	10-053-5
Total Fuel Hydrocarbons, mg/kg	72	<10	<10	<10

micro extraction: 10/10/87 soil/H₂O/pentane
- shake 2min
- aliquot injected to GC



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REPORT OF ANALYTICAL RESULTS

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED				
10-053-6	3 @ 8.5	29 SEP 87				
10-053-7	4 @ 4.5	29 SEP 87				
10-053-8	4 @ 10.5	29 SEP 87				
10-053-9	5 @ 4.0	29 SEP 87				
10-053-10	5 @ 8.0	29 SEP 87				
PARAMETER		10-053-7	10-053-8	10-053-9	10-053-10	
Total Fuel Hydrocarbons, mg/kg	320	<10	<10	<10	<10	



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REPORT OF ANALYTICAL RESULTS

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED	
10-053-11	6 @ 9.1	29 SEP 87	
10-053-12	6 @ 5.0	29 SEP 87	
PARAMETER		10-053-11	10-053-12
Total Fuel Hydrocarbons, mg/kg		<10	<10



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Oakland, California 94607

Project: C+H DEVELOPMENT

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-053-11	6 @ 9.1	29 SEP 87
10-053-12	6 @ 5.0	29 SEP 87
PARAMETER	10-053-11	10-053-12
Purgeable Priority Pollutants		
Extraction	---	10.07.87
1,1,1-Trichloroethane, mg/kg	---	<0.2
1,1,2,2-Tetrachloroethane, mg/kg	---	<0.2
1,1,2-Trichloroethane, mg/kg	---	<0.2
1,1-Dichloroethane, mg/kg	---	<0.2
1,1-Dichloroethylene, mg/kg	---	<0.2
1,2-Dichloroethane, mg/kg	---	<0.2
1,2-Dichloropropane, mg/kg	---	<0.2
1,3-Dichloropropene, mg/kg	---	<0.2
2-Chloroethylvinylether, mg/kg	---	<0.2
Acrolein, mg/kg	---	<2
Acrylonitrile, mg/kg	---	<2
Bromodichloromethane, mg/kg	---	<0.2
Bromomethane, mg/kg	---	<0.2
Benzene, mg/kg	---	<0.2
Chlorobenzene, mg/kg	---	<0.2
Carbon Tetrachloride, mg/kg	---	<0.2
Chloroethane, mg/kg	---	<0.2
Bromoform, mg/kg	---	<0.2
Chloroform, mg/kg	---	<0.2
Chloromethane, mg/kg	---	<0.2
Dibromochloromethane, mg/kg	---	<0.2
Ethylbenzene, mg/kg	---	<0.2



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REPORT OF ANALYTICAL RESULTS

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED	
10-053-11	6 @ 9.1	29 SEP 87	
10-053-12	6 @ 5.0	29 SEP 87	
PARAMETER		10-053-11	10-053-12
Methylene chloride, mg/kg		---	<0.2
Tetrachloroethylene, mg/kg		---	[REDACTED]
Trichloroethylene, mg/kg		---	[REDACTED]
Trichlorofluoromethane, mg/kg		---	<0.2
Toluene, mg/kg		---	<0.2
Vinyl chloride, mg/kg		---	<0.2
trans-1,2-Dichloroethylene, mg/kg		---	[REDACTED]
trans-1,3-Dichloropropene, mg/kg		---	<0.2

D. A. McLean, Laboratory Director

