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By dehloptoxic at 8:44 am, Nov 16, 2006



ENVIRONMENTAL ENGINEERING, INC
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TEL (925)734-6400 • FAX(925)734-6401

November 15, 2006

Mr. Don Hwang
Alameda County Health Care Services Agency
Environmental Health Services, Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: Response to ACHCS Comments for Fuel Leak Case No. RO0000317:
5725 Thornhill Drive, Oakland, California 94611

Dear Mr. Hwang:

Thank you for your letter dated August 15, 2006 in connection with the above addressed property. This letter addresses your technical comments as indicated in your letter. Your comments are bold and italicized and are followed by our response.

Comment 1

CPT-6 not installed- The proposed location is just upgradient from Temescal Creek and Boring BH-C sampled September 6, 2000, detected 25,000 ug/l TPH-Diesel, 7,300 ug/L TPH-Gasoline, and 5,300 ug/L MtBE. Nor was a soil borehole log provided. Please explain why "Previously planned CPT-6 could not be drilled due to physical constrains and obstruction of local traffic." Also, please include in a supplemental workplan, an alternative drilling method for this location or propose alternative boring locations.

The original "sidewalk" location of the CPT-6 boring was highly influenced by excessive traffic, and the presence of numerous utility lines, including a storm culvert running along the narrow Thornhill Drive, making it problematic to install the above boring in the street lane rather than in the sidewalk area. Figure 1 shows the original location of CPT-6.

During the advancement of the CPT-6 boring, an obstruction was encountered in the sidewalk area at a depth of approximately 3 to 4 feet bgs. Several attempts were made to advance the above referenced boring, approximately 10 feet to the west and to the east of the original boring location in the sidewalk area of Thornhill Drive. Each attempt was terminated upon encountering resistance at the similar depths. During this process the drilling equipment was damaged, and as a result, SOMA had to cease its efforts. SOMA exhausted its efforts and concluded that the encountered resistance could be construction debris, like

concrete fragments. An alternative drilling method and new boring location for the former proposed CPT-6 is outlined in our Workplan dated November 15, 2006.

Comment 2

MIP charts did not identify the corresponding CPT/MIP borings- Please label MIP charts with their corresponding CPT/MIP boring number.

SOMA has complied with this directive. Properly labeled CPT/MIP logs are attached to this letter as Attachment A.

Comment 3

No soil samples for analyses were collected from the CPT/MIP borings-Yet, MIP charts showed contaminant peaks. Please include in a supplemental workplan, a proposal to collect soil samples from the CPT/MIP borings.

SOMA concurs with this comment; some MIP charts did exhibit contaminant peaks, specifically CPT-2, CPT-3, CPT-8 and CPT-9. These peaks were observed at shallow depths ranging from 1 to 6 feet below ground surface (bgs) in CPT-2 and CPT-3, and from 10 to 12 feet bgs in CPT-2, CPT-3, CPT-8 and CPT-9. Figure 1 shows the locations of the above CPT borings.

During the May 2005 investigation all MIP charts were reviewed and compared to the extensive soil analytical data obtained during the March 2004 soil and groundwater investigation, as well as the historical data provided by Aqua Science Engineering.

Since MIP detectors 1 and 2, PID and FID channels respectively, represent voltage output from electrometer in micro volts (μV) and not the actual contaminant concentration; historical analytical data from the HP boring, located in close proximity to the CPT boring locations, was used to establish a representative correlation for the given contaminants. The on-site CPT-9 boring, located approximately 4.5 to 5 feet northwest from the HP-1 boring, exhibited MIP spikes in both PID and FID channels ($1.8 \text{ E}+5 \text{ uV}$ and $1.125 \text{ E}+5 \text{ uV}$, respectively) at approximate depths of 10 to 12 feet bgs. Review of the soil analytical data for HP-1 at the 9 to 15 feet bgs sampling depth, exhibited the presence of petroleum hydrocarbons, like gasoline, diesel and motor oil, with maximum concentrations of 16,000 $\mu\text{g}/\text{kg}$, 6,000 $\mu\text{g}/\text{kg}$ and 19,000 $\mu\text{g}/\text{kg}$, respectively. Review of the remaining MIP charts indicated that the spikes in the PID and FID channel outputs ranged between approximately $1 \text{ E}+5 \text{ uV}$ and $3 \text{ E}+5 \text{ uV}$, which exhibits only a slight variation, not even of one order of magnitude.

Though detectible concentrations of the petroleum hydrocarbons were present at the above referenced depths, they were considerably lower than the environmental screening levels (ESLs) of 100,000 ug/l (gasoline), 100,000 ug/l (diesel), and 500,000 ug/l (motor oil), assuming that the groundwater is a current potential drinking water source. Please note that the sensitive receptor survey, performed in May 2005, did not indicate the presence of any drinking water, domestic or irrigation wells within a quarter mile radius of the site. As such, less stringent ESLs should be used to assess the impact of the existing soil contamination beneath the site. Table 1 summarizes the results of the soil analytical data in comparison to the ESLs for potential drinking and non drinking water source scenarios.

Though neither historical data, nor field observations made during the CPT investigation, appear to support the collection of additional soil samples, SOMA complied with the ACHCS's request and proposed drilling additional soil borings in the area of the former waste oil tank to confirm the vertical extent of the soil contamination. The supplemental workplan, dated November 15, 2006, includes the locations of the proposed soil borings next to the former waste oil tank.

Comment 4

Cross-sections did not show contaminant data for soil nor groundwater samples, preferential pathways, the underground storage tank pit, and borings BH-A through BH-E- Please include in a supplemental workplan, a proposal to include contaminant data for soil and groundwater samples, preferential pathways, the underground storage tank pit, and borings BH-A - BH-E.

SOMA has complied with this directive. Cross sections have been revised to include the contaminant data for soil and groundwater samples, preferential pathways, the underground storage tank pit, and borings BH-A through BH-E.

A new storm and sewer map, obtained from the City of Oakland Public Works Department, was used to plot the utility lines in close proximity to the site. Figure 2 shows the storm and sewer utility flow lines and their diameter and flow direction. Upon careful review of the new records it was concluded that the depth of utility lines next to the site ranges between approximately 9 to 10.5 feet bgs, and 14 to 15.5 feet bgs near the Temescal Creek culvert. Based on the fact that the approximate first encountered depth of the groundwater at the site ranges between 6 and 16 feet bgs, the existing utility lines can potentially act as a preferential flow pathway along Thornhill Drive.

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Alameda County
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The revised geologic cross sections and soil boring logs BH-A through BH-E are included as Attachment B.

Upon implementing the proposed workplan, additional data will be used to update the existing cross-sections and the distribution of chemical data in the cross-sections. The final report will also include a site conceptual model and our request for site closure, if warranted.

This concludes our response to your comments. Please upon review of the attached workplan call me at (925) 734-6400, if you have any questions or comments.

Sincerely,



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



cc: Mr. Mo Mashhoon, the Property Owner

Attachments

FIGURES

- CPT/MIP/GS BOREHOLE (May 2005)
- ⊙ CPT/MIP/GS BOREHOLE WITH ADJACENT CALIBRATION BORING (May 2005)
- ▲ MONITORING WELL (May 2005)
- △ MONITORING WELL
- ⊕ SOMA SOIL BORING
- ⊕ AQUA SCIENCE SOIL BORING
- ⊗ LOCATION NOT DRILLED DUE TO SUBSURFACE OBSTRUCTION

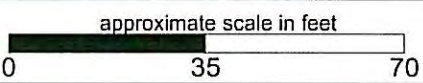
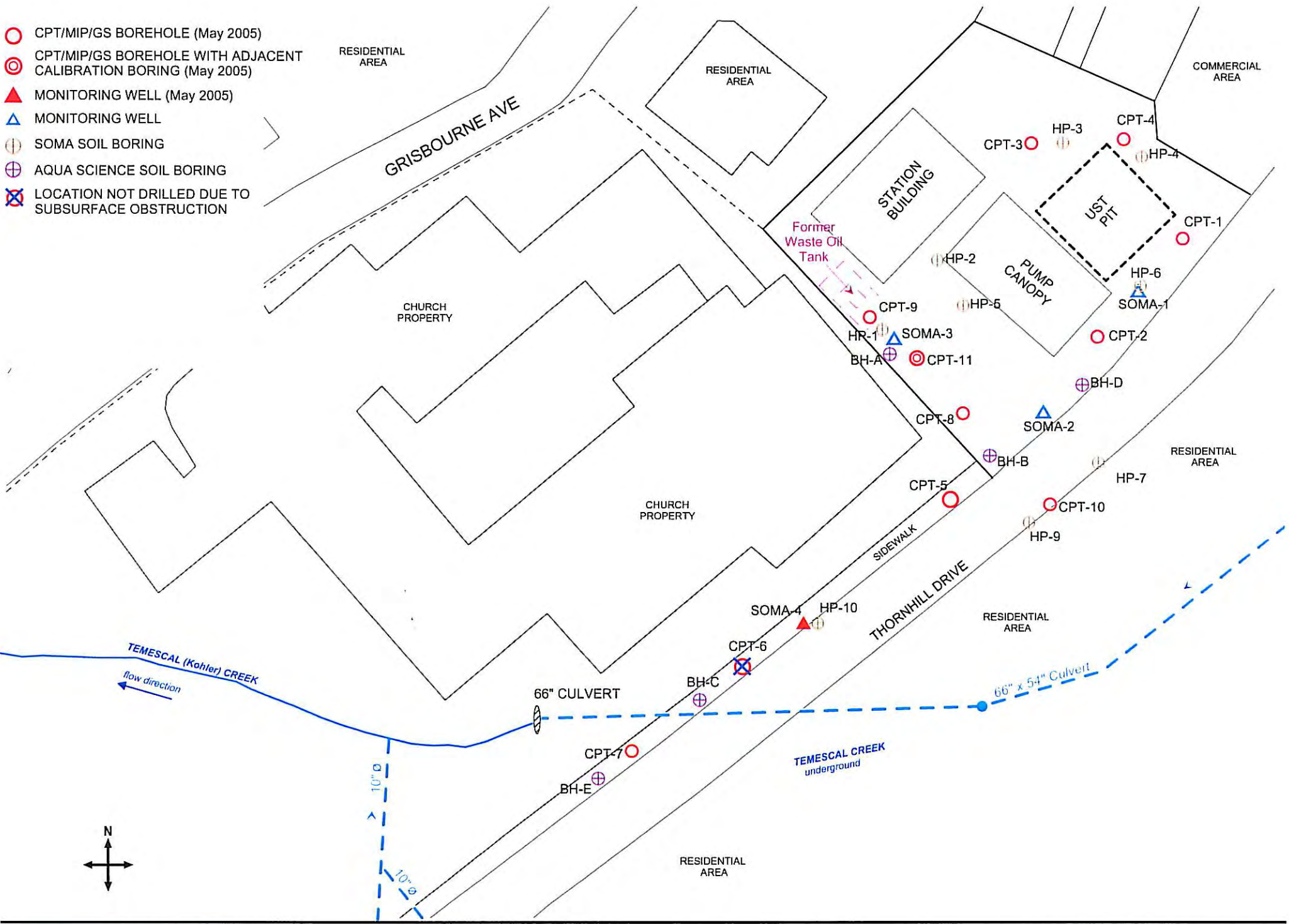


Figure 1: Locations of Previously Drilled Soil Borings and Installed Monitoring Wells

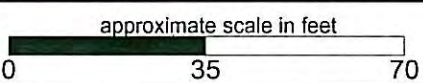
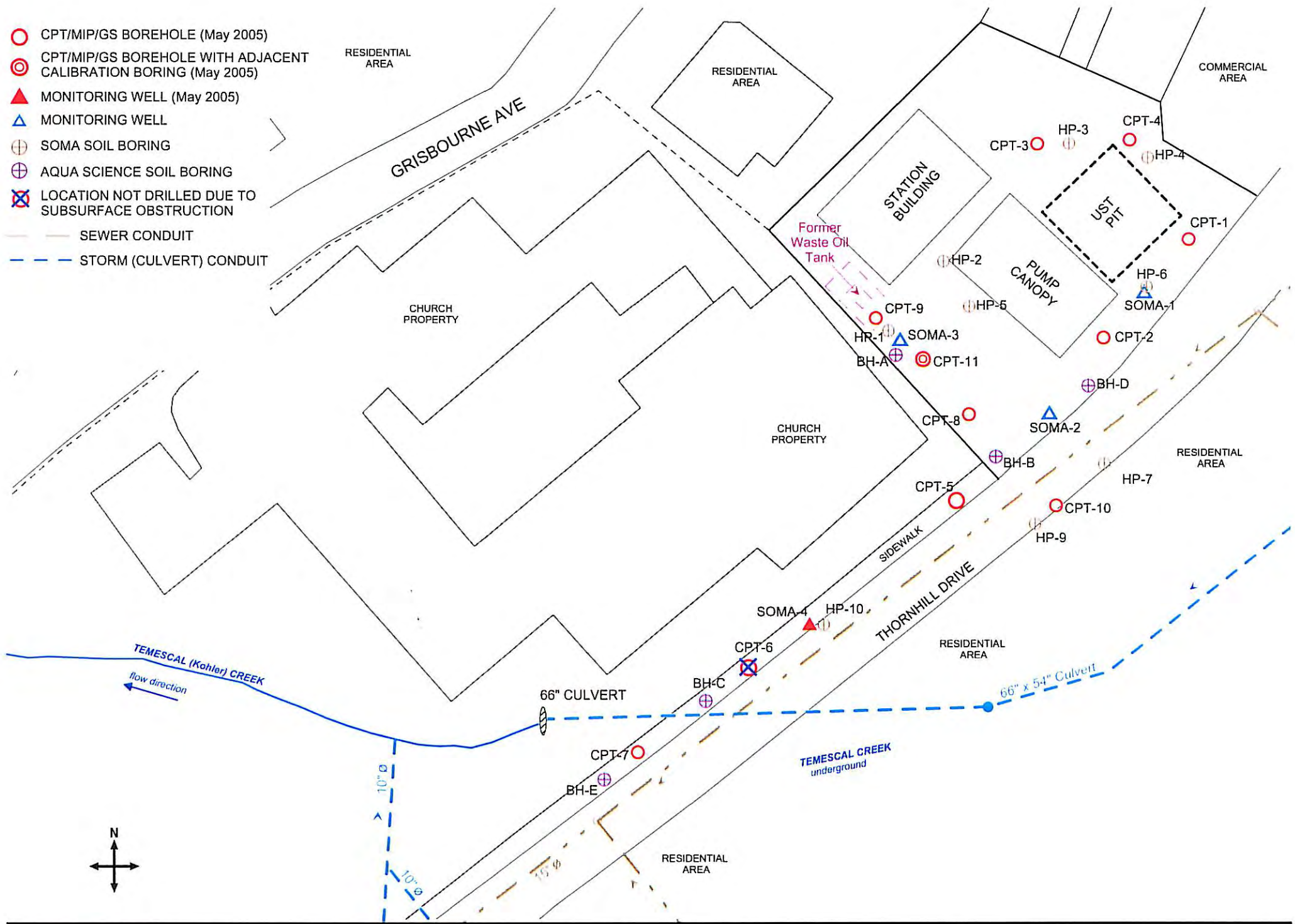


Figure 2: Site Map Showing the Location of the Utility Lines

TABLE

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)
<i>ESL* <9.8 ft</i>		100,000	100,000	500,000	23.00	44.00	2,900	3,300	2,300
<i>ESL* >9.8 ft</i>		100,000	100,000	1,000,000	23.00	44.00	2,900	3,300	2,300
<i>ESL** <9.8 ft</i>		100,000	100,000	500,000	2,000	180.00	9,300	32,000	11,000
<i>ESL** >9.8 ft</i>		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)
<i>ESL*</i> <9.8 ft		100,000	100,000	500,000	23.00	44.00	2,900	3,300	2,300
<i>ESL*</i> >9.8 ft		100,000	100,000	1,000,000	23.00	44.00	2,900	3,300	2,300
<i>ESL**</i> <9.8 ft		100,000	100,000	500,000	2,000	180.00	9,300	32,000	11,000
<i>ESL**</i> >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	<1,00	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

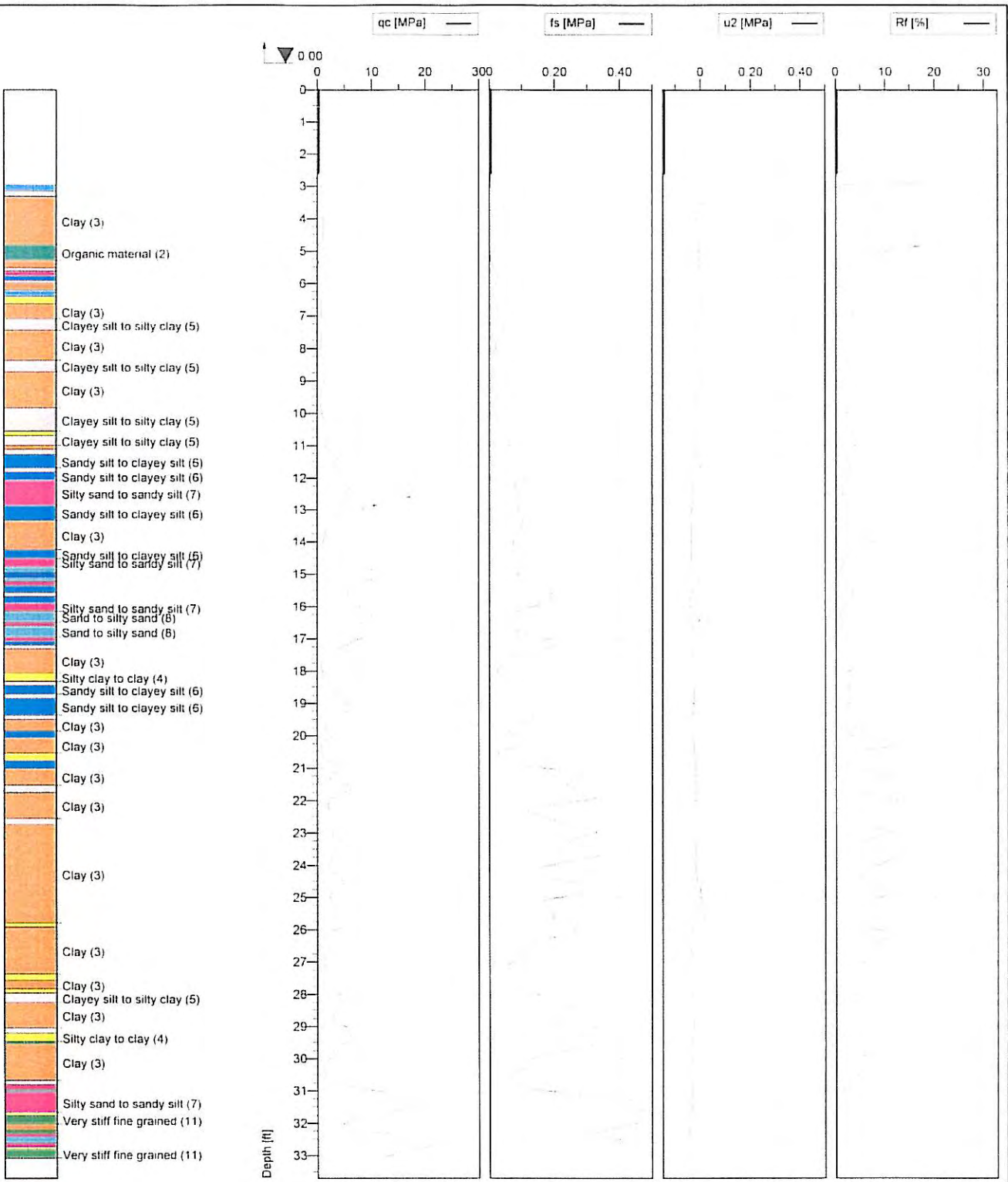
(5) ^Y Sample exhibits chromatographic pattern which does not resemble standard


* 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

Attachment A
CPT/MIP Logs





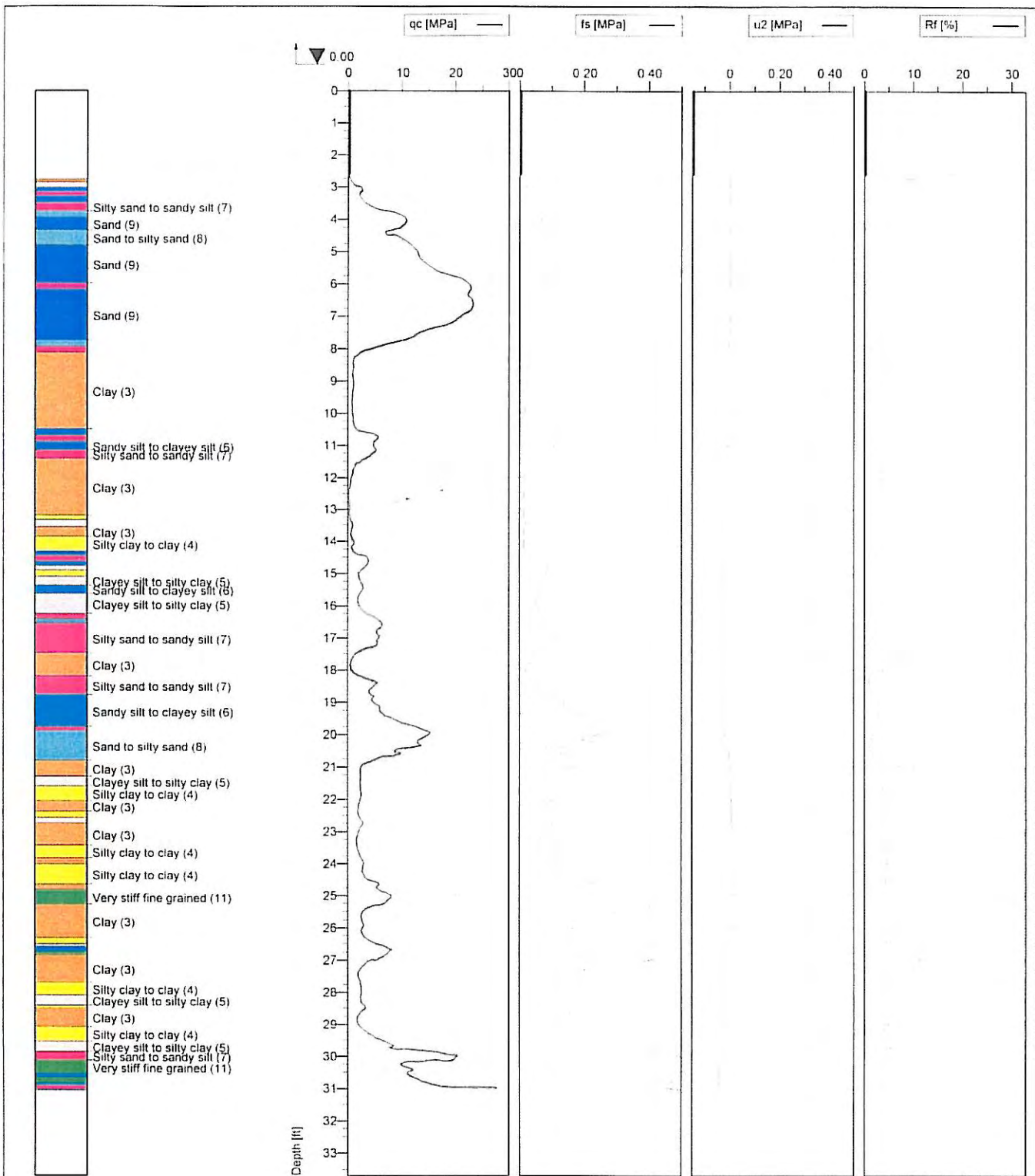
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 Sleeve area [cm²] 150

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Stoped Refusal	File: G3080-1.001	

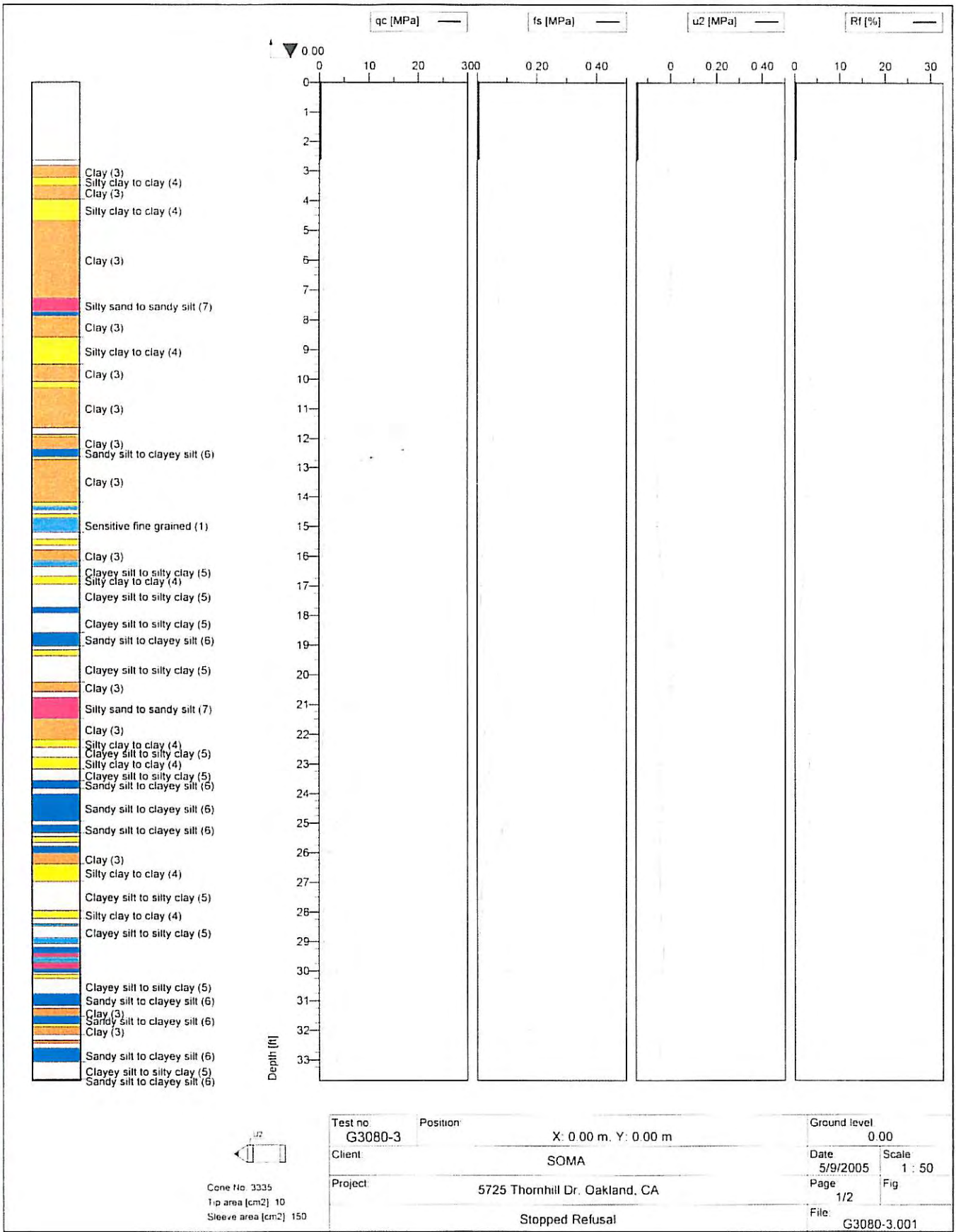
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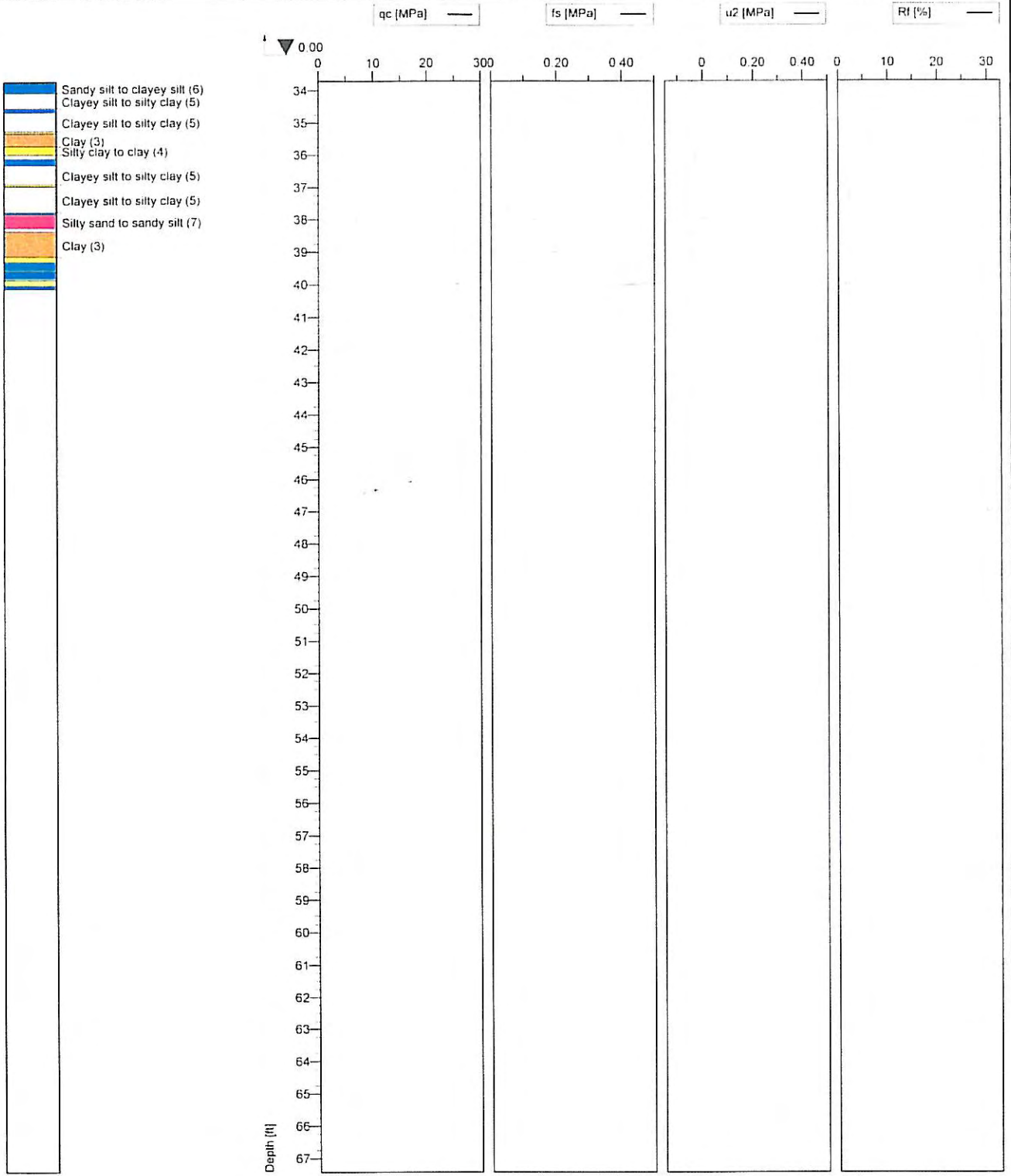

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
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CPT-2



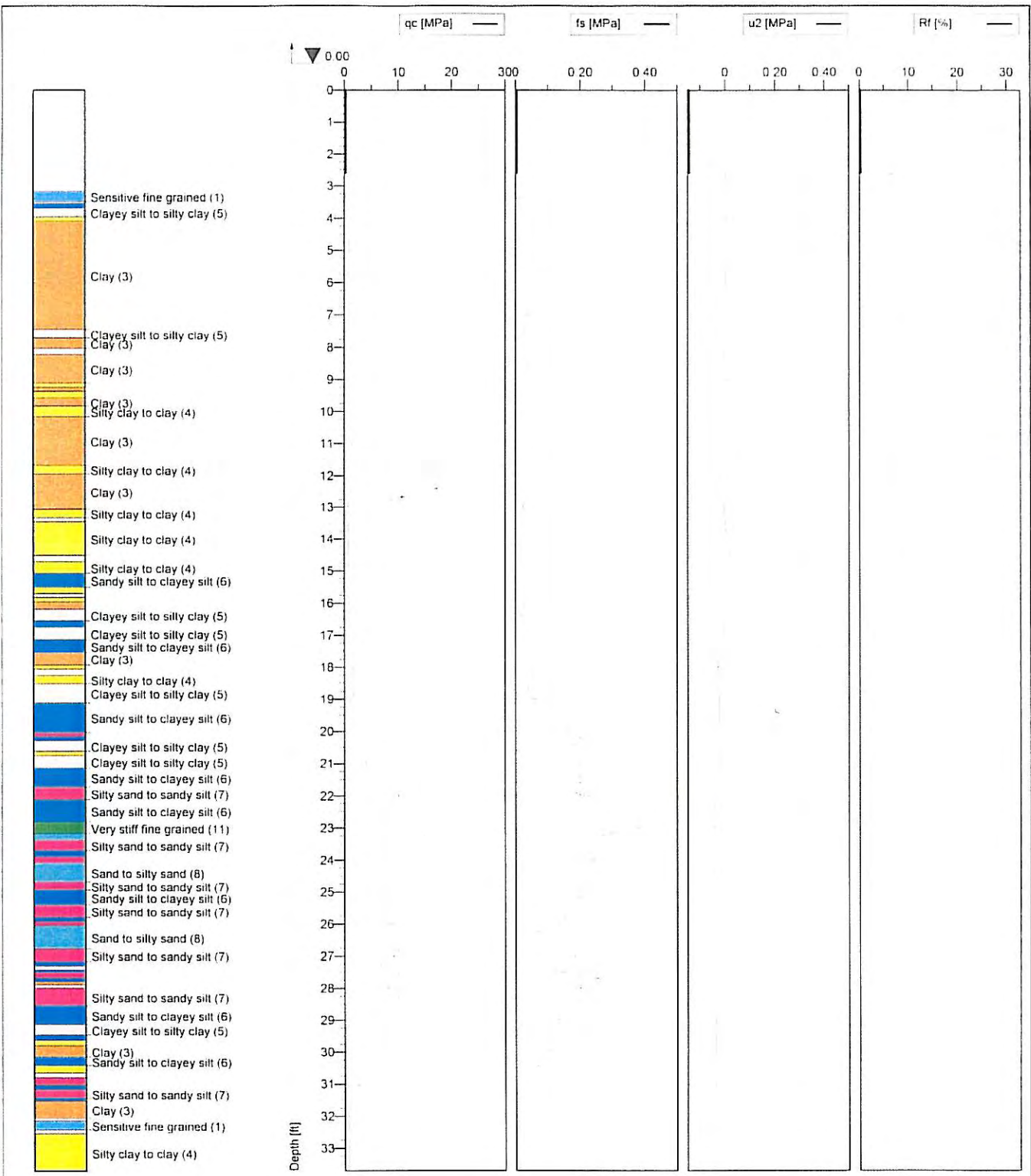
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



 Cone No 3335
 Tip area [cm²] 10
 Sleeve area [cm²] 150

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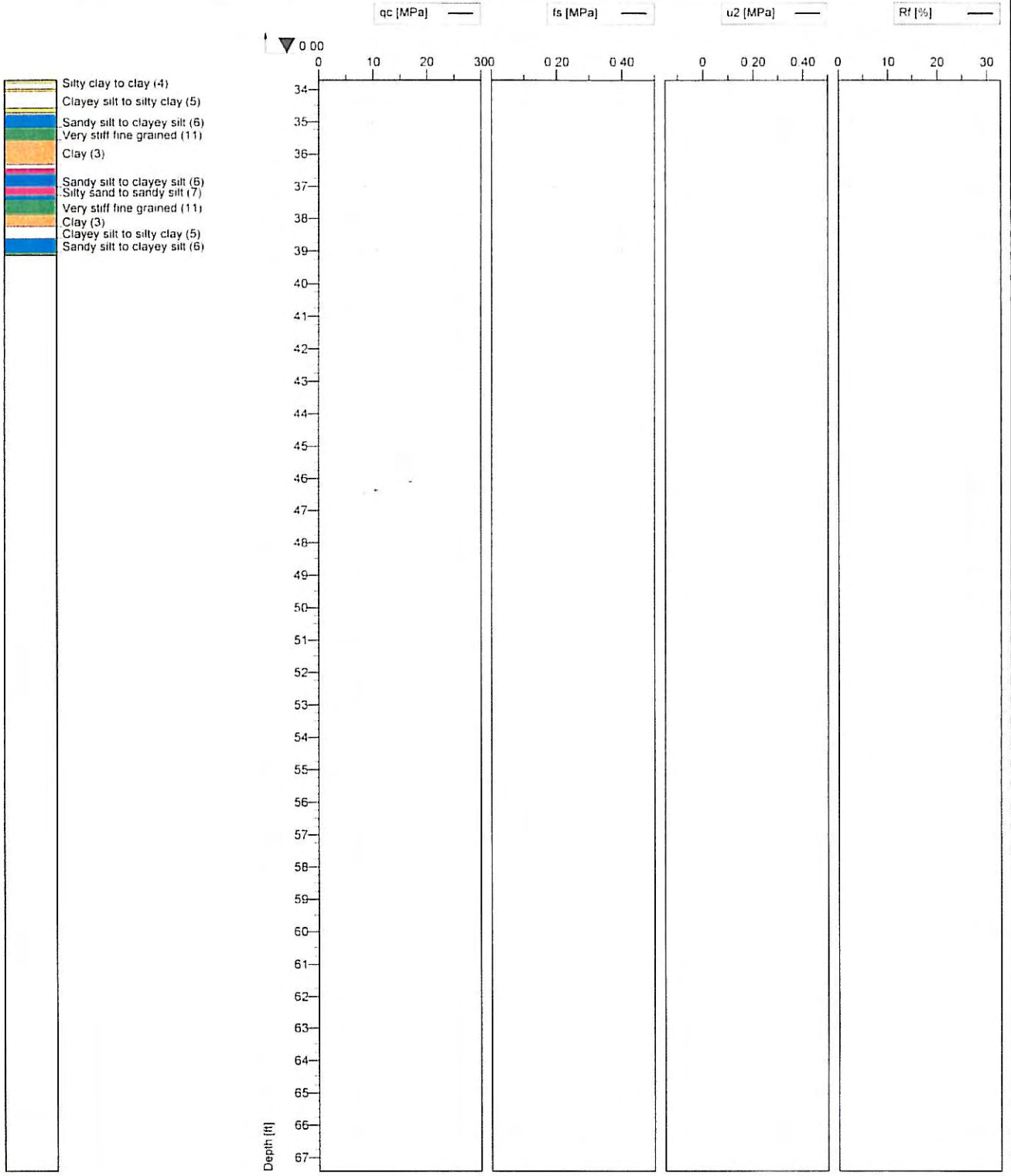
CPT-3 pg 2





 Cone No 3335
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 Sleeve area [cm²] 150

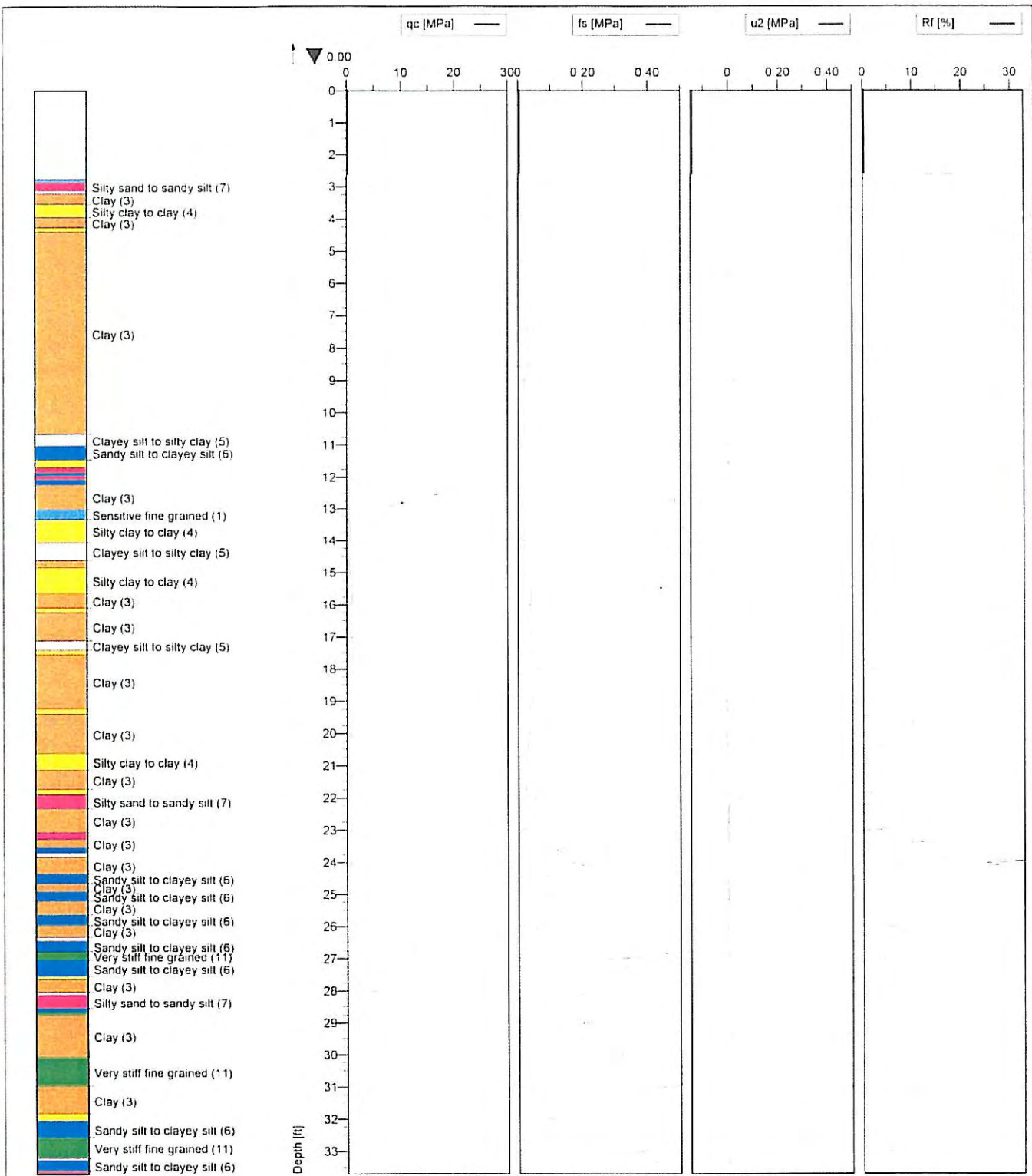
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Client SOMA	Date 5/9/2005	Scale 1 : 50
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	File G3080-4.001	


CPT-4



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	Project 5725 Thornhill Dr. Oakland, CA	Page 2/2	Fig
	File: G3080-4.001		

CPT 4 pg 2





 Cone No 3335

 Tip area [cm²] 10

 Sleeve area [cm²] 150

Test no G3080-5	Position X: 0.00 m, Y: 0.00 m	Ground level: 0.00
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Project 5725 Thornhill Dr. Oakland, CA	Page 1/2	Fig:
		File: G3080-5.001

CPT-5

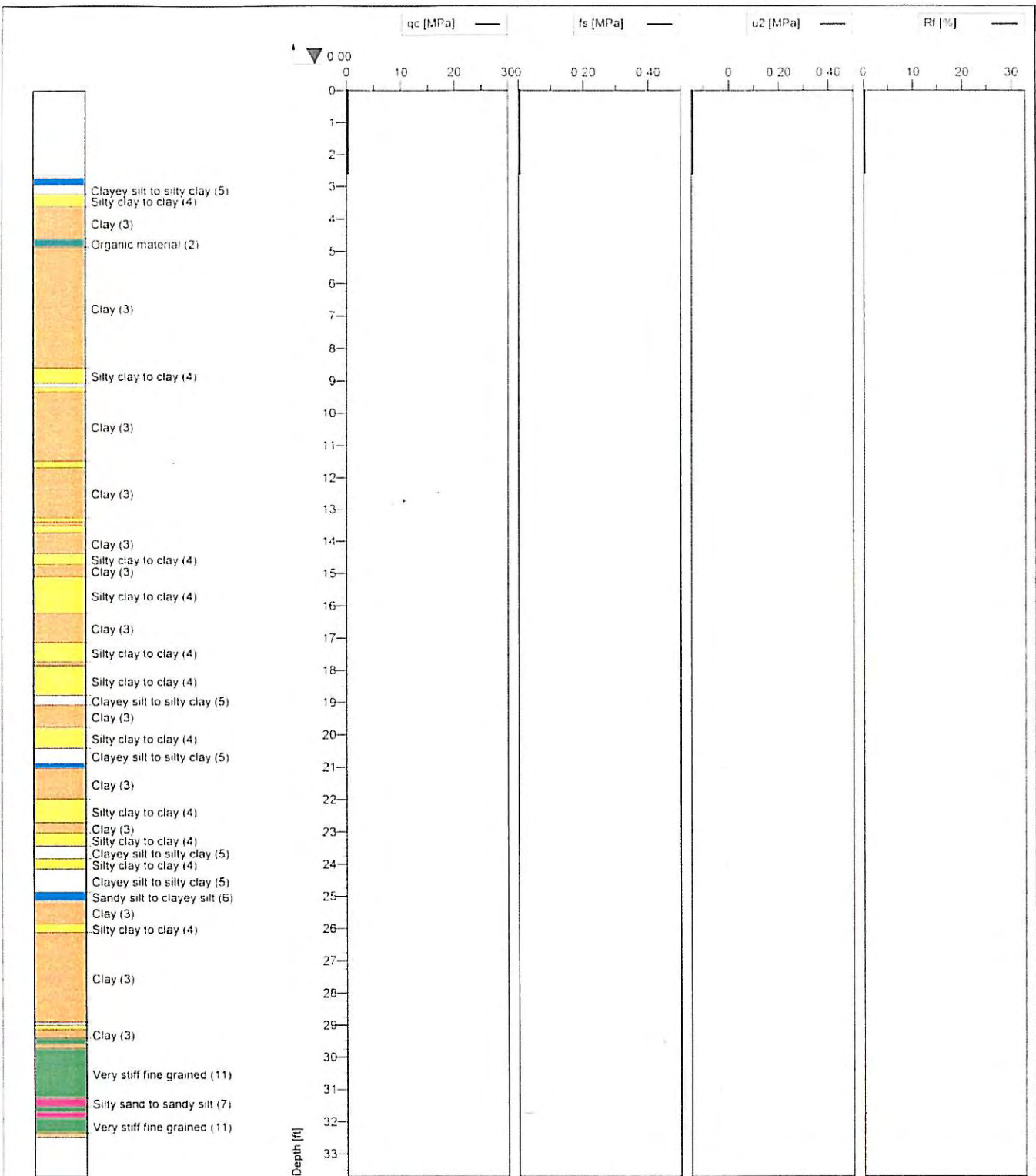




 Cone No 3335
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 Sleeve area [cm²] 150

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Project:	5725 Thornhill Dr. Oakland, CA	Page: 2/2 Fig:
		File: G3080-5.001

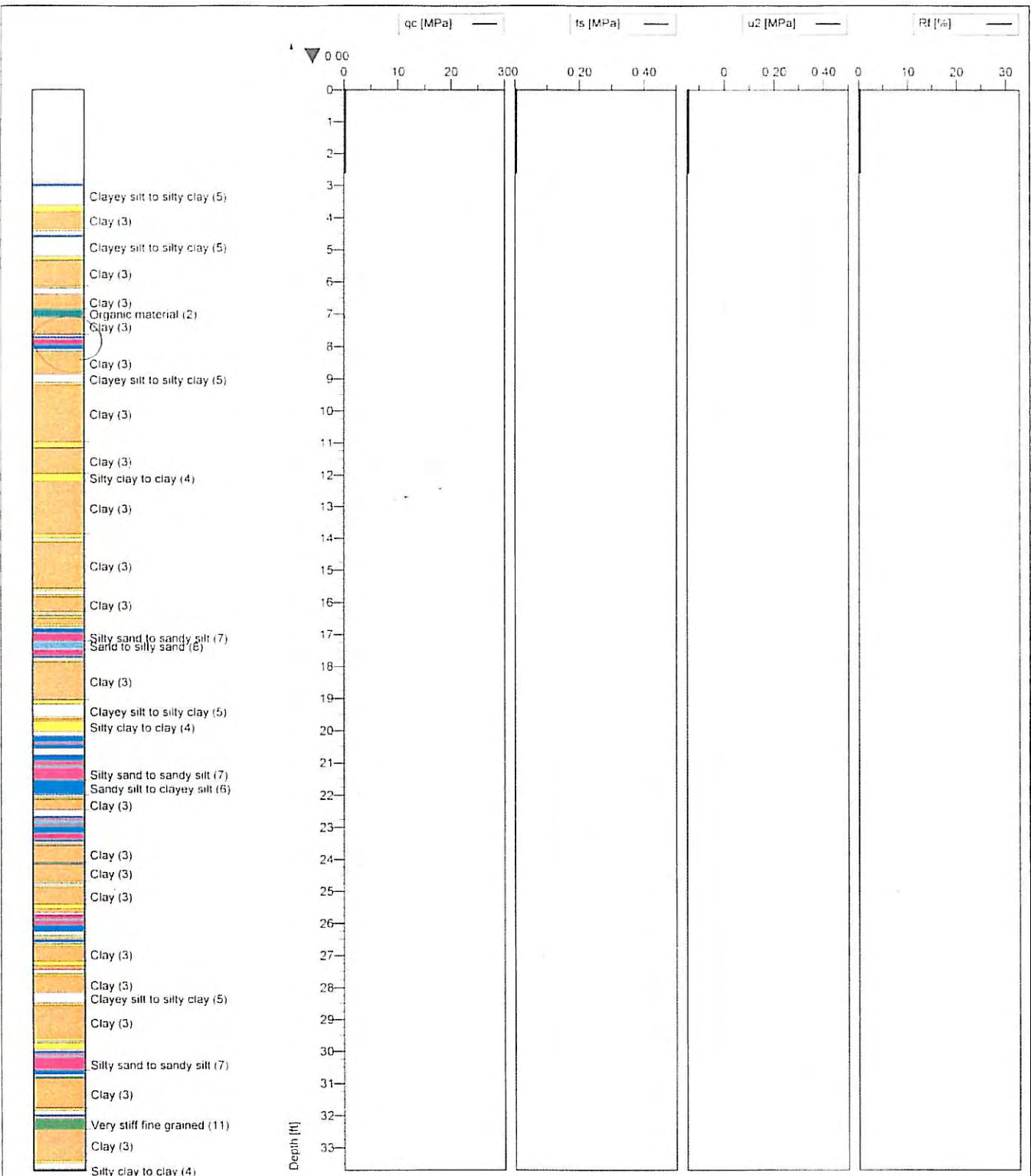
CPT 5 pg 2



Cone No. 3335
Tip area [cm²] 10
Sieve area [cm²] 150

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Client SOMA	Date 5/10/2005	Scale 1 50
Project 5725 Thornhill Dr. Oakland, CA	Page 1/1	Fig.
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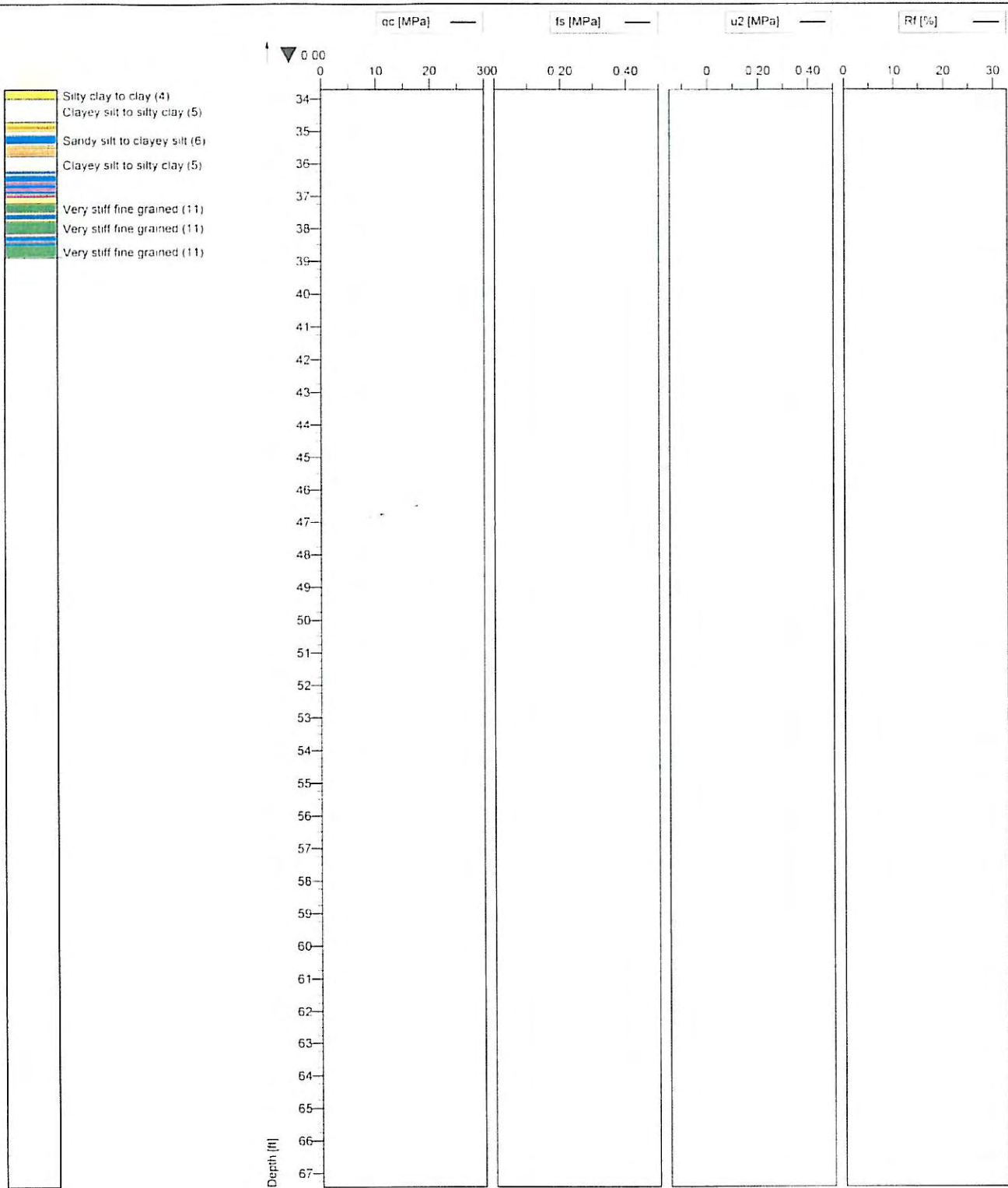
CPT-7



Cone No. 3355
 Tip area [cm²] 10
 Sleeve area [cm²] 150

Test no G3080-8	Position X: 0.00 m, Y: 0.00 m	Ground level 0.00
Client SOMA	Date 5/9/2005	Scale 1 : 50
Project 5725 Thornhill Dr. Oakland, Ca.	Page 1/2	Fig
Stopped Refusal	File G3080-8.001	

CPT-8



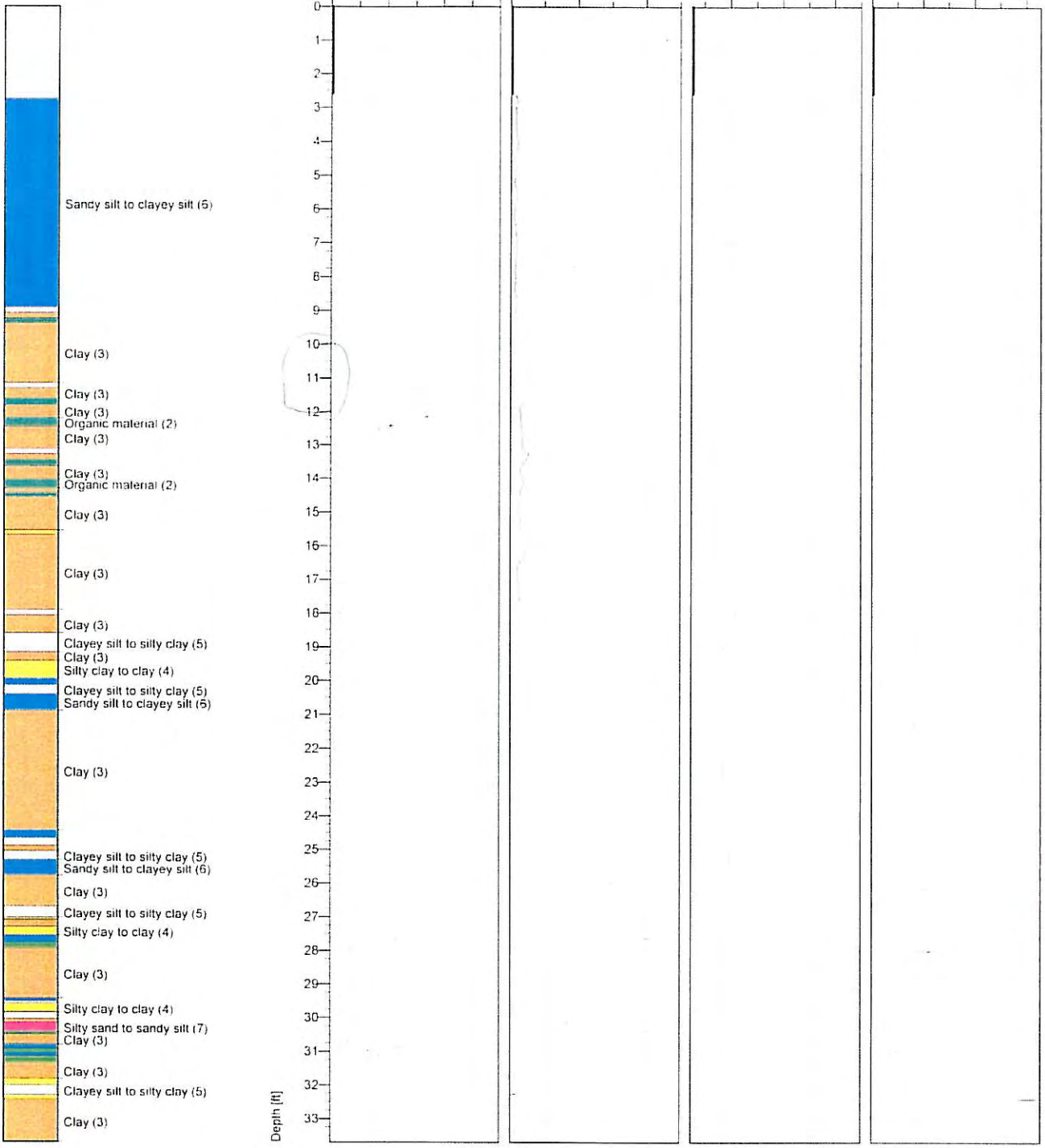
- Silty clay to clay (4)
- Clayey silt to silty clay (5)
- Sandy silt to clayey silt (6)
- Clayey silt to silty clay (5)
- Very stiff fine grained (11)
- Very stiff fine grained (11)
- Very stiff fine grained (11)

Cone No. 3335 Tip area [cm ²] 10 Sleeve area [cm ²] 150	Test no G3080-8	Position X: 0.00 m, Y: 0.00 m	Ground level 0.00
	Client SOMA	Date 5/9/2005	Scale 1 : 50
	Project 5725 Thornhill Dr. Oakland, Ca.	Page 2/2	Fig
	Stopped Refusal	File G3080-8.001	

CPT-8 pg 2

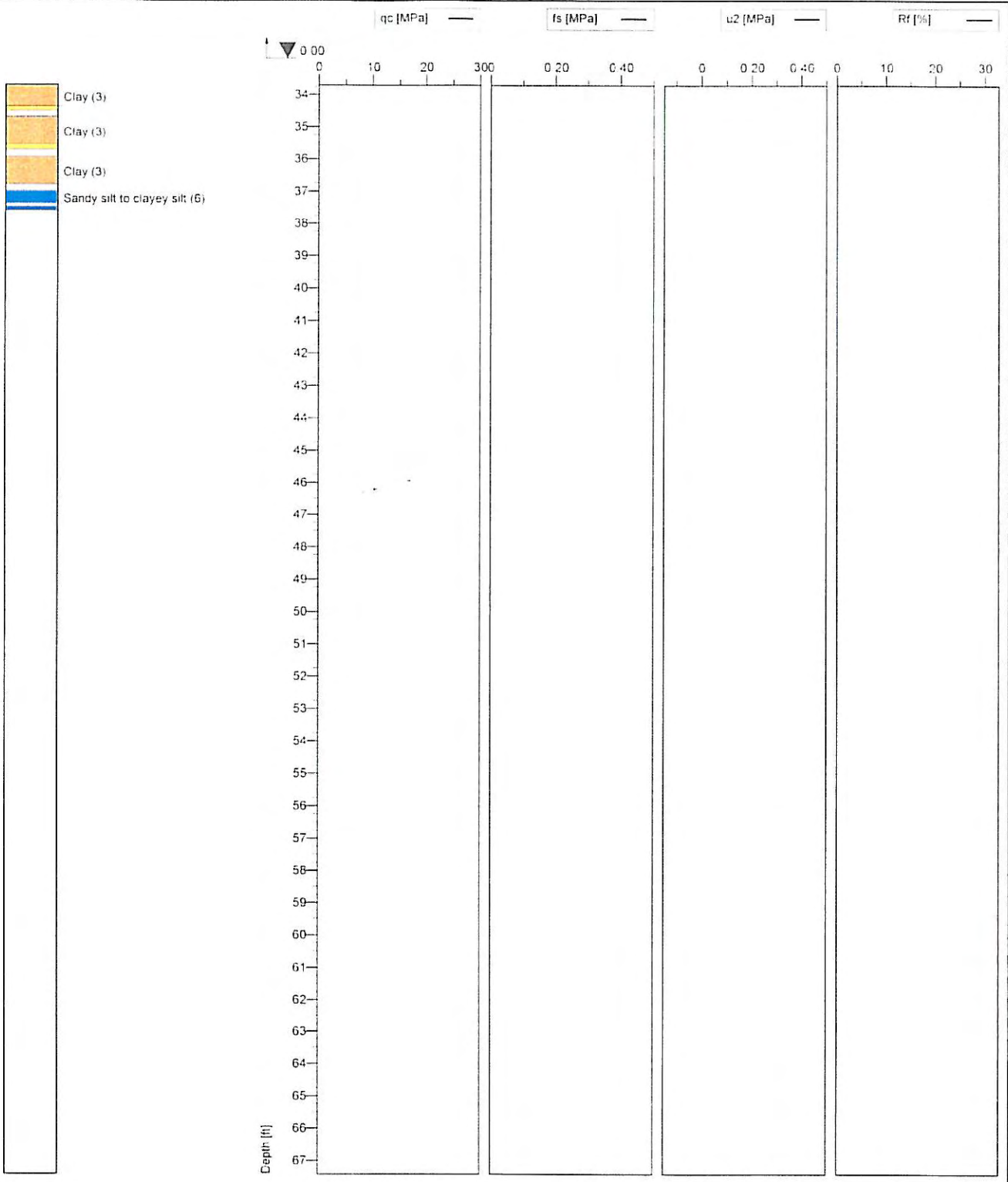
qc [MPa] fs [MPa] u2 [MPa] Rf [%]

0.00
 0 10 20 300 0.20 0.40 0 0.20 0.40 0 10 20 30



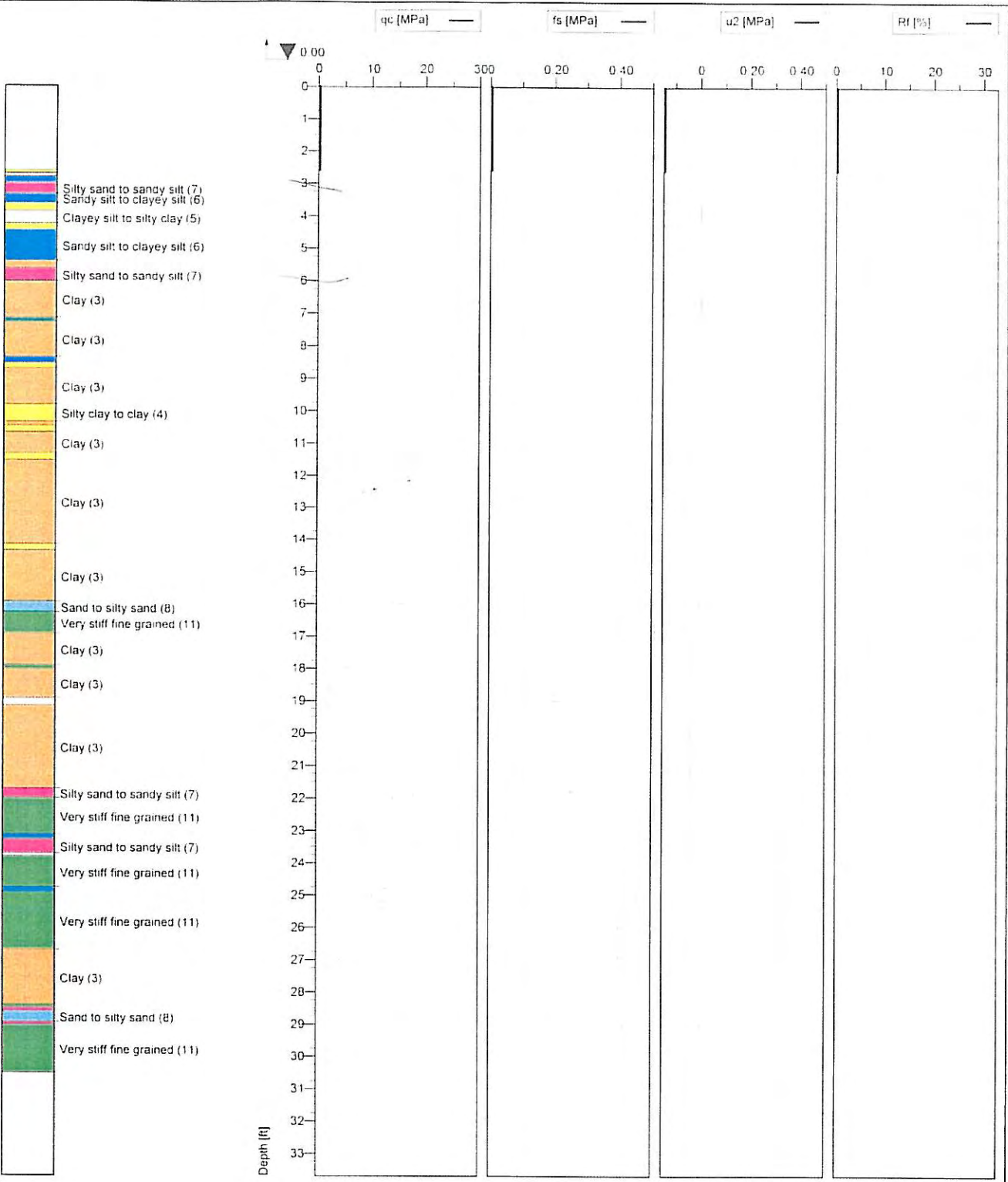
Cone No 3325 Tip area [cm ²] 10 Sleeve area [cm ²] 150	Test no G3080-9	Position X 0.00 m, Y: 0.00 m	Ground level 0.00
	Client SOMA	Date 5/9/2005	Scale 1 : 50
	Project 5725 Thornhill Dr. Oakland, CA	Page 1/2	Fig 1
	Stopped Refusal	File G3080-9 CPT	

CPT-9



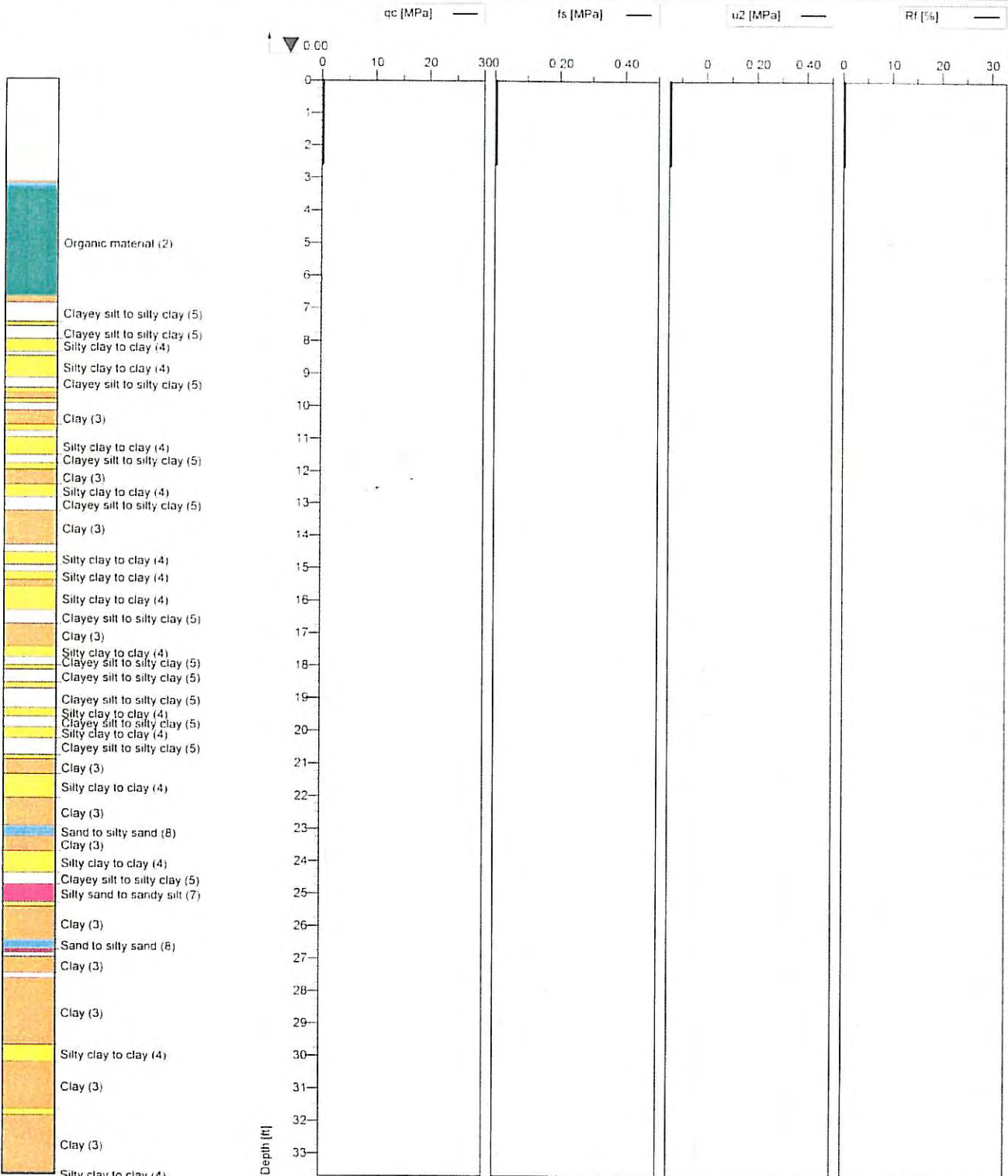
 Cone No: 3335 Tip area [cm ²]: 10 Sleeve area [cm ²]: 150	Test no	Position	Ground level
	G3080-9	X: 0.00 m, Y: 0.00 m	0.00
	Client	SOMA	Date
	Project	5725 Thornhill Dr, Oakland, CA	5/9/2005
		Stopped Refusal	Scale
			1 : 50
			Page
			2/2
			Fig
			File
			G3080-9 CPT

CPT-9 pg 2



Cone No. 3335 Tip area [cm ²] 10 Sleeve area [cm ²] 150	Test no. G3080-10	Position X: 0.00 m, Y: 0.00 m	Ground level 0.00
	Client SOMA	Project 5725 Thornhill Dr. Oakland, CA	Date 5/10/2005
		Stopped Refusal	Scale 1 : 50
			Page 1/1
			File G3080-10.001

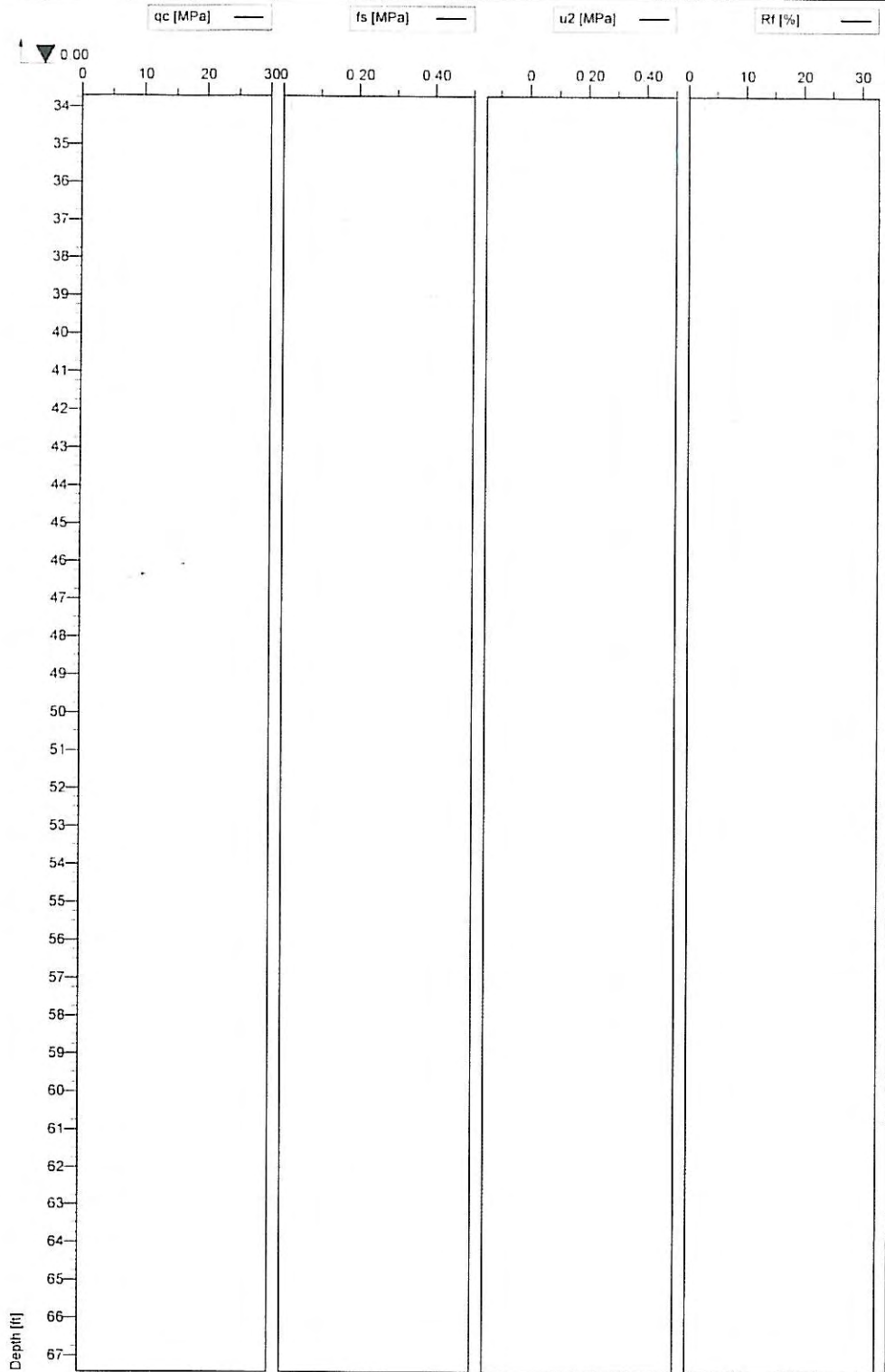
CPT-10



Test no: **G3080-11** Position: **X: 0.00 m, Y: 0.00 m** Ground level: **0.00**
 Client: **SOMA** Date: **5/9/2005** Scale: **1 : 50**
 Project: **5725 Thornhill Dr. Oakland, CA** Page: **1/2** Fig:
 Cone No: **3335** Tip area [cm²]: **10** Sleeve area [cm²]: **150** File: **G3080-11.001**
Stopped Refusal

CPT-11

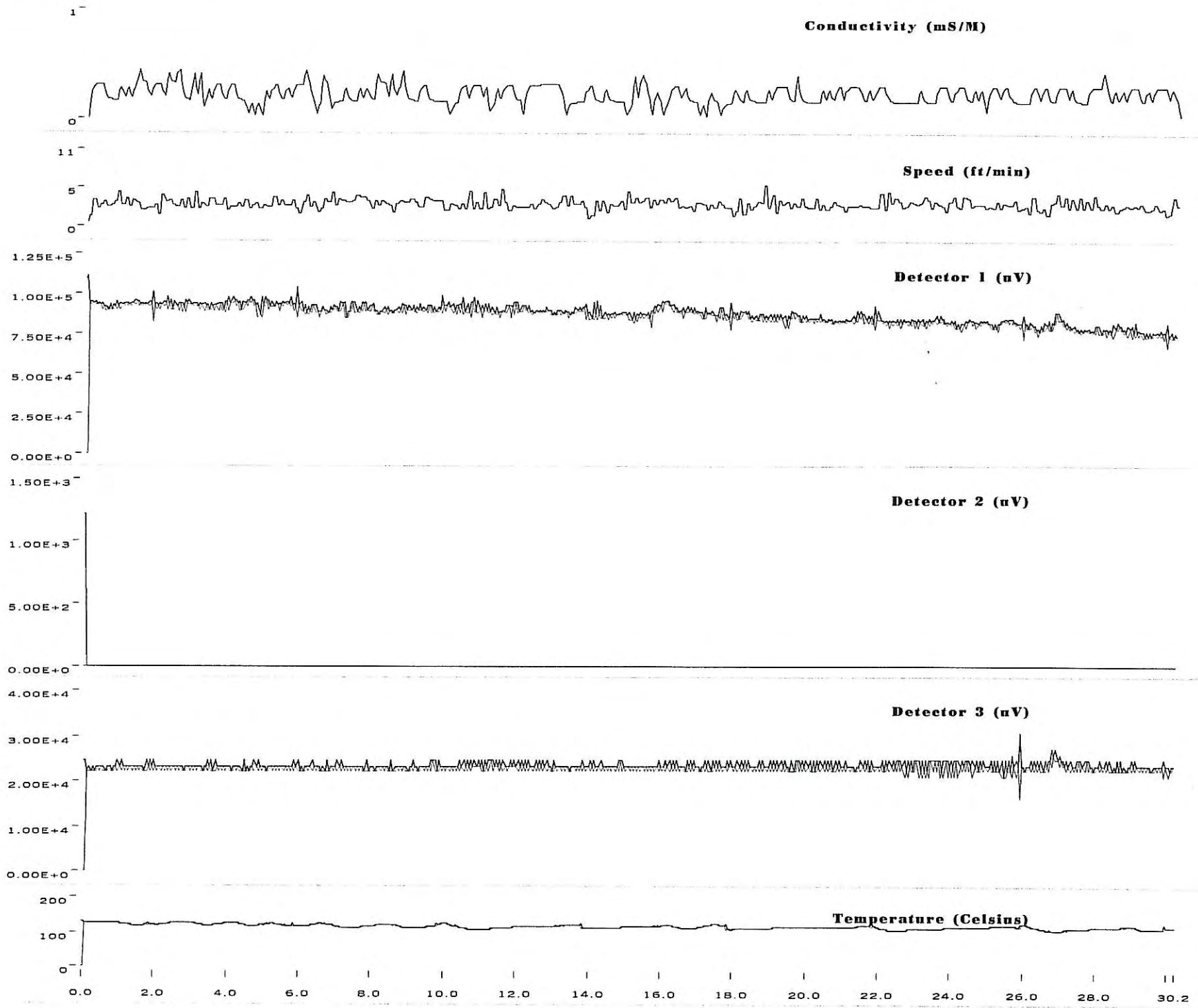
- Silty clay to clay (4)
- Clay (3)
- Silty sand to sandy silt (7)
- Very stiff fine grained (11)
- Sandy silt to clayey silt (6)
- Clay (3)
- Clayey silt to silty clay (5)
- Clay (3)
- Clayey silt to silty clay (5)
- Sand (9)



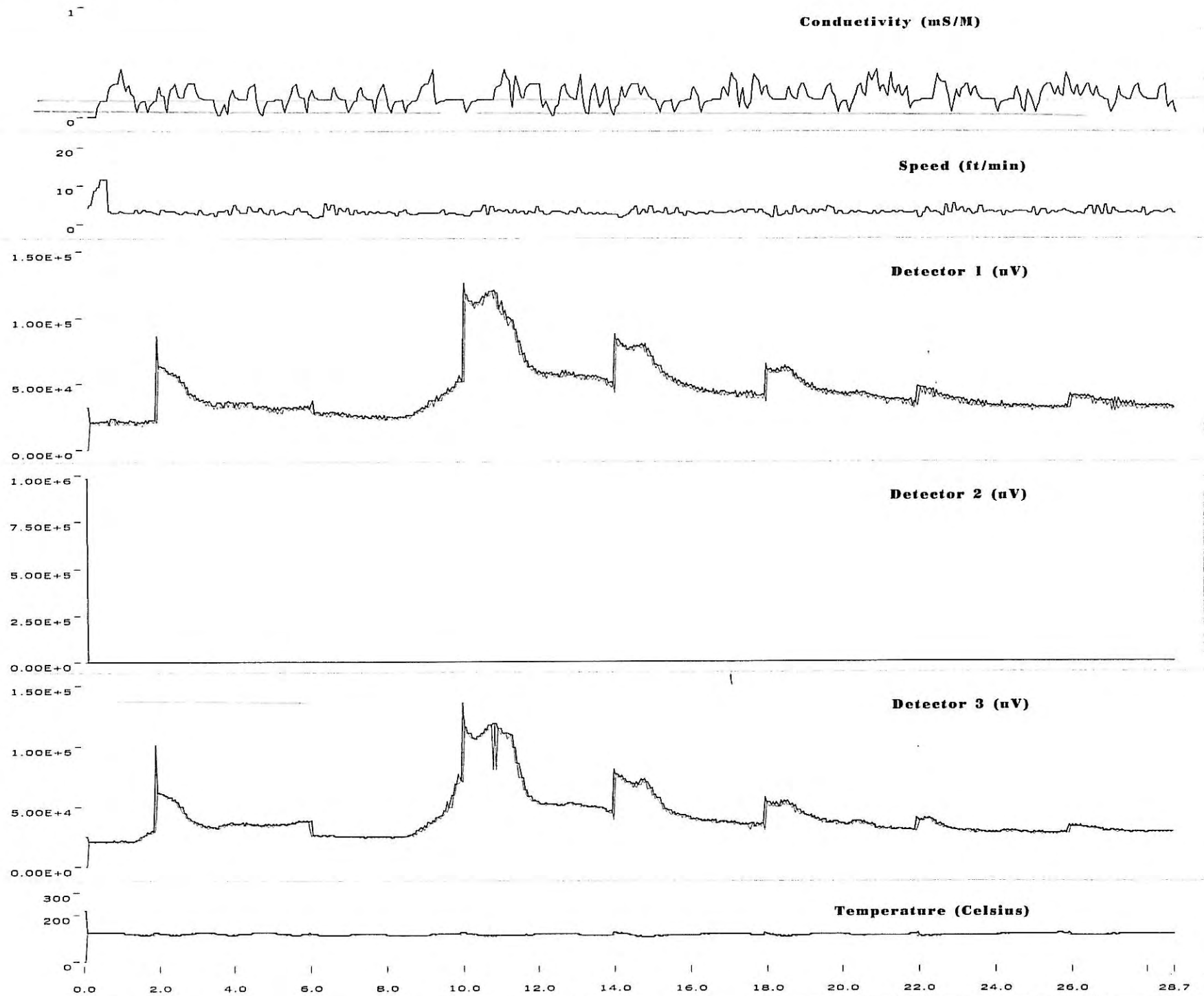
Cone No 3335
 Tip area [cm²] 10
 Sleeve area [cm²] 150

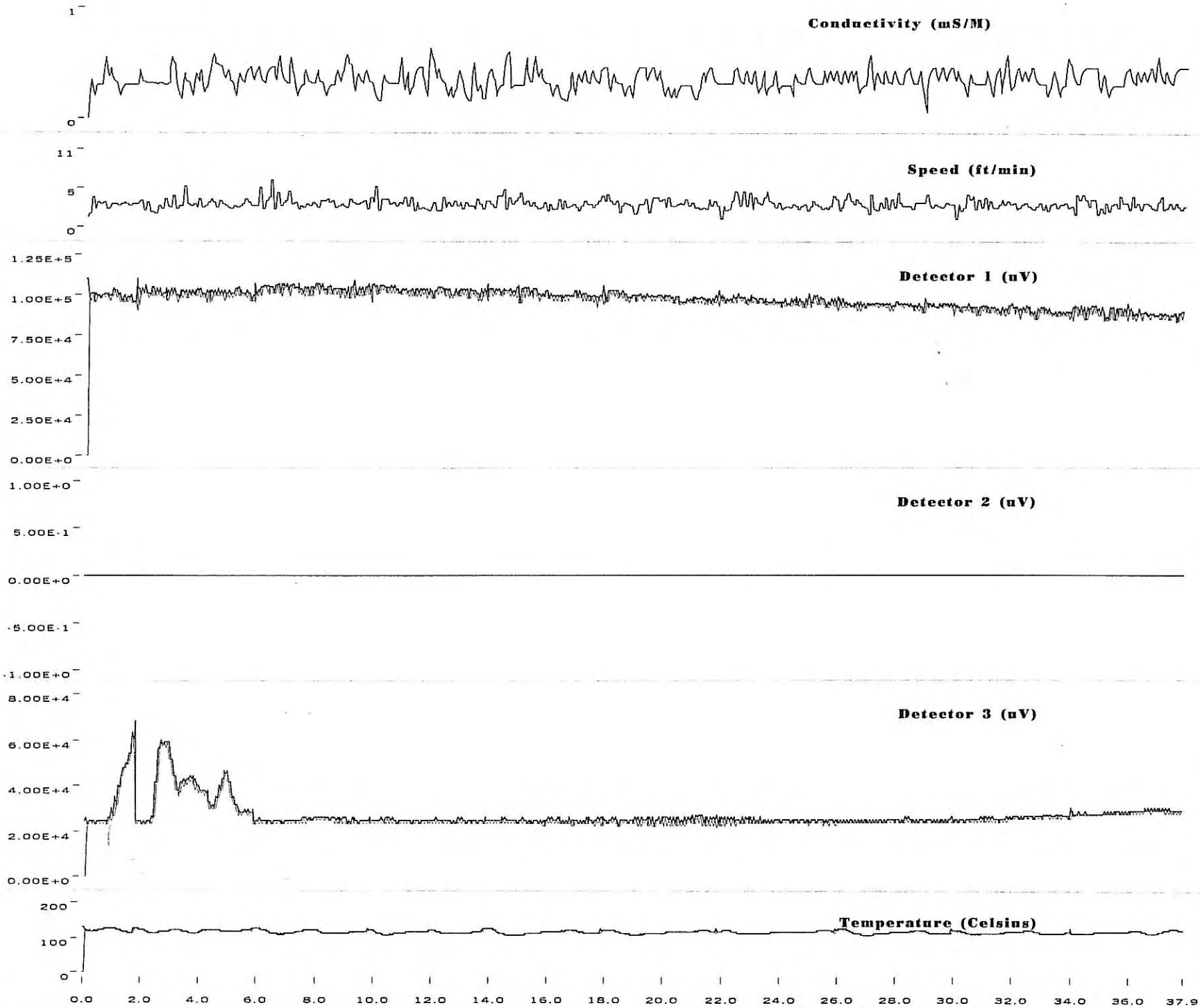
Test no G3080-11	Position X: 0.00 m, Y: 0.00 m	Ground level 0.00
Client SOMA	Date 5/9/2005	Scale 1 : 50
Project 5725 Thornhill Dr. Oakland, CA	Page 2/2	Fig
Stopped Refusal		File G3080-11.001

CPT-11 pg 2

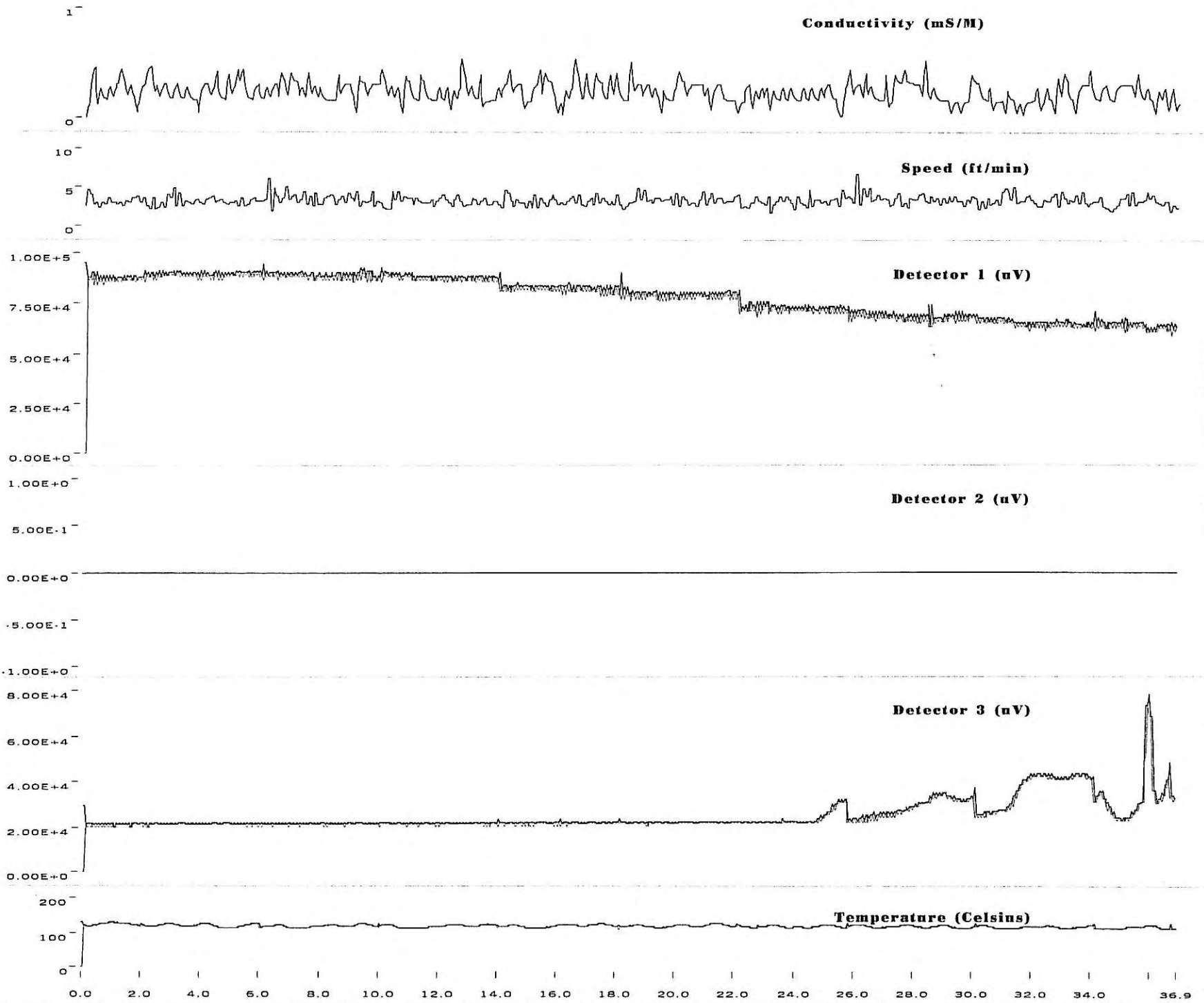


MIP / OPT-1

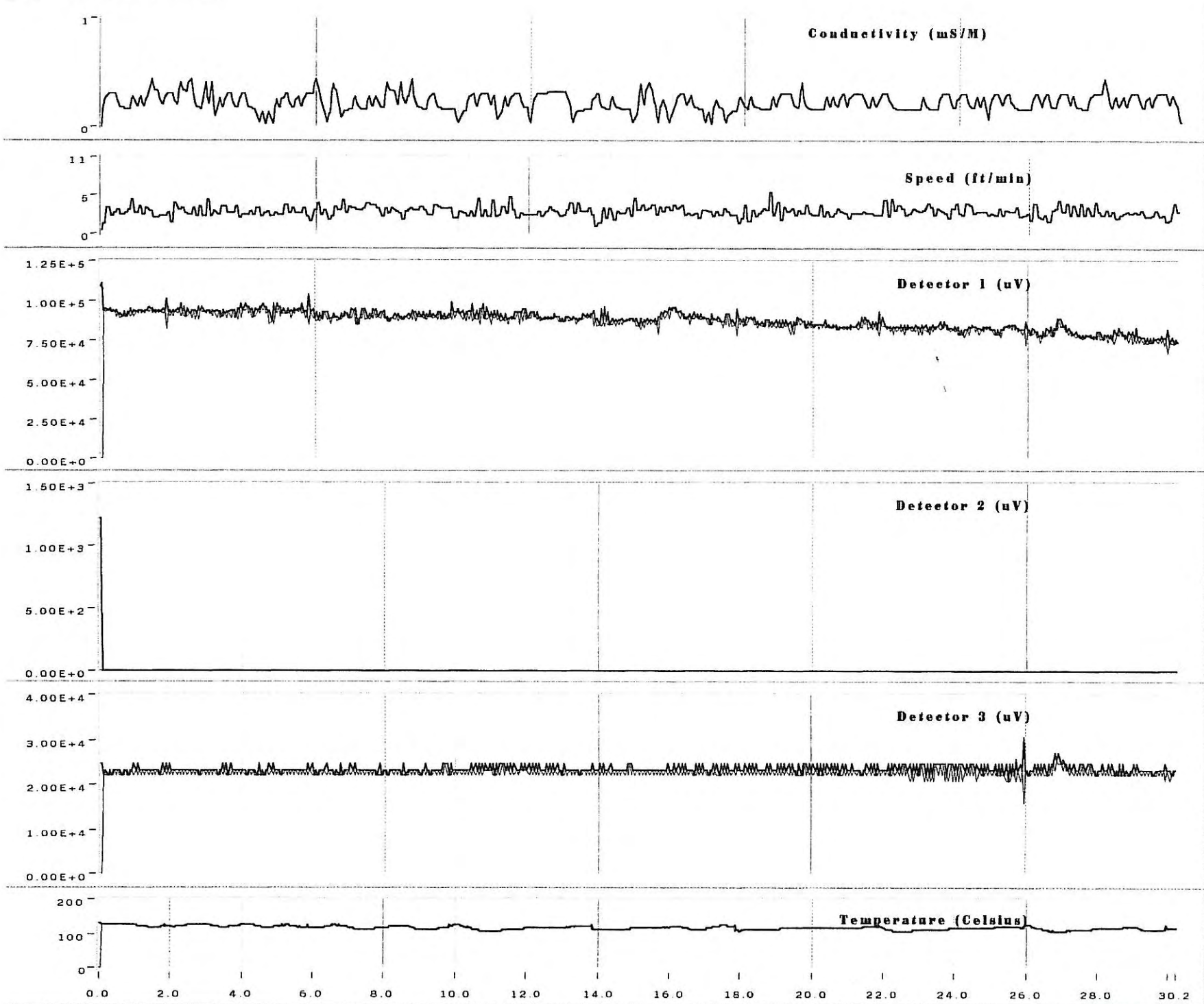




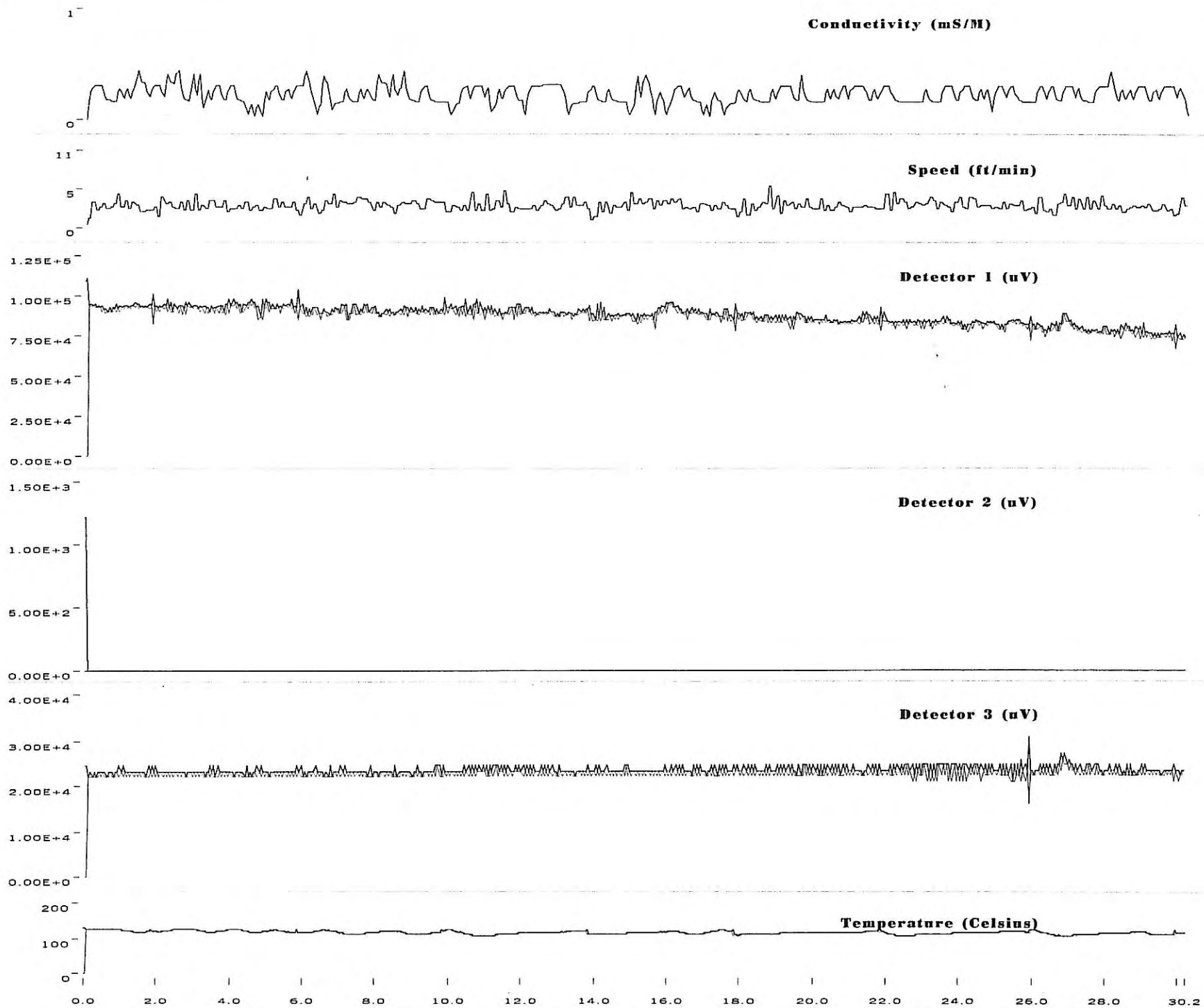
MIP / CPT-3



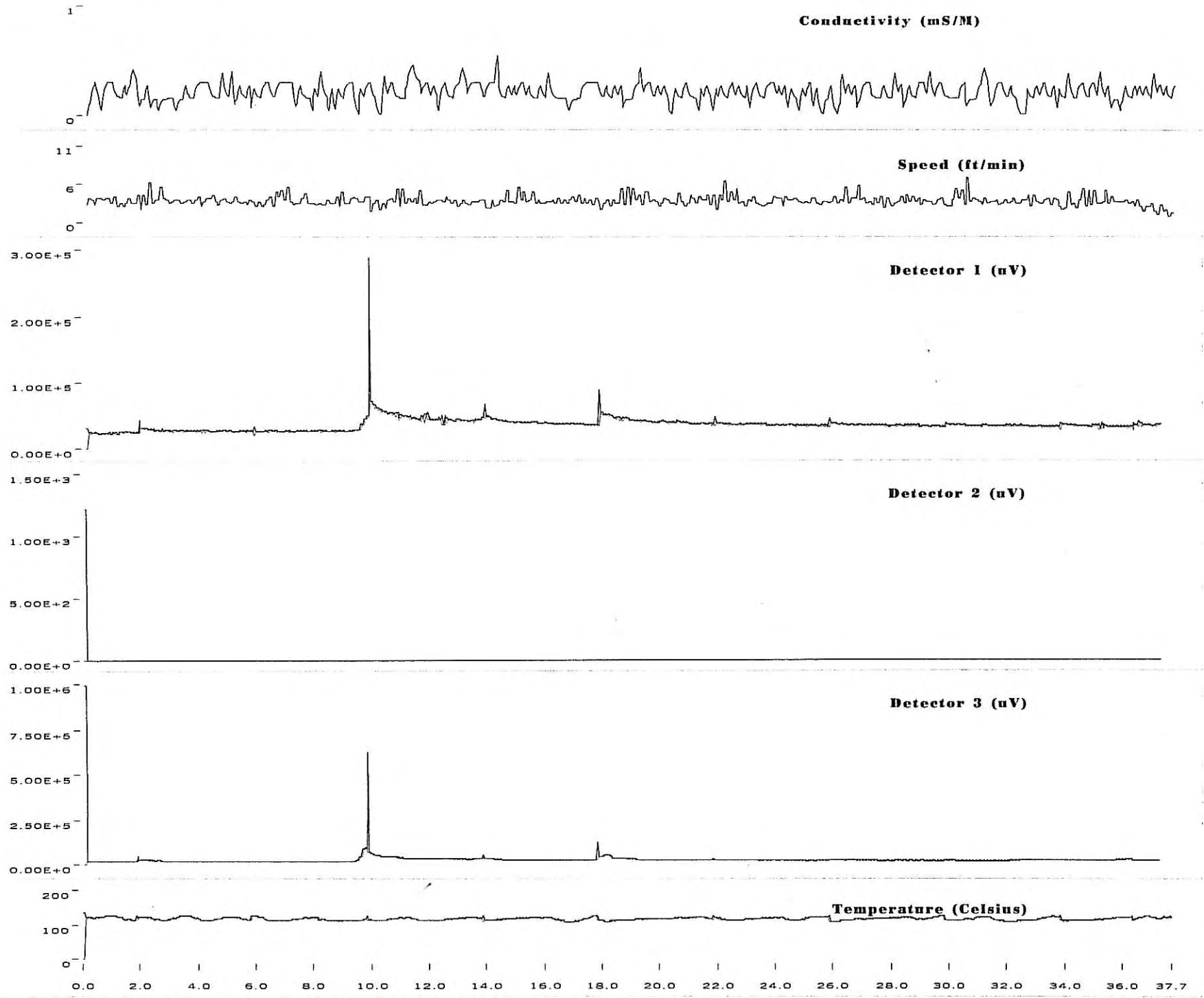
MIP / CPT-4



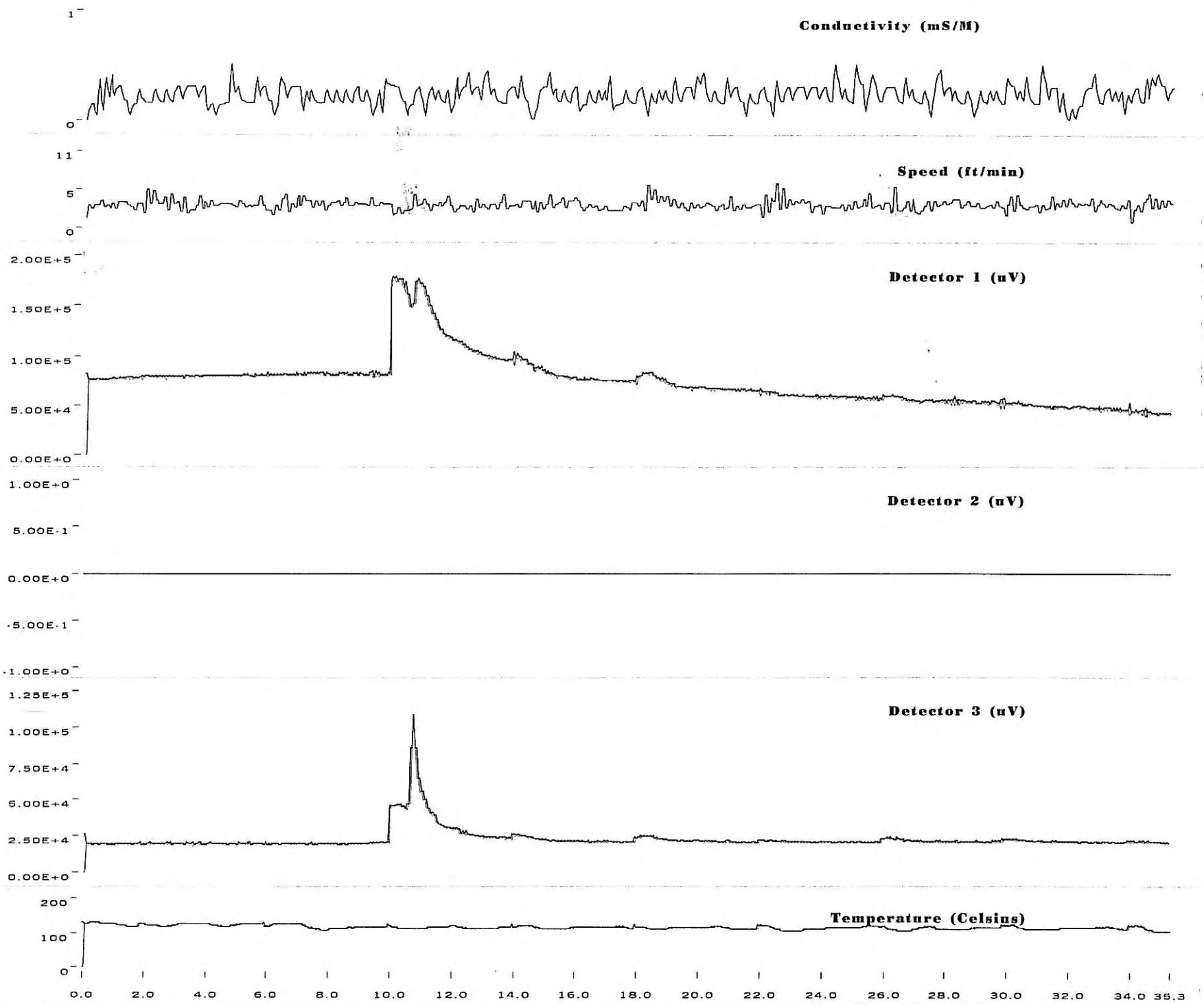
MIP/CPT-5



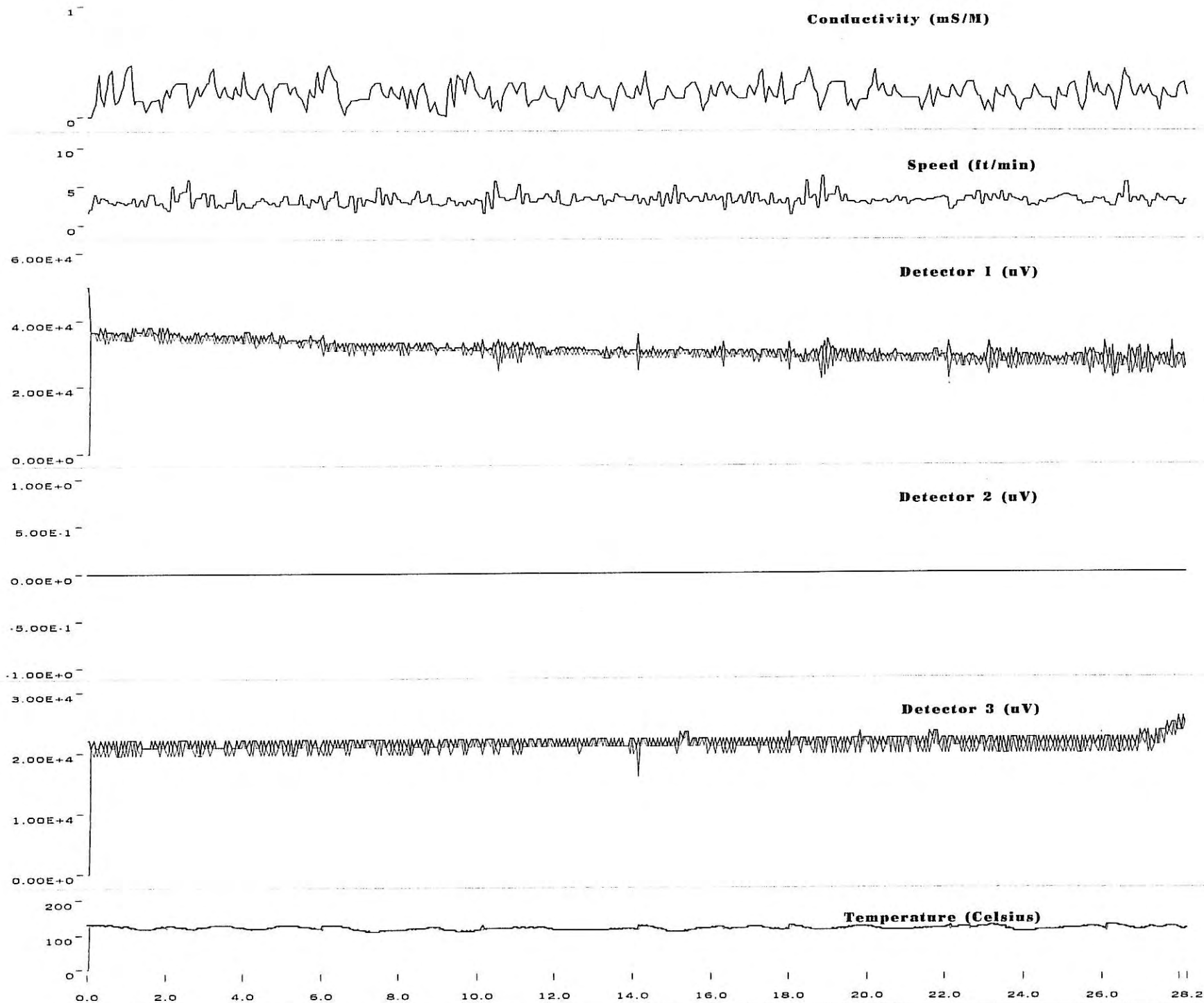
MIP / GPI-4



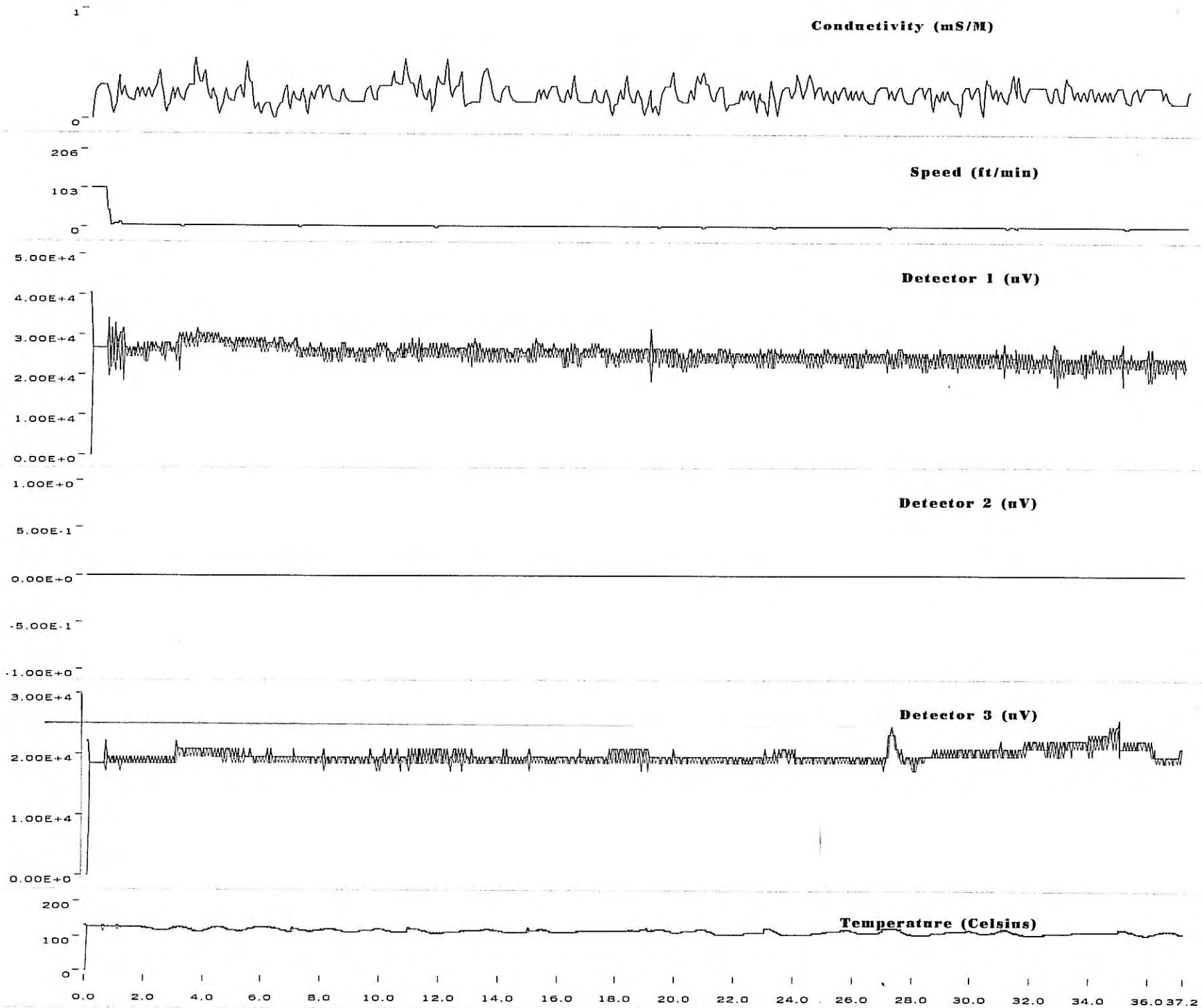
MIP/CPT-8



MIP / OPT-9



MFP/CPT-10



MIP/CPT-11

Attachment B
Geologic Cross Sections and
Soil Boring Logs BH-A and BH-E

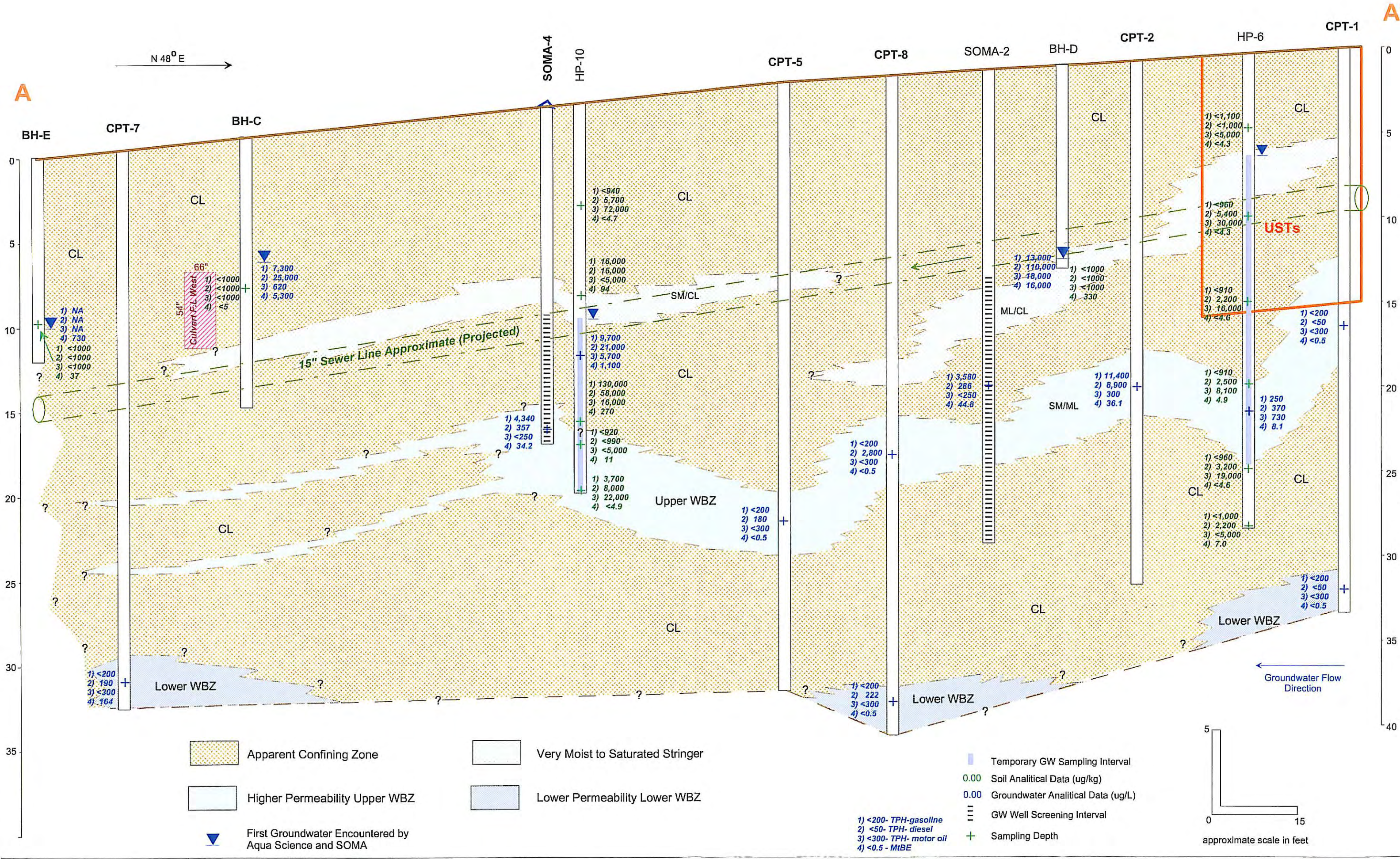


Figure 4: Geologic Cross Section A-A'.

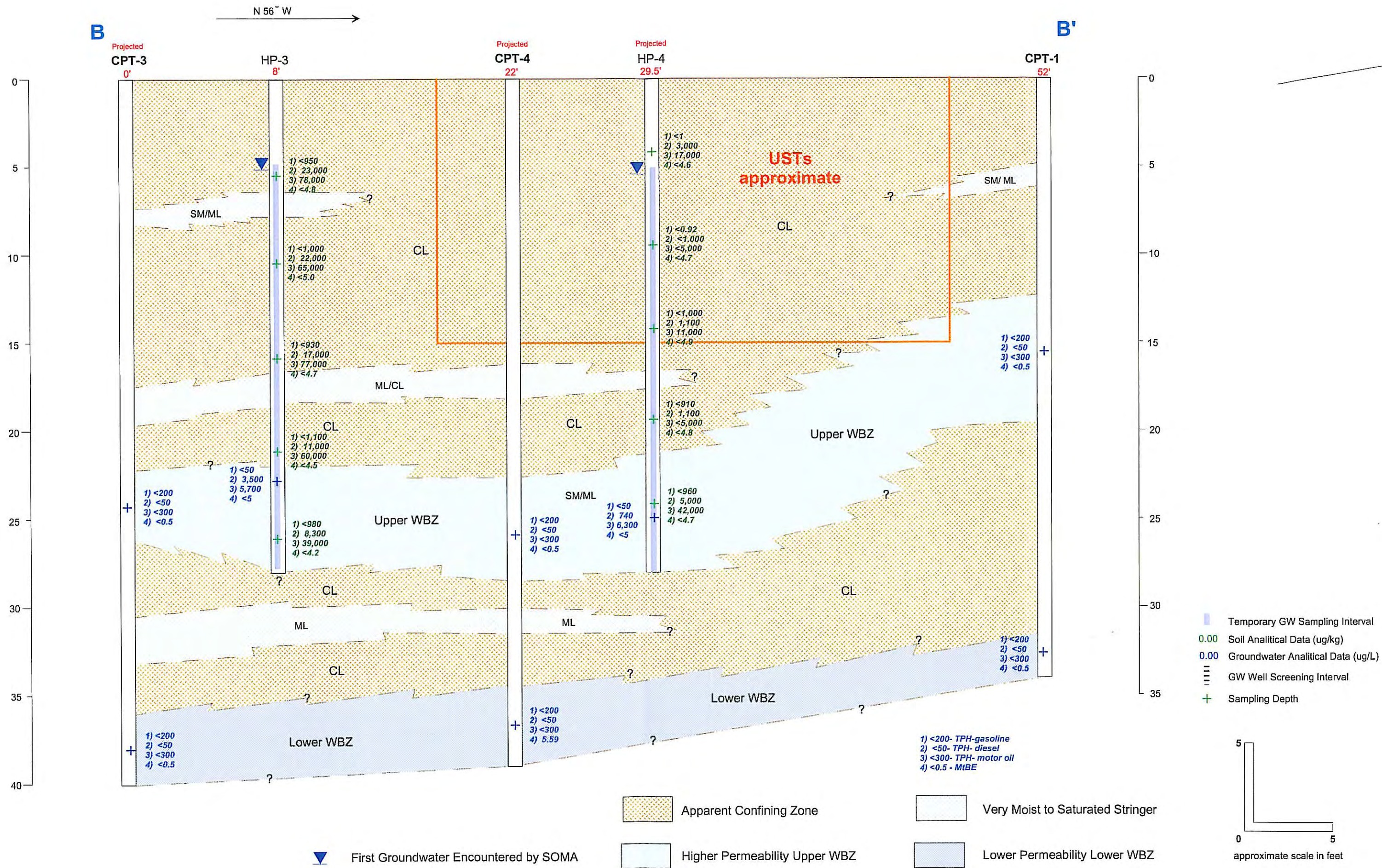


Figure 5: Geologic Cross Section B-B'.

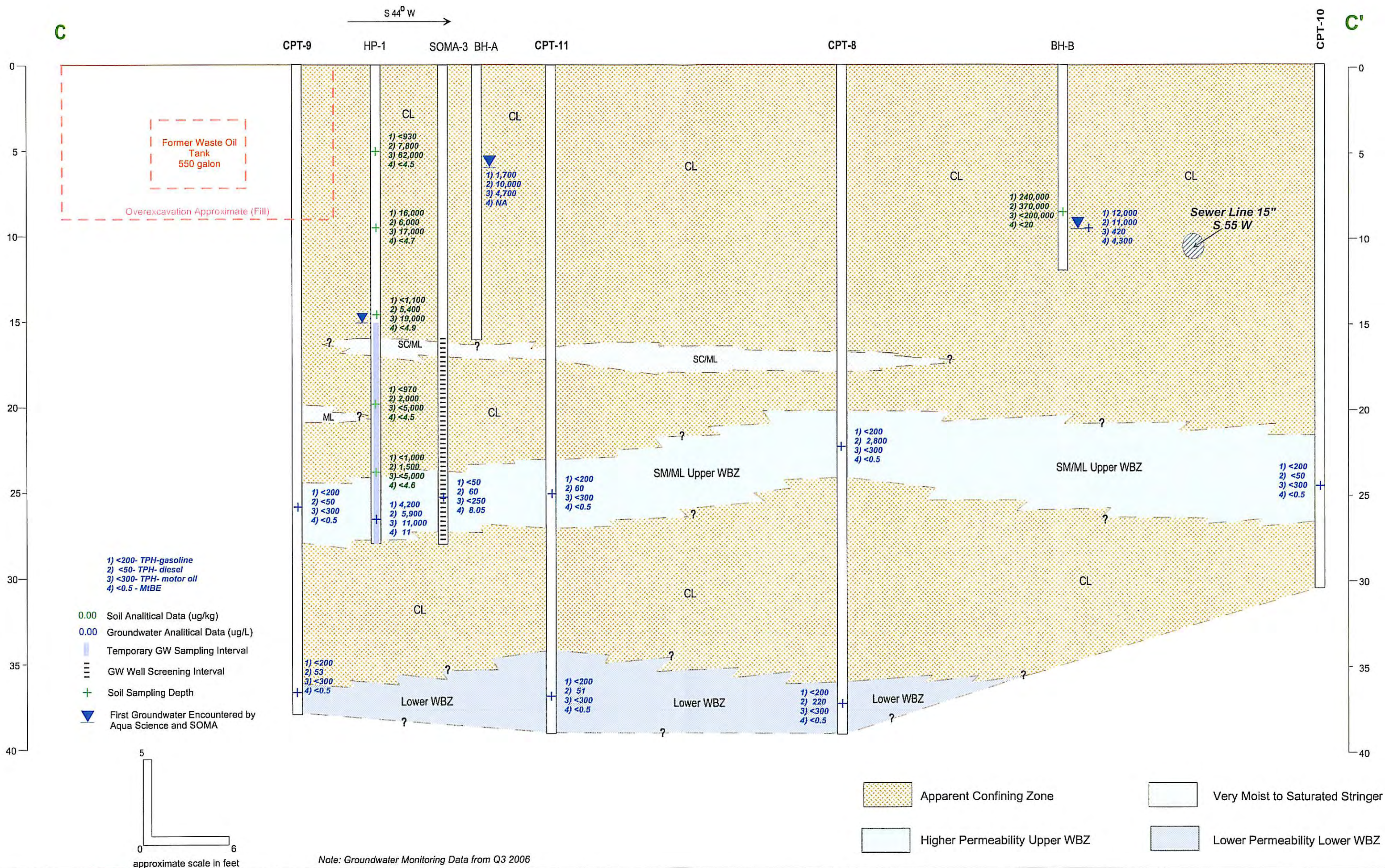


Figure 6: Geologic Cross Section C-C'.

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							Total Depth of Well Completed: NA		
Depth of Water First Encountered: 6.0'							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		
Depth in Feet	BORING DETAIL	Description	SOIL/ROCK SAMPLE DATA					Depth in Feet	DESCRIPTION OF LITHOLOGY
			Interval	Blow Counts	OVM (ppmv)	Water Level	Graphic Log		
0							0	Asphalt	
5							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		
10							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		
15							Sandy SILT (ML); brown; medium stiff; damp; 80% silt; 20% fine sand; trace clay; low plasticity; low estimated K; no odor		
20							15	Clayey SILT (MH); brown; stiff; wet; 70% silt; 30% clay; high plasticity; very low estimated K; slight hydrocarbon odor gray mottling at 8'	
25							20	End of boring at 16'	
30							25		
							30		

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS	Boring: BH-B
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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	Total Depth of Well Completed: NA
Depth of Water First Encountered: 8.0' "	Well Screen Type and Diameter: NA
Static Depth of Water in Well: NA	Well Screen Slot Size: NA
Total Depth of Boring: 12'	Type and Size of Soil Sampler: 2.0" I.D. Macro Sampler

Depth in Feet	BORING DETAIL	Description	SOIL/ROCK SAMPLE DATA					Depth in Feet	DESCRIPTION OF LITHOLOGY							
			Interval	Blow Counts	OVM (ppmv)	Water Level	Graphic Log		standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.							
0								0	Asphalt							
5								3,700	70	8	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					
10								3.700	70	8	gray; moist to wet; 60% silt; 30% fine to coarse sand; 10% gravel to 1.0" diameter; moderate hydrocarbon odor wet at 8'					
15								End of boring at 12'							15	
20															20	
25															25	
30															30	

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

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

Depth in Feet	BORING DETAIL	Description	SOIL/ROCK SAMPLE DATA					Depth in Feet	DESCRIPTION OF LITHOLOGY
			Interval	Blow Counts	OVM (ppmv)	Water Level	Graphic Log		standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0	<p>Portland Cement</p>						0	Concrete	
5							5	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					7.6		10	wet at 8.7' green to black; trace clay; moderate hydrocarbon odor	
15					3,620		15	gravel zone at 11.5' 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	
20							20	Sandy SILT (ML); gray to black; wet; stiff; 60% silt; 30% fine to coarse sand; 10% clay; strong hydrocarbon odor	
25							25		
30							30	End of boring at 16'	

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							Total Depth of Well Completed: NA		
Depth of Water First Encountered: 10'							Well Screen Type and Diameter: NA		
Static Depth of Water in Well: NA							Well Screen Slot Size: NA		
Total Depth of Boring: 12'							Type and Size of Soil Sampler: 2.0" I.D. Macro Sampler		
Depth in Feet	BORING DETAIL	Description	SOIL/ROCK SAMPLE DATA				Depth in Feet	DESCRIPTION OF LITHOLOGY	
			Interval	Blow Counts	OVM (ppmv)	Water Level		Graphic Log	standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0	 Portland Cement				380 2,000 2,000			0	Asphalt
5								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	
10								Sandy SILT (ML); dark grey; medium stiff; moist; 80% silt; 20% fine sand; non-plastic, low estimated K; moderate hydrocarbon odor	
15								End of boring at 12'	
20									
25									
30									

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							Total Depth of Well Completed: NA		
Depth of Water First Encountered: 10'							Well Screen Type and Diameter: NA		
Static Depth of Water in Well: NA							Well Screen Slot Size: NA		
Total Depth of Boring: 12'							Type and Size of Soil Sampler: 2.0" I.D. Macro Sampler		
Depth in Feet	BORING DETAIL	Description	SOIL/ROCK SAMPLE DATA				Depth in Feet	DESCRIPTION OF LITHOLOGY	
			Interval	Blow Counts	OVM (ppmv)	Water Level		Graphic Log	standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0								0	Concrete
5								<p>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</p> <p>@ 3'; dark brown; 70% silt; 30% fine sand; trace clay; slight plasticity; low estimated K; no odor</p> <p>@ 6'; stiff; 80% silt; 10% fine sand; 10% clay; low plasticity; very low estimated K; no odor</p> <p>wet at 8.7'</p>	
10								<p>@ 10'; grey to dark brown; wet; trace organics; slight hydrocarbon odor</p>	
15								End of boring at 12'	
20									
25									
30									