APPENDIX 2AA
LEE NUCLEAR STATION FIELD EXPLORATION DATA

This Appendix contains geotechnical boring logs, test pit logs, SPT energy measurements, and Packer Test results that are the basis for discussion in relevant sections of 2.5. The logs and tests represent a record of subsurface conditions at the William States Lee III Nuclear Station site. Attachment 1 contains geotechnical boring logs (121 borings in total) and monitoring well construction logs (25 in total) resulting from the COL investigation as well as a key to symbols and descriptions. Attachment 2 contains the results of STP energy measurement testing performed on the Lee Nuclear Station site. Attachment 3 contains test pit logs resulting from the COL investigation, 14 logs in total. Attachment 4 contains Packer Test results from four locations on the Lee site. Attachment 5 contains the Cone Penetrometer Test, Seismic Cone Penetrometer Test, and Pore Pressure Dissipation Test results performed on the Lee Nuclear Station Site.

WLS COL 2.5-1

APPENDIX 2AA
ATTACHMENT 1 – LEE NUCLEAR STATION GEOTECHNICAL BORING LOGS AND GROUNDWATER MONITORING WELL CONSTRUCTION LOGS

This Attachment contains geotechnical boring logs resulting from the COL investigation, a list of the included borings, and keys to the symbols and descriptions used in the soil and rock boring logs. 121 borings are represented within this attachment. Monitoring well construction logs are also included in this attachment, separate from the geotechnical monitoring well logs.

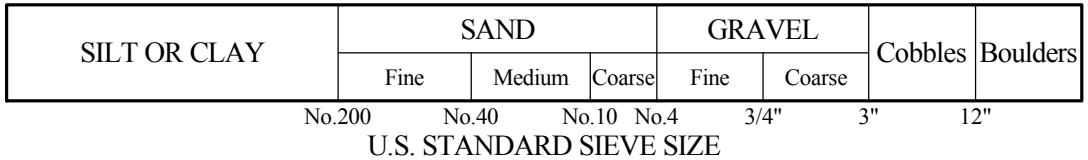
WLS COL 2.5-1

Lee Nuclear Station Boring Logs Included in Appendix 2AA, Attachment 1

Geotechnical Boring Logs				Construction Logs
B-1000	B-1029	B-1060	MW-1200	MW-1200
B-1000-UD	B-1030	B-1061	MW-1200A	MW-1201
B-1000-UDA	B-1031	B-1062	MW-1201	MW-1201A
B-1000-UDB	B-1031-UD	B-1063	MW-1202	MW-1202
B-1001	B-1031-UDA	B-1064	MW-1202A	MW-1203
B-1001A	B-1032	B-1065	MW-1203	MW-1204
B-1002	B-1033	B-1066	MW-1204	MW-1204A
B-1003	B-1033-UD	B-1067	MW-1204A	MW-1205
B-1004	B-1034	B-1068	MW-1205	MW-1206
B-1004A	B-1035	B-1068-UD	MW-1206	MW-1206A
B-1005	B-1036	B-1069	MW-1207	MW-1207
B-1006	B-1037	B-1070	MW-1207A	MW-1207A
B-1006A	B-1037A	B-1070-UD	MW-1208	MW-1208
B-1007	B-1037-UD	B-1071	MW-1209	MW-1209
B-1008	B-1038	B-1072	MW-1210	MW-1209A
B-1009	B-1044	B-1073	MW-1210A	MW-1210
B-1009A	B-1045	B-1074	MW-1211	MW-1210A
B-1010	B-1045-UD	B-1074A	MW-1212	MW-1211
WLS COL 2.5-1 B-1011	B-1046	B-1075	MW-1212A	MW-1212
B-1012	B-1046-UD	B-1075A	MW-1213	MW-1213
B-1013	B-1047		MW-1214	MW-1214
B-1014	B-1047-UD		MW-1214A	MW-1215
B-1015	B-1048		MW-1215	MW-1216
B-1016	B-1048-UD			MW-1217
B-1017	B-1049			MW-1218
B-1018	B-1050			
B-1019	B-1051			
B-1020	B-1052			
B-1021	B-1053			
B-1022	B-1053A			
B-1023	B-1053B			
B-1024	B-1053C			
B-1025	B-1053-UD			
B-1025-UD	B-1054			
B-1026	B-1055			
B-1026-UD	B-1056			
B-1027	B-1057			
B-1028	B-1058			
B-1028-UD	B-1059			

MAJOR DIVISIONS			GROUP SYMBOLS		TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)		GW	Well graded gravels, gravel - sand mixtures, little or no fines.
				GP	Poorly graded gravels or grave - sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)		GM	Silty gravels, gravel - sand - silt mixtures.
				GC	Clayey gravels, gravel - sand - clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)		SW	Well graded sands, gravelly sands, little or no fines.
				SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)		SM	Silty sands, sand - silt mixtures
				SC	Clayey sands, sand - clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)			ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts and with slight plasticity.
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
				OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS				PT	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.



References: ASTM D 2487-00, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Soil Classification System)
ASTM D 2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

	GROUP SYMBOLS		TYPICAL NAMES
SAMPLE TYPE		SPT	Split Spoon Sample
		CME	Continuous Soil Sample
		UD	Undisturbed Sample

ABBREVIATIONS

SAA - Same As Above
NA - Not Applicable
ND - Not Determined
WOH - Weight Of Hammer

Correlation of Penetration Resistance with Relative Density and Consistency

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
< 4	Very Loose	< 2	Very Soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
> 50	Very Dense	15 - 30	Very Stiff
		> 30	Hard

Datum Reference Information	Horizontal - SC State Plane NAD 83
	Elevation - NAVD 88

KEY TO SYMBOLS AND DESCRIPTIONS FOR SOIL LOGS

MACTEC

William States Lee III Nuclear Station

1) Note A - Water Level Data. The ground water level posted on the first page of each boring log represents the last reading taken either during drilling or directly following completion of drilling activities.

2) Suffix- Certain borings designations end in with a -A, -B, -C, -UD
   -A, B, C, offset hole due to obstruction or abandonment at original location, each subsequent offset is given a new suffix, ascending in alphabetical order
   -UD, Boring to obtain undisturbed samples
   -A, angle boring (B-1001A, B-1004A)

3) Color descriptors in Lithology Section - Color code for soil and rock (e.g. 5YR 5/8) is based on Munsell Soil Color Chart (1994) designations

GENERAL NOTES FOR SOIL AND ROCK LOGS

References: Brown, E. T. (1981) Rock characterization testing and monitoring ISRM suggested methods
Hoek, E. and Brown, E. T. (1997) Practical estimates of rock mass strength
ASTM 6032-02, Standard Test Method for Determining Rock Quality Designation (RQD) of Rock Core

WEATHERING (abbreviation)	ROCK STRENGTH (abbreviation)
FRESH (F) - No visible sign of rock material weathering; perhaps slight discoloration on major discontinutiy surfaces. SLIGHTY WEATHERED (SW) - Rock mass is generally fresh with slight discoloration in rock fabric. Discontinuities are stained and may contain clay. Decomposition extends up to 1" into rock. MODERATELY WEATHERED (MW) - Less than 50% of rock is decomposed. Significant portion of rock shows discoloration and weathering effects. HIGHLY WEATHERED (HW) - Rock mass is more than 50% decomposed. Rock can be broken by hand or scraped with knife or pick. COMPLETELY WEATHERED (CW) - Rock mass is completely decomposed but rock fabric and structure may still be evident. Specimen is easily crumbled or penetrated with knife or pick. Modified from Brown (1981)	EXTREMELY WEAK (R0) - Can be indented with difficulty by thumbnail. May be friable or moldable with finger pressure. VERY WEAK (R1) - Crumbles under firm blows with point of hammer. Can be pealed by a knife. WEAK (R2) - Can be pealed or scraped by a knife with difficulty. Cannot be scratched by fingernail. Shallow indentation made by firm blow of hammer. MEDIUM STRONG (R3) - Cannot be scraped or picked with a knife. STRONG (R4) - More than one blow of geologic hammer required to fracture specimen. VERY STRONG (R5) - Specimen requires many hard blows of hammer to fracture or chip. Modified from Brown (1981), Hoek (1997)

ROCK SYMBOLS AND NAMES

ROCK	META-DIORITE	AMPHIBOLITE	
	META-GRANODIORITE	QUARTZITE	
	META-QUARTZ DIORITE		
	SCHIST		

DEFINITIONS

RQD = The sum of the length of intact and sound rock pieces over 100 mm in length divided by the total length of the core run, multiplied by 100% (ASTM D 6032-02)

Datum Reference Information	Horizontal - SC State Plane NAD 83
	Elevation - NAVD 88

KEY TO SYMBOLS AND DESCRIPTIONS FOR ROCK LOGS

MACTEC

William States Lee III Nuclear Station

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1000**	
Type and Diameter of Boring Hollow stem auger / HQ core / 6 inch	Boring Location Unit 1 N 1166072 E 1846189		Total Depth 151 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 581.5 feet MSL	Ground Water Depth 29 feet	Depth to Bedrock 63.5 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 12	Date Started 3/30/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/1/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT sandy (ML), strong brown (7.5YR 5/6), medium stiff, dry ~15% sand, some road base crushed stone gravel in upper part, asphalt pieces within sample. FILL	Begin day 3/30/06	581
1												580
2												579
3												578
4		SPT 1	6 4 3	7/18								577
5												576
6												575
7												574
8												573
9		SPT 2	2 2 2	12/18						SAA, soft, dry, 15-20% fine sand, minor gravel. FILL		572
10												571
11												570
12												569
13												568
14		SPT 3	2 5 5	18/18						SILT sandy, gravelly (ML), strong brown (7.5YR 5/8), dry, stiff, ~20% sand mixed in road gravel FILL		567
15												566
16												565
17												564
18											Hard rocky drilling believed to be in shot rock	563
19		SPT 4	36 40 18	14/18					SM	SAND silty, gravelly (SM), light gray (2.5Y 7/2), dry, very dense, some lithic and quartzite fragments within sample, RESIDUUM		562
20												561
21												560
22												559
23												558
24		SPT 5	7 8 8	14/18					SM	SAND silty (SM), light brownish gray (2.5Y 6/2) to greenish gray (10Y 5/1), damp, medium dense. SAPROLITE		557
25												556
26												555
27												554
28												553
29		SPT 6	9 12 10	18/18					▽	SAA, light gray (2.5Y 7/2), 41 % fines, 12% gravel, SAPROLITE	Classification based on B-1000 UDA UD-2 at 28 to 29.2 ft	552
30												551
31												550
32												549
33												548
34		SPT 7	5 11 17	18/18						SAA, strong brown (7.5YR 4/6), damp, medium dense, relict veins some root casts; SAPROLITE		547
35												546
36												545
37												544
38												543
39		SPT 8	4 12 17	18/18						SAA, light olive brown (2.5Y 5/4) to olive yellow (2.5Y 6/8), damp, medium dense SAPROLITE		542
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1000

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												541
41												540
42												539
43												538
44		SPT 9	15 37 50/2	16 13.5					SM	SAND silty, clayey (SM), brown (10YR 4/3), damp to moist, SAPROLITE		537
45									SM	SAND silty (SM) yellow (10YR 7/8), PARTIALLY WEATHERED ROCK		536
46												535
47											Hard drilling	534
48												533
49		SPT 10	50/5	5 5						SAND silty; light olive brown (2.5Y 5/6), damp, hard, >12% silts and clays. PARTIALLY WEATHERED ROCK		532
50												531
51												530
52												529
53												528
54		SPT 11	50/1	2 1						SAA, brownish yellow (10YR 6/8) PARTIALLY WEATHERED ROCK		527
55												526
56												525
57												524
58											At 60 ft, end of hollow stem auger, begin rock coring. Refer to rock log for continuation of boring log	523
59		SPT 12	40 50/5	11 11						SAA; light olive brown (2.5Y 5/6 to 2.5Y 5/4) PARTIALLY WEATHERED ROCK		522
60												521
61												520
62												519
63												518
64												517
65												516
66												515
67												514
68												513
69												512
70												511
71												510
72												509
73												508
74												507
75												506
76												505
77												504
78												503
79												502
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1000**	
Type and Diameter of Boring Hollow stem auger / HQ core / 6 inch	Boring Location Unit 1 N 1166072 E 1846189		Total Depth 151 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 581.5 feet MSL	Ground Water Depth 29 feet	Depth to Bedrock 63.5 feet
Casing Size and Depth 4 inch / 60 feet	Length of Core Barrel and Bit 13 feet / 13 feet	No. of Core Boxes 6	Date Started 3/30/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/1/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
60		13	0.0/3.5	0	CW	R0		No recovery; PARTIALLY WEATHERED ROCK	End of day 3/30/06 Begin day 3/31/06, begin HQ core	521
64		14	3.8/5.0	20	MW to HW	R2 to R3		META-DIORITE, dark olive gray (5Y 3/2), fine grained, numerous oxidized veins, dissolution features along veins. META-QUARTZ DIORITE, pale brown (10YR 6/3), fine to medium grained, numerous with veins of altered material and high amounts of iron oxide along dissolution features.		518
69		15	3.3/5.0	0	MW to HW	R2		META-DIORITE; massive, manganese and pyrite mineralization along majority of fracture planes		513
74		16	1.5/5.0	0	HW	R1 to R2		SAA		508
79		17	5.0/5.0	60	MW	R0 to R1		META-DIORITE yellowish brown (10YR 5/6), plagioclase phenocrysts throughout, foliation (~50°) expressed as re-mineralized veins (manganese oxide) and alignment of plagioclase crystals.		503
84		18	4.8/5.0	36	MW	R0 to R2				498
89		19	5.0/5.0	34	MW	R1 to R2 R2		SAA; yellowish brown (10YR 5/6), massive, fine grained, manganese oxide, iron oxide mineralization along majority of joint surfaces At 90.5 ft quartz diorite-granodiorite xenolith is partially exposed with epidote mineralization		493
94		20	5.0/5.0	40	MW	R2 to R3		SAA; apparent foliation between 45 to 80°, Partially Weathered Rock.		488
100										482

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1000

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
100	21	3.3/4.0	20	MW	R2 to R3		META-DIORITE, dark olive brown with oxidized zones of yellowish brown (10YR 5/6), plagioclase phenocrysts throughout, foliation (~50°) expressed as re-mineralized veins (manganese oxide) and alignment of plagioclase crystals.		481
101									480
102									479
103	22	1.0/1.0	11	MW	R2 to R3				478
104				HW	R2 to R3				477
105									476
106	23	5.0/5.0	88	MW	R3				475
107				SW	R4		SAA; greenish gray Joint between 107 and 108 ft partially healed with epidote, quartz, calcite, and plagioclase		474
108									473
109							Joints and healed joints are apparent foliation joints that have similar orientation and dips (40 to 70°). Calcite, and epidote (minor) mineralization along joint surfaces and within healed joints, some pitting of infilled minerals along joint surface.		472
110									471
111	24	5.0/5.0	44	SW	R3 to R4				470
112									469
113									468
114							SAA; bluish black (10B 2.5/1), massive, fine to very fine grained, calcite mineralization along wavy healed veins (probable foliation) CONTINUOUS ROCK	End of day 3/31/06 Begin day 4/1/06; water level at 29 ft prior to start of drilling	467
115	25	5.0/5.0	78	F to MW	R3 to R4				466
116									465
117									464
118									463
119							SAA; fine grained with plagioclase phenocrysts, plagioclase crystals appear to be elongated along a foliation oriented approximately with the calcite healed joints and veins.		462
120									461
121	26	5.0/5.0	100	SW to F	R3 to R4				460
122									459
123									458
124							SAA; very fine grained plagioclase phenocrysts.		457
125									456
126	27	5.0/5.0	100	SW to F	R4				455
127									454
128									453
129							SAA; fine grained, weakly foliated, fewer plagioclase phenocrysts than above, foliation joints are primarily healed with calcite with minor quartz and plagioclase (altered) mineralization.		452
130									451
131	28	5.0/5.0	100	SW to F	R4				450
132									449
133									448
134							SAA; some to many chalcopyrite phenocrysts, healed joints are mineralized with calcite, some quartz, minor altered plagioclase, and traces of pyrite.		447
135									446
136	29	5.0/5.0	100	SW to F	R4				445
137									444
138									443
139									442
140									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1000

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
140										441
141		30	5.0/5.5	100	F	R4		SAA; some to many chalcopyrite phenocrysts, healed joints are mineralized with calcite, some quartz, minor altered plagioclase, and traces of pyrite.		440
142										439
143										438
144								SAA		437
145										436
146										435
147		31	7.0/7.0	100	F	R4				434
148										433
149									Boring terminated at 151 ft on 4/1/06	432
150										431
151										430
152										429
153										428
154								Total Depth 151 ft.		427
155								Groundwater encountered at 29 feet		426
156								Borehole Grouted On 4/27/06		425
157										424
158										423
159										422
160										421
161										420
162										419
163										418
164										417
165										416
166										415
167										414
168										413
169										412
170										411
171										410
172										409
173										408
174										407
175										406
176										405
177										404
178										403
179										402
180										

Project Name and Job Number		SOIL LOG - Boring No. B-1000-UD	
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.		
Type and Diameter of Boring Wash Rotary / 6 inch	Boring Location Unit 1 N 1166066 E 1846192		Total Depth 23 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 581.5 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 0	Date Started 6/10/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/10/06

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drilled without sampling, refer to B-1000 boring log	Begin drilling 6/10/06	581
1												580
2												579
3												578
4												577
5												576
6										Encountered a gravel zone		575
7												574
8												573
9												572
10												571
11												570
12												569
13												568
14											Lost all water	567
15												566
16										Gravel zone drilling 16 to 21 ft		565
17												564
18												563
19												562
20												561
21											Rig racking	560
22										Refusal occurred in shot rock fill	Tricone refusal, boring	559
23										Boring terminated	terminated on 6/10/06	558
24												557
25												556
26												555
27												554
28												553
29												552
30												551
31												550
32												549
33												548
34												547
35												546
36												545
37												544
38												543
39												542
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1000-UDA

Type and Diameter of Boring: Wash Rotary / 6 inch	Boring Location: Unit 1, N 1166062 E 1846181		Total Depth: 29.2 feet
Drilling Contractor and Rig: MACTEC/Banks/337153 / CME 550 X	Elevation and Datum: 581.6 feet MSL	Ground Water Depth: N/A	Depth to Bedrock: N/A
Sampling Method: Undisturbed	Sample Driving Hammer/Drop: NA / NA	No. of Samples: 2	Date Started: 6/10/06
	Borehole Inclination: -90	Logged by: J. Cerceo	Date Completed: 6/10/06

Reviewed by / Date: B. Reinicker 6/13/06
Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Begin B-1000 UDA drilling 6/10/06	581
1											Drilled without sampling to 23 ft	580
2												579
3												578
4												577
5												576
6											Very rocky drilling, losing water	575
7												574
8												573
9												572
10												571
11												570
12												569
13												568
14											Losing water	567
15												566
16												565
17												564
18												563
19												562
20												561
21												560
22												559
23		UD 1		7.2/24					SM	SAND silty (SM)	Shelby push from 23 to 25 ft	558
24												557
25											Drilled without sampling to 28 ft	556
26												555
27												554
28		UD 2		14.4/14.4	●	●	●		SM	SAND silty (SM); 12% gravel, 47% sand, 41% fines	Shelby push 28 to 29.2 ft	553
29											Boring terminated at 29.2 ft on 6/10/06, moved to B-1000 UDB	552
30												551
31												550
32												549
33												548
34												547
35												546
36												545
37												544
38												543
39												542
40												

Project Name and Job Number		SOIL LOG - Boring No. B-1000-UDB		
Lee Nuclear Station COL 6234-06-3389				
Type and Diameter of Boring Wash Rotary / 6 inch	Boring Location Unit 1 N 1166107 E 1846117			Total Depth 48 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 588.9 feet MSL		Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Split spoon / Undisturbed	Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 10	Date Started 6/12/06
	Borehole Inclination -90		Logged by J. Cerceo	Date Completed 6/12/06

Reviewed by / Date: B. Reinicker 6/12/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GP	GRAVEL (GP)	Begin 6/12/06	588
1											Drilled to 28.0 ft without sampling, difficult drilling	
2												587
3										No sampling from 0 to 28 ft		586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11												578
12												577
13												576
14												575
15												574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28		SPT 1A	3 10 14	14/18					SM	SAND silty (SM); strong brown (7.5YR 5/8), white (7.5YR 8/1); damp, medium dense, fine to medium grained, SAPROLITE		561
29												560
30												559
31		UD 1		16.8/16.8	●	●	●			SAA; 43% fines, 57% sand	Shelby push 30 to 31.4 ft. Shelby push refusal	558
32		SPT 1B	4 15 20	18/18						SAA; dense		557
33												556
34		SPT 2A	4 15 25	12/18								555
35												554
36		UD 2		13.2/24	●	●	●			42% fines, 58% sand	Changed to pitcher barrel equipment Pitcher drill 35 to 37 ft.	553
37												552
38		SPT 2B	3 14 24	18/18								551
39												550
40												549

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1000-UDB

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												548
41									SM		Pitcher drill 41 to 43 ft.	547
42		UD 3		8.4/24	●	●	●					546
43		SPT 3B	50/6	6/6						SAA, 2% gravel, 63% sand, 35% fines		545
44												544
45											Pitcher drill 45 to 46.7 ft	543
46		UD 4		7.2/20.4							Pitcher barrel drill refusal	542
47		SPT 4B	50/5	5/5						SAA; PATIALLY WEATHERED ROCK	Tricone refusal at 48 ft on 6/12/06	541
48												540
49												539
50												538
51												537
52												536
53												535
54												534
55												533
56												532
57												531
58												530
59												529
60												528
61												527
62												526
63												525
64												524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1001**	
Type and Diameter of Boring HQ core / 3 inch	Boring Location Unit 1 N 1166067 E 1846370		Total Depth 118.1 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 565.5 feet MSL	Ground Water Depth 19 feet	Depth to Bedrock 32.9 feet
Casing Size and Depth 3.5 inch / 28.8 feet	Length of Core Barrel and Bit 8.5 feet / 8.5 feet	No. of Core Boxes 10	Date Started 5/13/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/16/06

Reviewed by / Date F. Syms 5/24/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0							CONCRETE FLOOR PRE CORED - USING THIN WALLED CORING TOOL	Upper deck slab	565
3							OPEN CORRIDOR TO LOWER COMPARTMENT	Existing former Unit 1 corridor	562
19							▽	Groundwater measured at 19 ft on 5/15/06	546
21	1	1.9/2.3					CONCRETE PRE CORED, USING THIN WALLED CORING TOOL, rebar layer 21.1 to 21.3 ft and 23.3 to 23.5 ft, rebar diameter approximately 1 1/4 to 1 3/8 inch	Existing former Unit 1. Lower corridor slab (top)	544
24	2	0.8/1.1							541
25	3	2.3/2.3					CONCRETE ~5% void spaces up to 3/8 inch, ~50% coarse aggregate (0.75 inch) angular likely quartz diorite, ~35% fine aggregate, ~#2 coarse sand, angular.	Begin coring - HQ Cold joint in concrete at 24.77 ft.	540
29	4	4.9/4.9							536
33	5	4.9/4.9	49	MW	R2 to R3		META-QUARTZ DIORITE, bluish gray (10B 5/1), gray (5YR 6/1); fine to medium grained; intensely to moderately jointed, subvertical, manganese oxide and iron oxide staining, plagioclase, quartz, hornblende, biotite, irregular contact with overlying concrete. CONTINUOUS ROCK	Existing former Unit 1 lower corridor slab (bottom)	532
38	6	5.0/5.0	54	MW			38.6 ft, Joint dipping ~75°, planar, quartz in filling partially replaced with calcite, open portions 0.10 inch wide.		527

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1001

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40					R3				525
41									524
42							Becomes very dark greenish gray (10YR 3/1) Continuous Rock		523
43									522
44	7	5.0/5.0	86						521
45									520
46									519
47				SW			META-QUARTZ DIORITE; bluish gray (10B 5/1) to gray (5YR 6/1)	End drilling 5/13/06; start drilling 5/14/06, water at 21 ft below top of boring	518
48									517
49	8	5.0/5.0	95						516
50									515
51							50.8 to 51.2 ft quartz vein, steeply dipping 70 to 80°, 0.1 > 0.3 thick, irregular		514
52									513
53									512
54	9	5.0/5.0	100						511
55									510
56					R3 to R4				509
57							META-QUARTZ DIORITE; bluish gray (10B 5/1) to gray (5YR 6/1); fine to medium grained; pyrite mineralization within thin to medium thick quartz vein; quartz and calcite often coupled infilled/healed joints; hornblende, plagioclase		508
58									507
59	10	4.6/4.6	100						506
60							60.1 ft 0.5 inch thick Quartz pegmatite vein with calcite and pyrite mineralization, near horizontal		505
61	11	0.4/0.4	100	F					504
62									503
63	12	4.7/4.7	94						502
64									501
65							META-DIORITE; black (N 2.5), very dark greenish gray (10Y 3/1), fine grained; quartz, pyrite, phenocrysts <50%; hornblende, calcite; porphyritic		500
66									499
67									498
68	13	5.0/5.0	94						497
69									496
70									495
71									494
72									493
73	14	5.0/5.0	100						492
74									491
75					R3 to R4				490
76									489
77									488
78	15	5.0/5.0	96						487
79							Quartz pegmatite with calcite zones; quartz with calcite		486
80									

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1001

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80							phenocrysts scattered, varying in size, shape, and orientation <50% phenocrysts		485
81									484
82									483
83	16	5.0/5.0	96						482
84									481
85									480
86							META-QUARTZ DIORITE; bluish gray (10B 5/1), gray (5YR 6/1), black (N 2.5); fine to medium grain; plagioclase, quartz, hornblende, calcite, pyrite, altered plagioclase along some quartz-diorite contacts.		479
87									478
88	17	5.0/5.0	84						477
89									476
90									475
91	18	1.0/1.0	100						474
92								End drilling 5/14/06; start drilling 5/15/06, water at 19 ft	473
93							At 93 and 108 ft, Mafic inclusions (3.5 cm by 3 cm) (3.5 cm by 1 cm), respectively.		472
94	19	4.0/4.0	100	F			At 94 ft, Pegmatite vein noted		471
95									470
96									469
97	20	4.0/4.0	100						468
98									467
99									466
100									465
101									464
102	21	5.0/5.0	100		R4				463
103									462
104									461
105									460
106									459
107	22	4.2/4.2	100						458
108							Mafic inclusion		457
109									456
110	23	1.1/1.1	100						455
111							Pyrite mineralization along subvertical healed quartz infilled joints		454
112									453
113	24	5.0/5.0	100						452
114									451
115									450
116									449
117	25	2.7/2.7	100						448
118									447
119								Finish coring 5/15/06; 5/16/06 set 4 inch PVC casing to 28.9 ft for	446
120									

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1001

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120									geophysical logging.	445
121								Total Depth 118.1 ft.		444
122								Groundwater encountered at 19 feet		443
123								Borehole Grouted On 6/13/06		442
124										441
125										440
126										439
127										438
128										437
129										436
130										435
131										434
132										433
133										432
134										431
135										430
136										429
137										428
138										427
139										426
140										425
141										424
142										423
143										422
144										421
145										420
146										419
147										418
148										417
149										416
150										415
151										414
152										413
153										412
154										411
155										410
156										409
157										408
158										407
159										406
160										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1001A**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 N 1166085 E 1846293		Total Depth 270.8 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 568.1 feet MSL	Ground Water Depth 25.1 feet	Depth to Bedrock 49 feet
Casing Size and Depth 3.5 inch / 36 feet	Length of Core Barrel and Bit 13 feet	No. of Core Boxes 13	Date Started 4/29/06
	Borehole Inclination -54	Logged by R. Ortiz	Date Completed 5/9/06

Reviewed by / Date: B. Reinicker 5/17/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
36							CONCRETE		538
37									537
38	1	4.9/5.0							536
39									535
40									534
41									533
42	2	5.0/5.0							532
43									531
44									530
45									529
46									528
47	3	5.0/5.0	100						527
48									526
49				SW	R3 to R4		META-GRANODIORITE; bluish gray (10B 6/1); massive; fine to medium grained; ~15% K-spar CONTINUOUS ROCK	Concrete/rock contact ~80 to 90% water loss RQD value of run 3 applies to rock only	525
50									524
51				SW to MW	R3 to R4				523
52	4	4.9/5.0	71						522
53				SW to MW	R2		META-DIORITE to AMPHIBOLITE; very dark gray (N 3); massive to weakly foliated; very fine grained; infilled joint with quartz, calcite, and feldspars at 54 ft		521
54									520
55									519
56					R2				518
57	5	4.9/5.0	83	MW to SW	R3 to R4		META-GRANODIORITE; bluish gray (10B 6/1); massive; fine to medium grained; ~15% K-spar		517
58									516
59									515
60									514
61									513
62	6	4.6/5.0	100	SW	R3 to R4			63.5 to 64.75 ft. void attributed to rock excavation	512
63									511
64									510
65									509
66									508
67	7	5.0/5.0	98	SW to F	R4		META-GRANODIORITE to META-QUARTZ DIORITE; bluish gray (10B 6/1 to 5PB 4/1); massive; fine to medium grained; occasional healed shears with numerous randomly oriented mafic xenoliths.	End day 4/29/06 Start day 4/30/06	507
68									
69									
70									
71									
72	8	5.0/5.0	99	SW to F	R4				
73									
74									
75									
76									

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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1001A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
76									506
77									505
78	9	4.6/5.0	90	SW to F	R4		META-QUARTZ DIORITE; dark bluish gray (10B 4/1); fine to medium grained; large quartz veins		504
79									503
80							Very large quartz vein		502
81									501
82	10	4.9/5.0	87	SW to F	R4		Well developed mylonitized zone, pyrite, is highly mineralized with quartz, calcite and other minerals along large, thick (>1.5 inch) quartz, calcite vein that runs vertically from 81.4 to 83.8 ft		500
83									499
84								Losing ~80% of water	498
85									497
86	11	4.9/5.0	98	F	R4		Some healed minor brecciation along quartz infilled mylonitized zone		496
87									495
88									494
89									493
90	12	4.9/5.0	94	F	R4				492
91									491
92									490
93									489
94	13	5.0/5.0	100	F	R4		META-QUARTZ DIORITE to META-GRANODIORITE; very dark bluish gray (10B 3/1); fine to medium grained; massive to very weakly foliated; mylonitic rock fabric along healed joints		488
95									487
96								~75 to 80% water loss	486
97									485
98	14	5.0/5.0	94	F	R4		META-QUARTZ DIORITE; very dark bluish gray (10B 3/1); fine to medium grained; massive to very weakly foliated; mylonitic rock fabric along healed joints		484
99									483
100									482
101									481
102	15	4.9/5.0	98	F	R4				480
103									479
104									478
105									477
106	16	5.0/5.0	85	SW to F	R4				476
107									475
108								~80% water loss	
109									
110									
111									
112									
113									
114									
115									
116									

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ROCK LOG - Boring No. B-1001A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
116										474
117		17	5.0/5.0	100	F	R4		META-QUARTZ DIORITE; bluish gray (10B 5/1); mylonitic rock fabric along healed joints	End day 4/30/06 Start day 5/1/06; water level at 25 ft along inclined hole length	473
118										
119										472
120										471
121		18	5.0/5.0	100	F	R4		META-GRANODIORITE; bluish gray (10B 5/1); fine to medium grained; ~15% K-spar		470
122										
123										469
124										468
125										467
126		19	4.9/5.0	98	SW to F	R4		META-GRANODIORITE to META-QUARTZ DIORITE; fine to medium grained; massive to very weakly foliated; with mylonitic rock fabric along healed joints	~75% water loss	466
127										
128										465
129										464
130										463
131		20	5.0/5.0	100	F	R4				462
132										
133										461
134										460
135										459
136		21	5.0/5.0	95	F	R4		META-GRANODIORITE; bluish gray (10B 5/1); fine to medium grained; massive to weakly foliated; some mafic xenoliths within core		458
137										
138										457
139										456
140										455
141		22	4.6/5.0	92	F	R3 to R4		META-GRANODIORITE to META-QUARTZ DIORITE; SAA		454
142										453
143								META-DIORITE; greenish black (10G 2.5/1); very fine to fine grained; weakly foliated; contact with granodiorite is vertical along core axis; plagioclase phenocrysts	~75% water loss	
144										452
145										451
146								Quartz vein; wavy		450
147		23	4.9/5.0	98	F	R3 to R4				449
148										448
149										
150								Vein of meta-granodiorite between 149.2 to 150 ft		447
151										446
152		24	5.0/5.0	100	F	R4				445
153										444
154										
155										443
156										442

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1001A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
156										441
157										
158										440
159		25	5.4/5.4	100	F	R4				
160										439
161										438
162										437
163										
164		26	4.4/5.0	88	F	R4				436
165										435
166										434
167										433
168		27	2.6/2.6	100	F	R4		META-GRANODIORITE; bluish gray (5PB 6/1); fine to medium grained; massive		432
169										
170		28	2.4/2.4	100	F	R3 to R4		META-DIORITE; greenish black (10G 2.5/1); massive to very weakly foliated; very fine to fine grained; few calcite veins		431
171										430
172								SAA; dark greenish gray (5G 4/1); fine grained; more visible plagioclase Xenolith of meta-granodiorite	End day 5/1/06 Start day 5/2/06; water level at 26 ft along inclined hole length	429
173										428
174		29	5.0/5.0	86	SW to F	R3				
175										427
176										426
177										425
178										
179		30	4.9/5.0	98	SW to F	R3				424
180										423
181										422
182										421
183								META-DIORITE; greenish gray (5G 4/1); fine grained; massive; along calcite healed fractures		
184		31	5.6/5.6	100	SW to F	R3			~80% water loss	420
185										419
186										418
187										417
188										416
189										
190		32	5.0/5.0	100	SW to F	R3				415
191										414
192										413
193										412
194										
195		33	5.0/5.0	100	SW to F	R3				411
196								Plagioclase phenocrysts		410

Project Name and Job Number
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6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1001A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
196									409
197									408
198									407
199	34	5.0/5.0	100	SW to F	R3				406
200									405
201								~75 to 80% water loss	404
202									403
203									402
204	35	5.0/5.0	100	SW to F	R3				401
205									400
206									399
207									398
208	36	3.2/3.5	92	SW to F	R3 to R4		META-QUARTZ DIORITE; bluish gray (5PB 6/1); fine to medium grained; massive to very weakly foliated	Drilling getting harder	397
209									396
210									395
211	37	1.1/1.1	90	F	R4				394
212							Some mafic xenoliths	End day 5/2/06	393
213								Start day 5/3/06. No hole advance	392
214	38	5.4/5.4	100	F	R4			Start day 5/8/06. Start hole advance	391
215									390
216									389
217									388
218									387
219	39	4.9/5.0	95	F	R4				386
220									385
221							Zone of healed brecciation between 220.5 to 222 ft		384
222									383
223	40	2.6/2.6	100	F	R4				382
224									381
225									380
226	41	2.4/2.4	100	F	R4		META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray (5PB 5/1); massive to very weakly foliated; slight increase in K-spar		379
227							Quartz pegmatite vein		378
228	42	1.4/1.4	100	SW to F	R4		SAA; large amount of altered plagioclase and chlorite along fracture planes		377
229	43	1.0/1.1	91	SW to F	R4		SAA		376
230	44	2.4/2.5	96	SW to F	R3 to R4		META-GRANODIORITE to META-QUARTZ DIORITE; fine to medium grained; moderate foliation; with some areas of healed highly altered mylonitic texture; highly altered plagioclase and chlorite	End day 5/8/06 Start day 5/9/06; water level at 25.1 ft along inclined hole length	375
231									374
232									373
233							META-QUARTZ DIORITE; bluish gray (5PB 5/1); fine to medium grained; massive to weakly foliated; some healed shear zones at 0 to 70°; some mafic xenoliths		372
234									371
235	45	5.0/5.0	100	F	R4			~75% water loss	370
236									369

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1001A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
236										377
237										376
238										375
239										374
240		46	5.0/5.0	100	F	R4		Zone of sheared rock and quartz vein between 240 and 242 ft		373
241										372
242										371
243								SAA; with mylonitized zones darkens color to very dark bluish gray (5PB3/1); some chlorite mineralization along quartz veins		370
244		47	4.7/5.0	94	F	R4				369
245										368
246										367
247										366
248								META-QUARTZ DIORITE; bluish gray to very dark bluish gray (5PB 5/1 to 3/1); fine to medium grained; massive to weakly foliated; many quartz veins (0 to 90°) with minor mylonitic textured around veins		365
249		48	4.4/4.6	87	SW to F	R3 to R4				364
250										363
251										362
252										361
253										360
254		49	4.3/4.4	64	SW to F	R4		SAA; quartz veins at 255 ft. predominantly		359
255										358
256									Water return	357
257		50	1.0/1.0	0	SW to F	R3 to R4		SAA; very dark bluish gray (5B 3/1); with quartz veins		356
258										355
259								META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray (5PB 5/1); to very dark bluish gray (5PB 3/1); fine to medium grained; massive to slightly foliated; with mylonitic fabric along healed joints		354
260		51	5.0/5.0	89	SW to F	R4				353
261										352
262										351
263										350
264								META-QUARTZ DIORITE; dark bluish gray (5PB 4/1); massive to weakly foliated; some mafic xenoliths		349
265		52	5.0/5.0	76	SW to F	R4				348
266										347
267										346
268										345
269		53	3.8/3.8	100	F	R4				344
270										343
271									Coring terminated on 5/9/06	342
272										341
273										340
274								Total Depth 270.8 ft. Groundwater encountered at 25.1 feet Borehole Grouted On 5/10/06		339
275										338
276										337

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1002**	
Type and Diameter of Boring HQ core / 3 inch	Boring Location Unit 1 N 1166061 E 1846444		Total Depth 170.3 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 565.338 feet MSL	Ground Water Depth 21.5 feet	Depth to Bedrock 29.8 feet
Casing Size and Depth 4.5 inch / 25 feet	Length of Core Barrel and Bit 10 feet	No. of Core Boxes 13	Date Started 5/23/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 5/28/06

Reviewed by / Date F. Syms 5/30/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								Rig positioned on fabricated steel deck, coring performed in existing lower compartment approximately 21 ft below top of slab/deck	No sampling from 0 to 21 ft	565
1										564
2										563
3										562
4										561
5										560
6										559
7										558
8										557
9										556
10										555
11										554
12										553
13										552
14										551
15										550
16										549
17										548
18										547
19										546
20										545
21		1	2.5/2.5					▽ CONCRETE 1 1/4 to 1 3/8 inch rebar from 21.2 to 21.5 ft 5/8 inch rebar at 23.2 to 23.3 ft 1 1/4 inch rebar at 23.4 to 23.5 ft	Concrete pre-cored using thin wall core to 24.75 ft	544
22										543
23										542
24		2	1.2/1.3						Cold joint in concrete	541
25		1	3.8/4.3					CONCRETE	Start HQ core drilling on 5/23/06	540
26										539
27										538
28										537
29		2	0.7/0.8							536
30		2	4.2/4.2	81	F	R4 to R5		META-GRANODIORITE; light bluish gray (10B 7/1); medium to coarse grained; equigranular CONTINUOUS ROCK	End of concrete at 29.8 ft Top of rock	535
31										534
32										533
33										532
34		3	0.8/1.0	0	SW to F	R3				531
35		4	4.0/4.0	87	F	R4				530
36										529
37										528
38										527
39										526
40										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1002

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40									525
41	5	5.0/5.0	95	F	R4 to R5				524
42									523
43									522
44									521
45	6	4.9/5.0	96	F	R4 to R5				520
46									519
47									518
48									517
49									516
50	7	5.0/5.0	94	F	R4 to R5		META-GRANODIORITE; light bluish gray (10B 7/1), medium-coarse grained, equigranluar		515
51									514
52							51.9 ft, vein 0.5 inch white quartz, 45° inclination		513
53									512
54									511
55	8	4.7/5.0	81	F	R4 to R5				510
56									509
57									508
58									507
59									506
60	9	5.0/5.0	89	F	R4 to R5				505
61							61.3 to 62.2 ft, vein 0.5 inch quartz and feldspar infilled		504
62									503
63									502
64									501
65	10	4.0/4.0	100	F	R4 to R5				500
66									499
67									498
68	11	1.0/1.0	100	F	R4 to R5				497
69									496
70	12	5.0/5.0	100	F	R4 to R5				495
71									494
72					R2 to R3		META-DIORITE; bluish gray (5B 5/1); fine grained; equigranular; well defined foliation contact with metagranodiorite deformed - ductile flow (exhibits migmatitic fabric); calcite veins parallel to foliation 40°		493
73									492
74									491
75	13	5.0/5.0	100	F	R2 to R3		From 74.7 to 75 ft, meta-granodiorite - xenolith	End of day 5/23/06 Begin day 5/24/06	490
76									489
77					R4 to R5				488
78							META-GRANODIORITE; light bluish gray (5PB 7/1); medium to coarse grained; equigranular		487
79									486
80									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1002

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80									485
81	14	4.0/4.0	100	F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1), medium to coarse grained, equigrangluar		484
82									483
83	15	1.0/1.0	100	F	R4 to R5				482
84									481
85							84.4, to 85.0 ft, 0.5 inch vein, potassium feldspar pegmatite.		480
86	16	5.0/5.0	100	F	R4 to R5		META-GRANODIORITE; SAA, with pyrite flecks and inclusions		479
87									478
88									477
89									476
90	17	4.4/4.4	100	F	R4 to R5				475
91									474
92									473
93									472
94	18	5.6/5.6	88	F	R4 to R5				471
95									470
96									469
97									468
98									467
99					R3 to R4		META-DIORITE; bluish gray to dark bluish gray (10B 5/1 to 10B 4/1); fine to medium grained; equigranular; pervasive healed calcite veins inclined at 30 to 60°		466
100									465
101	19	5.0/5.0	100	F	R3 to R4		101.6 ft, 0.3 inch, calcite vein, 30-40°		464
102									463
103									462
104									461
105	20	5.0/5.0	98	F	R3 to R4				460
106									459
107									458
108									457
109					R3 to R4				456
110	21	5.0/5.0	100	F	R4				455
111									454
112									453
113									452
114									451
115	22	5.0/5.0	100	F	R4				450
116									449
117									448
118									447
119									446
120									

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1002

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120									445
121	23	5.0/5.0	96	F	R4				444
122									443
123									442
124									441
125	24	5.0/5.0	96	F	R4		META-DIORITE, bluish gray to dark bluish gray (10B 4.5/1), fine to medium grained, equigranular, pervasive white veining random orientation		440
126									439
127									438
128									437
129									436
130	25	1.9/2.0	90	F	R4			End day 5/24/06 Begin day 5/26/06	435
131									434
132	26	2.3/2.3	87	F	R4				433
133					R4 to R5		META-GRANODIORITE; light bluish gray (5PB 6/1); medium grained; equigranular		432
134					R4 to R5				431
135							META-DIORITE; bluish gray to dark bluish gray (10B 4/1 to 10B 5/1); fine grain, equigranular, pervasive calcite veining		430
136	27	5.5/5.7	96	F	R4				429
137									428
138									427
139									426
140	28	1.0/1.0	100	F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 5/1); medium grained; equigranular		425
141	29	1.0/1.0	100	F	R4 to R5			End of day 5/26/06 Begin day 5/27/06	424
142							META-DIORITE; bluish gray to dark bluish gray (10B 4/1 to 10B 5/1); fine to medium grained; equigranular; pervasive calcite veining		423
143	30	2.8/3.0	93	F	R4				422
144									421
145							META-GRANODIORITE; light bluish gray (10B 4.5/1); fine to medium grained; equigranular; pervasive calcite veining	RQD 144 to 148.2 ft artificially low due to drilling induced core breakage	420
146	31	3.1/4.2	64	F	R4 to R5				419
147									418
148									417
149	32	0.8/0.8	100	F	R4 to R5				416
150					R4 to R5				415
151					R4		META-DIORITE dike, migmatitic fabric		414
152	33	4.7/5.0	92	F	R4 to R5		153.0 ft, Quartz vein 60° dipping, 0.2 inch thick		413
153									412
154									411
155					R4 to R5				410
156	34	5.0/5.0	100	F			META-GRANODIORITE; light bluish gray (5PB 6/1) ; medium grained; equigranular		409
157									408
158					R4		META-DIORITE; bluish gray to dark bluish gray (10B 4/1 to 10B 5/1); fine to medium grained; equigranular; pervasive calcite veining, migmatitic fabric along contact with upper metagranodiorite		407
159					R4				406
160									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1002

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160										405
161		35	3.7/3.7	97	F	R4 to R5		159.8 ft, quartz vein, 1 inch thick, dipping 25° META-GRANODIORITE; light bluish gray (5PB 6/1); medium grained; equigranular		404
162										403
163		36	1.3/1.3	100	F	R4 to R5				402
164										401
165		37	2.9/2.9	91	F	R4 to R5				400
166										399
167									End of day 5/27/06	398
168		38	1.8/1.8	100	F	R4 to R5			Begin day 5/28/06	397
169		39	1.0/1.0	100	F	R4 to R5				396
170		40	0.6/0.6	100	F	R4 to R5			Boring terminated at 170.3 ft on 5/28/06 water at 21.5 ft	395
171								Total Depth 170.3 ft. Groundwater encountered at 21.5 feet Borehole Grouted On 6/13/06		394
172										393
173										392
174										391
175										390
176										389
177										388
178										387
179										386
180										385
181										384
182										383
183										382
184										381
185										380
186										379
187										378
188										377
189										376
190										375
191										374
192										373
193										372
194										371
195										370
196										369
197										368
198										367
199										366
200										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1003**	
Type and Diameter of Boring HQ core / 6 inch	Boring Location Unit 1 N 1165938 E 1846226		Total Depth 100 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 597.2 feet MSL	Ground Water Depth N/A	Depth to Bedrock 64 feet
Casing Size and Depth 4 inch / 56 feet	Length of Core Barrel and Bit 13 feet / 13 feet	No. of Core Boxes 4	Date Started 4/2/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/3/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
56								CONCRETE	Tricone refusal at 56 ft, begin HQ rock core	541
57		1	2.8/3.0							540
58										539
59										538
60									100% water loss	537
61		2	5.0/5.0							536
62										535
63										534
64								META-QUARTZ DIORITE; light gray (10R 7/1); fine to medium grained; massive; zone of increased weathering (oxidation: 64 to 64.6 ft and 66.8 to 67.7 ft); some minor dissolution features (pits) along healed joints. CONTINUOUS ROCK	Bottom of concrete, top of rock	533
65		3	3.7/3.7	86	SW	R3			100% water loss	532
66										531
67										530
68		4	1.3/1.3	100	SW	R3				529
69										528
70		5	5.0/5.0	97	SW	R3		SAA; plagioclase, quartz, and biotite are predominant minerals; some pyrite found filling small void spaces		527
71										526
72								Zone of increased oxidation 72.4 to 73.4 ft		525
73										524
74								META-QUARTZ DIORITE to META-GRANODIORITE; gray (N 5), massive, fine grained, zones of oxidation along joint planes, large (1 to 2 inch) quartz pegmatite veins below 77.3 ft, some mafic xenoliths also present.		523
75		6	5.0/5.0	83	SW	R3				522
76										521
77										520
78										519
79		7	1.8/1.8	100	SW to F	R3 to R4		SAA		518
80										517
81										516
82		8	3.0/3.2	96	SW to F	R3 to R4				515
83								SAA, with minor dissolution (vugs, pits) features along healed joints		514
84										513
85		9	4.9/5.0	94	SW	R3 to R4		SAA; fine to medium grained; some oxidation near joint surfaces; some altered plagioclase along totally to moderately healed joints Minor dissolution pits at 86 ft. (coated with calcite and iron oxide)		512
86										511
87										510
88										509
89										508
90										507
91		10	4.7/5.0	86	SW	R3 to R4				506
92										505
93										504
94										503
95										502
96										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1003

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
96										501
97		11	6.0/6.0	94	SW to F	R3 to R4		SAA; plagioclase, quartz, biotite, major minerals. No oxidation (iron staining) prevalent near joint surface.		500
98										499
99										498
100									Boring terminated at 100 ft on 4/3/06	497
101										496
102										495
103										494
104										493
105										492
106										491
107										490
108										489
109										488
110										487
111										486
112										485
113										484
114										483
115										482
116										481
117										480
118										479
119										478
120										477
121										476
122										475
123										474
124										473
125										472
126										471
127										470
128										469
129										468
130										467
131										466
132										465
133										464
134										463
135										462
136										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1004**	
Type and Diameter of Boring NQ / HQ core / 4 inch	Boring Location Unit 1 N 1165831 E 1846407		Total Depth 175 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 559 feet MSL	Ground Water Depth 9.5 feet	Depth to Bedrock 6.7 feet
Casing Size and Depth none / 0 feet	Length of Core Barrel and Bit 13 feet / 13.5 feet	No. of Core Boxes 14	Date Started 5/12/06
	Borehole Inclination -90	Logged by R. Ortiz/G. Maximov	Date Completed 5/22/06

Reviewed by / Date: F. Syms 6/12/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0									559
1	1	2.9/3.0					CONCRETE; 6 inches concrete core drilled and removed by thin wall bit.		558
2									557
3							CONCRETE	Begin rock core drilling at 3.0 ft. Begin coring 5/12/06	556
4	1	5.4/5.4	76						555
5									554
6									553
7				SW	R3 to R4		META-QUARTZ DIORITE; bluish gray (5PB 5/1); massive; fine to medium grained; minor healed shears; some mafic xenoliths CONTINUOUS ROCK	RQD is applicable to rock only	552
8									551
9	2	1.6/1.6	100	SW	R3 to R4		▽		550
10									549
11									548
12	3	4.9/5.0	93	SW	R3 to R4	CKE-02			547
13						CKE-01		Goodman Jack Tests: 12.22 to 12.89 ft 13.22 to 13.89 ft	546
14									545
15									544
16	4	4.7/5.0	86	SW	R3 to R4		SAA; dark bluish gray (5PB 4/1); slightly to moderately sheared with minor brecciation healed	End 5/12/06 Start 5/13/06; water level at 12 ft	543
17									542
18									541
19									540
20									539
21	5	4.3/4.3	87	SW	R4	CKE-04		Goodman Jack Tests: 22.22 to 22.89 ft 23.22 to 23.89 ft	538
22						CKE-03			537
23									536
24									535
25	6	5.1/5.7	90	SW	R4		SAA; dark bluish gray to bluish gray (5PB 4/1 to 5PB 5/1)		534
26									533
27									532
28								End 5/13/06 Start of day 5/14/06 100% water loss	531
29									530
30									529
31	7	5.1/5.2	94	SW to F	R4		SAA; bluish gray (5PB 5/1)		528
32									527
33						CKE-06		Goodman Jack Tests: 32.89 to 33.56 ft 33.89 to 34.56 ft	526
34						CKE-05			525
35									524
36									523
37	8	5.2/5.2	85	SW to F	R4				522
38									521
39									520
40							From 39.2 to 40.2 ft zone of healed brecciation		519

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1004

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										519
41		9	2.5/2.5	100	F	R4			100% water loss	518
42										517
43										516
44		10	2.8/2.8	88	F	R4	CKE-08		Goodman Jack Tests: 43.64 to 44.31 ft	515
45							CKE-07		44.64 to 45.31 ft	514
46									End of day 5/14/06	513
47		11	2.7/2.9	90	F	R4			Start of day 5/15/06	512
48										511
49								META-QUARTZ DIORITE to META-GRANODIORITE		510
50										509
51		12	4.8/5.0	86	F	R4				508
52										507
53										506
54								SAA; bluish gray (5PB 5/1); massive; fine to medium grained; with boudenage structures expressed along healed shears quartz vein		505
55		13	2.4/2.5	100	F	R4				504
56										503
57		14	2.4/2.5	88	F	R4				502
58										501
59										500
60										499
61		15	4.6/5.0	85	SW to F	R4				498
62										497
63										496
64										495
65										494
66		16	4.9/5.0	91	F	R4				493
67										492
68										491
69								META-QUARTZ DIORITE; dark bluish gray (5PB 4/1); fine to medium grained; pervasive shear fabric overprints original igneous texture; some zones of highly brecciated material but main texture appears predominantly mylonitic as opposed to brecciated		490
70										489
71		17	4.8/5.0	96	F	R4				488
72										487
73										486
74										485
75		18	4.0/4.0	100	F	R4				484
76										483
77										482
78										481
79										480
80										479

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1004

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80										479
81		19	5.8/6.0	100	F	R4				478
82										477
83										476
84										475
85										474
86		20	4.8/5.0	78	SW to F	R3 to R4				473
87										472
88										471
89									End of day 5/15/06	470
90		21	2.5/2.5	100	F	R4			Start of day 5/16/06 Water level at 11.1 ft	469
91										468
92		22	2.4/2.5	96	F	R4		SAA; very dark bluish gray to dark bluish gray (10B 3/1 to 10B 4/1); massive to moderately sheared; fine to medium grained		467
93								Mafic dike at ~ 91.3 to 91.6 ft	100% water loss	466
94										465
95										464
96		23	5.0/5.0	100	F	R4				463
97										462
98										461
99								SAA; dark bluish gray (10B 4/1); slightly sheared (healed) with some brecciation (healed) and minor mylonitization		460
100										459
101		24	5.0/5.0	88	F	R4				458
102										457
103										456
104		25	1.5/1.5	98	F	R4				455
105										454
106										453
107		26	3.4/3.5	93	F	R4				452
108										451
109										450
110										449
111		27	4.8/5.0	96	F	R4				448
112										447
113										446
114										445
115										444
116		28	5.0/5.0	98	F	R3 to R4		META-DIORITE; greenish black (10BG 2.5/1); massive to very weakly foliated; very fine to fine grained		443
117										442
118										441
119										440
120										439

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1004

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										439
121		29	5.2/5.2	85	SW to F	R3				438
122										437
123										436
124								META-QUARTZ DIORITE; bluish gray (5PB 5/1); massive to slightly sheared (healed); fine to medium grained; some minor mafic xenoliths		435
125										434
126		30	4.5/4.5	90	F	R3 to R4				433
127										432
128										431
129										430
130		31	3.8/3.8	100	F	R4				429
131										428
132										427
133		32	1.5/1.5	88	F	R4				426
134									End of day 5/16/06	425
135									Start of day 5/17/06; water level at 12 ft	424
136		33	4.7/5.0	94	F	R4				423
137										422
138										421
139										420
140										419
141		34	5.0/5.0	100	F	R4				418
142										417
143										416
144										415
145		35	3.0/3.0	89	F	R4				414
146										413
147								META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray (5PB 5/1); massive; fine to medium grained; some mafic xenoliths; slight increase in K-spar content		412
148		36	1.9/2.0	95	F	R4			100% water loss	411
149										410
150										409
151		37	4.9/5.0	98	F	R4				408
152										407
153										406
154										405
155		38	3.3/3.5	94	F	R4				404
156										403
157										402
158		39	1.5/1.5	100	F	R4				401
159										400
160										399

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1004

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160										399
161		40	4.0 / 4.0	100	F	R4				398
162										397
163									End of day at 5/17/06	396
164									Start day 5/22/06; water level at 9.5 ft	395
165		41	6.0 / 6.0	100	F	R4				394
166										393
167										392
168										391
169										390
170		42	4.0 / 4.0	100	F	R4				389
171										388
172										387
173		43	0.6	100	F	R4				386
174		44	0.6 / 1.8 / 1.8	100	F	R4				385
175									Coring terminated on 5/22/06	384
176										383
177										382
178								Total Depth 175 ft.		381
179								Groundwater encountered at 9.5 feet		380
180								Borehole Grouted On 4/4/07		379
181										378
182										377
183										376
184										375
185										374
186										373
187										372
188										371
189										370
190										369
191										368
192										367
193										366
194										365
195										364
196										363
197										362
198										361
199										360
200										359

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1004A**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 N 1165831 E 1846430		Total Depth 284.7 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 559 feet MSL	Ground Water Depth 14 feet	Depth to Bedrock 7 feet
Casing Size and Depth 4 / 3.5 feet	Length of Core Barrel and Bit 13 feet / 13 feet	No. of Core Boxes 16	Date Started 4/14/06
	Borehole Inclination -56	Logged by R. Ortiz/E. Weldon	Date Completed 4/28/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0										559
1		1	3.4/3.4					CONCRETE removed with 6-inch thin wall bit from 0 to 3.4 ft. NQ core began at 3.4 ft.		558
2										557
3										
4		1	3.1/3.1						Start coring 4/14/06	556
5										555
6										554
7		2	3.4/4.0	20	SW	R3		META-DIORITE; very dark gray (N 3) to very dark greenish gray (10Y 3/1); massive, fine to medium grained; some healed fractures (calcite/quartz).	Bottom of concrete, top of rock 100% water loss	553
8										552
9										
10										551
11		3	5.0/5.0	100	SW to F	R3		SAA; greenish gray (10BG 5/1); some plagioclase phenocrysts, calcite healed fractures. CONTINUOUS ROCK		550
12										549
13										548
14								▽		
15										547
16		4	5.0/5.0	72	SW	R3 to R4		SAA; massive to weakly foliated; plagioclase and mafic phenocrysts are evenly disbursed from sample	End 4/14/06 Start of day 4/17/06 100% water loss to formation	546
17										545
18										544
19										543
20										
21		5	4.3/5.0	77	SW	R3 to R4				542
22										541
23										540
24										539
25										538
26		6	4.5/5.0	86	SW	R3 to R4			60% loss of water to formation	537
27										536
28										535
29										534
30										
31		7	5.0/5.0	83	MW to SW	R3 to R4		Pegmatitic texture between 30.5 and 31.8 ft.		533
32										532
33										531
34										530
35										
36		8	5.0/5.0	99	SW	R3 to R4				529
37										528
38										527
39										526
40										

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1004A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40									
41	9	4.8/5.0	95	SW	R3 to R4				525
42									524
43									523
44									
45									522
46	10	2.2/2.5	30	SW	R3		META-GRANODIORITE; bluish gray (5PB 5/1); massive, fine to medium grained, very highly fractured		521
47									520
48									519
49	11	2.5/2.5	82	SW	R3				518
50							SAA; some mafic xenoliths; few quartz veins (pegmatite)		
51									517
52	12	4.5/5.0	74	SW	R3 to R4			100% water loss to formation	516
53									515
54									514
55									
56	13	5.0/5.0	84	SW	R3 to R4				513
57									512
58									511
59									510
60							Quartz pegmatite vein brittle-ductile flow structures present		509
61	14	4.8/5.0	96	SW	R3 to R4				508
62									507
63									506
64									505
65									504
66	15	5.0/5.0	81	SW	R4				503
67							META-DIORITE; greenish gray (10BG 5/1); fine grained; massive to weakly foliated		502
68									501
69									500
70	16	5.0/5.0	100	SW	R4		META-GRANODIORITE; bluish gray (5PB 5/1); fine to medium grained; massive; mafic xenoliths; some quartz rich veins (pegmatites); some minor brittle-ductile flow structures with little to some displacements.		499
71									498
72									497
73								100% water loss to formation	496
74									495
75									494
76	17	5.0/5.0	100	SW to F	R4 to R5				493
77									
78									
79									
80									

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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1004A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80									
81	18	1.0/1.0	0	SW	R3 to R4			End of drilling 4/17/06 No hole advance 4/18/06 Start 4/19/06	492
82									491
83	19	4.0/4.0	100	SW to F	R4				490
84									489
85							META-DIORITE; black, light orange gray; inequigranular 15 to 30% mafics, 30 to 50% feldspar,10% quartz, occasional xenoclasts of older mafic fine grained metadiorite or amphibolite? (2cm); albite? blue translucent subrounded crystals		488
86									
87	20	4.9/5.0	84	SW to F	R4			100% water loss to formation	487
88									486
89									485
90									484
91							META-QUARTZ DIORITE; as above increased veins and healed shears in lower part of run. Fabric appears both pegmatitic and migmatitic, grains crushed with brecciated appearance.	End of day on 4/19/06 Begin day 4/24/06; E. Weldon, rig geologist	483
92									
93	21	5.2/5.2	100	SW to F	R4				482
94								100% water loss	
95							META-QUARTZ DIORITE to META-GRANODIORITE; veins are pegmatitic (very coarse quartz, chlorite, k-spar) minor pyrite.		481
96									480
97									479
98	22	5.0/5.0	100	F	R4				478
99									477
100									476
101							As above, upper foot has pegmatitic texture chloride, quartz, plagioclase and orthoclase rich veins or xenoclasts, also large 5cm mafic xenoclasts are incorporated in the more dioritic groundmass.		475
102									
103	23	5.1/5.1	88	SW to F	R4				474
104									473
105									472
106							META-DIORITE with META-GRANODIORITE as above; large vein or dike (<1 ft) (feldspar rich) cuts upper 1.5 ft. Several quartz veins parallel to rock fabric.		471
107									
108	24	3.9/4.0	95	F	R4 to R5				470
109								Drilling slowly	469
110									468
111							META-GRANODIORITE similar to above; brecciated, healed joints and flow structures. Veins (quartz) truncated by healed joints.		467
112									
113	25	6.1/6.1	95	F	R4 to R5				466
114									465
115									464
116							META-GRANODIORITE to META-DIORITE Coarsely foliated (alternating mafic/felsic meta grains diorite above upper 6 inches). Meta granodiorite appears migmatized above contact (2 inches)		463
117									
118	26	4.9/4.9	62	F	R4				462
119							AMPHIBOLITE dark gray, equigranular, fine grained, >70% mafics		461
120									460

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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1004A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120									459
121									458
122	27	5.0/5.0	100	F	R4		META-GRANODIORITE; compositional banding and pervasive healed joints dipping 40°.		457
123									456
124									455
125									454
126	28	5.0/5.0	96	F	R4		META-GRANODIORITE to META-QUARTZ DIORITE fabric ranges from predominately brecciated (coarsely) to finely mylonitized zones. Moderately spaced to very closely spaced fractures and healed joints. Veins of quartz (with minor calcite and chlorite, pegmatitic) moderately to widely spaced.		453
127									452
128									451
129	29	4.9/5.0	92	F	R4		SAA		450
130									449
131									448
132									447
133	30	5.0/5.0	100	F	R4		Partially migmatized; quartz veins appear to cut granodiorite component but more mafic mylonitized (meta-quartz diorite) component appears to flow around veins.		446
134									445
135									444
136									443
137	31	4.7/5.0	94	F	R4				442
138									441
139									440
140									439
141	32	5.0/5.0	94	F	R4				438
142									437
143									436
144									435
145	33	4.0/5.0	99	F	R4				434
146									433
147									432
148									431
149	34	5.0/5.0	100	F	R4				430
150									429
151									428
152									427
153									
154									
155									
156									
157									
158									
159									
160									

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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160										426
161										425
162		35	4.7/4.7	100	SW to F	R4		META-GRANODIORITE; dark bluish gray (5PB 4/1), massive to poorly foliated, some mafic xenoliths and quartz pegmatite veins.		424
163										423
164										422
165										421
166		36	5.0/5.0	100	SW to F	R4		SAA; fine to medium grained, some partly healed incipient joints healed with calcite; some minor flow structures observed.	End day 4/24/06 No hole advance 4/25/06 Start of day 4/26/06; R. Ortiz, rig geologist	420
167										419
168										418
169										417
170										416
171		37	5.0/5.0	85	SW to F	R4		META-GRANODIORITE to META-QUARTZ DIORITE, dark bluish gray, massive to weakly foliated, little to no K-spar, increase in plagioclase from above, fine to medium grained.		415
172										414
173										413
174										412
175										411
176		38	4.9/5.0	84	SW to F	R4		SAA, offset quartz pegmatite vein within upper 6 inches of core, upper 1.5 ft of core has an apparent 30° foliation.		410
177										409
178										408
179										407
180										406
181		39	4.8/5.0	96	F	R4		META-GRANODIORITE to META-QUARTZ DIORITE; dark bluish gray (5PB 4/1); fine to medium grained, massive to very weakly foliated, minor epidote and chlorite along migmatitic zone.		405
182										404
183										403
184										402
185										401
186		40	5.0/5.0	96	F	R4				400
187										399
188										398
189										397
190										396
191		41	5.3/5.3	90	SW to F	R4		META-GRANODIORITE; dark bluish gray, fine to medium grained, massive, possibly very weak foliation (~10 to 12% K-spar), some mafic xenoliths, minor flow structures appears to be mineralized with calcite.		395
192										394
193										393
194										392
195										391
196		42	5.0/5.0	97	SW to F	R4		SAA; dark bluish gray (5PB 4/1); some small (2 to 3 cm) mafic xenoliths; some thin (<1 cm) migmatitic zones healed with chlorite.	100% water loss to formation	390
197										389
198										388
199										387
200										386

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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
200										393
201		43	4.9/5.0	94	F	R4				392
202										391
203										390
204										389
205										388
206		44	2.5/2.5	81	MW	R3		META-QUARTZ DIORITE; dark to bluish gray (5PB 4/1) to bluish gray (5PB 6/1); fine to medium grained; slightly weathered, massive; some oxidation stains within areas of moderate weathering		387
207					SW	R4				386
208					F	R4				385
209		45	2.5/2.5	72	SW to F	R4				384
210										383
211		46	4.9/5.0	95	SW to F	R4		META-QUARTZ DIORITE; dark bluish gray (5PB 4/1); fine to medium grained; massive; some zones with minor migmatitic fabric, much more fine grained material than the meta quartz diorite described above.	End 4/26/06 Start of day 4/27/06	382
212										381
213										380
214										379
215										378
216		47	5.0/5.0	95	SW to F	R4				377
217										376
218										375
219										374
220										373
221		48	5.0/5.0	94	F	R4		META-DIORITE to META-QUARTZ DIORITE; very dark greenish gray (10GY 3/1); very fine grained to fine grained with some medium grained quartz crystals, massive to very weakly foliated, many large quartz pegmatitic veins throughout, may be heavily altered quartz diorite. Quartz veins have some K-spar and calcite.		372
222										371
223										370
224										369
225										368
226		49	5.0/5.0	90	SW to F	R4		Thick quartz pegmatitic vein with associated breccia derived from quartz diorite.		367
227										366
228								META-QUARTZ DIORITE; fine to medium grained with mafic xenoliths; massive to very weakly foliated.		365
229										364
230										363
231		50	5.0/5.0	88	F	R4		META-QUARTZ DIORITE; dark greenish gray (5G 4/1), fine to medium grained, none to very weakly foliated, moderately altered, foliated large veins of quartz and calcite appear to be brecciated and may be offset by thin healed shears joints or fractures; pegmatitic texture.		362
232										361
233										360
234										359
235										358
236		51	3.2/3.2	83	SW to F	R4				357
237										356
238										355
239			1.8							354
240										353

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ROCK LOG - Boring No. B-1004A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
240	52	1.8	79	SW to F	R4				360
241									
242	53	2.0/2.0	95	SW to F	R4				359
243									358
244	54	3.2/3.2	100	SW to F	R4		META-QUARTZ DIORITE to META-GRANODIORITE; dark bluish gray (5PB 4/1), fine to medium grained, massive to very weakly foliated, upper 0.5 ft to 1.0 ft of core has a moderate mylonitic texture to it with some brecciation. Pegmatitic textures		357
245									356
246									355
247									354
248	55	4.8/5.0	96	F	R4				353
249									
250									352
251									351
252	56	5.0/5.0	100	F	R4		META-QUARTZ DIORITE to META-GRANODIORITE; dark bluish gray (10B Y/1), few flow structures and some small mafic xenoliths.	End day 4/27/06 Start of day 4/28/06; water level at 14 ft along inclined length of hole	350
253									349
254									
255									348
256									347
257	57	5.0/5.0	100	F	R4		META-QUARTZ DIORITE; dark bluish gray (10B 4/1 to 5PB 4/1), fine to medium grained, massive to weakly foliated. Highly sheared zone between 256.5 to 257.2 ft which exhibits both a mylonitic texture (along meta diorite veins) and a pegmatitic texture (within interior meta quartz diorite band)		346
258									345
259									344
260									343
261									342
262	58	5.0/5.0	95	F	R4				341
263									
264								100% water loss to formation	340
265									339
266									338
267							SAA; some thin healed fractures, some mafic xenoliths.		
268	59	5.0/5.0	91	SW to F	R4				337
269							META-DIORITE vein/dike, fine grained foliated, plagioclase phenocrysts		336
270									335
271									
272	60	3.0/3.0	100	SW to F	R4		META-QUARTZ DIORITE; dark bluish gray (5PB 4/1),shear zone between 271 to 271.8 ft exhibits moderate brecciation healed with some altered plagioclase (pink), pyrite, and quartz, calcite, plagioclase vein. Pegmatitic texture		334
273									333
274									332
275	61	2.0/2.0	91	F	R4				331
276									330
277									
278	62	5.0/5.0	100	F	R4			100% water loss	329
279									328
280									327

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ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
280										
281								SAA		326
282										325
283		63	3.7 / 3.7	88	F	R4				324
284									Boring terminated on 4/28/06 at 284.7 ft	323
285										322
286										321
287								Total Depth 284.7 ft.		320
288								Groundwater encountered at 14 feet		319
289								Borehole Grouted On 5/10/06		318
290										317
291										316
292										315
293										314
294										313
295										312
296										311
297										310
298										309
299										308
300										307
301										306
302										305
303										304
304										303
305										302
306										301
307										300
308										299
309										298
310										297
311										296
312										295
313										294
314										
315										
316										
317										
318										
319										
320										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1005**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 adjacent N 1165715 E 1846277		Total Depth 50 feet
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75	Elevation and Datum 562.2 feet MSL	Ground Water Depth 16.5 feet	Depth to Bedrock 8.2 feet
Casing Size and Depth none	Length of Core Barrel and Bit 10 feet / 10 feet	No. of Core Boxes 4	Date Started 4/2/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/2/06

Reviewed by / Date: F. Syms 5/27/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0		1	2.3 / 2.5					CONCRETE removed using 6 inch thin wall bit, no rebar, smooth break at 3.1 ft. NQ core began at 4.3 ft.		562
1										561
2		2	1.6 / 1.8	100						560
3										559
4									Start core drilling 4/2/06	558
5		1	4.8							557
6										556
7										555
8					SW	R4 to R5		META-GRANODIORITE, bluish gray (10B 6/1), medium grain, equigranular, very closely spaced totally healed fractures CONTINUOUS ROCK	RQD applies to rock only	554
9										553
10		2	4.7 / 5.0	80	SW	R4 to R5				552
11										551
12								META-QUARTZ DIORITE, bluish gray (10B 5/1), medium grain, equigranular		550
13										549
14										548
15		3	5.0 / 5.0	96	F	R4 to R5				547
16								▽		546
17										545
18										544
19								META-GRANODIORITE to META-QUARTZ DIORITE, bluish gray (10B 5/1), medium grain, equigranular		543
20										542
21		4	5.0 / 5.0	98	F	R4 to R5				541
22										540
23										539
24										538
25										537
26		5	4.9 / 5.0	48	SW	R4 to R5				536
27										535
28								Meta-diorite dike? upper contact highly irregular, lower contact at 45°		534
29										533
30								META-GRANODIORITE to META-QUARTZ DIORITE, bluish gray (10B 5/1), medium grained, equigranular		532
31										531
32		6	5.0 / 5.0	81	F	R4 to R5				530
33										529
34										528
35								SAA		527
36										526
37		7	5.0 / 5.0	80	F	R4 to R5				525
38										524
39										523
40										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1005

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40									522
41	8	5.0/5.0	89	F	R4 to R5				521
42									520
43									519
44							SAA, but lighter color (10B 6/1)		518
45									517
46				F	R4 to R5				516
47	9	5.7/6.0	74						515
48							SAA; bluish gray (10B 5/1)		514
49				SW	R4 to R5			Coring terminated on 4/2/06	513
50									512
51									511
52									510
53							Total Depth 50 ft.		509
54							Groundwater encountered at 16.5 feet		508
55							Borehole Grouted On 4/3/06		507
56									506
57									505
58									504
59									503
60									502
61									501
62									500
63									499
64									498
65									497
66									496
67									495
68									494
69									493
70									492
71									491
72									490
73									489
74									488
75									487
76									486
77									485
78									484
79									483
80									

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1006**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 adjacent N 1165456 E 1846165		Total Depth 30 feet
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75	Elevation and Datum 589.2 feet MSL	Ground Water Depth N/A	Depth to Bedrock 2 feet
Casing Size and Depth none	Length of Core Barrel and Bit 10 feet / 10 feet	No. of Core Boxes 1	Date Started 4/3/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/4/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								Unsampled gravel fill	Begin drilling on 4/3/06	589
2		1	1.0/1.0	45	F	R4 to R5		META-QUARTZ DIORITE		587
4		2	2.9/5.0	0	MW	R4 to R5				585
7										582
9		3	0.8/5.0	8	MW	R4 to R5				580
12										577
13					MW	R4 to R5				576
14		4	2.5/5.0	12	HW	R0 to R1		META-GRANODIORITE, bluish gray (10B 6/1), medium grained, equigranular, but highly weathered and pitted, strong oxidation.		575
16					CW	R0				573
18		5	0.0/5.0	0	CW	R0				571
21										568
23		6	0.2/5.0	0	CW	R0				566
26										563
28								No core recovered	End 4/3/06 Begin 4/4/06 Lost core barrel, hole abandon at 30 ft Moved to B-1006A	561
30										559
40										550

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1006A**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 adjacent N 1165453 E 1846160		Total Depth 90 feet
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75	Elevation and Datum 589.6 feet MSL	Ground Water Depth 25 feet	Depth to Bedrock 14 feet
Casing Size and Depth 3.5 inch / 14 feet	Length of Core Barrel and Bit 10 feet / 10 feet	No. of Core Boxes 3	Date Started 4/10/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/17/06

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								No Sampling	Start 4/11/06 0 to 14 ft - Drilled with NW casing without sampling	589
14		1	1.4/5.0	0	SW	R4 to R5		META-QUARTZ DIORITE, light gray (N 7), microcrystalline, thick quartz vein? massive body of quartz.	Begin NQ rock coring	575
18					HW	R0 to R1		META-GRANODIORITE, originally bluish gray (10B 6/1), medium gray, equigranular, pitted with heavy oxidation.		571
19		2	0.3/5.0	0	HW	R0 to R1				570
24		3	0.0/5.0	0	CW	R0		▽		565
28								META-DIORITE medium to fine grain, equigranular, weathered salt and pepper appearance with >50% dark minerals, quartz veins up to 0.2 inches wide.		561
29		4	0.9/5.0	0	HW	R0 to R1				560
34		5	3.6/5.0	7	MW	R2				555
35					MW	R3		META-GRANODIORITE, originally bluish gray (10B 6/1), medium grained, equigranular		554
40										550

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1006A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										549
41		6	4.0/5.0	0	MW	R3		SAA		548
42										547
43										546
44										545
45		7	3.5/5.0	10	HW to MW	R3				544
46										543
47										542
48										541
49					MW to SW	R3 to R4				540
50										539
51		8	4.1/5.0	20				META-DIORITE, salt and pepper appearance (aprox. 10B 4/1), medium grain, equigranular, minor pooly developed foliation, >50% dark minerals.		538
52										537
53										536
54										535
55		9	3.6/5.0	16	SW	R3 to R4				534
56										533
57										532
58										531
59								SAA, CONTINUOUS ROCK		530
60		10	5.0/5.0	90	F	R4 to R5				529
61										528
62										527
63										526
64								Meta-granodiorite xenolith 63.2 to 63.7 ft		525
65		11	4.8/5.0	83						524
66										523
67										522
68								META-GRANODIORITE; light bluish gray (10B 7/1); medium to coarse grained; equigranular		521
69					F	R4 to R5				520
70		12	5.0/5.0	80						519
71										518
72										517
73										516
74									End of 4/11/06	515
75		13	5.9/6.0	70	F	R4 to R5			Begin day 4/12/06, water level at 25 ft	514
76										513
77										512
78										511
79										510
80										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1006A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80									End day 4/12/06 Begin day 4/14/06	509
81										508
82		14	5.0/5.0	100	F	R4 to R5				507
83										506
84										505
85										504
86		15	5.0/5.0	80	F	R4 to R5				503
87										502
88										501
89										500
90								META-GRANODIORITE, light bluish gray (5PB 8/1), medium grain.	Coring terminated on 4/14/06	499
91										498
92										497
93								Total Depth 90 ft.		496
94								Groundwater encountered at 25 feet		495
95								Borehole Grouted On 4/15/06		494
96										493
97										492
98										491
99										490
100										489
101										488
102										487
103										486
104										485
105										484
106										483
107										482
108										481
109										480
110										479
111										478
112										477
113										476
114										475
115										474
116										473
117										472
118										471
119										470
120										

ROCK LOG CHEROKEE10-19-07.GPJ WLA9-8-06.GDT 10/24/07

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1007**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 adjacent N 1165712 E 1846489		Total Depth 51.25 feet
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75	Elevation and Datum 563 feet MSL	Ground Water Depth 7 feet	Depth to Bedrock 5.75 feet
Casing Size and Depth none	Length of Core Barrel and Bit 10 feet / 10 feet	No. of Core Boxes 3	Date Started 3/28/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 3/29/06

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0									563
1	1	2.3/2.5					CONCRETE removed using 6 inch thin wall bit. #6 rebar layer at 8 inches and 43 inches below top.	Concrete pre cored with thin wall bit to 4.25 ft 4 inch diameter steel pipe from 14 to 18 inch	562
2	2	1.8/1.8							561
3									560
4									559
5	1	5.0/5.0	82	SW to F	R4 to R5		CONCRETE	Begin core on 3/28/06	558
6									557
7							META-GRANODIORITE, blue gray (N 6), medium grain, equigranular, weak foliation can be seen by mafic minerals orientation, healed fractures closely spaced subparallel to foliation, biotite, quartz, K-spar, plagioclase, few quartz veins. CONTINUOUS ROCK		556
8								Losing water circulation at surface	555
9									554
10	2	4.9/5.0	70	SW to F	R4 to R5				553
11									552
12				F					551
13									550
14									549
15							1/4 to 1/2 inch quartz vein		548
16	3	5.0/5.0	86	F	R4 to R5		META-GRANODIORITE gneissic foliation grades to more distinct foliation		547
17							META-DIORITE, dark gray (N 4), fine grained, equigranular, contact shows slight gneissic bonding; calcite veins to 2 mm closely spaced 16 to 17 ft.		546
18									545
19									544
20	4	5.0/5.0	100	F	R4 to R5				543
21									542
22									541
23									540
24							Separation into mineral bands at contact increase in grain size, contact recrystallization?		539
25									538
26	5	4.7/5.0	58	F	R4 to R5		META-GRANODIORITE, gray (N 6), equigranular, medium grain, numerous calcite veins and quartz		537
27									536
28									535
29									534
30	6	5.0/5.0	77	F	R4 to R5				533
31									532
32									531
33									530
34									529
35	7	4.9/5.0	91	F	R4 to R5				528
36									527
37									526
38							META-DIORITE, dark gray (N 4), equigranular, fine grained lace with quartz vein, some containing chalcopyrite, foliated		525
39									524
40								End of 3/28/06	523

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1007

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40									Begin day 3/29/06	523
41										522
42		8	4.7/5.0	88	F	R4 to R5				521
43										520
44								META-GRANODIORITE, gray (N 6) equigranular, medium grain		519
45										518
46										517
47		9	5.0/5.0	100	F	R4 to R5				516
48								META-DIORITE, foliated, dark gray (N 4) equigranular, fine grained.		515
49										514
50		10	1.9/2.0	95	F	R4 to R5				513
51								META-GRANODIORITE xenolith, irregular		512
52									Coring terminated on 3/29/06 Water level at 7 ft	511
53										510
54								Total Depth 51.25 ft.		509
55								Groundwater encountered at 7 feet		508
56								Borehole Grouted On 3/29/06		507
57										506
58										505
59										504
60										503
61										502
62										501
63										500
64										499
65										498
66										497
67										496
68										495
69										494
70										493
71										492
72										491
73										490
74										489
75										488
76										487
77										486
78										485
79										484
80										483

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1008**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 adjacent N 1165623 E 1846335		Total Depth 51 feet
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75	Elevation and Datum 563.2 feet MSL	Ground Water Depth 15 feet	Depth to Bedrock 6.6 feet
Casing Size and Depth none	Length of Core Barrel and Bit 10 feet / 10 feet	No. of Core Boxes 3	Date Started 3/30/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 3/31/06

Reviewed by / Date: F. Syms 5/27/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0									563
1	1	2.4/2.5					CONCRETE removed using 6 inch thin wall bit. Several #3 rebars from 5.75 to 7.5 inch below the top. Several #5 rebars from 40 to 41 inch, #8 rebar at 3 inch	Concrete removed by thin wall bit to 4.25 ft	562
2									561
3	2	1.8/1.8							560
4									559
5							CONCRETE	Begin core 3/30/06	558
6									557
7	1	3.4/5.8	91	MW	R2		META-DIORITE, pyrite-rich, schistose fabric. CONTINUOUS ROCK	RQD applies to rock only	556
8				F	R4 to R5		META-GRANODIORITE, light gray (N 7), medium to coarse grain.		555
9									554
10									553
11									552
12	2	5.0/5.0	99	F	R4 to R5				551
13									550
14									549
15							▽		548
16							META-GRANODIORITE, gray (N 6)		547
17	3	5.0/5.0	55	F	R4 to R5				546
18									545
19									544
20									543
21							Pervasive calcite infilling along joints		542
22	4	5.0/5.0	66	F	R4 to R5				541
23									540
24									539
25									538
26									537
27	5	5.0/5.0	85	F	R4 to R5				536
28									535
29									534
30							META-GRANODIORITE, gray (N 6), medium to coarse grain with some darker (more mafic) xenoliths.		533
31									532
32	6	5.0/5.0	80	F	R4 to R5				531
33									530
34									529
35									528
36									527
37	7	4.7/5.0	82	F	R4 to R5				526
38									525
39									524
40									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1008

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										523
41										522
42		8	4.9/5.0	94	F	R4 to R5		Pervasive calcite veins		521
43										520
44										519
45								META-GRANODIORITE, quartz vein and thin calcite veins		518
46										517
47										516
48		9	6.0/6.0	93	F	R4 to R5		META-QUARTZ DIORITE to META-DIORITE, bluish gray (5B 5/1), medium grained		515
49								META-GRANODIORITE, gray (N 6)		514
50								META-QUARTZ DIORITE to META-DIORITE, bluish gray (5B 5/1), medium grained		513
51								META-GRANODIORITE, gray (N 6), medium to coarse grained, some calcite veins.	End day 3/30/06 Begin 3/31/06; water level at 15 ft Coring terminated on 3/31/06	512
52										511
53										510
54								Total Depth 51 ft. Groundwater encountered at 15 feet Borehole Grouted On 3/31/06		509
55										508
56										507
57										506
58										505
59										504
60										503
61										502
62										501
63										500
64										499
65										498
66										497
67										496
68										495
69										494
70										493
71										492
72										491
73										490
74										489
75										488
76										487
77										486
78										485
79										484
80										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1009**	
Type and Diameter of Boring Concrete core / 6 inch	Boring Location Unit 1 adjacent N 1165530 E 1846393		Total Depth 2.5 feet
Drilling Contractor and Rig Thin wall bit / Concrete core	Elevation and Datum 563 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth none	Length of Core Barrel and Bit 2.5 feet / 2.5 feet	No. of Core Boxes 1	Date Started 3/13/06
	Borehole Inclination -90	Logged by B. Reinicker	Date Completed 3/13/06

Reviewed by / Date C. Sams 4/7/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0										563
1		1	1.3/2.5					CONCRETE removed using 6 inch thin wall bit by coring sub-contractor, approximately 7/8 inch diameter rebar at 7 inch to 7-7/8 inch. Encountered pipe at 13 1/4 inch. Bottom of retrieval core at 16 1/4 inch.	Start 3/13/06 Water loss at 1 ft Core not recoverable below 16 inch due to pipe	562
2										561
3									End boring 3/13/06, core not continued due to pipe, see B-1009A	560
4										559
5										558
6										557
7										556
8										555
9										554
10										553
11										552
12										551
13										550
14										549
15										548
16										547
17										546
18										545
19										544
20										543
21										542
22										541
23										540
24										539
25										538
26										537
27										536
28										535
29										534
30										533
31										532
32										531
33										530
34										529
35										528
36										527
37										526
38										525
39										524
40										523

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1009A**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 adjacent turbine room N 1165529 E 1846392		Total Depth 51 feet
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75	Elevation and Datum 562.9 feet MSL	Ground Water Depth 0 feet	Depth to Bedrock 20.2 feet
Casing Size and Depth none	Length of Core Barrel and Bit 10 feet / 10 feet	No. of Core Boxes 3	Date Started 3/31/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/1/06

Reviewed by / Date: F. Syms 5/27/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0							CONCRETE removed using 6 inch thin wall bit. Light gray, approximately 1 inch diameter rebar at 8 to 9 inches encountered pipe from 14 to 17 3/4 inches. Approximately 1 inch diameter rebar at 40.5 to 41.5 inches	Concrete removed by thin wall to 5 ft; location 19 inch from B-1009	562
5							CONCRETE, dark gray color change at 46.75 inches CORING TERMINATED at 5.0 ft.		558
5	1	5.0/5.0					CONCRETE	Begin coring 3/31/06	558
10	2	5.0/5.0							553
15	3	5.0/5.0							548
20	4	4.6/5.0	77	F	R4 to R5		META-GRANODIORITE, gray (N 6), medium coarse grain, some calcite veins CONTINUOUS ROCK	End 3/31/06 Begin 4/1/06; water level at 0 ft due to nearby pumping operation	543
25	5	4.7/5.0	83	F	R4 to R5		META-QUARTZ DIORITE for 0.2 ft, no definite contact, slightly more mafic, possible xenolith		538
30	6	4.4/5.0	72	SW	R4 to R5				533
35	7	4.4/5.0	81	SW to F	R4 to R5		META-GRANODIORITE to META-QUARTZ DIORITE, gray to bluish gray (N 6 to 10B 5/1 to 10B 6/1), medium grain, At about 35 ft. begin to see color variation, gray grading into darker bluish gray, changes occur over intervals of 0.5 to 1 ft. More prominent calcite veining, veins up to 0.1 inch		528
40									523

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1009A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										522
41										521
42										520
43		8	5.0/5.0	71	F	R4 to R5				519
44										518
45										517
46										516
47										515
48		9	5.5/6.0	82	F	R4 to R5				514
49										513
50										512
51									Coring terminated 4/1/06; water at 16 ft	511
52										510
53										509
54								Total Depth 51 ft.		508
55								Groundwater encountered at 0 feet		507
56								Borehole Grouted On 4/1/06		506
57										505
58										504
59										503
60										502
61										501
62										500
63										499
64										498
65										497
66										496
67										495
68										494
69										493
70										492
71										491
72										490
73										489
74										488
75										487
76										486
77										485
78										484
79										483
80										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1010**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 adjacent N 1165551 E 1846525		Total Depth 51 feet
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75	Elevation and Datum 563.1 feet MSL	Ground Water Depth 7 feet	Depth to Bedrock 6.2 feet
Casing Size and Depth none	Length of Core Barrel and Bit 10 feet / 10 feet	No. of Core Boxes 3	Date Started 3/29/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 3/29/06

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0									563
1	1	2.0 / 2.5					CONCRETE removed using 6 inch thin wall bit. 7/8 inch diameter rebar at 8 1/4 inches CONCRETE 7/8 to 1 inch diameter rebar at 43 1/2 to 45 inches.	Concrete removed by 6 inch thin wall bit to 4.25 ft	562
2	2	1.8 / 1.8							561
3									560
4									559
5							CONCRETE	Begin drilling 3/29/06	558
6									557
7	1	5.1 / 5.1	71	F	R4 to R5		META-GRANODIORITE to META-QUARTZ DIORITE, gray (N 5) fine to medium grained, pervasive calcite veins up to 0.5 inch thick along foliation, weak foliation CONTINUOUS ROCK		556
8									555
9									554
10	2	5.7 / 5.7	89	F	R4 to R5		Mostly fine grain		553
11									552
12									551
13									550
14									549
15									548
16									547
17	3	4.6 / 5.0	86	F	R4 to R5		META-DIORITE dark gray (N 5), fine grain, pervasive calcite veins.		546
18									545
19									544
20							Gradational Zone; migmatite texture		543
21	4	5.0 / 5.0	68	F	R4 to R5		META-GRANODIORITE, gray (N 6), medium to coarse grain		542
22									541
23									540
24									539
25									538
26	5	4.9 / 5.0	86	F	R4 to R5				537
27									536
28									535
29									534
30									533
31	6	5.0 / 5.0	96	F	R4 to R5				532
32							META-QUARTZ DIORITE, dark gray (N 5), medium grain, with pervasive calcite veins		531
33									530
34									529
35									528
36									527
37	7	4.5 / 5.0	87	F	R4 to R5				526
38									525
39									524
40									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1010

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40		8	4.9/5.0	94	F	R4 to R5				523
41										522
42										521
43								METAGRANODIORITE, gray (N 5), medium to coarse grain.		520
44										519
45										518
46		9	5.5/5.0	92	F	R4 to R5				517
47										516
48										515
49										514
50										513
51									Coring terminated on 3/29/06; water at 7 ft	512
52										511
53										510
54								Total Depth 51 ft.		509
55								Groundwater encountered at 7 feet		508
56								Borehole Grouted On 3/29/06		507
57										506
58										505
59										504
60										503
61										502
62										501
63										500
64										499
65										498
66										497
67										496
68										495
69										494
70										493
71										492
72										491
73										490
74										489
75										488
76										487
77										486
78										485
79										484
80										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1011**	
Type and Diameter of Boring HQ core / 3.5 inch	Boring Location Unit 1 adjacent N 1165997 E 1846673		Total Depth 220 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 537.7 feet MSL	Ground Water Depth 4 feet	Depth to Bedrock 0 feet
Casing Size and Depth none	Length of Core Barrel and Bit 7 feet / 13 feet	No. of Core Boxes 16	Date Started 3/20/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 3/29/06

Reviewed by / Date: F. Syms 5/28/06
Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0									537
1	1	2.5/3.0	81	SW to F	R3		META-DIORITE, greenish gray, very fine grained, massive. CONTINUOUS ROCK	Begin 3/20/06	536
2									535
3									534
4	2	3.9/4.0	80	SW to F	R3		META-GRANODIORITE to META-QUARTZ DIORITE		533
5									532
6									531
7	3	1.0/1.0	0	SW to F	R3		META-DIORITE 7.5 to 8 ft		530
8									529
9	4	4.9/5.0	98	SW to F	R3		META-QUARTZ DIORITE to META-GRANODIORITE, fine to medium grained, massive		528
10									527
11									526
12									525
13									524
14	5	4.3/5.0	86	SW to F	R3 to R4		META-GRANODIORITE to META-QUARTZ DIORITE; quartz, plagioclase, and biotite gneiss metagranitoid		523
15									522
16									521
17									520
18	6	5.0/5.0	82	SW to F	R3 to R4		META-QUARTZ DIORITE, medium to coarse grained, moderately spaced fractures (foliation joints), mafic xenoliths up to 1 inch are present but not prevalent, quartz, plagioclase, biotite gneiss		519
19									518
20									517
21									516
22									515
23	7	4.5/5.0	71	SW to F	R3 to R4		SAA, medium to fine grained, quartz and feldspar veins are randomly oriented.		514
24									513
25									512
26									511
27									510
28	8	4.9/5.0	85	SW to F	R3 to R4		SAA; quartz, plagioclase gneiss, minor K-spar (as veins) calcite associated with incipient fractures; large pegmatite quartz vein cut half the diameter and half the length of the core between 28 and 30.3 ft		509
29									508
30									507
31									506
32								Losing ~50% of water Hard, slow drilling.	505
33	9	3.5/3.5	97	SW to F	R3 R4 to R5		SAA, fine to medium grained, quartz, plagioclase gneiss; fractures appear to have manganese oxide and possible slickenside development Quartz pegmatite vein from 35 to 38.65 ft		504
34									503
35									502
36									501
37	10	1.5/1.5	100	SW to F	R4 to R5				500
38									499
39	11	2.8	94	SW to F	R4 to R5				498
40									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1011

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40			3.0					Quartz pegmatite vein from 40.2 to 40.6 ft		497
41		12	1.9/2.0	95	SW to F	R4 to R5		SAA, slightly coarser grained than samples above, quartz, plagioclase gneiss		496
42										495
43		13	3.6/3.6	92	SW to F	R3 to R4		SAA, massive, predominately equigranular, quartz, plagioclase, biotite gneiss.		494
44										493
45										492
46										491
47		14	1.3/1.4	93	SW to F	R3 to R4			Start of day 3/22/06; water level at 5.4 ft	490
48										489
49		15	5.0/5.0	78	SW to F	R3 to R4				488
50										487
51										486
52										485
53										484
54		16	5.0/5.0	89	SW to F	R4 to R5		META-QUARTZ DIORITE to META-GRANODIORITE, bluish gray, medium to fine grained, massive, primarily equigranular, quartz, plagioclase, biotite gneiss, metagranitoid		483
55										482
56										481
57										480
58										479
59										478
60		17	4.9/5.0	96	SW to F	R4 to R5		META-QUARTZ DIORITE, bluish gray, quartz, plagioclase, biotite gneiss, some mafic xenoliths up to 1.5 inch wide, many healed joints with calcite.		477
61										476
62										475
63										474
64		18	5.0/5.0	100	SW to F	R4 to R5		SAA, massive, equigranular, numerous randomly oriented healed joints, unhealed joint surfaces are partially mineralized with probable chlorite; metagranitoid.		473
65										472
66										471
67										470
68										469
69		19	4.8/5.0	96	SW to F	R4 to R5				468
70										467
71										466
72										465
73										464
74		20	5.0/5.0	100	SW to F	R4 to R5		SAA, medium to coarse grained, massive to weakly foliated, calcite mineralization along incipient fractures and along joint surfaces, some randomly oriented mafic xenoliths.	End of day 3/22/06 Start day 3/27/06 water level at 3 ft	463
75										462
76										461
77										460
78										459
79										458
80			3.9							

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1011

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80		21	4.0	98	SW to F	R4 to R5				457
81										456
82		22	0.9 / 1.0	66	SW to F	R4 to R5				455
83								SAA; calcite mineralization along healed fractures and joint surfaces some mafic xenoliths.		454
84										453
85		23	4.9 / 5.0	84	SW to F	R4 to R5				452
86										451
87										450
88								SAA; bluish gray; medium to coarse grained; massive; some to many mafic xenoliths; plagioclase, quartz, biotite gneiss		449
89										448
90		24	5.0 / 5.0	100	F	R4 to R5				447
91										446
92										445
93										444
94		25	5.0 / 5.0	100	F	R4 to R5				443
95										442
96										441
97										440
98										439
99								META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray; medium to coarse grained; massive; calcite mineralization and minor K-spar mineralization along healed fractures and joint surfaces; some mafic xenoliths; plagioclase, quartz, biotite gneiss		438
100		26	4.8 / 5.0	96	SW to F	R4 to R5				437
101										436
102										435
103										434
104								META-QUARTZ DIORITE; bluish gray; medium to coarse grained; massive; calcite and minor K-spar mineralization along healed fractures and joint surfaces; mafic xenoliths randomly oriented; quartz, plagioclase, biotite gneiss		433
105		27	4.3 / 5.0	80	SW to F	R3 to R4				432
106										431
107										430
108								SAA; fine to medium grained; sample dominated by plagioclase and quartz with rich K-spar zones; some mafic xenoliths present	End of day 3/27/06 Start of day 3/28/06, water measured at 4 ft	429
109										428
110		28	4.8 / 5.0	84	SW to F	R3 to R4				427
111										426
112										425
113										424
114		29	4.9 / 5.0	94	SW to F	R3 to R4				423
115										422
116										421
117										420
118										419
119		30	3.4	75	SW to F	R3 to R4		META-QUARTZ DIORITE, fine to medium grained, massive, unit dominated by quartz and feldspar (plagioclase), also some biotite (~15%), some mafic		418
120										

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1011

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120		3.4					xenoliths.		417
121									
122	31	1.5/1.6	90	SW to F	R3 to R4				416
123									415
124					R3		META-QUARTZ DIORITE to META-GRANODIORITE, fine to medium grained, massive, dominated by plagioclase, quartz, and biotite, some mafic xenoliths		414
125	32	4.9/5.0	98	SW to F					413
126					R4 to R5				412
127									411
128									410
129							SAA		409
130	33	5.0/5.0	97	F	R4 to R5				408
131									407
132									406
133									405
134	34	1.0/1.0	85	SW to F	R4 to R5				404
135				SW to F	R4 to R5		META-GRANODIORITE to META-QUARTZ DIORITE, fine to medium grained, massive, plagioclase, quartz, and biotite are dominant minerals, some K-spar is also present, some randomly oriented mafic xenoliths also present.	Hard, slow drilling	403
136	35	3.9/4.0	98	SW to F	R4 to R5				402
137									401
138									400
139									399
140	36	5.0/5.0	96	SW to F	R4 to R5				398
141									397
142									396
143									395
144							META-QUARTZ DIORITE; bluish gray; fine to medium grained; massive; dominated by plagioclase, quartz, and biotite; some mafic xenoliths are found randomly oriented within sample		394
145	37	5.0/5.0	94	SW to F	R4 to R5				393
146									392
147									391
148									390
149							META-GRANODIORITE to META-QUARTZ DIORITE, fine to medium grained, massive, plagioclase, quartz, and biotite are the main major minerals, some randomly oriented mafic xenoliths present		389
150	38	5.0/5.0	90	SW to F	R4 to R5				388
151									387
152									386
153									385
154							META-GRANODIORITE to META-QUARTZ DIORITE, massive, fine to medium grained, biotite is accessory mineral to plagioclase and quartz	End of day 3/28/06	384
155	39	5.0/5.0	94	SW to F	R4 to R5			Start 3/29/06 water level at 4 ft	383
156									382
157									381
158									380
159							SAA, fine to coarse grained, quartz and feldspar (plagioclase and some K-spar); biotite is dominant accessory mineral; some mafic xenoliths present show		379
160									378

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1011

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160		40	4.9/5.0	89	SW to F	R3 to R5		probable elongation		377
161										376
162										375
163										374
164		41	5.0/5.0	85	SW to F	R4 to R5				373
165										372
166										371
167										370
168		42	5.0/5.0	94	SW to F	R3 to R5		SAA, bluish gray, plagioclase and quartz are dominant minerals, K-spar, biotite and some chlorite are accessory minerals, some mafic xenoliths.		369
169										368
170										367
171										366
172										365
173		43	4.9/5.0	98	SW to F	R4 to R5				364
174										363
175										362
176										361
177										360
178		44	5.0/5.0	93	SW to F	R4 to R5		META-QUARTZ DIORITE to META-GRANODIORITE, massive, fine to medium grained, some shear zones and brecciated areas are present, biotite and K-spar are the primary accessory minerals		359
179										358
180										357
181										356
182										355
183		45	4.9/5.0	92	SW to F	R3 to R5				354
184										353
185										352
186										351
187										350
188		46	5.0/5.0	98	SW to F	R3 to R4		SAA, bluish gray to pinkish gray, massive, fine to coarse grained, plagioclase alteration (translucent pink crystals) appears to be occurring along zones with high amounts of fractures both healed and open, probable foliation associated with joints.		349
189										348
190										347
191										346
192										345
193		47	4.8/5.0	96	SW to F	R4 to R5		SAA, some mafic xenoliths are present, weak to very weak foliation probable along joints.		344
194										343
195										342
196										341
197										340
198										339
199										338
200										

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1011

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
200										337
201		48	5.0/5.0	91	SW to F	R3 to R5				336
202										335
203										334
204		49	5.0/5.0	100	SW to F	R4 to R5				333
205										332
206										331
207										330
208								SAA; bluish gray; fine to medium grained; quartz, plagioclase, biotite, and possible K-spar		329
209										328
210		50	4.8/5.0	64	SW to F	R3 to R4				327
211										326
212										325
213									Losing some water ~25%	324
214										323
215										322
216		51	7.0/7.0	100	SW to F	R3 to R4				321
217										320
218										319
219										318
220									Coring terminated on 3/29/06	317
221										316
222										315
223								Total Depth 220 ft.		314
224								Groundwater encountered at 4 feet		313
225								Borehole Grouted On 4/26/06		312
226										311
227										310
228										309
229										308
230										307
231										306
232										305
233										304
234										303
235										302
236										301
237										300
238										299
239										298
240										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1012**	
Type and Diameter of Boring HQ core / 3.5 inch	Boring Location Unit 2 N 1166228 E 1847098		Total Depth 150.2 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 566.2 feet MSL	Ground Water Depth 7.2 feet	Depth to Bedrock 1 feet
Casing Size and Depth none	Length of Core Barrel and Bit 5 feet / 10 feet	No. of Core Boxes 12	Date Started 4/27/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/30/06

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0							Drilled without sampling using roller bit	0 to 1 ft drilled with roller bit Start 4/27/06	566
1	1	4.5/5.0	32	SW	R3 to R4		META-GRANODIORITE, light bluish gray (10B 7.5/1), medium to coarse grain, equigranular.		565
2									564
3								RQD artifically low due to CNS blasting and excavation methods/mechanically disturbed	563
4									562
5									561
6								End day 4/27/06	560
7	2	5.0/5.0	76	SW	R4		SAA, CONTINUOUS ROCK	Begin day 4/28/06	559
8				MW to HW	R1				558
9				SW to F	R4				557
10									556
11	3	5.0/5.0	100	SW to F	R4 to R5				555
12									554
13									553
14									552
15							SAA, light bluish gray (5B 7/1), medium grained		551
16	4	4.9/5.0	88	F	R5				550
17									549
18									548
19									547
20									546
21	5	5.0/5.0	100	F	R5				545
22									544
23									543
24									542
25									541
26	6	5.0/5.0	100	F	R5				540
27									539
28									538
29									537
30									536
31	7	5.0/5.0	100	F	R5		SAA, (10B 6.5/1)		535
32									534
33									533
34									532
35									531
36	8	5.0/5.0	100	F	R5				530
37									529
38									528
39									527
40									

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1012

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										526
41										525
42		9	5.0/5.0	100	F	R5		SAA, light bluish gray (10B 7/1)		524
43										523
44										522
45										521
46		10	5.0/5.0	100	F	R5				520
47										519
48										518
49										517
50										516
51		11	5.0/5.0	100	F	R5				515
52										514
53										513
54										512
55										511
56		12	5.0/5.0	100	F	R5			End day 4/28/06.	510
57									Begin day 4/29/06 water level at 7.2 ft.	509
58										508
59					F	R5		META-DIORITE zone, bluish gray (5B 5.5/1), medium to fine grained 58.7 to 61 ft		507
60										506
61		13	5.0/5.0	100	F	R5		META-GRANODIORITE, light bluish gray (5PB 7/1), coarse grained		505
62										504
63										503
64										502
65										501
66		14	5.0/5.0	98	F	R5				500
67										499
68										498
69										497
70								SAA, light bluish gray (5PB 7/1), coarse grain, equigranular		496
71		15	5.0/5.0	98	F	R5		Brecciated (healed), sub-vertical, incipient fracture filled with calcite, vein thin, widely spaced		495
72										494
73										493
74										492
75										491
76		16	5.0/5.0	100	F	R5		SAA, with plagioclase along and near healed joints.		490
77										489
78										488
79										487
80										

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ROCK LOG - Boring No. B-1012

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80										486
81										485
82										484
83										483
84		17	5.0/5.0	98	F	R5				482
85										481
86										480
87										479
88		18	5.0/5.0	97	F	R5				478
89										477
90										476
91										475
92										474
93		19	5.0/5.0	97	SW to F	R4				473
94										472
95										471
96										470
97										469
98		20	5.0/5.0	96	F	R4				468
99										467
100										466
101										465
102										464
103		21	4.9/5.0	98	F	R4		META-GRANODIORITE, dark bluish gray (5B 4/1), medium to coarse grain porphyritic weak foliation		463
104										462
105										461
106										460
107										459
108		22	4.7/5.0	94	F	R4		SAA, bluish black (10B 2.5/1), but more mafic, healed shear zones and fractures filled with fine grained meta-diorite		458
109										457
110										456
111										455
112								SAA, more pink coloration to feldspar near shear zones, weak foliation 40°		454
113		23	5.0/5.0	100	F	R4				453
114										452
115										451
116										450
117										449
118		24	5.0/5.0	96	F	R4				448
119										447
120										

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ROCK LOG - Boring No. B-1012

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										446
121										445
122								SAA, dark bluish gray (5B 4/1), medium to large grained, felsic grains are generally larger than mafic grains, some zones of healed shears and brecciation quartz grains blue, pyrite crystals, plagioclase		444
123		25	5.0/5.0	86	F	R4				443
124										442
125										441
126										440
127										439
128		26	5.0/5.0	100	SW to F	R4				438
129										437
130								META-DIORITE, dark greenish gray (5GY 4/1) strong foliation dipping 70 to 80° grain sizes aphanitic to medium size.		436
131										435
132										434
133		27	5.0/5.0	100	F	R5		SAA, (5GY 4/1)		433
134										432
135										431
136								META-DIORITE bluish gray (10PB 6/1), medium grain, strong foliation widely spaced veins with calcite.		430
137										429
138		28	5.0/5.0	100	F	R5				428
139										427
140										426
141										425
142										424
143		29	5.0/5.0	100	F	R5				423
144										422
145										421
146								META-GRANODIORITE, light bluish gray (5B 7/1) and bluish gray (5B 5/1), medium grained strong, foliation.		420
147										419
148		30	4.2/4.2	98	F	R5		META-DIORITE, dark greenish gray (5GY 4/1) medium grained.		418
149										417
150										416
151									Coring terminated on 4/30/06	415
152										414
153								Total Depth 150.2 ft.		413
154								Groundwater encountered at 7.2 feet		412
155								Borehole Grouted On 1/19/07		411
156										410
157										409
158										408
159										407
160										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1013**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 2 N 1166266 E 1847167		Total Depth 52 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 558.7 feet MSL	Ground Water Depth 8.5 feet	Depth to Bedrock 0 feet
Casing Size and Depth none	Length of Core Barrel and Bit 8 feet / 13 feet	No. of Core Boxes 3	Date Started 5/10/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 5/11/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0										558
1		1	3.4/3.5	97	SW	R3		META-GRANODIORITE, bluish gray (5PB 5/1), some chlorite associated with calcite along minor healed shear planes, massive, fine to medium grained CONTINUOUS ROCK	Begin day 5/10/06	557
2										556
3										555
4		2	4.5/5.0	100	SW	R3		META-GRANODIORITE to META-QUARTZ DIORITE, massive, fine to medium grained, some mafic xenoliths.		554
5										553
6										552
7										551
8										550
9		3	4.3/5.0	86	SW	R3 to R4		META-QUARTZ DIORITE, dark bluish gray (5B 4/1), massive, fine to medium grained, some mafic xenoliths	End of day 5/10/06 Start of day 5/11/06; at water to 8.5 ft	549
10										548
11										547
12										546
13										545
14		4	3.2/3.2	100	SW to F	R3 to R4				544
15										543
16										542
17		5	1.4/1.8	78	SW to F	R3 to R4				541
18										540
19										539
20		6	4.3/5.0	86	SW to F	R3 to R4		META-QUARTZ DIORITE to META-GRANODIORITE, dark bluish gray (5B 4/1); fine to medium grained; massive		538
21										537
22										536
23										535
24										534
25										533
26		7	5.0/5.0	99	SW to F	R3 to R4				532
27										531
28										530
29		8	1.5/1.5	100	SW to F	R4		META-QUARTZ DIORITE, dark bluish gray to bluish gray (5B 4/1 to 5PB 5/1), massive, fine to medium grained		529
30										528
31		9	2.7/3.0	90	SW to F	R4		META-QUARTZ DIORITE to META-GRANODIORITE, bluish gray (5PB 5/1), fine to medium grained, massive healed, quartz vein at 30.2 ft. minor offset along healed shear		527
32										526
33										525
34										524
35		10	5.3/5.5	96	SW to F	R4				523
36										522
37										521
38								META-DIORITE, greenish black (5G 2.5/1), very fine grained, massive to weakly foliated		520
39										519
40										

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ROCK LOG - Boring No. B-1013

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										518
41		11	4.2/5.0	84	SW to F	R3 to R4		META-QUARTZ DIORITE to META-GRANODIORITE, fine to medium grained, massive, healed zone of brecciation along quartz vein with altered plagioclase (pink) along margin of quartz vein		517
42										516
43									~30 to 50% water loss	515
44								META-DIORITE, greenish gray (5G 2.5/1), fine grained, massive to weakly foliated		514
45										513
46										512
47		12	7.0/7.0	100	SW to F	R3 to R4				511
48										510
49									~50% water loss	509
50									From 50.5 to 52 ft overdrilled to obtain core.	508
51									Drilling terminated	507
52									Coring terminated on 5/11/06	506
53										505
54										504
55								Total Depth 52 ft.		503
56								Groundwater encountered at 8.5 feet		502
57								Borehole Grouted On 4/11/06		501
58										500
59										499
60										498
61										497
62										496
63										495
64										494
65										493
66										492
67										491
68										490
69										489
70										488
71										487
72										486
73										485
74										484
75										483
76										482
77										481
78										480
79										479
80										

| Project Name and Job Number | | |

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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1014

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										504
41										503
42										502
43		11	5.0/5.0	100	F	R4		Mafic inclusion (4 cm x 5 cm)		501
44										500
45										499
46										498
47		12	5.0/5.0	100		R4				497
48										496
49										495
50										494
51										493
52		13	5.0/5.0	100	F	R4		Quartz and calcite pegmatite (2 cm x 1 cm)		492
53										491
54								Calcite quartz and epidote or hornblende pegmatite		490
55								Meta-diorite dike from 54.5 to 55.6 ft		489
56										488
57		14	5.0/5.0	100	F	R4		SAA; subvertical calcite stringers throughout		487
58										486
59										485
60								Meta-diorite dike from 59.5 to 59.8 ft		484
61										483
62		15	5.0/5.0	100	F	R4		META-GRANODIORITE AND META-QUARTZ DIORITE; bluish gray, gray, pinkish gray (5YR 7/2); black, fine to medium grained; calcite veins throughout. Mafic inclusion (10 cm x 8 cm)		482
63										481
64										480
65										479
66								Quartz pegmatite (1 cm x 4.5 cm)		478
67		16	5.0/5.0	100	F	R4		Mafic inclusion (2 cm x 4 cm)		477
68										476
69										475
70								Joint/fracture healed thick with quartz, K-spar, biotite, calcite, pyrite		474
71										473
72		17	4.0/4.2	95	F	R4				472
73										471
74										470
75									Coring terminated on 5/23/06	469
76										468
77										467
78								Total Depth 75.5 ft.		466
79								Groundwater encountered at 0 feet		465
80								Borehole Grouted On 4/3/07		

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1015**	
Type and Diameter of Boring HQ core / 3.5 inch	Boring Location Unit 2 N 1166134 E 1847192		Total Depth 250.3 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 560.1 feet MSL	Ground Water Depth 4.5 feet	Depth to Bedrock 0 feet
Casing Size and Depth 4 inch / 2.5 feet	Length of Core Barrel and Bit 8.1 feet / 8.1 feet	No. of Core Boxes 21	Date Started 5/1/06
	Borehole Inclination -90	Logged by A. Tillery/J. Cerceo	Date Completed 5/13/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0–5		1	4.9/5.0	62	MW to SW	R3		META-GRANODIORITE, dark bluish gray (5B 4/1) to bluish gray (5PB 5/1), medium grained, numerous healed joints. Quartz 15 to 20%, plagioclase 30 to 40%, mafics 30%, fine grained mafic xenoliths occasional and usually 1 to 5 cm rounded. Healed joint and foliation are often filled with calcite weak foliation	Begin 5/1/06 RQD artifically low due to historic CNS blasting and excavation methods (mechanically disturbed)	560–555
5–6		2	1.0/1.0	45	SW	R3				555–554
6–11		3	5.0/5.0	100	SW	R3 TO R4		SAA CONTINUOUS ROCK		554–549
11–15		4	5.0/5.0	84	SW to F	R4		Some large K-spar crystals		549–545
15–21		5	5.0/5.0	88	SW to F	R4		META-GRANODIORITE or META-QUARTZ DIORITE; dark bluish gray (10B 4/1), to light bluish gray (5PB 7/1), fine to medium grained, occasional mafic xenoliths, moderately spaced totally healed fractures, widely spaced vein and completely healed shear zones, quartz crystals		545–539
21–26		6	4.9/5.0	76	F	R4				539–534
26–31		7	4.9/5.0	86	F	R4				534–529
31–36		8	5.0/5.0	98	F	R4		SAA, light bluish gray (5PB 7/1) to dark bluish gray (5PB 3/1), medium grained; mafic xenoliths fine, small (1 cm), mafic rock xenoliths throughout healed shear zones and healed joints, joints moderately spaced throughout with weak to no foliation.		529–524
36–40		9	5.0/5.0	98	F	R4		SAA, slightly coarser grained, more pink feldspar		524–521

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ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										520
41									End of day 5/1/06 Start day 5/2/06 water level 4.0 ft	519
42										518
43		10	5.0/5.0	96	F	R4		SAA, dark bluish gray (5B 4/1) to light bluish gray (5PB 7/1), medium sized grains, foliation, healed fractures are often filled with calcite		517
44										516
45										515
46										514
47		11	5.0/5.0	90	F	R4 TO R5				513
48										512
49										511
50										510
51								SAA, several (1 inch thick) sub vertical healed shears zones, iIncreased amounts of K-spar		509
52										508
53		12	4.9/5.0	91	F	R4 TO R5				507
54										506
55								Strong mineral alignment 54.8 to 55.8 ft		505
56								SAA continued strong foliation ~40° dip at 56 to 57 ft		504
57										503
58		13	5.0/5.0	98	F	R5				502
59										501
60										500
61								SAA, dark bluish gray (5B 4/1) to light bluish gray (5PB 7/1) medium grained, blue quartz gray feldspar, some pink feldspar, calcite fills healed fractures, slight foliation, moderately spaced, healed fractures with zones of healed shearing and brecciation		499
62										498
63		14	4.9/5.0	72	F	R5				497
64										496
65										495
66										494
67										493
68		15	5.0/5.0	98	F	R4 TO R5				492
69										491
70										490
71										489
72										488
73		16	4.9/5.0	98	F	R5				487
74										486
75								META-DIORITE, bluish gray (5PB 6/1) to bluish black (10B 2.5/1)		485
76										484
77								META-GRANODIORITE or META-QUARTZ DIORITE, dry color: gray (6/N), pink bluish gray (10B 3/1), medium grained, occasional white quartz veins, crystalline quartz, plagioclase. Mafic minerals fine grained, foliation indicated by mineral alignment, intermittent.		483
78		17	5.0/5.0	99	F	R5				482
79										481
80										

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ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80										480
81										479
82										478
83		18	5.0/5.0	96	F	R5				477
84										476
85										475
86										474
87		19	4.8/5.0	90	F	R5			End day 5/2/06 Begin 5/3/06	473
88										472
89										471
90										470
91		20	5.0/5.0	100	F	R5		SAA, bluish gray (5PB 6/1) to dark bluish gray (10B 4/1), medium grained, slight foliation evidenced by alignment of mineral grains.		469
92										468
93										467
94										466
95										465
96		21	4.6/5.0	92	F	R5		SAA, some pegmatite feldspar and quartz veins widely spaced		464
97										463
98										462
99										461
100										460
101		22	5.0/5.0	100	F	R5				459
102										458
103										457
104										456
105										455
106										454
107		23	5.0/5.0	84	F	R5		META-GRANODIORITE, light bluish gray to bluish gray, black (2.5/N), red (10R 5/8), fine to medium grained, quartz, plagioclase, K-spar, calcite, epidote, hornblende.	End day 5/3/06 Start 5/9/2006 water measured 2.67 ft	453
108										452
109								Brecciated granodiorite healed with epidote and altered plagioclase, calcite, K-spar, quartz.		451
110										450
111										449
112										448
113		24	5.0/5.0	98	F					447
114										446
115										445
116						R5				444
117								META-QUARTZ DIORITE to META-GRANODIORITE, bluish gray to black, gray (7.5YR 6/1), fine to medium grained, gray mineralization and healed fractures; quartz, plagioclase, hornblende, K-spar, calcite, and altered plagioclase, mafic xenoliths		443
118		25	4.9/5.0	98	F					442
119										441
120										

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ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										440
121										439
122		26	4.0/4.0	100	F	R5		Healed brecciated zone (122 to 123.3 ft) from multiple fractures healed with mafic minerals. Subvertical fractures within the quartz vein		438
123										437
124										436
125		27	1.0/1.0	100						435
126										434
127		28	5.0/5.0	88	F	R5		Weak foliation from ~126.8 to 128.5		433
128										432
129								Weak foliation from partly healed incipient fractures.		431
130										430
131		29	5.0/5.0	94	F	R5				429
132										428
133										427
134										426
135										425
136		30	5.0/5.0	100	F	R5				424
137										423
138								Mafic xenolith		422
139								Mafic xenolith Stress fractures healed with a gray mineral		421
140										420
141		31	5.0/5.0	96	F	R5		SAA, bluish gray, black, red; fine to medium grained; biotite, muscovite, quartz, K-spar, pyrite, epidote, calcite, hornblende. Mafic vein (142.8 to 143.3 ft)	End drilling 5/9/06	419
142									Start day 5/10/06 water at 3.0 ft	418
143										417
144										416
145										415
146		32	4.9/5.0	92	F	R5		Gray mineralization along stress fractures; pyrite, muscovite, or biotite mineralization quartz and K-spar pegmatite.		414
147								META-GRANODIORITE bluish gray, black, light brown (10B 5.5/1, N 2.5, 7.5YR 6/4); fine to medium grained; quartz, plagioclase, hornblende, epidote, biotite, muscovite, pyrope (garnet) calcite and chlorite. Quartz pegmatite, pyrope (garnet) red mineralization.		413
148										412
149										411
150										410
151										409
152		33	5.0/5.0	100	F	R4		META-DIORITE, black and dark greenish gray (5G 4/1); fine grained; calcite and epidote healed most fractures; hornblende, plagioclase, biotite.		408
153										407
154										406
155										405
156										404
157		34	5.0/5.0	98	F	R4				403
158										402
159										401
160								META-GRANODIORITE; bluish gray, black, light brown,		

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ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160								fine to medium grained, plagioclase, quartz, altered plagioclase, hornblende, biotite, epidote, and calcite mineralization.		400
161										399
162		35	5.0/5.0	88	F	R4				398
163										397
164								Mafic xenolith		396
165										395
166										394
167										393
168		36	5.0/5.0	100	F	R4				392
169								META-DIORITE; very dark bluish gray (5PB 3/1); fine grained; quartz pegmatite, hornblende, plagioclase, quartz, biotite, calcite, epidote, muscovite.		391
170										390
171										389
172					SW	R3				388
173		37	5.0/5.0	91	F	R4		META-GRANODIORITE to META-QUARTZ DIORITE; bluish gray to light brown; fine to medium grained, hornblende, plagioclase, quartz, calcite		387
174										386
175										385
176										384
177										383
178		38	5.0/5.0	90	F	R4				382
179										381
180						R5				380
181										379
182										378
183		39	5.0/5.0	100	F	R5				377
184										376
185								Mafic inclusion		375
186										374
187								SAA; healed fractures		373
188		40	5.0/5.0	100	F	R5				372
189								Mafic inclusion		371
190								Mafic inclusion Mafic inclusion		370
191								Mafic inclusion (6 cm)		369
192									End drilling 5/10/06 Start drilling 5/11/06, water measured 4.5 ft.	368
193		41	5.0/5.0	100	F	R5		META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray, black, gray (7.5YR 6/1), fine to medium grained, plagioclase, hornblende, quartz, epidote		367
194								Mafic inclusion (4 cm)		366
195								Mafic inclusion (4 cm)		365
196										364
197								META-QUARTZ DIORITE; bluish gray, black gray (7.5YR 6/1); fine grained; plagioclase, hornblende, quartz, K-spar, mafic mineralization occurred along healed fractures.		363
198		42	5.0/5.0	100	F	R5				362
199										361
200										

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
200								Mafic inclusion (3 cm)		360
201										359
202		43	5.0/5.0	100	F	R5		Quartz pegmatite Mafic inclusion (4 cm); fine grained mineralization of pyrite, biotite and muscovite (202 to 202.3 ft)		358
203										357
204										356
205										355
206										354
207		44	5.0/5.0	100	F	R5				353
208										352
209										351
210										350
211		45	5.0/5.0	100	F	R5		META-QUARTZ DIORITE; bluish gray, black, gray (7.5YR 6/1); fine to medium grained; mafic mineralization healed in incipient fractures; mafic inclusion (5 cm); quartz, plagioclase, hornblende, calcite, biotite, muscovite.		349
212										348
213										347
214										346
215								Calcite is mostly equigranular (~2 mm), rhombohedral, white, and pale red to pink (10R 7/3 to 10R 8/3)		345
216		46	1.7/1.7	100	F	R5				344
217								Mafic inclusion (2 cm)		343
218		47	3.3/3.3	100		R5			End drilling 5/11/06	342
219									Start drilling 5/12/06	341
220									Water measured 27.3 ft	340
221		48	5.0/5.0	100	F	R5		Quartz pegmatite mafic inclusion (6 to 7 cm)		339
222										338
223										337
224								Quartz pegmatite with pyrite mineralization		336
225								Quartz pegmatite with mafic inclusion (2 cm)		335
226								Calcite healed joints with occasional vug (2 mm x 2 mm)		334
227		49	4.1/4.1	100	F	R5		META-QUARTZ DIORITE; bluish gray, black, gray (7.5YR 6/1); fine to medium grained; formation of micaceous minerals mostly near the joints/fractures along with quartz, calcite, K-spar, chlorite, and pyrite		333
228										332
229										331
230		50	0.9/0.9	100	F	R5		vug (2 cm x 2 mm), no staining. Calcite crystallization (7 cm x 3 cm) Quartz pegmatite (228.9 to 229.5 ft) Mafic dike, fine grained.		330
231										329
232		51	5.0/5.0	100	F	R5				328
233										327
234								Mafic inclusion (4 cm x 3 cm)		326
235										325
236										324
237		52	5.0/5.0	100	F	R5		Mafic inclusion (4 cm x 3 cm)		323
238										322
239								K-spar pegmatite (2 cm x 3 cm)		321
240										

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
240								Calcite mineralization (3 mm)		320
241								META-QUARTZ DIORITE; bluish gray, black gray (7.5YR 6/1); fine to medium grained; thin to very thin in filling along fractures/joints, tight		319
242										318
243		53	5.0/5.0	100	F	R5		Mafic inclusion (3.5 x 2 cm)		317
244								Quartz and K-spar pegmatite (4 cm x 3 cm)		316
245										315
246										314
247								META-QUARTZ DIORITE; bluish gray, black, gray (7.5YR 6/1); fine to medium grained; quartz, plagioclase, hornblende, K-spar, calcite, biotite, epidote		313
248		54	4.0/4.3	93	F	R5		Quartz and K-spar pegmatite (3 cm x 4 cm)		312
249								Quartz pegmatite		311
250									Boring terminated on 5/12/06 at 250.3 ft, overdrilled 0.3 ft not recovered	310
251										309
252										308
253								Total Depth 250.3 ft.		307
254								Groundwater encountered at 4.5 feet		306
255								Borehole Grouted On 1/19/07		305
256										304
257										303
258										302
259										301
260										300
261										299
262										298
263										297
264										296
265										295
266										294
267										293
268										292
269										291
270										290
271										289
272										288
273										287
274										286
275										285
276										284
277										283
278										282
279										281
280										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1016**	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch	Boring Location Unit 2 N 1166124 E 1847132		Total Depth 100.2 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 559.2 feet MSL	Ground Water Depth 2.5 feet	Depth to Bedrock 2.8 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 1	Date Started 4/25/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/27/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												559
1		SPT 1	24 44 50/5	16 17					GP	GRAVEL (GP) with sand Light gray (N 7) slightly damp, dry, very dense, 70% gravel, 29% sand, 17% fines; FILL	Start 4/25/06	558
2												557
3											Switched to NQ core	556
4												555
5												554
6												553
7												552
8												551
9												550
10												549
11												548
12												547
13												546
14												545
15												544
16												543
17												542
18												541
19												540
20												539
21												538
22												537
23												536
24												535
25												534
26												533
27												532
28												531
29												530
30												529
31												528
32												527
33												526
34												525
35												524
36												523
37												522
38												521
39												520
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1016**	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch	Boring Location Unit 2 N 1166124 E 1847132		Total Depth 100.2 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 559.2 feet MSL	Ground Water Depth 2.5 feet	Depth to Bedrock 2.8 feet
Casing Size and Depth 3.5 inch / 5 feet	Length of Core Barrel and Bit 5 feet / 10 feet	No. of Core Boxes 7	Date Started 4/25/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/27/06

Reviewed by / Date F. Syms 5/26/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
3								META-GRANODIORITE; light bluish gray (10B 7.5/1); medium to coarse grain. CONTINUOUS ROCK	Switched to NQ core	556
4										555
5										554
6										553
7		2	8.2/8.2	96	F	R5				552
8										551
9										550
10										549
11										548
12										547
13		3	5.0/5.0	87	F	R5				546
14										545
15								META-GRANODIORITE		544
16										543
17										542
18		4	5.0/5.0	74	F	R5				541
19										540
20										539
21										538
22										537
23		5	5.0/5.0	62	F	R5				536
24										535
25										534
26										533
27										532
28		6	5.0/5.0	80	F	R4 to R5				531
29										530
30										529
31										528
32									End day, 4/25/06 Begin day 4/26/06 Water level at 2.5 ft.	527
33		7	5.0/5.0	91	F	R5				526
34										525
35										524
36								META-GRANODIORITE		523
37										522
38		8	5.0/5.0	100	F	R5				521
39										520
40										519
41										518
42										517

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1016

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
43		9	5.0/5.0	98	F	R5				516
44										515
45								META-GRANODIORITE		514
46										513
47		10	5.0/5.0	100	F	R5				512
48										511
49										510
50										509
51		11	5.0/5.0	100	F	R5				508
52										507
53										506
54										505
55										504
56		12	5.0/5.0	96	F	R5				503
57										502
58										501
59										500
60					F	R5		META-DIORITE; bluish gray (5B 5/1); medium to fine grain, pervasive calcite veins with epidote		499
61										498
62		13	5.0/5.0	100	F	R5				497
63										496
64										495
65										494
66		14	4.9/5.0	93	F	R5				493
67										492
68										491
69										490
70										489
71					F	R5		META-GRANODIORITE; light bluish gray (5B 7.5/1); coarse grained		488
72		15	5.0/5.0	91	F	R5				487
73										486
74										485
75										484
76		16	5.0/5.0	88	F	R5				483
77										482
78										481
79										480
80										479
81										478
82										477

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1016

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
83		17	5.0/5.0	95	F	R5		META-GRANODIORITE		476
84										475
85										474
86										473
87		18	5.0/5.0	96	F	R5			End day 4/26/06 Begin day 4/27/06; water at 0 ft, (rain)	472
88										471
89					F	R5		META-DIORITE; bluish gray (5B 5/1); medium to fine grain.		470
90										469
91								META-GRANODIORITE; light bluish gray (5B 7.5/1); coarse grained		468
92										467
93		19	5.0/5.0	100	F	R5				466
94										465
95										464
96										463
97										462
98		20	4.2/4.2	100	F	R5				461
99										460
100									Coring terminated on 4/27/06 at 100.2 ft	459
101										458
102										457
103								Total Depth 100.2 ft.		456
104								Groundwater encountered at 2.5 feet		455
105								Borehole Grouted On 4/27/06		454
106										453
107										452
108										451
109										450
110										449
111										448
112										447
113										446
114										445
115										444
116										443
117										442
118										441
119										440
120										439
121										438
122										437

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1017**	
Type and Diameter of Boring HQ core / 3.5 inch	Boring Location Unit 2 N 1166004 E 1847155		Total Depth 175.6 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 560.7 feet MSL	Ground Water Depth 7 feet	Depth to Bedrock 2.3 feet
Casing Size and Depth 4.5 inch / 2.3 feet	Length of Core Barrel and Bit 13.8 feet / 13.8 feet	No. of Core Boxes 14	Date Started 5/28/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 6/7/06

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								Gravel FILL	Drilled through gravel with 4 inch roller bit, no sample	560
3		1	4.7/5.0	48	SW	R4		META-GRANODIORITE; light bluish gray (Gley 2), medium to coarse grained.	Begin HQ core 5/29/06 RQD artifically low due to historic CNS blasting and excavation methods (mechanically disturbed)	558
7								▽		554
8		2	1.6/1.6	100	SW	R4		SAA CONTINUOUS ROCK		553
9		3	4.8/4.8	88	SW	R4				552
14		4	1.5/1.5	100	SW	R4				547
16		5	3.4/3.5	97	F	R4 to R5				545
19		6	4.0/4.0	100	F	R4 to R5				542
23		7	0.8/0.8	100	F	R4 to R5			End of 5/29/06 Begin day 5/30/06	538
24		8	5.5/5.5	100	F	R4 to R5		From 25.7 to 26.4 ft, metadiorite vein; dark bluish gray (5PB 4.5/1) fine grained, From 26.7 to 27.2 ft, metadiorite vein; dark bluish gray (5PB 4.5/1) fine grained META-GRANODIORITE; light bluish gray (5PB 7/1); medium to coarse grained		537
26					F	R4 to R5				535
27					F	R4 to R5				534
28					F	R4 to R5				533
29					F	R4 to R5				532
30		9	3.0/3.0	100	F	R4 to R5				531
33		10	2.0/2.0	100	F	R4 to R5				528
35		11	2.0/2.0	100	F	R4 to R5				526
37		12	3.0/3.0	100	F	R4 to R5				524
40										521

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1017

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40									520
41	13	4.4/4.4	100	F	R4 to R5		META-GRANODIORITE		519
42									518
43									517
44	14	5.6/5.6	74	F	R4 to R5				516
45									515
46									514
47									513
48									512
49	15	2.5/2.5	74	F	R4 to R5				511
50									510
51	16	2.0/2.0	58	F	R4 to R5				509
52									508
53									507
54	17	5.4/5.5	79	F	R4 to R5				506
55									505
56									504
57									503
58				F	R4				502
59				F	R4 to R5		META-DIORITE; bluish gray (5PB 5/1) fine grained from 57.9 to 58.4 ft		501
60					R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1); medium grained		500
61	18	5.0/5.0	86	SW					499
62					R4				498
63									497
64									496
65	19	2.8/3.0	77	SW	R4				495
66									494
67									493
68	20	2.0/2.0	100	F	R4 to R5				492
69									491
70								End of 5/30/06 Begin day 5/31/06 Water level 10 ft.	490
71	21	3.5/3.5	87	F	R4 to R5				489
72									488
73	22	1.5/1.5	100	F	R4 to R5		META-GRANODIORITE		487
74									486
75									485
76	23	5.0/5.0	100	F	R4 to R5				484
77									483
78									482
79									481
80									

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1017

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80										480
81		24	5.0/5.0	100	F	R4 to R5		META-GRANODIORITE		479
82										478
83										477
84										476
85		25	5.0/5.0	98	F	R4 to R5				475
86										474
87										473
88										472
89								META-GRANODIORITE; light bluish gray (5PB 7/1), medium grained, equigranular		471
90		26	5.0/5.0	100	F	R4 to R5				470
91										469
92										468
93										467
94		27	5.0/5.0	97	F	R4 to R5				466
95										465
96										464
97										463
98										462
99										461
100		28	5.0/5.0	96	F	R4 to R5				460
101										459
102										458
103										457
104										456
105		29	5.0/5.0	100	F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1), medium grained, equigranular		455
106										454
107										453
108										452
109										451
110									End of 5/31/06 Begin day 6/5/06	450
111		30	5.0/5.0	100	F	R4 to R5				449
112										448
113										447
114								Massive quartz vein ~1.3 inch thick		446
115		31	2.0/2.0	100	F	R4 to R5				445
116								Mafic xenolith		444
117		32	3.0/3.0	100	F	R4 to R5				443
118										442
119										441
120										

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ROCK LOG - Boring No. B-1017

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										440
121		33	4.0/4.0	100	F	R4 to R5				439
122										438
123										437
124		34	6.0/6.0	100	F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1), medium grained, equigranular	End of 6/5/06 Begin day 6/6/06 Water level 7 ft	436
125										435
126										434
127										433
128										432
129										431
130		35	5.0/5.0	100	F	R4 to R5				430
131										429
132										428
133										427
134										426
135		36	5.0/5.0	100	F	R4 to R5				425
136										424
137										423
138										422
139										421
140		37	5.0/5.0	100	F	R4 to R5		META-GRANODIORITE		420
141										419
142										418
143										417
144										416
145					F	R4 to R5				415
146		38	5.0/5.0	97	F	R4		META-DIORITE; bluish gray to dark bluish gray (5PB 4.5/1) fine to medium grained		414
147										413
148										412
149					F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1); medium grained		411
150					F	R4 to R5				410
151		39	4.9/5.0	98	F	R4 to R5		META-DIORITE; dark bluish gray and white, (5B 4/1 and 8/N), medium grained		409
152										408
153					F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1); medium to coarse grained		407
154										406
155		40	2.3/3.0	94	F	R4 to R5				405
156										404
157										403
158		41	2.0/2.0	100	F	R4 to R5		SAA; bluish gray (10B 5/1)	End of day 6/6/06 Begin day 6/7/06, Water level 6.3 ft.	402
159										401
160										

Project Name and Job Number
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1017

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160										400
161		42	5.0/5.0	94	F	R4 to R5		META-GRANODIORITE; bluish gray (10B 5/1), medium to coarse grained, equigranular		399
162										398
163										397
164										396
165		43	5.0/5.0	100	F	R4 to R5				395
166										394
167										393
168										392
169								SAA		391
170										390
171										389
172		44	6.6/6.6	100	F	R4 to R5				388
173										387
174										386
175										385
176									Coring terminated on 6/7/06	384
177										383
178								Total Depth 175.6 ft.		382
179								Groundwater encountered at 7 feet		381
180								Borehole Grouted On 1/17/07		380
181										379
182										378
183										377
184										376
185										375
186										374
187										373
188										372
189										371
190										370
191										369
192										368
193										367
194										366
195										365
196										364
197										363
198										362
199										361
200										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1018**	
Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 2 N 1166028 E 1847265		Total Depth 100 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 552.7 feet MSL	Ground Water Depth 2.75 feet	Depth to Bedrock 0 feet
Casing Size and Depth none	Length of Core Barrel and Bit 5 feet / 10 feet	No. of Core Boxes 6	Date Started 4/13/06
	Borehole Inclination -90	Logged by G. Maximov/M.Angell	Date Completed 4/17/06

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0										552
1		1	6.5/7.0	23	SW	R4		META-GRANODIORITE; light bluish gray (10B 7.5/1), medium to coarse grained Fracture zone 0.2 to 11.8 ft	Start 4/13/06	551
2								▽		550
3										549
4										548
5										547
6										546
7		2	3.4/4.0	28	SW TO F	R4 TO R5			End 4/13/06 Start 4/14/06	545
8										544
9										543
10										542
11										541
12		3	4.4/5.0	44	SW	R3 TO R4				540
13										539
14								META-GRANODIORITE		538
15										537
16										536
17		4	5.0/5.0	80	F	R4		SAA CONTINUOUS ROCK		535
18										534
19									100% water loss	533
20										532
21										531
22		5	5.0/5.0	94	F	R4				530
23										529
24										528
25										527
26										526
27		6	5.0/5.0	76	F	R4				525
28						R2		META-DIORITE; dark greenish gray, healed mylonite shear zone with inclusions (Porphyroblasts) of quartz and feldspar and quartz stringers (recrystallized)		524
29										523
30						R4				522
31								META-GRANODIORITE; light bluish gray (10B 7.5/1); medium to coarse grained.		521
32		7	5.0/5.0	96	F	R4		META-DIORITE; dark greenish gray; fine grained, equigranular with abundant quartz veins (~0.4 ft spacing)		520
33										519
34										518
35										517
36										516
37		8	5.0/5.0	95	F	R4				515
38										514
39										513
40										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1018

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										512
41										511
42										510
43		9	5.0/5.0	91	F	R4		META-DIORITE; greenish gray (5BG 5.5/1); medium to fine grained, equigranular, with quartz veins, veins/lenses of calcite.		509
44										508
45										507
46										506
47		10	5.0/5.0	97	F	R5				505
48										504
49										503
50										502
51		11	5.0/5.0	84	F	R5				501
52										500
53										499
54										498
55										497
56								SAA; fine grained, strong foliation; mylonitic texture		496
57								Mylonite zone from 56.6 to 65.7 ft		495
58		12	5.0/5.0	98	F	R5		META-GRANODIORITE zone; light bluish gray (5PB 7/1) medium grained, from 56.9 to 57.2 ft SAA; clear foliation ~60°, mylonitic texture		494
59										493
60								META-DIORITE		492
61										491
62								META-GRANODIORITE; light bluish gray (5PB 7/1), medium grained increased fracture frequency totaly to moderately healed		490
63		13	5.0/5.0	100	F	R5		Meta-diorite zone as above from 62.2 to 62.7 ft		489
64										488
65									End of 4/14/06 Start day 4/15/06 Water level at 2 ft.	487
66										486
67										485
68		14	5.0/5.0	88	F	R5				484
69										483
70										482
71										481
72		15	4.9/5.0	93	F	R5				480
73										479
74										478
75										477
76										476
77										475
78		16	5.0/5.0	100	F	R5				474
79										473
80										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1018

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80									End of 4/15/06 Start day 4/17/06 Water level at 3.5 ft.	472
81										471
82										470
83		17	5.0/5.0	100	F	R5		META-GRANODIORITE		469
84										468
85								Widely spaced totally healed fractures.		467
86										466
87										465
88		18	5.0/5.0	100	F	R5				464
89										463
90										462
91								META-GRANODIORITE		461
92										460
93		19	5.0/5.0	100	F	R5				459
94										458
95										457
96										456
97										455
98		20	4.0/4.0	100	F	R5				454
99										453
100									Coring terminated on 4/17/06	452
101										451
102										450
103								Total Depth 100 ft. Groundwater encountered at 2.75 feet Borehole Grouted On 4/17/06		449
104										448
105										447
106										446
107										445
108										444
109										443
110										442
111										441
112										440
113										439
114										438
115										437
116										436
117										435
118										434
119										433
120										

Project Name and Job Number	SOIL LOG - Boring No. B-1019
Lee Nuclear Station COL 6234-06-3389	

Type and Diameter of Boring Wash Rotary / NQ core / 3 inch	Boring Location Unit 2 adjacent N 1166204 E 1847001		Total Depth 75 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 558.2 feet MSL	Ground Water Depth 15 feet	Depth to Bedrock 12 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 2	Date Started 4/18/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/24/06

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										GRAVEL FILL	Start 4/18/06	558
1									SM	SAND silty (SM), dark yellowish brown (10YR 4/6) to light olive brown (2.5Y 5/4), damp, very dense, fine sand, 40% fines. SAPROLITE		557
2												556
3												555
4		SPT 1	7 22 50	13.2 18								554
5												553
6												552
7												551
8												550
9		SPT 2	50/5.5	5.5 5.5						SAA, olive brown (2.5Y 4/4), moist, fine/medium sand, 40% fines. SAPROLITE	Switched to NQ rock coring	549
10												548
11												547
12												546
13												545
14												544
15												543
16												542
17												541
18												540
19												539
20												538
21												537
22												536
23												535
24												534
25												533
26												532
27												531
28												530
29												529
30												528
31												527
32												526
33												525
34												524
35												523
36												522
37												521
38												520
39												519
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1019**	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch	Boring Location Unit 2 adjacent N 1166204 E 1847001		Total Depth 75 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 558.2 feet MSL	Ground Water Depth 15 feet	Depth to Bedrock 12 feet
Casing Size and Depth 3 inch / 9 feet	Length of Core Barrel and Bit 5 feet / 10 feet	No. of Core Boxes 4	Date Started 4/18/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/24/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
9										549
10		1	0.0/3.0	0	CW	R0		NO RECOVERY. SAPROLITE or PARTIALLY WEATHERED ROCK	Refusal, switched to NQ coring 4/18/06	548
11										547
12					HW TO MW	R2 TO R3		METAGRANODIORITE; light bluish gray (10B 7.5/1); medium grained, but highly weathered and oxidized		546
13										545
14		2	3.4/5.0	19	MW	R2 TO R3		METADIORITE; dark bluish gray (5PB 3.5/1); fine grained, very oxidized		544
15								▽		543
16										542
17					MW	R3		SAA, bluish gray (10B 5/1)		541
18		3	2.9/5.0	7						540
19					SW	R4				539
20										538
21										537
22		4	5.0/5.0	93	F	R5		SAA CONTINUOUS ROCK		536
23										535
24										534
25										533
26										532
27		5	4.9/5.0	93	F	R5		SAA with pervasive quartz/calcite veins		531
28										530
29										529
30										528
31										527
32										526
33		6	5.0/5.0	93	F	R5		META-GRANODIORITE; light bluish gray (5PB 6.5/1); medium grained, poorly developed foliation		525
34										524
35										523
36										522
37		7	4.7/5.0	88	F	R5				521
38										520
39										519
40										518
41										517
42		8	4.8/5.0	96	F	R5			End of day 4/18/06 Begin day 4/19/06 Water level 14 ft	516
43										515
44										514
45										513
46										512
47										511
48										510
49								META-DIORITE; bluish gray (5B 5.5/1); fine to medium		

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1019

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
49		9	4.7/5.0	94	F	R5		grained, grading to fine grained away from contact with metagranodiorite		509
50										508
51										507
52									End of day 4/19/06	506
53		10	5.0/5.0	100	F	R5			Begin day 4/24/06	505
54									Water level 15 ft.	504
55										503
56					F			META-GRANODIORITE; light bluish gray (5PB 6.5/1); medium grained		502
57					F	R5				501
58					F	R5		META-DIORITE dike; bluish gray (5B 5.5/1); fine grained, from 57.5 to 59 ft		500
59		11	4.8/5.0	96				META-GRANODIORITE; light bluish gray (5PB 6.5/1); medium to coarse grained		499
60					F	R5				498
61										497
62										496
63										495
64		12	5.0/5.0	100	F	R5				494
65								META-GRANODIORITE		493
66										492
67										491
68										490
69		13	4.9/5.0	98	F	R5				489
70										488
71										487
72										486
73		14	3.0/3.0	100	F	R5				485
74										484
75									Coring terminated on 4/24/06	483
76										482
77										481
78								Total Depth 75 ft.		480
79								Groundwater encountered at 15 feet		479
80								Borehole Grouted On 4/24/06		478
81										477
82										476
83										475
84										474
85										473
86										472
87										471
88										470
89										

Project Name and Job Number	SOIL LOG - Boring No. B-1020
Lee Nuclear Station COL 6234-06-3389	

Type and Diameter of Boring Hollow stem auger / HQ core / 7 inch	Boring Location Unit 2 adjacent N 1166389 E 1847104		Total Depth 75 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 590 feet MSL	Ground Water Depth 35.3 feet	Depth to Bedrock 14.5 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 3	Date Started 4/4/06
	Borehole Inclination -90	Logged by E. Weldon/M. Angell	Date Completed 4/11/06

Reviewed by / Date: B. Reinicker 5/3/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML), yellowish brown (10YR 5/4) damp, stiff, <20% sand <10% clay, low plasticity, black manganese oxide veining. SAPROLITE	Start on 4/4/06	590
1												589
2												588
3												587
4		SPT 1	4 4 5	18/18								586
5												585
6												584
7												583
8									SM	SAND silty (SM); dark yellowish brown, (10YR 4/4), damp, dense, <40% silt, low plasticity, angular grains; SAPROLITE		582
9		SPT 2	6 17 19	16/18								581
10												580
11												579
12									SM	SPT Refusal, PARTIALLY WEATHERED ROCK	Difficult drilling	578
13											Tricone refusal at 13.5 ft, see rock log	577
14		SPT 3	50/0.5	0.5/0.5								576
15												575
16												574
17												573
18												572
19												571
20												570
21												569
22												568
23												567
24												566
25												565
26												564
27												563
28												562
29												561
30												560
31												559
32												558
33												557
34												556
35												555
36												554
37												553
38												552
39												551
40												550

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1020**	
Type and Diameter of Boring Hollow stem auger / HQ core / 7 inch	Boring Location Unit 2 adjacent N 1166389 E 1847104		Total Depth 75 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 590 feet MSL	Ground Water Depth 35.3 feet	Depth to Bedrock 14.5 feet
Casing Size and Depth 4.5 inch / 12 feet	Length of Core Barrel and Bit 8 feet / 7 feet	No. of Core Boxes 5	Date Started 4/4/06
	Borehole Inclination -90	Logged by E. Weldon/M. Angell	Date Completed 4/11/06

Reviewed by / Date: B. Reinicker 5/3/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
14								No core recovery; PARTIALLY WEATHERED ROCK	Begin HQ rock core Low water return	576
15		1	3.5/4.5	64	MW	R2 TO R3		META-QUARTZ DIORITE; white gray and reddish yellow ; fine to coarse grained; xenoblastic texture; >40% feldspar, 30% quartz, fracture surfaces are stained red and black (Fe and Mn oxides?); black xenoliths occasional, fine grained (~1 to 4 cm)		575
16										574
17										573
18										572
19		2	3.5/5.0	60	HW TO MW			SAA mafic inclusions offset less than (0.5 cm) by subvertical fractures (healed). Mafic inclusions very fine grained, greenish color		571
20										570
21										569
22										568
23										567
24		3	4.7/5.0	89	SW	R3 TO R4		META-QUARTZ DIORITE; black, dark gray, and light gray (5PB 6.5/1), xenoblastic, 20 to 40% mafics, chlorite, mica, hornblende, medium grained CONTINUOUS ROCK		566
25										565
26										564
27										563
28										562
29		4	5.0/5.0	96	F	R4				561
30										560
31										559
32										558
33										557
34		5	5.0/5.0	100	F	R4		34.3 to 34.6 ft Meta-diorite dike		556
35										555
36										554
37										553
38		6	5.0/5.0	96	F	R4			Resume drilling 4/11/06	552
39										551
40										550
41										549
42										548
43		7	5.0/5.0	100	F	R4		META-GRANODIORITE; coarse grained with local mineralogical banding of mafic minerals; randomly spaced.		547
44										546
45										545
46										544
47										543
48		8	5.0/5.0	96	SW	R4				542
49										541
50										540
51										539
52										538
53										537

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1020

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
54				SW	R3				536
55	9	5.0/5.0	87						535
56									534
57				F	R4		56.3 to 57.7 ft healed fracture zone		533
58							META-GRANODIORITE; medium to coarse grained		532
59									531
60	10	5.0/5.0	96	F	R4		59.2 to 59.7 ft mafic inclusion		530
61									529
62									528
63									527
64							63.5 to 66.2 ft minor mafic inclusions		526
65	11	5.0/5.0	100	F	R4				525
66									524
67							META-GRANODIORITE		523
68									522
69									521
70	12	5.0/5.0	100	F	R4				520
71							From 70.8 to 71.5 ft, massive quartz with pyrite and muscovite		519
72									518
73							META-GRANODIORITE; accessory minerals include pyrite, muscovite, and epidote		517
74	13	2.0/2.0	95	F	R4				516
75								Coring terminated on 4/11/06; water at 37.3 ft 4/12/06; water at 35.3 ft	515
76									514
77									513
78							Total Depth 75 ft.		512
79							Groundwater encountered at 35.3 feet		511
80							Borehole Grouted On 4/26/06		510
81									509
82									508
83									507
84									506
85									505
86									504
87									503
88									502
89									501
90									500
91									499
92									498
93									497

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1021**	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch	Boring Location Unit 2 adjacent N 1165897 E 1847301		Total Depth 75.4 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 565.5 feet MSL	Ground Water Depth 10 feet	Depth to Bedrock 5 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 1	Date Started 4/12/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/13/06

Reviewed by / Date: F. Syms 5/23/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									SM	SAND silty (SM), brownish yellow, (10YR 6/6), moist, ~12% silt, some gravel (~15%) PARTIALLY WEATHERED ROCK	Start 4/12/06	565
1												564
2												563
3												562
4		SPT 1	46 50/3	9							Refusal at 5 ft., see rock log	561
5												560
6												559
7												558
8												557
9												556
10												555
11												554
12												553
13												552
14												551
15												550
16												549
17												548
18												547
19												546
20												545
21												544
22												543
23												542
24												541
25												540
26												539
27												538
28												537
29												536
30												535
31												534
32												533
33												532
34												531
35												530
36												529
37												528
38												527
39												526
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1021**	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch	Boring Location Unit 2 adjacent N 1165897 E 1847301		Total Depth 75.4 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 565.5 feet MSL	Ground Water Depth 10 feet	Depth to Bedrock 5 feet
Casing Size and Depth 4 inch / 5 feet	Length of Core Barrel and Bit 13 feet	No. of Core Boxes 4	Date Started 4/12/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/13/06

Reviewed by / Date: F. Syms 5/23/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
5									560
6	2	1.7/3.0	0	MW	R2		META-GRANODIORITE; bluish gray (5PB 5/1); massive, fine to medium grained; few to some mafic xenoliths	Refusal, begin NQ core	559
7									558
8									557
9	3	4.8/5.0	30	MW	R2		▽	50% water loss	556
10									555
11									554
12									553
13	4	1.6/2.0	0	MW	R2				552
14									551
15	5	3.0/3.0	66	MW	R2 TO R3			50% water loss	550
16									549
17									548
18	6	5.0/5.0	61	MW	R3		SAA, increase in size of mafic xenoliths		547
19									546
20									545
21									544
22									543
23	7	5.0/5.0	94	SW	R3 TO R4		SAA, decrease in size of mafic xenoliths CONTINUOUS ROCK		542
24									541
25									540
26									539
27									538
28	8	4.9/5.0	85	SW	R3 TO R4		SAA; bluish gray to greenish gray (5PB 5/1 to 10G 5/1); massive, fine to medium grained, some mafic xenoliths, some altered plagioclase (pink crystals) found near fractured zones		537
29									536
30									535
31									534
32								About one-third water loss	533
33	9	4.6/5.0	84	SW	R3 TO R4				532
34									531
35									530
36									529
37									528
38	10	2.0/2.0	100	SW	R3 TO R4			End of day 4/12/06 Start of day 4/13/06 Water level 10 ft	527
39									526
40	11	3.0/3.0	90	SW	R4		META-GRANODIORITE; bluish gray (5PB 5/1); massive, fine to medium grained, some mafic xenoliths		525
41									524
42									523
43							Many healed incipient fractures (with calcite)		522
44									521
45									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1021

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
45		12	4.4/5.0	88	SW	R4				520
46										519
47										518
48		13	5.0/5.0	96	SW TO F	R4				517
49										516
50										515
51										514
52										513
53								Two minor healed shears, with calcite		512
54		14	4.9/5.0	98	SW	R4			40 to 50% water loss	511
55										510
56										509
57										508
58								Mafic xenoliths randomly oriented (>4 inch long), maybe very weak foliation expressed as zones of mafic mineral accumulation		507
59		15	4.8/5.0	93	SW	R4				506
60										505
61										504
62										503
63										502
64		16	5.0/5.0	100	SW	R4				501
65										500
66										499
67										498
68								Some mafic xenoliths, incipient fractures with minor offset		497
69		17	5.0/5.0	100	SW	R4				496
70										495
71									40% water loss	494
72								Subvertical quartz vein at ~71.5 ft		493
73								Some mafic xenoliths		492
74		18	2.4/2.4	100	SW	R4			Coring terminated at 75 ft on 4/13/06	491
75										490
76								Total Depth 75.4 ft.		489
77								Groundwater encountered at 10 feet		488
78								Borehole Grouted On 4/13/06		487
79										486
80										485
81										484
82										483
83										482
84										481
85										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1022**	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch/3 inch	Boring Location Unit 2 adjacent N 1165733 E 1847334		Total Depth 76 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 571.5 feet MSL	Ground Water Depth 11.1 feet	Depth to Bedrock 40 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 16	Date Started 4/4/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/5/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT sandy (ML) red (2.5YR 5/8), medium stiff, fine to coarse sand, ~15% sand, apparent relict rock texture, but very weathered. Texture is not continuous throughout, RESIDUUM	Begin drilling on 4/4/06	571
1												570
2												569
3												
4		SPT 1	1 3 3	14.4 / 18								568
5												567
6												566
7												565
8												564
9		SPT 2	1 4 4	18 / 18					ML	SILT sandy (ML), brownish yellow (10YR 6/8), medium stiff, fine to medium sand, ~15 to 20% sand, SAPROLITE		563
10												562
11									▽			561
12												560
13												559
14		SPT 3	1 2 2	18 / 18						SAA		558
15												557
16												556
17												555
18												554
19		SPT 4	5 8 11	12 / 18						SAA, very pale brown to brownish yellow (10YR 8/2 to 10 YR 6/8), damp, very stiff, ~30% sand, SAPROLITE		553
20												552
21												551
22												550
23												549
24		SPT 5	7 13 28	15.6 / 18						SAA; hard		548
25												547
26												546
27												545
28												544
29		SPT 6	8 13 17	18 / 18						SILT sandy (ML), light olive brown (2.5YR 5/2), damp, very stiff, 15 to 20% sand, SAPROLITE		543
30												542
31												541
32												540
33												539
34		SPT 7	7 16 19	18						SILT (ML), dark olive gray (5Y 3/2), damp, hard, very sand <5% (very fine to fine sand), SAPROLITE		538
35												537
36												536
37												535
38												534
39		SPT 8	6 19 50/4	16					ML	SILT (ML), dark olive gray to yellowish brown (5Y 3/2 to 10YR 5/6)	Refusal at 40 ft., see rock log	533
40												532

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1022**	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch/3 inch	Boring Location Unit 2 adjacent N 1165733 E 1847334		Total Depth 76 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 571.5 feet MSL	Ground Water Depth 11.1 feet	Depth to Bedrock 40 feet
Casing Size and Depth 4 inch / 40 feet	Length of Core Barrel and Bit 13 feet	No. of Core Boxes 3	Date Started 4/4/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/5/06

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40									531
41	9	2.0/3.0	42	MW to SW	R3 to R4		META-GRANODIORITE to META-QUARTZ DIORITE; bluish gray (5PB 5/1); massive, fine to medium grained	Tricone refusal at 40 ft, begin NQ core	530
42									529
43							SAA		528
44	10	5.0/5.0	91	SW	R4		CONTINUOUS ROCK		527
45									526
46									525
47									524
48	11	0.5	70	SW	R4			Very hard drilling	523
49		0.5					Likely incipient joints along foliation.		522
50	12	3.0/4.5	76	SW	R4				521
51									520
52									519
53							META-QUARTZ DIORITE; bluish gray (10B 5/1), massive; fine to medium grained; weakly foliated (many incipient joints with preferred orientation); some dissolution pits; quartz pegmatite veins show minor offset along healed fractures, calcite and epidote infilling the healed joints	End of day 4/4/06 Start of day 4/5/06 Water level 11.1 ft.	518
54	13	5.0/5.0	94	SW	R4				517
55									516
56									515
57									514
58									513
59	14	5.0/5.0	91	SW	R3 to R4		META-DIORITE; dark greenish gray (5G 4/1); massive; fine grained; weakly foliated, joints break along foliation, calcite is primarily mineralizing along foliation joints and healed incipient fractures		512
60									511
61									510
62									509
63							META-QUARTZ DIORITE; bluish gray (10B 5/1), massive; fine to medium grained; weakly foliated (many incipient joints with preferred orientation); some dissolution pits; quartz pegmatite veins are offset by healed fractures, calcite and epidote are primary mineral within the healed joints		508
64									507
65	15	5.0/5.0	100	SW	R4				506
66							META-DIORITE; dark greenish gray (5G 4/1); fine grained; massive; weakly foliated; epidote and calcite are the primary mineral within healed fractures		505
67									504
68									503
69									502
70									501
71									500
72	16	8.0/8.0	100	SW	R4				499
73									498
74									497
75							META-DIORITE; SAA	Coring terminated on 4/5/06	496
76									495
77									494
78									493
79							Total Depth 76 ft. Groundwater encountered at 11.1 feet		492
80									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1022

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80								Borehole Grouted On 4/5/06		491
81										490
82										489
83										488
84										487
85										486
86										485
87										484
88										483
89										482
90										481
91										480
92										479
93										478
94										477
95										476
96										475
97										474
98										473
99										472
100										471
101										470
102										469
103										468
104										467
105										466
106										465
107										464
108										463
109										462
110										461
111										460
112										459
113										458
114										457
115										456
116										455
117										454
118										453
119										452
120										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1023**	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch	Boring Location Unit 2 adjacent N 1165696 E 1847233		Total Depth 75 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 571.2 feet MSL	Ground Water Depth 8 feet	Depth to Bedrock 27 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 6	Date Started 4/10/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/11/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML), olive yellow (2.5Y 6/8), damp, medium stiff, ~15% sand, fine sand, RESIDUUM	Begin 4/10/06	571
1												570
2												569
3												568
4		SPT 1	2 4 4	14.4 / 18								567
5												566
6												565
7												564
8									▽			563
9		SPT 2	2 3 4	14.4 / 18						SAA		562
10												561
11												560
12									ML	SILT, sandy (ML), olive yellow to light gray (2.5Y 6/8 to 5Y 7/2), damp, very stiff, ~15 to 20% sand. SAPROLITE		559
13												558
14		SPT 3	4 9 10	18								557
15												556
16												555
17												554
18												553
19		SPT 4	7 11 11	12 / 18						SILT, sandy (ML), light gray, (2.5Y 7/2) to light olive brown (2.5Y 5/4), damp, very stiff ~25 % sand (fine sand), SAPROLITE		552
20												551
21												550
22												549
23												548
24		SPT 5	11 11 26	15.6 / 18						SILT, sandy (ML), brownish yellow, (10YR 6/8), to light gray (2.5Y 7/2), damp, hard, ~35-40% fine to medium sand. SAPROLITE		547
25												546
26												545
27		SPT 6	50/2	2 / 2							Refusal at 27 ft, see rock log	544
28												543
29												542
30												541
31												540
32												539
33												538
34												537
35												536
36												535
37												534
38												533
39												532
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1023**	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch	Boring Location Unit 2 adjacent N 1165696 E 1847233		Total Depth 75 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 571.2 feet MSL	Ground Water Depth 8 feet	Depth to Bedrock 27 feet
Casing Size and Depth 4 inch / 27 feet	Length of Core Barrel and Bit 13 feet	No. of Core Boxes 3	Date Started 4/10/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/11/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
27										544
28		7	4.5/5.0	32	MW	R1 to R2		METAGRANODIORITE; light bluish gray (5PB 8/1) to reddish yellow (7.5YR 6/8); massive; fine to medium grained	NQ rock coring begins 4/10/06	543
29										542
30										541
31										540
32		8	5.0/5.0	75	SW	R3		SAA; Light bluish gray (5PB 8/1); very weak foliation expressed as joints; some zones appear to be brecciated and healed CONTINUOUS ROCK		539
33										538
34										537
35										536
36										535
37		9	4.5/5.0	94	SW	R3		SAA; light bluish gray to bluish gray (5PB 8/1 to 10B 6/1); many healed joints with calcite mineralization and some epidote, some mafic xenoliths randomly distributed.	End of day 4/10/06 Start of day 4/11/06 Water level 8 ft. Sharpen bit with sand	534
38										533
39										532
40										531
41										530
42		10	5.0/5.0	98	SW	R3 to R4		SAA; bluish gray (10B 6/1); massive; fine to coarse grained, very weakly foliated, biotite mineral groups appear to be slightly elongated along foliation, many healed foliation joints and fractures with calcite mineralization, mafic xenoliths (randomly oriented).		529
43										528
44										527
45										526
46										525
47		11	5.0/5.0	94	SW	R3 to R4				524
48										523
49										522
50										521
51										520
52		12	5.0/5.0	75	SW	R3 to R4		SAA; dark bluish gray (10B 4/1); very weakly foliated, some to many mafic xenoliths		519
53										518
54										517
55										516
56										515
57		13	4.8/5.0	89	SW	R3		SAA; massive to weakly foliated; fine to medium grained; zone of brecciation (healed) Numerous mafic xenoliths, many healed to partly healed joints (w/calcite), some dissolution pits along partly healed joints.		514
58										513
59										512
60										511
61										510
62		14	2.3/2.5	27	MW to SW	R2 to R3		SAA, cut by high angle (80°) meta-diorite dike		509
63										508
64										507
65		15	2.5/2.5	80	SW	R3		SAA; dark bluish gray (10B 4/1), fine to medium grained; massive to weakly foliated		506
66										505
67										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1023

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
67									504
68									503
69	16	4.9/5.0	90	SW	R3 to R4		SAA; between 67 to 69 ft. highly sheared (mylonitic textures interfingered with fine grained meta-diorite and pegmatitic quartz veins at 70 ft. Epidote mineralization increases and appears to be replacing plagioclase within the matrix and calcite healed fracture.		502
70									501
71									500
72									499
73	17	3.0/3.0	71	SW	R3 to R4		META-GRANODIORITE; dark bluish gray with green; fine to medium grained; massive to very weakly foliated; epidote mineralization between 72 and 73.5 ft. Some mafic xenoliths		498
74									497
75							META-DIORITE; greenish black (5G 2.5/1); very fine grained; massive; weakly foliated	Coring terminated 4/11/06	496
76									495
77									494
78							Total Depth 75 ft. Groundwater encountered at 8 feet Borehole Grouted On 4/11/06		493
79									492
80									491
81									490
82									489
83									488
84									487
85									486
86									485
87									484
88									483
89									482
90									481
91									480
92									479
93									478
94									477
95									476
96									475
97									474
98									473
99									472
100									471
101									470
102									469
103									468
104									467
105									466
106									465
107									

| Project Name and Job Number | | |

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1024

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
41		13	4.8/5.0	76	SW	R3				498
42										497
43										496
44								SAA; incipient and healed fractures remineralized with calcite		495
45		14	4.8/5.0	89	SW to F	R4				494
46										493
47										492
48										491
49		15	2.0/2.0	100	F	R4 to R5				490
50										489
51		16	3.0/3.0	91	F	R5		Large quartz vein cuts core at 52 ft, and many irregular veins, incipient fractures filled by calcite.		488
52										487
53										486
54		17	1.5/1.5	100	F	R5			Hard drilling	485
55										484
56		18	2.4/2.5	96	F	R4 to R5				483
57										482
58										481
59		19	6.0/6.0	94	F	R4 to R5		META-DIORITE; dark gray to black; very fine grained; epidote mineralization along joints and within matrix; numerous white veins in calcite		480
60										479
61					SW to F					478
62								META-GRANODIORITE; bluish gray (10B 5/1); quartz, plagioclase, and biotite; calcite and quartz in thin veins (<1 cm)		477
63										476
64								SAA; few calcite filled incipient fractures, few quartz veins, weak to very weak gneissic fabric (foliation)		475
65		20	5.0/5.0	98	F	R4 to R5				474
66										473
67										472
68										471
69									End drilling 3/16/06. Begin drilling 3/17/06 water at 17.4 ft	470
70		21	4.7/5.0	94	SW to F	R4				469
71										468
72										467
73										466
74								SAA, interfingered with strongly foliated vein of mafic schist; schist is very fine grained with some apparent epidote along calcite veins		465
75		22	5.0/5.0	80	SW to F	R3 to R4				464
76										463
77										462
78										461
79										460
80									Losing water	459
81										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1024

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
81	23	4.9/5.0	89	F	R4				458
82									457
83									456
84	24	3.0/3.0	87	SW to F	R3 to R4		META-DIORITE; black to dark gray; very fine grained; mafic minerals epidote visible within matrix and along calcite veins, calcite veins randomly oriented to foliation surfaces.	Hard drilling	455
85									454
86									453
87	25	2.0/2.0	100	F	R4				452
88								Hard drilling	451
89	26	5.0/5.0	96	SW to F	R4 to R5		SAA; Dark gray black to dark green very fine grained, epidote visible, calcite veins follow foliation but also occur randomly 89 to 92.2 ft.	Losing water	450
90									449
91									448
92									447
93							META-GRANODIORITE, quartz, plagioclase, biotite gneiss, some mafic xenoliths, random calcite veins		446
94	27	4.9/5.0	93	SW to F	R4 to R5		META-GRANODIORITE; bluish gray (10B 5/1); quartz feldspar with biotite and epidote, incipient fractures mineralized with quartz and minor calcite; large accumulation of quartz and probable feldspar at 96 ft.	Losing some water	445
95									444
96									443
97									442
98									441
99	28	5.0/5.0	100	F	R4 to R5				440
100									439
101							META-DIORITE; black to dark gray; very fine grained; mafic mineral; epidote visible within matrix and along calcite veins.		438
102									437
103									436
104	29	4.7/5.0	94	F	R4 to R5			Faster drilling	435
105									434
106									433
107									432
108									431
109	30	4.9/5.0	94	F	R4 to R5				430
110									429
111									428
112									427
113									426
114	31	4.8/5.0	96	F	R4 to R5		SAA; greenish gray to black, many little porphyroblasts, calcite, and epidote from prominant veins along weak foliation; biotite, chlorite		425
115									424
116									423
117									422
118									421
119							META-DIORITE; gray to greenish black; very fine grained	End of drilling 3/17/06. Start drilling 3/18/06; water at 13.5 ft	420
120									419
121									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1024

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
121									418
122	32	4.8/5.0	96	F	R4 to R5				417
123									416
124									415
125	33	5.0/5.0	98	F	R4 to R5		Massive gray to greenish black, matrix equigranular.		414
126									413
127									412
128									411
129	34	4.8/5.0	92	F	R4 to R5				410
130									409
131									408
132									407
133	35	4.9/5.0	88	F	R4				406
134									405
135									404
136									403
137									402
138								Losing water	401
139									400
140									399
141	36	4.8/5.0	84	F	R3 to R4		META-GRANODIORITE; bluish gray (10B 5/1); medium to coarse grained; weak to very weak foliation; quartz plagioclase, and biotite; numerous incipient fractures mineralized with calcite, numerous mafic xenoliths	Harder drilling	398
142									397
143									396
144							SAA	End of drilling 3/18/06. Start drilling 3/19/06; water at 15.2 ft	395
145									394
146	37	4.9/5.0	77	F	R4 to R5				393
147									392
148									391
149									390
150									389
151	38	4.3/5.0	72	SW to F	R4				388
152									387
153									386
154									385
155									384
156	39	4.8/5.0	92	SW to F	R3 to R4		Some epidote along margins of quartz veins.	Losing some water	383
157									382
158									381
159									380
160	40	2.0/2.0	85	F	R3 to R4				379
161									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1024

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
161	41	1.0/1.0	95	F	R3 to R4				378
162									377
163	42	2.0/2.0	100	F	R4				376
164									375
165	43	4.9/5.0	92	SW to F	R3 to R4			Water return	374
166									373
167									372
168									371
169									370
170	44	3.9/4.0	89	SW to F	R3 to R4				369
171									368
172							Quartz pegmatite veins		367
173									366
174									365
175	45	6.0/6.0	97	SW to F	R4 to R5				364
176									363
177							META-DIORITE; fine grained; weak foliation plagioclase biotite, hornblende; phenocrysts, minor thin calcite veins along healed incipient fractures.		362
178									361
179							Dark greenish gray; very fine grained; biotite, hornblende, plagioclase gneiss. Epidote and calcite form veins along ~ 60° foliation. Epidote veins up to 0.5 inch wide.	End of drilling 3/19/06. Start drilling 3/20/06; water at 13.1 ft	360
180	46	4.8/5.0	95	F	R3 to R4				359
181									358
182									357
183									356
184									355
185	47	4.8/5.0	96	F	R4 to R5		Plagioclase and epidote rich zone appears to cross the foliation		354
186									353
187									352
188									351
189									350
190	48	4.9/5.0	98	F	R4 to R5				349
191									348
192									347
193									346
194									345
195	49	4.7/5.0	94	F	R4 to R5				344
196								Losing some water	343
197							Numerous calcite veins along foliation		342
198									341
199									340
200							META-GRANODIORITE; plagioclase, quartz, biotite, heavily brecciated in sections that have undergone some		339
201									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1024

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
201									338
202	50	5.3/5.3	100	SW to F	R3 to R4		shearing healed. Numerous random incipient fractures.		337
203									336
204									335
205									334
206	51	4.7/4.7	100	SW to F	R3 to R4		Quartz pegmatite veins with healed highly brecciated zone		333
207									332
208									331
209									330
210									329
211	52	4.0/4.0	90	SW to F	R4 to R5				328
212							2.5 to 3 inch wide quartz vein associated with a zone of healed brecciation	Losing some water	327
213									326
214									325
215									324
216	53	7.2/7.2	94	SW to F	R4 to R5		High density of random incipient fractures mineralized with calcite.		323
217									322
218									321
219									320
220								End of drilling 3/20/06, coring terminated	319
221									318
222									317
223							Total Depth 220.2 ft.		316
224							Groundwater encountered at 13.1 feet		315
225							Borehole Grouted On 6/13/06		314
226									313
227									312
228									311
229									310
230									309
231									308
232									307
233									306
234									305
235									304
236									303
237									302
238									301
239									300
240									299
241									

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1025**	
Type and Diameter of Boring Wash Rotary / NQ core / 3.5 inch	Boring Location Unit 1 CT N 1165263 E 1845471		Total Depth 52 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55	Elevation and Datum 609.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock 28.5 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 5	Date Started 4/12/06
	Borehole Inclination -90	Logged by M. Angell/G. Maximov	Date Completed 4/13/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy with gravel (ML); light yellowish gray, moist, stiff to very stiff, 30% sand and gravel. FILL	Begin 4/12/06	609
4		SPT 1	5 6 9	16.8/18						SILT sandy (ML), reddish brown (with light yellow streaks), moist, stiff, 30% sand, FILL		606
9		SPT 2	3 5 7	16.8/18	●					SILT sandy (ML) little to no gravel, light yellowish brown (10YR 6/4), moist, stiff, 2% gravel, 19% sand, 80% fines; FILL SILT sandy (ML) At 9.4' color becomes yellowish brown (10YR 5/4).	Classification based on B-1025-UD UD-2 from 8 to 10 ft	601
14		SPT 3	4 5 7	15.6/18	●					SILT, sandy (ML) with minor gravel, light yellowish brown (10YR 6/4), moist, stiff. FILL		596
19		SPT 4	6 8 12	18					ML	SILT sandy (ML), greenish gray (10Y 6/1), moist, very stiff, 30% very fine sand. SAPROLITE		591
24		SPT 5	45 50/3.5	9.5					SM	SAND silty (SM), light gray (N 7), moist. PARTIALLY WEATHERED ROCK		586
28		SPT 6	60/1	0/1							Refusal at 28.5 ft, see rock log	582
40												570

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1025**	
Type and Diameter of Boring Wash Rotary / NQ core / 3.5 inch	Boring Location Unit 1 CT N 1165263 E 1845471		Total Depth 52 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55	Elevation and Datum 609.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock 28.5 feet
Casing Size and Depth none	Length of Core Barrel and Bit 5 feet	No. of Core Boxes 1	Date Started 4/12/06
	Borehole Inclination -90	Logged by M. Angell/G. Maximov	Date Completed 4/13/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
29–31		1	2.1/3.5	41	MW	R1		META-GRANODIORITE; light bluish gray (10B 7.5/1); medium grained, equigranular, foliation at ~45°	Begin NQ core	581–579
32–35		2	3.2/5.0	50	MW	R1				578–575
36–39		3	3.8/5.0	50						574–571
40–42					MW	R5		META QUARTZITE; light bluish gray (10B 7/1), microcrystalline, pitted		570–568
43–46		4	1.5/5.0	11	SW	R3 to R4		METAGRANODIORITE; light bluish gray (10B 7/1), medium grained, equigranular		567–564
47–48					SW to F	R4		SAA, migmatitic texture CONTINUOUS ROCK	End drilling 4/12/06 Begin drilling 4/13/06	563–562
49–52		5	4.6/5.0	90	F	R4 to R5		METADIORITE; bluish gray (5PB 5.5/1); medium grained, equigranular, very clear foliation at 30 to 40°	Coring terminated at 52 ft on 4/13/06	561–558
53–68										557–542

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1025-UD**	
Type and Diameter of Boring Wash Rotary / Tricone 3 inch	Boring Location Unit 1 CT N 1165268 E 1845470		Total Depth 21 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 609.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 4	Date Started 5/27/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/27/06

Reviewed by / Date: B. Reinicker 5/30/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled without sampling to 4 ft. Refer to B-1025 for log material descriptions and unit assignments	609
5		UD 1		20.4/24					ML	SILT (ML)	Shelby push 4 to 6 ft.	605
7											Drilled without sampling to 8 ft.	603
9		UD 2		22/24	●	●	●		ML	SILT sandy (ML); 2% gravel, 19% sand, 61% fines	Shelby push 8 to 10 ft.	601
11											Drilled without sampling to 12 ft	599
13		UD 3		25/24					ML	SILT (ML)	Shelby push 12 to 14 ft	597
15											Drilled without sampling to 20 ft.	595
21		UD 4		22.8/12	●	●	●		SP-SM	SAND silty (SP-SM); 7% gravel, 87% sand, 6% fines	Shelby push 20 to 21 ft Shelby tube refusal at 21 ft	589
40												570

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1026**	
Type and Diameter of Boring Hollow stem auger / 8 inch	Boring Location Unit 1 CT N 1164883 E 1845089		Total Depth 99.9 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 610.2 feet MSL	Ground Water Depth 67 feet	Depth to Bedrock N/A
Casing Size and Depth	Length of Core Barrel and Bit	No. of Core Boxes N/A	Date Started 4/12/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/13/06

Reviewed by / Date F. Syms 5/24/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
100								Total Depth 99.9 ft. Groundwater encountered at 67 feet Borehole Grouted On 4/17/06		510
101										509
102										508
103										507
104										506
105										505
106										504
107										503
108										502
109										501
110										500
111										499
112										498
113										497
114										496
115										495
116										494
117										493
118										492
119										491
120										490
121										489
122										488
123										487
124										486
125										485
126										484
127										483
128										482
129										481
130										480
131										479
132										478
133										477
134										476
135										475
136										474
137										473
138										472
139										471

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1026-UD**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Unit 1 CT N 1164870 E 1845091		Total Depth 47 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 609.9 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 5	Date Started 5/28/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/28/06

Reviewed by / Date: B. Reinicker 5/31/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled without sampling to 8 ft.Refer to B-1026 log for material description and unit assignments.	609
10		UD 1		21.6/24	●	●	●		ML	SILT, sandy (ML); 24% sand, 1% gravel, 75% fines	Shelby push 9 to 11 ft.	600
12											Drilled without sampling to 12 ft.	598
13		UD 2		18.5/24	●	●	●		ML	SILT, sandy (ML); 2% gravel, 23% sand, 76% fines	Shelby push 12 to 14 ft.	597
14											Drilled without sampling to 34 ft.	596
35		UD 3		27/24	●	●	●		ML	SILT, sandy (ML); 28% sand, 73% fines	Shelby push 34 to 36 ft.	575
36											Drilled without sampling to 40 ft.	574
40												570

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1026-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												569
41		UD 4		27.25/24	●				ML	SILT (ML)	Shelby push 40 to 42 ft.	568
42												567
43											Drilled without sampling to 45 ft.	566
44												565
45											Shelby push 45 to 47 ft.	564
46		UD 5		27/24	●	●	●		ML	SILT, sandy (ML); 35% sand, 65% fines	Boring terminated at 47 ft	563
47												562
48												561
49												560
50												559
51												558
52												557
53												556
54												555
55												554
56												553
57												552
58												551
59												550
60												549
61												548
62												547
63												546
64												545
65												544
66												543
67												542
68												541
69												540
70												539
71												538
72												537
73												536
74												535
75												534
76												533
77												532
78												531
79												530
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1027**	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch	Boring Location Unit 1 CT N 1165384 E 1845448		Total Depth 50 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 609.7 feet MSL	Ground Water Depth 8 feet	Depth to Bedrock 31.6 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 6	Date Started 4/13/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/14/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Grass over a gravel mat, sand with silt	Begin 4/13/06	609
1									ML	SILT sandy (ML), red (10R 4/6), rock fragment, non plastic. FILL		608
2												607
3												606
4		SPT 1	6 9 8	18/18								605
5												604
6												603
7												602
8									▽			601
9		SPT 2	4 7 8	15/18						SAA; yellowish red (5YR 4/6)		600
10												599
11												598
12												597
13												596
14		SPT 3	3 8 12	14/18						SAA		595
15												594
16												593
17											Very hard drilling at approximately 16.5 ft	592
18									SM	SAND silty (SM), light bluish gray (10B 8/1) and (10B 7/1) with black (N 2.5) seams, fine sand, shows distinct rock texture, SAPROLITE/PARTIALLY WEATHERED ROCK		591
19		SPT 4	25 50/6	12/12								590
20												589
21									SM	SAND gravely (SP), light bluish gray (10B 8/1), very dense, quartz gravel and sand, subangular fine to coarse sand. PARTIALLY WEATHERED ROCK		588
22												587
23												586
24		SPT 5	50/6	6/6							End 4/13/06 Start 4/14/06; water at 8 ft	585
25												584
26												583
27												582
28										Drill refusal, refer to rock log	Refusal at 28.8 ft, see rock log	581
29		SPT 6	50/4	4/4								580
30												579
31												578
32												577
33												576
34												575
35												574
36												573
37												572
38												571
39												570
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1027**	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch	Boring Location Unit 1 CT N 1165384 E 1845448		Total Depth 50 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 609.7 feet MSL	Ground Water Depth 8 feet	Depth to Bedrock 31.6 feet
Casing Size and Depth 3 inch / 13 feet	Length of Core Barrel and Bit 13.1 feet	No. of Core Boxes 2	Date Started 4/13/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/14/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
29									580
30							SAND, gravelly (SP), light bluish gray (10B 8/1), very dense, quartz gravel and sand, subangular fine to coarse sand. PARTIALLY WEATHERED ROCK	Begin NQ rock coring	
31	7	2.7/5.0	0	CW	R0 to R1				579
32				HW	R3				578
33				CW	R1		QUARTZITE; light bluish gray (5PB 7/1); pyrite and dendritic manganese oxide formation along fracture surfaces.		577
34									576
35				MW	R2		META-GRANODIORITE; light bluish gray; foliation dipping 35 to 60°; very thinly laminated		575
36	8	4.2/4.6	41						574
37				MW to SW	R3 to R4		Quartz dike at 36.3 to 37.3 ft.		573
38				MW	R3				572
39									571
40	9	4.0/4.0	56	MW	R3				570
41									569
42									568
43	10	1.6/1.6	37	MW	R3				567
44							META-GRANODIORITE to SCHIST; light bluish gray; fine to medium grained; strongly foliated. (40 to 60° dip)		566
45									565
46							Dissolution pits and iron oxide stains throughout sample.	Losing ~50% water	564
47	11	3.7/6.0	51	MW	R3				563
48									562
49									561
50								Coring terminated at 50 ft on 4/14/06	560
51									559
52									558
53							Total Depth 50 ft. Groundwater encountered at 8 feet Borehole Grouted On 4/14/06		557
54									556
55									555
56									554
57									553
58									552
59									551
60									550
61									549
62									548
63									547
64									546
65									545
66									544
67									543
68									542
									541

Project Name and Job Number		
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1028**

Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Unit 2 CT N 1166140 E 1848027		Total Depth 103.55 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 609.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 21	Date Started 3/7/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 3/8/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin drilling 3/7/06	609
1											Fill	608
2												607
3												606
4	/	SPT 1	3 3 5	18/18	●	●				SILT sandy with gravel (ML), yellowish red (5YR 5/6), damp, medium stiff, 56% fines, 37% sand, 7% gravel. FILL		605
5												604
6												603
7												602
8												601
9	/	SPT 2	3 3 6	14/18	●					SILT sandy (ML), reddish brown (5YR 4/4), damp, stiff ~15% sand. FILL		600
10												599
11												598
12												597
13												596
14	/	SPT 3	7 7 9	10/18	●	●	●			SILT sandy with gravel (ML), yellowish red (5YR 4/6), very stiff; 36% sand; 3% gravel, 61% fines; FILL		595
15												594
16												593
17											Hard bouncing drilling	592
18												591
19	/	SPT 4	5 10 13	18/18	●					SILT sandy (ML), red to strong brown (2.5YR 4/8 to 7.5YR 5/6), damp, very stiff, ~30% sand, fine sand. FILL		590
20												589
21												588
22												587
23												586
24	/	SPT 5	5 6 9	15/18	●					SILT sandy (ML), red (2.5YR 4/8), damp, stiff to very stiff, fine to coarse sand,1% gravel, 32% sand, 67% fines. FILL	Classification based on B-1028-UD, UD-2 at 24 to 26 ft	585
25												584
26												583
27												582
28												581
29	/	SPT 6	13 11 10	0/18						NO SAMPLE RECOVERED		580
30												579
31												578
32												577
33												576
34	/	SPT 7	8 11 15	6/18	●	●				SILT sandy (ML), red (2.5YR 5/6), damp, very stiff, 35% sand, 65% fines, slightly sticky, slightly plastic. FILL		575
35												574
36												573
37												572
38											Classification based on B-1028-UD, UD-3 at 39 to 41 ft	571
39	/	SPT 8	4 7 8	17/18	●					SILT sandy (ML), red (2.5YR 4/8) 43% sand, 57% fines. FILL		570
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1028

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40											End of day 3/7/06 Begin drilling on 3/8/06	
41												569
42												568
43												567
44	/	SPT 9	5 8 9	14/18	●					SILT, sandy (ML); reddish brown (5YR 4/4), damp, stiff to very stiff, >30% sand. FILL		566
45												565
46												564
47												563
48												562
49	/	SPT 10	6 7 10	17/18	●	●				SILT sandy (ML), light olive brown (2.5Y 5/3), damp, very stiff, 30% sand, 70% fines. FILL		561
50												560
51												559
52												558
53												557
54	/	SPT 11	6 11 10	15/18	●					SILT sandy, clayey (ML), red (2.5YR 4/6), damp, very stiff, ~30% sand, minor clay. FILL		556
55												555
56												554
57												553
58												552
59	/	SPT 12	7 10 13	15/18	●	●				SILT, sandy (ML); red (2.5YR 4/6); very stiff; 33% sand; 2% gravel, 65% fines. FILL		551
60												550
61												549
62												548
63												547
64	/	SPT 13	5 9 12	18/18	●					SILT sandy (ML), red (10R 4/6), damp, very stiff, ~20% sand, fine sand, FILL		546
65												545
66												544
67									ML	SILT sandy, clayey (ML), light greenish gray (5G 8/1), damp, medium stiff, 36% sand, 64% fines, ALLUVIUUM		543
68												542
69	/	SPT 14	8 7 8	16/18	●	●						541
70												540
71												539
72												538
73											Switched from roller cone to wing bit	537
74	/	SPT 15	4 30 11	9.5/18	●					SILT clayey with sand (ML), light greenish gray (5G 8/1) to brownish yellow (10YR 6/8), damp, hard, ~30% sand. ALLUVIUUM		536
75												535
76									SM	SAND silty (SM), light brownish gray (10YR 6/2), moist, loose, 54% sand, 47% fines. RESIDUUM		534
77												533
78											Classification based on B-1028-UD, UD-6 at 79 to 81 ft	532
79	/	SPT 16	2 3 5	18/18	●							531
80												530

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1028

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80									SM			529
81												528
82												527
83												526
84		SPT 17	7 11 12	18/18	●					SAA, pale brown (10YR 6/3); very stiff. RESIDUUM		525
85												524
86												523
87												522
88												521
89		SPT 18	6 8 14	9.5/18	●					SAA; pale yellow (2.5Y 7/4); moist; very stiff; ~30% sand. RESIDUUM		520
90												519
91												518
92												517
93												516
94		SPT 19	3 4 9	15/18	●				SM	SAND, silty (SM); yellow (10YR 8/8), moist, medium dense, fine to medium sand. SAPROLITE 58% sand, 42% fines	Classification based on B-1028-UD, UD-7 at 94 to 94.6 ft	515
95												514
96												513
97												512
98												511
99		SPT 20	19 50/2	7/8	●	●			SM	SAND silty (SM), yellow (2.5Y 7/8), moist, 62% sand, 35% fines; 3% gravel; PARTIALLY WEATHERED ROCK		510
100												509
101												508
102												507
103		SPT 21	50/0.5	0/0.5						NO SAMPLE RECOVERED. PARTIALLY WEATHERED ROCK.	Boring terminated on 3/8/06 at 103.55 ft	506
104												505
105												504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												

Project Name and Job Number		
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1028-UD**

Type and Diameter of Boring Wash Rotary / 4 inch	Boring Location Unit 2 CT N 1166150 E 1848024		Total Depth 94.6 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 609.9 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 7	Date Started 6/8/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/9/06

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Offset 8.5 ft from B-1028. Begin 6/8/06	609
1											Drilled without sampling to 4 ft. Refer to B-1028 log for material descriptions and unit assignments.	608
2												607
3												606
4											Shelby push 4 to 6.3 ft.	605
5		UD 1		27.6 / 26.75					ML	SILT, sandy (ML)		604
6												603
7											Drilled without sampling to 24 ft.	602
8												601
9												600
10												599
11												598
12												597
13												596
14												595
15												594
16												593
17												592
18												591
19												590
20												589
21												588
22												587
23												586
24											Shelby push 24 to 26 ft	585
25		UD 2		18.6 / 24	●	●	●		ML	SILT, sandy (ML); 1% gravel, 32% sand, 68% fines		584
26											Drilled without sampling to 39 ft. End 6/8/06 Start 6/9/06	583
27												582
28												581
29												580
30												579
31												578
32												577
33												576
34												575
35												574
36												573
37												572
38												571
39												570
40		UD		25						Description provided on following page.	Shelby push 39 to 41.1 ft	

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1028-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		3		25	●	●	●		ML	SILT, sandy (ML); 43% sand, 57% fines		569
41											Drilled without sampling to 64 ft	568
42												567
43												566
44												565
45												564
46												563
47												562
48												561
49												560
50												559
51												558
52												557
53												556
54												555
55												554
56												553
57												552
58												551
59												550
60												549
61												548
62												547
63												546
64		UD 4		22.2/24					ML	SILT, sandy (ML)	Shelby push 64 to 66 ft	545
65												544
66											Drilled without sampling to 69 ft.	543
67												542
68												541
69		UD 5		24.6/24					ML	SILT, sandy, clayey (ML)	Shelby push 69 to 71 ft	540
70												539
71											Drilled without sampling to 79 ft	538
72												537
73												536
74												535
75												534
76												533
77												532
78												531
79		UD		26.4						Description provided on following page.	Shelby push 79 to 81 ft.	530
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1028-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80		6		24	●	●	●		SM	SAND, silty (SM); 47% fines, 54% sand		529
81											Drilled without sampling to 94 ft.	528
82												527
83												526
84												525
85												524
86												523
87												522
88												521
89												520
90												519
91												518
92												517
93												516
94		UD		7	●	●	●		SM	SAND, silty (SM) 42% fines, 58% sand	Shelby push 94 to 94.6 ft	515
95		7		7							Shelby push refusal, boring terminated on 6/9/06	514
96												513
97												512
98												511
99												510
100												509
101												508
102												507
103												506
104												505
105												504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												

Project Name and Job Number														
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.								**SOIL LOG - Boring No. B-1029**					
Type and Diameter of Boring Hollow stem auger / 8 inch									Boring Location Unit 2 CT N 1165581 E 1848117			Total Depth 99.25 feet		
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75									Elevation and Datum 609.8 feet MSL		Ground Water Depth 49.3 feet		Depth to Bedrock N/A	
Sampling Method SPT									Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 20		Date Started 4/11/06	
									Borehole Inclination -90		Logged by J. Cerceo		Date Completed 4/12/06	

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GP	GRAVEL (GP) with grass	Begin 4/11/06	609
1									ML			608
2												607
3												606
4		SPT 1	23 11 8	3/18						SILT sandy (ML), red (2.5YR 4/6), dry, very stiff, fine to medium sand, fine gravel, low to non plastic. FILL		605
5												604
6												603
7												602
8												601
9		SPT 2	3 6 9	3/18						SAA		600
10												599
11												598
12												597
13												596
14		SPT 3	1 5 8	14/18	●	●				SAA; 30% sand, 2% gravel, 68% fines. FILL		595
15												594
16												593
17												592
18												591
19		SPT 4	4 8 13	16/18						SAA; clayey fill deposits. FILL		590
20												589
21												588
22												587
23												586
24		SPT 5	2 8 10	12/18	●	●				SAA; 34% sand; 1% gravel, 65% fines. FILL		585
25												584
26												583
27												582
28												581
29		SPT 6	3 5 9	18/18						SILT sandy (ML), strong brown (7.5YR 5/6), dry, fine sand, non plastic. FILL		580
30												579
31												578
32												577
33												576
34		SPT 7	3 6 10	15/18	●	●				SAA; 32% sand, 68% fines. FILL		575
35												574
36												573
37												572
38												571
39		SPT 8	11 12 17	2/18								570
40												

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1029

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												569
41												568
42												567
43												566
44	/	SPT 9	9 11 15	18/18								565
45												564
46												563
47												562
48												561
49	/	SPT 10	5 13 14	18/18	●	●			▽	SILT, sandy with clay (ML), red (10R 4/8), dry, very stiff, 39% sand, 61% fines, quartzite fragments. FILL		560
50												559
51												558
52												557
53												556
54	/	SPT 11	4 6 9	18/18					ML	SILT, sandy (ML), light red (2.5YR 6/6) damp, very stiff, mottled, micaceous, fine to medium sand. RESIDUUM		555
55												554
56												553
57												552
58												551
59	/	SPT 12	3 9 11	18/18	●	●				SAA; moist; 46% sand, 54% fines	Groundwater first encountered during drilling at 59 ft	550
60												549
61												548
62												547
63												546
64	/	SPT 13	7 13 17	18/18						SAA; wet, hard, laminated banding		545
65												544
66												543
67												542
68												541
69	/	SPT 14	9 13 14	16/18	●	●				SAA; yellow (10YR 7/6), very pale brown (10YR 7/4), wet, coarse quartz fragments, very stiff; 40% sand, 60% fines. FILL		540
70												539
71												538
72												537
73												536
74	/	SPT 15	3 9 13	18/18						SAA; very dark brown veins, wet, fine to coarse subrounded sand. FILL		535
75												534
76												533
77												532
78												531
79	/	SPT 16	4 10 15	18/18								530
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1029

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80												529
81												528
82												527
83												526
84		SPT 17	5 12 18	14/18							End 4/11//06	525
85											Begin 4/12/06; water at 49.3 ft	524
86											Stiffer drilling	523
87												522
88												521
89		SPT 18	14 19 26	17/18					SM	SAND, silty (SM), brownish yellow (10YR 6/8) and very pale brown (10YR 8/3); wet, dense, <10% silt, fine to medium sand, micaceous. SAPROLITE		520
90												519
91												518
92									SM	SAND, silty (SM); mottled, very pale brown (10YR 8/3), brownish yellow (10YR 6/8), and very dark brown (10YR 2/2); wet, very dense, fine to medium sand, micaceous, PARTIALLY WEATHERED ROCK	Very hard drilling Partially weathered rock	517
93												516
94		SPT 19	32 50/6	9/12								515
95												514
96												513
97												512
98												511
99		SPT 20	45 50/3	9/9						SAND silty (SM) PARTIALLY WEATHERED ROCK/SAPROLITE	Boring terminated on 4/12/06	510
100												509
101												508
102										Total Depth 99.25 ft.		507
103										Groundwater encountered at 49.3 feet		506
104										Borehole Grouted On 4/12/06		505
105												504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1030**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location Unit 2 CT N 1165963 E 1848403		Total Depth 98.8 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 609.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 20	Date Started 4/11/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/12/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT slightly sandy, clayey (ML); yellowish-red (5YR 4/6), damp, stiff, low plasticity, micaceous. FILL	Begin 4/11/06	609
1												608
2												607
3												606
4	/	SPT 1	4 5 7	18/18								605
5												604
6												603
7												602
8												601
9	/	SPT 2	4 24 16	8.4/18	●	●			SM	SAND, silty with gravel (SM); mottled, yellowish-red (5YR 4/6) and reddish-yellow (5YR 7/8), damp, dense, non-plastic with large angular gravel 9.5 ft, micaceous; 21% gravel, 41% sand, 38% fines. FILL		600
10												599
11												598
12												597
13												596
14	/	SPT 3	4 6 7	12/18					ML	SILT, sandy (ML) trace clay, reddish-brown (2.5YR 4/4); moist, damp, stiff, non-plastic, small sub-angular gravel, micaceous. FILL		595
15												594
16												593
17												592
18												591
19	/	SPT 4	5 8 9	7.2/18	●	●				SILT (ML), low to non-plasticity, micaceous; 3% gravel, 43% sand, 54% fines. FILL		590
20												589
21												588
22												587
23												586
24	/	SPT 5	5 6 9	18/18						SAA, red (2.5YR 4/6); slight increase in clay content, low plasticity, micaceous. FILL		585
25												584
26												583
27												582
28												581
29	/	SPT 6	5 6 6	14.4/18						SILT slightly sandy, clayey (ML) strong brown (7.5YR 5/6), moist, stiff, low-plasticity, abundant small weathered gravels, micaceous. FILL		580
30												579
31												578
32												577
33												576
34	/	SPT 7	4 6 8	15.6/18	●	●				SILT sandy with gravel (ML) trace clay, primarily red (2.5YR 4/6) with various other weathered colors staining, moist, stiff, no to low plasticity except in some lenses of greater clay content with low to mid plasticity, micaceous; 2% gravel, 30% sand, 68% fines. FILL		575
35												574
36												573
37												572
38												571
39	/	SPT 8	4 13 11	14.4/18						SAA, only becoming very stiff at 38.2 ft. FILL		570
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1030

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												569
41												568
42												567
43												566
44	/	SPT 9	6 9 12	15.6/18	●	●				SILT sandy, clayey (ML) reddish brown (5YR 4/4); moist, very stiff, non-plastic, micaceous, 40% sand, 60% fines. FILL		565
45												564
46												563
47												562
48												561
49	/	SPT 10	5 8 12	15.6/18						SAA		560
50												559
51												558
52												557
53												556
54	/	SPT 11	5 7 10	15.6/18	●	●				SILT, sandy, trace clay (ML) reddish-brown (5YR 4/4); moist, very stiff, low to non-plastic, micaceous; 40% sand, 1% gravel, 59% fines. FILL		555
55												554
56												553
57												552
58												551
59	/	SPT 12	9 13 17	18/18						SILT, slightly sandy, clayey (ML); yellowish-red (5YR 4/6), damp, very stiff, low to medium plasticity, micaceous. FILL		550
60												549
61												548
62												547
63												546
64	/	SPT 13	3 6 6	18/18					ML	SILT, slightly sandy, clayey (ML); mottled, red (2.5YR 4/8) and reddish-yellow (7.5YR 6/6), damp to moist, stiff, low-plasticity. RESIDUUM		545
65											End 4/11/06	544
66											Start 4/12/06	543
67												542
68												541
69	/	SPT 14	2 3 4	18/18					ML	SILT (ML), yellowish-brown (10YR 5/6), moist to wet, medium stiff, non-plastic, micaceous, manganese oxide and iron oxide staining. SAPROLITE		540
70												539
71												538
72												537
73												536
74	/	SPT 15	2 2 4	18/18						SAA, mottled appearance due to manganese oxide and iron oxide staining.		535
75												534
76												533
77												532
78												531
79	/	SPT 16	2 3 4	18/18						SAA; dark yellowish-brown (10YR 4/6).		530
80												

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1030

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80									ML			529
81												528
82												527
83												526
84		SPT 17	4 4 5	18/18						SAA; olive brown (2.5YR 4/4), trace clay, very micaceous. SAPROLITE		525
85												524
86												523
87												522
88												521
89		SPT 18	3 5 8	16.8/18						SAA; light brownish-gray (2.5YR 6/2) from 88.5 to 89.5 ft, then to olive-yellow (2.5YR 6/6), stiff, SAPROLITE		520
90												519
91												518
92												517
93												516
94		SPT 19	19 34 50	18/18					SP-SM	SAND, silty (SP/SM), light gray (2.5YR 7/1), damp to moist, very dense, manganese-oxide staining and quartz in thin fracture. PARTIALLY WEATHERED ROCK		515
95												514
96												513
97												512
98												511
99		SPT 20	50/3	3/3						SAA, PARTIALLY WEATHERED ROCK	SPT refusal, boring terminated on 4/12/06	510
100												509
101												508
102												507
103												506
104												505
105												504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1031**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Switchyard N 1164731 E 1847445		Total Depth 38.8 feet
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC	Elevation and Datum 604 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 8	Date Started 3/3/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/3/06

Reviewed by / Date: F. Syms 5/23/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GM	GRAVEL with fines for 8 inches	Begin drilling 3/3/06	604
1									ML	SILT, sandy (ML); red (2.5YR 4/6), damp, stiff, micaceous, non-plastic. FILL		603
2												602
3												601
4		SPT 1	5 5 8	13.2 / 18								600
5												599
6												598
7												597
8												596
9		SPT 2	4 8 10	13.2 / 18	●	●				SILT, sandy (ML); red (2.5YR 4/6), very stiff with trace clay; 32% sand; 1% gravel, 67% fines. FILL		595
10												594
11												593
12												592
13												591
14		SPT 3	4 7 9	18 / 18	●				SM	SAND, silty (SM); yellowish brown (10YR 5/4); damp, medium dense, micaceous, quartzite fragments. FILL		590
15												589
16												588
17												587
18												586
19		SPT 4	5 6 7	18 / 18	●				ML	SILT, sandy (ML); yellowish brown (10YR 5/4); damp, stiff, micaceous, quartzite fragments. SAPROLITE		585
20												584
21												583
22												582
23												581
24		SPT 5	2 3 4	18 / 18	●					SILT, sandy (ML); very pale brown (10YR 7/3); moist, medium stiff; 44% sand, 56% fines, mottled, micaceous. SAPROLITE	Classification based on B-1031-UDA UD-2 at 24 to 26 ft	580
25												579
26												578
27												577
28												576
29		SPT 6	2 4 50/4	16 / 16								575
30									SM	SAND, silty (SM); dark grayish brown (10YR 4/2); moist, very dense, micaceous. PARTIALLY WEATHERED ROCK		574
31												573
32												572
33												571
34		SPT 7	40 50/4	12 / 10						SAND, silty (SM); pale brown (10YR 6/3); moist very dense micaceous. PARTIALLY WEATHERED ROCK		570
35												569
36												568
37												567
38												566
39		SPT 8	50/3	3 / 3						SAA; very dark grayish brown (10YR 3/2)	Boring terminated 3/3/06	565
40												564

Project Name and Job Number		
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1031-UD**

Type and Diameter of Boring Wash Rotary / 4 inch nominal	Boring Location Switchyard N 1164740 E 1847445		Total Depth 16 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 604 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 2	Date Started 5/29/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/29/06

Reviewed by / Date: B. Reinicker 5/30/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled without sampling to 4 ft.	604
1												603
2												602
3												601
4									ML	SILT, sandy (ML).	Shelby push 4 to 6 ft.	600
5		UD 1		27.75/24								599
6									ML	SILT, sandy (ML).	Drilled without sampling to 14 ft.	598
7												597
8												596
9												595
10												594
11												593
12												592
13												591
14											Shelby push 14 to 16 ft.	590
15		UD 2		0/24						No recovery.	No recovery. Boring terminated on 5/29/06.	589
16												588
17												587
18												586
19												585
20												584
21												583
22												582
23												581
24												580
25												579
26												578
27												577
28												576
29												575
30												574
31												573
32												572
33												571
34												570
35												569
36												568
37												567
38												566
39												565
40												564

SOIL LOG CHEROKEE10-19-07.GPJ WLA9-8-06.GDT 10/24/07

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1031-UDA**	
Type and Diameter of Boring Wash Rotary / 4 inch nominal	Boring Location Switchyard N 1164728 E 1847439		Total Depth 37 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 603.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 6	Date Started 6/7/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/8/06

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Offset 11.4 ft from B-1031 UD	603
1											Drilled without sampling to14 ft.	602
2												601
3												600
4												599
5												598
6												597
7												596
8												595
9												594
10												593
11												592
12												591
13												590
14		UD 1		19.2/24					SM	SAND, silty (SM).	Shelby push 14 to 16 ft.	589
15												588
16											Drilled without sampling to 24 ft.	587
17												586
18												585
19												584
20												583
21												582
22												581
23												580
24		UD 2		22.8/24	●	●	●		ML	SILT, sandy (ML); 44% sand, 56% fines.	Shelby push 24 to 26 ft	579
25												578
26											Drilled without sampling to 27 ft.	577
27		UD 3		0/24						No Recovery.	End 6/7/06 Start 6/8/06	576
28											Water was near the surface	575
29		UD 4		0/24						No Recovery.	Shelby push 27 to 29 ft, no recovery	574
30		UD 5		12/12					SM	SAND, silty (SM).	Shelby push 29 to 31 ft No recovery Shelby push 31 to 32 ft.	573
31											Shelby tube refusal at 32.0 ft	572
32												571
33												570
34												569
35		UD 6		10.8/24					SM	SAND, silty (SM).	Pitcher barrel sample 35 to 37 ft; softer zone of pitcher drilling 35.4 to 36.6 ft	568
36												567
37											Boring terminated 6/8/06	566
38												565
39												564
40												

Project Name and Job Number		SOIL LOG - Boring No. B-1032		
Lee Nuclear Station COL 6234-06-3389				
Type and Diameter of Boring: Wash Rotary / 3 inch	Boring Location: Switchyard N 1164553 E 1846696			Total Depth: 40.2 feet
Drilling Contractor and Rig: MACTEC/White/33115 / CME 55 LC	Elevation and Datum: 603.9 feet MSL	Ground Water Depth: N/A		Depth to Bedrock: N/A
Sampling Method: SPT	Sample Driving Hammer/Drop: 140 lbs / 30 inches	No. of Samples: 8		Date Started: 3/4/06
	Borehole Inclination: -90	Logged by: R. Ortiz		Date Completed: 3/4/06

Reviewed by / Date: F. Syms 5/23/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, (ML); yellowish brown (10YR 4/8) to olive brown (2.5Y 4/4); damp, medium stiff, <15% sand, non-plastic. FILL	Begin drilling 3/4/06	603
1												602
2												601
3												600
4		SPT 1	2 4 5	18/18								599
5												598
6												597
7												596
8												595
9		SPT 2	4 6 8	18/18						SAA; brownish yellow (10YR 6/8). FILL		594
10												593
11												592
12									ML	SILT, sandy (ML)' brown (10YR 5/3); damp to moist, hard, ~20 to 25% sand, non-plastic. SAPROLITE		591
13												590
14		SPT 3	10 16 21	15/18								589
15												588
16												587
17												586
18												585
19		SPT 4	25 37 50	18/18						SILT, sandy (ML); brown (10YR 5/3); damp, hard, >30% sand, fine to coarse sand. SAPROLITE		584
20												583
21												582
22									ML	SILT, sandy (ML) with minor gravel; brown to dark brown (10YR 4/3); damp to moist, hard, coarse to very coarse sand, fine gravel, gravel are lithic fragments of unweathered rock. PARTIALLY WEATHERED ROCK		581
23												580
24		SPT 5	30 50/5	9/11								579
25												578
26												577
27												576
28												575
29		SPT 6	8 10 25	13/18						SILT, sandy (ML) with minor gravel; brown to dark brown (10YR 4/3); damp to moist, >30% sand, fine gravel, hard. PARTIALLY WEATHERED ROCK		574
30												573
31												572
32												571
33												570
34		SPT 7	20 20 26	12/18						SILT, sandy (ML); brown (10YR 5/3); damp, hard ~30% sand, fine sands, minor fine gravel (from weathering of lithic fragments). PARTIALLY WEATHERED ROCK		569
35												568
36												567
37												566
38												565
39		SPT 8	50/3	4/3						SILT, sandy (ML); strong brown (7.5YR 5/6); damp, hard, ~>30% sand, medium to coarse sand, minor		564
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1032

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		SPT 9	50/2	4/2						fine gravel. PARTIALLY WEATHERED ROCK	Boring terminated on 3/4/06	563
41										SAA, yellowish brown (10YR 5/6). PARTIALLY WEATHERED ROCK		562
42												561
43												560
44												559
45												558
46												557
47												556
48												555
49												554
50												553
51												552
52												551
53												550
54												549
55												548
56												547
57												546
58												545
59												544
60												543
61												542
62												541
63												540
64												539
65												538
66												537
67												536
68												535
69												534
70												533
71												532
72												531
73												530
74												529
75												528
76												527
77												526
78												525
79												524
80												

Project Name and Job Number		
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1033**

Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Switchyard N 1164557 E 1847059		Total Depth 40.5 feet
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC	Elevation and Datum 604.4 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 10	Date Started 3/5/06
	Borehole Inclination -90	Logged by R. Ortiz	Date Completed 3/5/06

Reviewed by / Date: F. Syms 5/23/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Begin drilling 3/5/06	604
1												603
2												602
3												601
4		SPT 1	6 8 8	8/18	●							600
5									ML	SILT, sandy (ML); red (2.5YR 4/8); damp, medium stiff, fine sand, poorly graded. FILL		599
6												598
7												597
8												596
9		SPT 2	5 6 7	18/18	●					SILT, sandy, clayey (ML); red (2.5YR 4/6); damp, stiff, fine sand, poorly graded, 57% fines. FILL	Classification based on B-1033-UD UD-2 at 10 to 12 ft	595
10												594
11												593
12												592
13												591
14		SPT 3	4 6 8	15/18	●	●				SILT, sandy, clayey (ML); red (2.5YR 4/8), damp, stiff grades into a SILT with sand (ML) yellowish red (5YR 4/6), poorly graded; 36% sand, 64% fines. FILL		590
15												589
16												588
17												587
18												586
19		SPT 4	4 6 8	16/18	●					SILT, sandy (ML); red, (10YR 4/6); damp, stiff, ~25% sand. FILL		585
20												584
21												583
22									ML	SILT, sandy (ML); gray (7.5YR 6/10) to yellow brown (10YR 5/4); damp, hard >30% sand, fine sand, large quartz clast (~1.0 inch). SAPROLITE		582
23												581
24		SPT 5	11 20 38	18/18	●						Rocky drilling	580
25												579
26												578
27												577
28												576
29		SPT 6	7 20 16	18	●					SILT, sandy (ML); light brownish gray (2.5YR 6/2); hard, >30% sand, fine sand, large pieces of quartz. SAPROLITE	Rocky drilling, bouncing rig	575
30												574
31									ML	SILT, sandy (ML) with minor gravel; yellowish brown (10YR 5/6); damp, >30% sand, gravel due to the breakdown of lithic fragments, poorly graded. PARTIALLY WEATHERED ROCK		573
32												572
33												571
34		SPT 7	48 50/5	12/11								570
35												569
36												568
37												567
38												566
39		SPT 8	41 50/4	12/10						SAA, brown to dark brown (10YR 4/3).		565
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1033

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		SPT		6						SAA, yellowish brown (10YR 5/6). PARTIALLY WEATHERED ROCK.		564
41		50/6		6							Boring terminated on 3/5/06	563
42												562
43												561
44												560
45												559
46												558
47												557
48												556
49												555
50												554
51												553
52												552
53												551
54												550
55												549
56												548
57												547
58												546
59												545
60												544
61												543
62												542
63												541
64												540
65												539
66												538
67												537
68												536
69												535
70												534
71												533
72												532
73												531
74												530
75												529
76												528
77												527
78												526
79												525
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1033-UD**	
Type and Diameter of Boring Wash Rotary / 6 inch	Boring Location Switchyard N 1164563 E 1847059		Total Depth 28 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 604.1 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 4	Date Started 6/8/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/8/06

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled without sampling to 4 ft.	604
1												603
2												602
3												601
4												600
5		UD 1		19.2/24					ML	SILT, sandy (ML).	Shelby push from 4 to 6 ft	599
6												598
7											Drilled without sampling to 10 ft.	597
8												596
9												595
10												594
11		UD 2		24/24	●	●	●		ML	SILT, sandy (ML); 43% sand, 57% fines.	Shelby push from 10 to 12 ft	593
12												592
13											Drilled without sampling to 22 ft.	591
14												590
15												589
16												588
17												587
18												586
19												585
20												584
21												583
22											Pitcher drill from 22 to 24 ft	582
23		UD 3		7.2/24					ML	SILT, sandy (ML).		581
24												580
25											Drilled without sampling to 26 ft.	579
26											Pitcher drill from 26 to 28 ft	578
27		UD 4		19.2/24					ML	SILT, sandy (ML).		577
28											Boring terminated on 6/8/06	576
29												575
30												574
31												573
32												572
33												571
34												570
35												569
36												568
37												567
38												566
39												565
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1034**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Switchyard N 1164327 E 1847522		Total Depth 39.3 feet
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC	Elevation and Datum 604 feet MSL	Ground Water Depth 17.47 feet	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 6	Date Started 3/5/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/6/06

Reviewed by / Date: F. Syms 5/23/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); yellowish brown (10YR 5/8) to red (10R 4/8); damp, very stiff, <10% sand and clay, poorly graded. SAPROLITE	Begin drilling 3/5/06	604
1												603
2												602
3												601
4		SPT 1	9 7 9	18/18								600
5												599
6												598
7												597
8												596
9		SPT 2	6 9 9	16/18						SILT, sandy (ML); brown (10YR 5/3); damp, very stiff, <10% sand (fine), poorly graded, <10% clay. SAPROLITE		595
10												594
11												593
12												592
13												591
14		SPT 3	3 3 4	17/18						SILT, sandy (ML); yellow (10YR 7/8) to yellowish brown (10YR 5/4); damp, stiff, 10-15% fine sand, <10% clay, poorly graded. SAPROLITE		590
15												589
16												588
17									▽			587
18												586
19		SPT 4	3 3 5	16/18						SILT, sandy (ML); brown (10YR 5/3); damp, stiff, <30% fine sand, <10% clay. SAPROLITE		585
20												584
21												583
22												582
23												581
24		SPT 5	5 10 10	18/18						SILT, sandy (ML); white (5Y 8/1) to light yellowish brown (2.5YR 6/4); very stiff, damp ~30% fine sand <10% clay. SAPROLITE		580
25												579
26												578
27												577
28									ML	SILT, sandy (ML); very pale brown (10YR 7/3); damp, >30% sand, fine to medium grained, poorly to moderately graded. PARTIALLY WEATHERED ROCK		576
29		SPT 6	14 50/4	12/10						PARTIALLY WEATHERED ROCK No samples recovered		575
30												574
31												573
32												572
33												571
34		SPT 7 CORE	50/1	0/1								570
35				0/12							End of day 3/5/06 Begin day 3/6/06 Rock cored 34 to 35 ft, no recovery, return to SPT sampling	569
36												568
37												567
38												566
39		SPT 8	50/0.25 50/0	0/0.25							Boring terminated 3/6/06 39.3 ft	565
40												564

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1034

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		SPT 9		0 0								564
41												563
42										Total Depth 39.3 ft.		562
43										Groundwater encountered at 17.47 feet		561
44										Borehole Grouted On 3/6/06		560
45												559
46												558
47												557
48												556
49												555
50												554
51												553
52												552
53												551
54												550
55												549
56												548
57												547
58												546
59												545
60												544
61												543
62												542
63												541
64												540
65												539
66												538
67												537
68												536
69												535
70												534
71												533
72												532
73												531
74												530
75												529
76												528
77												527
78												526
79												525
80												524

Project Name and Job Number		
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1035**

Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Switchyard N 1164164 E 1847146		Total Depth 40.2 feet
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC	Elevation and Datum 604.6 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9	Date Started 3/6/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/7/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin drilling on 3/6/06	604
1												603
2												602
3												601
4		SPT 1	3 3 4	13/18						SILT, sandy (ML); light yellowish brown (2.5Y 6/4); damp, medium stiff, <10% sand (very fine), and clay. RESIDUUM		600
5												599
6												598
7												597
8												596
9		SPT 2	3 3 4	15/18						SILT, sandy (ML); yellowish brown (10YR 5/4); damp, medium stiff, <10 % sand or clay, poorly graded. RESIDUUM		595
10												594
11												593
12												592
13												591
14		SPT 3	6 9 12	13/18						SILT, sandy (ML); dark yellowish brown (10YR 5/6); damp, very stiff >30 % sand (well sorted, fine) >10% clay, poorly graded. RESIDUUM		590
15												589
16												588
17												587
18												586
19		SPT 4	18 30 46	16/18						SILT, sandy, clayey (ML); olive brown (2.5Y 4/4); damp, hard, < 20% very fine sand, < 10% clay. RESIDUUM		585
20												584
21												583
22												582
23												581
24		SPT 5	50/1	1/1					ML	SILT, (ML); dark olive gray (5Y 3/2); micaceous. PARTIALLY WEATHERED ROCK		580
25												579
26												578
27												577
28												576
29		SPT 6	49 50/3	11/9					ML	SILT, clayey, sandy and rock fragments, brown (10YR 4/3) to dark grayish brown (10YR 4/2); damp, <15 % clay. PARTIALLY WEATHERED ROCK		575
30												574
31												573
32												572
33												571
34		SPT 7	50/3	6/3						SILT, sandy (ML); dark yellowish brown (10YR 3/4); damp, <15% sand (fine) <10% clay. PARTIALLY WEATHERED ROCK	End drilling 3/6/06 Begin drilling 3/7/06	570
35												569
36												568
37												567
38												566
39		SPT 8	36 50/5.5	12/11.5						SILT, sandy (ML); grayish brown (2.5Y 5/2); ~25% sand, fine sand, poorly graded. PARTIALLY		565
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1035

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		SPT 9	50/2	4/2						WEATHERED ROCK SAA, olive brown (2.5YR 4/3)	Boring terminated 3/7/06 at 40.2 ft	564
41												563
42												562
43												561
44												560
45												559
46												558
47												557
48												556
49												555
50												554
51												553
52												552
53												551
54												550
55												549
56												548
57												547
58												546
59												545
60												544
61												543
62												542
63												541
64												540
65												539
66												538
67												537
68												536
69												535
70												534
71												533
72												532
73												531
74												530
75												529
76												528
77												527
78												526
79												525
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1036**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Low flow reservoir dam N 1166863 E 1844076		Total Depth 23.5 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 591.1 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 4	Date Started 6/5/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/6/06

Reviewed by / Date: B. Reinicker 6/14/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GP	Surface vegetation root mat (~0.2 ft)	Begin drilling 6/5/06	591
1									GP	Gravel mat (~0.1 ft)		590
2									ML	SILT, sandy (ML); strong brown (7.5YR 5/6); dry; very stiff; <20% sand; fine to medium grained; <5% fine gravel; nonplastic; FILL		589
3												588
4		SPT 1	4 8 8	18/18								587
5												586
6												585
7												584
8												583
9		SPT 2	4 8 12	18/18						SAA; micaceous; lifts of fine grained gravel		582
10												581
11												580
12											Losing water	579
13												578
14		SPT 3	9 13 16	18/18						SAA; damp, very stiff; <20% sand; fine to medium grained; <5% fine gravel; non to low plasticity; FILL	End 6/5/06 Start 6/6/06; no water	577
15												576
16											Hole caving, little to no water return	575
17												574
18												573
19		SPT 4	0 6 11	18/18						SAA; strong brown; (7.5 YR 5/6); damp to moist; <20% sand, <5% gravel, red clayey lifts; fine to medium sand, <5% roots, low to non plastic; FILL	Overdrilled by 6 inches	572
20												571
21												570
22												569
23												568
24											Boring terminated due to no water recirculation	567
25												566
26												565
27												564
28												563
29												562
30												561
31												560
32												559
33												558
34												557
35												556
36												555
37												554
38												553
39												552
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1037**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location East side excavation pit N 1166205 E 1847506		Total Depth 78.75 feet
Drilling Contractor and Rig MACTEC/White/33115 / CME 55	Elevation and Datum 589.3 feet MSL	Ground Water Depth 17.5 feet	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 16	Date Started 3/29/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/29/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin drilling 3/29/06	589
1												588
2												587
3												586
4		SPT 1	5 7 8	13/18						SILT, sandy, (ML); mottled red (10R 5/6) to brownish yellow (10YR 6/6), mottled, damp, stiff, medium plastic, poorly graded. Fragments of SAPROLITE (relict rock texture evident), sand is fine grained. FILL		585
5												584
6												583
7												582
8												581
9		SPT 2	5 7 9	14/18						SILT, sandy (ML) strong brown (7.5YR 5/6) and olive gray (5Y 5/2) at tip of shoe SAPROLITE (as above), very stiff, sand, <20 % fine grained. FILL		580
10												579
11												578
12												577
13												576
14		SPT 3	3 3 5	13/18	●	●				SILT, sandy with clay (ML); variegated strong brown and olive gray; medium stiff to stiff; 34% sand 66% fines. FILL		575
15												574
16												573
17									▽			572
18												571
19		SPT 4	3 3 4	13/18	●				ML	SILT, sandy (ML); dark yellowish brown (10YR 4/4) to green-gray grayish brown (2.5Y 5/2), medium stiff, damp, layers (~2 inch) of clay, 41% sand, 2% gravel, 57% fines. SAPROLITE		570
20											Classification based on B-1037-UD UD-2 at 19 to 21 ft	569
21												568
22									SM	SAND, silty (SM); yellow (2.5Y 7/6); moist, loose, fine to medium SAND, relict rock texture throughout, some red laminations clay (0.5 cm). SAPROLITE		567
23												566
24		SPT 5	3 3 2	14/18	●							565
25												564
26												563
27												562
28												561
29		SPT 6	2 2 4	16/18	●					SAND, silty (SM); white (2.5Y 8/0 to 2.5Y 5/2); moist, loose, fine grained SAND, to medium SAND, mica-rich, poorly graded, low plasticity, 5% gravel, 47% sand, 48% fines. SAPROLITE	Classification based on B-1037-UD UD-4 at 29 to 31 ft	560
30												559
31												558
32												557
33												556
34		SPT 7	2 3 3	17/18	●					SAND, silty (SM); loose. Some red clay layers medium black Manganese layers (<1 cm) also parallel foliation. SAPROLITE		555
35												554
36												553
37												552
38												551
39		SPT 8	4 5 7	12/18	●	●				SAND, silty (SM); olive gray (5Y 4/2) to white and grayish brown (2.5Y 8/1 to 2.5Y 5/2), damp,		550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1037

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										medium dense, fine grained, 53% SAND,, 47% fines. SAPROLITE	Boring abandoned due to squeezing of sidewall. Move hole to continue	549
41										SAND, silty (SM); yellow (2.5Y 7/6); moist, loose, fine to medium SAND, relict rock texture throughout, some red laminations clay (0.5 cm). SAPROLITE		548
42												547
43										*(Continued from previous page)*		546
44		SPT 9	3 3 6	17/18					ML	SILT, sandy (ML); olive gray (5Y 4/2) to white and grayish brown (2.5Y 8/1 to 2.5Y 5/2); 48% sand, 52% fines. SAPROLITE	Classification based on B-1037-UD UD-6 at 43 to 45 ft	545
45												544
46												543
47												542
48												541
49		SPT 10	5 8 10	15/18	●	●				SILT, sandy (ML); yellow and brownish yellow (10YR 7/6 to 10YR 6/6), damp, very stiff, 45% sand, 55% fines. SAPROLITE		540
50												539
51												538
52												537
53												536
54		SPT 11	7 8 10	16/18						SILT, sandy (ML); brownish yellow (10YR 6/6), very stiff, sand, is fine to medium grained; SAPROLITE	Losing about 70% water at 53 ft	535
55												534
56												533
57												532
58												531
59		SPT 12	5 6 10	16/18						SILT, sandy (ML) to SILT, clayey (ML) yellow and white (2.5Y 7/6 to 2.5Y 8/2) to brownish yellow (10YR 6/6) to olive brown (2.5Y 4/4), very stiff, damp, 50% SAND, 50% fines. SAPROLITE	Classification based on B-1037-UD UD-8 at 59 to 61 ft	530
60												529
61												528
62												527
63												526
64		SPT 13	8 9 13	15/18	●	●			SM	SAND, silty (SM), brownish yellow (10YR 6/6), damp, medium dense, 45% fines, 55% SAND, is fine to medium grained. SAPROLITE		525
65												524
66												523
67												522
68												521
69		SPT 14	14 29 43	15/18						SAND, silty (SM); sand has slightly increased coarser component, damp, very dense, moderately graded. SAPROLITE		520
70												519
71												518
72									SM	SAND, silty (SM); brownish yellow (10YR 6/6); SAND, fine to coarse grained. PARTIALLY WEATHERED ROCK		517
73												516
74		SPT 15	50/2	2/2								515
75											Drill grinding and crunching	514
76												513
77												512
78										No recovery.		511
79		SPT 16	50/1.5	1.5/1.5							Boring terminated, refer to B-1037A located for offset boring 10 ft north from	510
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1037

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80											B-1037	509
81										Total Depth 78.75 ft.		508
82										Groundwater encountered at 17.5 feet		507
83										Borehole Grouted On 4/26/06		506
84												505
85												504
86												503
87												502
88												501
89												500
90												499
91												498
92												497
93												496
94												495
95												494
96												493
97												492
98												491
99												490
100												489
101												488
102												487
103												486
104												485
105												484
106												483
107												482
108												481
109												480
110												479
111												478
112												477
113												476
114												475
115												474
116												473
117												472
118												471
119												470
120												

SOIL LOG CHEROKEE10-19-07.GPJ WLA9-8-06.GDT 10/24/07

Project Name and Job Number													
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.								**SOIL LOG - Boring No. B-1037-UD**				
Type and Diameter of Boring Wash Rotary / 6 inch									Boring Location General N 1166209 E 1847500			Total Depth 68 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X									Elevation and Datum 589.2 feet MSL		Ground Water Depth N/A	Depth to Bedrock N/A	
Sampling Method Undisturbed									Sample Driving Hammer/Drop NA / NA		No. of Samples 9	Date Started 6/9/06	
									Borehole Inclination -90		Logged by J. Cerceo	Date Completed 6/10/06	

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Boring located NW of B-1037 Drilled without sampling to 13 ft.	589
1												588
2												587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11												578
12												577
13		UD 1		21.6/24					ML	SILT, sandy (ML).	Shelby push 13 to 15 ft	576
14												575
15											Drilled without sampling to 19 ft.	574
16												573
17												572
18												571
19		UD 2		19.2/24	●	●	●		ML	SILT, sandy (ML); 2% gravel, 41% sand, 57% fines.	Shelby push 19 to 21 ft	570
20												569
21											Drilled without sampling to 23 ft.	568
22												567
23		UD 3		24/24					SM	SAND, silty (SM).	Shelby push 23 to 25 ft	566
24												565
25											Drilled without sampling to 29 ft.	564
26												563
27												562
28												561
29		UD 4		22.8/24	●	●	●		SM	SAND, silty (SM); 5% gravel, 47% sand, 48% fines.	Shelby push 29 to 31 ft	560
30												559
31											Drilled without sampling to 33 ft.	558
32												557
33		UD 5		24/24					SM	SAND, silty (SM).	Shelby push 33 to 35 ft	556
34												555
35											Drilled without sampling to 43 ft.	554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1037-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												549
41												548
42												547
43												546
44		UD 6		24/24	●	●	●		ML	SILT, sandy (ML); 48% sand, 52% fines.	Shelby push 43 to 45 ft	545
45												544
46											Drilled without sampling to 53 ft.	543
47												542
48												541
49												540
50												539
51												538
52												537
53												536
54		UD 7		24/24					ML	SILT, sandy (ML).	Shelby push 53 to 55 ft	535
55												534
56											Drilled without sampling to 59 ft.	533
57												532
58												531
59												530
60		UD 8		24/24	●	●	●		ML	SILT, sandy (ML); 50% sand, 50% fines.	Shelby push 59 to 61 ft.	529
61												528
62												527
63												526
64		UD 9		14.4/24					ML	SILT, sandy (ML).	Pitcher barrel 63 to 65 ft	525
65												524
66												523
67												522
68											Tricone refusal. Boring terminated	521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1037A**	
Type and Diameter of Boring HQ core / 3.75 inch	Boring Location East side excavation pit N 1166215 E 1847504		Total Depth 96.6 feet
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC	Elevation and Datum 589.3 feet MSL	Ground Water Depth 33 feet	Depth to Bedrock 70.6 feet
Casing Size and Depth 4 inch / 70.6 feet	Length of Core Barrel and Bit 8.6 feet / 8.6 feet	No. of Core Boxes 3	Date Started 4/2/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 4/4/06

Reviewed by / Date: F. Syms 5/25/06
Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
71		1	1.0/1.0	70	MW	R3		META-GRANODIORITE; mottled white (7.5YR 8/1); reddish yellow (7.5YR 8/6) and black (7.5YR 2/1); porphyroblastic, fine to coarse grained, reddish yellow oxides along fracture surfaces, healed fractures dip 50°, vugs/pits along healed incipient fractures; very closely spaced irregular incipient healed fractures.		518
72										517
73										516
74		2	3.3/5.0	32	MW	R2 to R3				515
75										514
76										513
77								SAA; increasing xenoliths of leucocratic to mafic composition CONTINUOUS ROCK		512
78										511
79		3	5.0/5.0	90	MW	R2 to R3				510
80										509
81								META-QUARTZ DIORITE META-GRANODIORITE		508
82										507
83								META-QUARTZ DIORITE; pegmatitic dikes (feldspar-rich) with calcite veins and quartz veins, and very closely to closely spaced incipient and healed fractures and foliation joints.		506
84		4	5.0/5.0	100	F	R4 to R5				505
85										504
86										503
87								META-GRANODIORITE; xenoblastic, fine to coarse grained; mafics >40%, feldspar 30 to 40%, quartz 20 to 30%.		502
88										501
89		5	5.0/5.0	100	F	R4 to R5				500
90										499
91										498
92								SAA; slightly mafic mineral composition near 94 ft	End of day 4/3/06 Begin day 4/4/06 water level 33 ft	497
93										496
94		6	4.9/5.0	98	F	R5		Migmatitic texture highly mafic zone.		495
95										494
96										493
97									End of coring	492
98										491
99								Total Depth 96.6 ft. Groundwater encountered at 33 feet Borehole Grouted On 4/26/06		490
100										489
101										488
102										487
103										486
104										485
105										484
106										483
107										482
108										481
109										480
110										479

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1038

Type and Diameter of Boring: Wash Rotary / NQ core / 3 inch / NQ	Boring Location: Unit 2, N 1166165 E 1847350		Total Depth: 50.2 feet
Drilling Contractor and Rig: MACTEC/Abingdon / CME 75	Elevation and Datum: 546.5 feet MSL	Ground Water Depth: 1 feet	Depth to Bedrock: 4.1 feet
Casing Size and Depth: none	Length of Core Barrel and Bit: 13.1 feet	No. of Core Boxes: 3	Date Started: 5/29/06
	Borehole Inclination: -90	Logged by: J. Cerceo	Date Completed: 5/31/06

Reviewed by / Date: B. Reinicker 10/6/06
Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
4							Wash rotary refusal at 4.1 ft.		542
5	1	2.2 / 2.2	67	MW to SW	R3		META-GRANODIORITE; bluish gray (5PB 6/1); black (N 2.5); light red (2.5YR 6/8); fine to medium grained; quartz, plagioclase, K-spar, hornblende, iron and manganese staining on some joint surfaces; micaceous minerals	Gravel fill to 4.1 ft for use as drill pad	541
6	2	1.6 / 1.6	100	MW to SW	R3				540
7									539
8	3	0.2	100	MW to SW	R3		Little to no iron staining	End day 5/29/06	
	4	0.2	100		R3			Start 5/30/06; water at 1 ft - area requires pumping to access drill rig.	538
9	5	0.8	57	MW to SW	R3				
10	6	0.8 / 0.4 / 0.7	89	MW to SW	R3		CONTINUOUS ROCK		537
11									536
12	7	1.8 / 1.8 / 2.3	100	MW to SW	R3				535
13									534
14	8	2.3	100	MW to SW	R3				533
15	9	0.5 / 0.5 / 4.3 / 4.3	100	MW to SW	R3				532
16									531
17									530
18									529
19							SAA; calcite in healed very closely spaced veins; mafic inclusion (~4 cm x 2 cm)		528
20	10	5.0 / 5.0	100	F	R4				527
21									526
22									525
23									524
24									523
25	11	5.0 / 5.0	95	F	R4				522
26									521
27									520
28									519
29									518
30	12	5.0 / 5.0	100	F	R4				517
31									516
32									515
33									514
34							META-GRANODIORITE		513
35	13	5.2 / 5.2	95	F	R4				512
36									511
37									510
38									509
39	14	2.0 / 2.0	100	F	R4				508
40									507
41							META-GRANODIORITE		506
42	15	4.1 / 4.1	100	F	R4				505
43									504
									503

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1038

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
44										502
45								SAA; epidote and calcite mineralization within some healed fractures	End day 5/30/06 Start 5/31/06; water measured 1.0 ft - area requires pumping to access drill rig.	501
46										500
47		16	5.9/5.9	98	F	R4				499
48										498
49										497
50										496
51									Boring terminated on 5/31/06	495
52										494
53								Total Depth 50.2 ft. Groundwater encountered at 1 feet Borehole Grouted On 1/19/07		493
54										492
55										491
56										490
57										489
58										488
59										487
60										486
61										485
62										484
63										483
64										482
65										481
66										480
67										479
68										478
69										477
70										476
71										475
72										474
73										473
74										472
75										471
76										470
77										469
78										468
79										467
80										466
81										465
82										464
83										463

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1044**	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch / NQ	Boring Location ISFSI N 1167711 E 1847455		Total Depth 43.6 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 588 feet MSL	Ground Water Depth N/A	Depth to Bedrock 23.6 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9	Date Started 5/1/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/1/06

Reviewed by / Date: F. Syms 5/22/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									SP-SM	Field straw grass root mat (3 inches thick)		588
1										SAND silty (SP to SM)		587
2										Light bluish gray (5PB 7/1),dense to very dense		586
3										<5% silt, fine to coarse sand, SAPROLITE		585
4		SPT 1	8 19 17	18								584
5												583
6												582
7												581
8												580
9												579
10		SPT 2	13 21 25	18/18								578
11												577
12												576
13											Refusal at 13.6 ft., see rock log	575
14		SPT 3	50/1	2/1						SAA; SAPROLITE.		574
15												573
16												572
17												571
18												570
19												569
20												568
21												567
22												566
23												565
24												564
25												563
26												562
27												561
28												560
29												559
30												558
31												557
32												556
33												555
34												554
35												553
36												552
37												551
38												550
39												549
40												548

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1044**	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch / NQ	Boring Location ISFSI N 1167711 E 1847455		Total Depth 43.6 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 588 feet MSL	Ground Water Depth N/A	Depth to Bedrock 23.6 feet
Casing Size and Depth 3.75 inch / 13.6 feet	Length of Core Barrel and Bit 13.1 feet	No. of Core Boxes 3	Date Started 5/1/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/1/06

Reviewed by / Date: F. Syms 5/22/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
14									SPT refusal at 13.6 feet Beginning NQ Rock core	574
15								Weathered mafic minerals such as hornblende, replaced with biotite, meta quartzite and muscovite.		573
16		4	4.3/5.0	36	HW	R2 to R3				572
17										571
18								Quartz vein with mineralization of biotite		570
19					MW	R3				569
20								Vugs manganese rich staining		568
21		5	5.0/5.0	44						567
22					HW	R2		Biotite mineralization around the quartz vein		566
23										565
24					MW	R3				564
25										563
26		6	5.0/5.0	66	HW	R2		META-GRANODIORITE to META-QUARTZ DIORITE; bluish gray (10PB 5/1); fine grained, felsic banding moderately spaced, thin and medium thick altered plagioclase or K-spar near subvertical closely spaced fractures. CONTINUOUS ROCK		562
27										561
28								Quartzite pegmatite vein (27.6 to 27.9)		560
29										559
30										558
31		7	4.8/5.0	96						557
32										556
33										555
34								META-QUARTZ DIORITE to META-GRANODIORITE; fine to medium grained, moderately spaced fractures, primary minerals quartz, hornblende, K-spar, biotite, muscovite.		554
35										553
36		8	5.0/5.0	100	SW to F	R3				552
37								Red aphanitic mineralization		551
38										550
39								Mafic xenoliths with calcite healed fractures		549
40										548
41		9	5.0/5.0	100						547
42										546
43								Mafic xenoliths.		545
44									Over drilled ~5 inch to ensure final depth and mechanical break near end of run	544
45										543
46										542
47										541
48										540
49										539
50										538
51										537
52										536
53										535

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1045**	
Type and Diameter of Boring Wash Rotary / NQ2 core / 3 inch / NQ	Boring Location ISFSI N 1167756 E 1847636		Total Depth 54 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 588.4 feet MSL	Ground Water Depth N/A	Depth to Bedrock 21 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 11	Date Started 4/24/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/1/06

Reviewed by / Date: F. Syms 5/22/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Field straw grass root mat	Begin drilling 4/24/06	588
1									ML	SILT, sandy (ML) red (10R 5/6); >10% fine sand, low plasticity, clayey fill deposits, fine gravel. FILL		587
2												586
3												585
4		SPT 1	3 3 6	10/18	●						End 4/24/06 Start 4/25/06 No water encountered Classification based on B-1045-UD, UD-1 at 4 to 6 ft	584
5										SAA; 5% gravel, 52% fines, 43% sand. FILL		584
6												583
7												582
8												581
9		SPT 2	3 7 12	15/18	●					SAA, red (10R 5/6); more dry, 41% sand, 59% fines. FILL	Classification based on B-1045-UD, UD-2 at 9 to 10.2 ft	580
10												579
11												578
12									ML	SILT, sandy (ML); red (10R 5/6) reddish brown (5YR 4/4), white (5YR 8/1); medium dense, fine to medium sand, trace quartz rock fragments. RESIDUUM		577
13												576
14		SPT 3	15 11 7	18						SAA; 48% sand, 52% fines	Classification based on B-1045-UD UD-3 at 14 to 16 ft	575
15												574
16												573
17												572
18												571
19		SPT 4	3 50/4	9/7					SM	SAND, silty (SM); pinkish gray (7.5YR 7/2); and brown (7.5YR 5/3); fine to medium sand, very dense, <10% silt, subangular, plagioclase and quartz rock fragments. SAPROLITE		570
20												569
21											End 4/25/06. No water encountered Start 4/30/06. No water encountered Tricone refusal at 21.0 ft, see rock log	568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												549

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1045**	
Type and Diameter of Boring Wash Rotary / NQ2 core / 3 inch / NQ	Boring Location ISFSI N 1167756 E 1847636		Total Depth 54 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 588.4 feet MSL	Ground Water Depth N/A	Depth to Bedrock 21 feet
Casing Size and Depth none	Length of Core Barrel and Bit 13.1 feet	No. of Core Boxes 3	Date Started 4/24/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/1/06

Reviewed by / Date: F. Syms 5/22/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
21									567
22	5	2.4/3.0	30	HW to MW	R2 to R3		META-QUARTZ DIORITE; bluish gray (5PB 6/1) to light bluish gray (5PB 7/1); fine to medium grained; hornblende, biotite, plagioclase, quartz. PARTIALLY WEATHERED ROCK	Begin rock core at 21.0 ft on 5/1/06 Did not use casing	566
23									565
24				HW	R2				564
25	6	4.7/5.0	88	MW			META-QUARTZ DIORITE; bluish gray (5PB 6/1) to light bluish gray (5PB 7/1); fine to medium grained. CONTINUOUS ROCK		563
26								100% water recirculation loss	562
27									561
28									560
29	7	5.0/5.0	100	SW to F	R3		META-QUARTZ DIORITE; healed breccia filled with biotite or hornblende.		559
30									558
31									557
32									556
33									555
34									554
35	8	5.0/5.0	100						553
36									552
37									551
38									550
39									549
40	9	4.8/5.0	88				META-QUARTZ DIORITE; bluish gray (5PB 6/1); fine to medium grained; plagioclase, quartz, hornblende, calcite, epidote, chlorite; subvertical epidote healed fractures Altered plagioclase near closely spaced healed fractures.		548
41									547
42				CW	R2		Chlorite and meta-quartzite healed fracture, weathered with manganese oxide stained vugs.		546
43									545
44									544
45	10	4.9/5.0	98				Fine grained zone from 45.1 to ~ 46.5 ft.		543
46									542
47									541
48				SW to F	R3				540
49									539
50							SAA; fine to medium grained; mafic xenoliths.		538
51	11	4.5/5.0	88						537
52									536
53									535
54								Last 0.5 ft of core left in hole	534
55								Boring terminated on 5/1/06	533
56									532
57							Total Depth 54 ft.		531
58							Borehole Grouted On 5/1/06		530
59									529
60									528
61									

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1045-UD**	
Type and Diameter of Boring Wash Rotary / 4 inch	Boring Location ISFSI N 1167749 E 1847628		Total Depth 16 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 588.4 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 3	Date Started 6/11/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/11/06

Reviewed by / Date B. Reinicker 6/13/06

Reviewed by / Date C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled without sampling to 4 ft.	588
1												587
2												586
3												585
4											Shelby push 4 to 6 ft	584
5		UD 1		20.4/24	●	●	●		ML	SILT, sandy (ML); 5% gravel, 43% sand, 52% fines.		583
6											Drilled without sampling to 9 ft.	582
7												581
8												580
9											Shelby push 9 to 10.2 ft	579
10		UD 2		14.4/14.4	●	●	●		ML	SILT, sandy (ML); 41% sand, 59% fines.	Shelby push refusal at 10.2 ft	578
11											Drilled without sampling to 14 ft.	577
12												576
13												575
14											Shelby push 14 to 16 ft	574
15		UD 3		18/24	●	●	●		ML	SILT, sandy (ML); 48% sand, 52% fines.		573
16											Boring terminated	572
17												571
18												570
19												569
20												568
21												567
22												566
23												565
24												564
25												563
26												562
27												561
28												560
29												559
30												558
31												557
32												556
33												555
34												554
35												553
36												552
37												551
38												550
39												549
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1046**	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch / NQ	Boring Location ISFSI N 1167815 E 1847834		Total Depth 93.3 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 588.3 feet MSL	Ground Water Depth 36 feet	Depth to Bedrock 61.4 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 12	Date Started 4/18/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/24/06

Reviewed by / Date: F. Syms 5/22/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	Grassmat 0.3 feet SILT, sandy (ML) red (2.5YR 4/6); stiff; clayey (fill) deposits, fine gravel; fine sand; 39% sand, 61% fines. FILL	Begin drilling 4/18/06	588
1												587
2												586
3												585
4		SPT 1	8 7 7	18	●	●					Very hard drilling	584
5												583
6												582
7												581
8												580
9		SPT 2	3 4 6	18/18	●							579
10										SILT, sandy (ML); light red (2.5YR 6/8); stiff; <10% sand; trace clayey fill deposits; scattered rock fragments. FILL		578
11												577
12												576
13												575
14		SPT 3	3 6 5	11/18	●					SAA; non to low plastic silts; quartz gravel pieces in first 6 inch 12% gravel, 36% sand, 53% fines. FILL	Classification based on B-1046-UD, UD-3 at 14 to 16 ft	574
15												573
16												572
17											Stiff drilling at 17.0 feet	571
18												570
19		SPT 4	4 6 7	14/18	●							569
20									SM	SAND silty (SM) red (2.5YR 4/8), dry, fine sand, medium dense; <15% silt, sparse and scattered rock fragments, FILL		568
21												567
22												566
23												565
24		SPT 5	3 5 6	13/18	●						Classification based on B-1046-UD, UD-5 at 24 to 26 ft	564
25									ML	SILT, sandy (ML) Light red (2.5YR 6/8), dry to damp, stiff, fine sand non to low plasticity; 25% sand, 74% fines. RESIDUUM		563
26											Harder drilling at ~ 25.5 feet	562
27												561
28												560
29		SPT 6	4 6 8	15/18						SAA; micaceous.		559
30												558
31												557
32												556
33												555
34		SPT 7	3 4 7	17/18	●							554
35									SM ▽	SAND, silty (SM), reddish yellow (5YR 6/6) medium dense, <30% silt, fine sand, quartz fragments, poorly graded. RESIDUUM		553
36												552
37												551
38												550
39		SPT 8	4 4 6	18/18	●							549
40									CL	CLAY, sandy (CL), red (10R 4/6); trace sand		

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1046

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									SM	medium plasticity. RESIDUUM		548
41										SAND, silty (SM); reddish yellow (5YR 6/6); loose, ~15% silt, fine sand, quartz fragments. RESIDUUM		547
42										*(Continued from previous page)*		546
43												545
44		SPT 9	5 12 20	18/18					ML	SILT, sandy (ML); reddish yellow (5YR 6/6); hard, 44% sand, 56% fines. RESIDUUM	Classification based on B-1046-UD UD-8 44 to 46 ft	544
45												543
46												542
47												541
48												540
49		SPT 10	15 22 37	15/18						SAA; hard, fine to medium sand, coarse component appears to be quartz or plagioclase. RESIDUUM		539
50												538
51												537
52												536
53												535
54		SPT 11	27 39 46	17/18	●					SAA; reddish yellow (5YR 6/6); hard, fine to medium sand. RESIDUUM		534
55												533
56												532
57												531
58									SM	SAND, silty (SM); reddish yellow (5YR 6/6); fine to medium sand.		530
59		SPT 12	50/1	1						SAPROLITE/PARTIALLY WEATHERED ROCK		529
60												528
61												527
62												526
63												525
64												524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1046**	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch / NQ	Boring Location ISFSI N 1167815 E 1847834		Total Depth 93.3 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 588.3 feet MSL	Ground Water Depth 36 feet	Depth to Bedrock 61.4 feet
Casing Size and Depth 3.5 inch / 58.6 feet	Length of Core Barrel and Bit 13.1 feet / 13.1 feet	No. of Core Boxes 3	Date Started 4/18/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/24/06

Reviewed by / Date: F. Syms 5/22/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
59							SAND, (SP); yellowish red (5YR 5/6); quartz vein.		529
60				RS to CW	R0 to R2		PARTIALLY WEATHERED ROCK	End SPT sampling at 58.6 feet; SPT refusal. Begin NQ rock core. See core log.	528
61	13	2.4/4.7	0						527
62				HW to MW	R3		META-GRANODIORITE, bluish gray (10B 6/1), fine to medium grained, joints are moderately open with very thin manganese staining. Quartz is the chief accessory mineral. PARTIALLY WEATHERED ROCK.		526
63				HW	R2				525
64	14	4.0/4.0	38	MW	R3				524
65									523
66									522
67				HW	R0				521
68							SAA,mafic xenoliths, epidote filling in some healed fractures.		520
69									519
70	15	6.0/6.0	95					Lost 100% water ~70 ft	518
71									517
72				MW to SW	R3				516
73							SAA; PARTIALLY WEATHERED ROCK		515
74									514
75	16	5.0/5.0	58						513
76									512
77					R2				511
78									510
79							META-DIORITE, dark bluish gray (5B 4/1) and dark brown (7.5YR 3/3), fine grained, foliation dipping 50°, calcite filled fractures with accessory minerals biotite or hornblende. CONTINUOUS ROCK.	End 4/18/06 Start 4/19/06 water at 38.0 feet	509
80									508
81	17	4.9/5.0	88				META-DIORITE, black (N 2.5), fine grained, calcite filled fractures with accessory minerals hornblende and biotite.		507
82									506
83							META-GRANODIORITE, light bluish gray, fine to medium grained, having accessory mineralization of calcite, biotite, quartz, plagioclase.		505
84									504
85	18	5.0/5.0	76	SW to F	R3				503
86									502
87									501
88									500
89							META-GRANODIORITE, bluish gray, (10B 6/1) fine to medium grained, biotite, quartz, plagioclase, calcite mineralization.	End 4/19/06 Start 4/24/06 water at 36.0 feet	499
90									498
91	19	4.7/5.0	82						497
92									496
93									495
94								Coring terminated 4/24/06	494
95									493
96							Total Depth 93.3 ft.		492
97							Groundwater encountered at 36 feet		491
98							Borehole Grouted On 4/24/06		490

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1046-UD**	
Type and Diameter of Boring Wash Rotary / 6 inch	Boring Location ISFSI N 1167822 E 1847835		Total Depth 54 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 588 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 9	Date Started 6/10/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/11/06

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											6/10/06 Drilled without sampling to 4 ft.	588
1												587
2												586
3												585
4		UD 1		0/3						No recovery.	Shelby push 4 to 4.25 ft Shelby push refusal No recovery	584
5												583
6												582
7											Drilled without sampling to 10 ft.	581
8												580
9												579
10		UD 2		23.4/24					ML	SILT, sandy (ML).	Shelby push 10 to 12 ft.	578
11												577
12											Drilled without sampling to 14 ft.	576
13												575
14		UD 3		15.6/24	●	●	●		ML	SILT, sandy (ML); 12% gravel, 36% sand, 52% fines	Shelby push 14 to 16 ft	574
15												573
16											Drilled without sampling to 19 ft.	572
17												571
18												570
19		UD 4		23.4/24					SM	SAND, silty (SM).	Shelby push 19 to 21 ft.	569
20												568
21											Drilled without sampling to 24 ft.	567
22												566
23												565
24		UD 5		22.8/24	●	●	●		ML	SILT, sandy (ML); 25% sand, 74% fines.	Shelby push 24 to 26 ft.	564
25												563
26											Drilled without sampling to 32 ft.	562
27												561
28												560
29												559
30												558
31												557
32		UD 6		16.2/24					SM	SAND, silty (SM).	Shelby push 32 to 34 ft End 6/10/06 Start 6/11/06 Groundwater not available	556
33												555
34											Drilled without sampling to 40 ft.	554
35												553
36												552
37												551
38												550
39												549
40												548

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1046-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												548
41		UD 7		27.6/28					SM	SAND, silty (SM).	Shelby push 40 to 42.3 ft.	547
42												546
43											Drilled without sampling to 44 ft.	545
44											Changed over to pitcher barrel equipment	544
45		UD 8		19.2/24	●	●	●		ML	SILT, sandy (ML); 44% sand, 56% fines.	Pitcher drill from 44 to 46 ft.	543
46												542
47											Drilled without sampling to 52 ft.	541
48												540
49												539
50												538
51												537
52												536
53		UD 9		8.4/24					SM	SAND, silty (SM).	Pitcher drill 52 to 54 ft.	535
54												534
55											Boring terminated 6/11/06	533
56												532
57												531
58												530
59												529
60												528
61												527
62												526
63												525
64												524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												508

Project Name and Job Number		
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1047**

Type and Diameter of Boring Wash Rotary / NQ core / 3 inch / NQ	Boring Location ISFSI N 1167543 E 1847907		Total Depth 93.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 588.1 feet MSL	Ground Water Depth 32 feet	Depth to Bedrock 58.5 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 11	Date Started 4/25/06
	Borehole Inclination -90	Logged by A. Tillery/E. Weldon	Date Completed 4/27/06

Reviewed by / Date: F. Syms 5/22/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									SM	SAND, silty (SM), yellow (10YR 7/8), damp, loose and yellow with quartz grain, mottled with dark black manganese and white spots. RESIDUUM	Begin drilling 4/25/06	588
1												587
2												586
3												585
4		SPT 1	4 2 3	18/18								584
5												583
6												582
7												581
8												580
9		SPT 2	3 3 4	16/18	●	●				SAND, silty (SM), yellow (10YR 7/8); damp, loose, mottled; large zone of black mineral manganese near top of sample; 43% fines, 57% sand.		579
10												578
11												577
12												576
13												575
14		SPT 3	4 5 8	17/18	●	●				SAND, silty (SM); much less yellow (2.5YR 5/3); damp, medium dense, more gray, white and black, still mottled, biotite quartz and fewer black inclusions; 42% fines, 58% sand. RESIDUUM		574
15												573
16												572
17												571
18												570
19		SPT 4	5 8 10	13/18	●				SM	SAND, silty (SM); gray upper 6 inches (10YR 7/2); damp, medium dense, bottom half (below 6 inches) more yellow (10YR 7/6). SAPROLITE		569
20												568
21												567
22												566
23												565
24		SPT 5	6 7 10	16/18	●	●				SAA, yellow (10YR 7/6); damp, medium dense, mottled yellow, gray, some black manganese oxide, 49% fines, 51% sand. SAPROLITE		564
25												563
26												562
27												561
28												560
29		SPT 6	5 12 26	15/18						SAA; yellow (10YR 6/6); damp; hard; mottled		559
30									SM	SAND, silty (SM); yellow, gray and some black; PARTIALLY WEATHERED ROCK		558
31												557
32										▽		556
33												555
34		SPT 7	34 46 50/5	16/17	●	●				SAND, silty (SM); yellow gray (10YR 6/4); damp, very dense, mica, quartz, less black manganese oxide, 39% fines, 61% sand. PARTIALLY WEATHERED ROCK		554
35												553
36												552
37												551
38												550
39		SPT 8	32 50/6	12/12						SAA, gray (2.5Y 7/2); damp, mottled. PARTIALLY WEATHERED ROCK		549
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1047

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												548
41												547
42												546
43												545
44		SPT 9	50/2	4/2						SAND, silty (SM); yellow (2.5Y 6/8); damp, some gravel sized rock fragments. PARTIALLY WEATHERED ROCK		544
45												543
46												542
47												541
48												540
49		SPT 10	50/4	6/4						SAND, silty (SM); yellow (10YR 5/8); damp, quartz fragments up to 0.5 cm, mottled. PARTIALLY WEATHERED ROCK		539
50												538
51												537
52												536
53												535
54		SPT 11	36 50/4	11/10	●	●				SAND, silty (SM) (2.5Y 6/3); 37% fines, 63% sand. PARTIALLY WEATHERED ROCK		534
55												533
56												532
57												531
58										No recovery.	SPT sampling terminated 58.5 ft. See rock log	530
59		SPT 12	50/1	0/1								529
60												528
61												527
62												526
63												525
64												524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1047**	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch / NQ	Boring Location ISFSI N 1167543 E 1847907		Total Depth 93.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 588.1 feet MSL	Ground Water Depth 32 feet	Depth to Bedrock 58.5 feet
Casing Size and Depth 3.5 inch / 58.5 feet	Length of Core Barrel and Bit 5 feet / 3 feet	No. of Core Boxes 2	Date Started 4/25/06
	Borehole Inclination -90	Logged by A. Tillery/E. Weldon	Date Completed 4/27/06

Reviewed by / Date: F. Syms 5/22/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
59								End 4/25/06	529
60								Begin 4/26/06; water at 27.2 ft	528
61	1	4.4/5.0	37	MW	R1 to R2		META-GRANODIORITE; gray to black to light orange; equigranular texture to moderately coarse grained. Weak foliation shown by mineral alignment and compositional segregation. Foliation direction varies from horizontal to 35°. Many healed fractures, brecciated in places, closely spaced with rough some vugs and pits weathered out.		527
62									526
63									525
64							Fractures healed with calcite		524
65									523
66	2	5.0/5.0	50	MW	R1 to R2				522
67									521
68							Meta-mafic dike or amphibolite from 67.8 to 69 ft		520
69									519
70							META-GRANODIORITE as above. CONTINUOUS ROCK.		518
71	3	5.0/5.0	68	MW to SW	R2 to R3		Meta-mafic dike or amphibolite from 70.6 to 71.4 ft		517
72							META-QUARTZ DIORITE to META-GRANODIORITE light color mineral lining fractures, minerals albite, quartz, feldspar, mafics, minor calcite, talc, and epidote.		516
73									515
74									514
75									513
76	4	5.0/5.0	68	MW to SW	R2 to R3				512
77									511
78									510
79	5	0.5/0.5	0	MW to SW	R2 to R3				509
80	6	2.5/2.5	68	MW to SW	R2 to R3				508
81									507
82	7	1.6/2.0	37	MW to SW	R2 to R3				506
83							AMPHIBOLITE; dark bluish gray (5B 4/1); very fine grained; foliation dip 60°, xenoliths of meta-quartz diorite/meta-granodiorite.		505
84									504
85									503
86	8	4.3/5.0	68	SW	R3				502
87									501
88							META-QUARTZ DIORITE to META-GRANODIORITE as described above		500
89								End 4/26/06	499
90								Begin 4/27/06; water at 32 ft	498
91	9	4.8/5.0	90	F	R4			Losing water	497
92									496
93									495
94								Boring terminated 4/27/06	494
95									493
96									492
97							Total Depth 93.5 ft. Groundwater encountered at 32 feet Borehole Grouted On 4/27/06		491
98									490

Project Name and Job Number	SOIL LOG - Boring No. B-1047-UD
Lee Nuclear Station COL 6234-06-3389	

Type and Diameter of Boring	Boring Location		Total Depth
Wash Rotary / 6 inch	ISFSI N 1167548 E 1847908		40 feet
Drilling Contractor and Rig	**Elevation and Datum**	**Ground Water Depth**	**Depth to Bedrock**
MACTEC/Banks/337153 / CME 550 X	588.2 feet MSL	N/A	N/A
Sampling Method	**Sample Driving Hammer/Drop**	**No. of Samples**	**Date Started**
Undisturbed	NA / NA	5	6/11/06
	Borehole Inclination	**Logged by**	**Date Completed**
	-90	J. Cerceo	6/11/06

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											6/11/06 Drilled without sampling to 4 ft.	588
1												587
2												586
3												585
4												
5		UD 1		23.4/24					ML	SILT, sandy (ML).	Shelby push 4 to 6 ft	584 / 583
6												
7											Drilled without sampling to 9 ft.	582
8												581
9												580
10		UD 2		25/25					ML	SILT, sandy (ML).	Shelby push 9 to 11.1 ft	579 / 578
11												
12											Drilled without sampling to 14 ft.	577
13												576
14												575
15		UD 3		22.8/24	●	●	●		SM	SAND, silty (SM); 35% fines, 65% sand.	Shelby push 14 to 16 ft.	574 / 573
16												
17											Drilled without sampling to 24 ft.	572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25		UD 4		15.6/19.2	●	●	●		ML	SILT, sandy (ML); 1% gravel, 47% sand, 52% fines.	Shelby push 24 to 25.6 ft. Shelby push refusal	564 / 563
26											Drilled without sampling to 34 ft. Changed to pitcher sample equipment	562
27												561
28												560
29												559
30												558
31												557
32												556
33												555
34												
35		UD 5		0/24						No recovery.	Pitcher drill from 34 to 36 ft.	554 / 553
36												
37											Drilled without sampling to 40 ft. Tricone refusal, boring terminated	552
38												551
39												550
40												549

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1048**	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch / NQ	Boring Location ISFSI N 1167477 E 1847718		Total Depth 84.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.5 feet MSL	Ground Water Depth 25 feet	Depth to Bedrock 44.5 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9	Date Started 4/27/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 4/29/06

Reviewed by / Date: F. Syms 5/23/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); strong brown (7.5YR 5/8); damp, stiff, sand ~10%, clay <10 to 15%, very fine sand, manganese oxide, veins, mottled. FILL	Begin drilling 4/27/06	587
1												586
2												585
3												584
4		SPT 1	3 4 5	20.4/18								583
5									ML	SILT, sandy (ML); red (2.5YR 4/8) to yellowish brown (10 YR 5/4); damp, medium stiff, manganese oxide, veining. RESIDUUM		582
6												581
7												580
8												579
9		SPT 2	2 3 4	18/18								578
10												577
11												576
12												575
13												574
14		SPT 3	3 3 4	18/18					ML	SILT, sandy (ML); light gray (7.5Y 7/4); damp, medium stiff, relict foliation apparent with parallel manganese veining, 74% fines. SAPROLITE	B-1048-UD, UD-2 at 14 to 16 ft	573
15												572
16												571
17												570
18												569
19		SPT 4	2 4 5	14.4/18						SAA; dark brown (10YR 3/3) to yellowish red (5YR 5/8); stiff, moist, sand (very fine) manganese oxide veins parallel to foliation. SAPROLITE		568
20												567
21												566
22												565
23												564
24		SPT 5	3 6 8	18/18						SAA; olive gray (5Y 4/2) with reddish yellow (7.5YR 6/8) veins occasional damp, stiff, 1% gravel, 63% fines. SAPROLITE	B-1048-UD, UD-2 at 24 to 26 ft	563
25									▽			562
26												561
27												560
28												559
29		SPT 6	12 22 48	18/18						SAA; light gray (10YR 7/2) to olive (5Y 5/3); hard, damp, fine to medium. SAPROLITE		558
30												557
31												556
32												555
33												554
34		SPT 7	11 12 24	16.8/18						SAA; olive gray (5Y 4/2); damp; hard; sand is very fine. SAPROLITE		553
35												552
36												551
37												550
38												549
39		SPT 8	7 11 17	20.4/18						SAA; olive gray (5Y 4/2); damp, very stiff. SAPROLITE		548
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1048

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												547
41												546
42									SM	SAND, silty, clayey (SM) with gravel; olive gray to dark olive gray (5Y 4/3 to 5Y 3/2); very hard, damp, <10% silt and clay, 60% sand, 40% gravel. PARTIALLY WEATHERED ROCK AT 43.9 ft.		545
43												544
44		SPT 9	50/4	0 / 4							Refusal at 44.4 ft., see rock log	543
45												542
46												541
47												540
48												539
49												538
50												537
51												536
52												535
53												534
54												533
55												532
56												531
57												530
58												529
59												528
60												527
61												526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1048**	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch / NQ	Boring Location ISFSI N 1167477 E 1847718		Total Depth 84.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.5 feet MSL	Ground Water Depth 25 feet	Depth to Bedrock 44.5 feet
Casing Size and Depth 3.5 inch / 44.5 feet	Length of Core Barrel and Bit 8 feet / 8 feet	No. of Core Boxes 3	Date Started 4/27/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 4/29/06

Reviewed by / Date F. Syms 5/23/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
45									543
46									542
47	1	1.7/5.0	0	HW to MW	R1 to R2		META-QUARTZ DIORITE; speckled light gray (10YR 7/1) to gray (10YR 6/6) to dark gray (10YR 4/1); equigranular; xenoblastic 40% feldspar, 25 to 30% mafics; biotite and hornblende, minor pyrite; occasional amphibolite xenoliths. PARTIALLY WEATHERED ROCK	Tricone refusal at 44.4 ft, drilled casing to 44.5 to start rock coring Start NQ core on 4/28/06. Total water loss Water loss continuous	541
48									540
49									539
50									538
51	2	2.4/5.0	20	HW to MW	R1 to R2			Water loss continuous	537
52									536
53									535
54									534
55									533
56									532
57	3	4.0/5.0	30	MW	R2 to R3			Water loss continuous	531
58									530
59									529
60									528
61	4	3.4/3.6	42	MW	R2				527
62									526
63									525
64	5	0.5/1.4	0	HW to MW	R1				524
65							AMPHIBOLITE to META-DIORITE; dark gray, hornblende, mica, biotite, plagioclase and pyrite; porphyroblasts randomly oriented; Epidote? green mineralization within 3 mm of contact	PARTIALLY WEATHERED ROCK	523
66									522
67	6	4.6/5.0	54	HW to MW	R1 to R3				521
68							META-QUARTZ DIORITE OR META-GRANODIORITE		520
69									519
70							SAA. META-QUARTZ DIORITE to META-GRANODIORITE.		518
71									517
72	7	4.9/5.0	78	MW to SW	R2 to R3		CONTINUOUS ROCK		516
73									515
74							AMPHIBOLITE to META-DIORITE; dark gray, equigranular, fine grained		514
75							META-QUARTZ DIORITE; sheared, with healed mylonitized fabric near (within 6 inch contact); calcite fills the finely sheared zone near contact.		513
76									512
77	8	4.1/5.0	68	SW	R4				511
78									510
79									509
80							META-GRANODIORITE or META-QUARTZ DIORITE; orthoclase-rich or plagioclase rich (altered)		508
81	9	3.3/3.3	91	SW	R3 to R4				507
82									506
83									505
84	10	1.7/1.7	76	SW	R3 to R4		SAA; epidote rich vein; brecciated and healed		504
							META-DIORITE to AMPHIBOLITE; dark gray,		503

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1048

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
85								porphyroblastic	Coring terminated on 4/29/06; water at 25 ft	503
86										502
87										501
88								Total Depth 84.5 ft.		500
89								Groundwater encountered at 25 feet		499
90								Borehole Grouted On 4/29/06		498
91										497
92										496
93										495
94										494
95										493
96										492
97										491
98										490
99										489
100										488
101										487
102										486
103										485
104										484
105										483
106										482
107										481
108										480
109										479
110										478
111										477
112										476
113										475
114										474
115										473
116										472
117										471
118										470
119										469
120										468
121										467
122										466
123										465
124										464
										463

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1048-UD**	
Type and Diameter of Boring Wash Rotary / 4 inch	Boring Location ISFSI N 1167471 E 1847715		Total Depth 26 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 587.5 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 3	Date Started 6/11/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/11/06

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled without sampling to 4 ft.	587
1												586
2												585
3												584
4											Shelby push 4 to 6 ft	583
5		UD 1		21.6/24					ML	SILT, sandy (ML).		582
6											Drilled without sampling to 14 ft.	581
7												580
8												579
9												578
10												577
11												576
12												575
13												574
14											Shelby push 14 to 16 ft	573
15		UD 2		15.6/24	●	●	●		ML	SILT, sandy (ML); 26% sand, 74% fines.		572
16											Drilled without sampling to 24 ft.	571
17												570
18												569
19												568
20												567
21												566
22												565
23												564
24											Shelby push 24 to 26 ft.	563
25		UD 3		24/24	●	●	●		ML	SILT, sandy (ML); 1% gravel, 36% sand, 63% fines.		562
26											Boring terminated at 26 ft on 6/11/06	561
27												560
28												559
29												558
30												557
31												556
32												555
33												554
34												553
35												552
36												551
37												550
38												549
39												548
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1049**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location ISFSI N 1167470 E 1847541		Total Depth 81 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.4 feet MSL	Ground Water Depth 23.8 feet	Depth to Bedrock 31 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 6	Date Started 4/29/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/1/06

Reviewed by / Date: F. Syms 5/27/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); red (2.5YR 5/8); dry, stiff, <5% clay, <10% sand, fine to coarse sand. FILL	Start on 4/29/06	587
4		SPT 1	6 7 7	19.2/18	●							583
7									ML	SILT, sandy (ML); very pale brown (10YR 8/3 and 10YR 7/3); damp, medium stiff, very fine <1% clay; manganese oxide veins subhorizontal. SAPROLITE		580
9		SPT 2	2 2 4	15.6/18								578
14		SPT 3	4 5 7	18/18					SP	SAND, silty (SP); gray (10YR 6/1) to yellow (10YR 7/6); medium dense, damp, fine grained. SAPROLITE		573
19		SPT 4	6 7 14	16.8/18						SAND, (SP); light gray (10YR 7/1); white (10YR 8/1), and yellow (10YR 8/6); damp, medium dense, fine grained, <5% clay, <10% silt. SAPROLITE		568
24		SPT 5	7 11 12	15.6/18					▽	SAND, (SP) as above; medium dense, manganese oxide vein (~45° dip). SAPROLITE		563
29		SPT 6	12 13 12	16.8/18						SAND, (SP); grayish brown (10YR 5/2) to white (5Y 8/1); damp; medium dense. SAPROLITE		558
31											SPT sampling terminated at 31.0 ft. See rock core log.	557
40												548

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1049**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location ISFSI N 1167470 E 1847541		Total Depth 81 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.4 feet MSL	Ground Water Depth 23.8 feet	Depth to Bedrock 31 feet
Casing Size and Depth 3.5 inch / 31 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 3	Date Started 4/29/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/1/06

Reviewed by / Date: F. Syms 5/27/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
31										556
32										555
33										554
34										553
35										552
36		1	3.6/5.0	52	MW to HW	R1 to R3		META-QUARTZ DIORITE or META-GRANODIORITE; black, pale yellow, light gray, speckled equigranular. Weak 20° foliation in upper and ~30° in mid to lower core. Mafics (hornblende, biotite, minor pyrite probably) 15 to 40%. Feldspar ~40%, quartz ~10 to 20% (gray blue)	Tricone refusal on 4/29/06 Start NQ rock core on 4/30/06; water at 18.3 ft	551
37										550
38		2	5.0/5.0	88	SW	R3 to R4		SAA. CONTINUOUS ROCK	Total water loss.	549
39										548
40								SAA		547
41										546
42		3	4.9/5.0	70	MW to SW	R3 to R4		Fabric becomes increasingly gneissic, felsic and mafic mineral separation and banding is more pronounced.		545
43										544
44										543
45										542
46		4	5.0/5.0	98	SW to F	R4 to R5				541
47										540
48										539
49										538
50										537
51		5	4.9/5.0	92	SW to F	R4 to R5				536
52										535
53										534
54										533
55										532
56										531
57		6	5.0/5.0	100	SW to F	R4 to R5		META-QUARTZ DIORITE; Speckled black, gray, blue gray; equigranular, aggregates fine grained; mafic and felsic minerals; xenoblastic except in veins		530
58										529
59										528
60										527
61		7	4.9/5.0	96	SW to F	R4 to R5				526
62										525
63										524
64										523
65										522
66								SAA		521
67									End day 4/30/06	520
68									5/1/06 start drilling; water level at 23.8 ft	519
69		8	5.1/5.1	94	F	R4 to R5		Foliation strong and very closely spaced healed fractures with shear, offset approximately 1 cm.	100% water loss	518
70										517
71										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

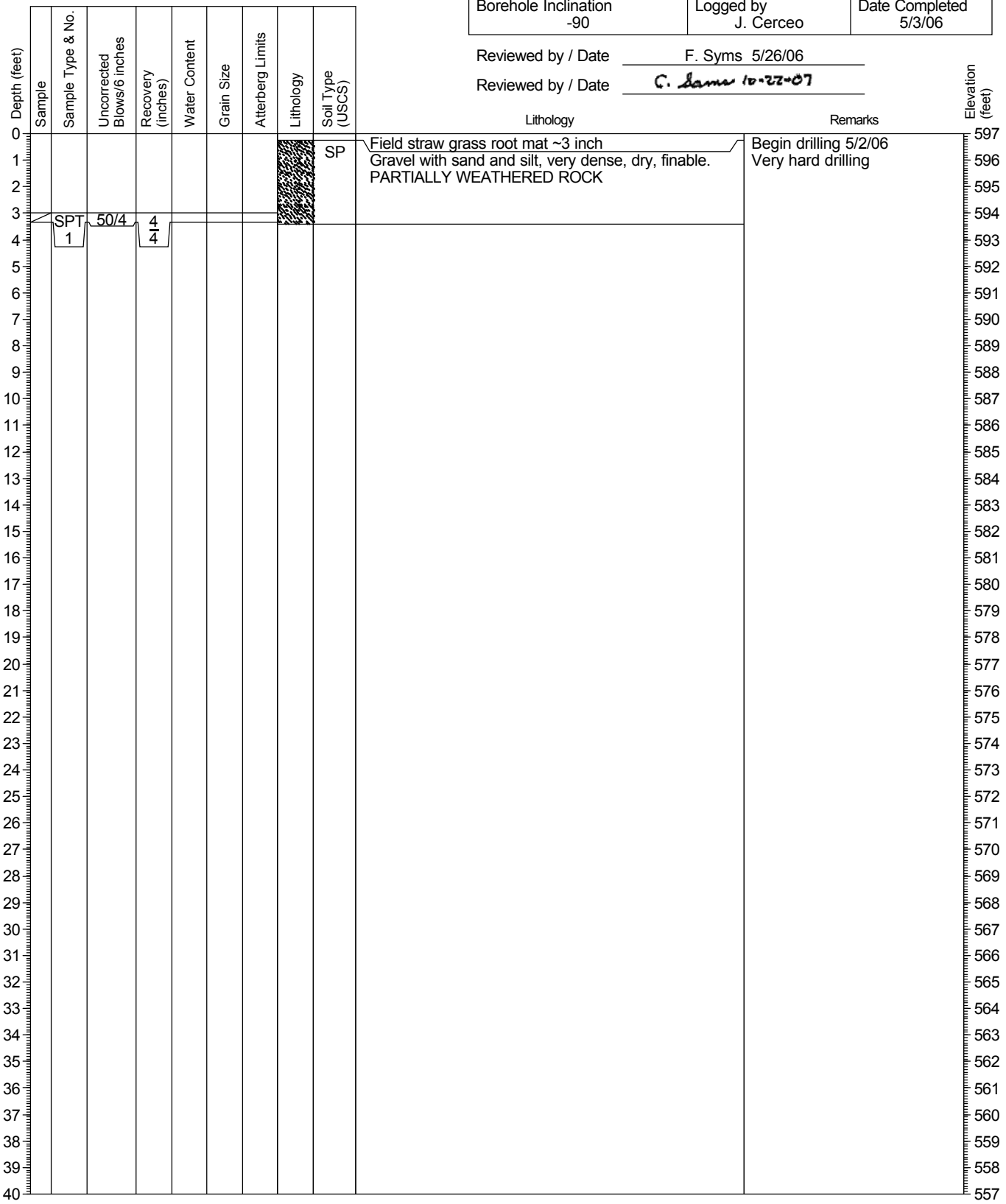
ROCK LOG - Boring No. B-1049

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
71							SAA		516
72								Water loss continues	515
73	9	4.8/4.9	97	F	R5				514
74									513
75									512
76	10	0.5	100	F	R5		SAA		511
77		0.5							510
78									509
79	11	4.5/4.5	93	F	R5				508
80									507
81								Coring terminated on 5/1/06	506
82									505
83									504
84							Total Depth 81 ft.		503
85							Groundwater encountered at 23.8 feet		502
86							Borehole Grouted On 5/1/06		501
87									500
88									499
89									498
90									497
91									496
92									495
93									494
94									493
95									492
96									491
97									490
98									489
99									488
100									487
101									486
102									485
103									484
104									483
105									482
106									481
107									480
108									479
109									478
110									477
111									

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1050**	
Type and Diameter of Boring Wash Rotary / NQ core / 3.75 inch / NQ	Boring Location Unit 1 N 1164915 E 1846053		Total Depth 73.4 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 597 feet MSL	Ground Water Depth 13 feet	Depth to Bedrock 3.4 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 15	Date Started 5/2/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/3/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: C. James 10-22-07



Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1050**	
Type and Diameter of Boring Wash Rotary / NQ core / 3.75 inch / NQ	Boring Location Unit 1 N 1164915 E 1846053		Total Depth 73.4 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 597 feet MSL	Ground Water Depth 13 feet	Depth to Bedrock 3.4 feet
Casing Size and Depth 3.75 inch / 3.4 feet	Length of Core Barrel and Bit 13.1 feet / 13.1 feet	No. of Core Boxes 3	Date Started 5/2/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/3/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
4									593
5									592
6	2	1.2/5.0	0				META-GRANODIORITE to META-QUARTZ DIORITE; dark reddish brown (5YR 2.5/2); fine grained; biotite, muscovite, quartz, altered plagioclase and pyrite. PARTIALLY WEATHERED ROCK.	Begin NQ rock core	591
7									590
8									589
9	3	1.5/5.0	0				SAA.		588
10									587
11									586
12									585
13				RS to CW	R1 to R2		▽		584
14	4	1.4/5.0	0						583
15									582
16									581
17									580
18									579
19	5	1.0/5.0	0						578
20									577
21									576
22									575
23									574
24	6	1.5/5.0	0	RS to CW	R0 to R1		SAA; increased mafic minerals, biotite, muscovite, hornblende		573
25									572
26									571
27									570
28									569
29	7	0.8/5.0	0	RS to CW	R0 to R1		META-DIORITE; dark reddish brown (5YR 2.5/2); fine grained; mafic minerals include biotite, and hornblende; highly weathered plagioclase. PARTIALLY WEATHEREED ROCK		568
30									567
31									566
32									565
33									564
34	8	0.9/5.0	0						563
35									562
36									561
37									560
38									559
39	9	2.3/5.0	7				META-QUARTZ DIORITE; very dark gray (10YR 3/1) and dark reddish brown; fine grained, quartz, plagioclase, hornblende, biotite, muscovite.		558
40									557
41									556
42									555
43				HW	R3				554

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1050

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
44					R1				553
45	10	1.3/5.0	0	RS to CW	R0 to R1				552
46				HW	R2				551
47				RS to CW	R0 to R1				550
48									549
49	11	1.7/5.0	10				SAA; bluish gray (5PB 6/1); fine grained, hornblende, plagioclase, biotite, pyrite, quartz.	End day 5/2/06 Begin 5/3/06; water at 13 ft	548
50									547
51				HW	R2				546
52				RS to CW	R0 to R1				545
53									544
54	12	1.9/5.0	0	HW	R2				543
55									542
56				RS to CW	R0 to R1				541
57									540
58									539
59	13	3.5/5.0	44	HW	R2		META-QUARTZ DIORITE; bluish gray; fine grained, hornblende, quartz, plagioclase. PARTIALLY WEATHERED ROCK		538
60				RS to CW	R0 to R1				537
61									536
62									535
63									534
64	14	5.0/5.0	100	SW to F	R3		META-QUARTZ DIORITE; bluish gray; fine to medium grained, most fractures healed with quartz and micaceous minerals. CONTINUOUS ROCK.		533
65									532
66							Quartz Pegmatite vein.		531
67							Subvertical fractures healed with quartz.		530
68									529
69	15	5.0/5.0	100				META-QUARTZ DIORITE; bluish gray; fine grained; hornblende, quartz, plagioclase, biotite.		528
70									527
71							Foliation dipping 50° perpendicular to healed quartz fractures.		526
72									525
73									524
74								Coring terminated on 5/3/06	523
75									522
76							Total Depth 73.4 ft.		521
77							Groundwater encountered at 13 feet		520
78							Borehole Grouted On 5/3/06		519
79									518
80									517
81									516
82									515
83									514

Project Name and Job Number					
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1051**			
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 1 Pipeline N 1164991 E 1846392		Total Depth 71.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.7 feet MSL	Ground Water Depth 14.7 feet	Depth to Bedrock 26.5 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 5	Date Started 5/9/06	
		Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/10/06	

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									CL	CLAY, silty (CL); yellowish red (5YR 5/6) to grayish brown (2.5Y 5/2); damp, stiff, <10% sand, occasional subangular rock fragment (<3 mm). FILL	Start 5/9/06	587
1												586
2												585
3												584
4		SPT 1	4 5 4	19.2 18								583
5												582
6												581
7												580
8												579
9		SPT 2	8 12 9	13.2 18	●	●			SM	SAND, silty with gravel (SM); grayish brown (5YR 5/6); dry; subangular; gravel sized rock pieces. FILL		578
10									SM	SAND, silty (SM) with gravel, reddish yellow (7.5YR 6/8) to yellow (10YR 8/6), damp, medium dense, 21% gravel, 51% sand, 28% fines; SAPROLITE		577
11												576
12												575
13												574
14		SPT 3	26 40 29	15.6 18	●	●				SAND, silty with gravel (SM); yellowish brown (10YR 5/6) to light yellowish brown (10YR 6/4), damp, very dense, 4% gravel, 62% sand, 34% fines. SAPROLITE		573
15									▽			572
16												571
17												570
18												569
19		SPT 4	12 20 50/5	13.2 17	●	●				SAND, silty (SM); yellowish brown (10YR 5/6); damp, very dense, mostly medium grained sand, 28% gravels, 56% sand, 16% fines. SAPROLITE		568
20												567
21												566
22												565
23												564
24		SPT 5	14 18 31	18 18	●	●				SAND, silty, with gravel (SM); brown to very dark brown (10YR 4/3 to 10YR 3/1) to strong brown (7.5YR 5/6); damp, dense, 2% gravels, 61% sand, 37% fines. SAPROLITE		563
25												562
26											Tricone refusal 26.5 ft., see rock log	561
27												560
28												559
29												558
30												557
31												556
32												555
33												554
34												553
35												552
36												551
37												550
38												549
39												548
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1051**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location Unit 1 Pipeline N 1164991 E 1846392		Total Depth 71.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.7 feet MSL	Ground Water Depth 14.7 feet	Depth to Bedrock 26.5 feet
Casing Size and Depth 3.5 inch / 26.5 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 3	Date Started 5/9/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/10/06

Reviewed by / Date F. Syms 5/26/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
27										561
28		1	3.5/4.0	0	HW to MW	R2		META-DIORITE to AMPHIBOLITE; black (2.5Y 2/0) to yellowish red (5YR 5/8) where weathered; equigranular; fine grained >50 to 60% mafic minerals (hornblende, biotite?, pyroxene?), 40 to 50% plagioclase? mostly strongly foliated near quartz veining. Very closely spaced incipient and healed fractures joints throughout. PARTIALLY WEATHERED ROCK.	Tricone refusal switched to NQ rock coring.	560
29										559
30									Losing ~20% water	558
31		2	0.7/1.0	0	HW	R2				557
32										556
33		3	2.0/3.8	0	HW	R1 to R2				555
34									70% water loss	554
35								More leucocratic and coarse grained, more brecciated 34.5 to 43.5 ft		553
36		4	1.3/1.2	69	HW to MW	R2			End 5/9/06 Start 5/10/06	552
37								META-QUARTZ DIORITE or META-DIORITE; brecciated with very closed spaced fractures, slightly more coarse grained texture.		551
38										550
39		5	4.7/4.8	35	MW	R2		SAA; healed or filled fracture joints throughout entire core. Orientations vary, intersecting and irregular. More brecciated in lower part of run 5.		549
40										548
41										547
42		6	2.0/2.2	41	MW	R2				546
43										545
44								METADIORITE to AMPHIBOLITE; upper ~ 1 ft. mylonitized? to schistose and darker color (dark gray) and more mafic than above.		544
45		7	2.5/3.0	13	HW to MW	R2			~80% water loss	543
46										542
47										541
48		8	2.7/2.7	15	HW	R2				540
49										539
50		9	1.0/2.3	0	HW to MW	R2		META-QUARTZ DIORITE or META-DIORITE; gray to brownish gray; equiangular, fine grained; (mafic inclusions) around hornblende? Hornblende and biotite 50 to 70%, plagioclase and quartz 50 to 30%		538
51										537
52		10	2.4/2.4	16	HW to MW	R2		Rock is weathered with MgO mineralization in all fracture and joint surfaces, and some FeO staining also. Veins forming along incipient joints and foliation joints, very closely spaced incipient joints, fractures.		536
53										535
54										534
55		11	1.7/2.6	0	HW to MW	R2		SAA, but also moderately spaced veins of quartz obliquely to vertical		533
56										532
57								Minor calcite and epidote associated wtih quartz veins SAA. PARTIALLY WEATHERED ROCK.		531
58										530
59		12	4.8/5.0	68	MW to SW	R2 to R3				529
60										528
61										527
62										526
63									100% water loss	525
64		13	5.0/5.0	64	MW to SW	R2 to R3				524
65										523
66										522

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1051

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
67										521
68										520
69		14	4.6/5.0	18	HW to MW	R2 to R3		META-DIORITE or AMPHIBOLITE; as above, but more weathered. PARTIALLY WEATHERED ROCK.		519
70										518
71										517
72									Coring terminated on 5/10/06; water at 14.7 ft	516
73										515
74								Total Depth 71.5 ft.		514
75								Groundwater encountered at 14.7 feet		513
76								Borehole Grouted On 5/10/06		512
77										511
78										510
79										509
80										508
81										507
82										506
83										505
84										504
85										503
86										502
87										501
88										500
89										499
90										498
91										497
92										496
93										495
94										494
95										493
96										492
97										491
98										490
99										489
100										488
101										487
102										486
103										485
104										484
105										483
106										482

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1052**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location Unit 1 Pipeline N 1165181 E 1846736		Total Depth 70.7 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.4 feet MSL	Ground Water Depth 26.5 feet	Depth to Bedrock 53.7 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 11	Date Started 5/3/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/9/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, (ML); yellowish red (5YR 5/8); damp, stiff, <5% clay and <5 % sand (very fine), low plasticity, some subangular rock fragments. FILL	Start 5/3/06 Fill	587
1												586
2												585
3												584
4		SPT 1	2 3 6	15.6 / 18								583
5												582
6												581
7												580
8												579
9		SPT 2	3 3 5	16.8 / 18	●	●			SC	SAND, clayey with gravel (SM); gray (5Y 6/1); damp, loose, 10% gravel, 46% sand, 44% fines medium plasticity. ALLUVIUM		578
10									CL	CLAY, silty, sandy (CL); pale yellow (2.5Y 7/6) and yellowish red (5YR 5/8). SAPROLITE		577
11												576
12												575
13									SM	SAND, silty with gravel (SM); very pale brown (10YR 7/4); damp to moist, 8% gravel, 70% sand, 22% fines. Grains are angular to subangular. PARTIALLY WEATHERED ROCK		574
14		SPT 3	50/6	6 / 6	●	●						573
15												572
16												571
17												570
18												569
19		SPT 4	50/4.5	5.4 / 4.5	●	●				SAND, silty with gravel (SM); dark grayish brown (2.5Y 4/2), moist, 7% gravel, 63% sand, 30% fines well graded, gravels are subangular. PARTIALLY WEATHERED ROCK		568
20												567
21												566
22												565
23												564
24		SPT 5	50/4	4 / 4	●	●			GM	GRAVEL with silt (GM); dark grayish brown (2.5Y 4/2); moist; 43% gravel, 42% sand, 15% fines. PARTIALLY WEATHERED ROCK		563
25												562
26									▽			561
27												560
28												559
29		SPT 6	50/5	6 / 5						SAA; grayish brown (2.5Y 5/2); damp, <10% clay, well graded to moderately graded. PARTIALLY WEATHERED ROCK		558
30												557
31												556
32												555
33												554
34		SPT 7	50/5.5	5.5 / 5.5						SAA; olive gray (5Y 5/2). PARTIALLY WEATHERED ROCK		553
35												552
36												551
37												550
38												549
39		SPT 8	50/1	1 / 1								548
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1052

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												547
41												546
42												545
43												544
44		SPT 9	12 20 31	18/18					ML	SILT, sandy (ML); pinkish white (7.5YR 8/2) and reddish yellow (7.5YR 7/8) and dark brown (7.5YR 4/2); damp, poorly graded, low plasticity. PARTIALLY WEATHERED ROCK		543
45												542
46												541
47												540
48												539
49		SPT 10	50/3	4.8/3					GW	GRAVEL, sandy (GW) olive gray (5Y 5/2); damp, ~10% clay, angular to subangular gravels (<1 cm). PARTIALLY WEATHERED ROCK.	End of drilling 5/3/06 Begin drilling 5/8/06; water at 26.5 ft Hard drilling 48.8 to 53.7 ft	538
50												537
51												536
52												535
53											Tricone refusal 53.65 ft., see rock log	534
54		SPT 11	50/2	0/2						No recovery.		533
55												532
56												531
57												530
58												529
59												528
60												527
61												526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1052**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location Unit 1 Pipeline N 1165181 E 1846736		Total Depth 70.7 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.4 feet MSL	Ground Water Depth 26.5 feet	Depth to Bedrock 53.7 feet
Casing Size and Depth 3.5 inch / 53.7 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 1	Date Started 5/3/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/9/06

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
54										533
55										532
56		1	5.0/5.0	50	MW	R3		META-GRANODIORITE or META-QUARTZ DIORITE; speckled gray, black, buffed, equigranular. ~30% quartz, ~30% mafics, ~30 feldspar (plagioclase).	Tricone refusal, begin NQ core	531
57										530
58										529
59		2	4.7/5.0	66	MW to SW	R3		SAA. Very closely spaced calcite healed fractures.		528
60										527
61										526
62										525
63										524
64		3	4.5/4.5	62	SW	R3		Increase in mafic minerals and development of foliation and healed mylonitization fabric		523
65										522
66								META-QUARTZ DIORITE; increasingly healed mylonitized and foliated fabric.		521
67										520
68								SAA. CONTINUOUS ROCK		519
69		4	2.5/2.5	72	SW	R3			100% water loss	518
70									~50% water loss	517
71									Coring terminated on 5/9/06	516
72										515
73								Total Depth 70.7 ft.		514
74								Groundwater encountered at 26.5 feet		513
75								Borehole Grouted On 5/9/06		512
76										511
77										510
78										509
79										508
80										507
81										506
82										505
83										504
84										503
85										502
86										501
87										500
88										499
89										498
90										497
91										496
92										495
93										494

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1053**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location Unit 2 Pipeline N 1165781 E 1847797		Total Depth 13.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 589.3 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 2	Date Started 5/11/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/11/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Start on 5/11/06	589
1												588
2												587
3												586
4		SPT 1	2 2 4	15.6/18						SILT, sandy, gravelly (ML); yellowish red (5YR 5/6 to 5YR 4/6); damp, medium stiff, <20% sand, <5% clay, angular gravels, low to medium plasticity, sands are fine to medium grained. FILL		585
5												584
6												583
7												582
8												581
9		SPT 2	0 0 2	0/18						No sample recovery, very soft.		580
10												579
11												578
12												577
13												576
14											Boring terminated at 13.5 ft on 5/11/06 due to apparent subsurface obstruction continue drilling on B-1053A offset 3.6 ft southerly	575
15												574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number	SOIL LOG - Boring No. B-1053-UD
Lee Nuclear Station COL 6234-06-3389	

Type and Diameter of Boring Wash Rotary / 4 inch	Boring Location Unit 2 Pipeline N 1165682 E 1847817		Total Depth 26.3 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 589.3 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 2	Date Started 6/8/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/8/06

Reviewed by / Date: B. Reinicker 6/13/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Offset 3.4 ft from B-1053C Drilled without sampling to 19 ft.	589
19		UD 1		26.75 / 27.25					ML	SILT, sandy (ML).	Shelby push 19 to 21.3 ft	570
24		UD 2		25.5 / 26.75	●	●	●		ML	SILT, sandy (ML); 71% fines, 29% sand.	Shelby push 24 to 26.3 ft	565
26											Boring terminated at 26.3 ft	563
40												550

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1053A**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location Unit 2 Pipeline N 1165778 E 1847798		Total Depth 16 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 589.3 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 1	Date Started 5/11/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/11/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drilled without sampling to 13.5 ft, see B-1053. FILL	B-1053A is offset 3.6 ft from B-1053 to the south. Drilled without sampling to 13.5 ft	589
1												588
2												587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10											Drill clanging, possible subsurface obstruction.	579
11												578
12												577
13												576
14		SPT 1	0 1 2	6/18					ML	SILT, sandy (ML); brown (7.5YR 5/4); moist, soft, fine to medium sand, minor gravel sized component, 30 to 40 % sand. FILL	Begin SPT sampling	575
15											Tricone refusal at 16.0 ft. on 5/11/06; possible subsurface obstruction, boring terminated Offset ~17 ft west to B-1053B to continue drilling	574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1053B**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location Unit 2 N 1165778 E 1847780		Total Depth 13.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 589.6 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method	Sample Driving Hammer/Drop	No. of Samples	Date Started 5/12/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/12/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drilled without sampling to 13.5 ft No sample collected	Start 5/12/06 Drilled without sampling to 13.5 ft	589
1												588
2												587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11												578
12												577
13												576
14											No sample recovered Boring terminated due to possible subsurface obstruction and offset to B-1053C ~100 ft southerly to continue drilling	575
15												574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number		
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1053C**

Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location Unit 2 Pipeline N 1165682 E 1847809		Total Depth 69.2 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 589.5 feet MSL	Ground Water Depth 17.4 feet	Depth to Bedrock 54.2 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 11	Date Started 5/12/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/12/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, (ML); brown (7.5YR 5/4) to yellowish red (5YR 5/8); damp; medium stiff or soft; <15% fine grained sand, FILL	5/12/06 Start drilling	589
1												588
2												587
3												586
4		SPT 1	2 3 4	15.6/18					SM	SAND, silty (SM); red (2.5YR 5/8) to very pale brown (10YR 7/3); damp, loose, >40 % silt; sand is fine to medium, manganese oxide veining. SAPROLITE		585
5												584
6												583
7												582
8												581
9		SPT 2	2 3 5	16.2/18	●	●				SAA; brownish yellow (10YR 6/6) to light brownish gray (10YR 6/2) to very dark grayish brown (10YR 3/2); damp, loose; 53% sand, 47% fines, manganese oxide veins (relict) rock texture. SAPROLITE		580
10												579
11												578
12												577
13												576
14		SPT 3	2 1 2	19.2/18	●	●				SAA; brownish yellow (10YR 6/8); moist and very loose, 4% gravel, 54% sand, 42% fines. SAPROLITE		575
15												574
16												573
17									▽			572
18												571
19		SPT 4	1 2 2	12/18	●					SAA; damp, very loose, fine to coarse sand, manganese oxide veins, some fine gravels <5%, subangular. SAPROLITE		570
20												569
21												568
22												567
23												566
24		SPT 5	2 2 4	19.2/18	●				ML	SILT, sandy (ML); gray (5Y 5/1) to yellow (2.5Y 7/6); moist, medium stiff, 29% sand, 71% fines. SAPROLITE	Classification based on B-1053-UD UD-2 from 24 to 26.3 ft	565
25												564
26												563
27												562
28												561
29		SPT 6	9 11 14	15.6/18	●	●			SM	SAND, silty (SM); gray to white to olive gray (5Y 6/1 to 5Y 8/1 to 5Y4/2), damp, medium dense, 61% sand, 39% fines. SAPROLITE		560
30												559
31												558
32												557
33												556
34		SPT 7	7 13 24	19.2/18	●					SAND, silty (SM); olive to dark olive (5Y 5/3 to 5Y 3/2); damp, dense, sand is mostly fine grained, micaceous. SAPROLITE		555
35												554
36												553
37												552
38												551
39		SPT 8	12 26 50	18/18	●	●			ML	SILT, sandy (ML); light olive brown (2.5Y 5/4) to yellowish brown (10YR 5/8); damp, hard,		550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1053C

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									ML	manganese oxide veins more coarse grained; 33% sand, 67% fines. PARTIALLY WEATHERED ROCK		549
41												548
42									SM	SAND, silty (SM); olive brown (2.5Y 4/4). PARTIALLY WEATHERED ROCK		547
43												546
44		SPT 9	25 50/5	10.8 11	●							545
45												544
46												543
47												542
48												541
49		SPT 10	50/4	6 4						SAND, silty (SM); strong brown to dark brown (7.5YR 5/6 to 10YR 4/3); damp; fine to medium grained. PARTIALLY WEATHERED ROCK		540
50												539
51												538
52												537
53												536
54		SPT 11	50/3	4.8 3						SAND, silty, gravelly (SM); very dark grayish brown (10YR 3/2) to yellowish brown (10YR 5/6); damp, gravels >40% angular, sand is predominantly medium to coarse. PARTIALLY WEATHERED ROCK	Tricone refusal at 54.2 ft. see rock log	535
55												534
56												533
57												532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1053C**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 2 Pipeline N 1165682 E 1847809	Total Depth 69.2 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 589.5 feet MSL	Ground Water Depth 17.4 feet Depth to Bedrock 54.2 feet
Casing Size and Depth 3.5 inch / 53.5 feet		Length of Core Barrel and Bit	No. of Core Boxes N/A Date Started 5/12/06
		Borehole Inclination -90	Logged by E. Weldon Date Completed 5/12/06

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
55		1	4.8/5.0	58	HW to SW	R1 to R3		META-QUARTZ DIORITE; yellowish brown (10YR 5/8) to gray (10YR 6/1) to very dark gray (10YR 3/1); coarse, equigranular but mafics sometimes aggregates of very fine crystals. Plagioclase ~50%, quartz ~15 to 25%, hornblende and mica 15 to 25%	Tricone refusal at 54.2 ft. Switched to NQ rock core 100% water return	535
56										534
57										533
58										532
59										531
60								SCHIST; dark brown (10YR 3/3); fine grained hornblende schist.		530
61		2	4.6/5.0	54				META-DIORITE; dark gray (7.5YR 4/0) with white porphyroblasts of plagioclase (or quartz?); strong foliation of porphyroblast 50 to 60° with thin quartz veins parallel to the foliation, veins fractured and totally filled with calcite.		529
62										528
63										527
64										526
65		3	5.0/5.0	98				SAA. Foliation at 70°, moderate to closely spaced quartz veins typically cut by foliation. CONTINUOUS ROCK	100% water return	525
66										524
67										523
68										522
69										521
70								Total Depth 69.2 ft. Groundwater encountered at 17.4 feet Borehole Grouted On 4/13/06	Coring terminated on 5/12/06 5/13/06 water at 17.4 ft	520
71										519
72										518
73										517
74										516
75										515
76										514
77										513
78										512
79										511
80										510
81										509
82										508
83										507
84										506
85										505
86										504
87										503
88										502
89										501
90										500
91										499
92										498
93										497
94										496

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1054**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location Unit 2 N 1165836 E 1847569		Total Depth 83.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 590.9 feet MSL	Ground Water Depth 19.4 feet	Depth to Bedrock 43.5 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9	Date Started 5/13/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/14/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); red (2.5YR 5/6) to grayish brown (2.5Y 5/2); damp to dry, stiff, ~30% sand, <20% clay, sands are very fine to coarse, mostly fine to medium, several gravel size (<3 cm) angular rock fragments in upper part. FILL	Start on 5/13/06	590
1												589
2												588
3												587
4	/	SPT 1	4 5 6	9.6/18								586
5												585
6												584
7												583
8												582
9	/	SPT 2	1 1/12	3.6/18						SAA; dark yellowish brown (10YR 4/4); wet, very soft, sand <40%, <10% clay, gravel sized fragments of fresh rock (upper part). FILL		581
10												580
11												579
12												578
13												577
14	/	SPT 3	0 0 1	6.6/18						SILT, sandy (ML); dark yellowish brown (10YR 4/4); moist to damp, very soft, sand 40%, fine to coarse (mainly fine grained). 5% clay. FILL		576
15												575
16												574
17												573
18												572
19	/	SPT 4	6 8 10	16.8/18					ML	SILT, sandy (ML); olive brown (2.5Y 4/4); damp, very stiff, manganese oxide veins. SAPROLITE		571
20												570
21												569
22												568
23												567
24	/	SPT 5	12 19 23	14.4/18					SM	SAND, silty with gravel (SM); very dark gray (2.5Y 3/1) to red (2.5 YR 4/8); damp, very dense, <20% silt, ~40% gravel (subangular to subrounded), micaceous. SAPROLITE		566
25												565
26												564
27												563
28												562
29	/	SPT 6	12 14	18/18					ML	SILT, sandy (ML); grayish brown (2.5Y 5/2) to very dark grayish brown (2.5Y 3/2); damp, very stiff, sand <20% very fine, micaceous. SAPROLITE		561
30												560
31												559
32												558
33												557
34	/	SPT 7	3 9 19	16.8/18						SILT, sandy (ML); light gray (10YR 7/1) (lower 1 ft) to dark olive gray (5Y 3/2) (upper 6 inch); damp, very stiff, <25% sand (very fine to medium grained), <10% clay, micaceous. SAPROLITE		556
35												555
36												554
37												553
38												552
39	/	SPT 8	3 3 6	18/18						SILT, sandy (ML); olive gray (5Y 4/2); damp, stiff. SAPROLITE		551
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1054

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												550
41												549
42												548
43		SPT 9	50/0.5	0 / 0.5						No sample recovery. PARTIALLY WEATHERED ROCK	Very hard drilling with tricone Refusal at 43.5 ft., see rock log	547
44												546
45												545
46												544
47												543
48												542
49												541
50												540
51												539
52												538
53												537
54												536
55												535
56												534
57												533
58												532
59												531
60												530
61												529
62												528
63												527
64												526
65												525
66												524
67												523
68												522
69												521
70												520
71												519
72												518
73												517
74												516
75												515
76												514
77												513
78												512
79												511
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1054**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location Unit 2 N 1165836 E 1847569		Total Depth 83.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 590.9 feet MSL	Ground Water Depth 19.4 feet	Depth to Bedrock 43.5 feet
Casing Size and Depth 3.5 inch / 43.5 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 2	Date Started 5/13/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/14/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
44									547
45								Refusal at 43.5 ft. Begin NQ core	546
46	1	4.5/5.0	84	SW	R3 to R4		META-QUARTZ DIORITE or META-DIORITE; gray to dark gray (2.5Y 5/1 to 2.5Y 4/1); fine to medium grained; foliated. Streaked fabric suggests slight mylonitization throughout.		545
47								Losing ~20% water	544
48									543
49									542
50	2	5.0/5.0	78	HW to SW	R1 to R3			100% water loss	541
51									540
52									539
53				CW					538
54							PARTIALLY WEATHERED ROCK and SAPROLITE SILT, sandy (ML); grayish brown (2.5Y 5/2); damp, <20 to 30 % sand, some fragments of partially weathered rock, very micaceous. SAPROLITE	End of 5/13/06	537
55								5/14/06 Start drilling; water at 19.4 ft	536
56	3	1.1/5.0	0	CW				100% water loss	535
57									534
58									533
59									532
60									531
61	4	3.7/5.0	34	HW to SW					530
62							META-DIORITE; very dark gray (7.5YR 3/1); fine to medium grained, slightly foliated texture. Shear fabric dipping ~40°		529
63									528
64									527
65	5	2.4/2.8	28	HW to MW			META-DIORITE schistose		526
66							META-QUARTZ DIORITE; white to dark yellowish brown, schistose		525
67	6	0.3/0.7	0	HW			GRANODIORITE; white to dark yellowish brown (10YR 8/2 to 10YR 4/4); strongly foliated; medium to fine grained, >70% mica		524
68	7	1.5/1.5	0	HW					523
69									522
70				HW					521
71	8	1.4/5.0	14				GRANODIORITE; lowest 0.3 ft is fracture zone fragments of altered weathered vugged calcite in filled quartz vein and schistose meta diorite.		520
72				SW to F			METADIORITE; very dark gray; fine grained; moderately foliated (50°); closely spaced calcite/quartz veins (<1 cm wide) parallel to foliation; coarse to medium grained ~72.4 ft. CONTINUOUS ROCK		519
73									518
74									517
75	9	5.0/3.7	98	SW to F					516
76									515
77									514
78	10	1.2/1.3	92	SW to F			Salt and pepper appearance sometimes seen where quartz veins are partially consumed or adjacent to them.		513
79							METADIORITE		512
80									511
81	11	3.9/4.7	74	SW to F					510
82									509
83									508

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1054

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
84		12	0.3	100	SW to F				Coring terminatd on 5/14/06	507
85			0.3							506
86								Total Depth 83.5 ft.		505
87								Groundwater encountered at 19.4 feet		504
88								Borehole Grouted On 4/14/06		503
89										502
90										501
91										500
92										499
93										498
94										497
95										496
96										495
97										494
98										493
99										492
100										491
101										490
102										489
103										488
104										487
105										486
106										485
107										484
108										483
109										482
110										481
111										480
112										479
113										478
114										477
115										476
116										475
117										474
118										473
119										472
120										471
121										470
122										469
123										468

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1055**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location Unit 2 N 1166463 E 1847463		Total Depth 66 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 590.5 feet MSL	Ground Water Depth 26.6 feet	Depth to Bedrock 46 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9	Date Started 5/14/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/15/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy, gravelly (ML); reddish brown (2.5YR 3/2) to red (2.5 YR 4/6) to yellowish brown (10YR 5/6); dry to damp, stiff, ~30 to 40% sand, mostly fine to medium grained, <5% clay, <20% gravels, angular to subangular. FILL	Start drilling 5/14/06	590
1												589
2												588
3												587
4		SPT 1	7 5 8	23.4 / 18								586
5												585
6												584
7												583
8												582
9		SPT 2	4 4 8	16.8 / 18	●	●				SILT, sandy (ML); yellowish red (5YR 5/6) and mottled red (10R 5/8); damp, stiff, 1% gravel, 56% fines, 43% sand. FILL	End 5/14/06 Start 5/15/06	581
10												580
11												579
12											Losing 80% water	578
13												577
14		SPT 3	2 3 4	15.6 / 18	●	●				SAA; reddish yellow (7.5YR 6/8); damp, 42% sand, 58% fines. FILL		576
15									SM	SAND, silty (SM); light reddish brown (2.5YR 6/4); loose. SAPROLITE		575
16												574
17												573
18												572
19		SPT 4	2 2 4	14.4 / 18	●	●				SAND, silty (SM); brownish yellow (10YR 6/6); damp, loose, sand 1% gravel, 54% sand, 45% fines, manganese oxide veins. SAPROLITE		571
20												570
21												569
22												568
23											Losing 80% water	567
24		SPT 5	2 2 3	3.6 / 18						SAA; wet, loose, and some (several <1 cm) weathered red stained quartz gravels. SAPROLITE		566
25												565
26									▽			564
27												563
28												562
29		SPT 6	3 4 7	14.4 / 18	●	●				SAA; light olive gray (5Y 6/2) to yellow (10YR 7/6) to yellowish red (5YR 5/8); damp, medium dense, 8% gravel, 53% sand, 39% fines, also manganese oxide veining, some minor coarse sand and fine quartz gravels. SAPROLITE.		561
30												560
31												559
32												558
33												557
34		SPT 7	4 5 8	13.2 / 18	●	●				SAND, silty (SM); brownish yellow (10YR 6/6) to white (10YR 8/2); damp, medium dense; 64% sand, 36% fines. SAPROLITE		556
35												555
36												554
37												553
38												552
39		SPT 8	9 12 24	14.4 / 18	●	●				SAA; brownish yellow (10YR 6/6); damp, dense, 61% sand, 39% fines. SAPROLITE		551
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1055

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									SM			550
41												549
42												548
43												547
44										SAND, silty with gravel (SM); brownish yellow (10YR 6/6); damp, very dense, 11% gravel, 64% sand, 25% fines, manganese oxide vein subvertical. SAPROLITE		546
45		SPT 9	28 50/5	11/11	●	●			SM		Tricone refusal 45.8 ft, drilled casing to 46 ft, see rock log	545
46										SAND, silty with gravel (SM). PARTIALLY WEATHERED ROCK		544
47												543
48												542
49												541
50												540
51												539
52												538
53												537
54												536
55												535
56												534
57												533
58												532
59												531
60												530
61												529
62												528
63												527
64												526
65												525
66												524
67												523
68												522
69												521
70												520
71												519
72												518
73												517
74												516
75												515
76												514
77												513
78												512
79												511
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1055**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location Unit 2 N 1166463 E 1847463		Total Depth 66 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 590.5 feet MSL	Ground Water Depth 26.6 feet	Depth to Bedrock 46 feet
Casing Size and Depth 3.5 inch / 46 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 2	Date Started 5/14/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/15/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
46										544
47										543
48										542
49										541
50										540
51		1	5.0/5.0	46	HW to MW	R2 to R3		META-GRANODIORITE or META-QUARTZ DIORITE; reddish yellow (7.5YR 7/8) alteration 46 to 48.5 ft to gray (7.5YR 6/1); medium to coarse grained, healed brecciated to ductilely sheared to slightly mylonitized fabric; feldspar 40 to 30 %; amphiboles and micas ~ 30%; quartz ~ 10%. CONTINUOUS ROCK	Losing 40% water	539
52										538
53		2	4.1/5.0	58	SW	R4		META-QUARTZ DIORITE; black to grayish brown (2.5Y 2.5/1) to 2.5Y 5/2); subvertical quartz vein (1 to 2 cm).		537
54										536
55										535
56										534
57		3	3.7/4.2	94	SW to F	R4		SAA; META-QUARTZ DIORITE. CONTINUOUS ROCK.		533
58										532
59										531
60		4	0.8/0.8	100	SW to F	R4				530
61								SAA; increased mafic content (>50%) foliated weakly.		529
62										528
63		5	4.7/5.0	94	F	R4 to R5				527
64										526
65										525
66									Boring terminated 5/15/06 5/16/06; water at 26.6 ft	524
67										523
68										522
69								Total Depth 66 ft. Groundwater encountered at 26.6 feet Borehole Grouted On 4/16/06		521
70										520
71										519
72										518
73										517
74										516
75										515
76										514
77										513
78										512
79										511
80										510
81										509
82										508
83										507
84										506
85										505
86										

Project Name and Job Number		SOIL LOG - Boring No. B-1056	
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.		
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Borrow Area 1 N 1163896 E 1846786		Total Depth 58.9 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 642.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 12	Date Started 4/12/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/13/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, trace clay (ML); mottled red (2.5YR 4/8) and reddish yellow (7.5YR 6/6); dry, medium stiff, micaceous. RESIDUUM	Start drilling 4/12/06	642
1												641
2												640
3												639
4	/	SPT 1	3 3 4	12/18								638
5												637
6												636
7												635
8												634
9	/	SPT 2	2 2 2	13.2/18					ML	SILT, trace clay (ML); mottled red (2.5YR 4/8) and reddish yellow (7.5YR 6/6); dry, soft; with manganese oxide staining along relict fracture traces. SAPROLITE	Stopped on 4/12/06 Started 4/13/06	633
10												632
11												631
12												630
13												629
14	/	SPT 3	3 3 5	12/18						SILT, (ML) with some very fine sand and trace clay, very pale brown (10YR 7/4), damp to dry; medium stiff; MnO staining and relict rock texture, micaceous. SAPROLITE		628
15												627
16												626
17												625
18												624
19	/	SPT 4	3 3 5	12/18						SAA.		623
20												622
21												621
22												620
23												619
24	/	SPT 5	4 5 7	14.4/18						SAA.		618
25												617
26												616
27												615
28												614
29	/	SPT 6	4 6 8	15.6/18						SAA; slightly more fine sand; moist.		613
30												612
31												611
32												610
33												609
34	/	SPT 7	8 10 14	14.4/18						SAA with slight color shift to light yellowish brown (10YR 6/4); medium stiff and highly micaceous. SAPROLITE		608
35												607
36												606
37												605
38												604
39	/	SPT 8	8 11 17	15.6/18						SAA.		603
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1056

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												602
41												601
42												600
43												599
44		SPT 9	11 13 19	15.6/18						SILT, sandy (ML), very fine sand; very sandy. SAPROLITE		598
45												597
46												596
47												595
48												594
49		SPT 10	6 8 13	18/18						SILT, (ML) with trace clay, light yellowish brown (10YR 6/4), moist, medium stiff, micaceous. SAPROLITE		593
50												592
51												591
52												590
53												589
54		SPT 11	9 14 43	15.6/18						SAA.		588
55									ML	SILT, sandy (ML) with trace clay, light yellowish brown (10YR 6/6); moist, hard, micaceous. PARTIALLY WEATHERED ROCK		587
56												586
57												585
58												584
59		SPT 11	50/4	4/4						SAA; olive brown (2.5YR 4/4). PARTIALLY WEATHERED ROCK	Boring terminated 4/13/06	583
60												582
61												581
62												580
63												579
64												578
65												577
66												576
67												575
68												574
69												573
70												572
71												571
72												570
73												569
74												568
75												567
76												566
77												565
78												564
79												563
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1057**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Borrow Area 1 N 1163743 E 1846819		Total Depth 54.8 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 639.1 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 11	Date Started 4/17/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/17/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, clayey (ML); variegated red (2.5YR 4/8); brownish yellow (10YR 6/6); and very pale brown (10YR 7/4), damp, medium stiff, micaceous, low plasticity, also some manganese oxide staining. SAPROLITE	Begin 4/17/06	639
1												638
2												637
3												636
4		SPT 1	2 2 3	16.8 / 18								635
5												634
6												633
7												632
8												631
9		SPT 2	2 2 4	16.8 / 18						SAA.		630
10												629
11												628
12												627
13												626
14		SPT 3	2 5 5	15.6 / 18						SILT, trace clay; variegated red (10R 4/8); olive brown (2.5Y 4/3); and olive yellow (2.5Y 6/8), damp, stiff, micaceous, variegated, non-plastic. SAPROLITE		625
15												624
16												623
17												622
18												621
19		SPT 4	2 3 4	16.8 / 18						SAA; red (2.5YR 5/8); yellow (10YR 7/6); and light gray (10YR 7/1); damp, medium, stiff, micaceous, non-plastic, manganese oxide staining. SAPROLITE		620
20												619
21												618
22												617
23												616
24		SPT 5	2 3 5	15.6 / 18						SAA; trace sand; yellow (10YR 7/6) and light gray (10YR 7/2); damp, medium stiff, thin, manganese oxide, stains, micaceous. SAPROLITE		615
25												614
26												613
27												612
28												611
29		SPT 6	3 3 5	18 / 18						SAA.		610
30										SAA; quartz vein (small gravel) at 29.8 ft.		609
31												608
32									SP-SM	SAND, silty, light gray (10YR 7/1) and yellow (10YR 7/6); damp, medium dense; with quartz vein at 34.5 ft. SAPROLITE		607
33												606
34		SPT 7	4 6 8	14.4 / 18								605
35												604
36												603
37									SP-SM	SAND, silty, light gray (10YR 7/1) and yellow (10YR 7/6), dense. PARTIALLY WEATHERED ROCK		602
38												601
39		SPT 8	10 13 18	12 / 18								600
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1057

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												599
41												598
42												597
43												596
44		SPT 9	18 25 26	16.8 18						SAA.		595
45												594
46												593
47												592
48												591
49		SPT 10	25 29 33	13.2 18					SW-SM	SAND, silty, variegated olive yellow (2.5Y 6/6) and light yellowish brown (2.5Y 6/3); damp, very dense, micaceous. PARTIALLY WEATHERED ROCK		590
50												589
51												588
52												587
53												586
54		SPT 11	47 48 50/3	15.6 15.6						SAA with some gravel. PARTIALLY WEATHERED ROCK	Refusal to SPT sampler at 54.8 ft, boring terminated on 4/17/06	585
55												584
56												583
57												582
58												581
59												580
60												579
61												578
62												577
63												576
64												575
65												574
66												573
67												572
68												571
69												570
70												569
71												568
72												567
73												566
74												565
75												564
76												563
77												562
78												561
79												560
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1058**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Borrow Area 1 N 1163577 E 1846860		Total Depth 45 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 638.4 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9	Date Started 4/15/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/17/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, trace sand (ML) and trace clay; red (2.5YR 4/8) and brownish yellow (10YR 6/8); damp to dry, medium stiff, micaceous. SAPROLITE.	Begin 4/15/06	638
1												637
2												636
3											Stopped 4/15/06	635
4		SPT 1	2 3 3	15.6 / 18							Started 4/17/06	634
5												633
6												632
7												631
8												630
9		SPT 2	3 4 5	14.4 / 18						SAA, stiff; 1/4 inch quartz vein at 9 ft and angling 50°.		629
10												628
11												627
12												626
13												625
14		SPT 3	4 5 7	14.4 / 18						SILT (ML), red (2.5YR 5/8) and strong brown (7.5YR 5/8); damp, stiff, non-plastic, micaceous. SAPROLITE		624
15												623
16												622
17												621
18												620
19		SPT 4	4 4 7	14.4 / 18						SILT (ML), red (2.5YR 5/8) and strong brown (7.5YR 5/8); damp, medium stiff, with prominent fracture traces with manganese staining (black), micaceous non-plastic. SAPROLITE		619
20												618
21												617
22												616
23												615
24		SPT 5	3 5 5	15.6 / 18						SAA; with some clay, non to low plasticity. SAPROLITE		614
25												613
26												612
27												611
28												610
29		SPT 6	4 5 6	14.4 / 18						SAA; brownish yellow (10YR 6/8), damp, stiff, micaceous, manganese oxide staining. SAPROLITE Quartz vein at 29.1 ft ~25°		609
30												608
31												607
32												606
33												605
34		SPT 7	4 10 29	16.8 / 18								604
35									GW	GRAVEL (GW); gray (10YR 5/1); dense. PARTIALLY WEATHERED ROCK		603
36												602
37												601
38												600
39		SPT 8	10 12 16	16.8 / 18					GP-GM	GRAVEL, silty (GP to GM); brownish yellow (10YR 6/8) and gray (10YR 6/1); damp to moist, mainly		599
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1058

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										quartz gravels, medium dense. PARTIALLY WEATHERED ROCK.		598
41												597
42												596
43												595
44		SPT 9	15 36 50/5.5	17.5						SAA; dense to very dense SAA; densde to very dense. PARTIALLY WEATHERED ROCK.		594
45											Refusal to SPT sampler on 4/17/06, boring terminated	593
46												592
47												591
48												590
49												589
50												588
51												587
52												586
53												585
54												584
55												583
56												582
57												581
58												580
59												579
60												578
61												577
62												576
63												575
64												574
65												573
66												572
67												571
68												570
69												569
70												568
71												567
72												566
73												565
74												564
75												563
76												562
77												561
78												560
79												559
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1059**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Borrow Area west of Motor Pool N 1164621 E 1845733		Total Depth 55 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 687 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 13	Date Started 4/18/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/18/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GW	GRAVEL (GW), yellowish brown (10YR 5/4); dry, very loose, gravel coarse and very fine sand, some low organic content, granitic and quartz gravels. FILL	Start 4/18/06	687
1												686
2												685
3												684
4		SPT 1	1 4 5	15.6/18								683
5									ML	SILT clayey (ML), dark red (2.5YR 3/6), dry to damp, medium stiff, micaceous. TOPSOIL ZONE	Apparent topsoil 4.1 to 4.5 ft over saprolite	682
6									ML	SILT (ML) dark red (2.5YR 3/6), and pinkish white (2.5YR 8/2), variegated, dry, stiff, non-plastic. SAPROLITE		681
7												680
8												679
9		SPT 2	4 6 9	18/18						SAA, without pinkish white, with an olive brown (2.5Y 4/4) variegation along with the red, damp, soft to medium stiff, non-plastic, very micaceous. SAPROLITE		678
10												677
11												676
12												675
13												674
14		SPT 3	3 6 7	15.6/18						SAA; variegated colors red, olive. brown, and pinkish white.		673
15												672
16												671
17												670
18												669
19		SPT 4	3 4 6	15.6/18						SAA, weak red (10R 4/4), red (10R 5/6), and light brown (7.5YR 6/4).		668
20												667
21												666
22												665
23												664
24		SPT 5	4 6 6	13.2/18					SM	SAND, silty (SM);, predominantly white (10YR 8/1) and yellow (10YR 7/6) with some pale red (10R 6/4); and manganese oxide staining, dry, medium dense, sand is very fine. SAPROLITE		663
25												662
26												661
27									ML	SILT, sandy (ML); variegated weak red (10R 4/4), light brown (7.5YR 6/4), olive brown (2.5Y 4/4), and red (2.5YR 4/6); damp to dry, medium stiff, micaceous, manganese oxide staining and quartz gravel vein at 29 ft, non-plastic. SAPROLITE		660
28												659
29		SPT 6	4 4 6	18								658
30												657
31												656
32												655
33												654
34		SPT 7	3 5 8	15.6/18						SILT, clayey (ML); variegated yellowish brown (10YR 5/8), and yellow (10YR 7/6); dry, stiff, manganese oxide staining, low plasticity. SAPROLITE		653
35												652
36												651
37												650
38												649
39		SPT 8	2 3 5	15.6/18						SAA, abundant relict fractures filled with very pale brown (10YR 8/4) colored mineral, also some dark,		648
40												647

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1059

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										yellowish brown (10YR 4/4).		647
41												646
42												645
43												644
44		SPT 3	5 5 9	13.2/18						SAA, dark red (2.5YR 3/6) and olive brown (2.5Y 4/4); low plasticity. SAPROLITE		643
45										SILT, clayey (ML) with talc, white(2.5YR 8/1), and		642
46										pale red (10R 6/4); dry, soft and getting slightly		641
47										sandy at 45 ft, non-plastic. SAPROLITE		640
48									GW-GM	GRAVEL, sandy, silty (GW to GM); dark red (10R		639
49		SPT 10	17 27 35	13.2/18						3/6) to light red (10R 6/8) with gray (2.5Y 6/1)		638
50										smokey quartz, dry, very dense, gravel is large and		637
51										angular, quartz vein. SAPROLITE		636
52												635
53									ML	SILT, clayey (ML), yellowish brown (10YR 5/6);		634
54		SPT 11	3 5 9	13.2/18						damp, stiff, micaceous, low plasticity. SAPROLITE.		633
55											Boring terminated on 4/18/06	632
56												631
57												630
58												629
59												628
60												627
61												626
62												625
63												624
64												623
65												622
66												621
67												620
68												619
69												618
70												617
71												616
72												615
73												614
74												613
75												612
76												611
77												610
78												609
79												608
80												607

Project Name and Job Number		SOIL LOG - Boring No. B-1060	
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.		
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Borrow Area 1 N 1163796 E 1847079		Total Depth 54.4 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 634.5 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140.5 lbs / 30 inches	No. of Samples 11	Date Started 4/13/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/14/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, clayey (ML), mottled red (2.5YR 4/8) and reddish-yellow (7.5YR 6/8); damp, medium stiff, low plasticity, slightly micaceous. RESIDUUM.	Begin drilling 4/13/06	634
1												633
2												632
3												631
4		SPT 1	2 2 4	10.8 / 18								630
5												629
6												628
7									ML	SILT, clayey, trace sand (ML); mottled, red (10R 4/8), yellowish red (5YR 5/6), and reddish yellow (7.5YR 6/6); moist, medium stiff, manganese oxide staining, micaceous, and non-plastic to low plasticity. SAPROLITE.		627
8												626
9		SPT 2	2 2 3	15.6 / 18								625
10												624
11												623
12												622
13												621
14		SPT 3	2 2 4	10.8 / 18						SAA.	End drilling 4/13/06 Resumed on 4/14/06	620
15												619
16												618
17												617
18												616
19		SPT 4	2 3 5	16.8 / 18						SILT (ML) with trace clay; mottled red (2.5YR 5/8) and reddish-yellow (7.5YR 6/6); moist, medium stiff, manganese oxide staining (black) with 1/2 inch quartz gravel vein zone at 20 ft, non-plastic, micaceous. SAPROLITE.		615
20												614
21												613
22												612
23												611
24		SPT 5	2 3 5	14.4 / 18						SILT, clayey (ML), mottled pinkish gray (7.5YR 6/2) and reddish yellow (7.5YR 6/6), moist, medium stiff; manganese oxide staining, low-plasticity, micaceous. SAPROLITE		610
25												609
26												608
27												607
28												606
29		SPT 6	3 4 7	15.6 / 18					ML	SILT, sandy (ML); light yellowish brown (10YR 6/4); moist, stiff, micaceous, very fine sand, non-plastic. SAPROLITE		605
30												604
31												603
32												602
33												601
34		SPT 7	4 7 10	13.2 / 18						SAA; trace to some clay, non-plastic to low plasticity.		600
35												599
36												598
37												597
38												596
39		SPT 8	3 10 17	15.6 / 18						SAA, with an interval from 38.5 to 38.9 ft of mottled yellowish brown (10YR 5/8) and olive gray (5Y 5/2).		595
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1060

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										SAPROLITE		594
41												593
42									SP-SM	SAND, silty (SP to SM), yellow (10YR 7/6); moist, dense, non-plastic, micaceous, very fine silt. SAPROLITE.		592
43												591
44		SPT 9	10 23 27	15.6/18								590
45												589
46												588
47												587
48												586
49		SPT 10	15 26 37	15.6/18						SAA; very dense.		585
50												584
51												583
52												582
53												581
54		SPT 11	36 50/5	10.8/11						SAA. SAPROLITE	Refusal to SPT at 54.4 ft, boring terminatd on 4/14/06	580
55												579
56												578
57												577
58												576
59												575
60												574
61												573
62												572
63												571
64												570
65												569
66												568
67												567
68												566
69												565
70												564
71												563
72												562
73												561
74												560
75												559
76												558
77												557
78												556
79												555
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1061**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Borrow Area west of Motor Pool N 1164300 E 1845630		Total Depth 50 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 685.3 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140.5 lbs / 30 inches	No. of Samples 10	Date Started 4/23/06
	Borehole Inclination -90	Logged by M. Gray/A. Tillery	Date Completed 4/23/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red (10YR 4/6); dry, medium stiff to stiff, trace clay. RESIDUUM	Begin drilling 4/23/06	685
1												684
2												683
3												682
4		SPT 1	3 3 5	18/18								681
5										SAA. Quartzite clast.		680
6												679
7												678
8												677
9		SPT 2	4 6 11	16/18						SILT (ML); red (10YR 3/6); dry to damp, very stiff, bonds of lighter silt (yellow) mottled. RESIDUUM		676
10												675
11												674
12												673
13												672
14		SPT 3	5 8 12	14/18						SILT (ML); red (10YR 4/8); dry to damp, very stiff; mottled with pale yellow/gray silt medium MnO, micaceous fabric; Fractures at 35 to 45° lined with yellow silt. RESIDUUM		671
15												670
16												669
17												668
18												667
19		SPT 4	5 9 12	12/18						SILT (ML); red (10YR 3/6); damp, very stiff, laminated 0.1 inch band of yellow, very light gray silt. RESIDUUM		666
20												665
21												664
22												663
23												662
24		SPT 5	5 8 10	16/18						SAA; red (10YR 3/6); damp, very stiff, yellow silt bands (5YR 3/3), change to dark red and black. Quartz vein. 1 inch. RESIDUUM		661
25												660
26												659
27												658
28												657
29		SPT 6	5 8 9	15/18						SILT (ML); red (7.5YR 3/3), damp, very stiff, mica grains, non-plastic. RESIDUUM		656
30									ML	SILT (ML); yellow (7.5YR 6/6); damp, very stiff, rock structure evident in color bands. SAPROLITE		655
31												654
32												653
33												652
34		SPT 7	7 12 11	14/18						SAA; yellow (7.5YR 4/6); red (10R 3/6) mottled, damp, very stiff, sandy texture (<15 % sand). SAPROLITE		651
35												650
36												649
37												648
38												647
39		SPT 8	6 7 12	14/18						SAA; yellow (2.5Y 8/3); damp, very stiff, mottled with gray and red bands, some dark (black) bands		646
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1061

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										manganese inclusions. SAPROLITE		645
41												644
42												643
43												642
44		SPT 9	5 7 12	13/18						SAA; red (10R 4/4); damp, very stiff, red with yellow veins, 1 weathered quartz vein (0.5 inches), most yellow veins <1 mm thick, some black manganese oxide patches surrounded by yellow sand except within weathered quartz. SAPROLITE		641
45												640
46												639
47												638
48												637
49		SPT 10	5 9 12	17/18						SAA; red (10R 5/8) mottled with (2.5Y 5/4) or (2.5Y 7/4), very stiff,micaceous, manganese oxide, little to no sand, SAPROLITE	SPT refusal, boring terminated on 4/23/06	636
50												635
51												634
52												633
53												632
54												631
55												630
56												629
57												628
58												627
59												626
60												625
61												624
62												623
63												622
64												621
65												620
66												619
67												618
68												617
69												616
70												615
71												614
72												613
73												612
74												611
75												610
76												609
77												608
78												607
79												606
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1062**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Borrow Area 1 N 1164027 E 1847313		Total Depth 40 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 621.6 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140.5 lbs / 30 inches	No. of Samples 8	Date Started 4/15/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/15/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									CL-ML	SILT, clayey (ML to CL), dark red (2.5YR 3/6); damp, stiff, low to medium plasticity, micaceous. RESIDUUM	Begin 4/15/06	621
4		SPT 1	3 5 8	15.6/18								617
8									ML	SILT, trace sandy (ML) and trace clay; dark red (2.5YR 3/6) and strong brown (7.5YR 5/8); damp, medium stiff, mottled, micaceous, non-plastic to low plasticity, manganese oxide staining and quartz gravel veins at 8.8 ft. RESIDUUM		613
9		SPT 2	3 3 5	13.2/18								612
12									ML	SILT (ML) with some clay; dark red (2.5YR 3/6) at 13.5 to 13.8 ft, then variegated yellowish-red (5YR 4/6) and light gray (5YR 7/1); damp, stiff, micaceous, non-plastic to low plasticity. SAPROLITE		610
14		SPT 3	3 5 6	14.4/18								608
19		SPT 4	3 5 7	15.6/18						SAA, variegated red (10YR 5/8), light brown (7.5YR 6/4), and light gray (7.5YR 7/1). SAPROLITE		603
24		SPT 5	3 5 7	13.2/18						SAA, yellowish-brown (10YR 5/4). SAPROLITE		598
29		SPT 6	2 4 4	16.8/18						SAA, strong brown (7.5YR 5/8) and olive brown (2.5YR 4/3). SAPROLITE		593
34		SPT 7	2 3 5	18/18						SAA, with little more clay content; dark olive brown (2.5Y 3/3) with olive yellow (2.5Y 6/6); weathering along relict fracture traces, very micaceous, low plasticity. SAPROLITE.		587
39		SPT 8	2 3 4	16.8/18						SAA, yellowish-brown (10YR 5/6).	Boring terminated at 40 ft on	582
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1062

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40											4/15/06	581
41												580
42												579
43												578
44												577
45												576
46												575
47												574
48												573
49												572
50												571
51												570
52												569
53												568
54												567
55												566
56												565
57												564
58												563
59												562
60												561
61												560
62												559
63												558
64												557
65												556
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67												554
68												553
69												552
70												551
71												550
72												549
73												548
74												547
75												546
76												545
77												544
78												543
79												542
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1063**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location Borrow Area CT 1 N 1165768 E 1845001		Total Depth 28.8 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 610.9 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Split Spoon	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 6	Date Started 5/2/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/2/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML). FILL	Begin drilling 5/2/06	610
1												
2											Drill clanking possible rock pieces	609
3												608
4		SPT 1	10 17 21	19.2/18					ML	SILT, sandy (ML); pale brown (10YR 6/3) to pale yellowish brown (10YR 6/4); damp, hard, >30% sand (fine), <10 % clay, some relict rock texture and manganese oxide veins (black) (subvertical). SAPROLITE		607
5												606
6												605
7												604
8												603
9		SPT 2	10 16 20	15.6/18	●	●	●			SILT, sandy (ML); brownish yellow (10YR 6/8) to yellowish brown (10YR 5/8); damp, hard, 26% sand, 74% fines. Remnant foliation, micaceous, manganese oxide veining (subvertical). SAPROLITE	100% return water	602
10												601
11												600
12												599
13												598
14		SPT 3	26 50/5	9.6/11	●	●	●			SILT, sandy (ML); light yellowish brown (2.5Y 6/4); 13% sand, 87% fines.		597
15												596
16												595
17												594
18												593
19		SPT 4	6 10 13	14.4/18						SILT, clayey (ML) dark yellowish brown (10YR 4/6), damp, very stiff, <15% sand (very fine), relict foliation manganese oxide veins (black). SAPROLITE		592
20												591
21												590
22												589
23												588
24		SPT 5	26 33 36	16.8/18						SILT, clayey (ML); light brownish gray (2.5Y 6/2); damp, hard, <10% sand (fine). SAPROLITE		587
25												586
26												585
27												584
28									ML	SILT (ML); white (5Y 8/1); damp. PARTIALLY WEATHERED ROCK	Tricone refusal at 28.8 ft.	583
29		SPT 6	50/3	1.2/3							Boring terminated on 5/2/06	582
30												581
31												580
32												579
33												578
34												577
35												576
36												575
37												574
38												573
39												572
40												571

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1064**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location Borrow Area CT 1 N 1166042 E 1845355		Total Depth 20 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 609.4 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Split Spoon	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 4	Date Started 5/2/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/2/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); yellowish brown (10YR 5/4) to dark gray (5Y 4/1) to white (5Y 8/2); damp, stiff, 3% gravel, 38% sand, 59% fines. FILL	Begin 5/2/06	609
1												608
2												607
3												606
4		SPT 1	4 4 6	20.4/18	●	●	●					605
5												604
6												603
7												602
8												601
9		SPT 2	4 7 11	15.6/18	●	●	●		MH	SILT, sandy (MH); red (2.5YR 4/8) to yellowish brown (10YR 5/4); damp, very stiff, 23% sand, 77% fines. FILL		600
10												599
11												598
12												597
13												596
14		SPT 3	7 8 9	16.8/18	●	●	●		ML	SILT sandy with gravel (ML), strong brown (7.5YR 5/6), damp, very stiff, 7% gravel, 31% sand, 62% fines. FILL		595
15												594
16									ML	SILT, sandy (ML); white (5Y 8/1); dry, gravel sized fragments of quartz, very angular. PARTIALLY WEATHERED ROCK	Hard drilling, abundant rock fragments	593
17												592
18											100% water loss	591
19		SPT 4	50/5	6/5							Tricone refusal at 20 ft on 5/2/06, boring terminated	590
20												589
21												588
22												587
23												586
24												585
25												584
26												583
27												582
28												581
29												580
30												579
31												578
32												577
33												576
34												575
35												574
36												573
37												572
38												571
39												570
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1065**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location Borrow Area CT 1 N 1165642 E 1845273		Total Depth 30 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 610.1 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Split Spoon	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 6	Date Started 5/2/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/2/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0–8									SP-SM	SAND, silty with gravel (SP-SM); brown (7.5YR 5/4) to pinkish white (7.5YR 8/2); dry to damp, sand medium to coarse grained, 11% fines, 84% sand, 5% gravel (< 4 cm, subangular). FILL	Start 5/2/06 Hard drilling	610–602
4		SPT 1	27 22 10	18/18	●	●						
8–17		SPT 2	8 11 14	18/18					ML	SILT, sandy (ML); reddish yellow (7.5YR 6/8), damp, <2% clay, manganese oxide veins (black, 2-3 mm thick) various orientations. RESIDUUM		601–593
14		SPT 3	6 8 10	17/18						SILT, sandy (ML); reddish yellow (7.5YR 6/8); 50% sand (very fine) 50% silt. RESIDUUM		
17–24		SPT 4	9 9 25	16/18					ML	SILT, sandy (ML); olive (5Y 5/3 to 5Y 4/3) to dark yellowish brown, (10YR 4/6); damp, hard, sand 50% fine to medium grained , 50% silt low to medium plasticity, black manganese oxide veins. SAPROLITE		593–586
24		SPT 5	5 7 12	18/18						SILT, sandy (ML); light olive brown (2.5YR 5/4); damp, stiff, ~30% sand, fine to medium grained, no clay; micaceous. SAPROLITE		
27–30		SPT 6	9 13 14	18/18					SM	SAND, silty (SM); pale yellow (2.5Y 7/4) to dark grayish brown (2.5Y 4/2), damp, medium dense, fine to medium sand, 40% silt, micaceous. SAPROLITE	No water encountered. Boring terminated at 30 ft on 5/2/06	583–580
30–40										Total Depth 30 ft. Borehole Grouted On 5/2/06		580–571

Project Name and Job Number		SOIL LOG - Boring No. B-1066	
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.		
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Borrow Area 1 N 1163965 E 1847564		Total Depth 35 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 632.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140.5 lbs / 30 inches	No. of Samples 7	Date Started 4/14/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/14/06

Reviewed by / Date: F. Syms 5/24/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, clayey (ML); mottled red (2.5YR 4/8), and reddish-yellow (7.5YR 6/8), damp to dry, medium stiff, low plasticity, micaceous. RESIDUUM	Begin 4/14/06	632
1												631
2												630
3												629
4		SPT 1	3 3 5	18/18								628
5										SILT (ML); variegated pinkish white (5YR 8/2) and yellowish red (5YR 4/6); dry, medium stiff, non-plastic, micaceous. RESIDUUM		627
6												626
7												625
8												624
9		SPT 2	2 2 3	16.5/18						SILT, clayey (ML); intervals of dark red (2.5YR 3/6) and strong brown (7.5YR 5/8); moist, medium stiff, manganese oxide. RESIDUUM		623
10												622
11												621
12												620
13												619
14		SPT 3	2 3 3	16.5/18						SAA strong brown (7.5YR 5/8). RESIDUUM		618
15												617
16												616
17												615
18												614
19		SPT 4	2 3 4	16.5/18								613
20									ML	SILT, clayey (ML), mottled very pale brown grains (10YR 7/8) and strong brown (7.5YR 5/8). SAPROLITE		612
21												611
22												610
23												609
24		SPT 5	3 3 6	13.2/18						SAA; with increasing very pale brown and manganese oxide staining. SAPROLITE		608
25												607
26												606
27												605
28												604
29		SPT 6	2 3 4	14.4/18						SAA.		603
30												602
31												601
32												600
33												599
34		SPT 7	3 4 5	13.2/18						SAA. SAPROLITE		598
35											Boring terminated on 4/14/06	597
36												596
37												595
38												594
39												593
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1067**	
Type and Diameter of Boring Wash Rotary / 3 inch	Boring Location Borrow Area 1 N 1163861 E 1847598		Total Depth 60 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 629 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140.5 lbs / 30 inches	No. of Samples 12	Date Started 4/18/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/18/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin 4/18/06	629
1												628
2												627
3												626
4	/	SPT 1	4 5 4	16.8/18						SILT (ML) with trace clay and trace sand; mottled, red (2.5YR 4/8) and reddish yellow (7.5YR 7/6); damp, stiff, micaceous, non-plastic. RESIDUUM		625
5												624
6												623
7												622
8												621
9	/	SPT 2	2 2 3	16.8/18						SILT, sandy (ML) with trace clay; varigated pink (7.5YR 7/3) and reddish yellow (7.5YR 6/8), variegated, damp, medium stiff, micaceous, non-plastic. RESIDUUM		620
10												619
11												618
12												617
13									ML	SILT, sandy (ML); variegated red (2.5YR 5/8), reddish-yellow (7.5YR 6/8), and white (7.5YR 8/1); damp to dry, stiff, micaceous, non-plastic. SAPROLITE		616
14	/	SPT 3	2 3 6	13.2/18								615
15												614
16												613
17												612
18									SM	SAND, silty (SM); intervals of light gray (2.5Y 7/1) and light olive brown (2.5Y 5/6); damp to dry, loose, micaceous. SAPROLITE		611
19	/	SPT 4	3 3 4	14.4/18								610
20												609
21												608
22												607
23												606
24	/	SPT 5	3 4 5	14.4/18						SAND, silty (SM); light gray (10YR 7/1) with yellow (10YR 8/8); damp, loose, weathering and manganese oxide staining (black) along relict fractures, micaceous, with quartz vein (gravel) at 23.5 ft. SAPROLITE		605
25												604
26												603
27												602
28									ML	SILT, sandy (ML); light gray (10YR 7/1) with yellow (10YR 8/8); damp, stiff, non-plastic. SAPROLITE		601
29	/	SPT 6	4 6 7	12/18								600
30												599
31												598
32												597
33												596
34	/	SPT 7	3 4 6	14.4/18						SILT (ML) with trace clay; light olive brown (2.5Y 5/6); damp, stiff, micaceous. SAPROLITE		595
35												594
36												593
37												592
38												591
39	/	SPT 8	3 5 6	15.6/18						SILT, sandy (ML) with trace clay; light olive brown (2.5Y 5/4) and yellow (2.5Y 7/8); damp, stiff,		590
40												589

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1067

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										micaceous. SAPROLITE		589
41												588
42												587
43												586
44		SPT 9	6 10 14	18/18						SAA, light olive brown (2.5Y 5/4); very stiff.		585
45												584
46												583
47												582
48												581
49		SPT 10	9 10 15	18/18						SAA; olive yellow (2.5Y 6/6) and light olive brown (2.5Y 5/6); relict rock fabric), moist to damp, very stiff, manganese oxide staining. SAPROLITE		580
50												579
51												578
52									SP-SM	SAND, silty (SP-SM); varigated yellowish brown (10YR 5/6) and gray (10YR 5/1); moist to damp, dense. SAPROLITE		577
53												576
54		SPT 11	7 15 23	15.6/18								575
55												574
56												573
57												572
58												571
59		SPT 12	8 12 15	18/18						SAA; some very pale brown (10YR 8/4); medium dense. SAPROLITE		570
60											Boring terminated at 60 ft on 4/18/106	569
61												568
62												567
63												566
64												565
65												564
66												563
67												562
68												561
69												560
70												559
71												558
72												557
73												556
74												555
75												554
76												553
77												552
78												551
79												550
80												549

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1068**	
Type and Diameter of Boring Wash Rotary / Tricone 4 inch	Boring Location Switchyard N 1164807 E 1847481		Total Depth 39 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 605.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 20	Date Started 8/20/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/20/06

Reviewed by / Date B. Reinicker 8/21/06

Reviewed by / Date C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0–2		SPT 1	2 5 6	15/24					ML	SILT, sandy (ML); yellowish brown (10YR 5/6); dry to damp; stiff; ~75% silt, 20% very fine sand, trace subangular gravel. FILL	Begin 8/20/06	605–604
2–4		SPT 2	3 5 6	17/24						SAA.		603–602
4–6		SPT 3	2 5 5	4/24						SAA; yellowish brown to reddish yellow (5YR 5/6).		601–600
6–8		SPT 4	2 4 5	20/24						SAA; red (2.5YR 4/6); thin clayey layers.		599–598
8–10		SPT 5	2 6 7	19/24						SAA; yellowish red (5YR 5/8).		597–596
10–12		SPT 6	2 4 6	19/24						SAA; 10% gravel, 75% fines.	Lab data from B-1068-UD, UD-2 at 10 to 12 ft	595–594
12–14		SPT 7	2 6 7	15/24						SAA. SAA; red (2.5YR 4/6); more clay rich layer 60% silt, 30% clay, 10% sand.		593–592
14–16		SPT 8	2 3 3	20/24					SP	SAND, (SP); yellowish red (5YR 5/8); wet; loose; medium sand. FILL		591–590
									SM	SAND silty (SM); yellowish brown (10YR 5/6); damp; medium dense; mostly fine sand. FILL		
16–18		SPT 9	3 5 8	19/24						SAA; alternating with layers of SILT clayey with sand (ML); red (2.5YR 4/6) from 15.3 to 17 ft.		589–588
18–20		SPT 10	6 11 14	16/24								587–586
20–22		SPT 11	3 5 7	20/24						SAA; with alternating silt layers. FILL		585–584
22–24		SPT 12	4 6 9	16/24						SAA. FILL		583–582
24–26		SPT 13	5 6 7	10/24						SAA; gravels up to 0.4 inch; very fine sand. FILL	B-1068-UD, UD-4 at 24 to 26 ft had 9% gravel, 65% fines, was (ML)	581–580
26–28		SPT 14	1 2 4	10/24						SAA; loose.		579–578
28–30		SPT 15	3 4 6	20/24						SAA.		577–576

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1068

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
30										SAND silty (SM); yellowish brown (10YR 5/6); damp; medium dense; mostly fine sand. FILL		575
31		SPT 16	2 6 6	20/24						*(Continued from previous page)* SAND, silty (SM); yellowish brown (10YR 5/6); damp; medium dense; ~60% very fine sand; 40% fines; trace gravels.		574
32										SAA; poor recovery due to quartz gravel.		
33		SPT 17	3 5 6	7/24								573
34												572
35		SPT 18	2 3 5	11/24					SM	SAND, silty (SM); alternating dark yellowish brown (10YR 4/4) and speckled light gray (10YR 7/2); damp; loose. SAPROLITE		571
36												570
37		SPT 19	3 4 5	16/24					SM	SAND, silty (SM); yellowish red (5YR 4/6) to reddish gray (5YR 5/2); damp; loose. SAPROLITE		569
38		SPT 20	50/2	0/2						No recovery. PARTIALLY WEATHERED ROCK	Tricone refusal at 39 ft on 8/20/06; boring terminated	568
39												567
40												566
41												565
42												564
43												563
44												562
45												561
46												560
47												559
48												558
49												557
50												556
51												555
52												554
53												553
54												552
55												551
56												550
57												549
58												548
59												547
60												546

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1068-UD**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location Switchyard N 1164805 E 1847471		Total Depth 32 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 605.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 5	Date Started 8/23/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/23/06

Reviewed by / Date: B. Reinicker 10/5/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled without sampling 0 to 6 ft	605
1												604
2												603
3												602
4												601
5												600
6											Shelby push 6 to 8 ft	599
7		UD 1		18/24					SM	SAND, silty (SM).		598
8											Drilled without sampling 8 to 10 ft	597
9												596
10											Shelby push 10 to 12 ft	595
11		UD 2		19.5/24	●	●	●		ML	SILT, sandy (ML); 10% gravel, 15% sand, 75% fines.		594
12											Drilled without sampling 12 to 16 ft	593
13												592
14												591
15												590
16											Shelby push 16 to 18 ft	589
17		UD 3		17.5/24					SM	SAND, silty (SM).		588
18											Drilled without sampling 18 to 24 ft	587
19												586
20												585
21												584
22												583
23												582
24											Shelby push 24 to 26 ft	581
25		UD 4		22/24	●	●	●		ML	SILT, sandy (ML); 9% gravel, 26% sand, 65% fines.		580
26											Drilled without sampling 26 to 30 ft	579
27												578
28												577
29												576
30									SM	SAND, silty (SM).	Shelby push 30 to 32 ft	575
31		UD 5		17/24							Boring terminated on 8/23/06	574
32												573
33												572
34												571
35												570
36												569
37												568
38												567
39												566
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1069**	
Type and Diameter of Boring Wash Rotary / Tricone 4 inch	Boring Location Switchyard N 1164802 E 1847447		Total Depth 40 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 604.9 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 20	Date Started 8/19/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/19/06

Reviewed by / Date: B. Reinicker 8/21/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Unsampled gravels.	Begin on 8/19/06	
1		SPT 1	4 5 4	17/24					ML	SILT, sandy, clayey (ML); yellowish red (5YR 5/6); dry; stiff to very stiff; trace gravels up to 1 inch diameter; fine sands. FILL		604
2												603
3		SPT 2	6 7 12	21/24						SAA; yellowish brown (10YR 5/8). FILL		602
4												601
5		SPT 3	3 5 7	7/24								600
6										SAA; yellowish red (5YR 5/6); damp. FILL		599
7		SPT 4	2 3 5	19/24						SAA; strong brown (7.5YR 5/6) to yellowish red (5YR 5/6).		598
8												597
9		SPT 5	3 4 7	18/24								596
10												595
11		SPT 6	3 7 8	19/24						SAA with some pieces of weathered diorite and granodiorite (~1.5 inch across).		594
12												593
13		SPT 7	3 4 7	14/24					SP	SAND, clayey, silty (SP); yellow (2.5Y 7/4); damp; medium dense.		592
14									ML	SILT, sandy, clayey (ML) strong brown (2.5YR 5/6) to yellowish red (5YR 5/6).		591
15		SPT 8	1 1 3	8/24					SP	SAND, clayey, silty (SP); yellow (2.5Y 7/4); damp; soft.		590
16									SM	SILT, sandy, clayey (ML), soft; strong brown (2.5YR 5/6) to yellowish red (5YR 5/6).		589
17		SPT 9	2 4 5	18/24						SAND, clayey, silty (SP); yellow (2.5Y 7/4); damp; soft.		588
18										SILT, sandy, clayey (ML); yellowish red (5YR 5/6); damp; stiff; and SAND silty, clayey (SM); pale yellow (2.5Y 7/4); damp; medium dense; saprolite-fragments; both with trace gravels up to 1 inch diameter. FILL		587
19		SPT 10	3 5 6	20/24								586
20												585
21		SPT 11	3 6 7	15/24					SM	SAND, silty, clayey (SM); light yellowish brown (10YR 6/4); damp; medium dense; fine sand; laminated appearance; micaceous; trace gravels. FILL		584
22												583
23		SPT 12	3 6 8	15/24						SAA.		582
24												581
25		SPT 13	1 2 5	11/24						SAA; loose; some meta-granodiorite pieces just above 26 ft depth. FILL		580
26												579
27		SPT 14	2 5 5	21/24						SAA; some siltier layer, slightly darker, yellowish brown (10YR 5/4).		578
28												577
29		SPT 15	2 4 5	20/24						SAA.		576
30												575

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1069

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
30												574
31		SPT 16	2 4 4	15/24					SM	SAND, silty, clayey (SM); light yellowish brown to yellowish brown (10YR 5.5/4); damp to moist; loose; micaceous; laminated appearance; trace gravels up to 1 inch diameter. FILL		
32												573
33		SPT 17	1 3 5	16/24						SAA; more silt ~35%; FILL.		572
34												571
35		SPT 18	2 4 6	11/24						SAA.		570
36												569
37		SPT 19	2 7 9	14/24						SAA.		568
38												567
39		SPT 20	4 5 6	22/24						Quartz gravels (subangular up to 0.5 inch). FILL		566
40									ML	SILT, sandy, clayey (ML); red (2.5YR 4/6); damp; stiff; micaceous; laminated. FILL	End of drilling on 8/19/06; boring terminated at 40 ft	565
41												564
42												563
43												562
44												561
45												560
46												559
47												558
48												557
49												556
50												555
51												554
52												553
53												552
54												551
55												550
56												549
57												548
58												547
59												546
60												545

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1070**	
Type and Diameter of Boring Wash Rotary / Tricone 4 inch	Boring Location Cooling Tower N 1165725 E 1848283		Total Depth 106 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 610.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 50	Date Started 8/17/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/19/06

Reviewed by / Date: B. Reinicker 8/21/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Gravel fill, no sample collected.	Start 8/17/06	610
1		SPT 1	5 12 7	16/24					ML	SILT clayey (ML); red (2.5YR 5/8); dry to damp; very stiff; trace gravel up to 1.2 inch diameter (sub-angular); trace fine to very fine sand. FILL		609
2												608
3		SPT 2	5 7 8	17/24								607
4										SAA; red (2.5YR 5/8); stiff		606
5		SPT 3	2 6 7	1/24								605
6										SILT sandy, clayey (ML); light yellowish brown (10YR 6/4); more very fine sand		604
7		SPT 4	5 6 7	17/24								603
8										SAA; red (2.5YR 5/8)		602
9		SPT 5	3 5 6	16/24							Lab data from B-1070-UD, UD-2 9 to 11 ft	601
10										SAA; alternating layers of light yellowish brown and red; 10% gravel, 57% fines		600
11		SPT 6	3 5 6	18/24								599
12										SAA		598
13		SPT 7	3 5 7	10/24								597
14												596
15		SPT 8	2 4 7	15/24								595
16										SILT sandy, clayey and gravels (ML); alternating bands of red (2.5YR 5/8) and light yellowish brown (10 YR 6/4); stiff to very stiff; damp; sand mostly fine; sub angular gravels up to 1.2 inch diameter; FILL		594
17		SPT 9	3 6 7	16/24								593
18										SAA		592
19		SPT 10	3 10 11	18/24							B-1070-UD, UD-4, 19 to 21 ft	591
20										Increased sand content from 19.4 to 19.6 ft 23% gravel, 29% fines		590
21		SPT 11	3 8 8	4/24								589
22										SAA; red (2.5YR 5/8).		588
23		SPT 12	3 5 6	21/24								587
24										SAA; laminated in light yellowish brown layers. FILL		586
25		SPT 13	2 5 6	17/24								585
26										SAA; red (2.5YR 5/8).		584
27		SPT 14	2 6 9	9/24								583
28										Thin layer of fine sand		582
29		SPT 15	5 5 7	21/24						SAA; light yellowish brown (10YR 6/4)	B-1070-UD, UD-6 at 29 to 31 ft	581
30												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1070

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
30												580
31		SPT 16	5 5 5	0/24						No recovery; 4% gravel, 59% fines. FILL		579
32												578
33		SPT 17	3 6 10	19/24						SILT, sandy, clayey with gravels (ML); alternating bands of red (2.5YR 5/8); and light yellowish brown (10YR 6/4); stiff to very stiff; damp; sand mostly fine; clay; 5% sub angular gravels up to 1.2 inch diameter		577
34												576
35		SPT 18	4 7 8	19/24						SAA; light yellowish brown.		575
36												574
37		SPT 19	3 5 6	16/24						SAA; light yellowish brown.		573
38												572
39		SPT 20	4 10 12	14/21						SAA; reddish yellow (7.5YR 6/6). Layer of higher gravel content, gravels composed of weathered meta-granodiorite from 38.8 to 41.4 ft		571
40												570
41		SPT 21	2 5 12	15/24					ML	SAA; red (2.5YR 5/8), very pale brown (10YR 7/3) from 41.4 to 41.8 ft., increased sand content. FILL	End of day 8/17/06 Begin day 8/18/06; water at 0 ft	569
42												568
43		SPT 22	4 11 12	7/24						SAA; red (2.5YR 5/8)		567
44												566
45		SPT 23	5 6 11	14/24						SAA; yellowish red (5YR 5/6); 2% gravel, 57% fines.	B-1070-UD, UD-8 at 44 to 45.6 ft	565
46												564
47		SPT 24	4 8 9	20/24						SILT, sandy, clayey and gravels (ML); red (2.5YR 3/8) to yellowish red (5YR 4/6); laminated appearance, damp; stiff to very stiff; sand mostly fine, 5% sub-angular gravels up to 1.2 inch diameter. FILL		563
48												562
49		SPT 25	5 6 10	19/24						More clay rich layer 46.4 to 46.8 ft		561
50												560
51		SPT 26	3 6 6	19/24								559
52												558
53		SPT 27	4 5 8	16/24						SAA; light brown (7.5YR 6/4).		557
54												556
55		SPT 28	2 6 7	8/24						SAA; yellowish red (7.5YR 6/6).		555
56												554
57		SPT 29	2 8 11	15/24						SAA; yellowish red (7.5YR 6/6).		553
58												552
59		SPT 30	3 6 10	21/24						SAA; brown (7.5YR 5/4). FILL.		551
60												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1070

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
60												
61		SPT 31	6 11 13	6/24						SILT sandy, clayey and gravels (ML); brown (7.5YR 5/4) to yellowish red (5YR 4/6); laminated appearance; moist; stiff to very stiff; ~55% silt, 30% fine sand; 10% clay, 5% sub-angular gravels up to 1.2 inch diameter. FILL		550
62										Damp from 62 to 64 ft		549
63		SPT 32	8 8 13	15/24								548
64												547
65		SPT 33	3 5 7	20/24						SAA; yellowish red with light yellowish brown (10YR 6/4) from 64.9 to 65.3 ft.		546
66												545
67		SPT 34	2 6 9	17/24						Yellowish red (no gravels); moist from 66.4 to 67 ft.		544
68												543
69		SPT 35	1 5 7	12/24						Yellowish red (no gravels); damp at 68 to 70 ft.		542
70												541
71		SPT 36	4 7 9	22/24						SAA.		540
72												539
73		SPT 37	5 10 11	17/24						SAA; yellowish red (5YR 4/6) some small gravels/coarse sand		538
74												537
75		SPT 38	2 2 7	24/24						SAA; gravels present; wet between 74.8 and 75.3 ft. FILL		536
76												535
77		SPT 39	4 6 9	22/24						SAA; with some mottled color variations; damp; stiff to very stiff; 55% silt, 30% fine sand; 10% clay; 5% sub-angular gravels up to 1.2 inch diameter; laminated. FILL		534
78												533
79		SPT 40	6 8 11	16/24						SAA; brown (7.5YR 5/4). Thin clay rich layer.		532
80												531
81		SPT 41	6 7 12	7/24					ML	SAA; red (2.5YR 4/8); moist. FILL		530
82												529
83		SPT 42	2 9 13	18/24						SAA; strong brown (7.5YR 5/6); from 82.9 to 83.4 ft		528
84												527
85		SPT 43	2 8 11	14/24						SAA; red (2.5YR 4/8) FILL		526
86												525
87		SPT 44	5 10 12	21/24					SM	SAND silty, clayey and gravels (SM); strong brown (7.5YR 5/6); moist; medium dense; some small gravels <5%; fine to very fine sand; 20% silt; 5% clay. FILL		524
88										SAA		523
89		SPT 45	2 7 10	17/24								522
90												521

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1070

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
90												520
91		SPT 46	5 8 10	19/24						SAND, silty (SM); strong brown (7.5YR 4/6); with some color variations; moist; medium dense; subangular gravels up to 1 inch diameter (<5%); ~75% fine sand; 20% silt; 5% clay. FILL		519
92												518
93		SPT 47	3 13 17	15/24					SM	SAND silty, clayey and gravels (SM); light greenish gray (5G 7/1); medium dense to dense; damp; sub angular quartz gravels up to 1.2 inch diameter; ~60% fine sand; 25% silt; 10% clay; 5% quartz gravels. RESIDUUM		517
94												516
95		SPT 48	6 8 16	18/24								515
96										SAND silty, clayey and gravels (SM); light greenish gray (5G 7/1); with salt and pepper appearance; damp; dense; brownish yellow oxidation staining (10YR 6/8); sub-angular quartz gravels; ~60% fine sand; 25% silt; 10% clay; 5% quartz gravels; micaceous. SAPROLITE		514
97		SPT 49	5 13 26	21/24								513
98												512
99		SPT 50	9 19 22	16/24								511
100											End of day 8/18/06 Begin day 8/19/06 Drilled without sampling 100 to 106 ft	510
101												509
102												508
103												507
104												506
105												505
106											Tricone refusal at 106 ft; boring terminated on 8/19/06	504
107												503
108												502
109												501
110												500
111												499
112												498
113												497
114												496
115												495
116												494
117												493
118												492
119												491
120												

Project Name and Job Number		
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1070-UD**

Type and Diameter of Boring Wash Rotary / Tricone 4 inch	Boring Location Cooling Tower N 1165720 E 1848293		Total Depth 57.7 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 610.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Undisturbed	Sample Driving Hammer/Drop NA / NA	No. of Samples 11	Date Started 8/21/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/22/06

Reviewed by / Date: B. Reinicker 8/23/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Start 8/21/06 Drilled without sampling 0 to 4 ft	610
1												609
2												608
3												607
4		UD 1		18/24					ML	SILT (ML).	Shelby push 4 to 6 ft	606
5												605
6									SM	SAND, silty (SM).	Drilled without sampling 6 to 9 ft	604
7												603
8												602
9											Shelby push 9 to11 ft	601
10		UD 2		18/24	●	●	●		ML	SILT, sandy (ML); 10% gravel, 33% sand, 57% fines.	End day 8/21/06 Begin day 8/22/06	600
11											Drilled without sampling 11 to 14 ft	599
12												598
13												597
14											Shelby push 14 to 16 ft	596
15		UD 3		19/24					SM	SAND, silty (SM).		595
16											Drilled without sampling 16 to 19 ft	594
17												593
18												592
19											Shelby push 19 to 21 ft	591
20		UD 4		12/24	●	●	●		SM	SAND, silty (SM); 23% gravel, 47% sand, 29% fines.		590
21											Drilled without sampling 21 to 24 ft	589
22												588
23												587
24											Shelby push 24 to 26 ft	586
25		UD 5		15/24					ML	SILT, sandy (ML).		585
26											Drilled without sampling 26 to 29 ft	584
27												583
28												582
29											Shelby push 29 to 31 ft	581
30		UD 6		15/24	●	●	●		ML	SILT, sandy (ML); 4% gravel, 37% sand, 59% fines.		580
31											Drilled without sampling 31 to 34 ft	579
32												578
33												577
34											Shelby push 34 to 36 ft	576
35		UD 7		18.5/24					SM	SAND, silty (SM).		575
36											Drilled without sampling 36 to 44 ft	574
37												573
38												572
39												571
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1070-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												570
41												569
42												568
43												567
44		UD 8		17/20	●	●	●		ML	SILT, sandy (ML); 2% gravel, 41% sand, 57% fines.	Shelby push 44 to 45.6 ft	566
45												565
46											Drilled without sampling 45.6 to 49 ft	564
47												563
48												562
49									ML	SILT, sandy (ML).		561
50		UD 9		16.5/24							Shelby push 49 to 51 ft	560
51									SM	SAND, silty (SM).		559
52											Drilled without sampling 51 to 54 ft	558
53												557
54												556
55		UD 10		15/24					SM	SAND, silty (SM).	Shelby push 54 to 56 ft	555
56												554
57		UD 11		8/20					SM	SAND, silty (SM).	Shelby push 56 to 57.7 ft	553
58											Boring terminated 8/22/06	552
59												551
60												550
61												549
62												548
63												547
64												546
65												545
66												544
67												543
68												542
69												541
70												540
71												539
72												538
73												537
74												536
75												535
76												534
77												533
78												532
79												531
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1071**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location Cooling Tower N 1165707 E 1848320		Total Depth 100 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 610.5 feet MSL	Ground Water Depth 6.5 feet	Depth to Bedrock N/A
Sampling Method	Sample Driving Hammer/Drop	No. of Samples	Date Started 8/16/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/17/06

Reviewed by / Date: B. Reinicker 8/21/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Gravels; no sample collected	Begin 8/16/06	610
1		SPT 1	2 8 3	14/24					ML	SILT clayey (ML); red (2.5YR 4/6); damp; stiff; ~70% silt, ~30% clay; FILL		609
2												608
3		SPT 2	5 7 8	12/24						SAA; red (2.5YR 5/6); mottled appearance with trace fine sands; clay ~10%; micaceous; low plasticity; FILL		607
4												606
5		SPT 3	5 7 8	9/24								605
6									▽			604
7		SPT 4	3 4 5	19/24						SAA; brownish yellow (10YR 6/6); FILL		603
8												602
9		SPT 5	3 5 6	18/24						SAA; red (2.5YR 4/6); with trace gravels; up to 1.5 inch diameter. FILL		601
10												600
11		SPT 6	4 6 7	20/24						SAA; slightly more clay-rich layer ~30% clay from 10 to 11 ft. SAA; red (2.5YR 4/6) and brownish yellow (10YR 6/6); 3 to 4 inch lifts. FILL		599
12												598
13		SPT 7	3 4 7	17/24						SILT, sandy (ML); yellowish brown (10YR 5/4); damp; stiff; gravels up to 1 inch from 12.6 to 13 ft SILT, clayey (ML); red (2.5YR 4/6); damp; stiff; alternating with ~4 inch layers of brownish yellow, SILT sandy, and gravels		597
14												596
15		SPT 8	4 7 7	18/24								595
16												594
17		SPT 9	3 6 8	20/24						SILT, clayey (ML); alternating bands of red (2.5YR 5/6) and brownish yellow (10YR 6/6); damp; stiff; with fine to medium sands and trace gravels; ~10% clay; gravels average ~1 inch diameter; becomes micaceous. FILL SAA; brownish yellow to 19.4 ft, then red. FILL		593
18												592
19		SPT 10	4 8 7	20/24								591
20												590
21		SPT 11	2 2 5	10/24						SAA; red (2.5 YAR 5/6); medium stiff. FILL		589
22												588
23		SPT 12	2 5 6	7/24						SAA; yellowish red layer (5YR 4/6); moist; stiff. FILL		587
24												586
25		SPT 13	7 7 9	12/24						SAA; red (2.5YR 5/6) from 25.8 ft down; very stiff. FILL		585
26												584
27		SPT 14	3 7 9	20/24						SAA; alternating red and brownish yellow below. FILL		583
28												582
29		SPT 15	4 7 8	17/24						SAA; stiff; thin gray layer from 29.8 to 29.9 ft. FILL		581
30												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1071

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
30									ML	SAA; reddish yellow (7.5YR 6/6); moist to damp; stiff; with fine to medium sands; trace gravels up to 1 inch diameter; ~10% clay; micaceous; mottled with brownish gray (10 YR 6/2) from 30.5 to 31 ft		580
31		SPT 16	3 6 7	23/24								579
32										SAA; no gravels, trace sands		578
33		SPT 17	4 7 7	19/24						Thin greenish gray layer (10BG 6/1) from 33.1 to 33.3 ft		577
34										SAA; red (7.5YR 4/6); to 35.3 ft, then light yellowish brown (10YR 6/4). FILL		576
35		SPT 18	2 6 8	15/24								575
36										SAA; very stiff; with fine lamination in fill material; FILL		574
37		SPT 19	4 8 10	23/24								573
38										SAA; yellowish red (5YR 5/6) with fine lamination		572
39		SPT 20	5 7 12	4/24								571
40										SAA; alternating red and light yellowish brown layers. FILL		570
41		SPT 21	6 10 11	13/24								569
42												568
43		SPT 22	2 11 15	15/24								567
44										SAA; alternating layers of red (2.5YR 4/8) and mottled brown (7.5YR 5/3); damp; stiff. FILL		566
45		SPT 23	2 3 8	13/24								565
46										SILT clayey and trace sand (ML); alternating layers of red (2.5YR 4/8) and brown (7.5YR 5/3); damp; very stiff; trace gravel up to 1.5 inch diameter; sub angular; micaceous. FILL		564
47		SPT 24	4 9 9	18/24								563
48										SAA; stiff. FILL		562
49		SPT 25	3 4 6	18/24								561
50										SAA; with reddish yellow (7.5YR 6/6); clayish layer from 51.8 to 51.9 ft. FILL		560
51		SPT 26	2 6 9	12/24								559
52										SAA; very stiff; fine to medium grained; ~10% sand. FILL		558
53		SPT 27	4 8 9	21/24								557
54										SAA; stiff.		556
55		SPT 28	3 5 8	13/24								555
56										SAA; light brown (7.5YR 6/3); moist; light brown (gravel); low plasticity. FILL		554
57		SPT 29	6 10 10	7/24								553
58										SAA; more gravel from 58.7 ft down; ~5% coarse sand/small gravel. FILL		552
59		SPT 30	4 9 12	22/24								551
60												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1071

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
60									ML	SAA; yellowish brown (10YR 5/4); damp to moist; very stiff; micaceous; gravel sub angular (mostly quartz); up to 0.8 inch diameter; ~5 to 10% coarse sand and gravel; >10% clay; low plasticity. FILL		550
61		SPT 31	4 8 12	17/24								549
62										SAA; moist; very micaceous; no gravels or coarse sand. FILL		548
63		SPT 32	5 13 14	4/24								547
64										SAA; reddish brown (5YR 5/4) to brown (7.5YR 5/4); damp; ~5% medium sand. FILL		546
65		SPT 33	4 10 12	19/24								545
66										SAA; yellowish red (5YR 5/8). FILL		544
67		SPT 34	4 6 7	22/24								543
68										SAA; some olive green layers at 68.8 ft. FILL		542
69		SPT 35	4 11 12	18/24								541
70										SAA; red (2.5YR 5/6). FILL		540
71		SPT 36	4 10 10	19/24								539
72										SAA. FILL		538
73		SPT 37	4 9 11	18/24								537
74												536
75		SPT 38	6 7 13	17/21						SILT, clayey, sandy (ML); red (2.5YR 5/6); damp; very stiff; ~10% clay, ~5% fine to medium sand; trace gravels; micaceous; low to medium plasticity. FILL		535
76												534
77		SPT 39	5 11 14	20/24						Highly weathered meta-granodiorite fragments from 77.6 to 77.9 ft.		533
78												532
79		SPT 40	4 7 8	21/24								531
80										SAA; red to reddish yellow (2.5YR 6/8); no gravels. FILL	End of day 8/16/06 Begin day 8/17/06; water level at 6.5 ft	530
81		SPT 41	6 9 14	22/24								529
82										SAA; zone of high gravel/coarse sand content (~40%); angular clasts up to 1.2 inch diameter, average coarse sand size from 82.3 to 83.1 ft		528
83		SPT 42	2 8 11	20/24								527
84										SAA; red to reddish yellow (2.5YR 6/3); with trace gravels. FILL		526
85		SPT 43	3 5 9	14/24						SAA; red (2.5YR 5/6), stiff. FILL		525
86												524
87		SPT 44	3 7 9	11/24						SAA; more reddish brown (7.5YR 4/4); very stiff; sand increase to ~15% (fine sand). FILL		523
88												522
89		SPT 45	4 10 10	24/24								521
90									SM			

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1071

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
90												520
91		SPT 46	5 8 8	18/24						SAND silty, clayey (SM); light greenish gray (10GY 5/1); damp; medium dense; ~60% very fine sand, ~30% silt, ~10% clay; yellow oxidation staining; root pieces; RESIDUUM		519
92										*(Continued from previous page)*		518
93		SPT 47	4 4 8	8/24						SAA; trace gravels up to 1.2 inch diameter, average 0.5 inch diameter; mostly quartz, some mafics angular to sub-angular		517
94										SAA; very gravel rich from 93.8 to 94 ft. RESIDUUM		516
95		SPT 48	2 5 9	8/24						SAA; gravel percentage increasing with depth; sand component becomes coarser. RESIDUUM		515
96												514
97		SPT 49	2 3 4	16/24					ML	SILT clayey (ML); dark yellowish brown (10YR 4/4); damp to moist; medium stiff; very micaceous. SAPROLITE		513
98										SAA; SAPROLITE		512
99		SPT 50	2 4 5	20/24							Boring terminated on 8/17/06	511
100												510
101												509
102												508
103										Total Depth 100 ft.		507
104										Groundwater encountered at 6.5 feet		506
105										Borehole Grouted On 8/19/06		505
106												504
107												503
108												502
109												501
110												500
111												499
112												498
113												497
114												496
115												495
116												494
117												493
118												492
119												491
120												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1072**	
Type and Diameter of Boring Wash Rotary / Tricone 2 7/8 inch	Boring Location Borrow Area N 1164001 E 1847171		Total Depth 45 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 630.2 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9	Date Started 8/21/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/21/06

Reviewed by / Date: B. Reinicker 8/23/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Start drilling 8/21/06	630
1												629
2												628
3												627
4	/	SPT 1	2 4 7	14/18						SILT, clayey (ML); red (2.5Y 4/8); dry to damp; stiff; 80% silt, 20% clay. RESIDUUM		626
5												625
6												624
7												623
8												622
9	/	SPT 2	1 3 3	12/18						SILT, sandy, clayey (ML); yellowish red (5YR 5/8); to red (10R 5/6); dry to damp; medium stiff; ~60% silt, 30% very fine sand; ~10% clay. RESIDUUM		621
10												620
11												619
12												618
13												617
14	/	SPT 3	2 3 3	12/18								616
15									ML	SILT, clayey, sandy (ML); brownish yellow (10YR 6/6); damp; medium stiff; black lenses of manganese oxide oriented at 35° (relict rock texture); ~70% silt, ~20% clay, ~10% fine sand. SAPROLITE		615
16												614
17												613
18												612
19	/	SPT 4	1 3 3	16/18								611
20												610
21												609
22												608
23												607
24	/	SPT 5	1 3 5	13/18						SAA; mottled strong brown (7.5YR 5/8). SAPROLITE		606
25												605
26												604
27												603
28												602
29	/	SPT 6	1 3 2	18						SAA.		601
30												600
31												599
32												598
33												597
34	/	SPT 7	1 3 3	21/18						SAA; brownish yellow (10YR 6/8). SAPROLITE		596
35												595
36												594
37												593
38												592
39	/	SPT 8	1 3 5	17/18						SAA.		591
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1072

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												590
41												589
42												588
43												587
44		SPT 9	7 15 40/4	16/16						SAA; light olive brown (2.5Y 5/4); more micaceous; manganese oxide veins. SAPROLITE	Tricone refusal at 45 ft on 8/21/06; boring terminated	586
45												585
46												584
47												583
48												582
49												581
50												580
51												579
52												578
53												577
54												576
55												575
56												574
57												573
58												572
59												571
60												570
61												569
62												568
63												567
64												566
65												565
66												564
67												563
68												562
69												561
70												560
71												559
72												558
73												557
74												556
75												555
76												554
77												553
78												552
79												551
80												

Project Name and Job Number		SOIL LOG - Boring No. B-1073		
Lee Nuclear Station COL 6234-06-3389				
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Borrow Area N 1163676 E 1847239		Total Depth 78.5 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 626.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock 42 feet
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 8	Date Started 8/20/06
		Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/21/06

Reviewed by / Date: B. Reinicker 8/23/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Start 8/20/06	626
1												625
2												624
3												623
4		SPT 1	1 3 3	7/18						SILT, sandy, clayey (ML); red (2.5YR 4/6) and brownish yellow (10YR 6/6); damp; medium stiff; micaceous. RESIDUUM		622
5												621
6												620
7												619
8												618
9		SPT 2	2 3 3	10/18								617
10										SAA.		616
11												615
12												614
13												613
14		SPT 3	2 3 3	9/18						SAA; brownish yellow (10YR 6/6).		612
15												611
16												610
17									ML	SILT, sandy (ML); light yellowish brown (2.5Y 6/4); damp; medium stiff; micaceous; ~60% silt, ~40% fine sand. SAPROLITE		609
18												608
19		SPT 4	2 3 4	11/18								607
20												606
21												605
22												604
23												603
24		SPT 5	2 4 5	13/18								602
25												601
26												600
27												599
28												598
29		SPT 6	3 5 8	16/18						SAA; light yellowish brown to brownish yellow (10YR 6/8); original veining and fracture in parent rock. SAPROLITE		597
30												596
31												595
32									SM	SAND, silty (SM); yellow (2.5Y 7/6); dry to damp; very dense; micaceous ~40% silt. SAPROLITE		594
33												593
34		SPT 7	6 20 39	12/18								592
35												591
36												590
37												589
38												588
39		SPT 8	9 12 20	15/18								587
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. B-1073

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									ML	SILT, sandy (ML); light yellowish brown (2.5Y 6/4); damp; hard; micaceous. SAPROLITE	Tricone refusal at 42 ft on 8/20/06, see rock log	586
41												585
42												584
43												583
44												582
45												581
46												580
47												579
48												578
49												577
50												576
51												575
52												574
53												573
54												572
55												571
56												570
57												569
58												568
59												567
60												566
61												565
62												564
63												563
64												562
65												561
66												560
67												559
68												558
69												557
70												556
71												555
72												554
73												553
74												552
75												551
76												550
77												549
78												548
79												547
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1073**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location Borrow Area N 1163676 E 1847239		Total Depth 78.5 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 626.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock 42 feet
Casing Size and Depth 3.5 inch / 42 feet	Length of Core Barrel and Bit 13.5 feet	No. of Core Boxes 2	Date Started 8/20/06
	Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/21/06

Reviewed by / Date: B. Reinicker 8/23/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
42									584
43	1	4.1/6.5	0	MW	R2 to R3		META-GRANODIORITE; light brownish gray (2.5Y 6/2); medium grained; equigranular; oxidation staining.	8/20/06 begin NQ coring	583
44									582
45									581
46									580
47									579
48									578
49	2	2.8/4.0	0	MW	R2 to R3				577
50									576
51				SW to F	R4		SAA; bluish gray (5PB 5/1)		575
52								Hard drilling	574
53	3	1.0/1.0	40	SW to F	R4				573
54	4	2.8/3.0	12	HW HW	R0 R2		Friable layer, thin (~0 to 2 inch)	100% water loss	572
55				HW to MW	R3		SAA; fine to medium grained		571
56				MW	R3				570
57	5	2.0/2.0	35	SW to MW	R4				569
58				SW to MW	R3		META-GRANODIORITE		568
59				SW to MW	R3				567
60							Change in weathering to fresh. CONTINUOUS ROCK.		566
61	6	4.8/5.0	67	F	R4 to R5				565
62							SAA; slightly darker to bluish gray (5PB 5/1)		564
63									563
64	7	1.2/1.2	100	F	R4 to R5		SAA; calcite veining	End of day 8/20/06 Begin day 8/21/06	562
65									561
66	8	3.7/3.7	97	F	R4 to R5		SAA.		560
67									559
68									558
69	9	2.3/2.3	100	F	R4 to R5				557
70							SAA; pervasive calcite veining		556
71							SAA.		555
72	10	2.7/2.8	100	F	R4 to R5				554
73							META-GRANODIORITE		553
74							SAA.		552
75									551
76	11	4.9/5.0	98	F	R4 to R5				550
77									549
78									548
79								End drilling 8/21/06, boring terminated	547
80									546
81									545
82									

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1074**	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch	Boring Location Unit 1 N 1166070 E 1846246		Total Depth 67.5 feet
Drilling Contractor and Rig MACTEC/Warren/211797 / CME 75	Elevation and Datum 569.2 feet MSL	Ground Water Depth 21.1 feet	Depth to Bedrock 31.5 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9	Date Started 3/5/07
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/9/07

Reviewed by / Date: M. Gray 3/29/07

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin drilling at 1:30 pm 3.25 inch hollow augering with center bit	569
1												568
2												567
3												566
4		SPT 1	1 1 2	0/18					ML	SILT, sandy (ML), yellowish brown (10YR 5/8), to yellowish red (5YR 4/6), moist, soft, nonplastic, micaceous FILL	No recovery from split spoon	565
5												564
6												563
7												562
8												561
9		SPT 2	1 2 2	5/18					ML	SILT, sandy (ML), yellowish brown (10YR 5/6), moist, soft, ~ 20% fine sand, 10% fine gravel FILL		560
10												559
11												558
12												557
13												556
14		SPT 3	1 2 2	12/18					ML	SILT, sandy (ML), yellowish red (5YR 4/6), moist, soft, ~10% fine sand, ~10% fine gravel, micaceous nonplastic, FILL		555
15												554
16												553
17												552
18												551
19		SPT 4	WOH 2 2	4/18					ML	SILT, sandy (ML), yellowish red (5YR 4/6), moist, soft 10% fine sand, 5-10% fine gravel, micaceous, nonplastic, FILL		550
20												549
21									▼			548
22												547
23												546
24		SPT 5	WOH 2 3	8/18								545
25												544
26									▽			543
27												542
28												541
29									SM	SAND, silty (SM) with gravel, dark gray (7.5YR 4/1) and dark brown (7.5YR 3/2), wet, very dense fine sandy, ~15% silt, micaceous FILL	Groundwater at 28.5 ft Rods sunk 0.8 ft to 29.3 ft	540
30		SPT 6	WOH 26 50/2	18/18					GP	Gravel (GP), dark gray (N 4) wet, fine gravel, <15% fine sand PARTIALLY WEATHERED ROCK	Weight of hammer (WOH) for 5" - 26/1" Gravel layer "shot rock" or the like at 29.9 ft Auger refusal at 29.9 ft Setup wash drilling equipment 2 7/8" roller cone through hollow augers	539
31												538
32												537
33												536
34												535
35												534
36												533
37												532
38												531
39												530
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. B-1074**	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch	Boring Location Unit 1 N 1166070 E 1846246		Total Depth 67.5 feet
Drilling Contractor and Rig MACTEC/Warren/211797 / CME 75	Elevation and Datum 569.2 feet MSL	Ground Water Depth 21.1 feet	Depth to Bedrock 31.5 feet
Casing Size and Depth 4 inch / 31 feet	Length of Core Barrel and Bit 8.5 feet / 8.5 feet	No. of Core Boxes 2	Date Started 3/5/07
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/9/07

Reviewed by / Date M. Gray 3/29/07

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
32		9	1.7/2.2	25	MW-HW	R3		META-GRANODIORITE; light gray to very dark gray (N 7 to N 3), speckled "salt and pepper" appearance, 20 to 25% mafics, 15 to 20% quartz, 55 to 65% plagioclase, 0.5 inch thick, vuggy quartz vein at 33 ft at 60° , medium grained, moderately to highly weathered, medium strong to strong, healed joint dipping 45° present from 32.55 to 32.75 feet Manganese oxide staining on most natural joints, dry	No record of sample 7 or run 8 When the casing was set, casing was not centered over the cored hole. Continued coring (Run 9) from depth of casing at 31.5 ft. Groundwater measured at 12.5 ft 30 minutes after drilling terminated End drilling for 3/5/07. Groundwater measured at 25.4 ft Changed to higher gear at ~36.7 ft Losing ~70% of water down hole Driller noted a void at 38.0 to 38.1 Ft Run 11 core was stuck in barrel broken while getting it out Pressuremeter Test: 42.7 ft on 3/7/07 Pressuremeter Test: 44.4 ft on 3/7/07 Water level 7:30 a.m. 3/8/07 25.8 ft below ground level Conducted SPT test at 46.0 ft 50/2" (7A) Pressuremeter Test: 48.2 ft on 3/7/07 Pressuremeter Test: 49.2 ft on 3/8/07 Gray water returns for Run 14 SPT conducted from 51.0 ft to 51.15 ft (8A) 50/2" Pressuremeter Test: 53.3 ft on 3/8/07 Pressuremeter Test: 54.8 ft on 3/8/07 Brown to clear water returns for Run 15 Pressuremeter Test: 58.3 ft on 3/8/07 No core recovery from 60.5 ft to 61.0 ft Pressuremeter Test: 62.8 ft on 3/8/07 Pressuremeter Test: 64.3 ft on 3/8/07 Drill string vibrating a lot during Run 17 Stopped after 1.5 ft of drilling PVC casing, broke with mud entering hole Stopped drilling and abandoned hole	537
33										536
34										535
35										534
36		10	3.6/5.0	24	MW	R3 to R4				533
37										532
38										531
39										530
40										529
41		11	2.2/5.0	44	SW	R4				528
42										527
43							Lee2			526
44		12	1.5/2.3	0	MW	R3	Lee1	META-GRANODIORITE to META-QUARTZ DIORITE; brown (7.5YR 4/4) quartz mica schist, fine grained, moderately weathered, medium strong, dry		525
45										524
46										523
47		13	1.0/5.0	0	SW	R4	Lee4 Lee3	META-GRANODIORITE; primarily light gray (N 7), with grains that are very dark gray (N 3), ~ 75% plagioclase, 10 to 15% quartz, 10% hornblende, medium grained, slightly weathered, strong, dry. Natural joints coated with oxide minerals from 46.2 to 53.1 ft. Hornblendes weathered along grain margins (7.5YR 4/6). Below 53.1 weathering decreasing. Diabase dike intrudes at an angle of 70° from 51.1 to 51.55 ft. Quartz intrusions that are vuggy at 52.7, 53.3, 53.6, 54.6, and 54.8 ft. Subvertical incipient fractures from 51.6 to 53.0 ft. Secondary mineralization on joint faces includes oxides and epidote Rock becomes slightly weathered from 55.8 to 58.4 ft.		522
48										521
49										520
50										519
51										518
52		14	4.3/5.0	52	SW to F	R4	Lee6 Lee5			517
53										516
54										515
55										514
56										513
57										512
58		15	3.2/4.5	9	SW	R4	Lee7			511
59										510
60										509
61			0.5					META-QUARTZ DIORITE; light gray matrix (7/N) with medium gray (5/N) and dark brown (7.5YR 3/4) phenocrysts, 75% plagioclase, ~ 10% quartz, ~ 10% hornblende, medium grained, strong, dry, many steeply dipping very thin dikes, 0.5 inch vuggy quartz intrusion near 62.6 ft.		508
62		16	4.5/5.0	66	F	R4	Lee9 Lee8			507
63										506
64										505
65										504
66										503
67		17	0.5/1.5	33	F	R4				502
68										501
69										500
70								Total Depth 67.5 ft. Groundwater encountered at 21.1 feet		499
71										498

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1074

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
72								Borehole Grouted On 4/6/07	Water level on 3/11/07 10:15 a.m. is 21.1 ft below ground surface	497
73										496
74										495
75										494
76										493
77										492
78										491
79										490
80										489
81										488
82										487
83										486
84										485
85										484
86										483
87										482
88										481
89										480
90										479
91										478
92										477
93										476
94										475
95										474
96										473
97										472
98										471
99										470
100										469
101										468
102										467
103										466
104										465
105										464
106										463
107										462
108										461
109										460
110										459
111										458

| Project Name and Job Number | | |

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1074A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
72	9	3.8/3.9	90	F	R4	Lee21		While reaming HQ, lost all water returns at 70 ft	497
73								Pressuremeter Test: 72.3 ft on 3/13/07	496
74						Lee20			495
75	10	3.3/3.1	100	F	R4	Lee19 Lee18		Drill rod chatter from 72.5 ft to 73.5 ft	494
76								Pressuremeter Test: 73.8 ft on 3/13/07	493
77								Pressuremeter Test: 75.3 ft on 3/13/07	492
78	11	3.4/3.5	90	F	R4			Pressuremeter Test: 75.8 ft on 3/13/07	491
79								Rod chatter from 77.5 ft to 78.5 ft	490
80								Pressuremeter Test: 80.5 ft on 3/14/07	489
81						Lee22	META-GRANODIORITE; light gray to light bluish gray (7/N to 10B 7/1), medium grained, fresh, strong, dry.	Sharp contact	488
82	12	3.7/3.5	100	F	R4	Lee24	META-DIORITE; dark bluish gray (10B 4/1), fine grained, ~55% mafics, ~ 45% plagioclase, fresh, strong, dry, numerous very thin to thin (up to 0.2 inch) quartz veins cut core at high angles.	Pressuremeter Test: 81.7 ft on 3/14/07	487
83						Lee23	Diorite is very slightly metamorphosed.	Driller Jason Cain took over rig from Jimmy Warren after Run 12.	486
84								Switched to HQ coring with 5 ft runs.	485
85	13	1.6/1.6	97	F	R4			Water level 9:00 a.m. 3/15/07 at 22.8 ft	484
86							META-GRANODIORITE; light gray to light bluish gray (7/N to 10B 7/1), medium grained, ~ 30% mafics, ~ 25% quartz, ~ 40% plagioclase, ~ 5% potassium feldspar, fresh, strong, dry.	Pressuremeter Test: 83.2 ft on 3/14/07	483
87	14	2.9/3.0	97	F	R4				482
88									481
89									480
90	15	4.9/5.0	98	F	R4		Some phenocrysts of mafics up to 0.7 inch present from 89.8 to 91.2 ft.		479
91									478
92							Very thin (<0.1 inch) quartz veins closely to moderately spaced cut through at high angles.		477
93							Veins at 91.7 and 93.1 ft. are very vuggy, incipient fracture planes.		476
94									475
95									474
96	16	4.4/4.4	100	F	R4		META-GRANODIORITE; bluish gray (10B 7/1), ~ 40% potassium feldspar, ~ 30% quartz, ~ 20% mafics, ~ 10% plagioclase, medium grained, fresh, strong, dry, numerous closely spaced thin (<0.1 inch) mafic intrusions.	Gradational contact	473
97								Water level at 9:50 a.m. 23.7 ft	472
98								3/21/07 taped hole to 96.0 ft	471
99	17	0.4/0.4	87.5	F	R4				470
100									469
101	18	4.7/5.0	88	F	R4			Poor water returns during Runs 18,19, and 20	468
102							Thin (<0.1 inch) mafic intrusions not visible at 101.9 ft.		467
103									466
104							At 103.5 ft. potassium feldspar percentage decreases to 10 to 15%, ~ 30 to 35% mafics, ~ 25% quartz, ~ 35% plagioclase.		465
105									464
106	19	5.0/5.0	100	F	R4				463
107									462
108							Thin foliated bands of from 108 to 108.1 ft. and 108.5 to 108.7 ft.		461
109									460
110									459
111	20	4.9	98	F	R4		META-GRANODIORITE; bluish gray (10B 7/1), medium grained, ~ 30 to 35% mafics, ~ 30% plagioclase, ~ 20% quartz, ~ 15 to 20 % potassiuim feldspar, fresh, strong,		458

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1074A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
112			5.0					dry, fine grained zone from 110 to 110.1 ft. , below 110.1 ft are few subvertical healed joints.		457
113										456
114								Steeply dipping healed joints from 114.3 to 115.1 ft.	Poor water returns during Run 21	455
115		21	2.6/3.0	87	F	R4				454
116									Slight rod chatter from 115.9 to 116.7 ft	453
117										452
118										451
119		22	4.3/5.0	85	F	R4			It is possible that some core from Run 22 was left in hole. RQD for the 4.25 ft retrieved would be 100%	450
120										449
121										448
122										447
123									Attempted to measure depth to bottom but weight on measuring tape would not sink through mud in hole.	446
124										445
125								Total Depth 121.9 ft.		444
126								Groundwater encountered at 23.7 feet		443
127								Borehole Grouted On 4/6/07		442
128										441
129										440
130										439
131										438
132										437
133										436
134										435
135										434
136										433
137										432
138										431
139										430
140										429
141										428
142										427
143										426
144										425
145										424
146										423
147										422
148										421
149										420
150										419
151										418

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. B-1075**	
Type and Diameter of Boring Hollow stem / 6.5 inch	Boring Location Unit 1 N 1166030 E 1846256		Total Depth 23.7 feet
Drilling Contractor and Rig MACTEC/Warren/211797 / CME 75	Elevation and Datum 569.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Hollow-stem augers with split sampler	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 4	Date Started 3/22/07
	Borehole Inclination -90	Logged by R. Turner	Date Completed 3/22/07

Reviewed by / Date: M. Gray 3/29/07

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												569
1												568
2												567
3												566
4		SPT 1	4 3 2	12/18					SM	SAND silty (SM), strong brown (7.5YR 4/6), loose to very loose density, subangular, minimum size is silt, maximum size is fine sand damp FILL		565
5												564
6												563
7												562
8											Gravel layer from 7.0 ft to 7.5 ft	561
9		SPT 2	1 3 3	6/18						SAND silty (SM), yellowish brown (10YR 5/4), very loose density, subangular, minimum size is silt, maximum size is fine sand, damp, FILL		560
10												559
11												558
12												557
13												556
14		SPT 3	2 3 2	6/18					SM	SAND silty with gravel (SM), strong brown (7.5YR 4/6), very loose density, subangular, minimum size is silt, maximum size is a 1 inch piece of gravel FILL, damp		555
15												554
16												553
17												552
18											WOH = weight of hammer	551
19		SPT 4	WOH 1 2	9/18					SW-SM	SAND silty (SW-SM), medium toughness, yellowish brown (10YR 5/4) medium stiff, slow dilatency, nonplastic, well graded, damp to moist, maximum size coarse sand FILL		550
20												549
21											Hole abandoned as the augers hit rock or gravel layer and deviated from vertical	548
22												547
23												546
24		SPT 5	50/2	3/2					GW	GRAVEL, light gray (7/N), angular, 1.5 inch, single piece SPT refusal	SPT refusal at 23.5 ft. See B-1075A	545
25												544
26												543
27												542
28												541
29												540
30												539
31												538
32												537
33												536
34												535
35												534
36												533
37												532
38												531
39												530
40												

| Project Name and Job Number | | |

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1075A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
65										505
66		10	3.0/3.0	100	F	R4		META-GRANODIORITE;; light bluish gray (10B 7/1), medium grained, ~ 35% biotite/hornblende, ~ 25% quartz, ~ 25% plagioclase, ~ 15% potassium feldspar, fresh, strong, dry.		504
67										503
68		11	2.1/2.0	100	F	R4		Very thin quartz vein (0.1 inch) cuts core from 65.7 to 66.3 ft.		502
69										501
70		12	4.4/5.0	88	F	R4		Very thin quartz vein (<0.1 inch) at 68.5 ft. Quartz veins at 69.2 and 69.4 ft. (~0.1 to 0.2 inch thick)	At 70, 0.3 ft, drill advanced rapidly	500
71										499
72										498
73										497
74										496
75		13	5.0/5.0	100	F	R4		0.1 inch quartz vein at 75.8 ft.		495
76										494
77										493
78										492
79										491
80		14	1.7/3.0	57	F	R4		META-QUARTZ DIORITE; light bluish gray to bluish gray (10B 7/1 to 10B 6/1), medium grained, ~ 35% biotite/hornblende, ~35% quartz, ~ 25% plagioclase, ~ 5% potassium feldspar, strong, fresh, dry.	Gradational contact at 80 ft After Run 14 was cored, the core wouldn't break at the bottom	490
81										489
82										488
83		15	1.7/2.0	85	F	R4		META-GRANODIORITE;; light bluish gray (10B 7/1), medium grained, fresh, strong, dry, 0.1 to 0.7 inch quartz veins.	Pulled rod to get core out 82.8 ft gradational contact	487
84										486
85										485
86		16	5.0/5.0	100	F	R5		META-DIORITE; dark bluish gray (10B 4/1), fine grained, fresh, strong, 0.1 to 0.2 inch quartz veins from 86 to 88.1 ft.	At ~85 ft, water returns changed from light to dark gray	484
87										483
88										482
89										481
90		17	4.9/5.0	97	F	R5		META-GRANODIORITE;; light bluish gray (10B 7/1), ~ 35% quartz, ~ 30% plagioclase, ~ 25% biotite/hornblende, ~ 10% potassium feldspar, medium grained, fresh, very strong, phenocrysts of mafics 0.5 to 2.4 inch from 90.5 to 92.8 ft.	Sharp contact that occurs between 89.6 ft and 89.8 ft	480
91										479
92										478
93										477
94										476
95		18	4.9/5.0	97	F	R5		META-GRANODIORITE;; light bluish gray (10B 7/1), medium grained, fresh, very strong, dry. Zone from 94.9 to 95.6 ft. is ~ 40% quartz, ~ 40% plagioclase, ~ 15% potassium feldspar, ~ 5% biotite/hornblende. Below 95.6 ft. rock is ~ 40% biotite/hornblende, ~ 30% quartz, ~ 20% plagioclase, ~ 10% potassium feldspar. From 96.2 to 97.4 ft. are 6 healed joints dipping 60 to 70 degrees spaced 1.5 to 4.0 inches apart.		475
96										474
97										473
98										472
99										471
100		19	5.0/5.0	100	F	R5		Two generations of quartz vein intrusions between 102.9 and 103.3 ft., a feldspathic quartz vein cuts and offsets a		470
101										469
102										468
103										467
104										466

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1075A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
105							pure quartz vein.		465
106							META-QUARTZ DIORITE; bluish gray (10B 6/1), medium grained, fresh, very strong, dry.	Gradational contact	464
107	20	5.3/5.0	100	F	R5		0.8 inch thick feldspathic quartz vein cuts core at 65 degrees from 105.85 to 106.55 ft.		463
108							From 107.3 to 107.7 ft. and 108.2 to 108.45 ft. rock is fine grained and gneissic.		462
109									461
110									460
111							META-QUARTZ DIORITE; light bluish gray (10B 7/1), medium grained, ~ 45% biotite/hornblende, ~ 35% quartz, ~15% plagioclase, ~ 5% potassium feldspar,		459
112	21	4.7/5.0	93	F	R5		fresh, very strong, dry.	Gradational contact	458
113							META-GRANODIORITE; light bluish gray (10B 7/1), medium to coarse grained, ~ 35% quartz, ~ 30% biotite/hornblende, ~ 20% plagioclase, ~ 15% potassium		457
114							feldspar, fresh, very strong, dry.		456
115							1.2 inch quartz vein from 112.25 to 113.1 ft.		455
116							healed microfaulted quartz veins from 113.8 to 114.1 ft.		454
117	22	5.0/5.0	100	F	R5		0.2 inch thick quartz vein at 116.6 ft.		453
118							Granite from 116.8 to 117.3 ft.		452
119									451
120							From 118.8 to 119.6 ft. a single 3 inch thick quartz vein comprises 40 to 60% of the core	Measured water level at 23.4 ft at 7:30 a.m., 3/26/07	450
121	23	3.2/3.2	100	F	R5		META-QUARTZ DIORITE; bluish gray (10B 6/1), fine to medium grained, 50 to 55% quartz, 35 to 40% plagioclase, ~ 10% biotite, <5% potassium feldspar,		449
122							fresh, very strong, dry.		448
123							Subvertical mafic intrusion from 119.8 to 120.45 ft.		447
124	24	1.9/2.0	95	F	R5				446
125									445
126							META-QUARTZ DIORITE; light bluish gray (10B 7/1), ~ 40% biotite/hornblende, ~ 30% quartz, ~ 30 % plagioclase, ~ 5% potassium feldspar, medium grained,		444
127	25	5.0/5.0	100	F	R5		fresh, very strong, dry.		443
128							Granitic zone with 0.5 inch thick quartz vein from 125.5 to 125.8 ft.		442
129									441
130									440
131									439
132	26	5.1/5.0	100	F	R5				438
133									437
134									436
135									435
136	27	2.0/2.0	100	F	R5		0.3 inch thick quartz vein cuts core at 70 degrees from 135.1 to 135.5 ft.		434
137									433
138	28	2.7/3.0	90	F	R5				432
139								Mechanical breaks from 138.5 to 139.5 ft caused while removing core from sample barrel	431
140									430
141							META-QUARTZ DIORITE; light bluish gray (10B 7/1), medium grained, ~ 40% biotite, ~ 35% quartz, ~ 20% plagioclase, ~ 5% potassium feldspar, fresh, very strong,		429
142	29	4.7/5.0	94	F	R5		dry.		428
143							0.1 inch quartz vein from 140.2 to 140.6 ft.		427
144							0.5 to 0.7 inch thick quartz vein from 142.5 to 142.75 ft.		426

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. B-1075A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
145										425
146										424
147		30	5.0/5.0	100	F	R5		Mafic xenoliths present from 147 to 147.9 ft.		423
148										422
149										421
150		31	0.6/0.6	100	F	R5				420
151										419
152										418
153								Total Depth 150.4 ft.		417
154								Groundwater encountered at 23.4 feet		416
155								Borehole Grouted On 4/6/07		415
156										414
157										413
158										412
159										411
160										410
161										409
162										408
163										407
164										406
165										405
166										404
167										403
168										402
169										401
170										400
171										399
172										398
173										397
174										396
175										395
176										394
177										393
178										392
179										391
180										390
181										389
182										388
183										387
184										386

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1200**	
Type and Diameter of Boring CME Sampler / 7 inch/NQ	Boring Location General site N 1166347 E 1845577		Total Depth 8.5 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 591.5 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 1	Date Started 3/18/06
	Borehole Inclination -90	Logged by M. Cooke	Date Completed 3/18/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									SM	Topsoil, sandy (SM).	Begin drilling 3/18/06	591
1–3									SM	SAND, silty (SM); light yellowish brown to white (10YR 6/4 to 10YR 8/1); dry; fine to medium grained; contains 2 to 3 inch fragments of weathered rock. FILL		590–589
4–5		CME 1		30/30							Hard drilling 3.5 to 6 ft	588–587
6										PARTIALLY WEATHERED ROCK Refusal to hollow stem auger, moved 4 ft east from MW-1200 to core rock, see soil and rock log MW-1200A Refer to MW-1200A for rock description		586
7–8											CME sampler refusal	585–584
9												583
10–40												582–552

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1200A**	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch	Boring Location General site N 1166348 E 1845580		Total Depth 63.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 591.8 feet MSL	Ground Water Depth 23 feet	Depth to Bedrock 31 feet
Casing Size and Depth 3.5 inch / 8.5 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 3	Date Started 3/27/06
	Borehole Inclination -90	Logged by M. Cooke	Date Completed 3/28/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
9									Begin NQ core	583
10									Began rock coring, see rock log	582
11		1	1.0/5.0	0	CW to HW	R0 to R1				581
12										580
13										579
14		2	2.0/5.0	0	CW to HW	R0 to R1		META-GRANODIORITE; bluish grya (10B 6/1); highly weathered; no recovery. PARTIALLY WEATHERED ROCK.		578
15										577
16										576
17										575
18										574
19		3	1.0/5.0	0	CW to HW	R0 to R1		SAA.	~10% loss of coring water	573
20										572
21										571
22										570
23								▽		569
24		4	2.0/5.0	0	CW to HW	R0 to R1		SAA.		568
25										567
26										566
27										565
28										564
29		5	4.5/5.0	58	CW to HW	R0 to R1			End day 3/27/06 Begin day 3/28/06; water at 23 ft	563
30										562
31					MW	R3		META-GRANODIORITE; bluish gray (10B 6/1); weakly foliated ~ 30 to 45°, 1 to 3 mm grain size; pitting and vugs on surface of core from dissolution of secondary minerals (calcite); quartz veins along foliation.		561
32										560
33										559
34		6	5.0/5.0	23	HW to MW	R2		SAA; highly weathered 33.5 to 36 ft.		558
35										557
36										556
37					MW	R3				555
38										554
39		7	5.0/5.0	18	HW	R1 to R2		SAA; highly weathered 38.5 to 40.7 ft, more pronounced foliation.		553
40										552
41										551
42					MW	R3				550
43										549
44		8	5.0/5.0	0	HW	R1 to R2		SAA; fracture parallel to foliation 43.2 to 43.5 ft.		548
45										547
46								Quartz dike 45.7 to 47 ft.		546
47										545
48										544

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1200A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
49–53		9	5.0/5.0	81	SW to F	R3 to R4		META-DIORITE; dark bluish gray (10B 4/1); medium to coarse grained; slight foliation inclined at 30 to 45° ; quartz, plagioclase, biotite, hornblende; CONTINUOUS ROCK Quartz rich zone Shear zone 60°, highly weathered, brecciated along boundaries		543–539
54–58		10	5.0/5.0	97	F	R4				538–534
59–63		11	5.0/5.0	100	F	R4		SAA.	End drilling 3/28/06	533–529
64–88								Total Depth 63.5 ft. Groundwater encountered at 23 feet Borehole Grouted On 3/29/06		528–504

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1201**	
Type and Diameter of Boring CME Sampler / 7 inch/NQ	Boring Location General site N 1166696 E 1846574		Total Depth 150 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 589.5 feet MSL	Ground Water Depth 36.2 feet	Depth to Bedrock 99 feet
Sampling Method Continuous Sampler/Standard	Sample Driving Hammer/Drop NA / NA	No. of Samples 13	Date Started 3/18/06
	Borehole Inclination -90	Logged by M. Cooke	Date Completed 3/21/06

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	4 topsoil inch with decomposed organics SILT sandy (ML); yellowish brown (10YR 5/6); damp to dry; fine to medium sand; trace mica, trace gravel. FILL	Begin drilling 3/18/06	589
1												588
2												587
3											Begin CME continuous sampling	586
4		CME 1		60/60								585
5												584
6												583
7												582
8												581
9		CME 2		60/60						SAA; red (10R 4/8).		580
10												579
11												578
12										At 12 ft, gravel zone, contains 2 inch diameter angular quartz gravel size rock fragments.		577
13												576
14		CME 3		60/60								575
15												574
16												573
17												572
18												571
19		CME 4		60/60								570
20												569
21												568
22												567
23												566
24		CME 5		12/60						SAA.		565
25												564
26											Low recovery, sampler likely blocked by gravel	563
27												562
28												561
29		CME 6		60/60								560
30									SM	SAND, silty (SM); yellowish brown (10YR 5/6); damp; fine grained. FILL		559
31									ML	SILT, sandy (ML); weak red (10R 4/4); damp; fine sand. FILL		558
32												557
33												556
34		CME 7		60/60								555
35												554
36									▽			553
37												552
38												551
39												550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1201

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												549
41		CME 8		60/60								548
42												547
43												546
44												545
45		CME 9		45/60								544
46												543
47												542
48												541
49										48.5 to 52.5 ft becomes wet.	End drillilng 3/18/06	540
50											Begin drilling 3/19/06; water at 42 ft	539
51		CME 10		48/60								538
52												537
53									SM	SAND silty (SM); brownish yellow to yellow (10YR 6/8 to 10YR 7/6); dry; fine to medium grained; quartz, mica, ~1/8 inch rock fragments; relict metamorphic texture;	Hard drilling 52.5 to 58.5 ft	536
54												535
55												534
56		CME 11		42/60						3 inch weathered quatz dike; SAPROLITE		533
57												532
58												531
59											Very hard drilling	530
60												529
61		CME 12		60/60								528
62										Quartz dike.		527
63										Quartz dike.		526
64												525
65												524
66		CME 13		30/60								523
67												522
68										Refusal to CME sampler and hollow stem augers. Refer to rock log for continuation of borehole log		521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1201**	
Type and Diameter of Boring CME Sampler / 7 inch/NQ	Boring Location General site N 1166696 E 1846574		Total Depth 150 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 589.5 feet MSL	Ground Water Depth 36.2 feet	Depth to Bedrock 99 feet
Casing Size and Depth 3.5 inch / 68.5 feet	Length of Core Barrel and Bit 13 feet	No. of Core Boxes 7	Date Started 3/18/06
	Borehole Inclination -90	Logged by M. Cooke	Date Completed 3/21/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
69							SAND silty (SM); dark yellowish brown (10YR 3/6); with rock fragments; SAPROLITE.	End of day 3/19/06; water at 36.75 ft Begin coring 3/20/06; water at 37 ft	521
70									520
71	1	0.0/5.5	0	RS to CW	R0				519
72									518
73									517
74							SAND silty (SM) dark yellowish brown (10YR 3/6); medium to coarse grained with rock fragments; SAPROLITE		516
75									515
76	2	0.8/5.0	0	CW	R0				514
77									513
78									512
79									511
80	3	1.0/5.0	0	CW	R0				510
81									509
82									508
83									507
84									506
85	4	1.0/5.0	0	HW to CW	R0				505
86									504
87									503
88									502
89									501
90	5	1.5/5.0	0	HW to CW	R0				500
91									499
92									498
93									497
94									496
95	6	1.0/5.0	0	HW to CW	R0				495
96									494
97									493
98									492
99									491
100	7	5.0/5.0	0	HW	R1 to R2		META-GRANODIORITE; white (10YR 8/1); weathered yellow oxidation; texture and foliation obscured by highly weathering conditions; numerous open veinlets and vugs due to weathering of secondary minerals along interlocking series of fracture; quartz, plagioclase, calcite. PARTIALLY WEATHERED ROCK.	End drilling 3/20/06 Begin drilling 3/21/06; water at 36.2 ft	490
101									489
102									488
103									487
104									486
105									485
106	8	1.5/5.0	0	CW	R0		PARTIALLY WEATHERED ROCK SAA.		484
107									483
108									482
									481

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1201

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
109										481
110		9	4.3/5.0	0	HW	R1 to R2		META-GRANODIORITE; weathered yellow (10YR 7/8); branching/interlocking vertical fractures, abundant calcite along fractures and vugs. PARTIALLY WEATHERED ROCK		480
111										479
112										478
113					CW	R0		SAA.		477
114										476
115		10	5.0/5.0	83	MW	R2 to R3		META-DIORITE; greenish gray (10GY 4/1); very fine grained, calcite in stringers and parallel to foliation; CONTINUOUS ROCK		475
116					F	R4				474
117										473
118										472
119										471
120		11	5.0/5.0	100	F	R4				470
121										469
122										468
123										467
124										466
125		12	5.0/5.0	80	F	R4				465
126										464
127										463
128										462
129										461
130		13	5.0/5.0	94	F	R4				460
131										459
132										458
133										457
134										456
135		14	5.0/5.0	100	F	R4				455
136										454
137										453
138										452
139										451
140		15	5.0/5.0	94	F	R4				450
141										449
142										448
143										447
144										446
145		16	6.0/6.0	91	F	R4				445
146										444
147										443
148										442
										441

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1201

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
149										441
150					MW	R3		SAA.		440
151									End drilling 3/21/06	439
152										438
153								Total Depth 150 ft.		437
154								Groundwater encountered at 36.2 feet		436
155								Borehole Grouted On 6/8/06		435
156										434
157										433
158										432
159										431
160										430
161										429
162										428
163										427
164										426
165										425
166										424
167										423
168										422
169										421
170										420
171										419
172										418
173										417
174										416
175										415
176										414
177										413
178										412
179										411
180										410
181										409
182										408
183										407
184										406
185										405
186										404
187										403
188										402
										401

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1202**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location General site N 1167007 E 1847460		Total Depth 48.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.3 feet MSL	Ground Water Depth 24 feet	Depth to Bedrock N/A
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 9	Date Started 3/14/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/15/06

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0–3									SM	SAND, silty (SM); weak red (10R 4/4); dry; fine to medium grained; some quartz rock fragments; zones of light brown fine sand. FILL	Begin drilling on 3/14/06	587–584
4–8		CME 1		34.8/60								583–579
9–13		CME 2		7.2/60						SAA; damp to moist; micaceous.		578–574
14–18		CME 3		43.2/60								573–569
19–23		CME 4		60/60					ML	SILT, clayey, sandy (ML); dark brown (7.5YR 3/3); moist; micaceous; trace quartz fragments; trace wood fragments. FILL		568–564
24–28		CME 5		58.8/60					ML	SILT, (ML); strong brown (7.5YR 4/6); moist; low plasticity; micaceous; trace fine sand. RESIDUUM	Water on rods at ~22 ft	563–559
29–33		CME 6		25.2/60					ML	▽ SAA; red (2.5YR 4/6); and reddish yellow (7.5YR 6/6) with black (7.5YR 2.5/1); seams; wet; low plasticity; little mica. RESIDUUM	Saturated soil cuttings	558–554
34–38		CME 7		31.2/60					ML	SILT, (ML); red (2.5YR 4/6); and reddish yellow (7.5YR 6/6) with black (7.5YR 2.5/1); seams; wet; low plasticity; little mica. SAPROLITE		553–550
39–40										SAA; mottledvery dark brown (10YR 2/2) to yellowish brown (10YR 5/4) to grayish brown (10YR 5/2); wet; trace fine sand; very micaceous; low to no plasticity. SAPROLITE	Harder drilling	549–548
										SAA; yellowish brown (10YR 5/4) to grayish brown (10YR 5/2); wet; 10% sand; nonplastic; micaceous.		

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1202

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												547
41		CME 8		32.4/60					ML	SAPROLITE		546
42												545
43												544
44										SAA. SAPROLITE		543
45												542
46		CME 9		40.8/60								541
47												540
48											End of day 3/14/06 Begin day 3/15/06; water at 24 ft Very hard drilling, lost drilling tools in the hole See MW-1202A	539
49												538
50												537
51										Total Depth 48.5 ft. Groundwater encountered at 24 feet Borehole Grouted On 4/10/06		536
52												535
53												534
54												533
55												532
56												531
57												530
58												529
59												528
60												527
61												526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1202A**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location General site N 1167013 E 1847466		Total Depth 115.6 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.5 feet MSL	Ground Water Depth 16.8 feet	Depth to Bedrock 60.6 feet
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 7	Date Started 3/15/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/18/06

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										No samples attempted, refer to MW-1202.	Offset boring from MW-1202. Drilled without sampling to 48.5 ft	587
1												586
2												585
3												584
4												583
5												582
6												581
7												580
8												579
9												578
10												577
11												576
12												575
13												574
14												573
15												572
16												571
17									▽			570
18												569
19												568
20												567
21												566
22												565
23												564
24												563
25												562
26												561
27												560
28												559
29												558
30												557
31												556
32												555
33												554
34												553
35												552
36												551
37												550
38												549
39												548
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1202A

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										No samples attempted, refer to MW-1202. *(Continued from previous page)*	Offset boring from MW-1202. Drilled without sampling to 48.5 ft.	547
41												546
42												545
43											Begin SPT sampling at 48.5 ft	544
44												543
45												542
46												541
47												540
48												539
49		SPT 1	6 8 10	13.2/24					SM	SAND, silty (SM); light gray (5YR 7/1) and yellowish brown (10YR 5/4); damp; fine to medium grained; 15% silt; trace mica. SAPROLITE	Start MW-1202A at 48.5 ft with SPT sampling	538
50												537
51		SPT 2	4 7 8	18/24							Drove spoon with hammer 24 inches to obtain continuous soil sample	536
52												535
53		SPT 3	4 5 10	12/24							SPT HAMMER WEIGHT NOT CERTIFIED-SPT BLOWS FOR INFORMATION ONLY AND NOT DESIGN INPUT	534
54												533
55		SPT 4	8 10 15	19.2/24						SAA; light gray (5YR 7/1); and very dark greenish gray (5BG 3/1); fine to medium grained; 20% silt, micaceous. SAPROLITE		532
56												531
57		SPT 5	5 8 39	20.4/20.4								530
58												529
59		SPT 6	50/1.2	0/1.2					SP	SAND (SP); black (5YR 2.5/1); and light gray (5YR 7/1); micaceous. PARTIALLY WEATHERED ROCK	See rock log MW-1202A	528
60												527
61		SPT 7	50/1.2	0/1.2								526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1202A**	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch	Boring Location General site N 1167013 E 1847466		Total Depth 115.6 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 587.5 feet MSL	Ground Water Depth 16.8 feet	Depth to Bedrock 60.6 feet
Casing Size and Depth 3.5 inch / 60.6 feet	Length of Core Barrel and Bit 8.1 feet	No. of Core Boxes 8	Date Started 3/15/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/18/06

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
61–65		1	4.8/5.0	28	HW	R2 to R3		META-GRANODIORITE; very pale brown (10YR 7/2); fine to medium grained. Highly jointed rock dipping 0 to 90° partly healed with manganese iron oxide and calcite	Start drilling 3/17/06; water at 16.8 ft; partial loss of water return See rock log MW-1202A	526–522
66–70		2	5.0/5.0	42	HW	R2 to R3		SAA. Foliations dipping 35 to 55°		521–518
71–75		3	5.0/5.0	56	HW	R2 to R3				517–513
76–80		4	3.2/5.0	42	HW	R2 to R3		SAA; bluish gray (10B 5/1)		512–508
81						R2 to R3		SAA. CONTINUOUS ROCK.		507
82–84		5	4.8/4.8	74	HW	R1 to R2		Joints not filled or healed Badly broken zone		506–504
85–90		6	5.0/5.0	98	SW	R3 to R4		SAA; medium to coarse grained; weakly foliated; biotite, calcite		503–498
91–95		7	5.0/5.0	86	SW	R3 to R4				497–493
96–100		8	4.9/5.0	92	SW	R3 to R4				492–487

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1202A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
101		9	5.2/5.2	98	SW	R3 to R4		META-GRANODIORITE, as described above.		486
106		10	5.0/5.0	100	SW	R3 to R4		SAA.		481
111		11	4.7/5.0	86	SW	R3 to R4		SAA.		476
116								Total Depth 115.6 ft. Groundwater encountered at 16.8 feet Borehole Grouted On 4/10/06	Coring terminated at 115.6 ft on 3/18/06	471
140										447

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1203**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location Cooling Tower Unit 2 N 1166694 E 1847841		Total Depth 112.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 589.5 feet MSL	Ground Water Depth 18 feet	Depth to Bedrock 42.5 feet
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 8	Date Started 3/29/06
	Borehole Inclination -90	Logged by M. DePalma	Date Completed 3/31/06

Reviewed by / Date: F. Syms 5/26/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	1 ft of topsoil SILT, sandy (ML); orange red (5YR 5/8); dry; micaceous. FILL	Auger cuttings examined 0 to 3.5 ft	589
1												588
2												587
3												586
4		CME 1		21.5/60						SILT, sandy (ML); yellowish red (5YR 5/8); dry; micaceous; black lenses observed. FILL		585
5												584
6												583
7												582
8												581
9									ML	SILT, sandy (ML); yellowish red (5YR 5/6); stratified red, gray bands near end of run; SAPROLITE		580
10		CME 2		60/60								579
11												578
12												577
13										Strong brown (7.5YR 5/6); damp; micaceous.		576
14												575
15		CME 3		60/60								574
16												573
17												572
18									▽			571
19										Brown (7.5YR 5/2); moist.		570
20		CME 4		60/60								569
21												568
22												567
23												566
24		CME 5		38/60							Wet 26 to 27 ft	565
25												564
26												563
27												562
28										Damp to moist.		561
29		CME 6		30/60								560
30												559
31												558
32												557
33												556
34		CME 7		25/60								555
35												554
36												553
37												552
38												551
39									SM	SAND, silty (SM); pinkish gray (7.5YR 6/2) medium to coarse grained; moist; micaceous. SAPROLITE		550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1203

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		CME 8		13.5/48						Description on previous page.		549
41												548
42											Auger refusal at 42.75 ft on 3/27/06, see rock log begins 42.5 ft	547
43												546
44												545
45												544
46												543
47												542
48												541
49												540
50												539
51												538
52												537
53												536
54												535
55												534
56												533
57												532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1203**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location Cooling Tower Unit 2 N 1166694 E 1847841		Total Depth 112.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 589.5 feet MSL	Ground Water Depth 18 feet	Depth to Bedrock 42.5 feet
Casing Size and Depth 3.5 inch / 42.5 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 5	Date Started 3/29/06
	Borehole Inclination -90	Logged by M. DePalma	Date Completed 3/31/06

Reviewed by / Date F. Syms 5/26/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
43		1	0.3/5.0	0	CW to HW	R0 to R1		META-GRANODIORITE; gray (N 7); fine to medium grained, other dark minerals, green, gray clay (CL) at the top of core run		547
44										546
45										545
46										544
47										543
48		2	1.0/5.0	0	CW to HW	R0 to R1		SAA; no recovered clay		542
49										541
50										540
51										539
52										538
53		3	1.7/5.0	0	CW to HW	R0 to R1				537
54										536
55										535
56										534
57										533
58		4	3.6/5.0	0	HW to MW	R1		META-GRANODIORITE; gray (10Y 7/1); fine grained; biotite, epidote, iron staining; foliation 40°		532
59										531
60										530
61										529
62										528
63		5	2.7/5.0	10	MW	R2		Foliation 30° less secondary minerals		527
64										526
65										525
66										524
67										523
68		6	2.7/5.0	0	MW	R1 to R2		META-GRANODIORITE; dark green gray (10Y 4/1); foliated 30 to 45°		522
69										521
70										520
71										519
72										518
73		7	4.4/5.0	0	HW to MW	R1 to R2		META-GRANODIORITE; (10Y 6/1); medium to fine grained; foliated 30 to 45°		517
74										516
75										515
76										514
77										513
78		8	5.0/5.0	47	MW to SW	R2 to R3		SAA; (N 8); foliated 30°. Schist layer from 78.5 to 79.5 ft.		512
79										511
80										510
81										509
82										508
										507

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1203

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
83–87		9	5.0/5.0	47	SW	R3		SAA Quartz vein from 86.5 to 87.5 ft.		507–503
88–92		10	4.8/5.0	68	SW	R4		SAA; (N 5); quartz dike through first 1.5 ft; epidote veins; pyrite. CONTINUOUS ROCK. Quartz dike predominant 88 to 92.5 ft; light bluish gray mineral inclusions.	End drilling on 3/30/06 Begin drilling 3/31/06	502–498
93–97		11	4.8/5.0	85	SW to F	R4 to R5		META-DIORITE; very dark gray (N 3); quartz dike upper 3 inches, foliation widely spaced at top 1.5 ft.		497–493
98–102		12	5.0/5.0	97.5	F	R4		Calcite veins from 99.5 to 100.5 ft.		492–488
103–107		13	5.0/5.0	100	F	R4 to R5		Epidote veins at 102.5 ft. Pyrite phenocrysts at 104.5 ft.		487–483
108–112		14	5.0/5.0	100	F	R4 to R5		SAA		482–478
113–122								Total Depth 112.5 ft. Groundwater encountered at 18 feet Borehole Grouted On 3/31/06	Coring terminated 3/31/06	477–467

Project Name and Job Number		
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1204**

Type and Diameter of Boring CME Sampler / 7.5 inch/NQ	Boring Location Cooling Tower Unit 2 N 1166135 E 1848031		Total Depth 98.4 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 609.8 feet MSL	Ground Water Depth 39 feet	Depth to Bedrock N/A
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 19	Date Started 3/30/06
	Borehole Inclination -90	Logged by C. Gaskins/ E. Weldon	Date Completed 4/2/06

Reviewed by / Date: B. Reinicker 5/4/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drilled without sampling to 3.5 ft		609
4		CME 1		60/60					ML	SILT sandy (ML); (5YR 7/6 to 10YR 7/4); moist; 80% silt, 20% sand; <5% coarse sand to fine gravel; FILL		606
9		CME 2		60/60						SAA.		601
14		CME 3		4/60						No recovery, sampler blocked by rock fragment.		596
19		CME 4		0/60						No recovery.		591
24		CME 5		12/60					ML	SILT, sandy (ML); (5YR 5/6); moist; medium stiff; 65% silt; 35% sand; less than 5% coarse sand and fine gravel; FILL		586
29		CME 6		60/60						SAA; (10YR 5/4 to 5YR 5/6 to 10R 4/6); stiff to very stiff.		581
34		CME 7		60/60						SAA; (5YR 4/4, 5YR 5/6, 10R 6/6, 10YR 5/4, 10R 4/6) Large round rock fragment		576
39									▽	SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6)		571
40												570

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1204

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												
41		CME 8		60/60						SILT, sandy (ML); (5YR 5/6); moist; medium stiff; 65% silt; 35% sand; less than 5% coarse sand and fine gravel; FILL *(Continued from previous page)*		569
42												568
43												567
44										SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6)		566
45												565
46		CME 9		60/60								564
47												563
48												562
49										SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6) Angular rock fragment		561
50												560
51		CME 10		60/60								559
52												558
53												557
54										SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6)		556
55												555
56		CME 11		28/60								554
57												553
58												552
59										SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6)		551
60												550
61		CME 12		7/60								549
62												548
63												547
64										SILT sandy (ML); (5R 4/6); wet; 80% silt, 20% sand. FILL	End of day 3/30/06 Begin day 3/31/06; water level at 39 ft	546
65												545
66		CME 13		36/60								544
67												543
68												542
69										SAA; (10YR 6/6). FILL		541
70												540
71		CME 14		6/60								539
72												538
73												537
74									SM	SAND silty (SM); (5YR 7/2); wet; 55% sand; 45% silt. FILL		536
75												535
76		CME 15		9/60								534
77												533
78												532
79									ML	SILT sandy (ML); (10YR 6/6); moist to wet; 55% silt, 45% sand. SAPROLITE		531
80												530

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1204

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80												529
81		CME 16		36/60						SILT sandy (ML); (10YR 6/6); moist to wet; 55% silt, 45% sand. SAPROLITE *(Continued from previous page)*		528
82												527
83												526
84										SAA; (10YR 6/2 to 10YR 6/6 to 10YR 4/2). SAPROLITE		525
85												524
86		CME 17		48/60								523
87												522
88												521
89										SAA; (10YR 4/2 to 10YR 6/6). SAPROLITE		520
90												519
91		CME 18		60/60								518
92												517
93												516
94									SM	SAND silty (SM); (10YR 5/4 to 10YR 6/6); 75% sand; 25% silt. SAPROLITE		515
95												514
96		CME 19		58.8/58.8								513
97												512
98												511
99											Auger refusal at 98.4 ft; rock coring equipment lost in hole; moved 5 ft east; advanced casing to 100 ft; begin NQ coring on 4/1/06 MW-1204A on field log	510
100												509
101										Total Depth 98.4 ft. Groundwater encountered at 39 feet Borehole Grouted On 4/3/06		508
102												507
103												506
104												505
105												504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1204A**	
Type and Diameter of Boring NQ core / 7.5 inch	Boring Location Cooling Tower Unit 2 N 1166132 E 1848026		Total Depth 135 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 609.6 feet MSL	Ground Water Depth 37.1 feet	Depth to Bedrock 104.6 feet
Casing Size and Depth 3.5 inch / 100 feet	Length of Core Barrel and Bit 13 feet	No. of Core Boxes 10	Date Started 4/1/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 4/3/06

Reviewed by / Date: B. Reinicker 5/4/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
100							Drilled without sampling to 100 ft. See MW-1204 for soil description	Begin NQ coring on 4/1/06	509
105	1	0.2/4.6	0	CW	R0 to R4		SAND, silty (ML); reddish yellow (7.5 YR 6/8); white to light gray quartzite fragment; equigranular; very coarse grained. SAPROLITE		504
110	2	1.3/5.0	0	CW to MW	R3		META-GRANODIORITE; white to dark gray (N 8 to 2.5Y 3/1); porphyroblastic; fine to coarse grained; reddish yellow to black staining; foliation 50°; hornblende, biotite, quartz, feldspars.		499
115	3	3.3/5.0	0	MW	R3		META-QUARTZ DIORITE		494
120	4	4.6/5.4	33	MW	R3		META-GRANODIORITE; bluish gray (10B 5/1); fine to medium grained; quartz and weathered plagioclase altered K-spar.	End of day 4/1/06 Begin day 4/2/06; water at 37.1 ft; changed from a 10 ft core barrel to a 5 ft core barrel	489
125	5	4.8/5.0	90	MW	R3		SAA; xenoliths, schist, scattered vugs; small dendritic manganese and iron staining. CONTINUOUS ROCK		484
130	6	5.0/5.0	100	SW to F	R3 to R4		META-DIORITE; fine to medium grained; thin laminated foliation; quartz, hornblende. META-GRANODIORITE; bluish gray; fine to medium grained; various thin fractures filled with calcite.		479
135	7	4.9/5.0	98	SW to F	R3 to R4				474
140							Total Depth 135 ft. Groundwater encountered at 37.1 feet Borehole Grouted On 4/3/06	End of drilling on 4/2/06 at 135 ft; boring terminated	470

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1205**	
Type and Diameter of Boring CME Sampler / 7 inch/NQ	Boring Location General site N 1165628 E 1848312		Total Depth 150 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 609.6 feet MSL	Ground Water Depth 43.9 feet	Depth to Bedrock 105.5 feet
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 23	Date Started 3/4/06
	Borehole Inclination -90	Logged by M. Cooke	Date Completed 3/17/06

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date C. Sams 10-22-07

Depth (feet)	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Soil Type (USCS)	Lithology	Remarks
0							GP	Crushed stones with fines.	Drilled without sampling to 3.5 ft. Logged with auger cuttings
1							ML	SILT, sandy (ML); red (10R 4/6); damp to dry; ~15% very fine to fine sand; non plastic; micaceous. FILL	
4	SPT 1	3 3 4	18/18						
5	CME 1		27.6/42						
9	CME 2		27.6/60					SAA; mottled with brownish yellow (10YR 6/6).	
14	CME 3		18/18						
15	CME 4		60/60						
20	CME 5		60/60					SILT, sandy (ML) SAA; yellowish brown (10YR 5/6); dry to damp; ~35% fine sand. FILL	
24							CL	CLAY, sandy (CL); red (10R 4/8); dry; hard; ~30% fine sand; low to medium plasticity; FILL	
25	CME 6		60/60				ML	SILT, sandy (ML); brownish yellow (10YR 6/6); with zones of red (10R 4/8); dry to damp; ~35% fine sand; low plasticity to non plastic. FILL	
30	CME 7		60/60						
33							SM	SAND, silty (SM); yellow (10YR 7/8); moist; ~30% fines; poorly graded. FILL	
34							ML	SILT, sandy (ML); yellowish brown (10YR 5/6); dry; low plasticity. FILL	
35	CME 8		51.6/60						End drilling 3/4/06 Begin drillilng on 3/5/06; water at 34.1 ft very wet zone 35 to 36.5 ft Dry 37.85 to 40 ft

Elevation (feet): 609, 608, 607, 606, 605, 604, 603, 602, 601, 600, 599, 598, 597, 596, 595, 594, 593, 592, 591, 590, 589, 588, 587, 586, 585, 584, 583, 582, 581, 580, 579, 578, 577, 576, 575, 574, 573, 572, 571, 570

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1205

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										SILT, sandy (ML); yellowish brown (10YR 5/6); dry; low plasticity. FILL		569
41										*(Continued from previous page)*		568
42		CME 9		60/60						SAA; zones of red (2.5YR 4/8); dry.		567
43												566
44									▽	Zone of subangular to angular 2 to 3 inch quartz fragments.		565
45										SAA; dark yellowish brown (10YR 4/6 to 10YR 3/6); damp to moist; fine to coarse sand composed of quartz and small rock fragments; trace gravel-sized rock fragments. FILL		564
46												563
47		CME 10		49.2/60							Hard drilling to hollow stem auger	562
48												561
49												560
50										SAA; red (10R 4/6) to dark yellowish brown (10YR 4/6); moist. FILL		559
51												558
52		CME 11		60/60								557
53												556
54												555
55										SAA; dark yellowish brown; rock fragments. FILL		554
56												553
57		CME 12		60/60								552
58												551
59												550
60										SAA; brownish yellow (10YR 6/8) to dark yellowish brown (10YR 4/6); trace gravel. FILL		549
61												548
62		CME 13		38.4/60								547
63												546
64												545
65										SAA; with some 1 to 2 inch diameter rock fragments. FILL		544
66												543
67		CME 14		60/60								542
68												541
69												540
70												539
71												538
72		CME 15		60/60								537
73												536
74												535
75										SAA; red (10R 4/6). FILL		534
76		CME 16		32.4/32.4								533
77												532
78												531
79		CME 17		27.6/27.6								530
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1205

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80										SILT, sandy (ML); yellowish brown (10YR 5/6); dry; low plasticity. FILL	End drilling 3/5/06	529
81										*(Continued from previous page)*	Begin drilling 3/6/06; water at 59.4 ft	528
82		CME 18		27.6/60						SAA; some zones containing 1 to 2 inch gravels; medium to coarse grained sand.	Hard drilling 80 to 85 ft	527
83												526
84												525
85												524
86		CME 19		36/36								523
87											Hard drilling 87 to 88 ft	522
88										Wood fragment at 88 ft.		521
89										Sandy zone with rock fragments from 89 to 90 ft.		520
90		CME 20		60/60						Decomposed wood fragment at 89 ft.	End drilling on 3/7/06	519
91											Begin drilling on 3/13/06	518
92												517
93											Wet soil 93 to 95.7 ft	516
94												515
95		CME 21		60/60								514
96									SM	SAND, silty (SM); (10YR 6/6, 2.5YR 4/8); moist.		513
97									SM	ALLUVIUM		512
98										SAND, silty (SM); yellow (10R 7/8); dry to damp; fine to medium grained; quartz poorly graded. RESIDUUM		511
99										SAA; (2.5Y 3/3); wet		510
100		CME 22		54/60								509
101									ML	SILT, (ML); olive brown (2.5Y 4/3); moist; <10% sand; non plastic; slight relict foliated rock texture. RESIDUUM		508
102										SAA; brownish yellow (2.5YR 6/6) 101.5 to 103 ft.		507
103											Hard drilling	506
104		CME 23		30/30								505
105											See rock log	504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1205**	
Type and Diameter of Boring CME Sampler / 7 inch/NQ	Boring Location General site N 1165628 E 1848312		Total Depth 150 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 609.6 feet MSL	Ground Water Depth 43.9 feet	Depth to Bedrock 105.5 feet
Casing Size and Depth 3.5 inch / 105.5 feet	Length of Core Barrel and Bit 13 feet	No. of Core Boxes 10	Date Started 3/4/06
	Borehole Inclination -90	Logged by M. Cooke	Date Completed 3/17/06

Reviewed by / Date: F. Syms 5/25/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
106				MW					504
107	1	1.9/3.5	29	SW	R3		META-GRANODIORITE; light bluish gray (10B 7/1); fine to medium grained; slight 60° foliation; quartz, feldspar; biotite; some veinlets of quartz and/or calcite; some pyrite mineralization along fractures; some fine grained muscovite; numerous vugs on surface of core lined with sulfides.	Auger refusal at 105.5 ft on 3/13/06 Begin drilling 3/14/06; water at 60.1 ft	503
108									502
109				MW					501
110				HW	R3		Oxidized fracture 109.4 to 109.9 ft	100% water loss	500
111	2	4.9/5.0	40	MW					499
112				HW	R2 to R3		Oxidized fracture 111.3 to 113 ft		498
113									497
114				MW	R3				496
115				MW	R2 to R3		Calcite mineralization along fractures 114.6 to 114.9 ft		495
116	3	3.5/5.0	20				Oxidized fracture zone 115.7 to 119 ft		494
117				HW	R2				493
118									492
119									491
120				HW	R2		Highly weathered fracture zone 119 to 120.5 ft		490
121	4	3.9/5.0	58				Amphibolilte xenolith 120.5 to 120.9 ft; veinlets and stringers are lined with biotite; slight mylonitic structure		489
122				SW to F	R3 to R4				488
123									487
124				MW	R3		SAA. CONTINUOUS ROCK.		486
125									485
126	5	5.0/5.0	86	MW to SW	R3 to R4		Quartz, plagioclase, hornblende, biotite		484
127									483
128									482
129									481
130	6	5.0/5.0	77	MW to SW	R3 to R4		SAA.	End drilling 3/16/06 Begin drilling 3/17/06; water at 43.9 ft still losing water	480
131									479
132							Epidote zone; plagioclase altered to epidote		478
133									477
134									476
135	7	5.0/5.0	69	SW to F	R3 to R4		META-GRANODIORITE		475
136									474
137									473
138									472
139									471
140	8	5.0/5.0	74	F	R4				470
141									469
142									468
143									467
144									466
145							META-GRANODIORITE		465

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1205

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
146		9	5.0/5.0	90	F	R4		META-GRANODIORITE		464
147										463
148										462
149										461
150		10	1.0/1.0	83	F	R4				460
151									Coring terminated at 150 ft on 3/17/06	459
152										458
153								Total Depth 150 ft.		457
154								Groundwater encountered at 43.9 feet		456
155								Borehole Grouted On 3/17/06		455
156										454
157										453
158										452
159										451
160										450
161										449
162										448
163										447
164										446
165										445
166										444
167										443
168										442
169										441
170										440
171										439
172										438
173										437
174										436
175										435
176										434
177										433
178										432
179										431
180										430
181										429
182										428
183										427
184										426
185										425

Project Name and Job Number														
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.								**SOIL LOG - Boring No. MW-1206**					
Type and Diameter of Boring: CME Sampler / 8 inch/NQ									Boring Location: General site N 1166650 E 1846689			Total Depth: 93 feet		
Drilling Contractor and Rig: Gregg/Smith/311025 / CME 55									Elevation and Datum: 589.6 feet MSL		Ground Water Depth: N/A	Depth to Bedrock: 59 feet		
Sampling Method: Continuous Sampler									Sample Driving Hammer/Drop: NA / NA		No. of Samples: 10	Date Started: 4/2/06		
									Borehole Inclination: -90		Logged by: J. Martin	Date Completed: 4/4/06		

Reviewed by / Date: F. Syms 5/28/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, trace sandy (ML) with trace clay; yellowish brown (10YR 5/4); moist; micaceous; and few small angular pieces gravel. FILL	Drilled without sampling to 3.5 ft observed auger cuttings	589
1												588
2												587
3												586
4		CME 1		60/60						SAA; but with variety of gravel small to large.		585
5												584
6												583
7												582
8												581
9									ML	SILT, clayey, slightly sandy (ML); red (2.5YR 4/6); light gray (10YR 7/2); and yellowish brown (10YR 5/6); moist; damp; randomly varying lenses (interval).		580
10		CME 2		60/60						Large cobble of quartz zone 12 to 12.4 ft.		579
11												578
12												577
13										SAA; more ribbed appearance along core; mostly stiff.		576
14												575
15		CME 3		60/60								574
16												573
17												572
18												571
19										SAA. FILL		570
20		CME 4		60/60								569
21												568
22												567
23												566
24		CME 5		60/60								565
25												564
26												563
27												562
28												561
29		CME 6		60/60						SAA. FILL		560
30												559
31												558
32												557
33												556
34									ML	SILT, sandy (ML); yellowish red (5YR 4/6); damp. RESIDUUM		555
35		CME 7		60/60					ML	SILT, sandy (ML); light gray (10YR 7/2); damp; relict rock texture; lamination at ~30 to 0°; of manganese oxide staining. SAPROLITE		554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1206

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												549
41		CME 8		54/60					ML	SILT, sandy to SAND silty; brownish yellow (10YR 6/6); foliation 30°; increasing grain size with depth; fine to medium sand; SAPROLITE		548
42												547
43									GM	GRAVEL (GM) quartz with silt; wet; angular; blocky.		546
44									ML	SAPROLITE		545
45									ML	SILT, sandy (ML); yellowish red (5YR 4/6); damp. SAPROLITE		544
46		CME 9		49.2/60						SILT, sandy to SAND silty; light gray (10YR 7/2) to		543
47									SM	brownish yellow (10YR 6/6); moist to wet. SAPROLITE		542
48										SAND and GRAVEL in SILT matrix (SM); damp to moist; quartz veins ~60°; foliation at ~30°.		541
49		CME 10		6/6						PARTIALLY WEATHERED ROCK. No sample collected	Refusal at 49 ft.	540
50												539
51												538
52												537
53												536
54												535
55											Advanced casing ~10 ft through PWR before start coring; no samples collected. Rock coring began at 59 ft See rock log	534
56												533
57												532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1206**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location General site N 1166650 E 1846689		Total Depth 93 feet
Drilling Contractor and Rig Gregg/Smith/311025 / CME 55	Elevation and Datum 589.6 feet MSL	Ground Water Depth N/A	Depth to Bedrock 59 feet
Casing Size and Depth 3.5 inch / 59 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 7	Date Started 4/2/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 4/4/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
59										530
60		1	1.2/4.0	0	CW to MW	R0 to R2		META-GRANODIORITE; light gray (7.5YR 7/1); medium grained; some iron and manganese staining on fracture surfaces; kaolinitization of feldspar; quartz, feldspar, biotite, hornblende		529
61										528
62										527
63		2	3.8/5.0	0	CW to MW	R0 to R2		SAA; gray (10YR 6/1); feldspar weatheared with yellow stain; some schistocity (or phyllitic texture) noted		526
64										525
65										524
66										523
67										522
68		3	4.7/5.0	56	SW to MW	R3 to R4		META-GRANODIORITE; bluish gray (5B 5/1); medium grained; iron and manganese staining; pyrite on fractures surfaces; most incipient joints are quartz healed CONTINUOUS ROCK	Losing some water	521
69										520
70										519
71										518
72										517
73		4	4.9/5.0	64	SW to MW	R3 to R4		META-GRANODIORITE; quartz and calcite observed along incipient joints		516
74										515
75										514
76										513
77										512
78		5	5.0/5.0	75	SW to F	R3 to R4		SAA; some phyllictic texture; incipient joints with quartz and calcite; few vugs. CONTINUOUS ROCK.		511
79										510
80										509
81										508
82										507
83		6	5.0/5.0	100	SW to F	R4 to R5		SAA; some schistosity/gneissic foliation; quartz vein with some orange coloration; few diorite xenoliths throughout		506
84										505
85										504
86								Gneissic foliation from 86.2 to 88 ft		503
87										502
88		7	5.0/5.0	100	SW to F	R4 to R5		SAA; dark bluish gray (10B 4/1); medium grained; extensive interconnected incipient joints; quartz, biotite, feldspar, and hornblende; mostly low angle incipient joints		501
89										500
90										499
91										498
92										497
93								META-DIORITE to HORNFELS SCHIST; black (N 2.5); fine grained to aphanitic	Coring terminated on 4/4/06	496
94										495
95										494
96										493
97										492
98										491
99										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1207**	
Type and Diameter of Boring CME Sampler / 7 inch/NQ	Boring Location General site N 1166840 E 1846668		Total Depth 62 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 588.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Continuous Sampler/Standard	Sample Driving Hammer/Drop NA / NA	No. of Samples 21	Date Started 4/1/06
	Borehole Inclination -90	Logged by M. DePalma	Date Completed 4/1/06

Reviewed by / Date: B. Reinicker 5/4/06

Reviewed by / Date: C. Lamm 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0–3									ML	SILT, sandy (ML); red; dry. FILL		588–586
4–8		CME 1		30/60						SAA; red brown (2.5YR 4/6); dry; micaceous; gravel at bottom of sample.		585–581
9–13		CME 2		43/60					ML	SILT, sandy (ML); reddish brown (2.5YR 5/3); dry; mica; stratifications of white. FILL		580–576
14–18		CME 3		60/60						SAA; brown red (10YR 3/6); dry; slight mica; gravel fragment throughtout; mottled white and light red. FILL		575–571
19–23		CME 4		42/60					SC	SAND, clayey (SC); green gray (5Y 5/1); damp; micaceous; organics from 23 to 23.5 ft. FILL		570–566
24–28		CME 5		46/60						Organics present; fine to medium grained		565–561
29–33		CME 6		37/60					SM	SAND, silty (SM); yellow green gray (2.5Y 5/3); wet to moist; fine to medium grained; micaceous; quartz fragment at bottom. RESIDUUM		560–556
34–38		CME 7		41/60						SAA; less moisture		555–551
39–40												550–549

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1207

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												548
41		CME 8		24/60						SAND, silty (SM); yellow green gray (2.5Y 5/3); wet to moist; fine to medium grained; micaceous; quartz fragment at bottom. RESIDUUM *(Continued from previous page)*		547
42												546
43										SAA; medium to coarse grained.		545
44												544
45		CME 9		31/60								543
46												542
47												541
48												540
49		CME 10		24/60								539
50												538
51												537
52												536
53												535
54		CME 11		21/60						SAA. RESIDUUM		534
55												533
56												532
57												531
58												530
59		CME 12		26/42								529
60												528
61												527
62											Auger refusal at 62 ft on 4/1/06, moved 4 ft south and used NQ core barrel to drilled to 87 ft. See MW-1207A	526
63												525
64												524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1207A**	
Type and Diameter of Boring Wash Rotary / NQ core	Boring Location General site N 1166836 E 1846666		Total Depth 133.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 588.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock 108.5 feet
Casing Size and Depth 4 inch / 97 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 3	Date Started 4/3/06
	Borehole Inclination -90	Logged by M. DePalma	Date Completed 4/4/06

Reviewed by / Date: B. Reinicker 5/4/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
109				HW	R0		META-GRANODIORITE; bluish gray (5PB 7/1)	SPT refusal at 108.5 ft, see soil log	480
110							Quartz dike from 109.5 to 110.5 ft		479
111	1	4.5/5.0	22	MW	R1 to R2		SAA; bluish gray (5PB 7/1); biotite slightly foliated 30 to 45°; micaceous; several incipient fractures throughout		478
112									477
113									476
114							Vugs from 114 to 115 ft		475
115									474
116	2	3.2/5.0	44	MW	R2				473
117									472
118							Quartz fragment		471
119				HW	R1		Gneiss layer; dark gray (N 3); foliated 30 to 45° from 119 to 122 ft; incipient fractures throughout		470
120	3	4.7/5.0	50						469
121									468
122				HW to MW	R1 to R2				467
123							META-GRANODIORITE; bluish gray (N 3); biotite foliated 30 to 45°		466
124				MW to SW	R2 to R4		SAA. CONTINUOUS ROCK.		465
125									464
126	4	5.0/5.0	97						463
127									462
128							SAA. quartz fragment		461
129				SW to F	R3 to R4		Quartz vein		460
130									459
131	5	5.0/5.0	83						458
132									457
133									456
134								Borehole terminated at 133.5 on 4/4/06	455
135									454
136									453
137									452
138									451
139									450
140									449
141									448
142									447
143									446
144									445
145									444
146									443
147									442
148									441

SOIL LOG CHEROKEE10-19-07.GPJ WLA9-8-06.GDT 10/24/07

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1208**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location General site N 1167184 E 1846588		Total Depth 139.3 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 587.1 feet MSL	Ground Water Depth 38.2 feet	Depth to Bedrock 59.3 feet
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 12	Date Started 3/27/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/29/06

Reviewed by / Date: F. Syms 5/29/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Topsoil over gravel and sand	Observed auger cuttings to classify above top of first CME sample.	587
1												586
2									MH	SILT (MH); dusky red (2.5YR 3/2); dry; <10% sand and/or gravel; decomposing roots. FILL		585
3												584
4		CME 1		60/60								583
5												582
6									ML	SILT, sandy (ML); pale red (10R 6/3); dry; <30% sand; layers of gravel and sand; some weathered rock pieces; roots. FILL		581
7												580
8												579
9		CME 2		60/60								578
10												577
11												576
12												575
13												574
14		CME 3		60/60								573
15												572
16									SM	SAND, silty (SM); pale red (10R 6/4); dry; fine to medium grained; 5 to 12% silt.		571
17									ML	SILT, sandy (ML); red (10R 4/6); damp; low to non plastic; fine sand; quartz. FILL		570
18												569
19		CME 4		60/60								568
20												567
21												566
22												565
23									SM	SAND, silty (SM); red (10R 4/6) to yellowish red (5YR 5/8) to reddish brown (5YR 4/3); dry to damp; some clayey silt; micaceous; trace roots. FILL		564
24												563
25		CME 5		50.4/60								562
26												561
27												560
28												559
29		CME 6		33.6/60								558
30												557
31												556
32												555
33												554
34		CME 7		60/60								553
35												552
36												551
37												550
38									▽		Saturated soil encountered	549
39									ML	SILT sandy (ML); wet; fine to medium sand; clayey deposits; quartz; RESIDUUM		548
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1208

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												547
41		CME 8		52.8/60					SM	SAND, silty (SM); white (10YR 8/1), mottled with very dark brown (10YR 2/2); wet to moist; fine to coarse grained. SAPROLITE		546
42												545
43												544
44												543
45		CME 9		44.4/60								542
46												541
47												540
48												539
49												538
50		CME 10		44.4/60								537
51												536
52												535
53												534
54										SAA; strong brown (7.5YR 5/6); some silt from 55 to 57.5 ft.		533
55												532
56		CME 11		46.8/60								531
57												530
58										SAA; white (10 YR 8/1), mottled with very dark brown (10 YR 2/2); wet to damp; coarse quartz fragments. SAPROLITE		529
59		CME 12		9.6/9.6							CME refusal at 59.3 ft on 3/27/06, see rock log	528
60												527
61												526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1208**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location General site N 1167184 E 1846588		Total Depth 139.3 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 587.1 feet MSL	Ground Water Depth 38.2 feet	Depth to Bedrock 59.3 feet
Casing Size and Depth 3.5 inch / 59.3 feet	Length of Core Barrel and Bit 13 feet	No. of Core Boxes 4	Date Started 3/27/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/29/06

Reviewed by / Date: F. Syms 5/29/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
60							META-GRANODIORITE; with quartz fine grained	Begin core drilling on 3/28/06; water level at 47 ft	527
61	1	1.2/5.0	0	CW	R0 to R1			Lost water recirculation	526
62									525
63				MW	R3				524
64				CW	R0 to R1				523
65	2	1.0/5.0	0	CW	R0 to R1			Still losing some water circulation (approx. 200 gallons per 5 ft run)	522
66									521
67				MW	R3 to R4				520
68				CW	R0 to R1				519
69									518
70	3	4.2/5.0	20	HW to CW	R0 to R1				517
71				MW	R2 to R3				516
72									515
73									514
74				HW	R0 to R1				513
75	4	1.2/4.0	0	CW to HW	R0 to R3		Quartz veins	Still losing some water circulation (200 gallons per 4 ft.)	512
76									511
77									510
78									509
79	6	2.5/4.0	33	CW to HW	R0 to R3		META-GRANODIORITE; fine grained; pyrite; meta-diorite xenoliths		508
80									507
81							No recovery 80.2 to 82.4 ft		506
82									505
83	7	2.0/2.0	30	CW to HW	R0 to R3		META-GRANODIORITE; fine grained; pyrite; meta-diorite xenoliths		504
84									503
85	8	4.7/5.0	46	CW to HW	R0 to R3				502
86									501
87									500
88									499
89									498
90	9	5.0/5.0	56	CW to HW	R0 to R3		META-GRANODIORITE		497
91									496
92									495
93									494
94							Quartz vein		493
95	10	5.0/5.0	60	CW to HW	R0 to R3				492
96									491
97									490
98							Dike 98 to 98.8 ft		489
99									488

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1208

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
100							Dike 99 to 99.3 ft		487
101									486
102	11	1.7/5.0	8	CW to HW	R0 to R3				485
103									484
104									483
105									482
106									481
107	12	5.0/5.0	52	CW to HW	R0 to R3				480
108									479
109									478
110							META-GRANODIORITE; bluish gray (5B 5/1); fine to medium grained; quartz; pyrite; manganese oxide staining	End drilling 3/28/06 Begin drilling 3/29/06; water at 38.2 ft	477
111				MW to SW	R3 to R4				476
112	13	3.9/5.0	50						475
113							Xenolith of meta-diorite Vugs, iron and manganese oxide staining		474
114				CW to HW	R2		BIOTITE SCHIST; greenish black (10Y 2.5/1); fine grained		473
115									472
116	14	2.3/5.0	10	CW to HW	R2				471
117									470
118									469
119				MW to SW	R4				468
120							META-GRANODIORITE; bluish gray (5B 5/1); xenolith schist		467
121				CW	R0 to R1				466
122	15	2.7/5.0	40						465
123				F	R3 to R4		META-DIORITE; black (N 2.5); fine grained; iron staining		464
124							SAA. CONTINUOUS ROCK.		463
125									462
126									461
127	16	4.9/5.0	98	F	R3 to R4				460
128									459
129									458
130									457
131							Poorly developed foliation		456
132	17	4.9/5.0	98	F	R3 to R4		META-GRANODIORITE; bluish gray (5B 5/1); medium grained		455
133									454
134							SAA		453
135									452
136									451
137	18	5.0/5.0	80	F	R3 to R4				450
138									449
139									448

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1208

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
140									Boring terminated at 139.3 ft on 3/29/06	447
141									Boring terminated at 139.3 ft on 3/29/06	446
142								Total Depth 139.3 ft.		445
143								Groundwater encountered at 38.2 feet		444
144								Borehole Grouted On 3/29/06		443
145										442
146										441
147										440
148										439
149										438
150										437
151										436
152										435
153										434
154										433
155										432
156										431
157										430
158										429
159										428
160										427
161										426
162										425
163										424
164										423
165										422
166										421
167										420
168										419
169										418
170										417
171										416
172										415
173										414
174										413
175										412
176										411
177										410
178										409
179										408

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1209**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location General site N 1165080 E 1848078		Total Depth 125.5 feet
Drilling Contractor and Rig Gregg/Smith/311025 / CME 55	Elevation and Datum 586.6 feet MSL	Ground Water Depth 51.5 feet	Depth to Bedrock 83.1 feet
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 16	Date Started 3/28/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 3/31/06

Reviewed by / Date: F. Syms 5/29/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0–3									ML	SILT, trace sand, trace clay (ML); brownish yellow (10YR 6/8); dry to damp; low plasticity; some small to medium gravel; few inches of organic topsoil at top. FILL	Observed auger cuttings to classify above top of first CME sample.	586–584
4–8		CME 1		18/60					ML	SILT, sandy (ML); trace clay; yellowish brown (10YR 5/8); dry to damp; with some angular to subangular gravel and saprolite clasts. FILL		583–579
9–12		CME 2		24/60					SP-SM	SAND, silty, gravely (SP-SM); brownish yellow (10YR 6/8); dry to damp; gravel is small to large; fine sand; quartz subrounded. FILL		578–575
13									ML	SILT, clayey (ML); yellowish brown (10YR 5/8); mottled with olive (5YR 5/4); damp; micaceous; fine laminations and lenses of varying density. FILL		574
14–18		CME 3		60/60					SM ML SW ML SM	SILT, (ML); brown (7.5YR 5/4); damp. FILL SAND, silty (SM); light yellowish brown (10YR 6/4); damp. FILL SILT (ML); brown (7.5YR 5/4); damp. FILL SAND, gravely (SW); yellow (10YR 7/6); damp to dry. FILL SILT, (ML); brown (7.5YR 5/4); damp. FILL		573–569
19–23		CME 4		60/60					SM ML	SAND, silty (SM); light yellowish brown (10YR 6/4); damp. FILL SILT, (ML); brown (7.5YR 5/4); with intervals of silt and silty sand. Quartz clasts from 20.8 to 21 ft SAA; moist to wet silty sand interval		568–564
24–28		CME 5		60/60					ML	SAA; brown (7.5YR 5/4); moist. FILL		563–559
29–33		CME 6		60/60					SM ML	SAND, silty (SM); brown (7.5YR 5/2); wet. FILL SILT, (ML); strong brown (7.5YR 5/6); moist; soft; with large saprolite and rock clasts. FILL		558–554
34–38		CME 7		60/60					SM ML ML	SAND, silty (SM); strong brown (7.5YR 5/6); wet. FILL SILT (ML); light brown to gray (10YR 6/2); moist; with organics. FILL SAA; no organics SAA; strong brown (7.5YR 5/6); moist to damp. FILL		553–549
39–40									ML	SILT, sandy (ML); yellowish brown (10YR 5/6); moist to damp. FILL		548–547

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1209

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												546
41		CME 8		60/60						SILT, sandy (ML); yellowish brown (10YR 5/6); moist to damp. FILL		545
42										*(Continued from previous page)* SAA; yellowish brown (10YR 3/6); large roots in fill		544
43									SP	SAND (SP); yellowish brown (10YR 5/4); trace clay; damp; FILL		543
44									ML	SILT (ML); red (2.5YR 5/6); damp. FILL		542
45		CME 9		60/60						SAA; wet 43.5 to 44.3 ft, then moist		541
46												540
47												539
48												538
49										SAA; wet from 48.5 to 48.8 ft.		537
50												536
51		CME 10		60/60					▽			535
52										Quartz clasts interval.		534
53												533
54										SAA; wet from 53.5 to 56 ft. FILL		532
55												531
56		CME 11		50.4/60								530
57										SILT slightly sandy (ML); brown to dark brown (10YR 4/3); moist; organics. ALLUVIUM		529
58												528
59									ML	SILT, sandy (ML); with abundant organics, roots and large rounded to subrounded gravels. ALLUVIUM	End of drilling 3/29/06	527
60											Begin drilling 3/30/06; water at 51.5 ft	526
61		CME 12		60/60								525
62												524
63												523
64												522
65												521
66		CME 13		44.4/60					CH	CLAY, sandy (CH); very dark grayish brown (10YR 3/2); wet. ALLUVIUM		520
67									SW	SAND, gravely (SW); gray (2.5Y 5/1); wet; fine to medium quartz gravel. ALLUVIUM		519
68												518
69									GW	SAND, gravely (SW-GW); coarse sand with very large gravel and cobbles at 69.1 ft; gravel is quartz, epidote and granite subangular to angular. ALLUVIUM		517
70									GM			516
71		CME 14		49.2/60					ML	GRAVEL silty, clayey; light gray (5Y 7/1); moist; gravel consist of weathered rock fragments. SAPROLITE		515
72												514
73												513
74									ML	SILT, clayey (ML); olive (5Y 4/3); grading to yellowish brown (10YR 5/8); moist; foliated with relict rock texture; micaceous; SAPROLITE		512
75												511
76		CME 15		56.4/60						SILT, (ML); olive (5Y 4/3); yellowish brown (10YR 5/8) to 76.5 ft; micaceous; manganese oxide staining.		510
77												509
78												508
79												507
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1209

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80												506
81		CME 16		45.6 / 45.6						SILT, (ML); olive (5Y 4/3); yellowish brown (10YR 5/8) to 76.5 ft; micaceous; manganese oxide staining.	See rock log	505
82										*(Continued from previous page)*		504
83												503
84												502
85												501
86												500
87												499
88												498
89												497
90												496
91												495
92												494
93												493
94												492
95												491
96												490
97												489
98												488
99												487
100												486
101												485
102												484
103												483
104												482
105												481
106												480
107												479
108												478
109												477
110												476
111												475
112												474
113												473
114												472
115												471
116												470
117												469
118												468
119												467
120												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1209**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location General site N 1165080 E 1848078		Total Depth 125.5 feet
Drilling Contractor and Rig Gregg/Smith/311025 / CME 55	Elevation and Datum 586.6 feet MSL	Ground Water Depth 51.5 feet	Depth to Bedrock 83.1 feet
Casing Size and Depth none / 82.3 feet	Length of Core Barrel and Bit 5.2 feet	No. of Core Boxes 2	Date Started 3/28/06
	Borehole Inclination -90	Logged by J. Martin	Date Completed 3/31/06

Reviewed by / Date: F. Syms 5/29/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
83				CW	R0		No recovery	Hollow stem auger refusal at 82.3 ft on 3/30/06 Begin drilling 3/31/06 Losing water	504
84	1	4.0/4.7	7	SW to F	R3 to R4		META-GRANODIORITE; light gray (10YR 7/1); medium grained; pyrite visible; feldsar, quartz, biotite, and hornblende		503
85									502
86									501
87									500
88	2	1.2/5.0	0	SW to CW	R0 to R4		META-GRANODIORITE; gray (5Y 6/1); medium grained with pyrite; feldspar, quartz, hornblende, biotite, vuggy		499
89									498
90									497
91									496
92									495
93	3	0.1/5.0	0	CW	R0 to R3			Low recovery zone; partially weathered rock	494
94									493
95									492
96									491
97									490
98	4	0.0/5.0	0	CW	R0				489
99									488
100									487
101									486
102									485
103	5	1.8/4.0	15	SW to CW	R0 to R3				484
104									483
105									482
106									481
107	6	0.9/5.0	0	SW to CW	R0 to R3		META-DIORITE; black (2.5Y 2.5/1); fine grained; some pyrite on fracture faces; phyllitic/shistose texture	Low recovery zone; partially weathered rock	480
108									479
109									478
110							Interval of vuggy phyllite about 2 inch thick		477
111									476
112	7	4.6/5.0	44	SW to F	R2 to R4		SAA; gray (5Y 6/1); grain size lost to schistosity; increase mica.		475
113							META-GRANODIORITE; Bluish gray (5B 5/1); medium to coarse grained; pyllitic; feldspar, quartz, hornblende, biotite		474
114									473
115									472
116									471
117	8	5.0/5.0	100	F	R4 to R5		SAA; slight color change to pinkish yellow of feldspar due to alteration. CONTINUOUS ROCK.		470
118									469
119									468
120									467
121									466
122							SAA.		465

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1209

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
123		9	4.5/4.5	100	F	R4 to R5		SAA.		464
124										463
125										462
126									Coring terminated on 3/31/06	461
127										460
128								Total Depth 125.5 ft.		459
129								Groundwater encountered at 51.5 feet		458
130								Borehole Grouted On 4/2/06		457
131										456
132										455
133										454
134										453
135										452
136										451
137										450
138										449
139										448
140										447
141										446
142										445
143										444
144										443
145										442
146										441
147										440
148										439
149										438
150										437
151										436
152										435
153										434
154										433
155										432
156										431
157										430
158										429
159										428
160										427
161										426
162										425

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1210**	
Type and Diameter of Boring CME Sampler / 7 inch/NQ	Boring Location Unit 2 adjacent N 1165324 E 1847451		Total Depth 38 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 589.4 feet MSL	Ground Water Depth 15 feet	Depth to Bedrock N/A
Sampling Method Continuous Sampler/Standard	Sample Driving Hammer/Drop NA / NA	No. of Samples 23	Date Started 3/20/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/20/06

Reviewed by / Date: F. Syms 5/20/06

Reviewed by / Date: C. Lamm 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Drilled with hollow stem auger to 3.5 ft; classified auger cuttings.	589
1												588
2												587
3										SILT sandy (ML); red (10R 5/6); damp; medium stiff; <15% sand; <15% clay; medium plasticity; mottled; some roots; FILL		586
4												585
5												584
6		CME 1		60/60								583
7												582
8												581
9										SAA; red (2.5YR 4/6) to strong brown (7.5R 5/6); damp; <10% clay; <15% sand; occasional angular gravel. FILL		580
10												579
11		CME 2		60/60								578
12												577
13												576
14									ML	SILT clayey (ML); red (2.5YR 4/8); damp; high plasticity; poorly graded		575
15									▽			574
16		CME 3		60/60								573
17												572
18												571
19									ML	SILT sandy (ML); reddish brown (5YR 5/6); wet; <15% sand; <10% clay; thick black manganese oxide along broken surfaces. RESIDUUM		570
20										SAA; damp		569
21		CME 4		44.4/60								568
22												567
23												566
24										SAA; yellowish red (5YR 5/6); damp. RESIDUUM		565
25												564
26		CME 5		60/60					ML	SILT sandy (ML); yellow (10YR 7/6); damp; <15% sand; <10% clay; relic rock texture; SAPROLITE		563
27												562
28										SAA; wet; low plasticity; >30% sand; <10% clay. SAPROLITE		561
29												560
30												559
31		CME 6		42/60					ML	SILT clayey (ML); white (2.5Y 8/0).SAPROLITE		558
32												557
33												556
34									ML	SILT sandy (ML); very pale brown (10YR 7/2 to 7/3) to light gray (10YR 8/1 to 7/1); very moist to damp; low plasticity; relict texture of meta igneous rock. SAPROLITE		555
35												554
36		CME 7		39.6/54								553
37												552
38											End of drilling 3/20/06; water level at 15 ft. See MW-1210A.	551
39												550
40												

SOIL LOG CHEROKEE10-19-07.GPJ WLA9-8-06.GDT 10/24/07

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC

WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1210

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										Total Depth 38 ft.		549
41										Groundwater encountered at 15 feet		548
42										Borehole Grouted On 6/12/06		547
43												546
44												545
45												544
46												543
47												542
48												541
49												540
50												539
51												538
52												537
53												536
54												535
55												534
56												533
57												532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1210A**

Type and Diameter of Boring Wash Rotary / NQ core / 3 inch	Boring Location Unit 2 adjacent N 1165324 E 1847455		Total Depth 126.3 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 589.4 feet MSL	Ground Water Depth 16.6 feet	Depth to Bedrock 96.3 feet
Sampling Method Rock core/SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 19	Date Started 3/21/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/23/06

Reviewed by / Date F. Syms 5/20/06

Reviewed by / Date C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drilled without sampling to 38 ft. See MW-1210		589
1												588
2										No recovery; drilled with NQ core barrel		587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11												578
12												577
13												576
14												575
15												574
16									▽			573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38				0						No recovery; drilled with NQ core barrel	Begin drilling NQ core barrel 3/22/06	551
39												550
40												

Project Name and Job Number
Lee Nuclear Station COL
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MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1210A

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		CORE		48						No recovery; drilled with NQ core barrel		549
41												548
42										No recovery; drilled with NQ core barrel		547
43												546
44		CORE		0/60								545
45												544
46												543
47										No recovery; drilled with NQ core barrel		542
48												541
49		CORE		0/60								540
50												539
51												538
52												537
53		SPT 1	5 4 6	12/24					ML	SILT sandy (ML); brownish yellow to white (10YR 6/6 to 10YR 8/1); damp; <15% sand; poorly graded; low to medium plasticity. SAPROLITE	Started SPT sampler	536
54												535
55		SPT 2	4 8 9	19.2/24						SILT sandy, gravelly (ML); white (2.5YR 8/1) to yellow (10YR 7/6); damp; >30% sand; <15% clay; fine to coarse sand. SAPROLITE		534
56												533
57												532
58												531
59		SPT 3	3 6 13	18/18						SAA; pale yellow (5Y 7/2 to 7/3) to olive yellow (2.5Y 6/6), with white (2.5Y 8/1) damp; >30% sand, <15% clay; relict rock texture. SAPROLITE		530
60												529
61												528
62												527
63												526
64		SPT 4	7 8 11	16.8/18						SILT sandy (ML); white to yellow (2.5Y 8/1 to 2.5Y 7/4); damp; <20% sand; <15% clay; poorly graded; relict rock texture. SAPROLITE		525
65												524
66												523
67												522
68												521
69		SPT 5	9 12 21	18/18								520
70											End of day 3/21/06	519
71											Begin day 3/22/06; water at16.5 ft	518
72		SPT 6	21 30 35	16.8/18						SAA; white to dark yellowish brown (10YR 8/1 to 10YR 4/4); damp; sand ~40%, clay <10%; fine grained sand. SAPROLITE		517
73												516
74		SPT 7	22 25 38	16.8/18						SAA; fine to medium grained; micaceous		515
75												514
76												513
77		SPT 8	9 19 31	18/18						SAA; white to dark yellowish brown (10YR 8/1 to 10YR 3/4); damp; sand ~ 40 to 50%; <10% clay; fine grained; relict foliation 60° dip; micaceous. SAPROLITE		512
78												511
79		SPT	6 9	21.6					ML	SILT clayey (ML); dark yellowish brown (10YR 3/4);		510
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1210A

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80		9	15	18					ML	damp; <15% clay; very poorly graded; low plasticity; micaceous. SAPROLITE		509
81												508
82		SPT 10	5 7 14	18/18						SAA; dark grayish brown (10YR 4/4 to 3/2); damp. SAPROLITE		507
83												506
84		SPT 11	7 12 17	18/18								505
85												504
86												503
87		SPT 12	7 11 18	16.8/18					ML	SILT (ML); dark olive gray (5Y 3/2); damp; <5% sand; <10% clay; relict texture; several thin white veins. SAPROLITE		502
88												501
89		SPT 13	9 12 22	18/18						SAA; very dark grayish brown (2.5Y 3/2); damp; <10% sand or clay; relict foliation 55°. SAPROLITE		500
90												499
91												498
92		SPT 14	21 25 50	18/18						SAA; sub vertical iron stained vein (0.5 cm). SAPROLITE		497
93												496
94		SPT 15	11 21 30	15.6/18					ML	SILT sandy, gravelly (ML); very dark grayish brown (2.5Y 3/2); mottled with red, white and black manganese; damp; fine to coarse sand <15%; fine to medium grained gravel <10%; non plastic. SAPROLITE	96.3 ft started NQ coring - See rock log.	495
95												494
96		SPT 16	50/2	1.8/2					ML	SILT sandy, gravelly (ML); black; dark yellowish brown and white (2.5Y 2/1, 10 YR 4/6, 2.5Y 8/1); damp. PARTIALLY WEATHERED ROCK		493
97												492
98												491
99												490
100												489
101												488
102												487
103												486
104												485
105												484
106												483
107												482
108												481
109												480
110												479
111												478
112												477
113												476
114												475
115												474
116												473
117												472
118												471
119												470
120												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1210A**	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch	Boring Location Unit 2 adjacent N 1165324 E 1847455		Total Depth 126.3 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 589.4 feet MSL	Ground Water Depth 16.6 feet	Depth to Bedrock 96.3 feet
Casing Size and Depth 3.75 inch / 96.3 feet	Length of Core Barrel and Bit 8 feet	No. of Core Boxes 6	Date Started 3/21/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/23/06

Reviewed by / Date F. Syms 5/20/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
97										493
98										492
99		11	2.0/5.0	28	F	R4 to R5		META-GRANODIORITE; light gray (5YR 7/1); coarse, crystalline; probably pegmatite vein; manganese dendritic formation and white mica on fracture surfaces; minor rounded inclusions of intrusive dark igneous rocks.	Started NQ coring 7/22/06	491
100									100% water loss	490
101										489
102		12	4.9/5.0	78	F	R3 to R4		META-GRANODIORITE (MICA SCHIST); black (7.5YR 2.5/1) with white (7.5YR 8/1) veins of calcite; equigranular; fine to coarse grained; strong foliation 45°; mica present and possible chlorite, minor pyrite. CONTINUOUS ROCK.		488
103										487
104										486
105										485
106										484
107		13	5.0/5.0	84	F	R4		META-DIORITE; with thick (1 to 1.5 ft) quartzite veins; low angle 10° laminations of calcite crosscut 45° to foliation; pyrite is parallel to the low angle calcite veins		483
108										482
109										481
110										480
111										479
112		14	5.0/5.0	100	F	R5		META-DIORITE; white, black, and greenish black; hornblende (diopside); abundant calcite, feldspar (albite?), quartz, epidote and chlorite in lower part Migmatite texture from 112 to 115 ft	End of day 3/22/06 Begin day 3/23/06; water at 16.6 ft	478
113										477
114									Still losing all coring water	476
115								Minor pyrite		475
116										474
117		15	5.0/5.0	86	SW to F	R4		META-DIORITE with epidote, chlorite, garnet (?), orthoclase and calcite Red and green assemblages of minerals: epidote, calcite, chlorite, garnet from 116.7 to 117.8 ft		473
118										472
119								META-GRANODIORTE; with light gray mica, quartz and feldspar, xenoblastic porphyroblastic, microcrystalline to coarse grained mafic minerals, mica, chlorite, hornblende very fine grained		471
120										470
121										469
122		16	5.0/5.0	86	SW to F	R4				468
123										467
124										466
125								Becomes increasingly foliated and sheared; mylonitized; chlorite filling shears along foliations, completely healed.		465
126										464
127									Coring terminated on 3/23/06	463
128										462
129								Total Depth 126.3 ft. Groundwater encountered at 16.6 feet Borehole Grouted On 6/12/06		461
130										460
131										459
132										458
133										457
134										456
135										455
136										454

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1211**	
Type and Diameter of Boring CME Sampler / 7 inch/NQ	Boring Location Unit 1 adjacent N 1165196 E 1846389		Total Depth 65.5 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 589.3 feet MSL	Ground Water Depth 21.5 feet	Depth to Bedrock 12.5 feet
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 3	Date Started 3/13/06
	Borehole Inclination -90	Logged by J. Cerceo/E. Weldon	Date Completed 3/16/06

Reviewed by / Date: F. Syms 5/29/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Topsoil		589
1									SP-SM	SAND, gravelly (SP-SM); light brown (7.5YR 6/4); dry; fine to coarse grained; ~30% gravel; FILL		588
2		CME 1		56.4/60								587
3									ML	SILT, sandy (ML); reddish brown (2.5YR 5/4); dry; 15% sand; some gravel zones; FILL		586
4									SM	SAND, silty (SM); light brown (7.5YR 6/4); dry; fine to coarse grained; with some gravel zones; FILL		585
5												584
6												583
7		CME 2		27.6/60					SP	SAND, gravelly (SP); very pale brown (10YR 7/3); dry; fine to coarse; ~35% gravel, ~10% silt; FILL		582
8												581
9									ML	SILT, sandy (ML); red (2.5YR 4/6); dry to damp; fine sand; trace clay; some gravel; FILL		580
10												579
11		CME 3		27.6/30								578
12									SM	SAND, silty (SM); gray (5YR 6/1); wet; fine to medium grained; trace gravel; FILL	End of CME sampling See rock log Begin rock coring, see rock log	577
13												576
14												575
15												574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1211**	
Type and Diameter of Boring CME Sampler / 7 inch/NQ	Boring Location Unit 1 adjacent N 1165196 E 1846389		Total Depth 65.5 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 589.3 feet MSL	Ground Water Depth 21.5 feet	Depth to Bedrock 12.5 feet
Casing Size and Depth 3.5 inch / 13 feet	Length of Core Barrel and Bit 8.1 feet	No. of Core Boxes 4	Date Started 3/13/06
	Borehole Inclination -90	Logged by J. Cerceo/E. Weldon	Date Completed 3/16/06

Reviewed by / Date: F. Syms 5/29/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
13		1	0.0 / 1.0	0	CW			META-GRANODIORITE; with quartzite vein (4 inch) light to medium gray; equigranular		576
14		2	2.5 / 2.5	60	SW	R3		META-QUARTZ DIORITE; medium gray; schistose (micas aligning in planes); upper one foot more weathered and higher K-spar content		575
15										574
16										573
17		3	5.0 / 5.0	92	SW to F	R3 to R4		SAA; gray; coarse equigranular; schistose to mylonitized texture		572
18										571
19										570
20										569
21										568
22		4	5.0 / 5.0	60	SW to F	R3 to R4		META-QUARTZ DIORITE; medium gray; coarse equigranular; slightly schistose		567
23										566
24										565
25								META-GRANODIORITE; above contact with meta-quartz diorite gradual; increase in K-spar		564
26										563
27										562
28		5	4.8 / 5.0	38	SW to HW	R2 to R3		SAA; very pale brown (10YR 7/3); to white (10YR 8/1); fine to coarse equigranular to migmatite		561
29										560
30										559
31								META-QUARTZ DIORITE; above contact with meta-granodiorite transitional within 0.5 ft noted by increase in quartz and decrease in orthoclase and light pink to medium gray	End of day 3/14/06 Begin day 3/15/06	558
32										557
33		6	4.1 / 5.0	54	F	R4 to R5		META-QUARTZ DIORITE; gray (N 6); fine to medium grained; closed to moderately spaced healed joints/fractures		556
34										555
35										554
36										553
37		7	4.2 / 4.4	64	SW to MW	R3		SAA; mylonitized shears are often conjugate pairs or subvertical; calcite crystallized along shears		552
38										551
39										550
40										549
41								SAA; but more inclusions (mafic and felsic) CONTINUOUS ROCK		548
42										547
43		8	4.9 / 5.0	82	SW to F	R3 to R4				546
44										545
45										544
46										543
47		9	4.9 / 5.0	100	SW	R3				542
48										541
49										540
50										539
51									End of day 3/15/06 Begin day 3/16/06; water level 21.5 ft	538
52										537

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1211

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
53		10	5.0/5.0	82	SW	R4				536
54										535
55								META-GRANODIORITE; gray; fine to coarse grained		534
56										533
57						R4				532
58		11	5.0/5.0	100	SW to F					531
59						R3 to R4				530
60								META-DIORITE; medium to dark gray, fine to coarse grained; foliation dips ~10°; with quartz; plagioclase, and minor orthoclase		529
61										528
62										527
63		12	4.9/5.1	80	SW to F	R3				526
64										525
65										524
66									Coring terminated on 3/16/06	523
67										522
68								Total Depth 65.5 ft.		521
69								Groundwater encountered at 21.5 feet		520
70								Borehole Grouted On 3/17/06		519
71										518
72										517
73										516
74										515
75										514
76										513
77										512
78										511
79										510
80										509
81										508
82										507
83										506
84										505
85										504
86										503
87										502
88										501
89										500
90										499
91										498
92										497

Project Name and Job Number														
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.								**SOIL LOG - Boring No. MW-1212**					
Type and Diameter of Boring CME Sampler / 8 inch									Boring Location Unit 1 CT N 1165375 E 1845450			Total Depth 22 feet		
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850									Elevation and Datum 609.7 feet MSL		Ground Water Depth N/A	Depth to Bedrock N/A		
Sampling Method Continuous Sampler									Sample Driving Hammer/Drop NA / NA		No. of Samples 4	Date Started 3/18/06		
									Borehole Inclination -90		Logged by J. Cerceo	Date Completed 3/19/06		

Reviewed by / Date: F. Syms 5/29/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0–8		CME 1		33.6/60					GP SM	GRAVEL sandy, silty (GP); gray (N 6); dry; fine. FILL SAND silty (SM); yellowish red (5YR 5/8); dry; fine to medium grained; >15% silt; little fine gravel with trace clay and rock fragments. FILL		609–602
8–16		CME 2		52.8/60					ML	SILT sandy (ML); strong brown (7.5YR 5/6); damp; fine to medium grained; sand >30%; fine gravel <5%; low plasticity; micaceous. SAPROLITE	End drilling 3/18/06 Begin drillling 3/19/06; no water encountered	601–594
16–18		CME 3		22.8/60					SM	SAND silty (SM); brownish yellow (10YR 6/8); dry to damp; fine to medium grained; <10% silt; micaceous. SAPROLITE		593–592
18–22		CME 4		42/41					SM	SAND silty (SM); pinkish gray (7.5YR 7/2); dry; >10% silt; appreciable rock fragments; PARTIALLY WEATHERED ROCK	Offset to MW-1212A See rock log	591–588
22–40												587–570

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1212A**	
Type and Diameter of Boring NQ2 core / 3 inch	Boring Location Unit 1 CT N 1165371 E 1845450		Total Depth 89.2 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 609.3 feet MSL	Ground Water Depth 32.9 feet	Depth to Bedrock 20.2 feet
Casing Size and Depth 3.5 inch / 20.2 feet	Length of Core Barrel and Bit 8.1 feet	No. of Core Boxes 5	Date Started 3/20/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/21/06

Reviewed by / Date: F. Syms 5/29/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
20							Drilled without sampling to 20.2 ft. See MW-1212	Begin NQ core	589
21	1	3.6/5.0	6	MW	R3		META-GRANODIORITE; greenish gray (5GY 6/1) to light gray (N 7); fine grained; biotite rich; massive Silicified zone from 21 to 22.9 ft No recovery from 23.3 to 24.2 ft Developed gneissic texture from 24.2 to 25.2 ft		588
22									587
23									586
24									585
25	2	0.7/5.0	0	CW			META-GRANODIORITE, silty, fine sand, rock highly weathered. PARTIALLY WEATHERED ROCK.		584
26									583
27									582
28									581
29									580
30	3	4.5/5.0	18	MW	R3		META-GRANODIORITE; light greenish gray (10GY 7/1); fine grained; foliated; vugs 2 to 5 mm in width; biotite rich quartz plagioclase	Losing water (100 gallons per 5 ft.)	579
31									578
32									577
33							▽ Vugs increase in size, stained with manganese oxide from 33.2 to 35 ft		576
34									575
35	4	4.9/5.0	54	CW	R0		SAA; light greenish gray (10GY 7/1); highly weathered zone; fine grained. PARTIALLY WEATHERED ROCK.		574
36				HW	R0 to R1				573
37									572
38									571
39				SW to F	R4				570
40	5	5.0/5.0	84	SW to F	R4			Losing more water (200 gallons per 5 ft.)	569
41									568
42									567
43									566
44									565
45	6	5.0/5.0	56	SW to F	R4				564
46									563
47									562
48									561
49									560
50	7	4.9/5.0	88	SW to F	R4		META-GRANODIORITE; bluish gray (5PB 6/1). CONTINUOUS ROCK.		559
51									558
52									557
53									556
54									555
55	8	5.0/5.0	90	SW to F	R4			Losing water (200 gallons per 3 ft.)	554
56									553
57									552
58									551
59									550
60									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1212A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
61–65	9	5.0/5.0	82	SW to F	R4		META-GRANODIORITE; bluish gray (5PB 6/1); fine grained; slightly foliated; biotite speckled; manganese oxide stained vugs	Losing water (100 gallons per 1 ft.)	549–545
66–69	10	4.0/4.0	66	SW	R3		QUARTZITE; light gray (5Y 7/1)		544–541
70–74	11	5.0/5.0	84	SW	R3 to R4		META-GRANODIORITE; bluish gray (5PB 6/1)	End drilling 3/20/06 Begin drilling 3/21/06; water level at 31 ft	540–536
75–79	12	5.0/5.0	64	SW	R3 to R4				535–531
80–84	13	5.0/5.0	94	SW	R4		SAA; fine; foliated vugs with manganese oxide staining.		530–526
85–89	14	4.9/5.0	100	SW to F	R4		SAA; bluish gray (5PB 6/1) to bluish black (10B 2.5/1); fine grained; foliated; quartz veins; manganese oxide stained vugs		525–521
90–100							Total Depth 89.2 ft. Groundwater encountered at 32.9 feet Borehole Grouted On 3/22/06	End drilling 3/21/06; coring terminated On 3/22/06; water at 32.9 ft	520–510

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1213**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location Switchyard N 1164716 E 1847770		Total Depth 78.3 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 578.5 feet MSL	Ground Water Depth 10.1 feet	Depth to Bedrock 52.6 feet
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 6	Date Started 4/4/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/10/06

Reviewed by / Date F. Syms 5/29/06

Reviewed by / Date C. Sams 10-22-07

Depth (feet)	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0							GP	GRAVEL, silty, sandy (GP); 0.3 ft of topsoil. FILL	Observed auger cuttings to classify above top of first CME sample.	578
1							ML	SILT, sandy (ML); red (2.5YR 3/6); dry. FILL		577
4	CME 1		60/60				SM	SAND, silty (SM); brown (7.5YR 4/3); dry; 30% silt; trace gravel; rock fragments. FILL		574
9	CME 2		60/60							569
14	CME 3		60/60							564
18							ML	SILT, (ML); yellowish red (5YR 4/6); moist to wet; no to low plasticity. RESIDUUM	Water on sampler	560
19	CME 4		39.6/60							559
24	CME 5		34.8/60							554
29	CME 6		28.8/60							549
32							SM	SAND, silty (SM); pale brown (10YR 6/3); damp to moist; <10% silt; dark rock fabric like veins. PARTIALLY WEATHERED ROCK	Auger refusal at 34 ft, see rock log	546
34	CME 7		0/6							544

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1213**	
Type and Diameter of Boring CME Sampler / 8 inch/NQ	Boring Location Switchyard N 1164716 E 1847770		Total Depth 78.3 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 578.5 feet MSL	Ground Water Depth 10.1 feet	Depth to Bedrock 52.6 feet
Casing Size and Depth 2 inch / 34 feet	Length of Core Barrel and Bit 13.1 feet	No. of Core Boxes 4	Date Started 4/4/06
	Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/10/06

Reviewed by / Date: F. Syms 5/29/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
34							SAND silty (SM); pale brown (10YR 6/3); wet; <10% silt. PARTIALLY WEATHERED ROCK		544
35									543
36	1	2.9/4.3	0	RS	R0				542
37									541
38								End drilling on 4/4/06 Begin drilling 4/5/06; water level at 18.4 ft	540
39									539
40	2	0.3/5.0	0	RS	R0				538
41									537
42									536
43									535
44	3	0.0/5.0	0	RS	R0				534
45									533
46									532
47									531
48									530
49	4	1.6/5.0	0	RS	R0				529
50									528
51									527
52									526
53				HW	R3		META-GRANODIORITE; bluish gray (10B 6/1); fine to medium grained; manganese staining on the fracture faces		525
54									524
55	5	1.1/4.0	0	HW	R3				523
56									522
57									521
58	6	0.9/1.0	0	HW	R3				520
59							SAA; several schist xenoliths; chlorite, K-spar, plagioclase, biotite, iron staining on surfaces		519
60									518
61	7	5.0/5.0	30	HW to MW	R3				517
62									516
63									515
64	8	2.5/2.5	60	MW	R3		SAA; bluish gray; fine to medium grained; chlorite staining vugs <1 mm, quartz xenoliths from 63.3 to 65.8 ft		514
65									513
66								End day 4/5/06 Begin day 4/10/06; water level at 10.1 ft	512
67	9	2.4/2.5	72	MW	R3		Vugs on the side of the core show pyrite mineralization		511
68									510
69							SAA; epidote initially along healed fractures Mafic zone 68.7 to 69.2 ft; fine grained; calcite healed fractures; biotite rich speckling with pyrite xenoliths increased in size and frequency		509
70									508
71	10	4.9/5.0	98	SW to F	R3 to R4				507
72									506
73									505
74									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1213

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
74										504
75										503
76		11	4.8/5.0	96	F	R3 to R4				502
77										501
78								META-GRANODIORITE; dark bluish gray (10B 4/1); fine grained; calcite, epidote and altered plagioclase filling most fractures.	Coring terminated at 78.3 ft on 4/10/06	500
79										499
80										498
81								Total Depth 78.3 ft.		497
82								Groundwater encountered at 10.1 feet		496
83								Borehole Grouted On 4/10/06		495
84										494
85										493
86										492
87										491
88										490
89										489
90										488
91										487
92										486
93										485
94										484
95										483
96										482
97										481
98										480
99										479
100										478
101										477
102										476
103										475
104										474
105										473
106										472
107										471
108										470
109										469
110										468
111										467
112										466
113										465
114										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1214**	
Type and Diameter of Boring CME Sampler / 7 inch	Boring Location Switchyard N 1164174 E 1847143		Total Depth 15 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 604.5 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 3	Date Started 3/17/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/17/06

Reviewed by / Date: F. Syms 5/23/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Augered to 3.5 ft wihout sampling.	Auger drilled to 3.5 ft to begin CME sampler	604
1												603
2												602
3												601
4		CME 1		60/60					ML	SILT clayey (ML); light yellowish brown (10YR 6/4) damp; <15% clay; very micaceous. SAPROLITE		600
5												599
6										SAA; dark yellowish brown (10YR 4/4).		598
7												597
8												596
9		CME 2		60/60						SILT sandy (ML); yellowish brown (10YR 5/6 to 10YR 5/4); damp; soft; <15 to 20% fine sand; <10% clay some manganese oxide veinlets. SAPROLITE		595
10												594
11												593
12												592
13												591
14		CME 3		18/18						SAA; yellowish brown (10YR 5/4). SAPROLITE		590
15									GM	GRAVEL (GM); yellowish brown (10YR 5/6); damp; <15% fines; PARTIALLY WEATHERED ROCK	Auger refusal 15 ft; moved 5 ft from this hole and extended casing to 16 ft, begin rock coring, see soil log and rock log MW-1214A	589
16												588
17												587
18												586
19												585
20												584
21												583
22												582
23												581
24												580
25												579
26												578
27												577
28												576
29												575
30												574
31												573
32												572
33												571
34												570
35												569
36												568
37												567
38												566
39												565
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**ROCK LOG - Boring No. MW-1214A**	
Type and Diameter of Boring NQ core / 8 inch/NQ	Boring Location Switchyard N 1164175 E 1847147		Total Depth 96 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC	Elevation and Datum 604.5 feet MSL	Ground Water Depth 14 feet	Depth to Bedrock 16 feet
Casing Size and Depth 3 inch / 18 feet	Length of Core Barrel and Bit 8.1 feet	No. of Core Boxes 4	Date Started 3/17/06
	Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/19/06

Reviewed by / Date: F. Syms 5/23/06

Reviewed by / Date: M. Gray 10-22-07

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
16									588
17									587
18									586
19									585
20									584
21	1	2.5/5.0	0	HW to MW	R0 to R3		META-QUARTZ DIORITE; light brownish gray (2.5Y 6/2); porphyroblastic; fine to coarse grained; foliation 45 to 50°. Fractures mainly parallel foliation or break subvertically; minor minerals mica and pyrite; fine grained pyroxene or amphibole; plagioclase and quartz		583
22									582
23									581
24	2	3.0/5.0	22	HW to MW	R1				580
25									579
26				HW	R1		SAA; dark grayish brown (10YR 4/2)		578
27									577
28	3	3.3/5.0	7	MW	R1		SAA; (2.5Y 8/1); rock slightly stronger SAA; but heavily fractured; less biotite than above		576
29									575
30									574
31									573
32	4	2.2/5.0	0	HW	R0		META-GRANODIORITE; color change to dark grayish brown; medium to coarse grained; equigranular; crystals aligned parallel to foliation at 30°. PARTIALLY WEATHERED ROCK.		572
33									571
34									570
35									569
36	5	2.6/5.0	8	HW	R0				568
37									567
38									566
39									565
40									564
41					R1		SAA; very pale brown (10YR 7/3); foliation at 30°; abundant incipient fractures.	Begin drilling 3/19/04; water at 14 ft; losing some water	563
42	6	3.4/5.0	9	MW					562
43					R2		SAA; medium to coarse grained; porphyroblastic texture; very fine grained minerals, feldspar, quartz		561
44									560
45									559
46									558
47	7	5.0/5.0	26	SW	R3		META-GRANODIORITE; with biotite; gray (2.5Y 6/1); fine to coarse grained biotite; quartz, feldspar (plagioclase), other mafics; healed fractures throughout; veins filled with pyrite; minor calcite. PARTIALLY WEATHERED ROCK.		557
48									556
49									555
50									554
51									553
52	8	5.0/5.0	40	SW	R3		SAA; grayish brown (2.5Y 5/2).		552
53									551
54									550
55									549
56									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1214A

Depth (feet)	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
56									548
57									547
58									546
59	9	5.0/5.0	34	SW	R3		SAA; grey (5Y 5/1); fine to medium grained; pervasive healed shears; very closed spaced fractures irregular and planar parallel to foliation. Joint surfaces display mica aligned parallel to foliation. Vugs and pits in fractures		545
60									544
61							META-GRANODIORITE; medium to coarse grained; migmitized/cataclasized textured; abundant iron oxide stains on fracture surfaces		543
62									542
63	10	2.2/5.0	0	SW	R3			Still losing some water	541
64									540
65									539
66									538
67							SAA; dark gray (2.5Y 4/1); becoming fine grained near 70 ft.		537
68	11	2.1/5.0	0	SW	R3				536
69									535
70									534
71									533
72							SAA; fine grained.		532
73	12	5.0/5.0	80	F	R4		Thin healed shears common, often parallel, some calcite filled; calcite veins (<5 mm) planar to irregular and discontinuous	Losing all water	531
74									530
75									529
76									528
77							SAA; gray (2.5Y 6/1).		527
78	13	4.7/5.0	70	F	R4				526
79									525
80				HW to MW	R1				524
81							META-GRANODIORITE; gray (5Y 5/1); vugs and pits along foliation and fracture/shear lines; some fractures surfaces stained black. PARTIALLY WEATHERED ROCK.		523
82									522
83	14	2.8/5.0	0	HW to MW	R1			Still losing all water	521
84									520
85									519
86				SW	R3				518
87							META-GRANODIORITE biotite rich; gray with foliated sheared (mylonitized); fabric ~40 to 60°. CONTINUOUS ROCK.		517
88	15	4.8/5.0	84	SW	R3		SAA; gray; fine to medium grained throughout core; crystals xenoblastic; very closely spaced irregular fractures; minor calcite veins thin (1 mm); quartz vein (1 cm)		516
89									515
90				SW to F	R4				514
91									513
92									512
93	16	4.8/5.0	90	F	R3 to R4				511
94									510
95									509
96									

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

ROCK LOG - Boring No. MW-1214A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
96									Coring terminated at 96 ft	508
97										507
98										506
99								Total Depth 96 ft.		505
100								Groundwater encountered at 14 feet		504
101								Borehole Grouted On 3/28/06		503
102										502
103										501
104										500
105										499
106										498
107										497
108										496
109										495
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111										493
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130										474
131										473
132										472
133										471
134										470
135										469
136										

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. MW-1215**	
Type and Diameter of Boring No samples / 12 inch/8 inch	Boring Location General site N E		Total Depth 101.5 feet
Drilling Contractor and Rig Geologic / D120 / Air	Elevation and Datum MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method No sampling	Sample Driving Hammer/Drop NA / NA	No. of Samples 0	Date Started 4/17/06
	Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/17/06

Reviewed by / Date: J. Jordan 4/14/06

Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled with 12 inch hollow stem augers Refusal at 69 ft. Switched to air drill	
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
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Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. MW-1215

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40											Drilled with 12 inch hollow stem augers Refusal at 69 ft. Switched to air drill	
69											Air rotary drilling, easy drilling	
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

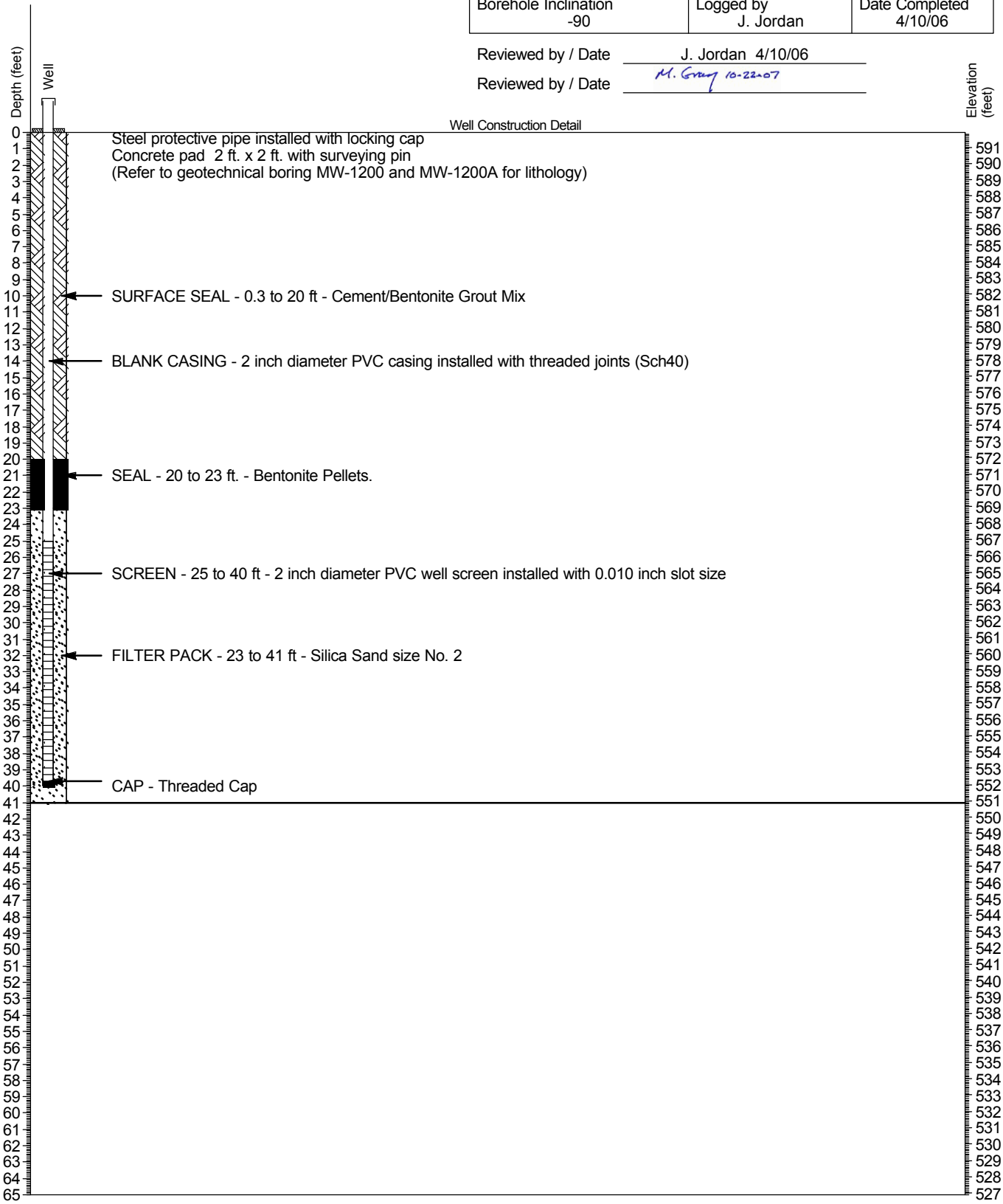
SOIL LOG - Boring No. MW-1215

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80–101											Air rotary drilling, harder drilling Removed drill rods, hole caved, removed cave-in to 88 ft with 12 inch hollow stem augers, then used 8 inch mud rotary drilling (with water) to remove additional cuttings to 101.5 ft. Boring terminated at 101.5 ft, installed well	
102–120												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1200 (well)**
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location General site N 1166347.301 E 1845577.653	Total Depth 41 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 591.9 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 40 feet	Top of Casing Elevation 594 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/10/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/10/06

Reviewed by / Date: J. Jordan 4/10/06

Reviewed by / Date: M. Gray 10-22-07

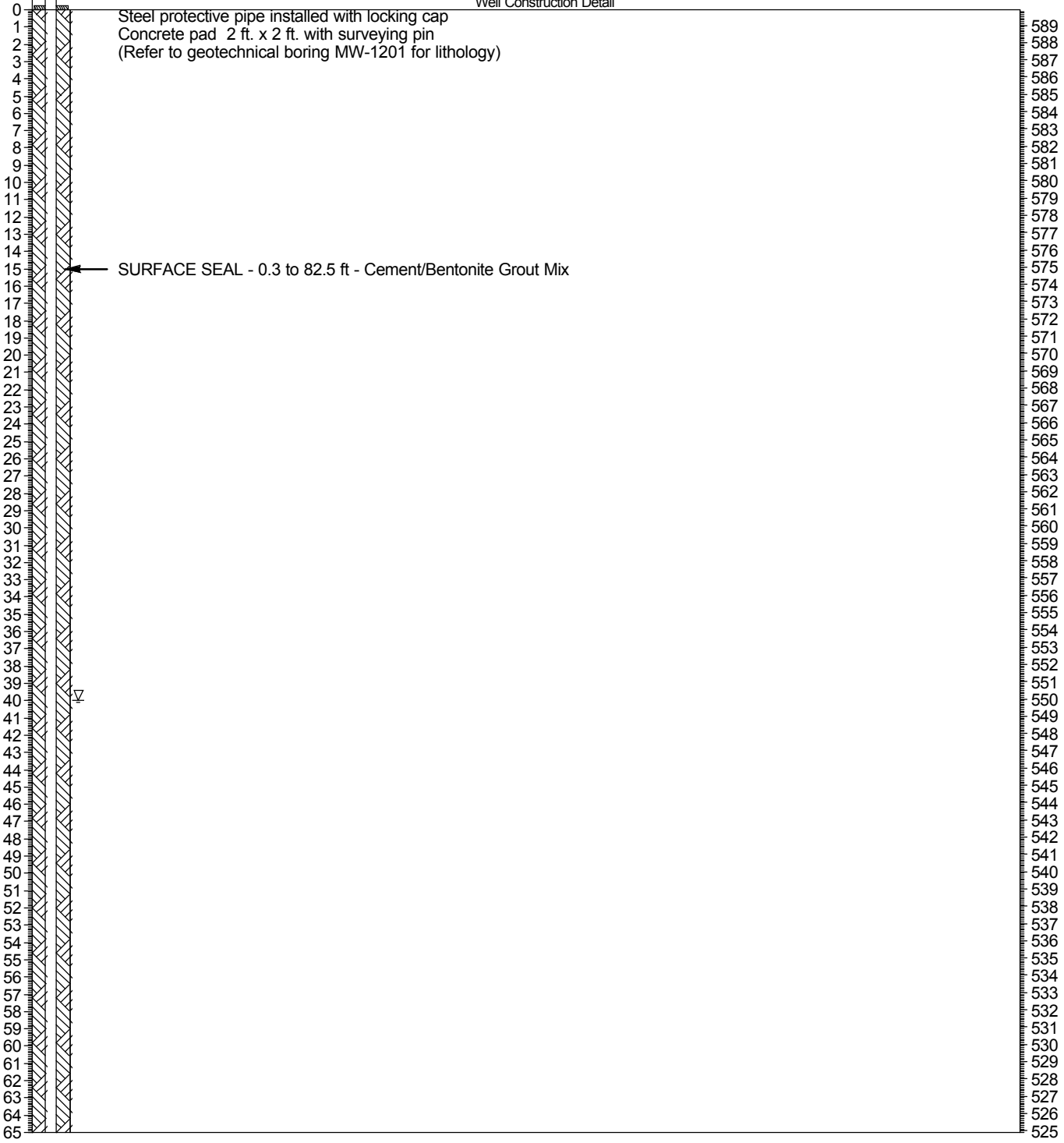


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1201 (well)**		
Type and Diameter of Boring Air Rotary / 10 inch / 6 inch			Boring Location General site N 1166696.031 E 1846574.254		Total Depth 102.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW			Elevation and Datum 589.9 feet MSL	Ground Water Depth 40 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 101.5 feet	Top of Casing Elevation 592.1 feet		Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/19/06
			Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/19/06

Reviewed by / Date J. Jordan 4/19/06

Reviewed by / Date M. Gray 10-22-07

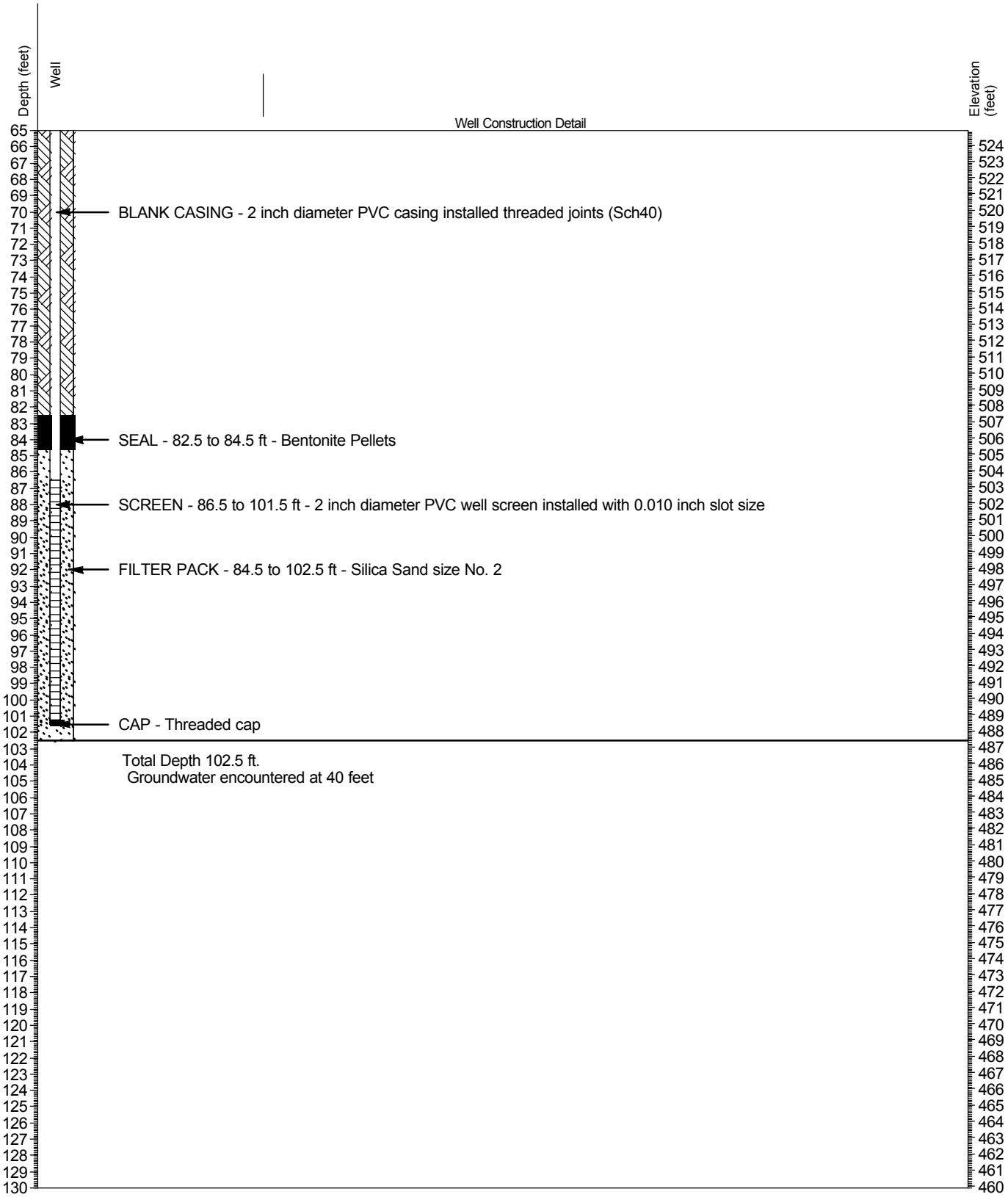
Well Construction Detail



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

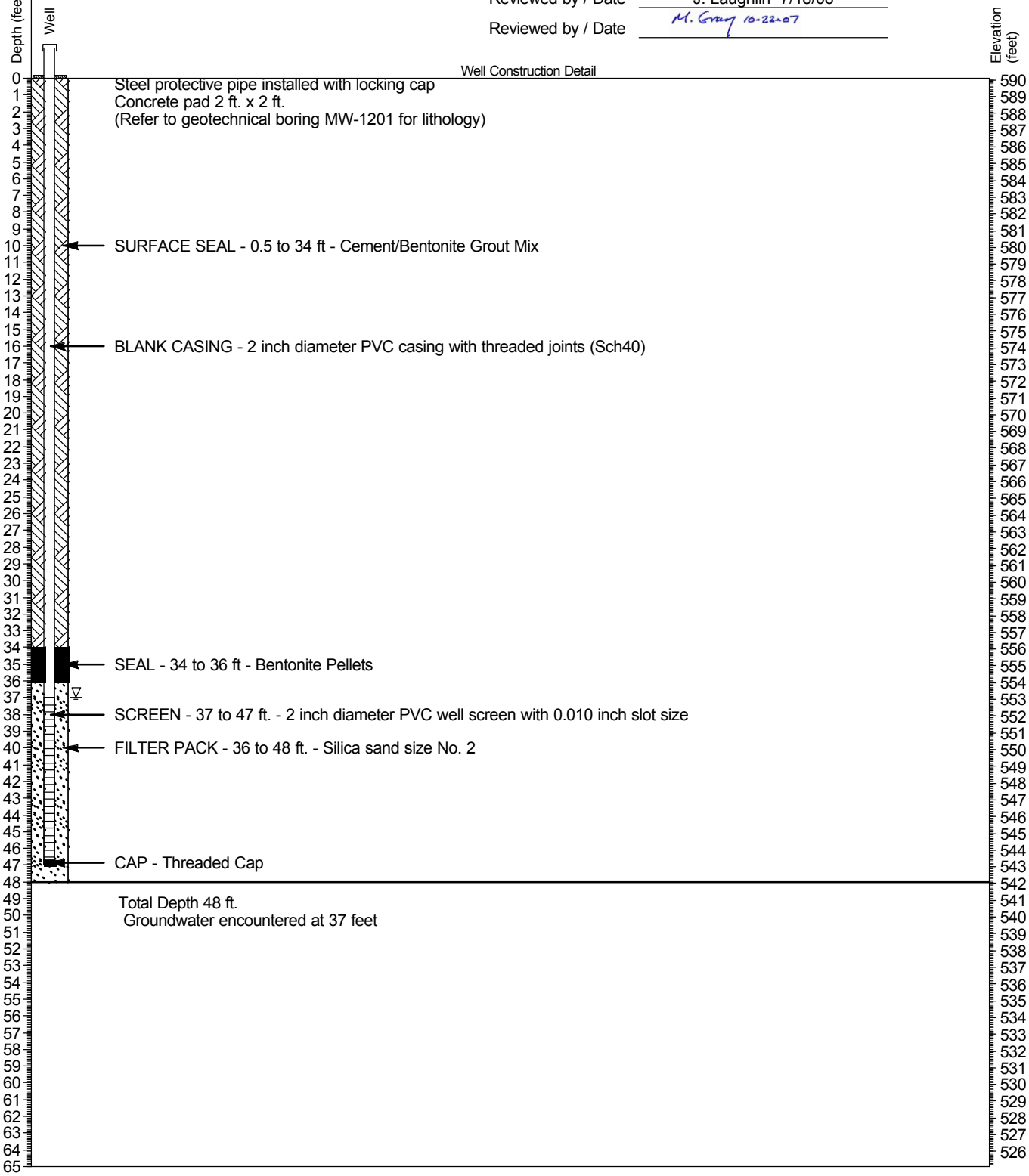
WELL CONSTRUCTION LOG - MW-1201 (well)



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1201A (well)**
Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location General site N 1166693.529 E 1846576.539	Total Depth 48 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 590.1 feet MSL	Ground Water Depth 37 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 47 feet	Top of Casing Elevation 592.1 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/18/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/18/06

Reviewed by / Date J. Laughlin 7/18/06

Reviewed by / Date M. Gray 10-22-07

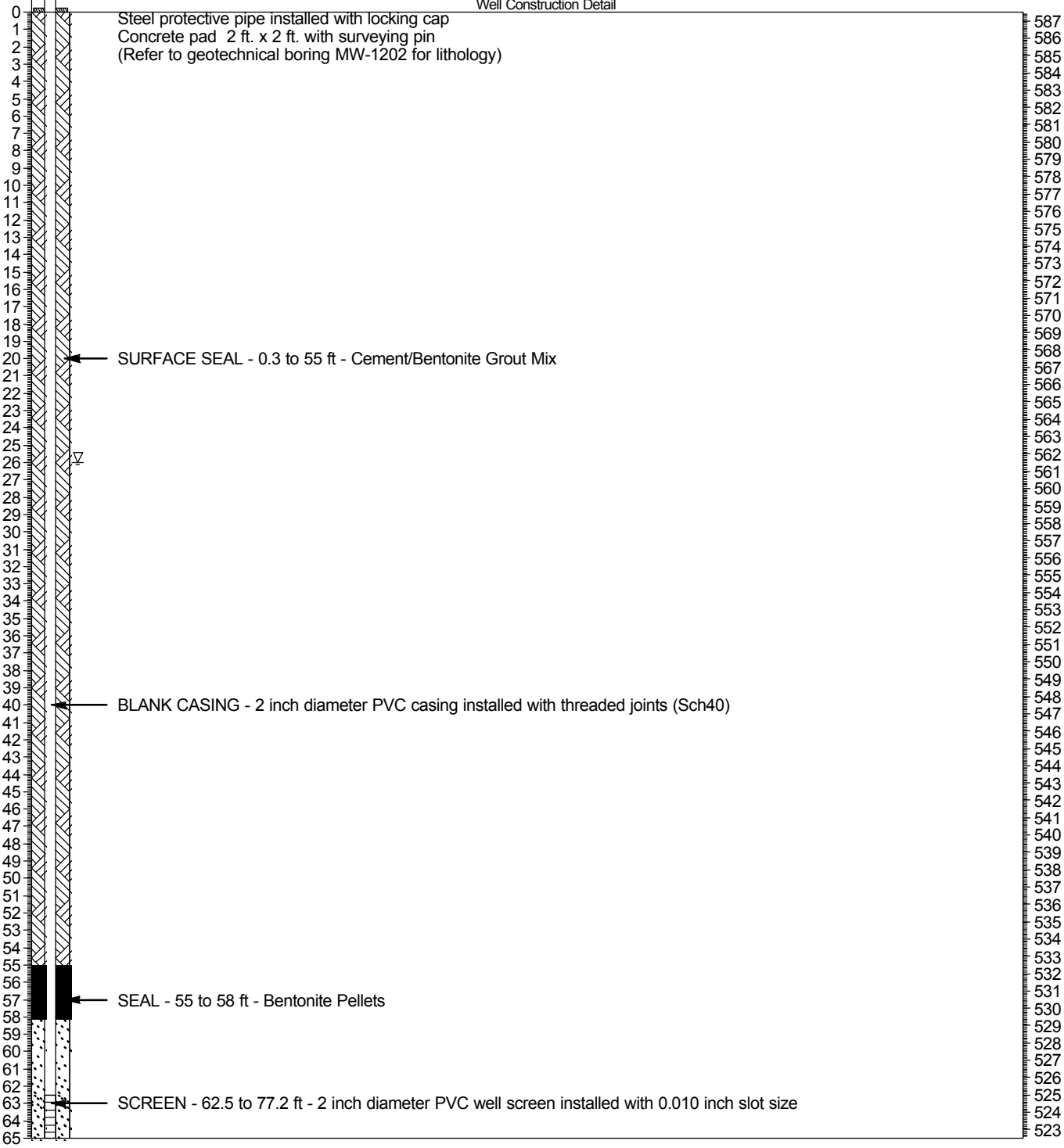


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1202 (well)**
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1167007.315 E 1847460.055	Total Depth 78.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW/D50		Elevation and Datum 587.5 feet MSL	Ground Water Depth 26 feet Depth to Bedrock N/A
Casing Size and Depth 2 inch / 77.5 feet	Top of Casing Elevation 589.7 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A Date Started 4/14/06
		Borehole Inclination -90	Logged by J. Jordan Date Completed 4/14/06

Reviewed by / Date J. Jordan 4/14/06

Reviewed by / Date M. Gray 10-22-07

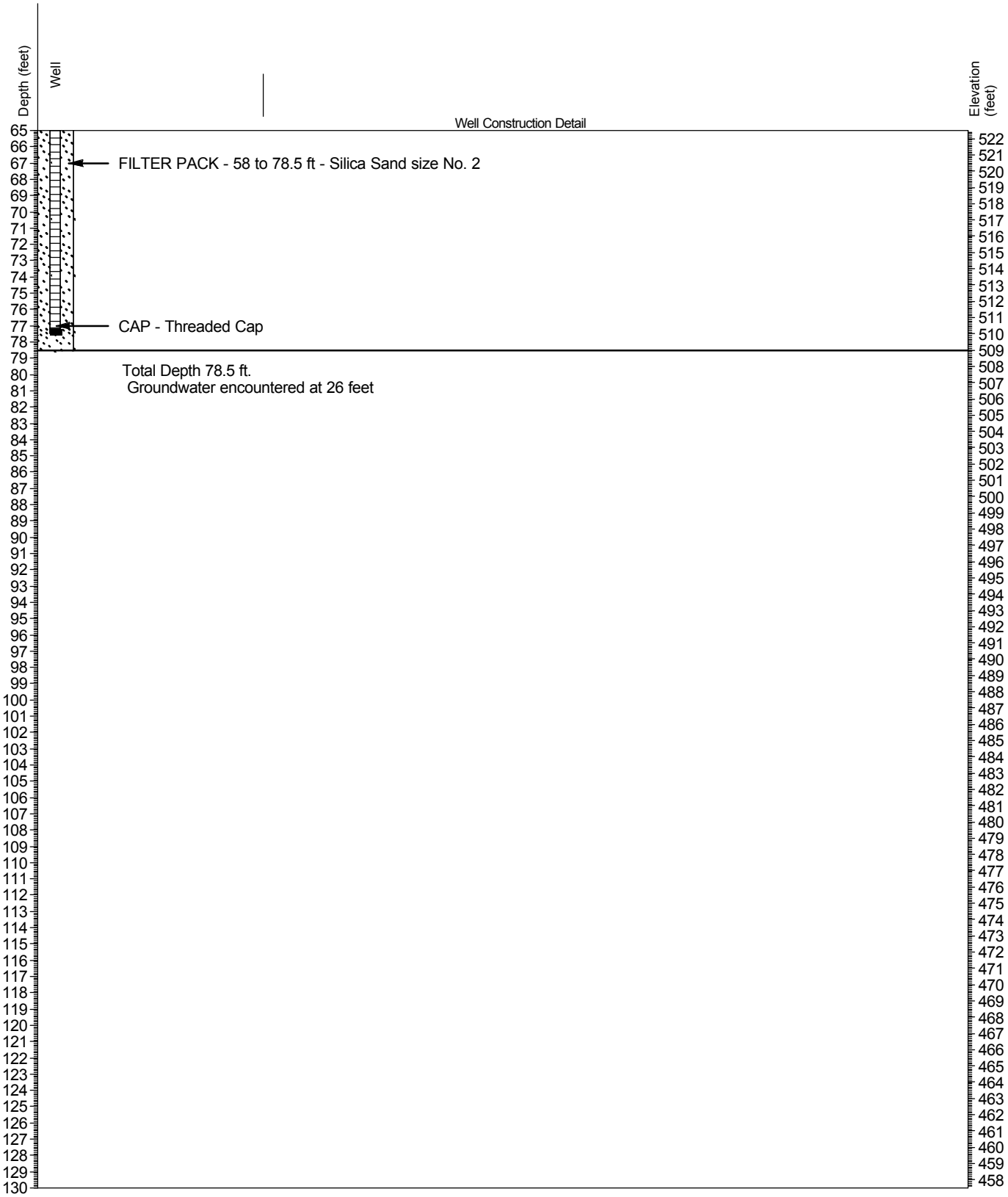
Well Construction Detail



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

WELL CONSTRUCTION LOG - MW-1202 (well)

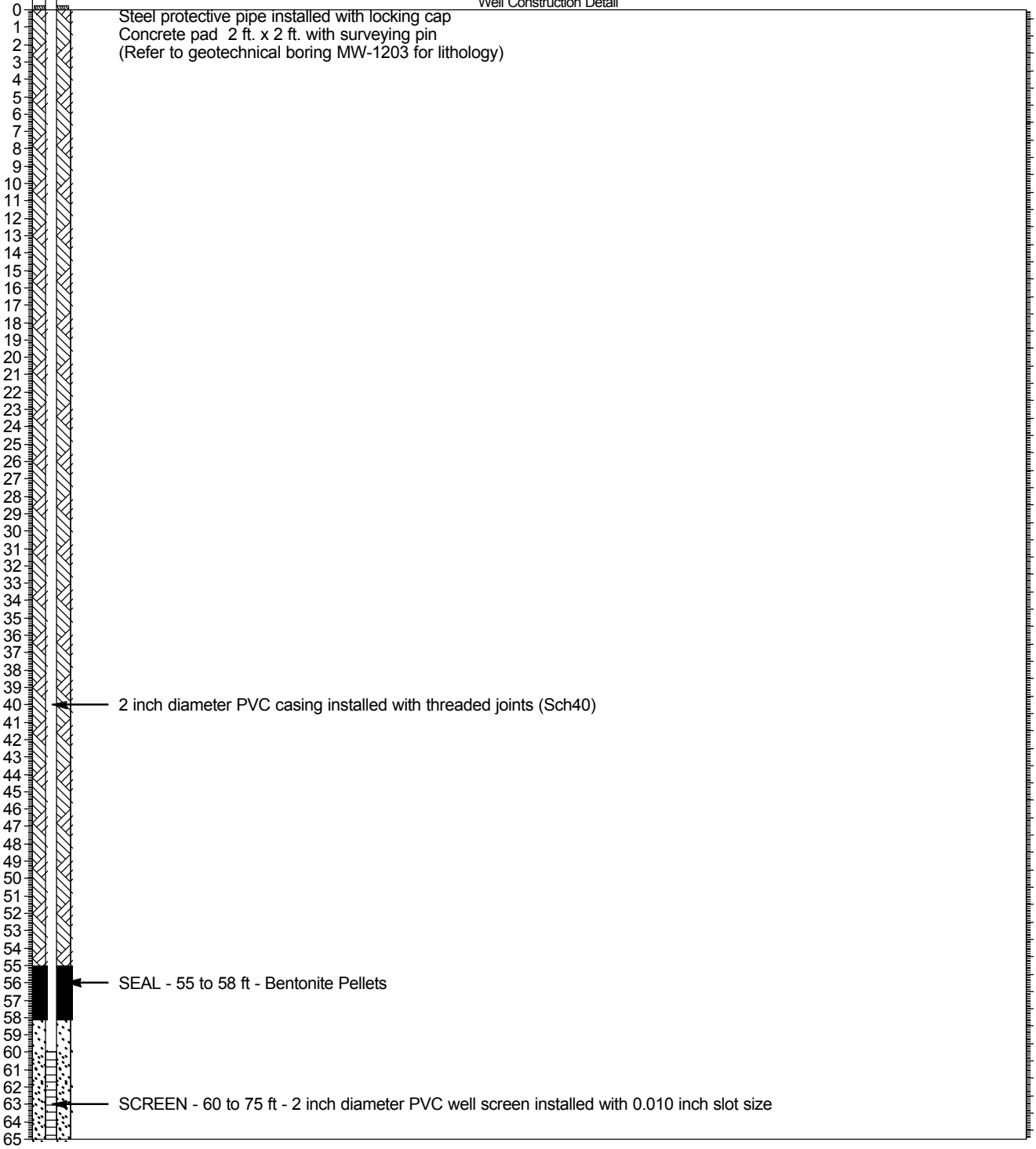


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		**WELL CONSTRUCTION LOG - MW-1203 (well)**		
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location Cooling Tower Unit 2 N 1166694.46 E 1847841.558		Total Depth 77 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 589.5 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 75 feet	Top of Casing Elevation 591.9 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/11/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/11/06

Reviewed by / Date J. Jordan 4/11/06

Reviewed by / Date M. Gray 10-22-07

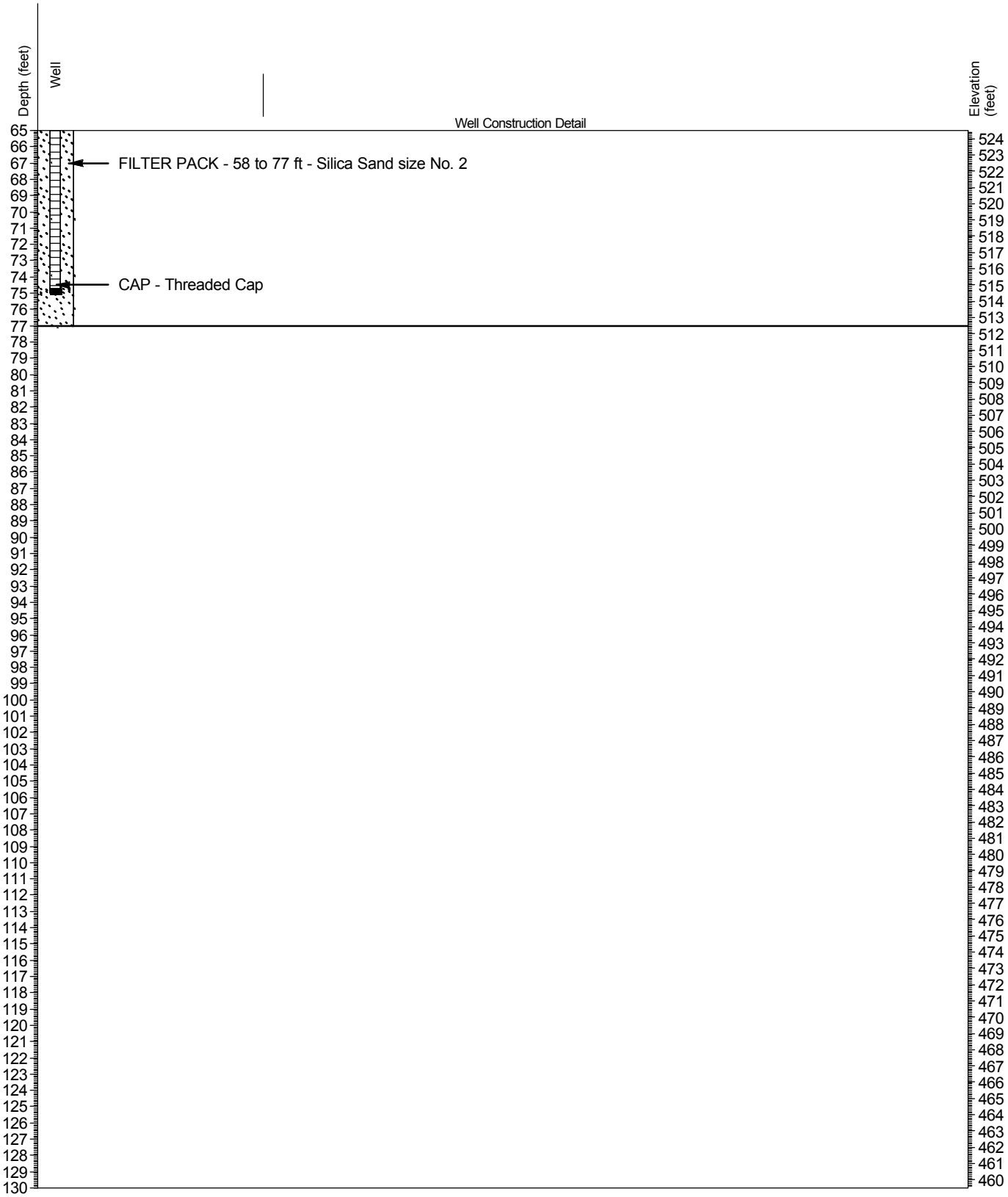
Well Construction Detail



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

WELL CONSTRUCTION LOG - MW-1203 (well)

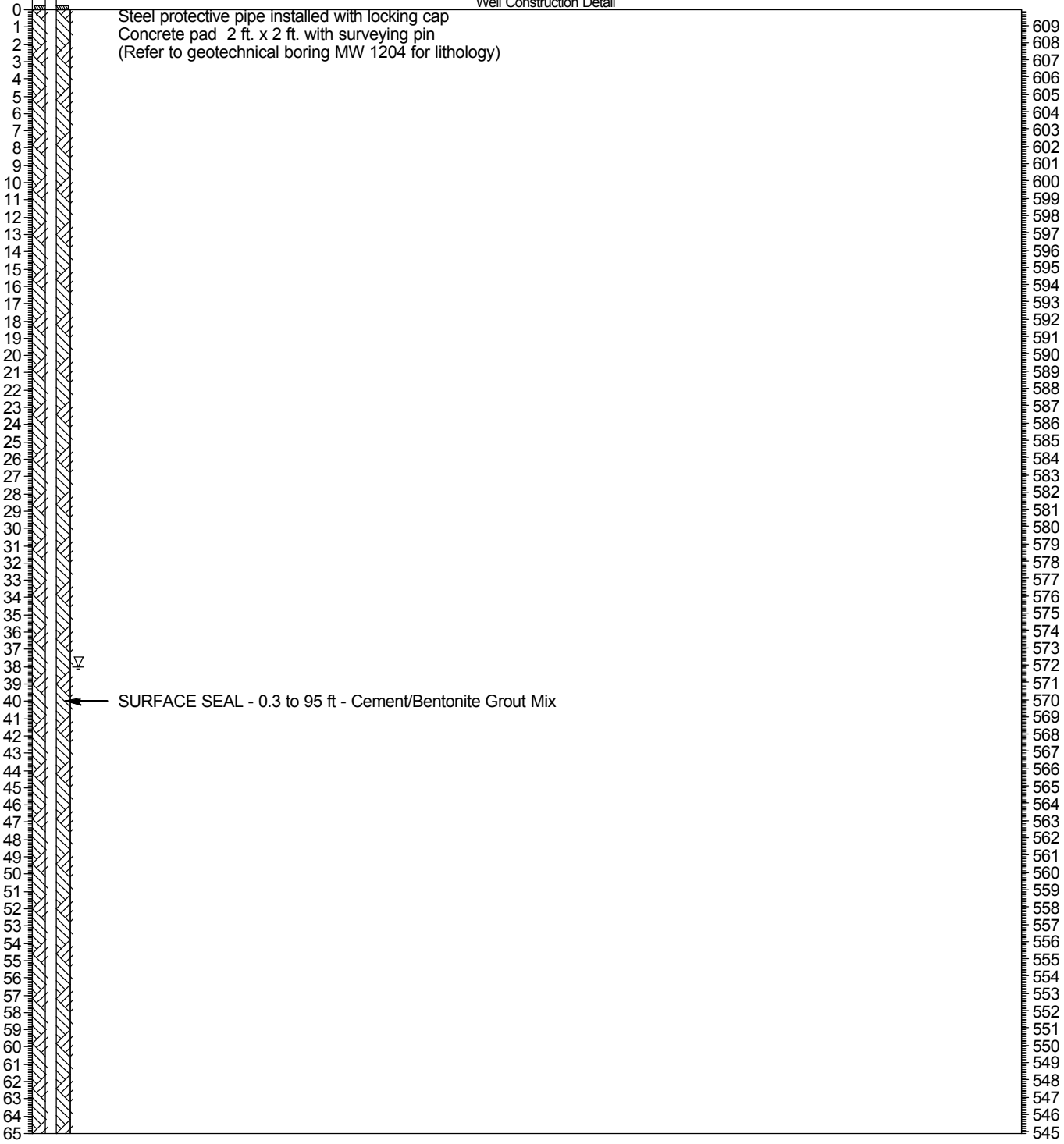


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1204 (well)**
Type and Diameter of Boring Hollow stem / Air Rotary / 6 inch		Boring Location Cooling Tower Unit 2 N 1166135.181 E 1848031.336	Total Depth 115 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 609.9 feet MSL	Ground Water Depth 38 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 114 feet	Top of Casing Elevation 612.4 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/14/06
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/14/06

Reviewed by / Date J. Cerceo 4/14/06

Reviewed by / Date M. Gray 10-22-07

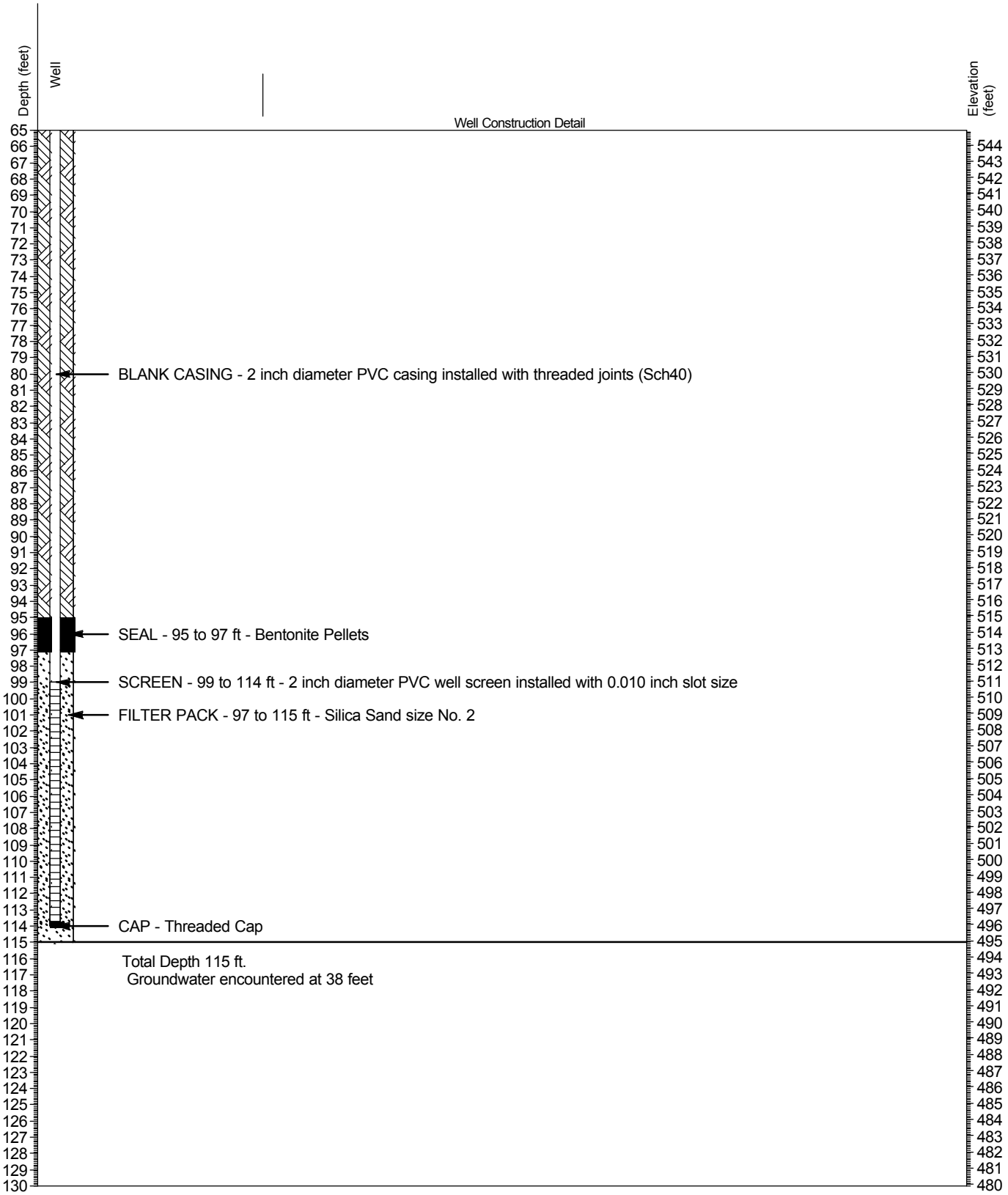
Well Construction Detail



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

WELL CONSTRUCTION LOG - MW-1204 (well)

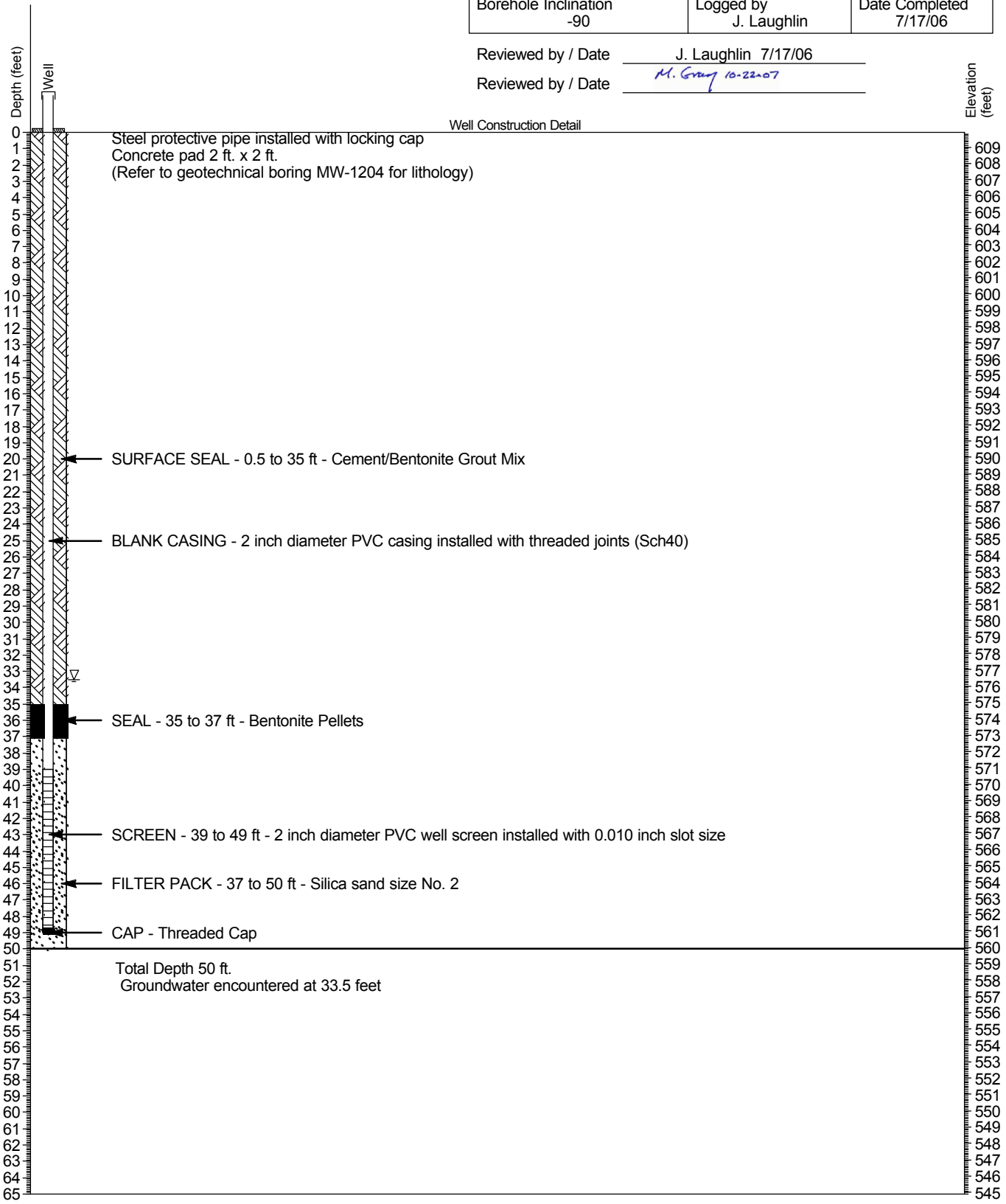


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**WELL CONSTRUCTION LOG - MW-1204A (well)**

Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location Cooling Tower Pad N 1166133.724 E 1848034.258		Total Depth 50 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 609.9 feet MSL	Ground Water Depth 33.5 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 49 feet	Top of Casing Elevation 612.4 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/17/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/17/06

Reviewed by / Date J. Laughlin 7/17/06

Reviewed by / Date M. Gray 10-22-07



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1205 (well)**
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1165628.988 E 1848312.858	Total Depth 124 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 610 feet MSL	Ground Water Depth 50 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 123 feet	Top of Casing Elevation 612.6 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/15/06
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/15/06

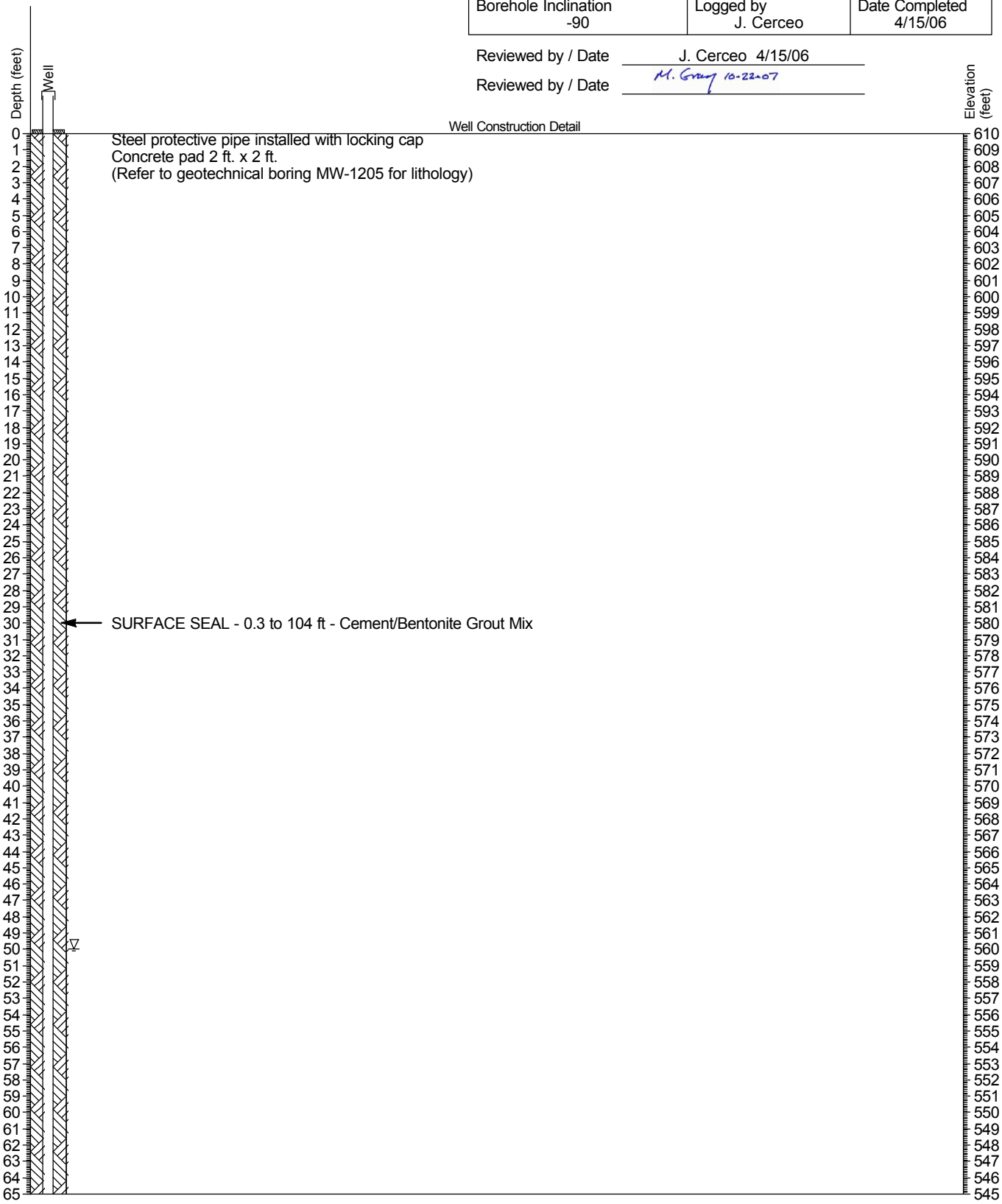
Reviewed by / Date J. Cerceo 4/15/06

Reviewed by / Date M. Gray 10-22-07

Well Construction Detail

Steel protective pipe installed with locking cap
Concrete pad 2 ft. x 2 ft.
(Refer to geotechnical boring MW-1205 for lithology)

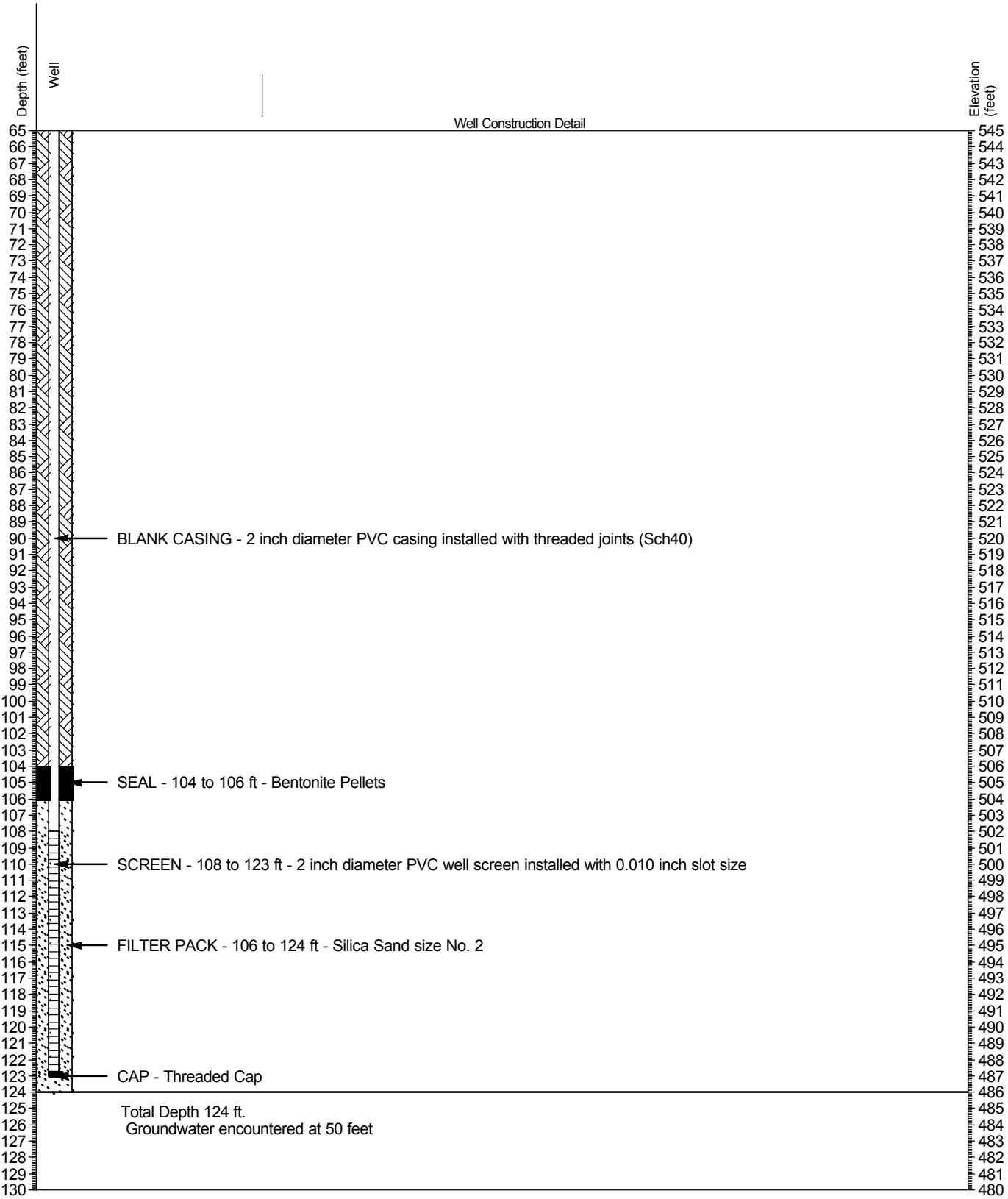
SURFACE SEAL - 0.3 to 104 ft - Cement/Bentonite Grout Mix



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

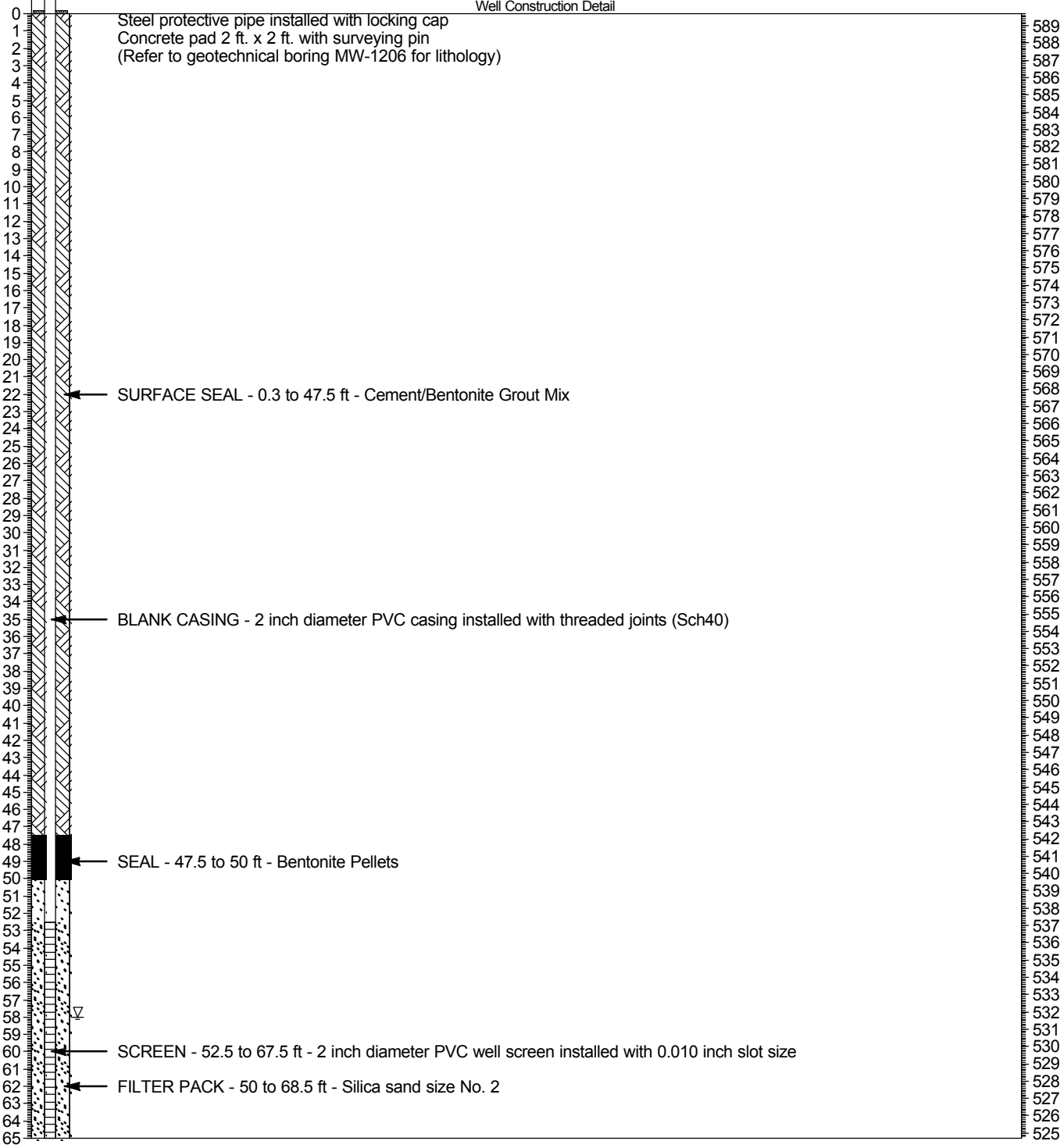
WELL CONSTRUCTION LOG - MW-1205 (well)



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1206 (well)**		
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch			Boring Location General site N 1166650.035 E 1846689.096		Total Depth 68.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW			Elevation and Datum 589.7 feet MSL	Ground Water Depth 58 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 67.5 feet	Top of Casing Elevation 591.5 feet		Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/18/06
			Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/18/06

Reviewed by / Date J. Jordan 4/18/06

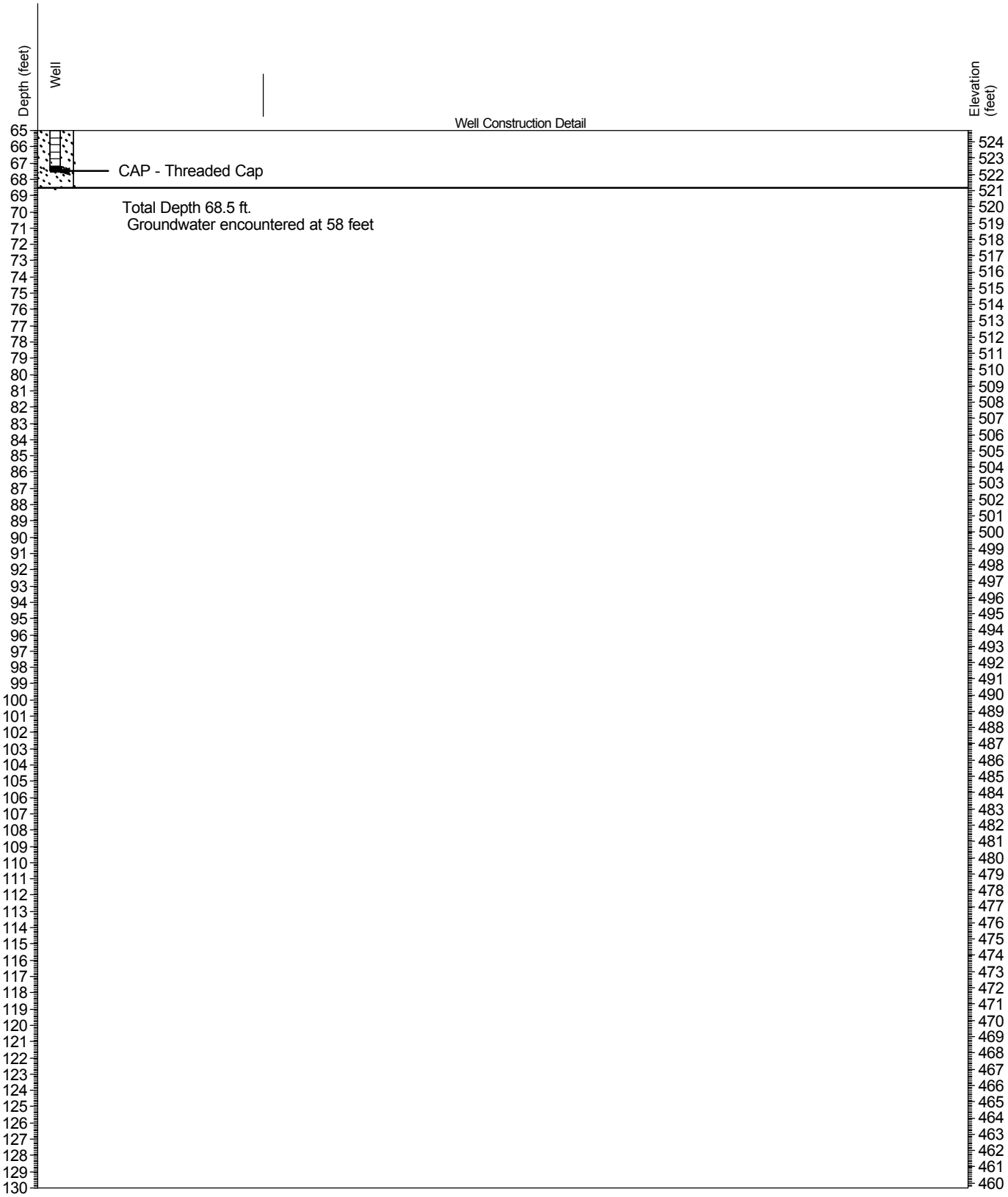
Reviewed by / Date M. Gray 10-22-07



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

WELL CONSTRUCTION LOG - MW-1206 (well)

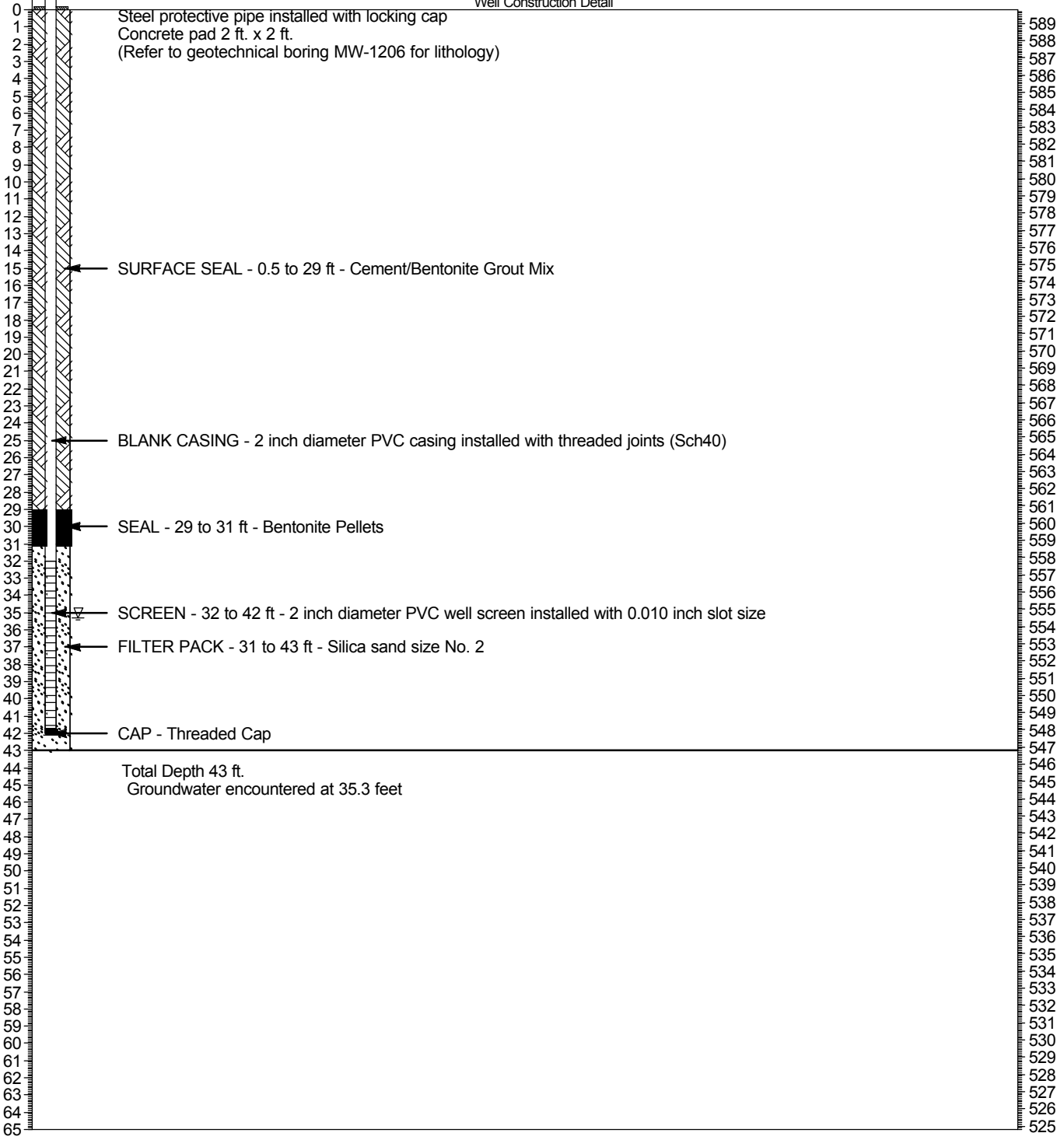


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**WELL CONSTRUCTION LOG - MW-1206A (well)**	
Type and Diameter of Boring Hollow stem auger / 8.25 inch	Boring Location General site N 1166656.288 E 1846693.299		Total Depth 43 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120	Elevation and Datum 589.8 feet MSL	Ground Water Depth 35.3 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 42 feet	Top of Casing Elevation 591.4 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/17/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/17/06

Reviewed by / Date: J. Laughlin 7/17/06

Reviewed by / Date: M. Gray 10-22-07

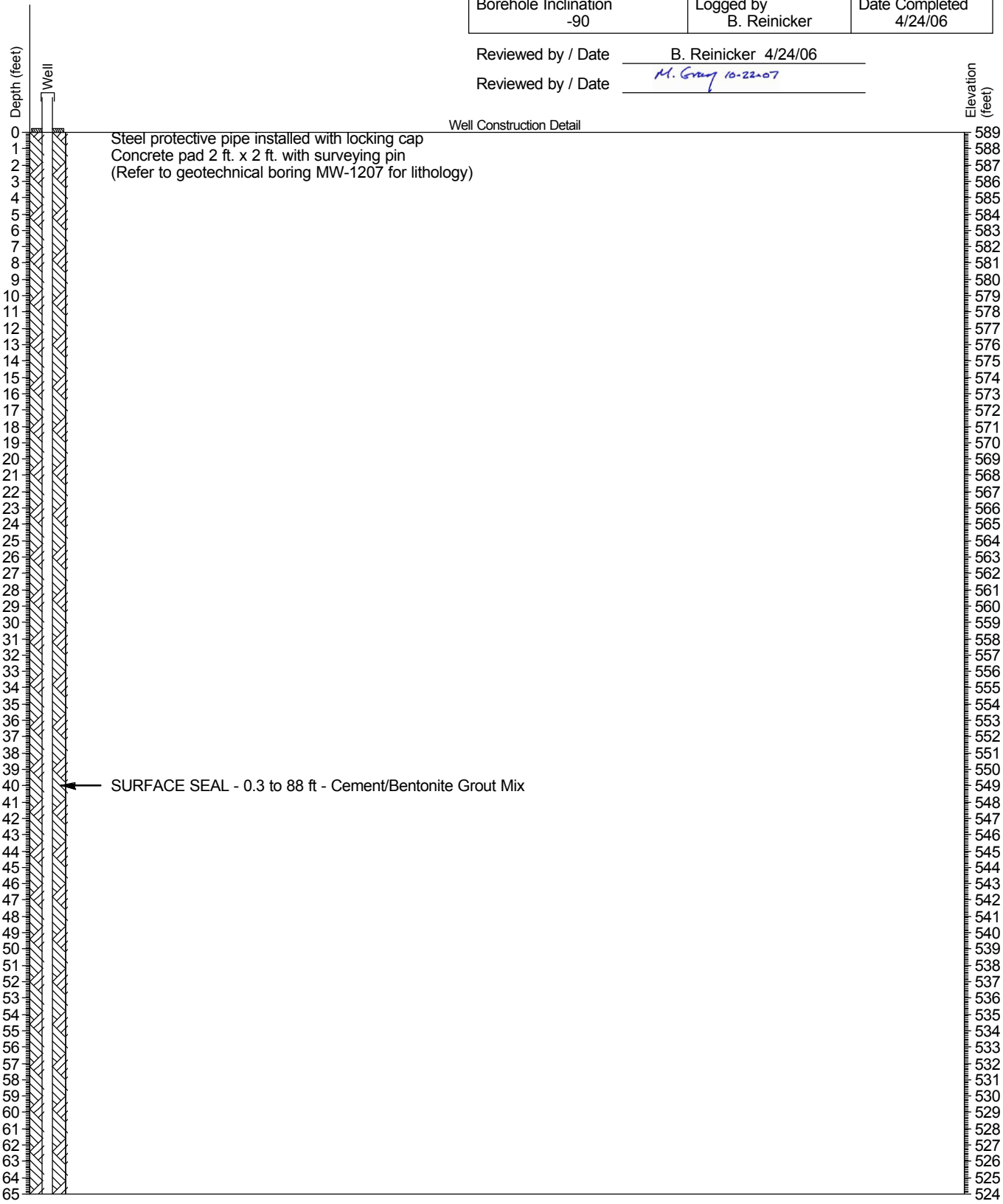
Well Construction Detail



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1207 (well)**
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1166840.186 E 1846668.529	Total Depth 108 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 589 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 107.3 feet	Top of Casing Elevation 591.4 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/24/06
		Borehole Inclination -90	Logged by B. Reinicker	Date Completed 4/24/06

Reviewed by / Date: B. Reinicker 4/24/06

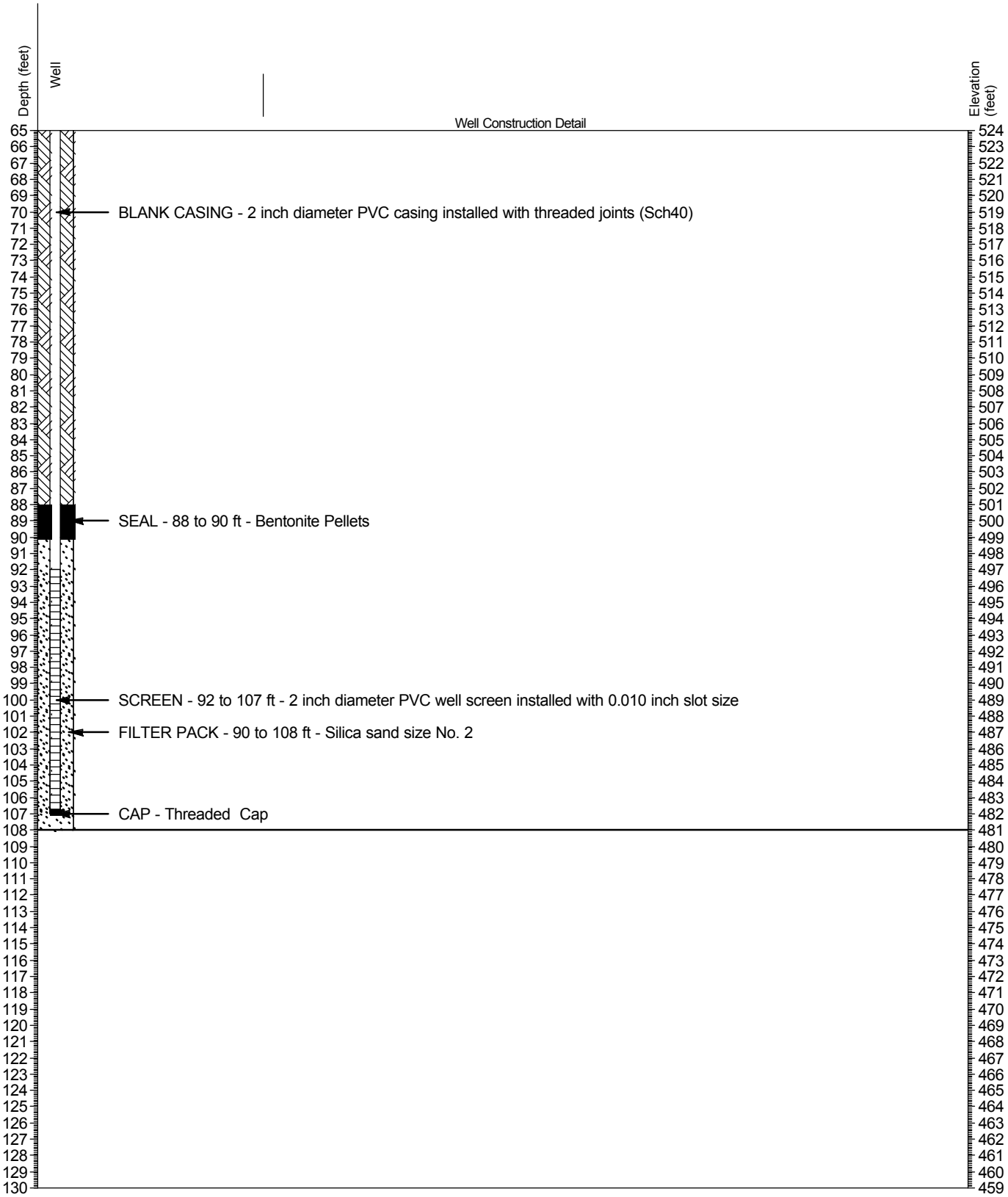
Reviewed by / Date: M. Gray 10-22-07



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

WELL CONSTRUCTION LOG - MW-1207 (well)

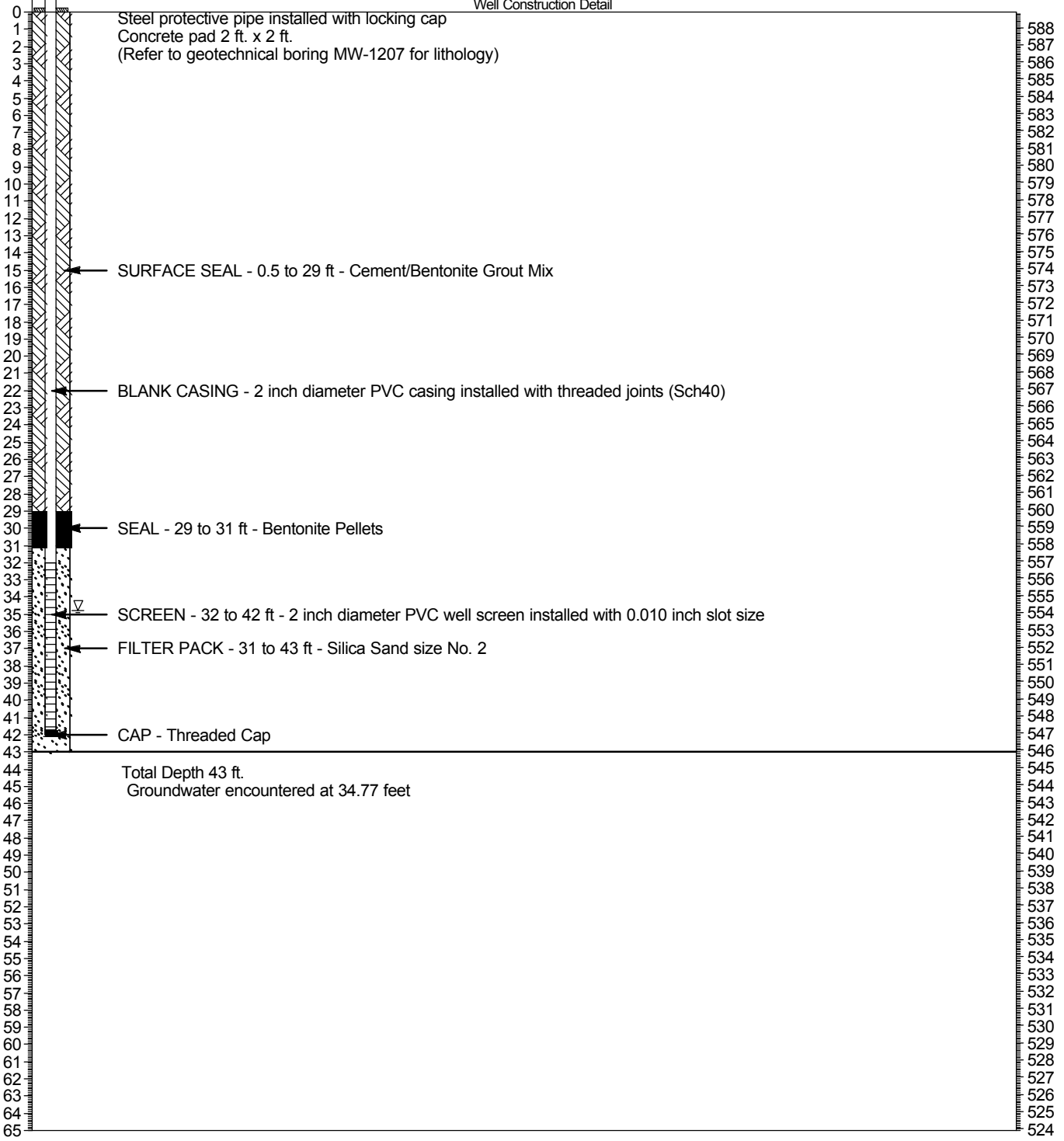


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1207A (well)**
Type and Diameter of Boring Hollow stem / 8.25 inch		Boring Location General site N 1166846.232 E 1846673.41	Total Depth 43 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 588.9 feet MSL	Ground Water Depth 34.77 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 42 feet	Top of Casing Elevation 591 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/18/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/18/06

Reviewed by / Date: J. Laughlin 7/18/06

Reviewed by / Date: M. Gray 10-22-07

Well Construction Detail

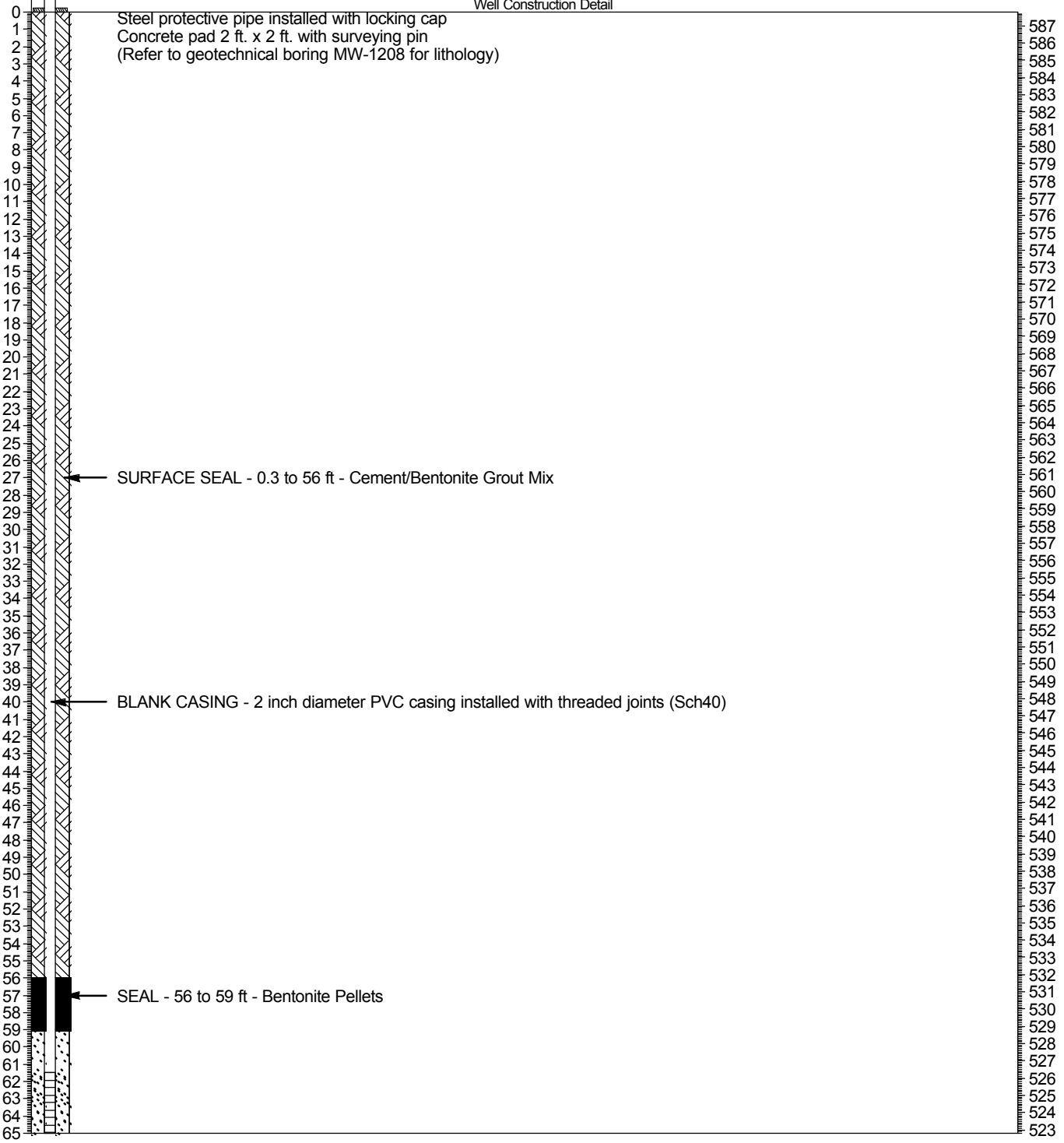


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1208 (well)**
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1167184.041 E 1846588.623	Total Depth 79 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 587.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 76.5 feet	Top of Casing Elevation 590 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/13/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/13/06

Reviewed by / Date J. Jordan 4/13/06

Reviewed by / Date M. Gray 10-22-07

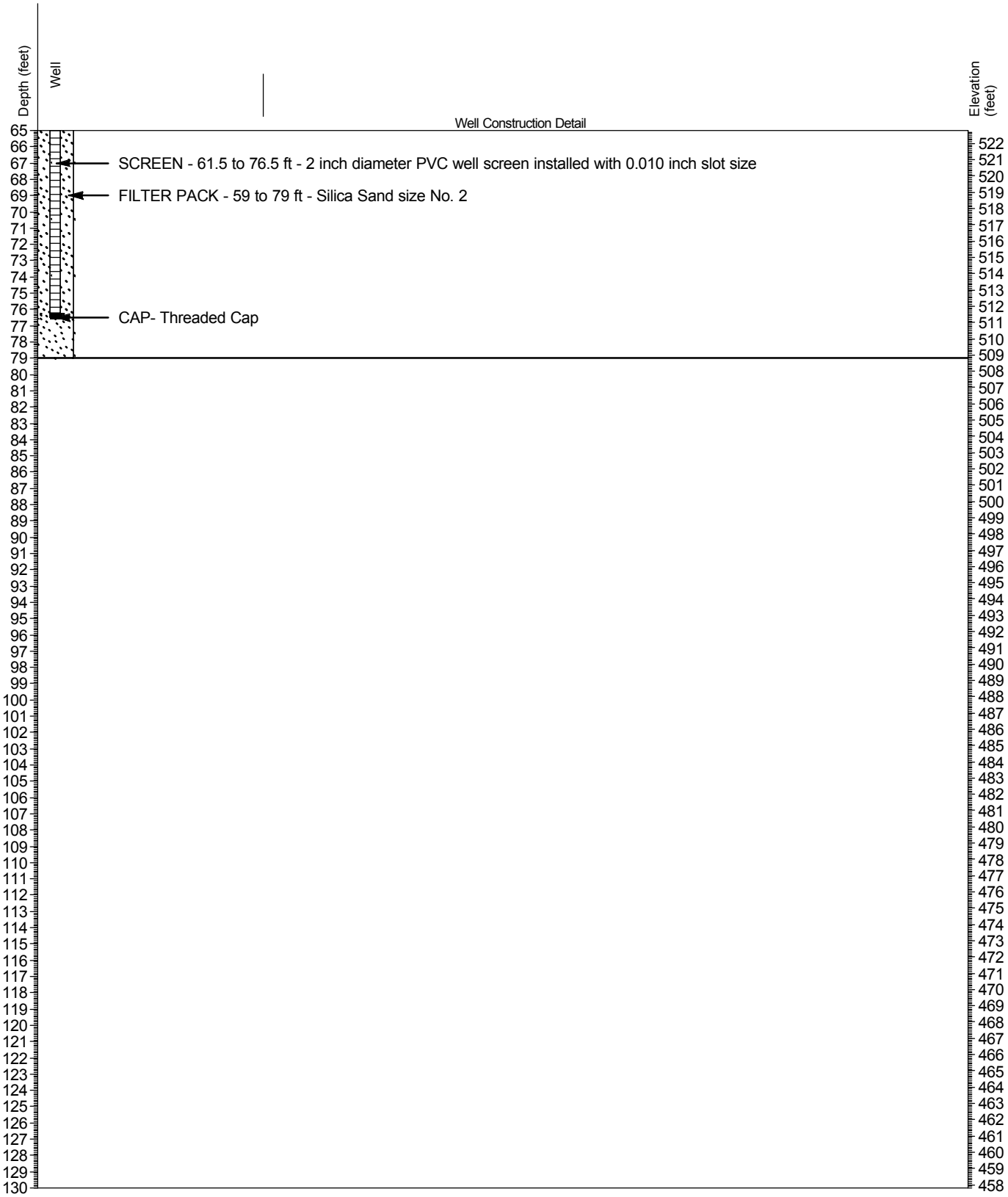
Well Construction Detail



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

WELL CONSTRUCTION LOG - MW-1208 (well)

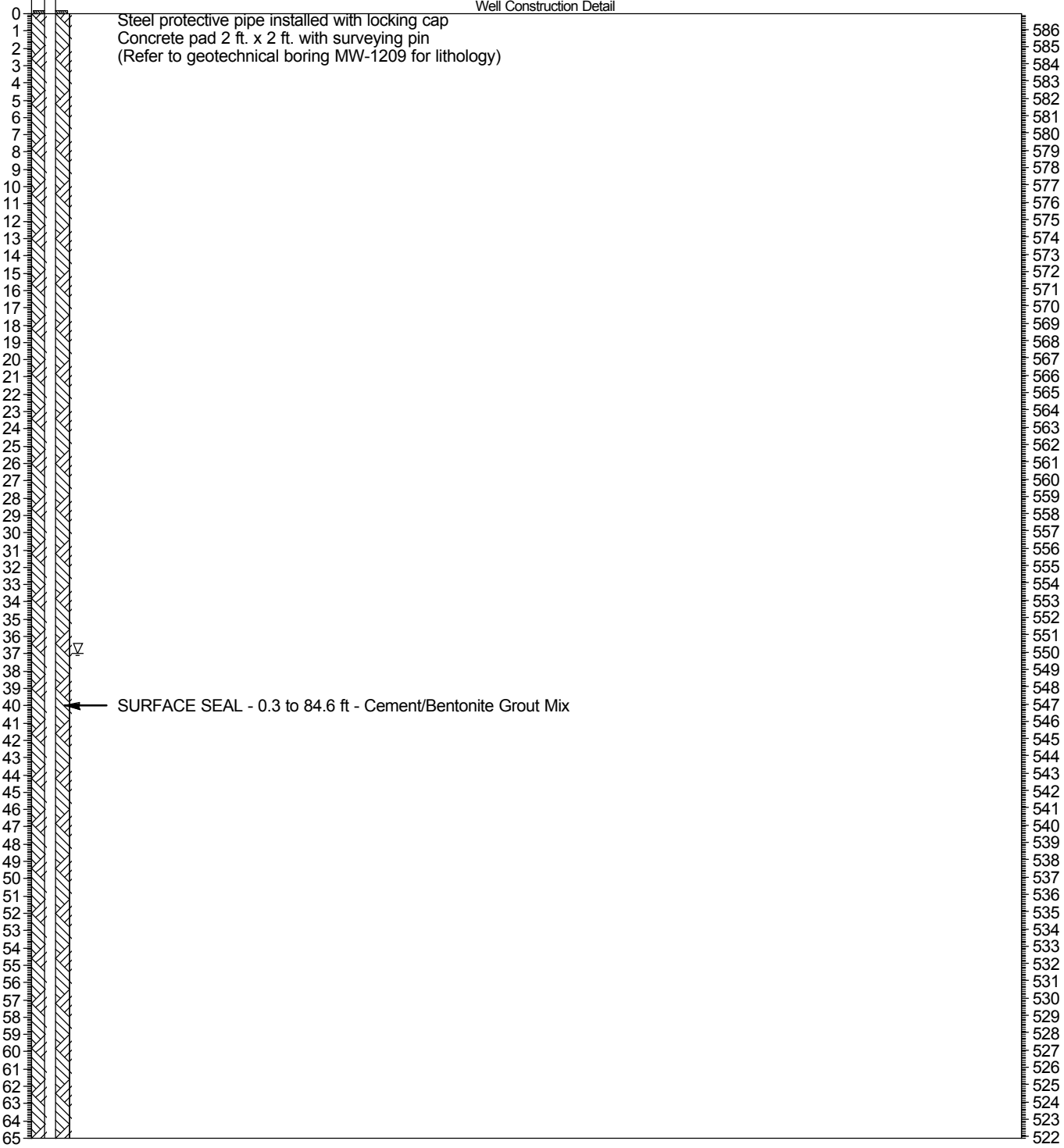


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1209 (well)**
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1165080.624 E 1848078.551	Total Depth 106 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 586.9 feet MSL	Ground Water Depth 37 feet
Casing Size and Depth 2 inch / 104 feet	Top of Casing Elevation 588.9 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A
		Borehole Inclination -90	Logged by J. Jordan

		Depth to Bedrock N/A	
		Date Started 4/18/06	
		Date Completed 4/18/06	

Reviewed by / Date J. Jordan 4/18/06

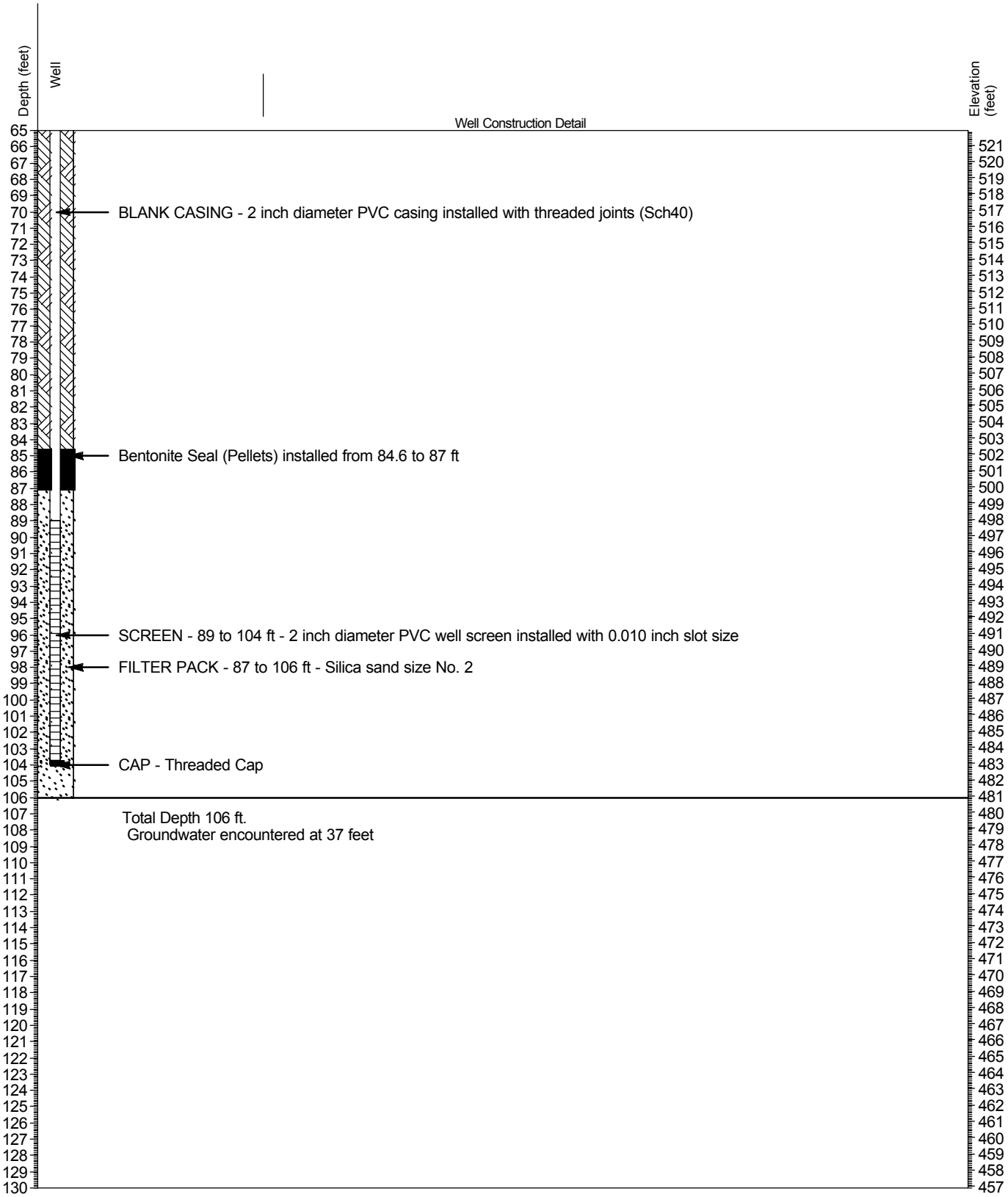
Reviewed by / Date M. Gray 10-22-07



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

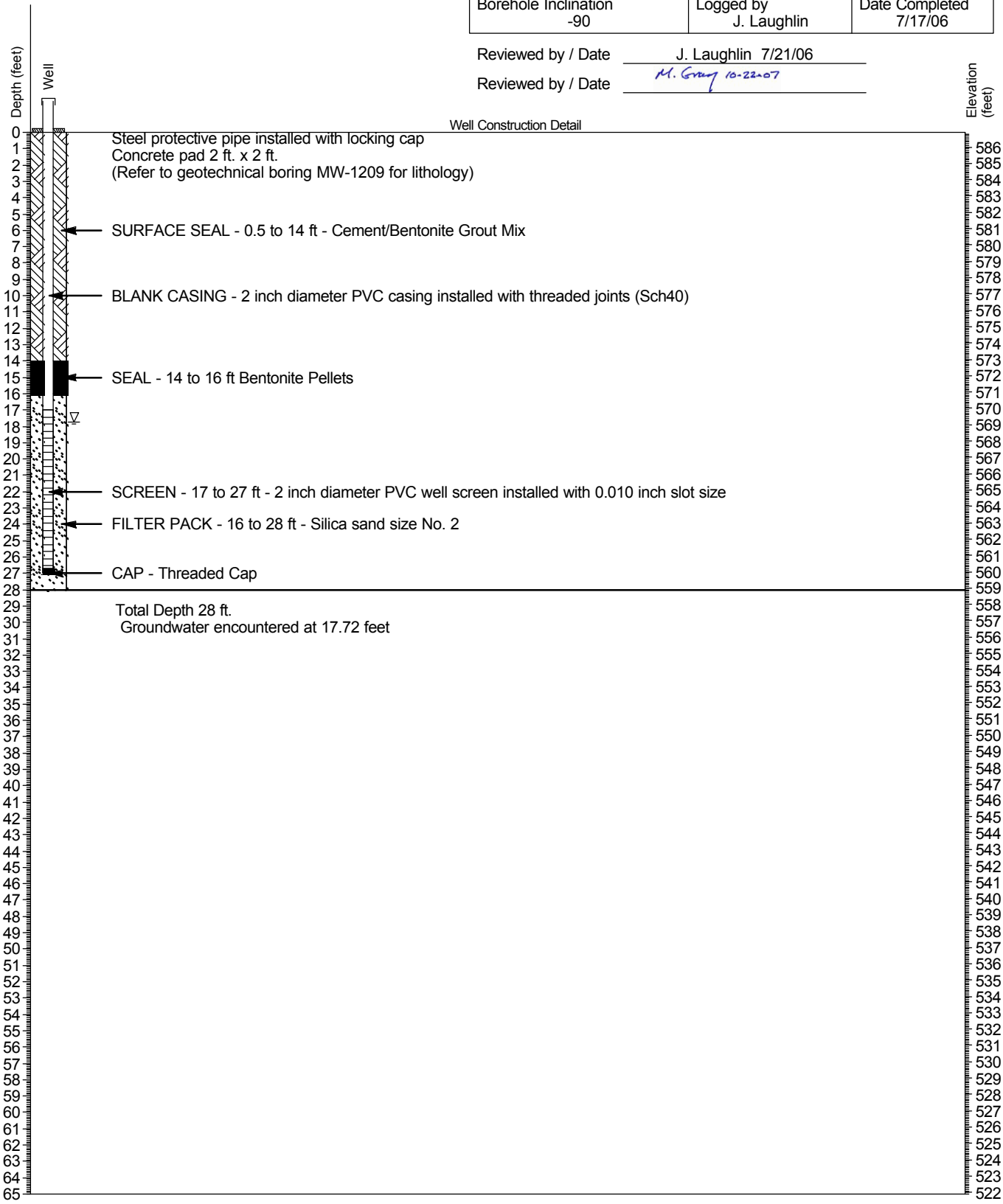
WELL CONSTRUCTION LOG - MW-1209 (well)



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1209A (well)**
Type and Diameter of Boring Hollow stem / 8.25 inch		Boring Location General site N 1165076.658 E 1848072.885	Total Depth 28 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 586.9 feet MSL	Ground Water Depth 17.72 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 27 feet	Top of Casing Elevation 589 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/17/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/17/06

Reviewed by / Date: J. Laughlin 7/21/06

Reviewed by / Date: M. Gray 10-22-07

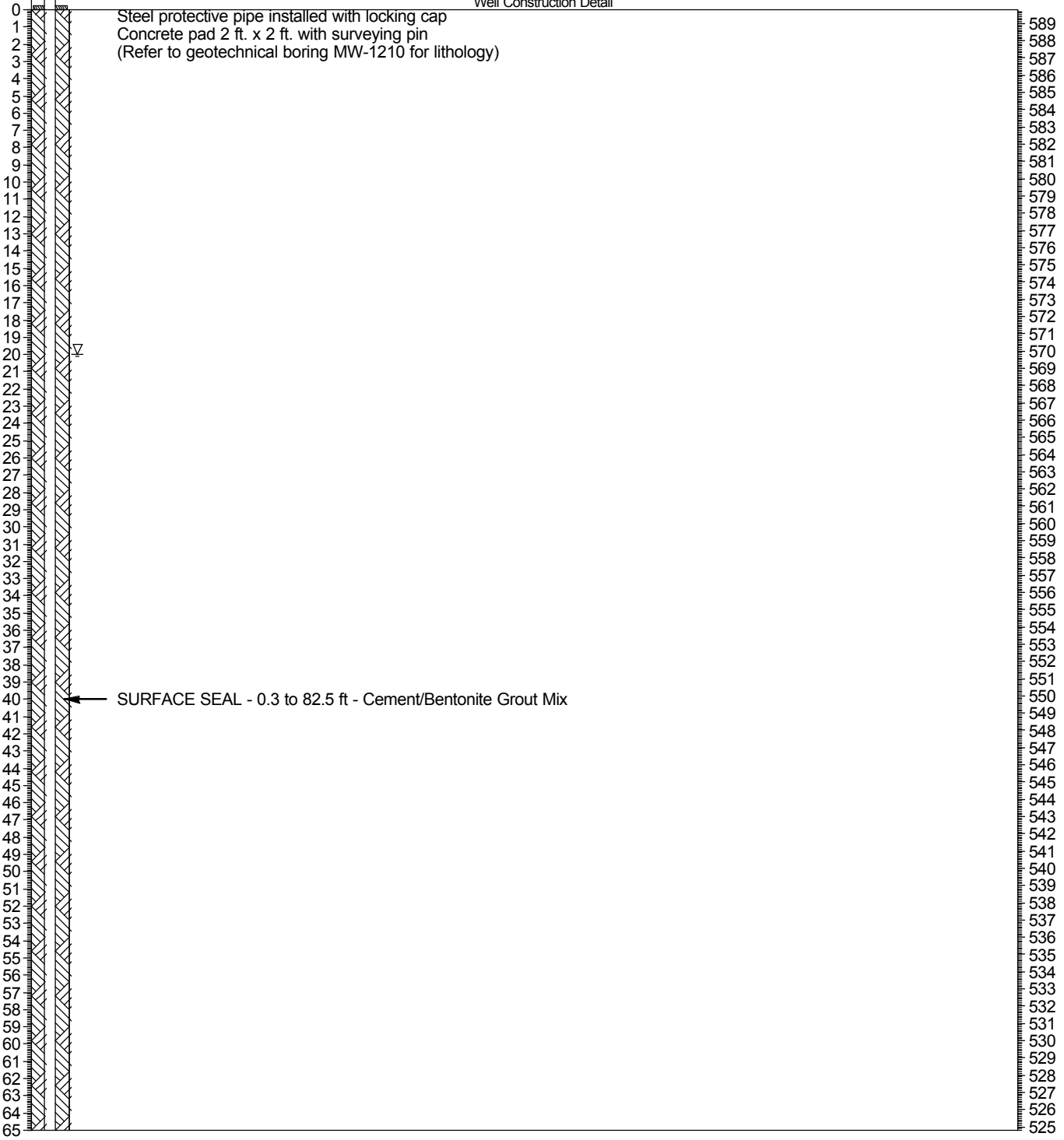


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1210 (well)**
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location Unit 2 adjacent N 1165324.031 E 1847451.588	Total Depth 101.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 589.8 feet MSL	Ground Water Depth 20 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 101.5 feet	Top of Casing Elevation 592.3 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/15/06
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/16/06

Reviewed by / Date J. Cerceo 4/16/06

Reviewed by / Date M. Gray 10-22-07

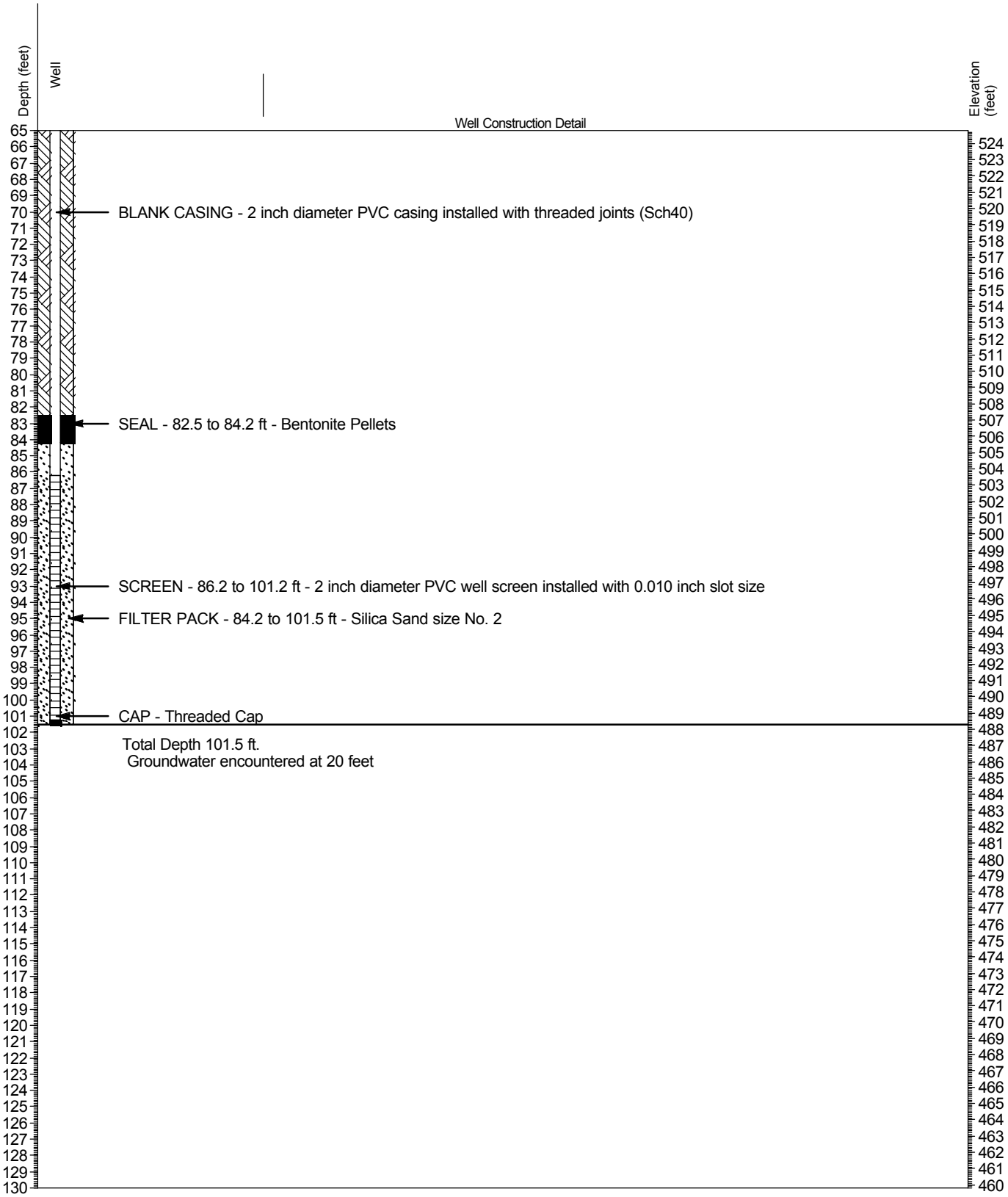
Well Construction Detail



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

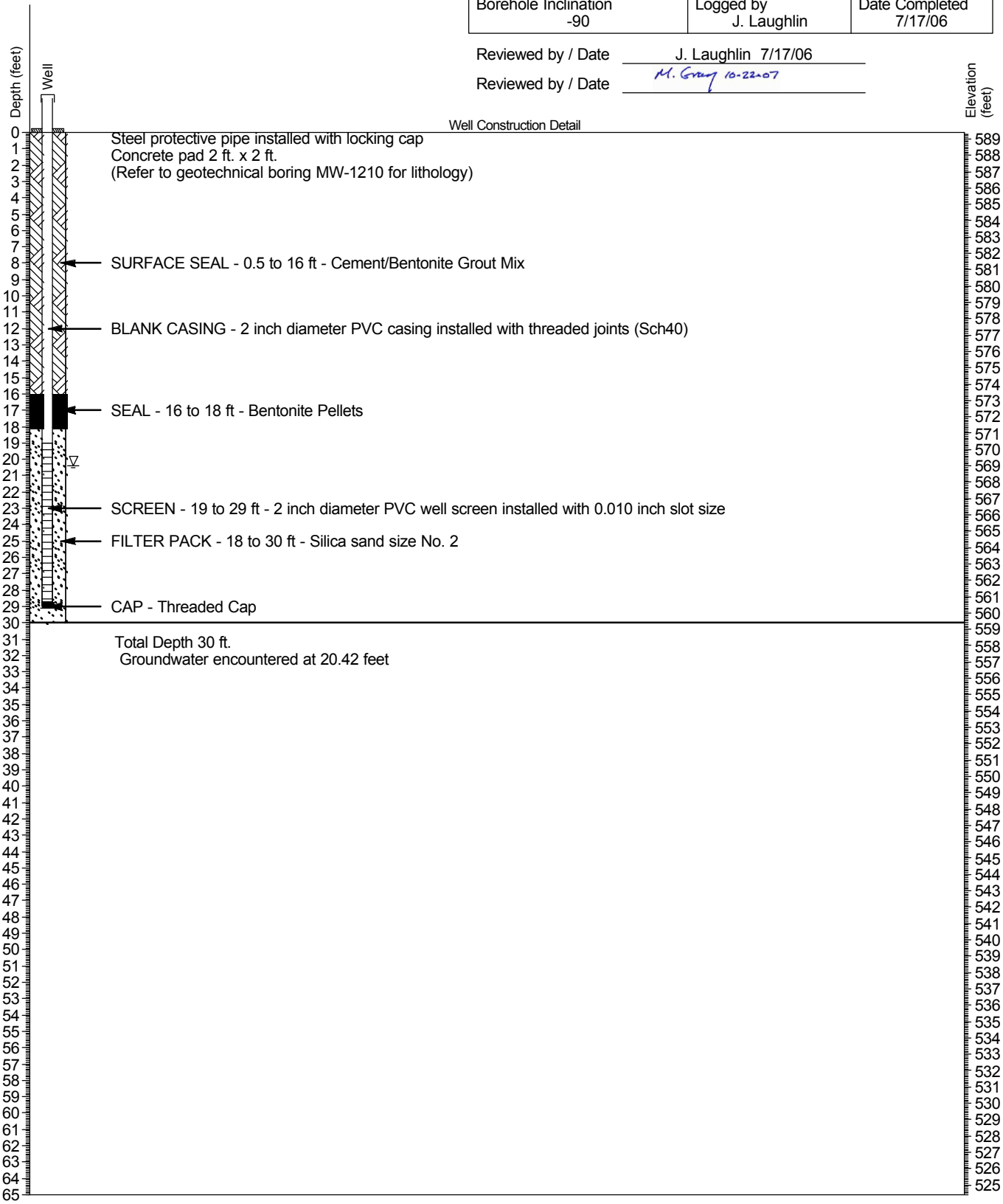
WELL CONSTRUCTION LOG - MW-1210 (well)



Project Name and Job Number					
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**WELL CONSTRUCTION LOG - MW-1210A (well)**			
Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location Unit 2 adjacent N 1165312.832 E 1847436.803		Total Depth 30 feet	
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 589.4 feet MSL	Ground Water Depth 20.42 feet	Depth to Bedrock N/A	
Casing Size and Depth 2 inch / 29 feet	Top of Casing Elevation 591.7 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/17/06	
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/17/06	

Reviewed by / Date: J. Laughlin 7/17/06

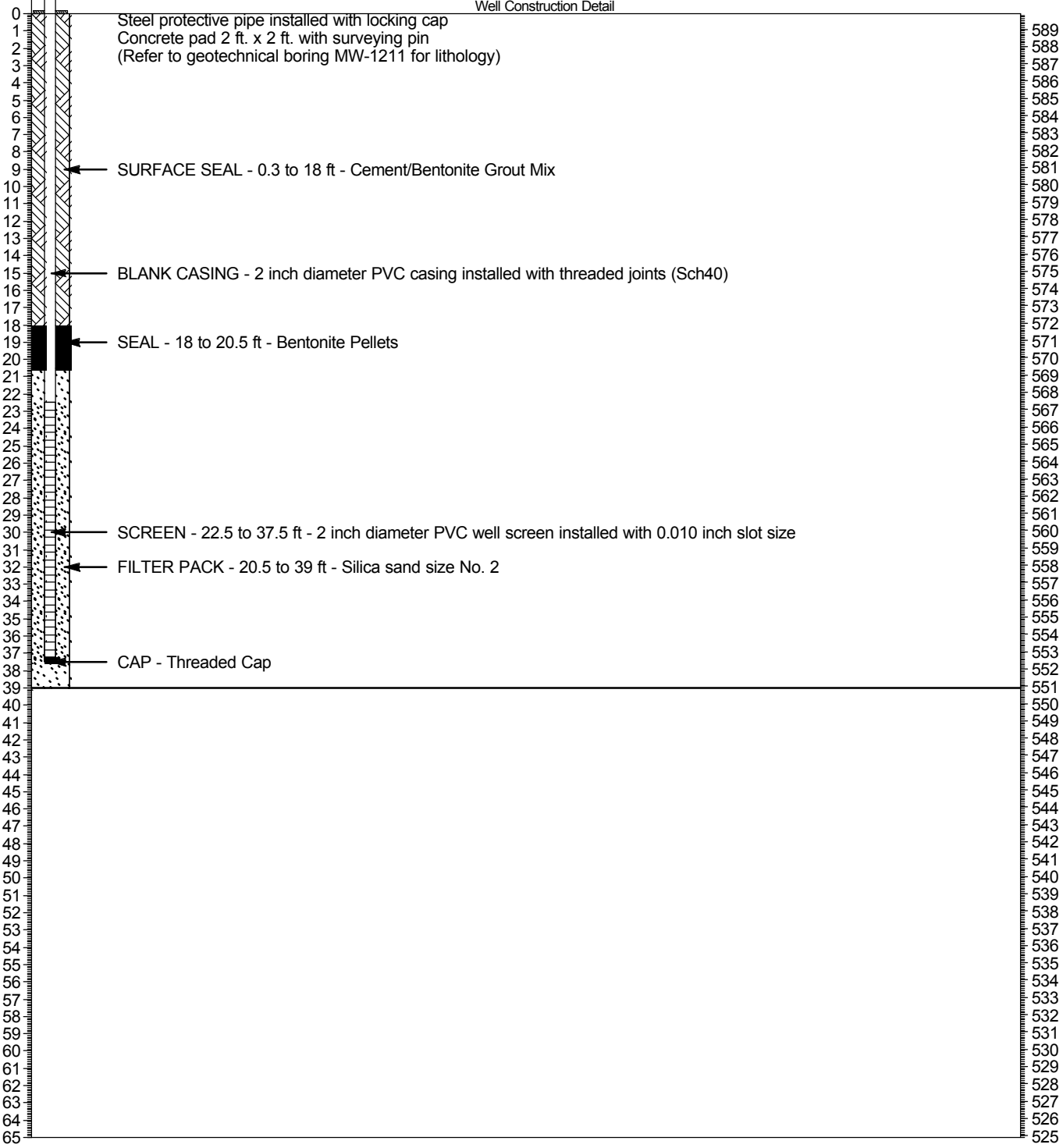
Reviewed by / Date: M. Gray 10-22-07



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		**WELL CONSTRUCTION LOG - MW-1211 (well)**		
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location Unit 1 adjacent N 1165196.276 E 1846389.259		Total Depth 39 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 589.9 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 37.5 feet	Top of Casing Elevation 591.6 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/11/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/11/06

Reviewed by / Date J. Jordan 4/11/06

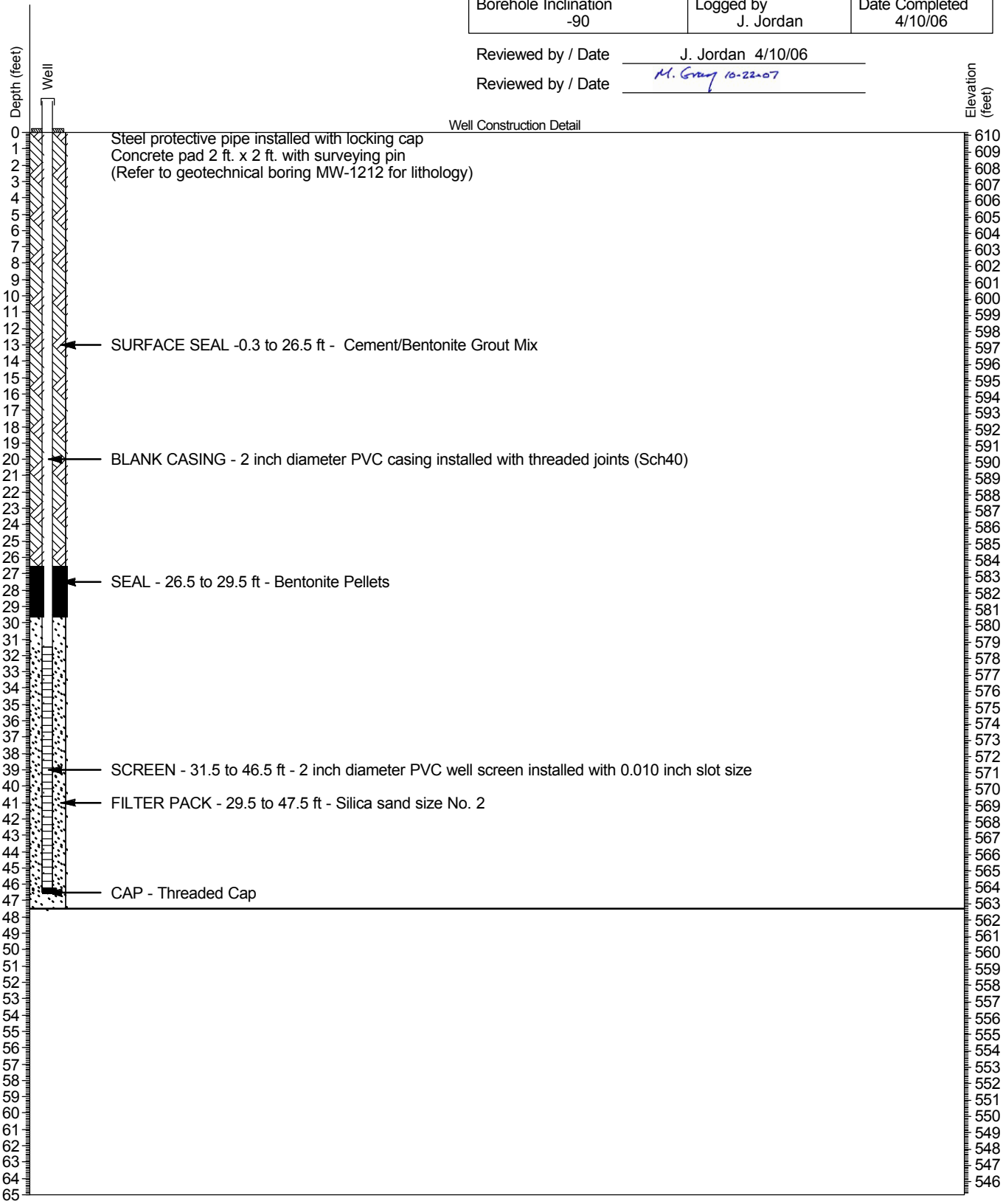
Reviewed by / Date M. Gray 10-22-07



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1212 (well)**
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location Unit 1 CT N 1165375.527 E 1845450.152	Total Depth 47.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 610.2 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 46.5 feet	Top of Casing Elevation 612.3 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/10/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/10/06

Reviewed by / Date J. Jordan 4/10/06

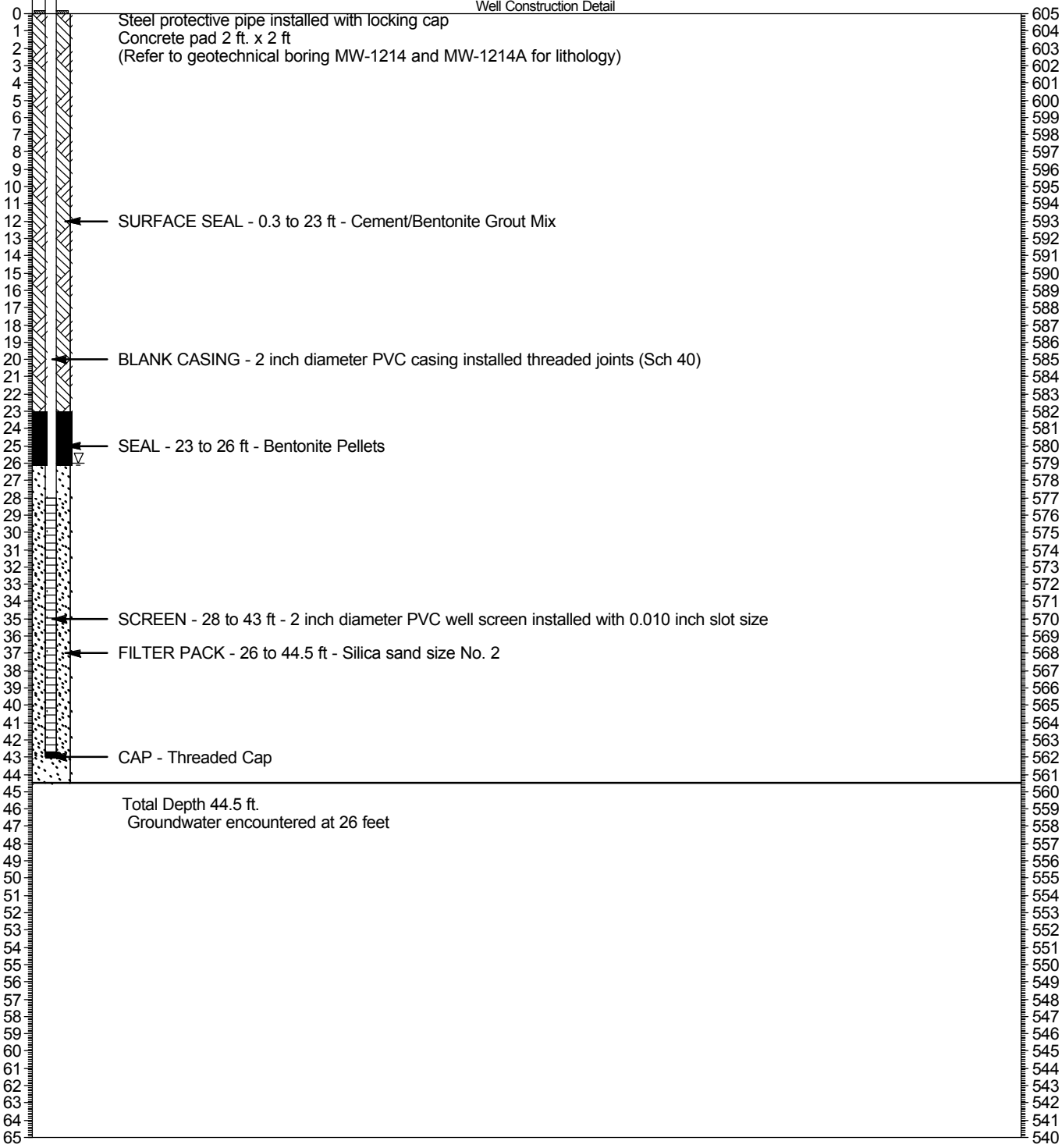
Reviewed by / Date M. Gray 10-22-07



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1214 (well)**
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location Switchyard N 1164174.596 E 1847143.086	Total Depth 44.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 605 feet MSL	Ground Water Depth 26 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 43 feet	Top of Casing Elevation 606.5 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/11/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/11/06

Reviewed by / Date J. Jordan 4/11/06

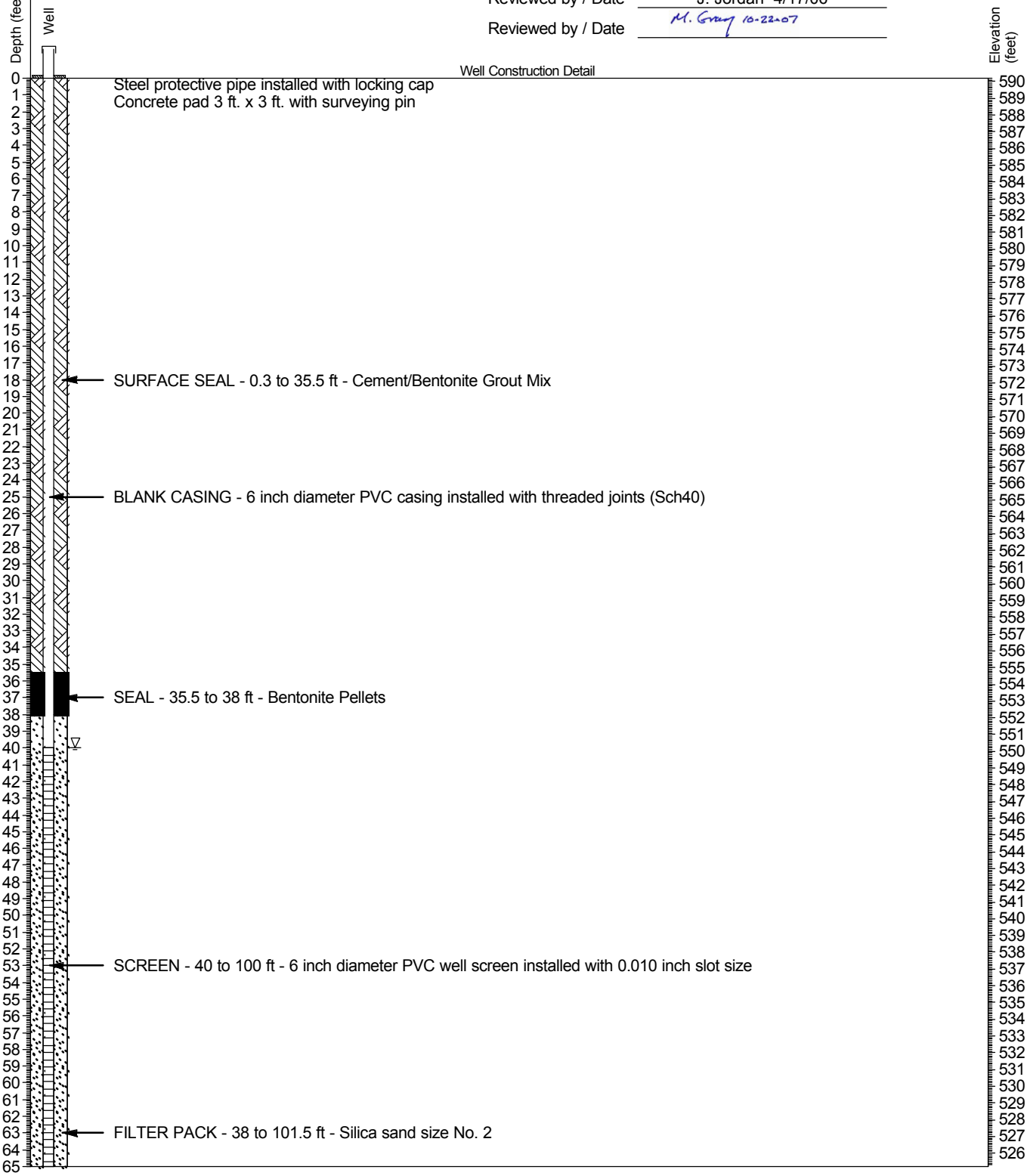
Reviewed by / Date M. Gray 10-22-07



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1215 (well)**
Type and Diameter of Boring No samples / 12 inch/8 inch		Boring Location General site N 1166710.545 E 1846624.819	Total Depth 101.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 590.2 feet MSL	Ground Water Depth 40 feet	Depth to Bedrock N/A
Casing Size and Depth 6 inch / 100 feet	Top of Casing Elevation 592.1 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/17/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/17/06

Reviewed by / Date J. Jordan 4/17/06

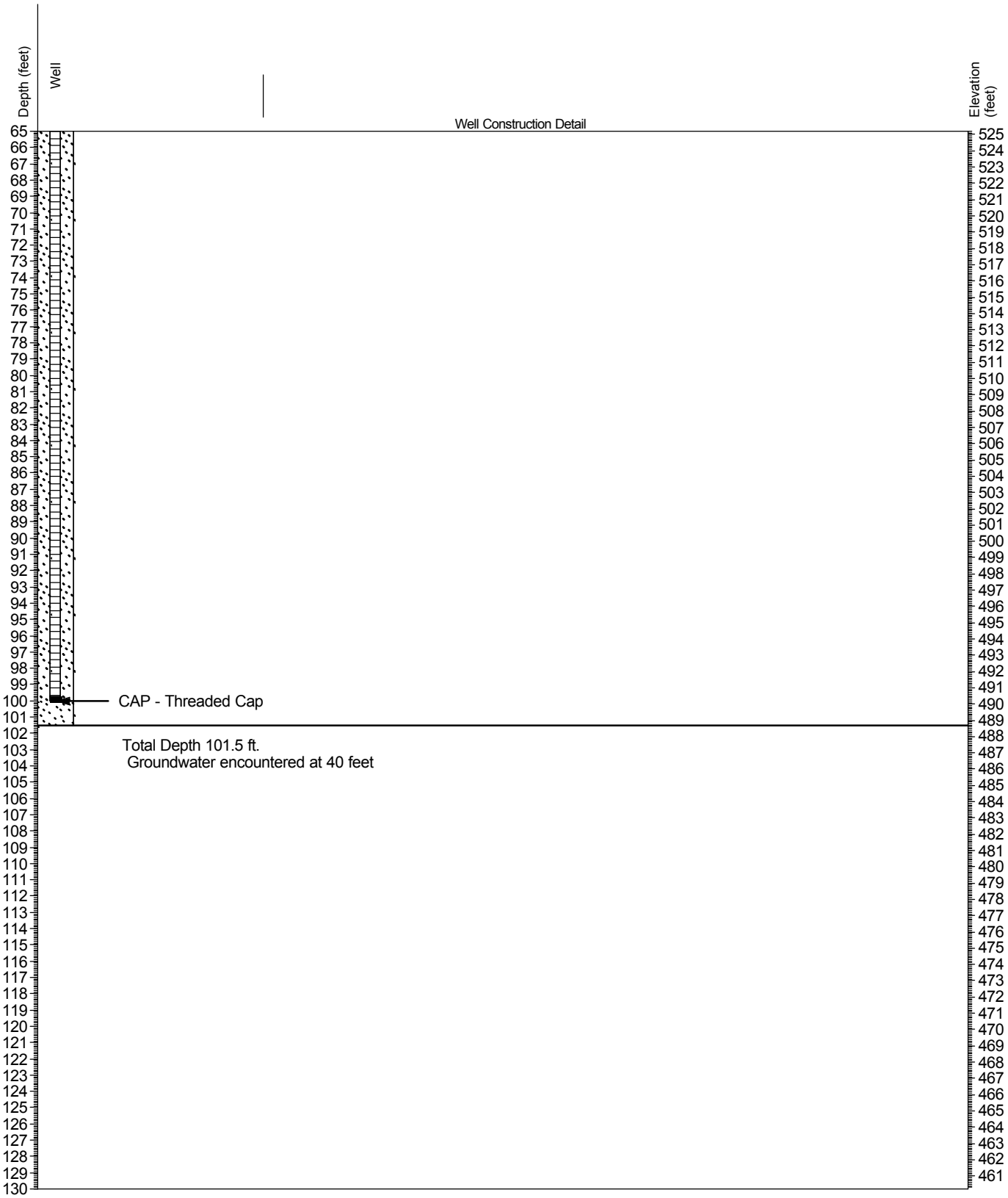
Reviewed by / Date M. Gray 10-22-07



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

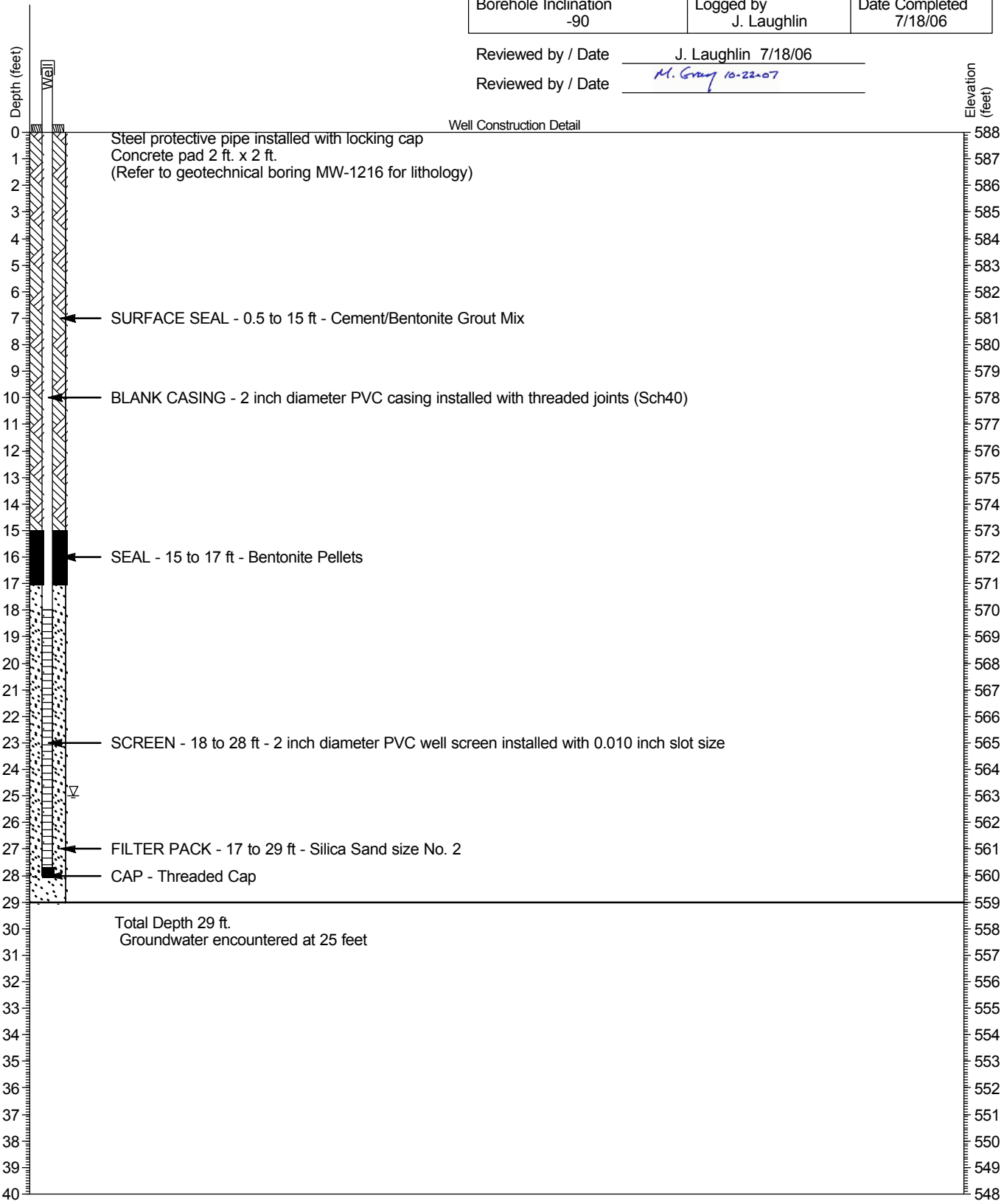
WELL CONSTRUCTION LOG - MW-1215 (well)



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			**WELL CONSTRUCTION LOG - MW-1216 (well)**
Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location South of Power Block N 1165171.882 E 1846927.273	Total Depth 29 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 588 feet MSL	Ground Water Depth 25 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 28 feet	Top of Casing Elevation 590.7 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/18/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/18/06

Reviewed by / Date J. Laughlin 7/18/06

Reviewed by / Date M. Gray 10-22-07



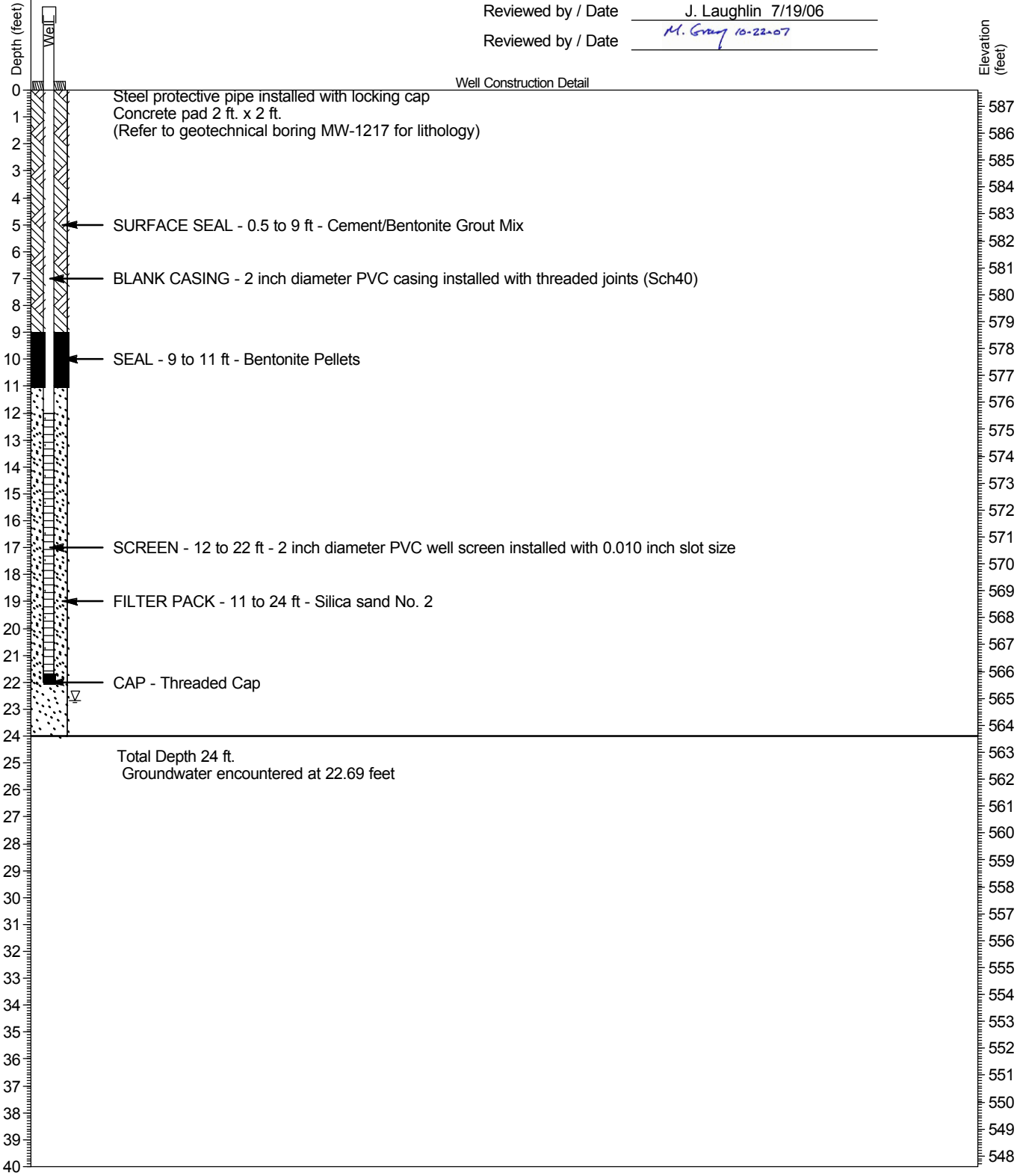
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**WELL CONSTRUCTION LOG - MW-1217 (well)**

Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location South of Power Block N 1165042.463 E 1846983.878		Total Depth 24 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 587.6 feet MSL	Ground Water Depth 22.69 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 22 feet	Top of Casing Elevation 590.7 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/19/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/19/06

Reviewed by / Date: J. Laughlin 7/19/06

Reviewed by / Date: M. Gray 10-22-07

Well Construction Detail

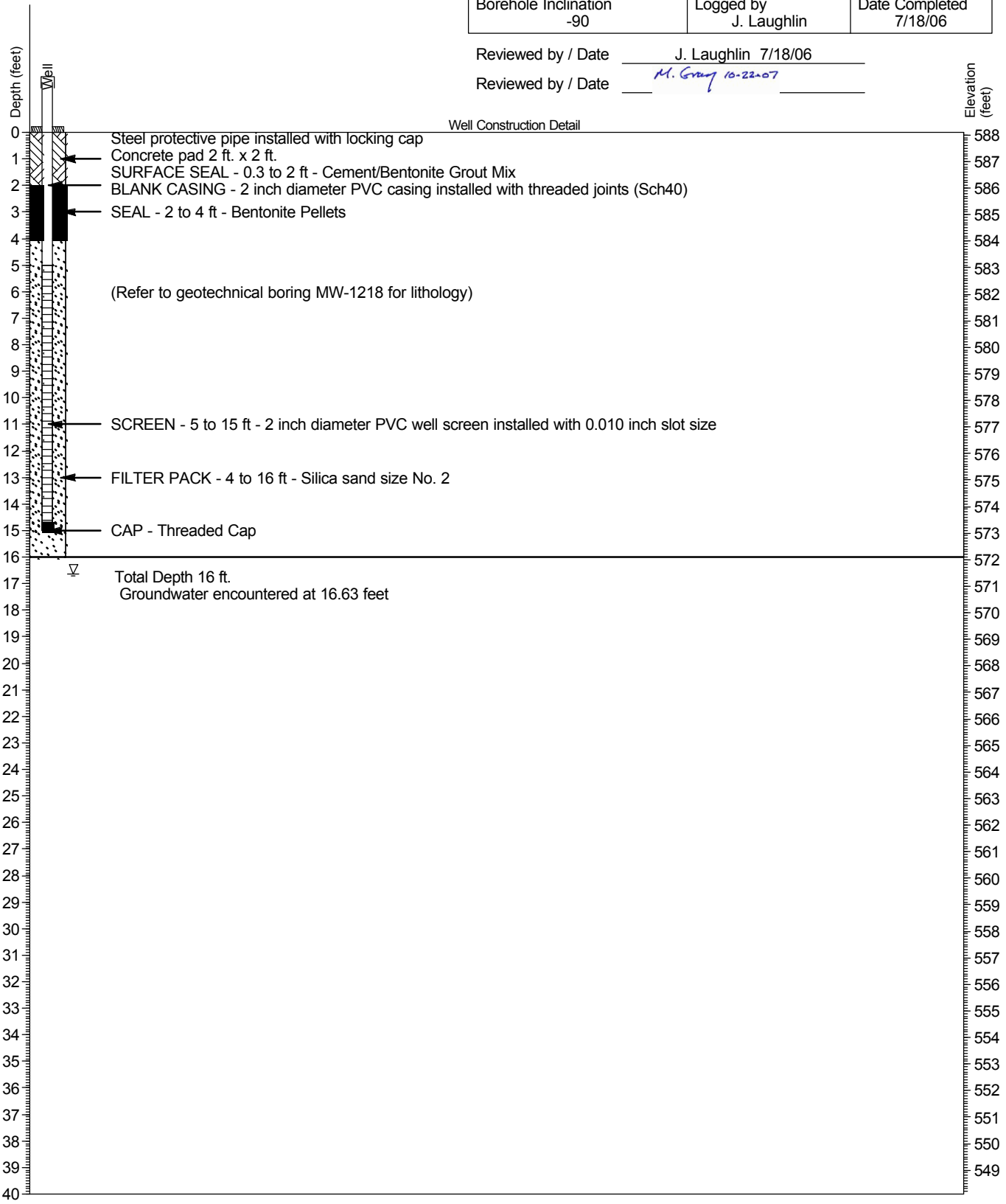


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**WELL CONSTRUCTION LOG - MW-1218 (well)**

Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location South of Power Block N 1164859.672 E 1847139.635		Total Depth 16 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 588.1 feet MSL	Ground Water Depth 16.63 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 15 feet	Top of Casing Elevation 590.2 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/18/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/18/06

Reviewed by / Date J. Laughlin 7/18/06

Reviewed by / Date M. Gray 10-22-07



APPENDIX 2AA
ATTACHMENT 2 – LEE NUCLEAR STATION SPT ENERGY MEASUREMENTS

This Attachment contains a table showing results of STP energy measurement testing performed by MACTEC Engineering, Inc. for the Lee Nuclear Station COL investigation. Tests were performed between April 10, 2006 and August 5, 2006, and were performed in compliance with ASTM standard D4633-05.

WLS COL 2.5-1

TABLE B-1: SUMMARY OF SPT ENERGY MEASUREMENTS (ASTM D4633-05)

Lee Nuclear Station COL Project

Gaffney, Cherokee County, South Carolina

MACTEC Project No. 6234-06-3389

Rig Serial No.	Rig Owner	Rig Operator	Boring No. Tested	Date Tested	Sample Depth (feet)	SPT Blow Count (blows per six inches)	No. of Blows Analyzed	Average Measured Energy (ft-lbs)[a]	Energy Transfer Ratio (%)[b]
337153 (CME 550x)	MACTEC (Atlanta Office)	Robert Banks	B-1023	4/10/2006	13.5 - 15.0	4 - 9 - 10	23	260	74.3%
					18.5 - 20.0	7 - 11 - 11	28	273	78.0%
					23.5 - 25.0	11 - 11 - 26	48	278	79.4%
					27.0 - 28.5	50 / 2"	39	277	79.1%
						Total Average for Rig:		**273.7**	**78.2%**
211797 (CME 75 Truck)[c]	MACTEC (Abingdon Office)	Wayne Gibson	B-403	8/5/2006	8.5 - 10.0	2 - 3 - 7	10	253	72.3%
					13.5 - 15.0	6 - 7 - 14	23	287	82.0%
					18.5 - 20.0	WOH - 6 - 13	20	262	74.9%
					23.5 - 25.0	3 - 5 - 10	18	262	74.9%
						Total Average for Rig:		**268.8**	**76.8%**
331145 (CME 55LC Truck)[c]	MACTEC (Raleigh Office)	David White	B-304	6/5/2006	11.0 - 12.5	4 - 5 - 7	16	293	83.7%
					13.5 - 15.0	4 - 6 - 8	18	290	82.9%
					18.5 - 20.0	4 - 6 - 7	17	288	82.3%
					23.5 - 25.0	5 - 7 - 10	22	287	82.0%
					28.5 - 30.0	5 - 7 - 7	19	291	83.1%
						Total Average for Rig:		**289.6**	**82.8%**

Prepared By: SL Date: 12-7-06

Checked By: Clay Sams Date: 12-7-06

TABLE B-1: SUMMARY OF SPT ENERGY MEASUREMENTS (ASTM D4633-05)

Lee Nuclear Station COL Project

Gaffney, Cherokee County, South Carolina

MACTEC Project No. 6234-06-3389

Rig Serial No.	Rig Owner	Rig Operator	Boring No. Tested	Date Tested	Sample Depth (feet)	SPT Blow Count (blows per six inches)	No. of Blows Analyzed	Average Measured Energy (ft-lbs)[a]	Energy Transfer Ratio (%)[b]
190742 (CME 850 Track)	Trigon (Greensboro Office)	Willie Duggins	B-1030	4/11/2006	13.5 - 15.0	4 - 6 - 7	18	278	79.4%
					18.5 - 20.0	5 - 8 - 9	23	289	82.6%
					23.5 - 25.0	5 - 6 - 9	22	293	83.7%
					28.5 - 30.0	5 - 6 - 6	18	294	84.0%
					33.5 - 35.0	4 - 6 - 8	19	293	83.7%
					38.5 - 40.0	4 - 13 - 11	29	279	79.7%
						Total Average for Rig:		**287.2**	**82.1%**

[a]Measured Energy is energy based on the EFV method, as outlined in ASTM D4633-05, for each blow recorded by the PDA. In some cases, the initial blow produced poor quality data, and was not used to calculate the Average Measured Energy.

[b]Energy Transfer Ratio is the Measured Energy divided by the theoretical SPT energy of 350 foot-pounds (140 pound hammer falling 2.5 feet).

[c]Rig was tested at VC Summer COL site in Jenkinsville, South Carolina (MACTEC Project No. 6234-06-3534S).

Prepared By: SL	Date: 12-7-06	Checked By: Clay Sams	Date: 12-7-06

APPENDIX 2AA
ATTACHMENT 3 – LEE NUCLEAR STATION TEST PIT AND TRENCH LOGS

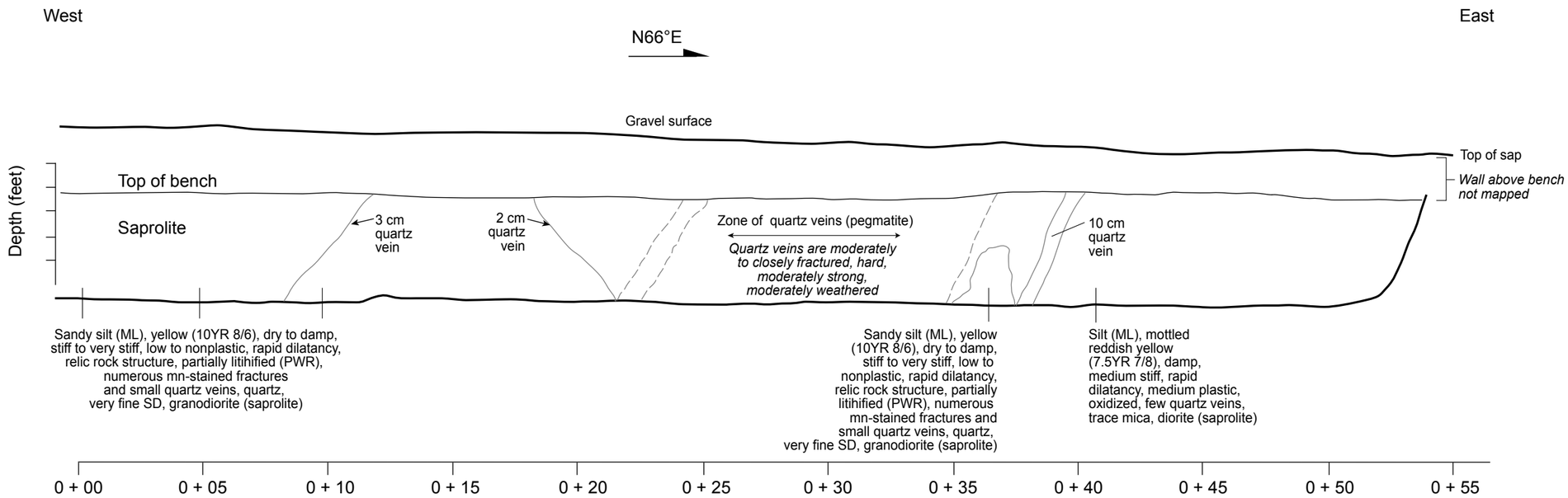
This Attachment contains test pit and trench logs resulting from the COL investigation. A list of the test pits and trenches is included within this attachment.

WLS COL 2.5-1

Test Pits and Trenches Included in Appendix 2AA, Attachment 3

T-1400A
T-1400B
T-1401
T-1402
T-1403
T-1404
T-1419
T-1420
T-1421
T-1422
T-1423
T-1424
T-1425
T-1426

WLS COL 2.5-1



Northing	1165455
Easting	1846182
Elevation (ft MSL)	589

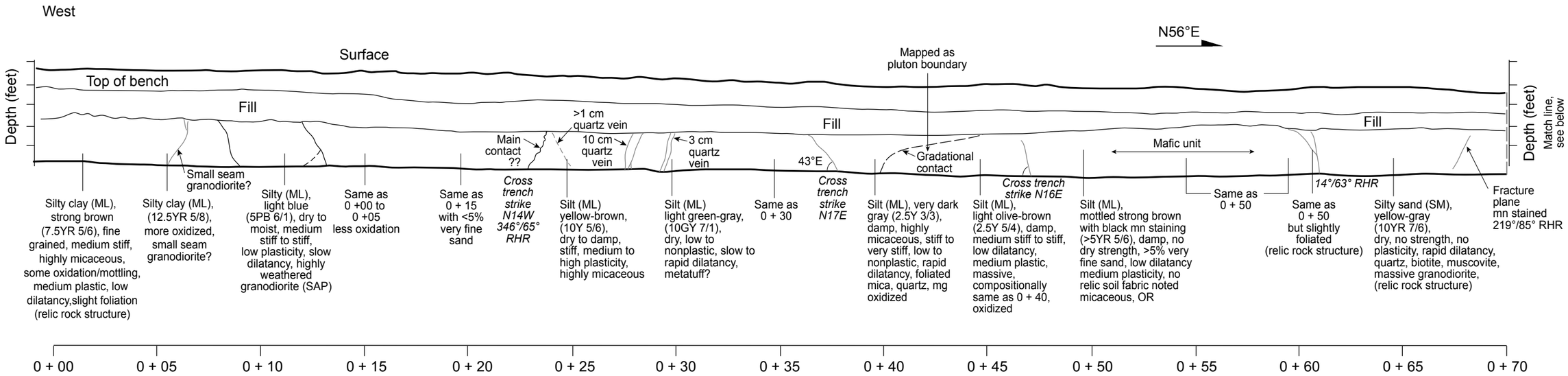
Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench.
2. Horizontal datum: South Carolina State Plane, NAD83 International feet.
3. Vertical datum: NAVD88.

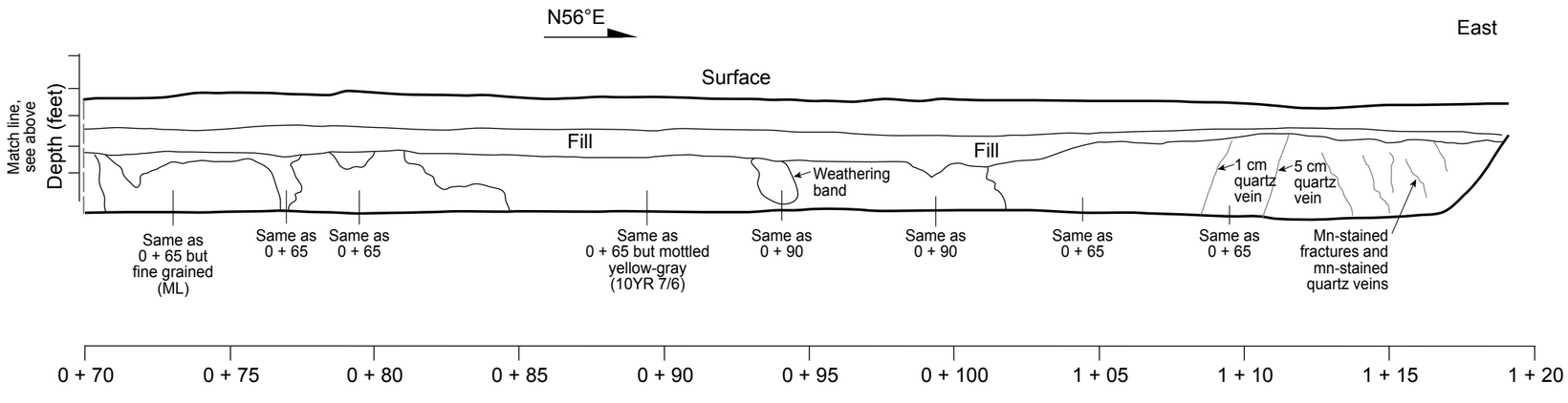
DUKE LEE COL PROJECT

Trench Log – T-1400A

WLA William Lettis & Associates, Inc.

Revised October 16, 2007





Northing	1165328
Easting	1845956
Elevation (ft MSL)	590

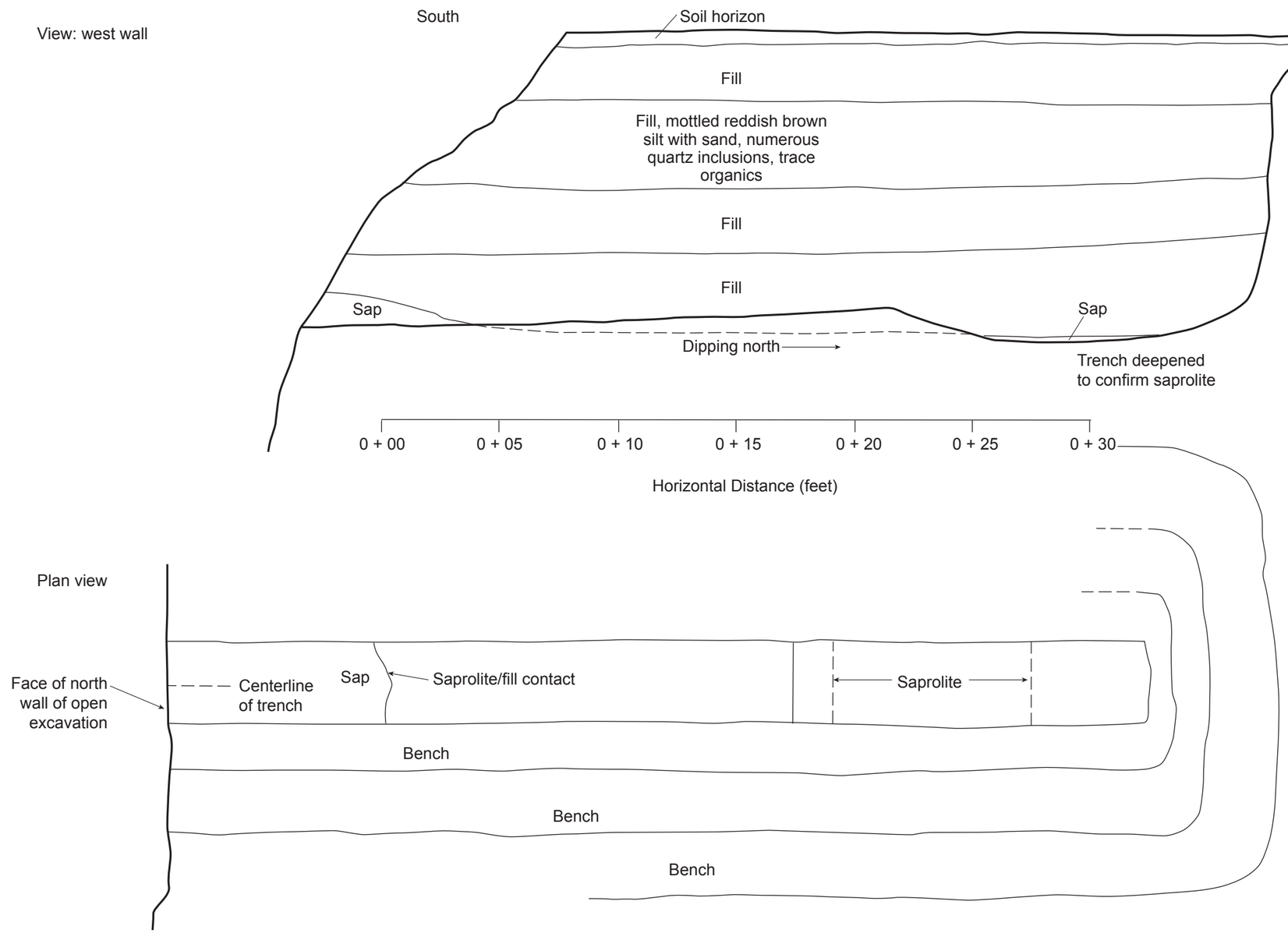
Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench.
2. Horizontal datum: South Carolina State Plane, NAD83 International feet.
3. Vertical datum: NAVD88.

DUKE LEE COL PROJECT

T-1400B

WLA William Lettis & Associates, Inc.

View: west wall



Unit Descriptions

Sap — Saprolite, light greenish gray (10Y 8/1), silt (ML) very stiff, damp, oxidation staining (granite saprolite)

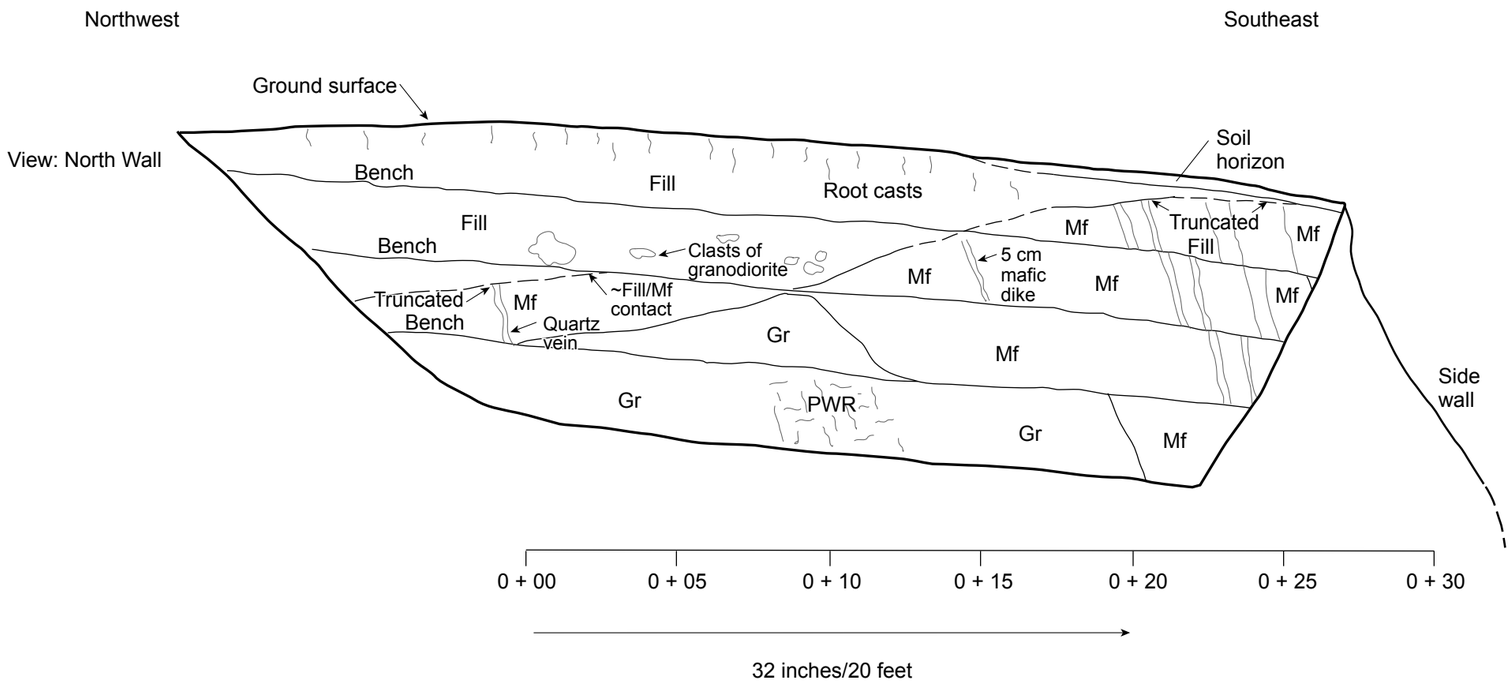
Northing	1166317
Easting	1846816
Elevation (ft MSL)	590

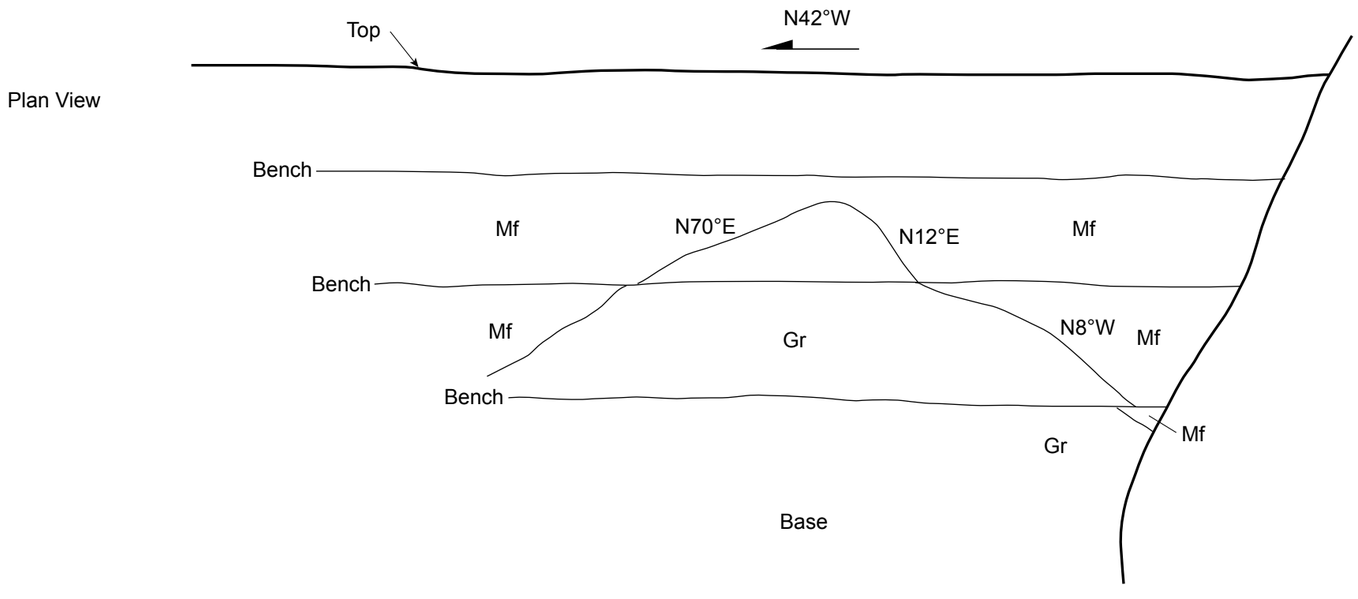
Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench.
2. Horizontal datum: South Carolina State Plane, NAD83 International feet.
3. Vertical datum: NAVD88.

DUKE LEE COL PROJECT

T-1401

WLA William Lettis & Associates, Inc.





Unit Descriptions

Gr (granitic saprolite)	Sandy silt (ML), to silt with fine sand, light gray (10YR 7/1), dry, very stiff, no dry strength, rapid dilatancy, nonplastic, >30% quartz sand, ~15% mica
Mf (mafic saprolite)	Silt (ML), brownish yellow (10YR 6/8), damp to dry, stiff, no dry strength, slow to rapid dilatancy, high to medium plasticity
PWR	Partially weathered rock

Northing	1166377
Easting	1846888
Elevation (ft MSL)	590

Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench.
2. Horizontal datum: South Carolina State Plane, NAD83 International feet.
3. Vertical datum: NAVD88.

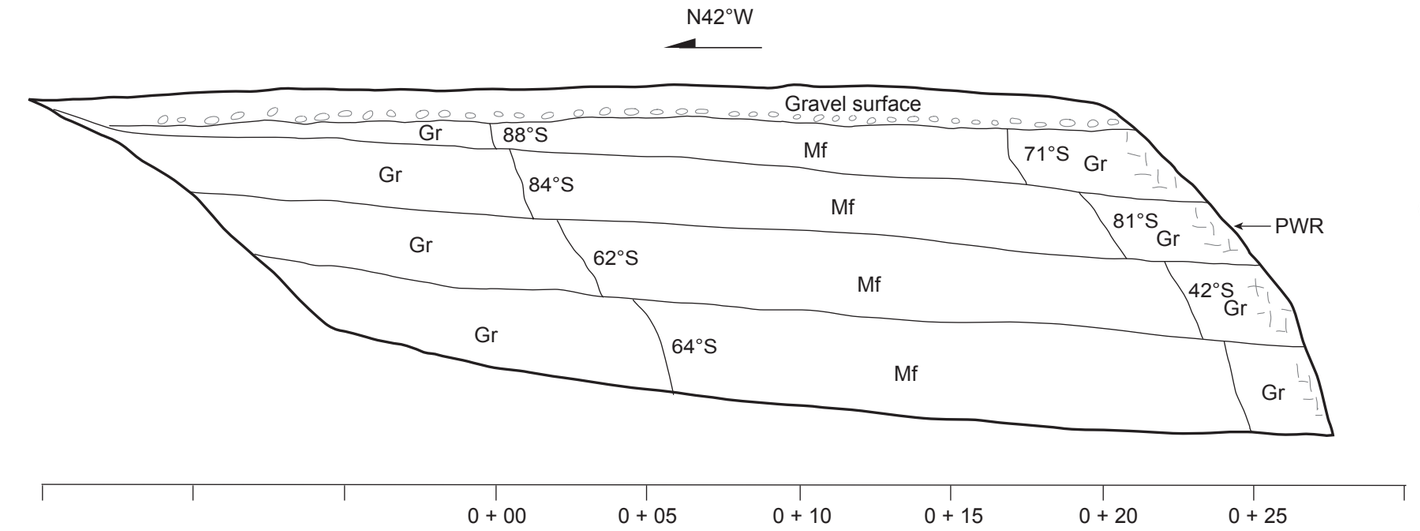
DUKE LEE COL PROJECT

T-1402

WLA William Lettis & Associates, Inc.

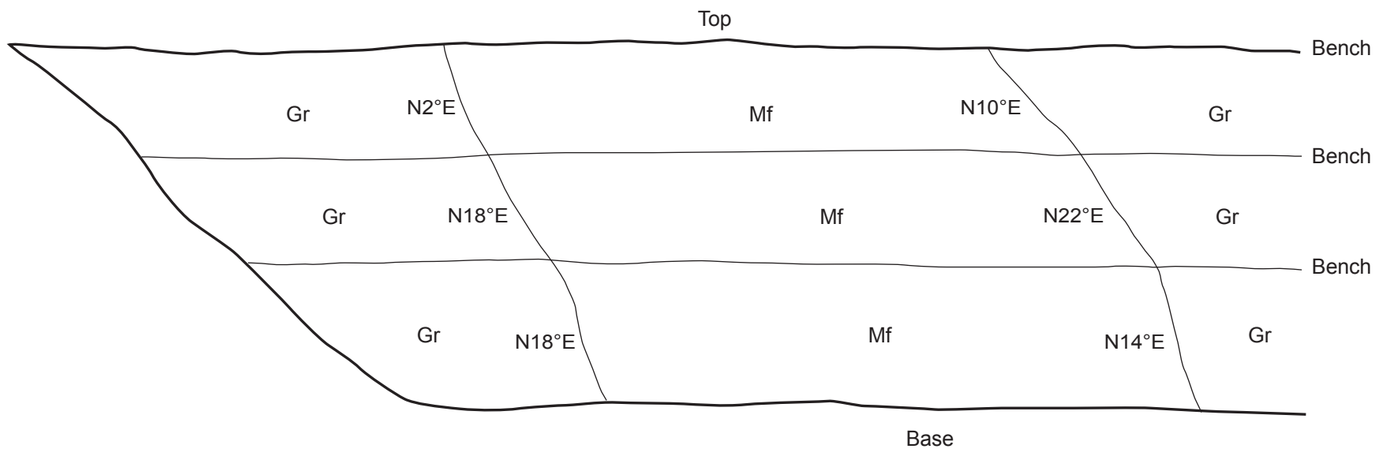
Revised October 16, 2007

View: looking northeast



Stations at N20°W

Plan view



Unit Descriptions

GR (granitic saprolite)	Sandy silt (ML), light gray (10YR 7/1), dry, stiff to hard, quartz 15%,mica <5%, no dry strength, nonplastic, rapid dilatancy, slightly more lithified at southern end of test pit
Mf (mafic saprolite)	Silt (ML), yellowish brown (10YR 5/8), dry to damp, stiff to medium stiff, >50% fines, no dry strength, non-plastic, oxidation staining

Northing	1166394
Easting	1847141
Elevation (ft MSL)	590

Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench.
2. Horizontal datum: South Carolina State Plane, NAD83 International feet.
3. Vertical datum: NAVD88.

DUKE LEE COL PROJECT

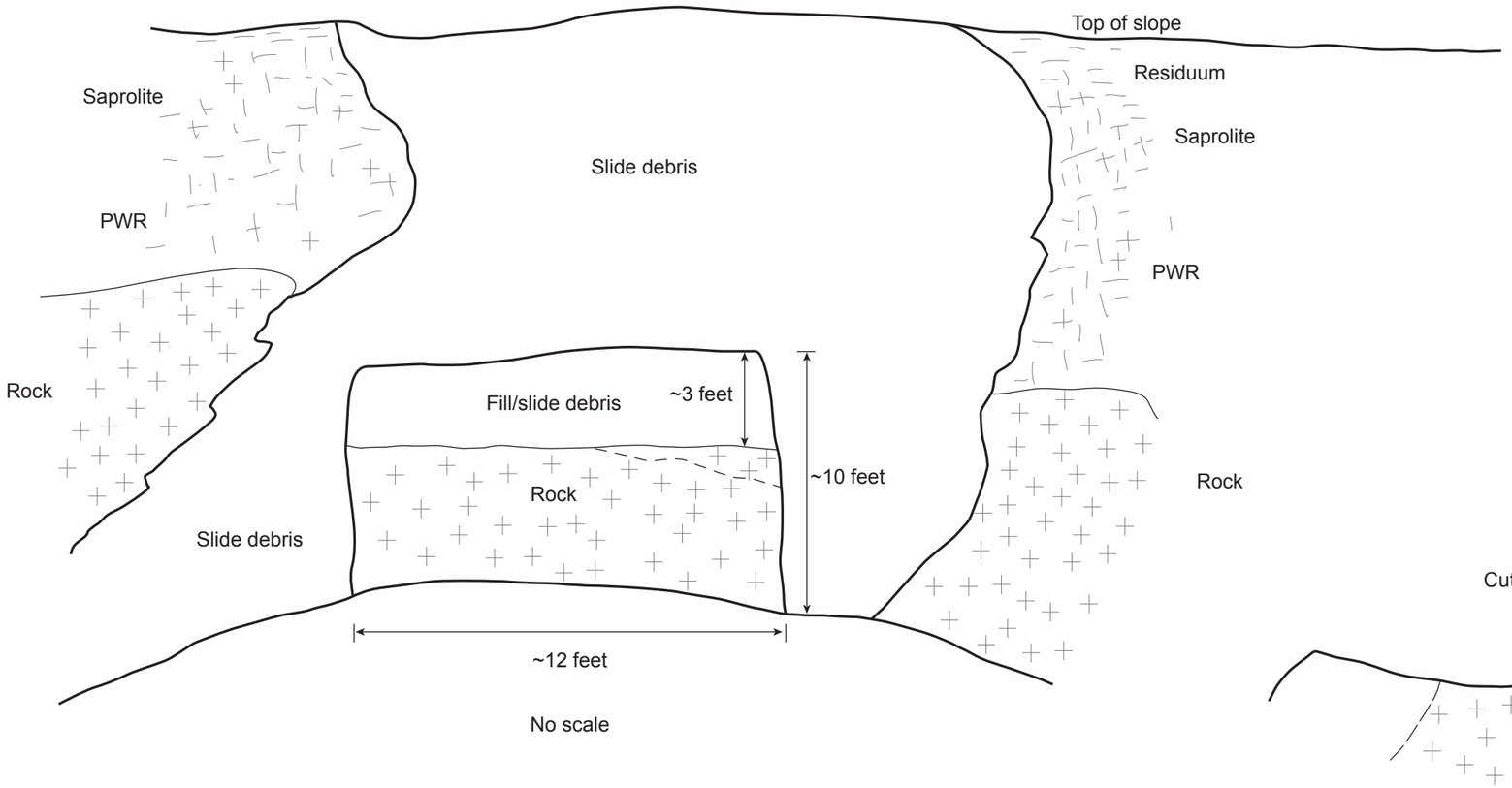
T-1403

WLA William Lettis & Associates, Inc.

Revised October 16, 2007

T-1404

Cut in northwest corner (old unit 2)



View: looking north



Side view

Northing	1166250
Easting	1846714
Elevation (ft MSL)	551

Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench.
2. Horizontal datum: South Carolina State Plane, NAD83 International feet.
3. Vertical datum: NAVD88.

DUKE LEE COL PROJECT

T-1404

WLA William Lettis & Associates, Inc.

Revised October 16, 2007

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC WLA William Lettis & Associates, Inc.

SOIL LOG - Boring No. T-1419

Type and Diameter of Boring: Pit / NA	Boring Location: Borrow Area 1 near B-1056 N 1163896 E 1846789		Total Depth: 20 feet
Drilling Contractor and Rig: Hall Construction / Trackhoe	Elevation and Datum: 642.5 feet MSL	Ground Water Depth: N/A	Depth to Bedrock: N/A
Sampling Method: Bulk	Sample Driving Hammer/Drop: NA	No. of Samples: 1	Date Started: 5/15/06
	Borehole Inclination: -90	Logged by: F. Syms	Date Completed: 5/15/06

Reviewed by / Date: B. Reinicker 5/30/06
Reviewed by / Date: C. James 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT very sandy (ML); red brown (7.5YR 6/4); dry; non plastic; micaceous; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	642
1												641
2												640
3												639
4												638
5												637
6									ML	SILT very sandy (ML); yellowish brown to gray (10YR 7/3); micaceous; relict rock fabric; SAPROLITE	Saved three 5-gallon buckets of material (all identical)	636
7												635
8												634
9												633
10				240	●	●	●			51% fines, 49% sand	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	632
11												631
12												630
13												629
14												628
15												627
16												626
17												625
18												624
19												623
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		622
21												621
22												620
23												619
24												618
25												617
26												616
27												615
28												614
29												613
30												612
31												611
32												610
33												609
34												608
35												607
36												606
37												605
38												604
39												603
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. T-1420**	
Type and Diameter of Boring Pit / NA	Boring Location Borrow Area 1 near B-1058 N 1163582 E 1846854		Total Depth 20 feet
Drilling Contractor and Rig Hall Construction / Trackhoe	Elevation and Datum 638 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Bulk	Sample Driving Hammer/Drop NA	No. of Samples 1	Date Started 5/15/06
	Borehole Inclination -90	Logged by F. Syms	Date Completed 5/15/06

Reviewed by / Date: B. Reinicker 5/30/06

Reviewed by / Date: C. Lamm 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red brown (2.5YR 5/8); dry to moist; some quartz blocks; non plastic; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	638
1												637
2												636
3												635
4									ML	SILT sandy (ML); light gray and yellow (10YR 7/3); dry; non plastic; few quartz blocks; micaceous; relict structure; SAPROLITE		634
5												633
6											Saved three 5-gallon buckets of material (all identical)	632
7												631
8												630
9												629
10				240	●	●	●			39% sand, 61% fines	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft.	628
11												627
12												626
13												625
14												624
15												623
16												622
17												621
18												620
19												619
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		618
21												617
22												616
23												615
24												614
25												613
26												612
27												611
28												610
29												609
30												608
31												607
32												606
33												605
34												604
35												603
36												602
37												601
38												600
39												599
40												598

Project Name and Job Number														
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.								**SOIL LOG - Boring No. T-1421**					
Type and Diameter of Boring Pit / NA									Boring Location Borrow Area West of Former Motor Pool N 1164323 E 1845632			Total Depth 20 feet		
Drilling Contractor and Rig Hall Construction / Trackhoe									Elevation and Datum 685.5 feet MSL		Ground Water Depth N/A		Depth to Bedrock N/A	
Sampling Method Bulk									Sample Driving Hammer/Drop NA		No. of Samples 1		Date Started 5/22/06	
									Borehole Inclination -90		Logged by F. Syms		Date Completed 5/22/06	

Reviewed by / Date: B. Reinicker 5/30/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red brown (10YR 3/5); dry; very fine sand; non plastic; micaceous; RESIDUAL SOIL		685
1												684
2												683
3												682
4												681
5												680
6											Saved three 5-gallon buckets of material (all identical)	679
7												678
8												677
9												676
10				240	●	●	●			54% fines, 26% sand, 20% gravel	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	675
11												674
12												673
13												672
14												671
15												670
16												669
17												668
18												667
19									ML	SILT (ML); light brown, gray (7.5YR 6/3); relict rock fabric; non plastic; micaceous; quartzite vein noted; PARTIALLY WEATHERED ROCK		666
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		665
21												664
22												663
23												662
24												661
25												660
26												659
27												658
28												657
29												656
30												655
31												654
32												653
33												652
34												651
35												650
36												649
37												648
38												647
39												646
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. T-1422**	
Type and Diameter of Boring Pit / NA	Boring Location Borrow Area 1 N 1163992 E 1847171		Total Depth 20 feet
Drilling Contractor and Rig Hall Construction / Trackhoe	Elevation and Datum 630.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Bulk	Sample Driving Hammer/Drop NA	No. of Samples 1	Date Started 5/15/06
	Borehole Inclination -90	Logged by F. Syms	Date Completed 5/15/06

Reviewed by / Date: B. Reinicker 5/30/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT sandy (ML); red brown; dry; very fine sand; some clay bands; moderately to non plastic; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	630
5									ML	SILT sandy (ML); yellowish brown mottled; dry; very fine sand; relict rock fabric; micaceous; SAPROLITE	Saved three 5-gallon buckets of material (all identical)	625
10				240	●	●	●			73% fines, 27% sand	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	620
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		610
40												591

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. T-1423**	
Type and Diameter of Boring Pit / NA	Boring Location Borrow Area 1 N 1163666 E 1847256		Total Depth 20 feet
Drilling Contractor and Rig Hall Construction / Trackhoe	Elevation and Datum 625.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Bulk	Sample Driving Hammer/Drop NA	No. of Samples 1	Date Started 5/15/06
	Borehole Inclination -90	Logged by F. Syms	Date Completed 5/15/06

Reviewed by / Date: B. Reinicker 5/30/06

Reviewed by / Date: C. Sams 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0–5									ML	SILT (ML); red brown; little to no sand; trace root clasts	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	625–620
6–19				240	●	●	●		SM	SAND silty (SM); light gray, yellow; fine sand; trace rock fabric; micaceous; mottled appearance 47% fines; 53% sand	Saved three 5-gallon buckets of material (all identical) Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	619–606
20–40										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		605–586

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. T-1424**	
Type and Diameter of Boring Pit / NA	Boring Location Borrow Area 1 N 1164081 E 1847436		Total Depth 19 feet
Drilling Contractor and Rig Hall Construction / Trackhoe	Elevation and Datum 628.3 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Bulk	Sample Driving Hammer/Drop NA	No. of Samples 1	Date Started 5/15/06
	Borehole Inclination -90	Logged by F. Syms	Date Completed 5/15/06

Reviewed by / Date: B. Reinicker 5/30/06

Reviewed by / Date: C. Lamus 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0–6									ML	SILT (ML); red brown (7.5YR 7/3); dry; very fine sand < 5%; trace clay; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	628–622
6–15				228	●	●	●		ML	SILT sandy (ML); yellowish brown (2.5Y 5/3); dry; with relict rock fabric; SAPROLITE 62% fines; 38% sand	Saved three 5-gallon buckets of material (all identical) Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	622–613
15–19									ML	SILT sandy (ML); light brown, trace black; dry; relict fabric at bottom of hole; SAPROLITE; PARTIALLY WEATHERED ROCK?;		613–609
19–40										Test pit terminated at 19 ft. Test pit backfilled with excavated material after sampling		609–589

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. T-1425**	
Type and Diameter of Boring Pit / NA	Boring Location Borrow Area 1 near B-1067 N 1163869 E 1847595		Total Depth 20 feet
Drilling Contractor and Rig Hall Construction / Trackhoe	Elevation and Datum 629.6 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Bulk	Sample Driving Hammer/Drop NA	No. of Samples 1	Date Started 5/15/06
	Borehole Inclination -90	Logged by F. Syms	Date Completed 5/15/06

Reviewed by / Date: B. Reinicker 5/30/06

Reviewed by / Date: C. Lamm 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red brown (7.5YR 7/3); slightly moist; non plastic; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	629
1												628
2												627
3												626
4												625
5												624
6											Saved three 5-gallon buckets of material (all identical)	623
7									ML	SILT sandy (ML); light tan, yellow (2.5Y 5/6); dry; fine sand; relict rock fabric; SAPROLITE		622
8												621
9												620
10				240	●	●	●			68% fines; 32% sand	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	619
11												618
12												617
13									ML	SILT sandy (ML); light gray (2.5Y 5/4); dry; very fine; micaceous; SAPROLITE		616
14												615
15												614
16												613
17												612
18												611
19												610
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		609
21												608
22												607
23												606
24												605
25												604
26												603
27												602
28												601
29												600
30												599
31												598
32												597
33												596
34												595
35												594
36												593
37												592
38												591
39												590
40												

Project Name and Job Number			
Lee Nuclear Station COL 6234-06-3389	MACTEC / WLA William Lettis & Associates, Inc.	**SOIL LOG - Boring No. T-1426**	
Type and Diameter of Boring Pit / NA	Boring Location Cooling Tower Pad - Former Unit 1 N 1166029 E 1845369		Total Depth 20 feet
Drilling Contractor and Rig Hall Construction / Trackhoe	Elevation and Datum 609.6 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Bulk	Sample Driving Hammer/Drop NA	No. of Samples 1	Date Started 5/22/06
	Borehole Inclination -90	Logged by F. Syms	Date Completed 5/22/06

Reviewed by / Date: B. Reinicker 5/30/06

Reviewed by / Date: C. Lamm 10-22-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT trace clay (ML); brown (7.5YR 5/6); dry; some stiff zones; moderately plastic; mottled; occasional rocks greated than 6 inch diameter; FILL		609
1												608
2												607
3												606
4												605
5												604
6											Saved three 5-gallon buckets of material (all identical)	603
7												602
8												601
9												600
10				240	●	●	●			71% fines; 26% sand	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	599
11												598
12												597
13												596
14												595
15												594
16												593
17												592
18												591
19												590
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		589
21												588
22												587
23												586
24												585
25												584
26												583
27												582
28												581
29												580
30												579
31												578
32												577
33												576
34												575
35												574
36												573
37												572
38												571
39												570
40												

APPENDIX 2AA
ATTACHMENT 4 – LEE NUCLEAR STATION PACKER TEST RESULTS

This attachment contains Packer Test results from four locations on the Lee site: B-1004, B-1015, MW-1201, and MW-1210. Tests were performed by MACTEC Engineering, Inc. Tabular as well as graphical representations of the data are included.

WLS COL 2.5-1

B-1004 Packer Test Data
Cherokee COL Site
MACTEC Project 6234-06-3389

Given Parameters

Test Section Length _, ft: 5
Radius of Borehole r_o, ft: 0.125
GW Elevation, ft: 10.25

Interval: 26-31

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	H_g, ft	H_o, ft
T1	25.4	5	1.34	3.66	3.09	12.25	20.70
T2	29	6	1.79	4.21	4.13	12.25	21.97
T3	13.4	1	0.6	0.4	1.38	12.25	13.17

Q/H_o, GPM/ft **1.24**
K_e, ft/year **10,235**

Interval: 39-44

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	H_g, ft	H_o, ft
T1	12.5	8	0.83	7.17	1.92	14.25	30.80
T4	18.4	14	1.22	12.78	2.82	14.25	43.74
T5	12.7	8	0.84	7.16	1.94	14.25	30.77
T6	5.3	8	0.33	7.67	0.76	14.25	31.95
T7	18	14	1.2	12.8	2.77	14.25	43.79
T8	21.1	17	1.45	15.55	3.35	14.25	50.13

Note: T2 & T3 not conducted

Q/H_o, GPM/ft **0.42**
K_e, ft/year **3,467**

Interval: 45-50

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	H_g, ft	H_o, ft
T1	15	9	1.2	7.8	2.77	13.25	31.25
T4	4.6	7	0.4	6.6	0.92	13.25	28.48
T5	26.2	20	2.45	17.55	5.65	13.25	53.75
T6	1.73	13	0.14	12.86	0.32	13.25	42.93
T7	3.8	3	0.3	2.7	0.69	13.25	19.48

Note: T2 & T3 not conducted

Q/H_o, GPM/ft **0.41**
K_e, ft/year **3,384**

Notes:

Q = flow rate

Test ID, flow rate (GPM) and gauge pressure taken from field measurements. Head loss due to pipe taken from USBR Figure 17.4, confirmed based on field measurement.

P_g is equal to gauge pressure, P_f is equal to pressure loss due to pipe friction (psi), h_f is equal to head loss due to pipe friction (ft)

$H_{gravity}$ is equal to depth to water + height of surface pressure gauge above the datum (excess pressure due to weight of water in flowpipe)

$H_o = (P_g/\_{w}) + H_{gravity} - h_f$

$K_e = ((Q/H_o)*(1/\_))*1/2\pi*\ln(R/r_o)*(525{,}600 \text{ min/year})*(.1337 \text{ ft}^3\text{/gal})$

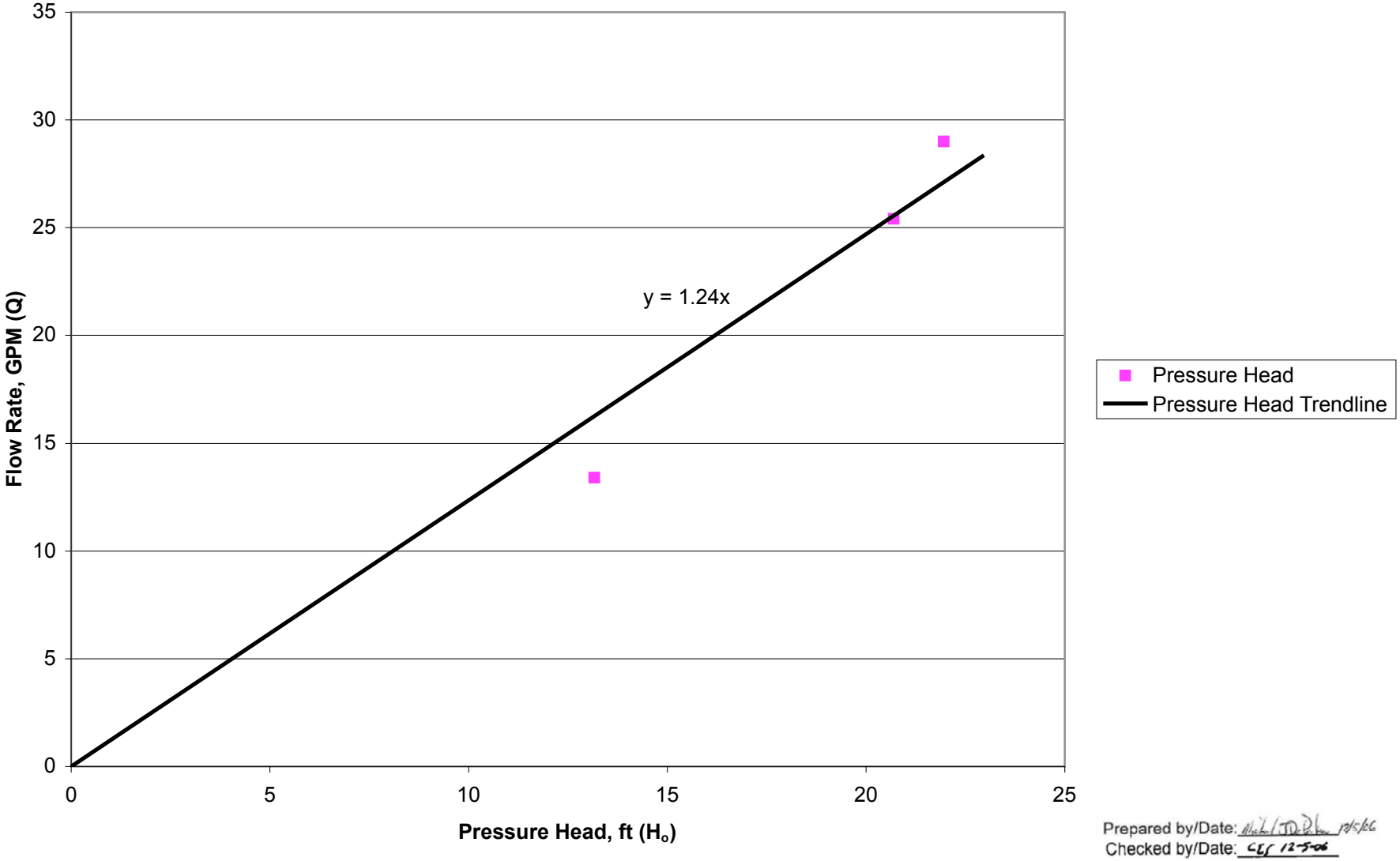
R is equal to total length between packers, _

Radius of borehole (r_o) taken from outside diameter of core bit, 3 inches

Q/H_o is equal to the slope of the linear trendline of H_o (x-axis) and Q (y-axis)

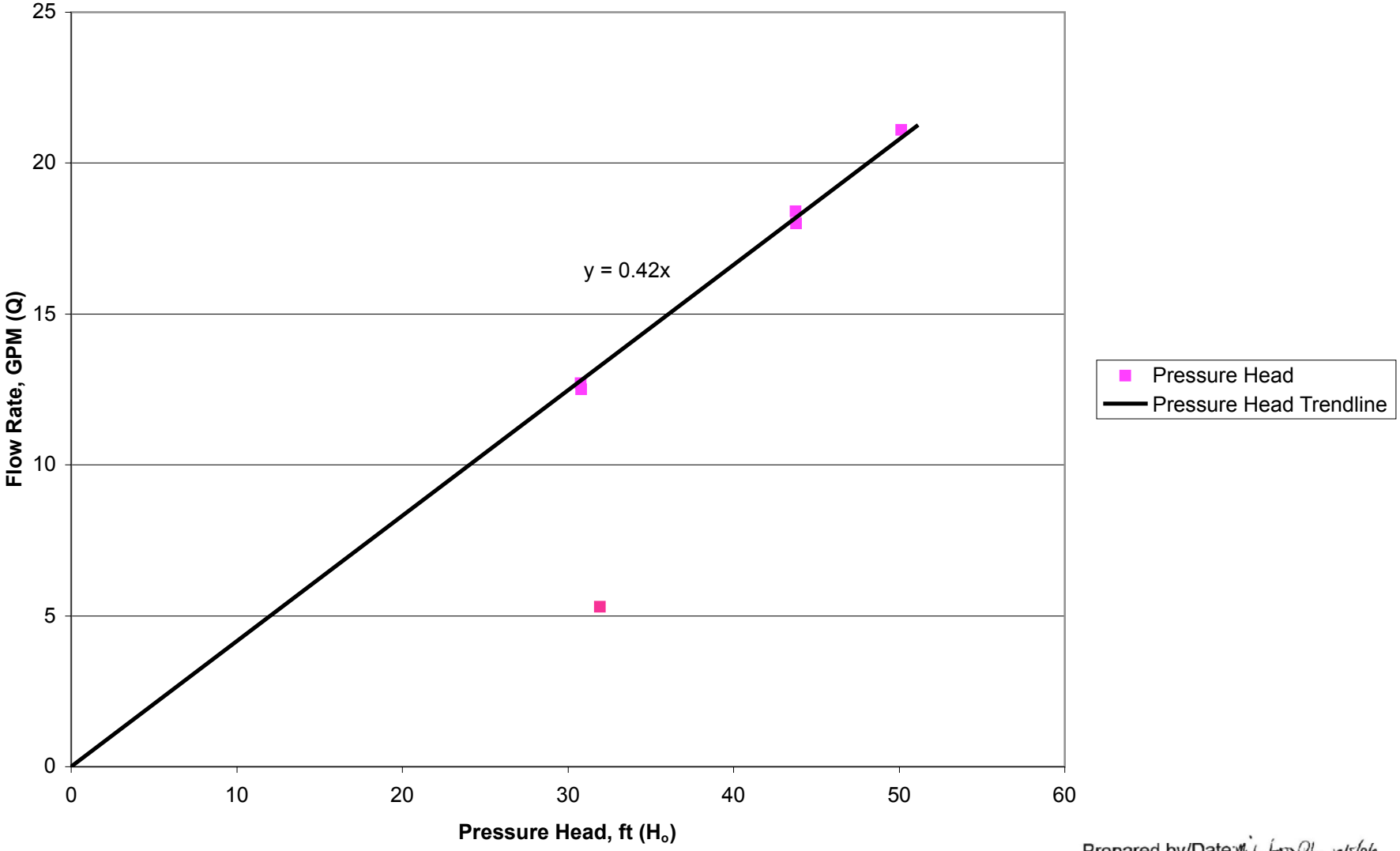
Prepared by/Date: [signature] 12/5/06
Checked by/Date: CES 12-5-06

Pressure Head vs. Flow Rate, B-1004 Interval 26-31 ft. bls



Prepared by/Date: [illegible] 12/5/06
Checked by/Date: CLC 12-5-06

Pressure Head vs. Flow Rate, B-1004 Interval 39-44 ft. bls

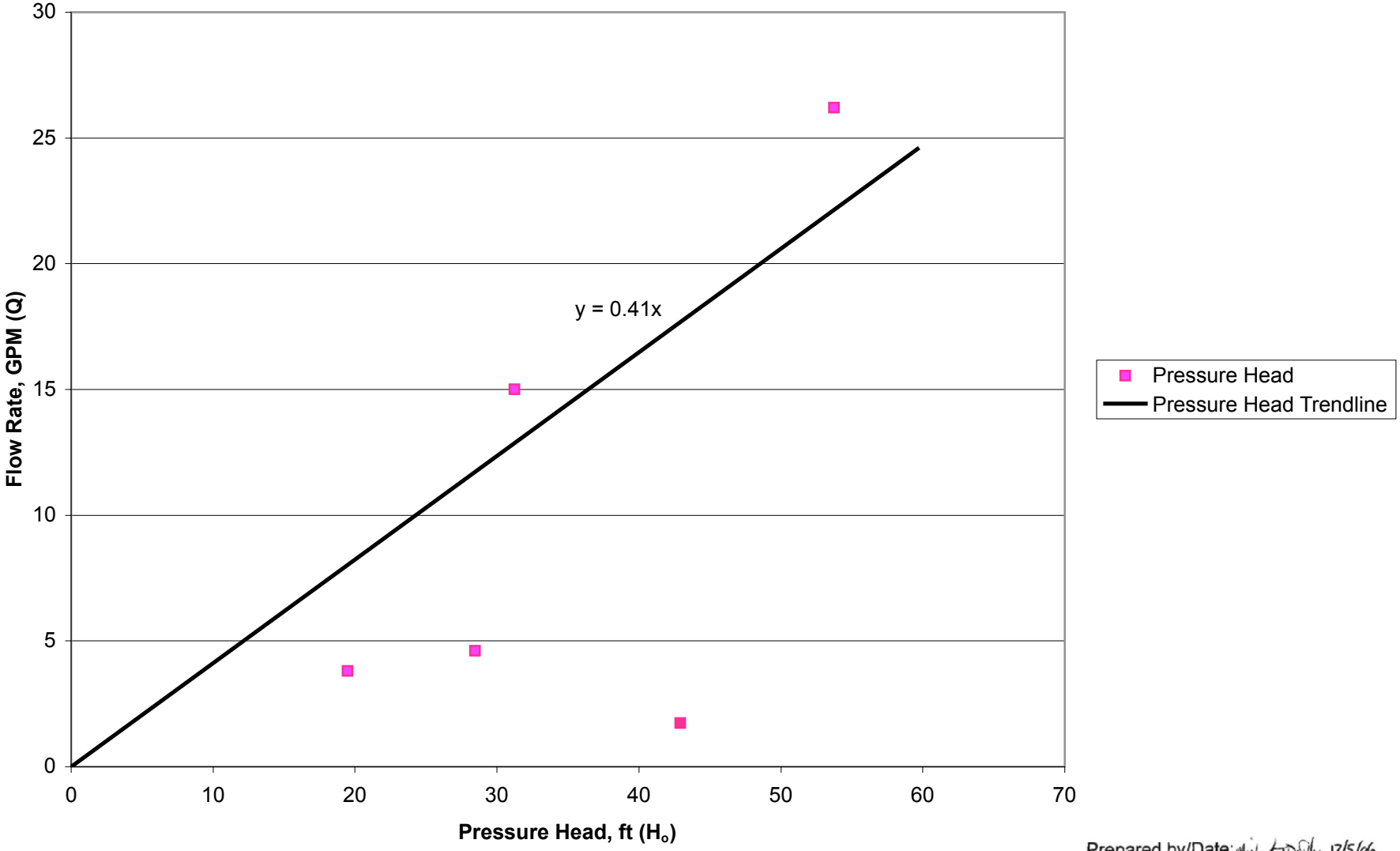


Prepared by/Date: 12/5/06

Checked by/Date:

Attachment B: Table B-2
DCN: CH 248

Pressure Head Vs. Flow Rate, B-1004 Interval 45-50 ft. bls



Prepared by/Date: 12/5/06

Checked by/Date:

Attachment B: Table B-2
DCN: CH 248

B-1015 Packer Test Data
Cherokee COL Site
MACTEC Project 6234-06-3389

Given Parameters

Test Section Length _, ft: 5
Radius of Borehole r_o, ft: 0.125
GW Elevation, ft: 8

Interval: 8.5-13.5

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	$H_{gravity}$, ft	H_o, ft
T1	0	1.5	0	1.5	0	13	16.46
T2	0	4.5	0	4.5	0	13	23.38
T3	0.05	10	0	10	0	13	36.08
T4	4.5	15	0.08	14.92	0.18	13	47.43

Q/H_o, GPM/ft: 0.09
K_e, ft/year: 743

Interval: 22-27

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	$H_{gravity}$, ft	H_o, ft
T1	1.56	5	0.04	4.96	0.09	11	22.45
T2	4	20	0.16	19.84	0.37	11	56.78
T3	9.5	25	0.4	24.6	0.92	11	67.77
T4	1.6	11	0.06	10.94	0.15	11	36.24

Q/H_o, GPM/ft: 0.10
K_e, ft/year: 825

Interval: 31-36

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	$H_{gravity}$, ft	H_o, ft
T1	1.8	7	0.05	6.95	0.12	12	28.04
T2	8.5	22	0.43	21.57	0.99	12	61.78
T3	19.2	40	1.6	38.4	3.69	12	100.62

Q/H_o, GPM/ft: 0.17
K_e, ft/year: 1,403

Notes:

Q = flow rate

Test ID, flow rate (GPM) and gauge pressure taken from field measurements. Head loss due to pipe taken from USBR Figure 17.4, confirmed based on field measurement.

P_g is equal to gauge pressure, P_f is equal to pressure loss due to pipe friction (psi), h_f is equal to head loss due to pipe friction (ft)

$H_{gravity}$ is equal to depth to water + height of surface pressure gauge above the datum (excess pressure due to weight of water in flowpipe)

$H_o = (P_g/\_w) + H_{gravity} - h_f$

$K_e = ((Q/H_o)*(1/\_))*1/2\pi*\ln(R/r_o)*(525{,}600 \text{ min/year})*(.1337 \text{ ft}^3/\text{gal})$

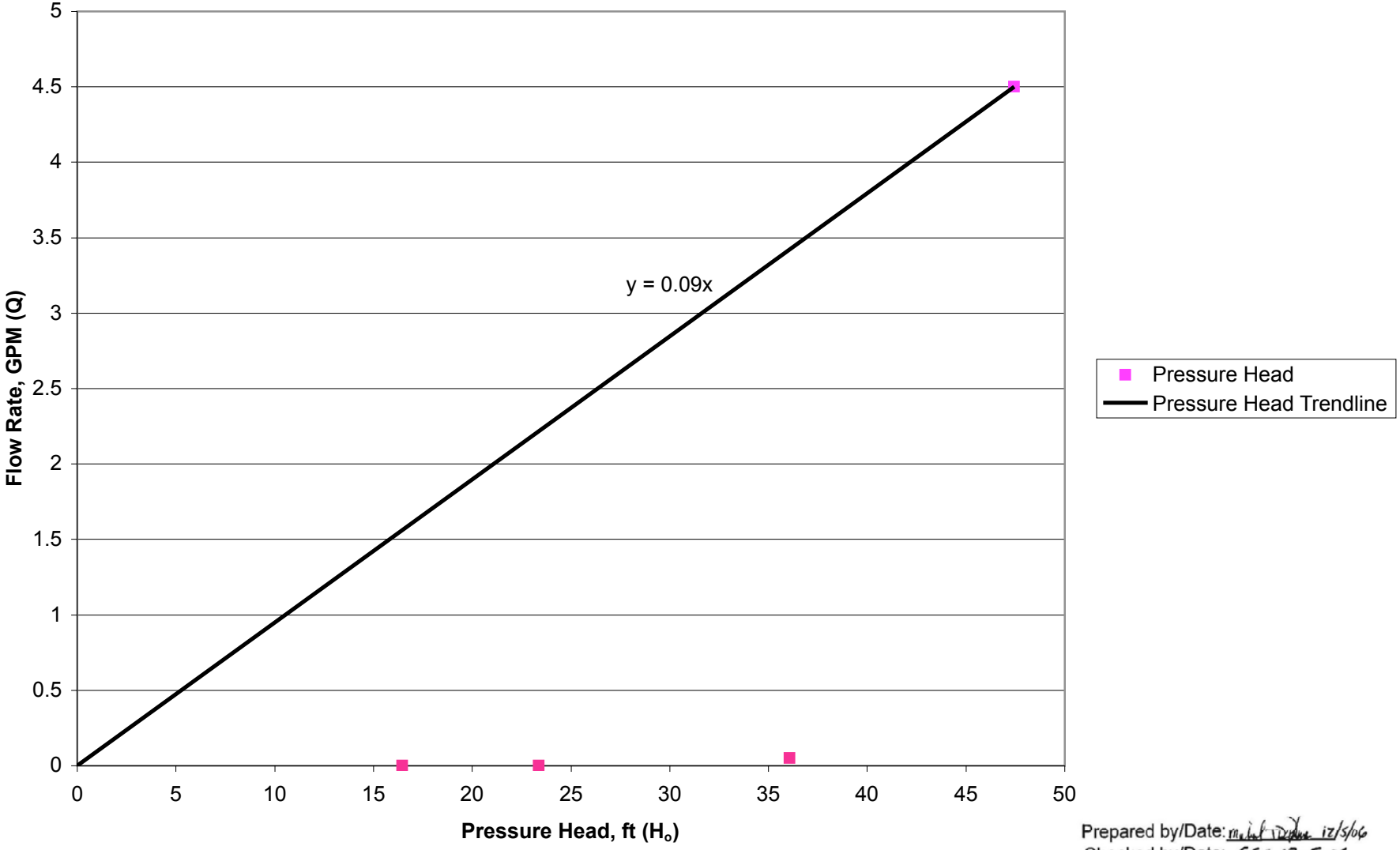
R is equal to total length between packers, _

Radius of borehole (r_o) taken from outside diameter of core bit, 3 inches

Q/H_o is equal to the slope of the linear trendline of H_o (x-axis) and Q (y-axis)

Prepared by/Date: [signature] 12/5/06
Checked by/Date: CGS 12-5-06

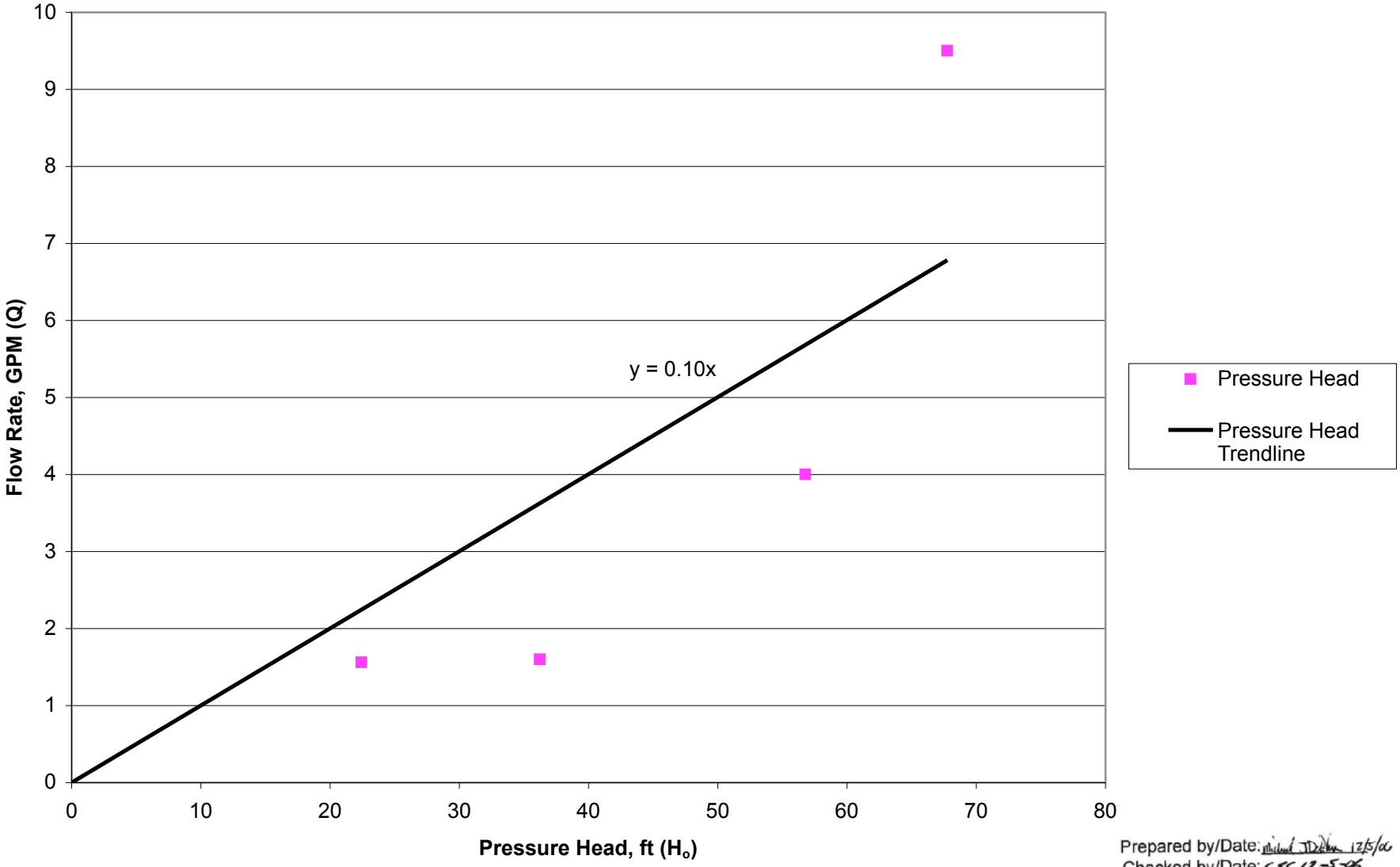
Pressure Head vs. Flow Rate, B-1015 Interval 8.5-13.5 ft. bls



Prepared by/Date: [signature] 12/5/06
Checked by/Date: CES 12-5-06

Attachment B: Table B-3
DCN: CH 255

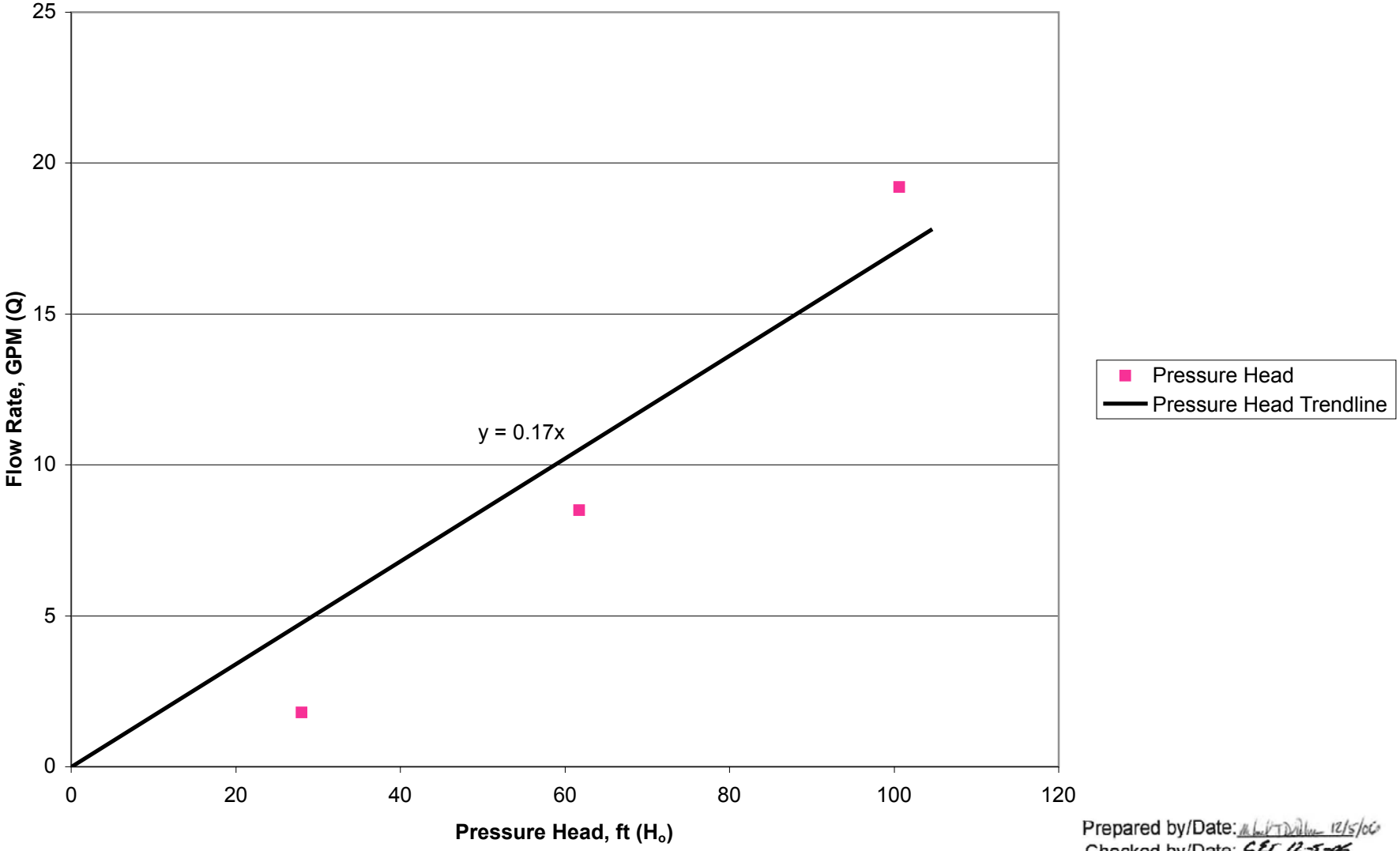
Pressure Head vs. Flow Rate, B-1015 Interval 22-27 ft. bls



Prepared by/Date: [signature] 12/5/06
Checked by/Date: CBS 12-5-06

Attachment B: Table B-3
DCN: CH 255

Pressure Head vs. Flow Rate, B-1015 Interval 31-36 ft. bls



Prepared by/Date: [illegible] 12/5/06
Checked by/Date: CES 12-5-06

Attachment B: Table B-3
DCN: CH 255

MW-1201 Packer Test Data
Cherokee COL Site
MACTEC Project 6234-06-3389

Given Parameters

Test Section Length _, ft: 10
Radius of Borehole r_o, ft: 0.125
GW Elevation, ft: 37

Interval: 87-97

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	H_g, ft	H_o, ft
T1	1.03	11	0.21	10.79	0.48	40	64.90
T4/T5	1.86	20	0.28	19.72	0.65	40	85.51
T7	0.46	12	0.15	11.85	0.35	40	67.35
T8	1.93	24	0.31	23.69	0.72	40	94.67

Q/H_o, GPM/ft: 0.020
K_e, ft/year: 98

Note: T2 & T3 and T6 not conducted

Interval: 117-127

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	H_g, ft	H_o, ft
T1	1.36	20	0.35	19.65	0.81	40	85.35
T4	2	30	0.39	29.61	0.90	40	108.33
T5	2.83	37	0.61	36.39	1.41	40	123.98
T6	0.13	15	0.2	14.8	0.46	40	74.15
T7	1.9	35	0.37	34.63	0.85	40	119.92
T8	2.16	41	0.39	40.61	0.90	40	133.72

Q/H_o, GPM/ft: 0.018
K_e, ft/year: 88

Note: T2 & T3 not conducted

Interval: 127-137

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	H_g, ft	H_o, ft
T1	1.86	23	0.42	22.58	0.97	40	92.11
T4	2.63	23	0.61	22.39	1.41	40	91.67
T5	2.9	30	1.06	28.94	2.45	40	106.78
T6	1	15	0.02	14.98	0.04	40	74.58
T7	1.8	23	0.61	22.39	1.41	40	91.67

Q/H_o, GPM/ft: 0.023
K_e, ft/year: 113

Note: T2 & T3 and T8 not conducted

Notes:

Q = flow rate

Test ID, flow rate (GPM) and gauge pressure taken from field measurements. Head loss due to pipe taken from USBR Figure 17.4, confirmed based on field measurement.

P_g is equal to gauge pressure, P_f is equal to pressure loss due to pipe friction (psi), h_f is equal to head loss due to pipe friction (ft)

$H_{gravity}$ is equal to depth to water + height of surface pressure gauge above the datum (excess pressure due to weight of water in flowpipe)

$H_o = (P_g/\_w) + H_{gravity} - h_f$

$K_e = ((Q/H_o)*(1/\_))*1/2\pi*\ln(R/r_o)*(525{,}600 \text{ min/year})*(.1337 \text{ ft}^3/\text{gal})$

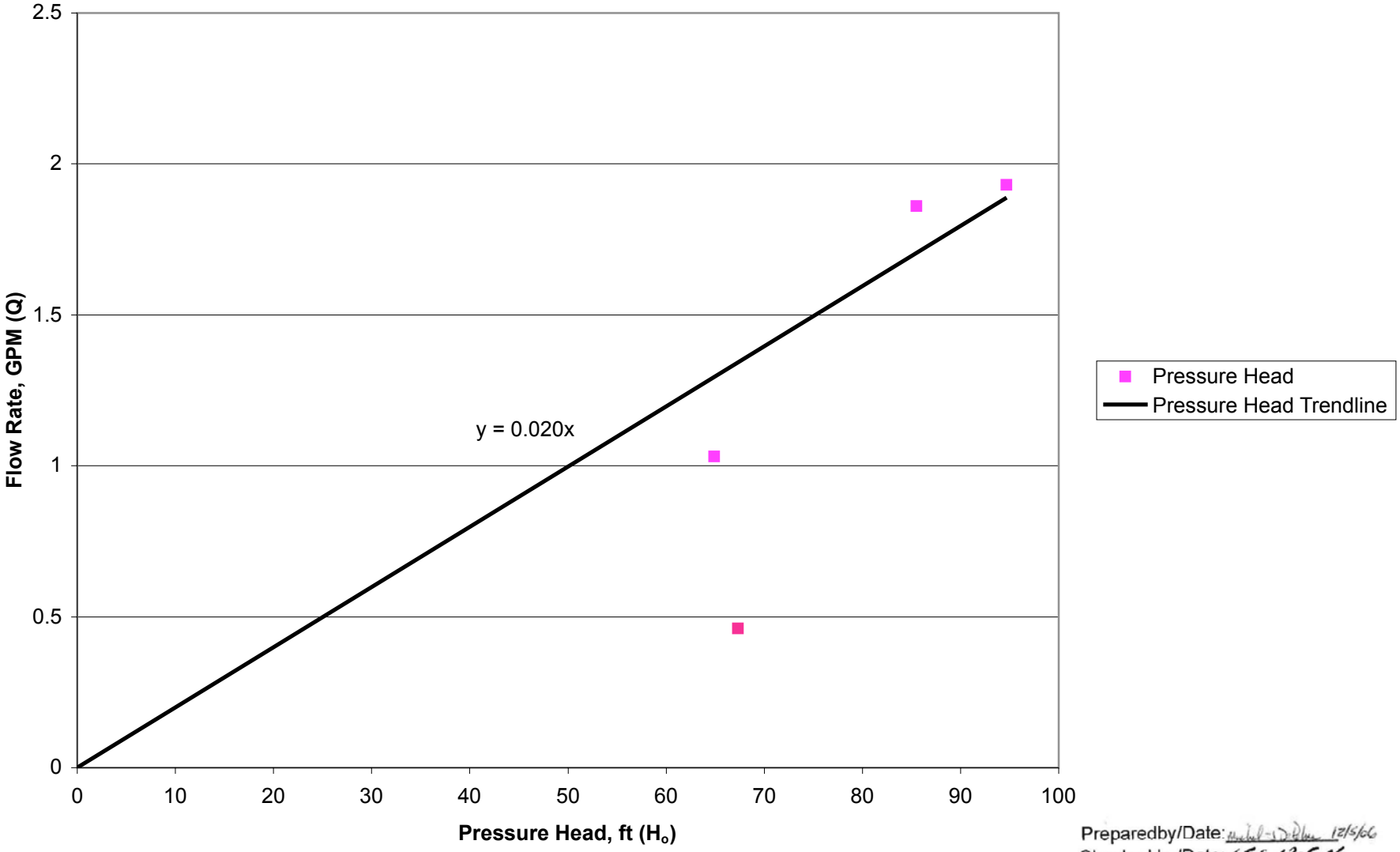
R is equal to total length between packers, _

Radius of borehole (r_o) taken from outside diameter of core bit, 3 inches

Q/H_o is equal to the slope of the linear trendline of H_o (x-axis) and Q (y-axis)

Prepared by/Date: [signature] 12/5/06
Checked by/Date: CES 12-5-06

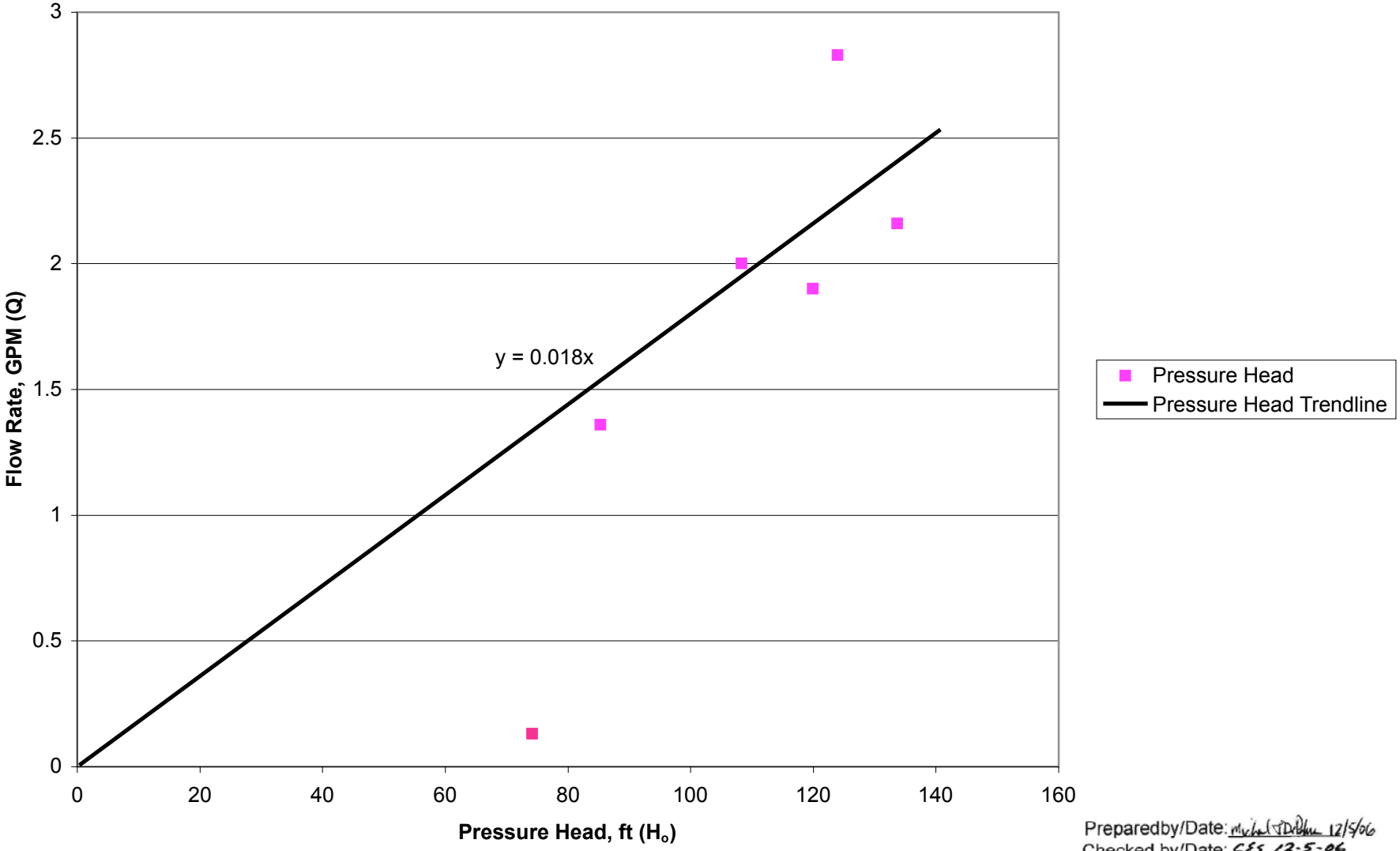
Pressure Head vs. Flow Rate, MW-1201 Interval 87-97 ft. bls



Preparedby/Date: [signature] 12/5/06
Checked by/Date: CES 12-5-06

Attachment B: Table B-4
DCN: CH 179

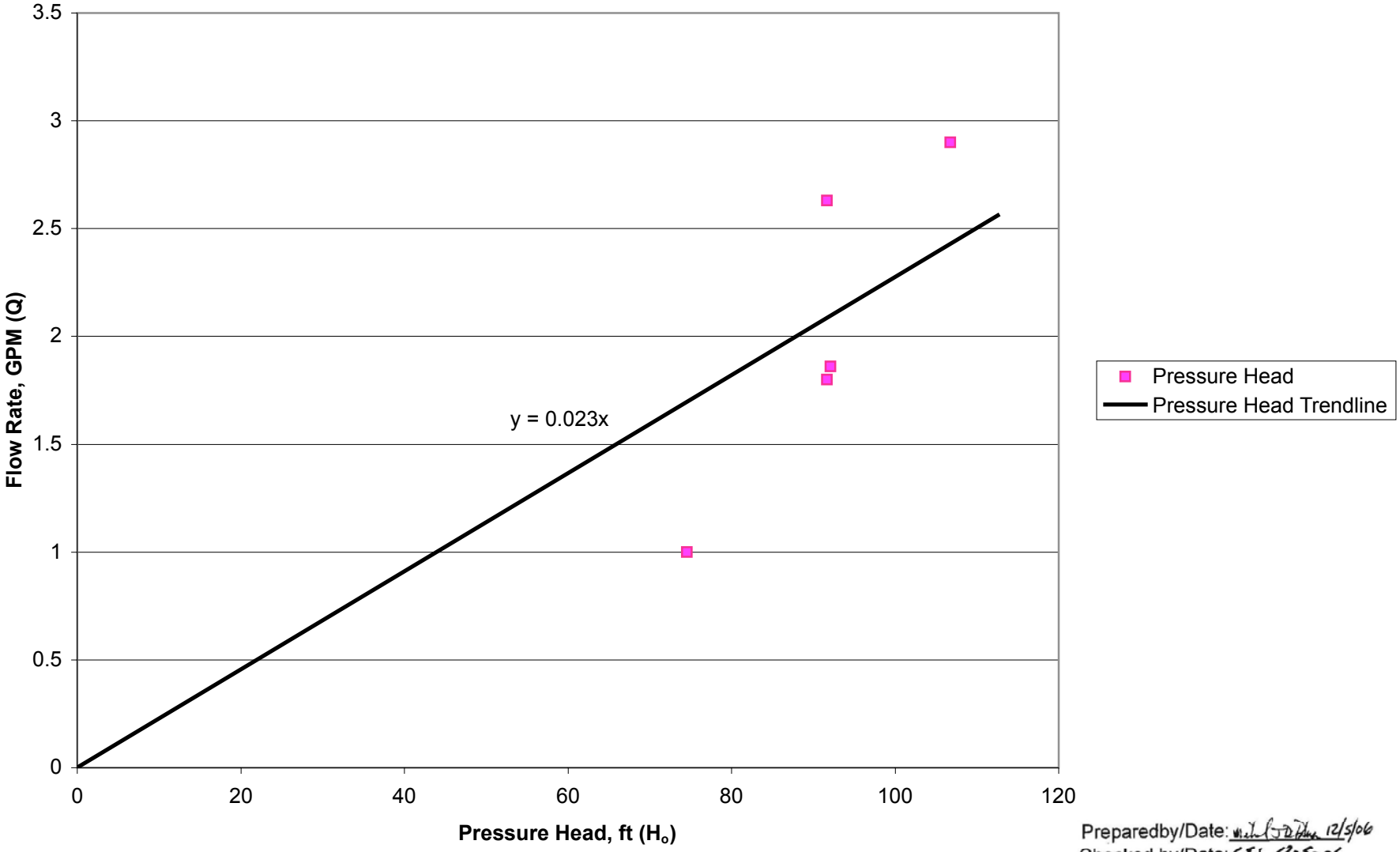
Pressure Head vs. Flow Rate, MW-1201 Interval 117-127



Preparedby/Date: [illegible] 12/5/06
Checked by/Date: CES 12-5-06

Attachment B: Table B-4
DCN: CH 179

Pressure Head Vs. Flow Rate, MW-1201 Interval 127-137



Preparedby/Date: [signature] 12/5/06
Checked by/Date: CEJ 12-5-06

Attachment B: Table B-4
DCN: CH 179

MW-1210 Packer Test Data
Cherokee COL Site
MACTEC Project 6234-06-3389

Given Parameters

Test Section Length _, ft: 10
Radius of Borehole r_o, ft: 0.125
GW Elevation, ft: 16.5

Interval: 96-106

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	H_g, ft	H_o, ft
T1	27.5	17	6.06	10.94	13.98	20.5	45.75
T2	12.9	8	2.04	5.96	4.71	20.5	34.25
T3	4	9	0.99	8.01	2.28	20.5	38.98

Q/H_o, GPM/ft **0.388**
K_e, ft/year **1,902**

Interval: 105-115

Test ID	Q, GPM	Pg, psi	P_f, psi	$P_g - P_f$, psi	h_f, ft	H_g, ft	H_o, ft
T1	28	18	6.6	11.4	15.23	21.5	47.81
T2	17.8	9	3.85	5.15	8.88	21.5	33.38
T3	11.4	5	1.76	3.24	4.06	21.5	28.98
T4	6.3	19	1.06	17.94	2.44	21.5	62.91

Q/H_o, GPM/ft **0.534**
K_e, ft/year **2,618**

Notes:

Q = flow rate

Test ID, flow rate (GPM) and gauge pressure taken from field measurements. Head loss due to pipe taken from USBR Figure 17.4, confirmed based on field measurement.

P_g is equal to gauge pressure, P_f is equal to pressure loss due to pipe friction (psi), h_f is equal to head loss due to pipe friction (ft)

$H_{gravity}$ is equal to depth to water + height of surface pressure gauge above the datum (excess pressure due to weight of water in flowpipe)

$H_o = (P_g/\_{w}) + H_{gravity} - h_f$

$K_e = ((Q/H_o)*(1/\_))*1/2\pi*\ln(R/r_o)*(525{,}600 \text{ min/year})*(.1337 \text{ ft}^3/\text{gal})$

R is equal to total length between packers, _

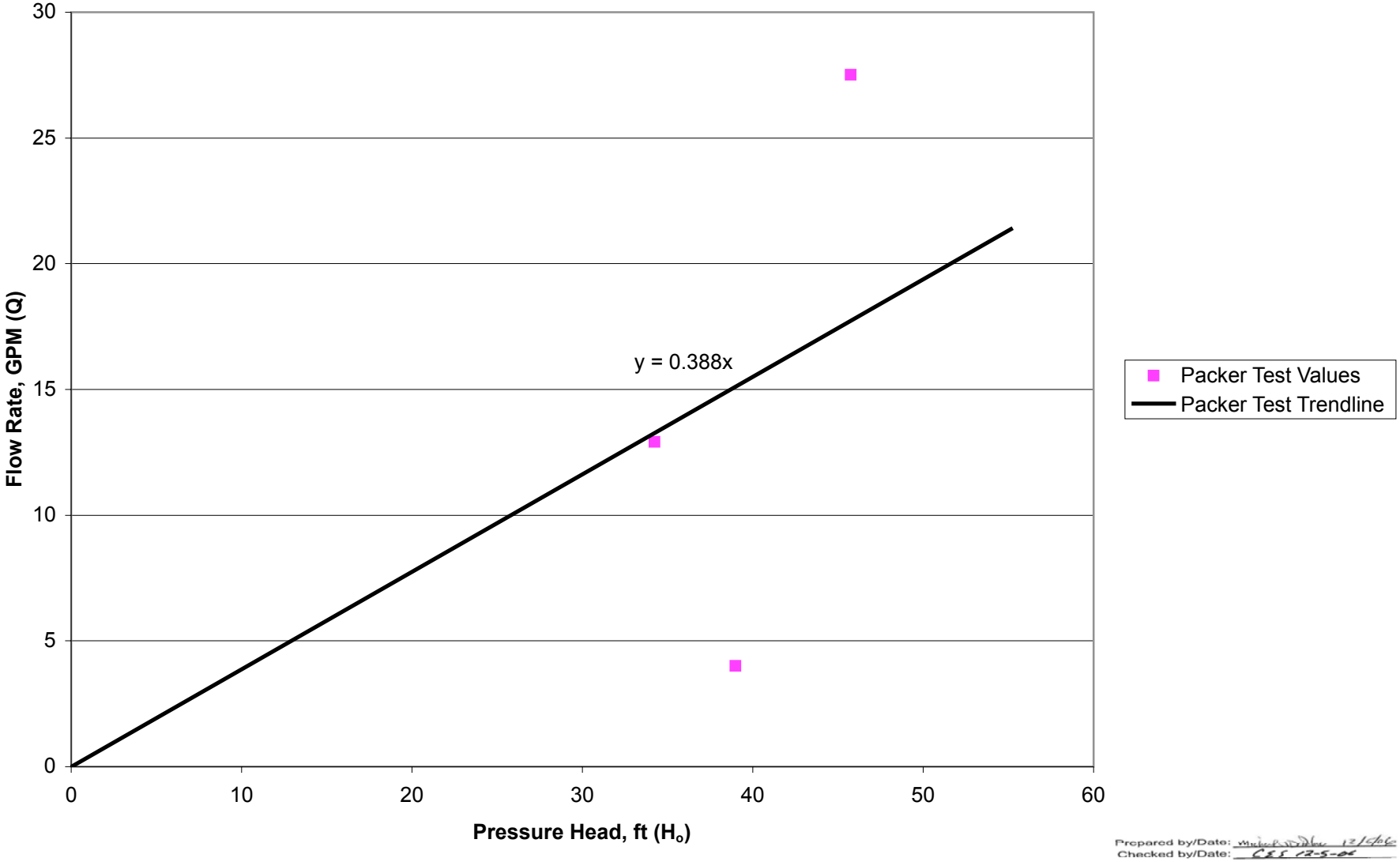
Radius of borehole (r_o) taken from outside diameter of core bit, 3 inches

Q/H_o is equal to the slope of the linear trendline of H_o (x-axis) and Q (y-axis)

Boring depth had caved to approximately 115 ft. bls prior to packer testing

Prepared by/Date: [signature] 12/5/06
Checked by/Date: CES 12-5-06

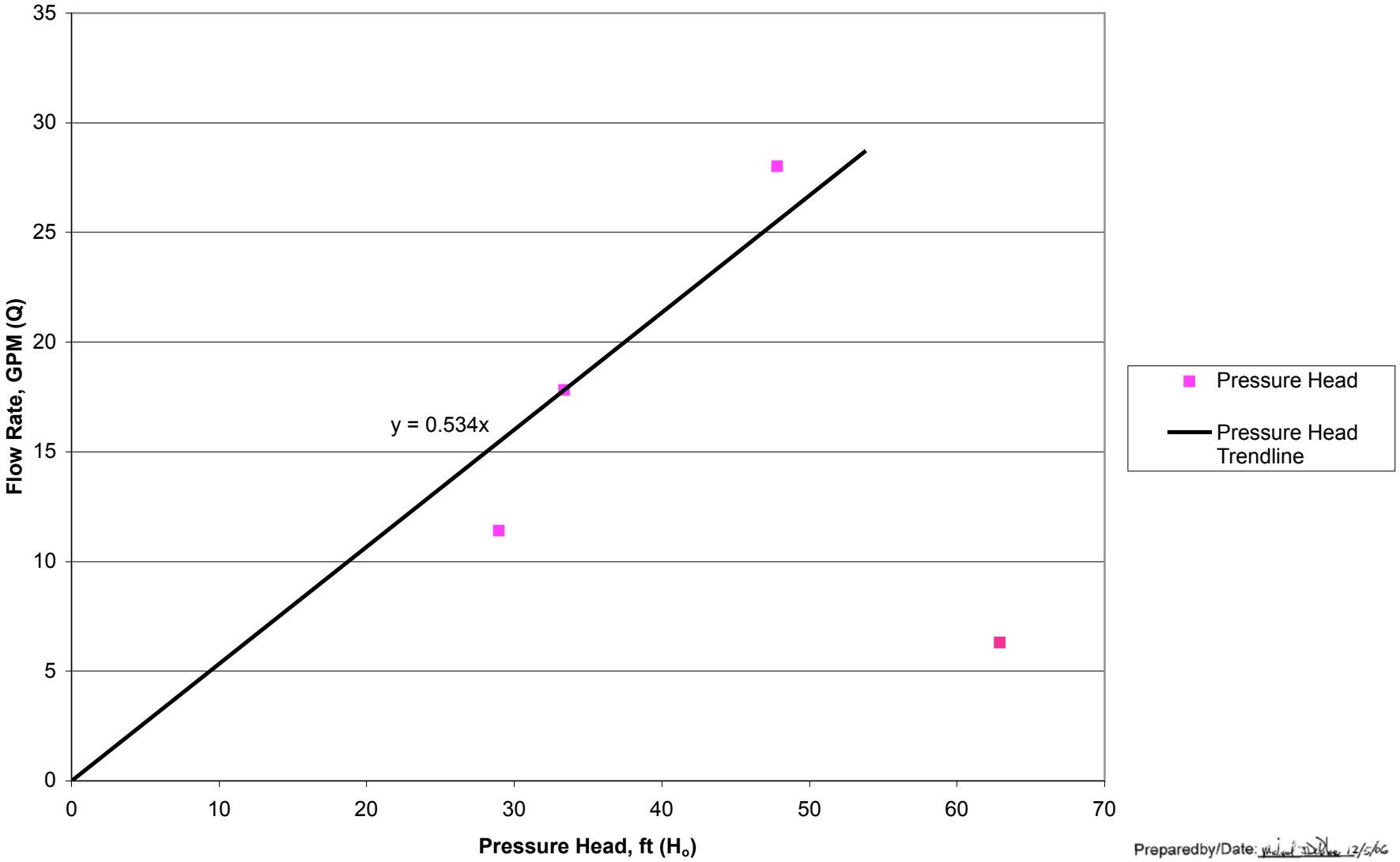
Pressure Head vs. Flow Rate, MW-1210 Interval 96-106



Prepared by/Date: [signature] 12/6/06
Checked by/Date: CES 12-5-06

Attachment B: Table B-5
DCN: CH 236

Pressure Head vs. Flow Rate, MW-1210 Interval 105-115



Preparedby/Date: [illegible] 12/5/06
Checked by/Date: CES 12-5-06

Attachment B: Table B-5
DCN: CH 236

APPENDIX 2AA
ATTACHMENT 5 – LEE NUCLEAR STATION CONE PENETROMETER TEST (CPT) RESULTS

This attachment contains Cone Penetrometer Test (CPT) results from the Lee Nuclear Site. CPT tests were attempted at 29 locations. Seismic CPT tests were also attempted at 10 of these locations. Results are also included for Pore Pressure Dissipation Tests performed at 12 CPT locations. Tests were conducted by GREGG In Situ, Inc.

WLS COL 2.5-1

Cone Penetration Test Sounding Summary

-Table 1-

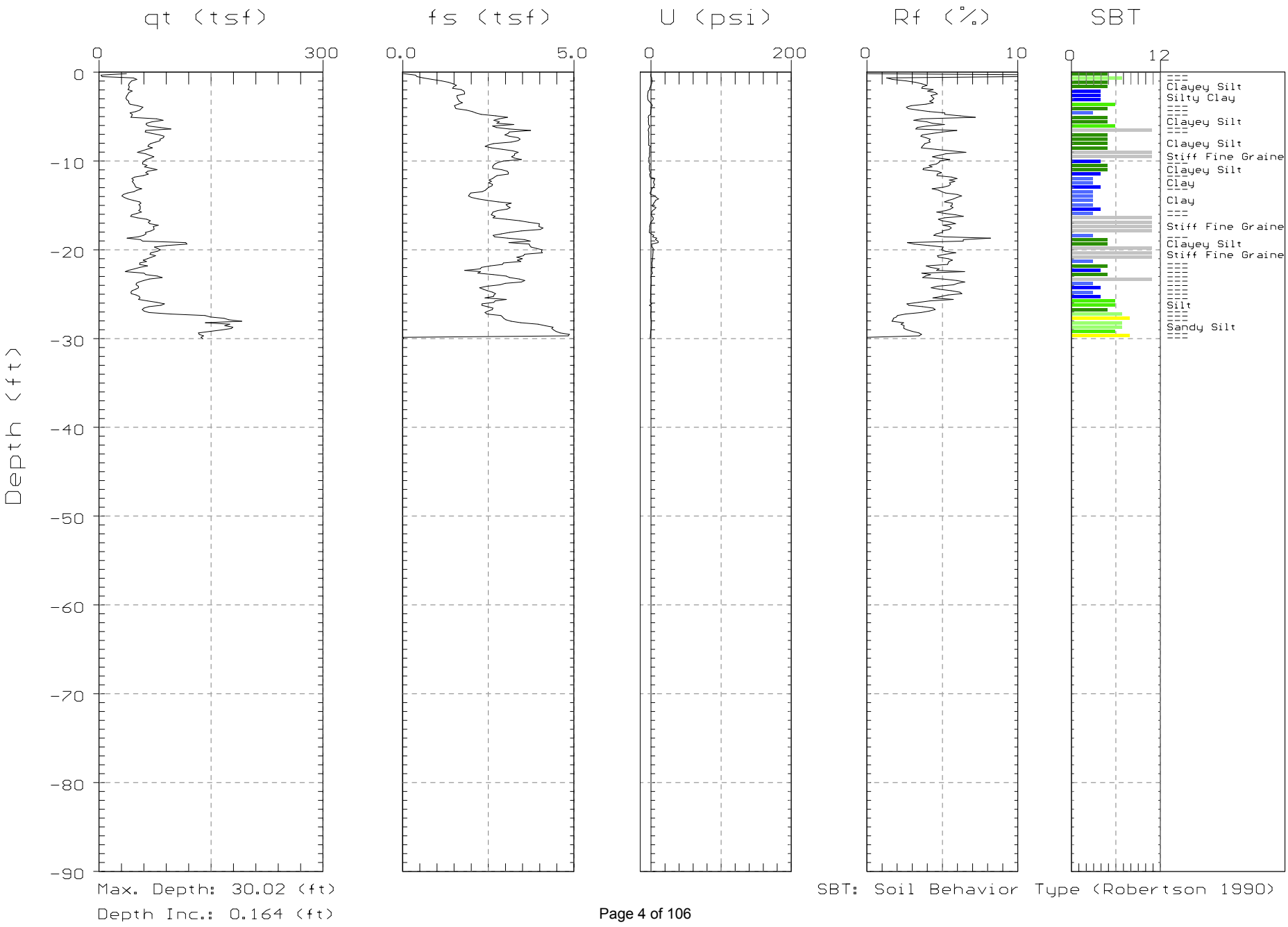
CPT Sounding Identification	File Name	Date	Termination Depth (Feet)	Depth of Soil Samples (Feet)	Depth of Pore Pressure Dissipation Tests (Feet)
CPT-1300	061c00	5/12/06	30	-	18.5, 30.0
CPT-1301	061c01	5/11/06	30	-	-
CPT-1302	061c02	5/12/06	80	-	34.9, 80.1
CPT-1303	061c03	5/13/06	90	-	65.9, 80.2
CPT-1304	061c04	5/12/06	74	-	74.0
CPT-1305	061c05	5/12/06	34	-	-
CPT-1306	061c06	5/12/06	19	-	-
CPT-1306a	061c6a	5/12/06	21	-	-
CPT-1307	061c07	5/16/06	20	-	-
CPT-1308	061c08	5/13/06	8	-	-
CPT-1308a	061c08a	5/14/06	41	-	41.2
CPT-1308b	061c08b	5/16/06	39.5	-	-
CPT-1309	061c09	5/14/06	85	-	60.0, 85.1
CPT-1314	061c14	5/15/06	6	-	-
CPT-1315	061c15	5/15/06	40	-	-
CPT-1316	061c16	5/15/06	57.6	-	-
CPT-1317	061c17	5/15/06	8.7	-	-
CPT-1317a	061c17a	5/15/06	19.5	-	-
CPT-1317b	061c17b	5/16/06	20.7	-	-
CPT-1318	061c18	5/15/06	16	-	-
CPT-1319	061c19	5/15/06	47.6	-	-
CPT-1320	094c1320	8/20/06	32.3	-	32.2
CPT-1321	094c1321	8/20/06	43.3	-	43.3

CPT-1322	094c1322	8/20/06	48.1	-	48.1
CPT-1323	094c1323	8/19/06	84.2	-	81.0, 84.2
CPT-1324	094c1324	8/19/06	3.1	-	-
CPT-1324b	094c1324b	8/19/06	77.3	-	77.3
CPT-1325	094c1325	8/19/06	40.0	-	-
CPT-1325a	094c1325a	8/19/06	55.1	-	55.1

GREGG

MACTEC

Site: N=1165285.875E=1845003.07 Engineer: C.SAMS
Location: CPT-1300L=609.2 Date: 05:12:06 06:35



Max. Depth: 30.02 (ft)
Depth Inc.: 0.164 (ft)

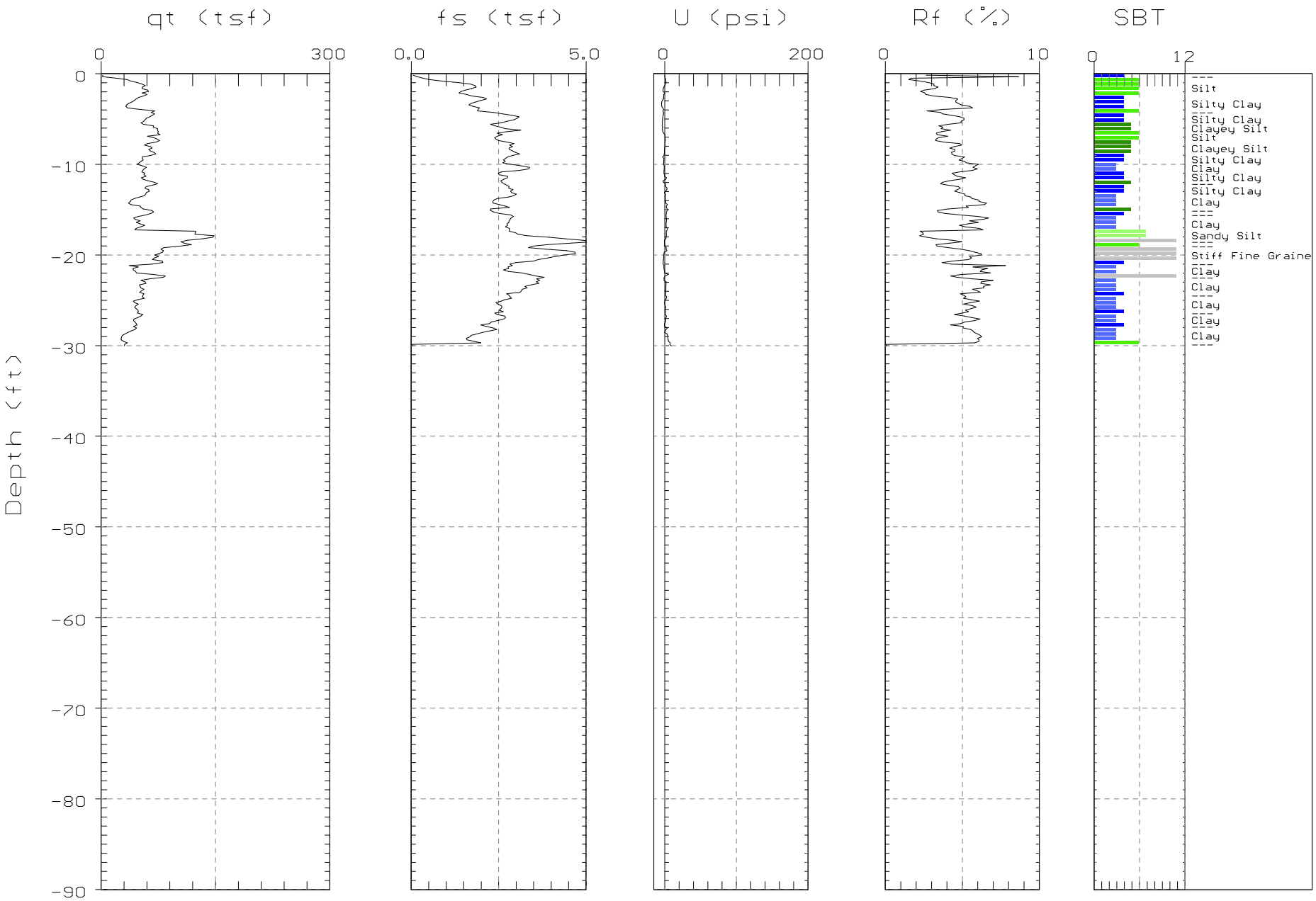
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1164894.228E=1845085.762 Engineer: C.SAMS

Location: CPT-1301L=609.8 Date: 05/11/06 14:37



Max. Depth: 30.02 (ft)

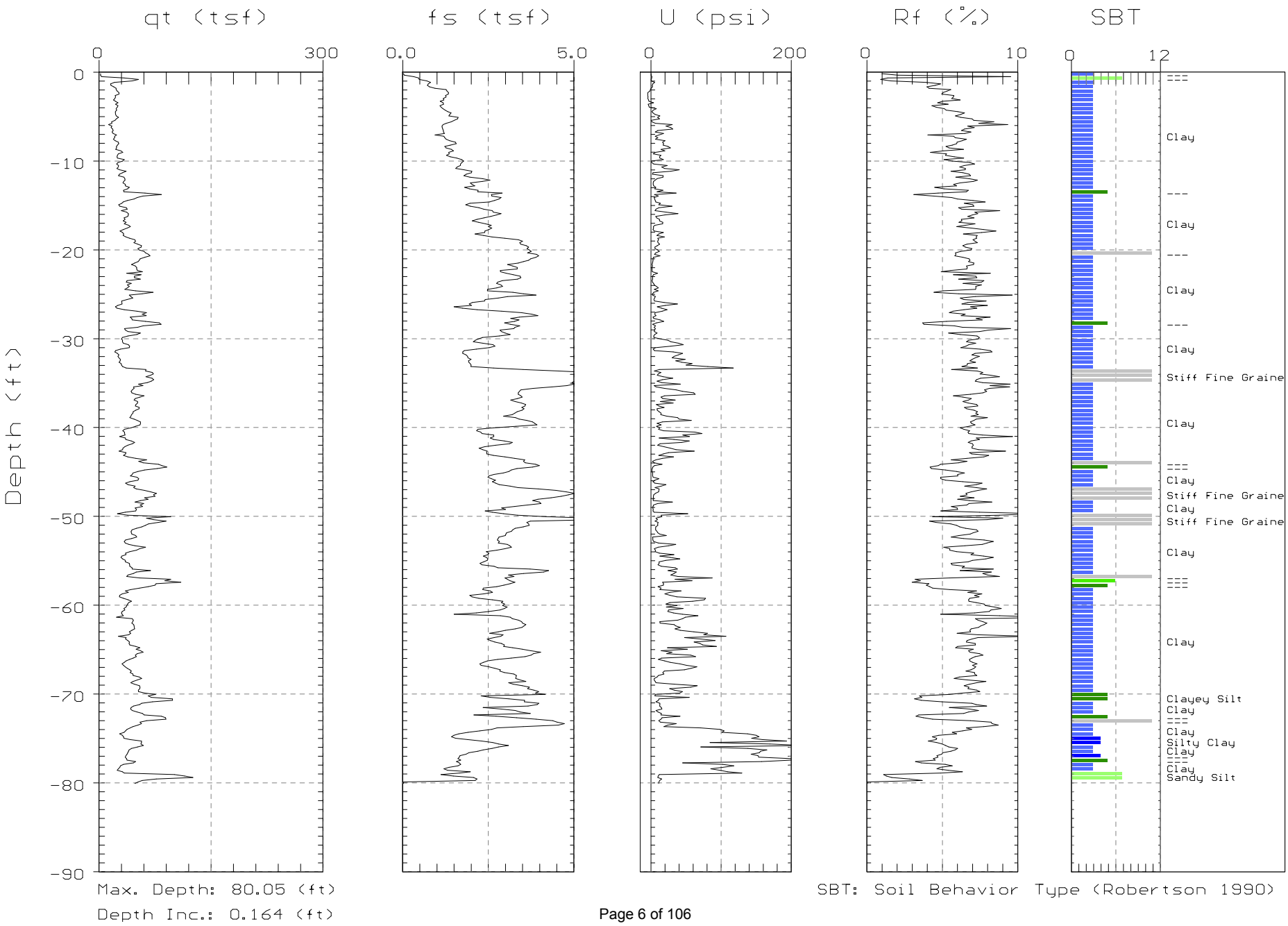
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

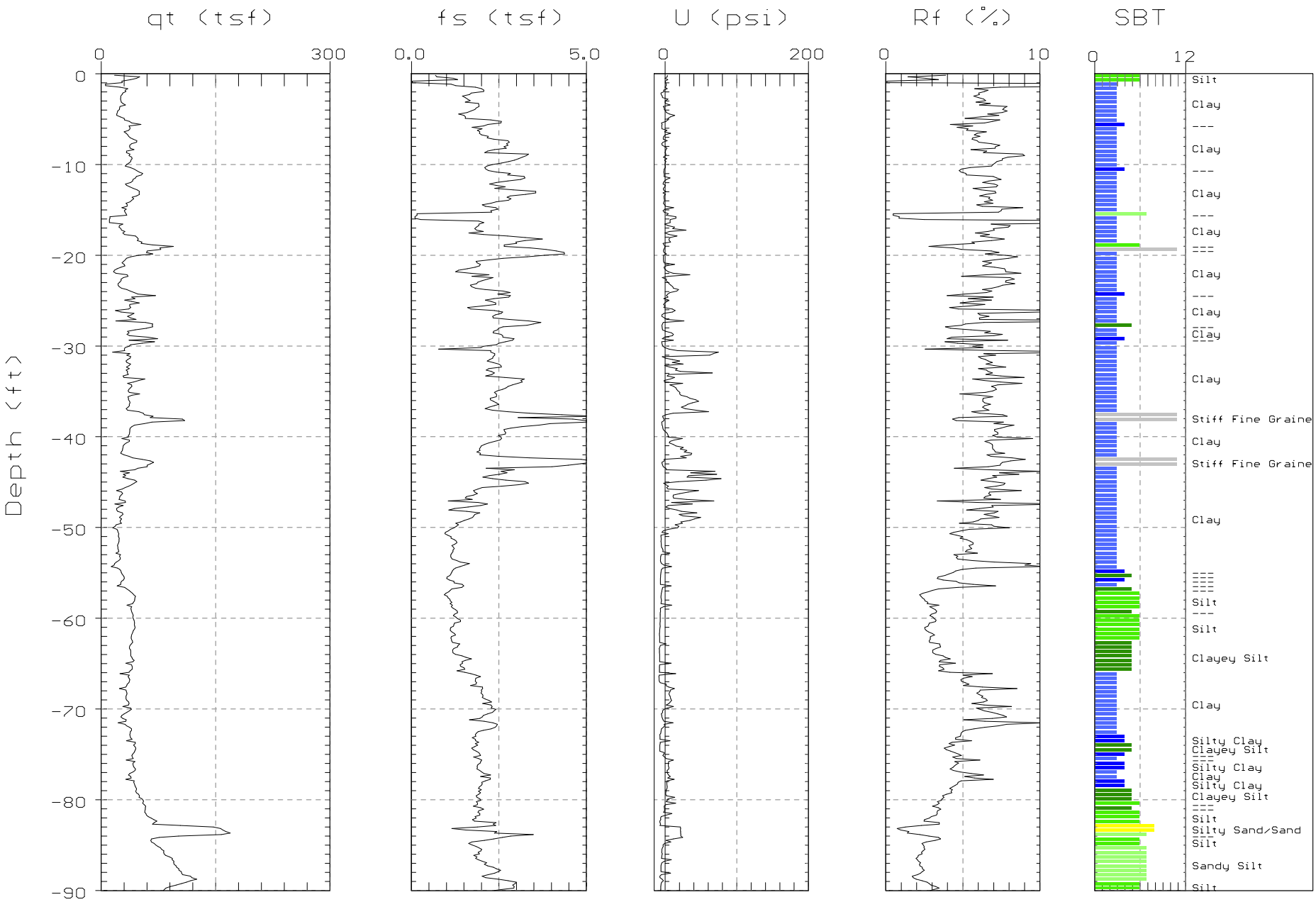
Site: N=1166124.625E=1848040.224 Engineer: C.SAMS
Location: CPT-1302L=609.3 Date: 05/12/06 11:13



GREGG

MACTEC

Site: N=1165582.495E=1848103.244 Engineer: C.SAMS
Location: CPT-1303L=609.6 Date: 05/13/06 08:30



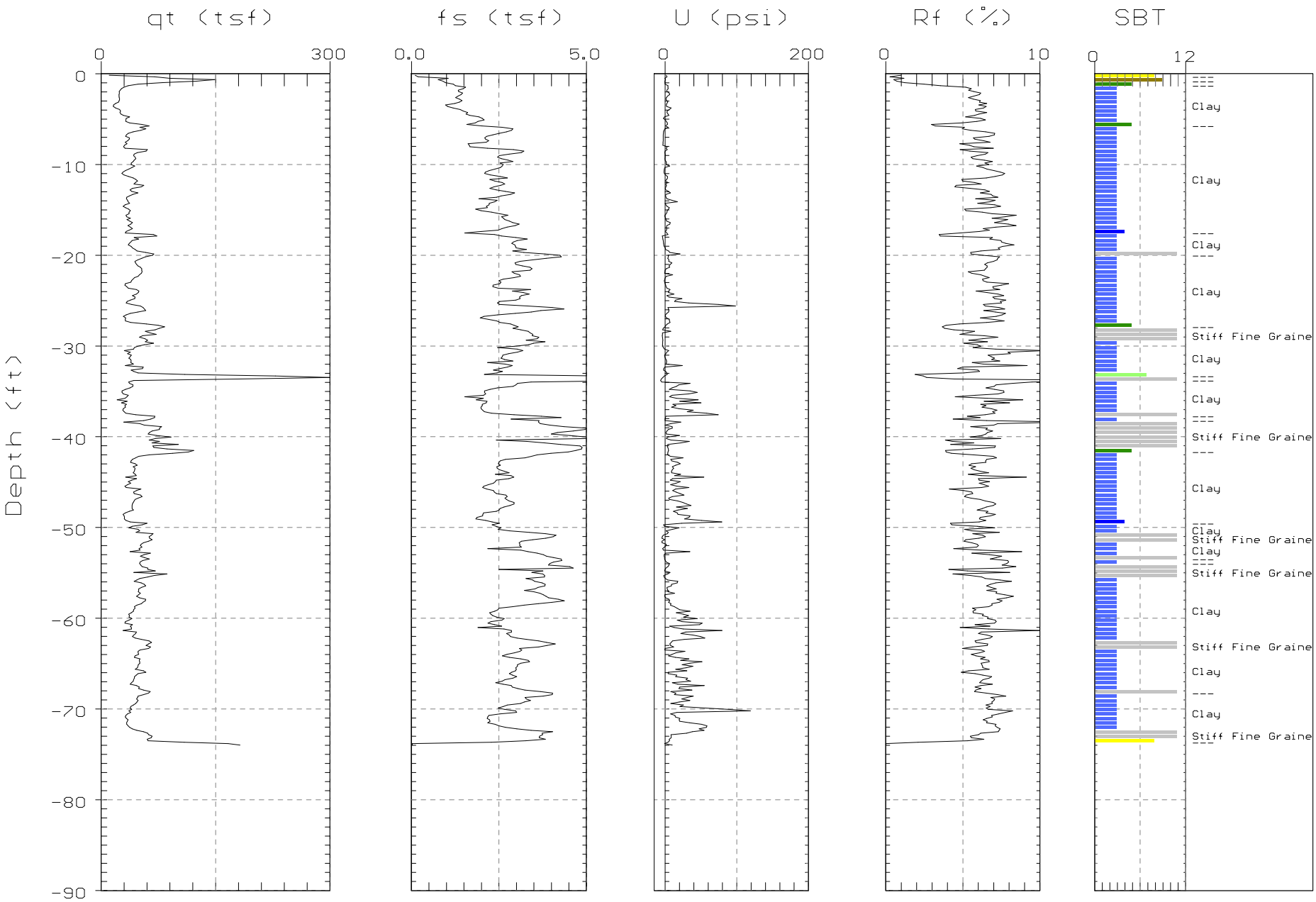
Max. Depth: 90.55 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

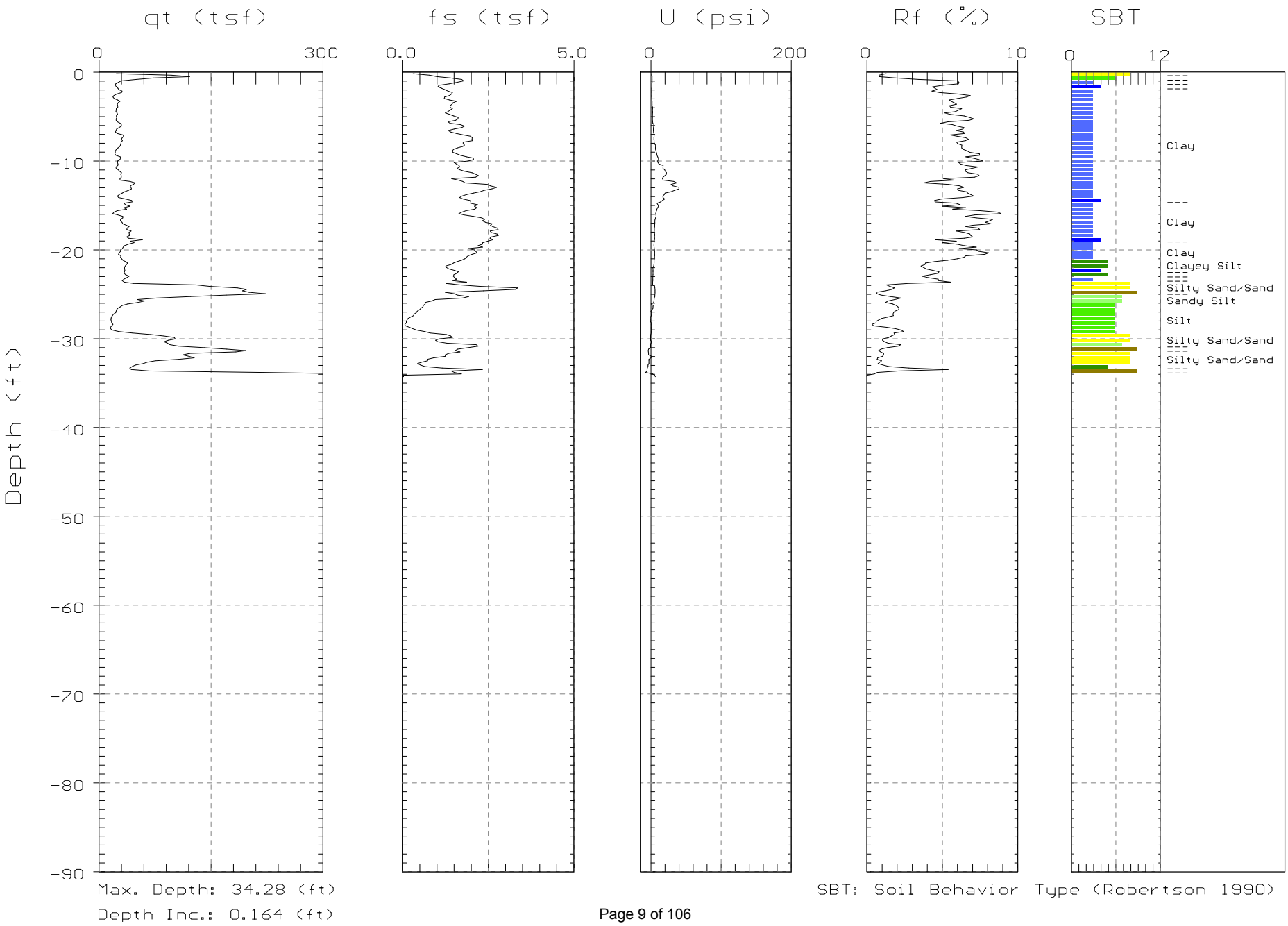
Site: N=1165892.587E=1848181.888 Engineer: C.SAMS
Location: CPT-1304L=609.8 Date: 05/12/06 13:23



GREGG

MACTEC

Site: N=1164732.401E=1847452.326 Engineer: C.SAMS
Location: CPT-1305L=603.7 Date: 05/12/06 08:29

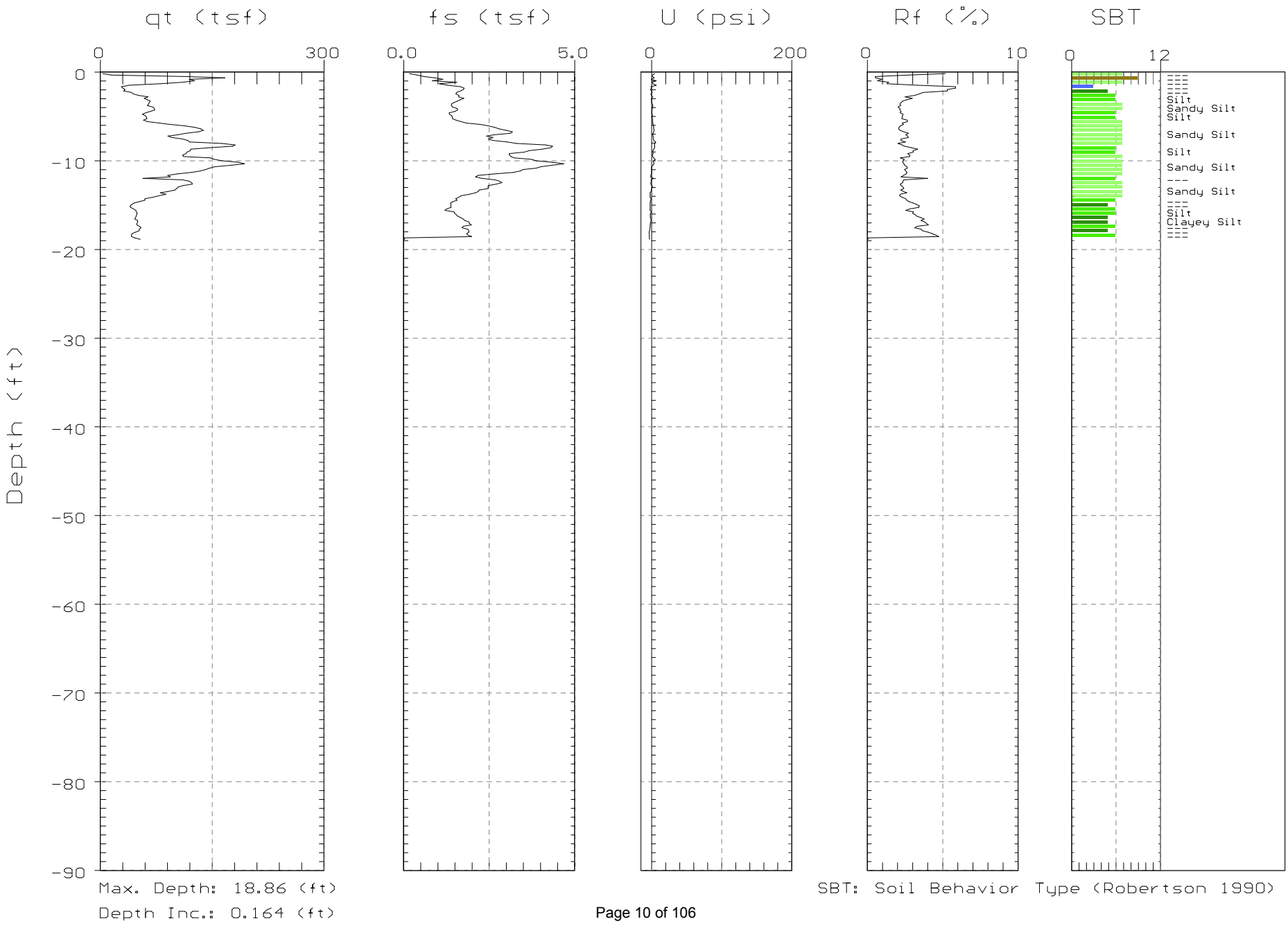


GREGG

MACTEC

Site: N=1164174.233E=1847132.668 Engineer: C.SAMS

Location: CPT-1306L=604.3 Date: 05/12/06 09:37



Max. Depth: 18.86 (ft)

Depth Inc.: 0.164 (ft)

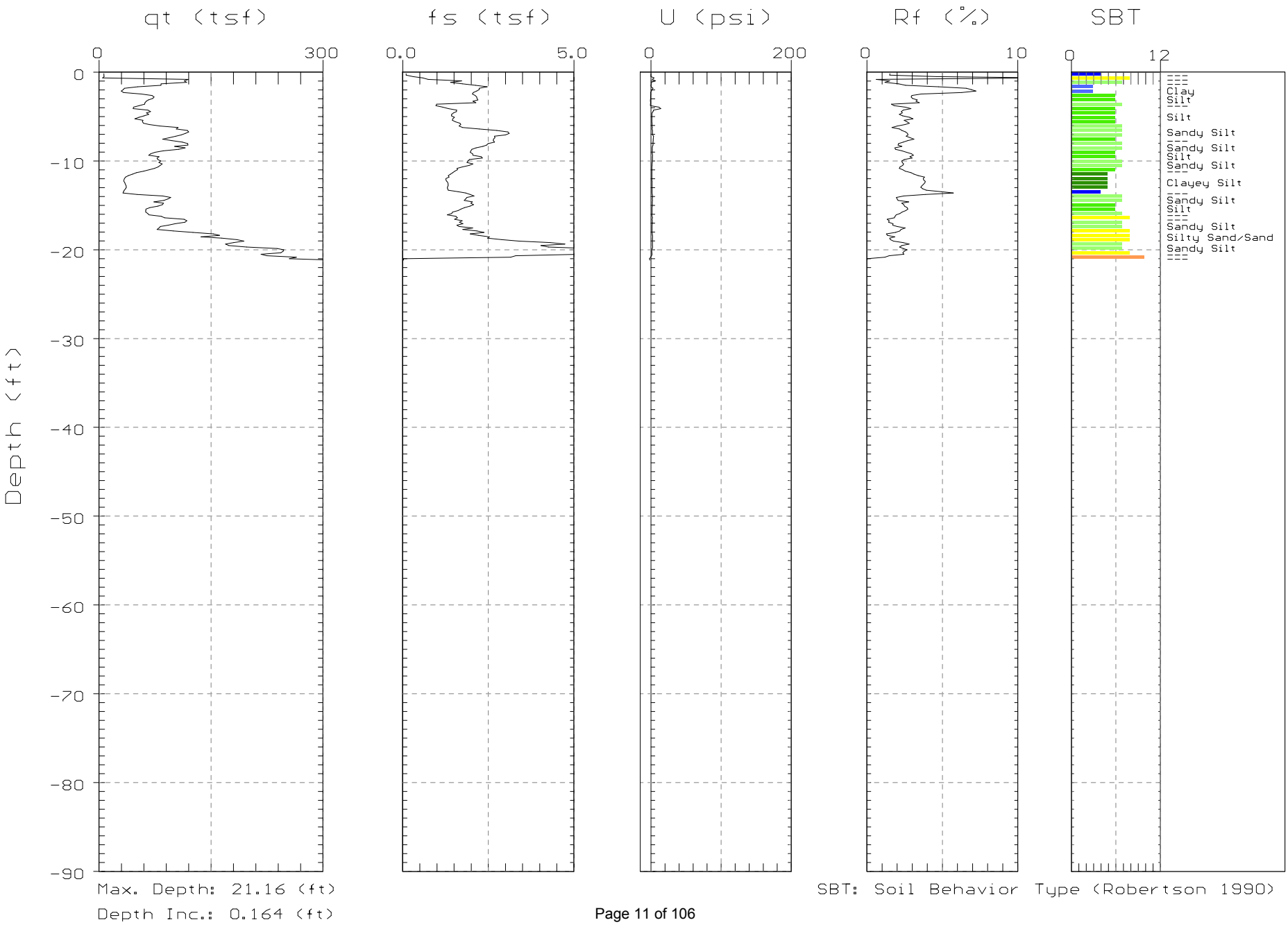
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1164172.987E=1847128.893 Engineer: C.SAMS

Location: CPT-1306AL=604.3 Date: 05/12/06 10:09



Max. Depth: 21.16 (ft)

Depth Inc.: 0.164 (ft)

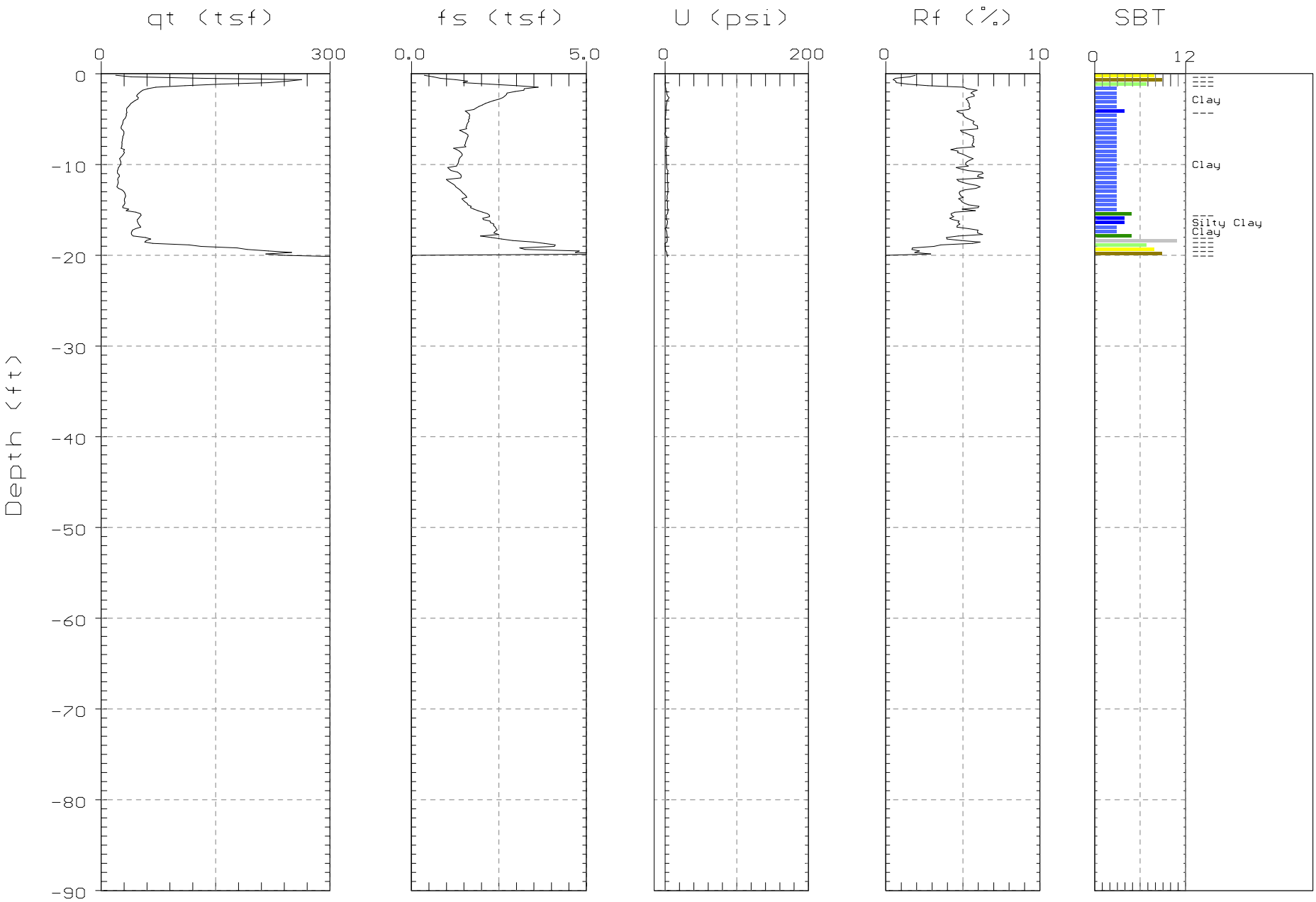
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1166393.067E=1847138.502 Engineer: C.SAMS

Location: CPT-1307L=589.8 Date: 05/16/06 08:51



Max. Depth: 20.18 (ft)

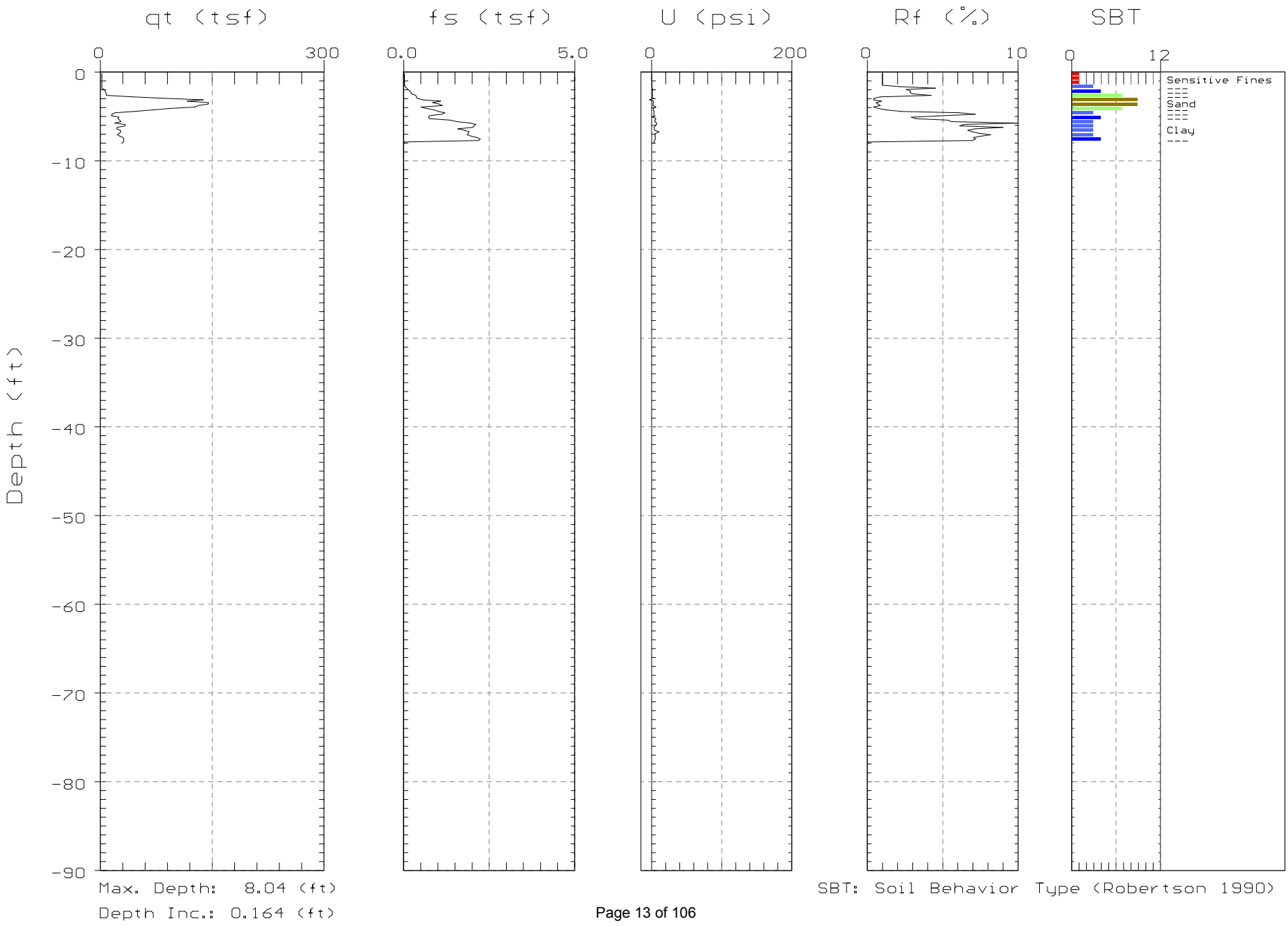
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1166994.842E=1844214.37 Engineer: C.SAMS
Location: CPT-1308L=538.0 Date: 05/13/06 11:57

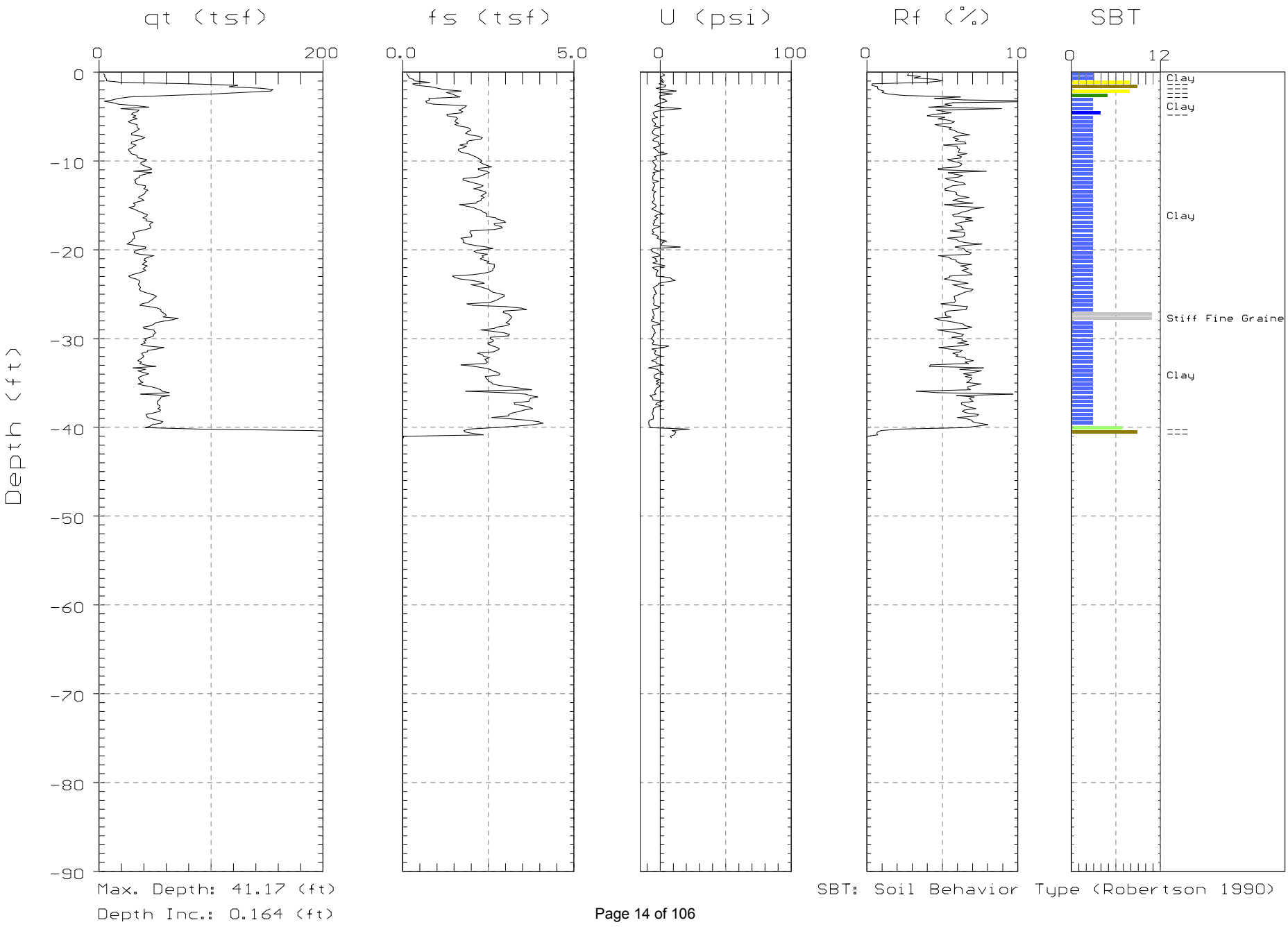


GREGG

MACTEC

Site: N=1167001.502E=1844206.906 Engineer: C.SAMS

Location: CPT-1308AL=538.0 Date: 05/14/06 05:56

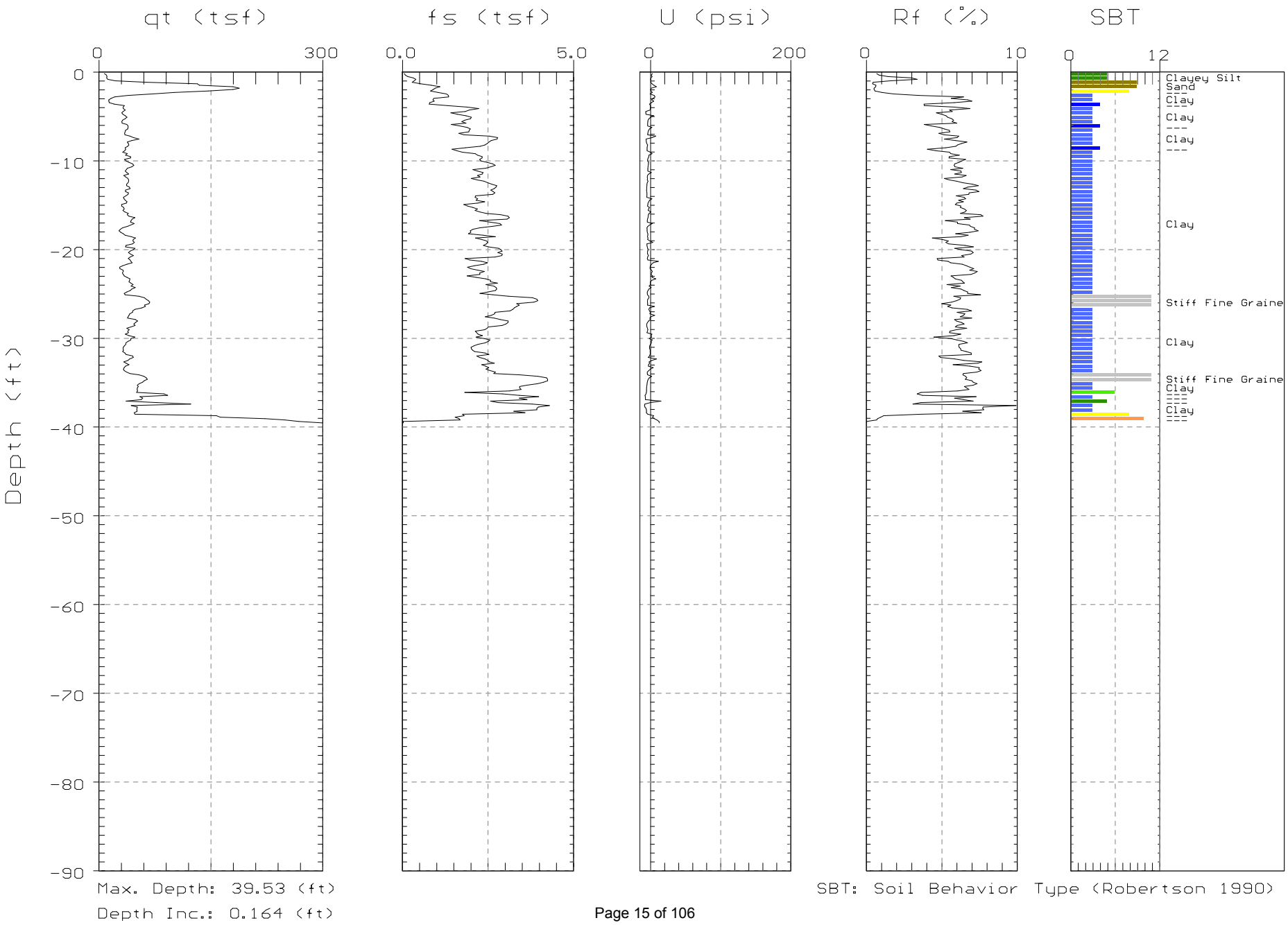


GREGG

MACTEC

Site: N=1167008.152E=1844199.436 Engineer: C.SAMS

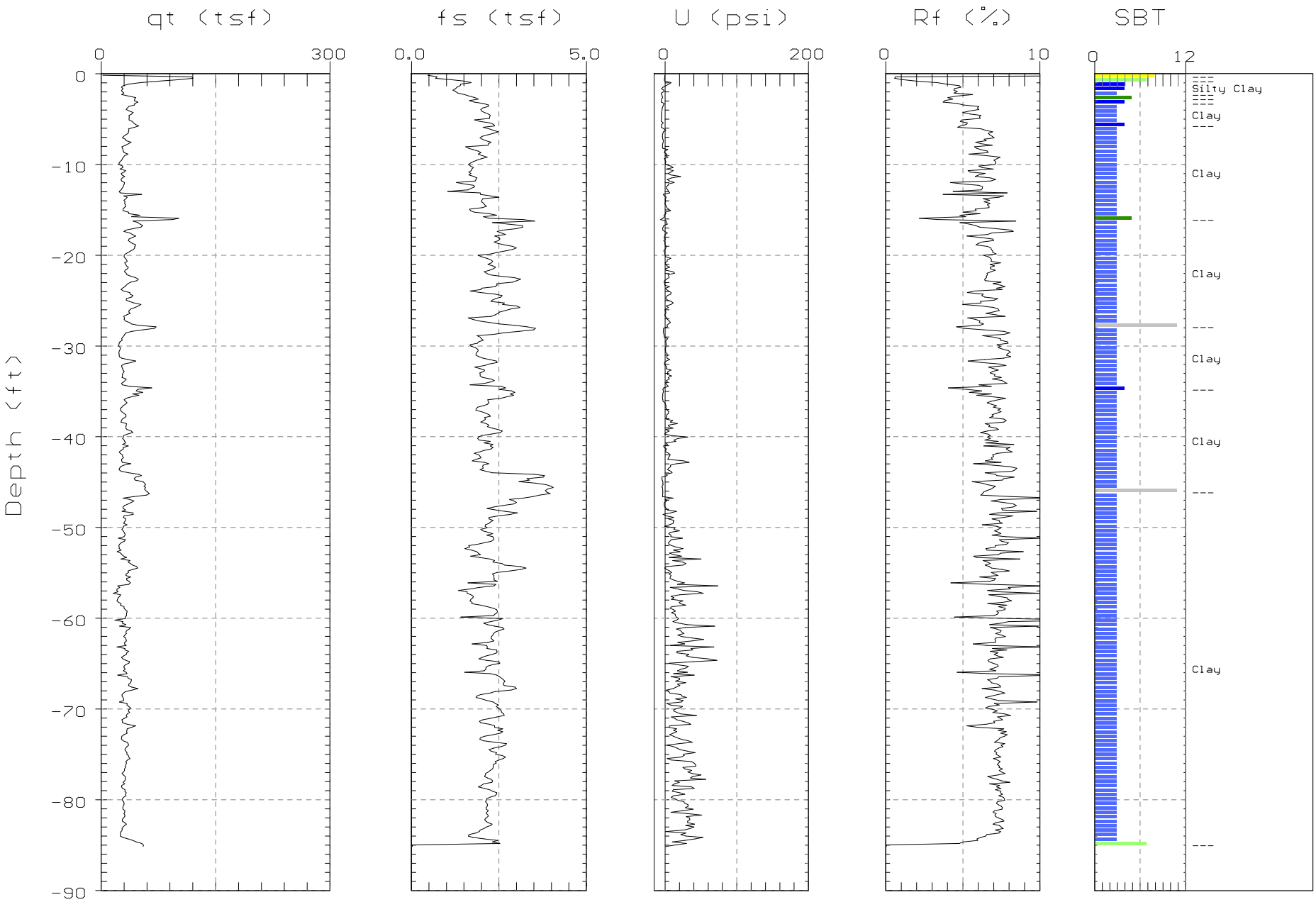
Location: CPT-1308BL=538.0 Date: 05/16/06 06:35



GREGG

MACTEC

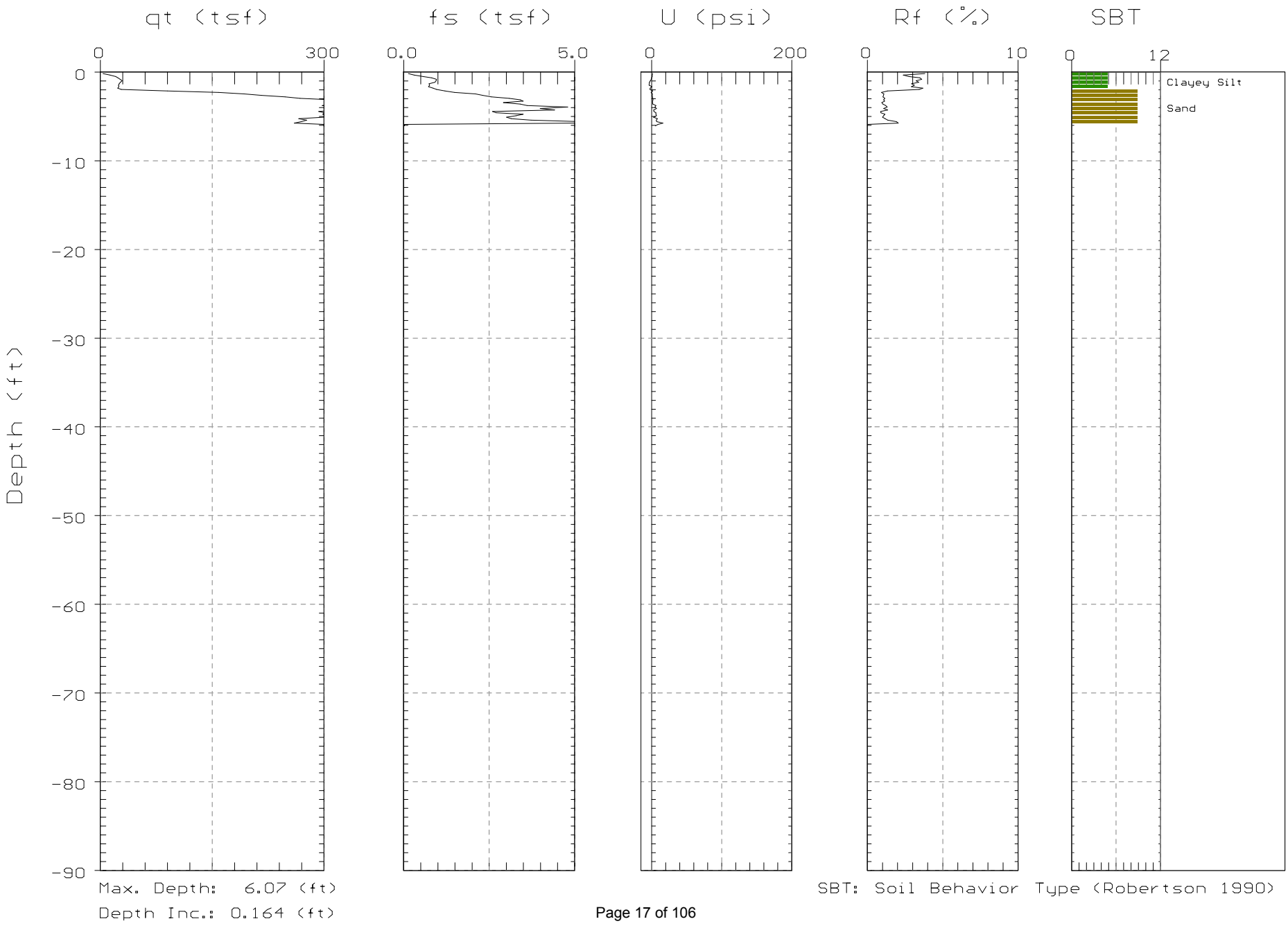
Site: N=1166860.56E=1844074.211 Engineer: C.SAMS
Location: CPT-1309L=591.0 Date: 05/14/06 10:04



GREGG

MACTEC

Site: N=1164932.132E=1846220.577 Engineer: C.SAMS
Location: CPT-1314L=590.0 Date: 05/15/06 13:37



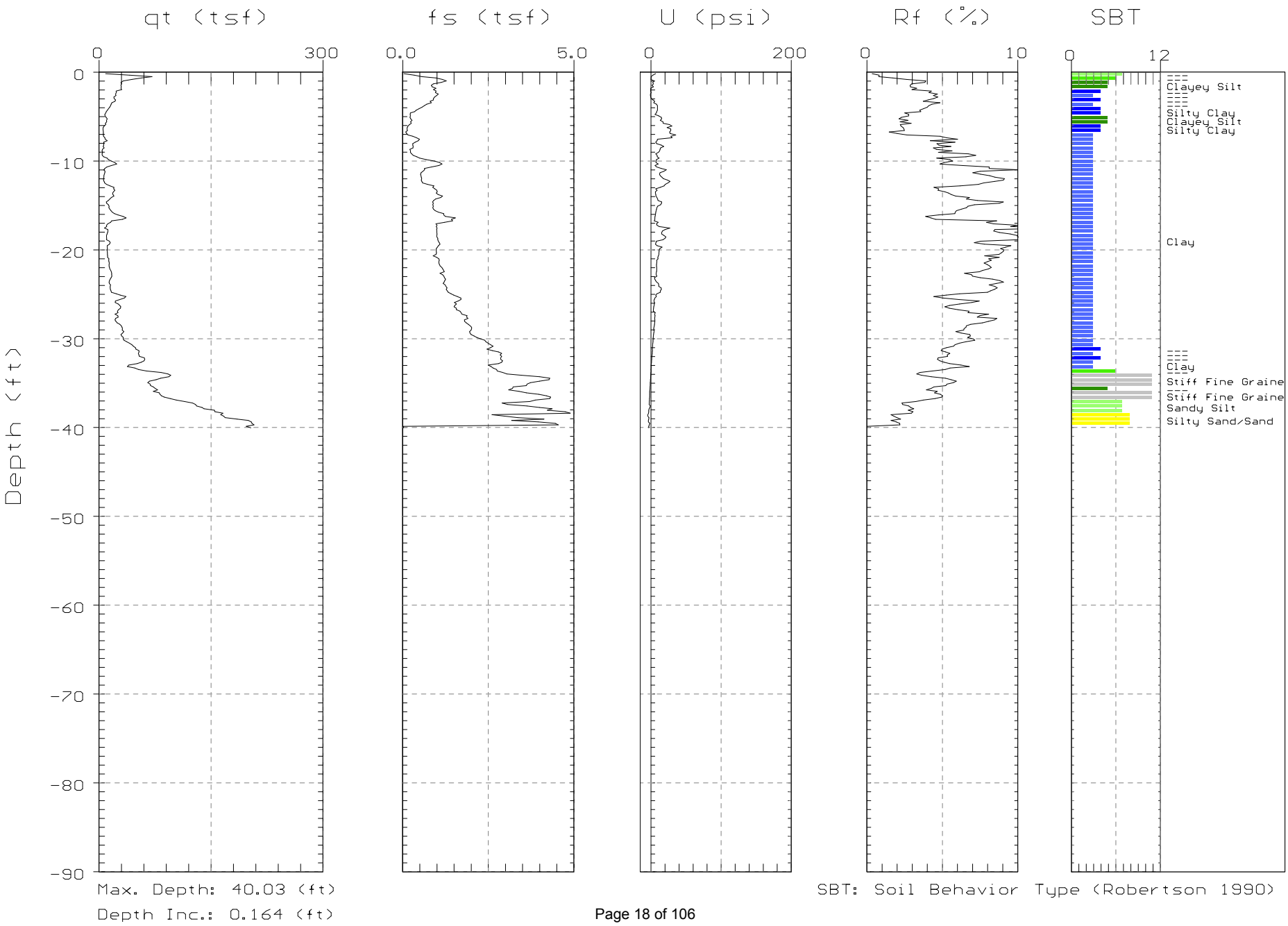
Max. Depth: 6.07 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165032.071E=1846589.827 Engineer: C.SAMS
Location: CPT-1315L=586.9 Date: 05/15/06 12:48

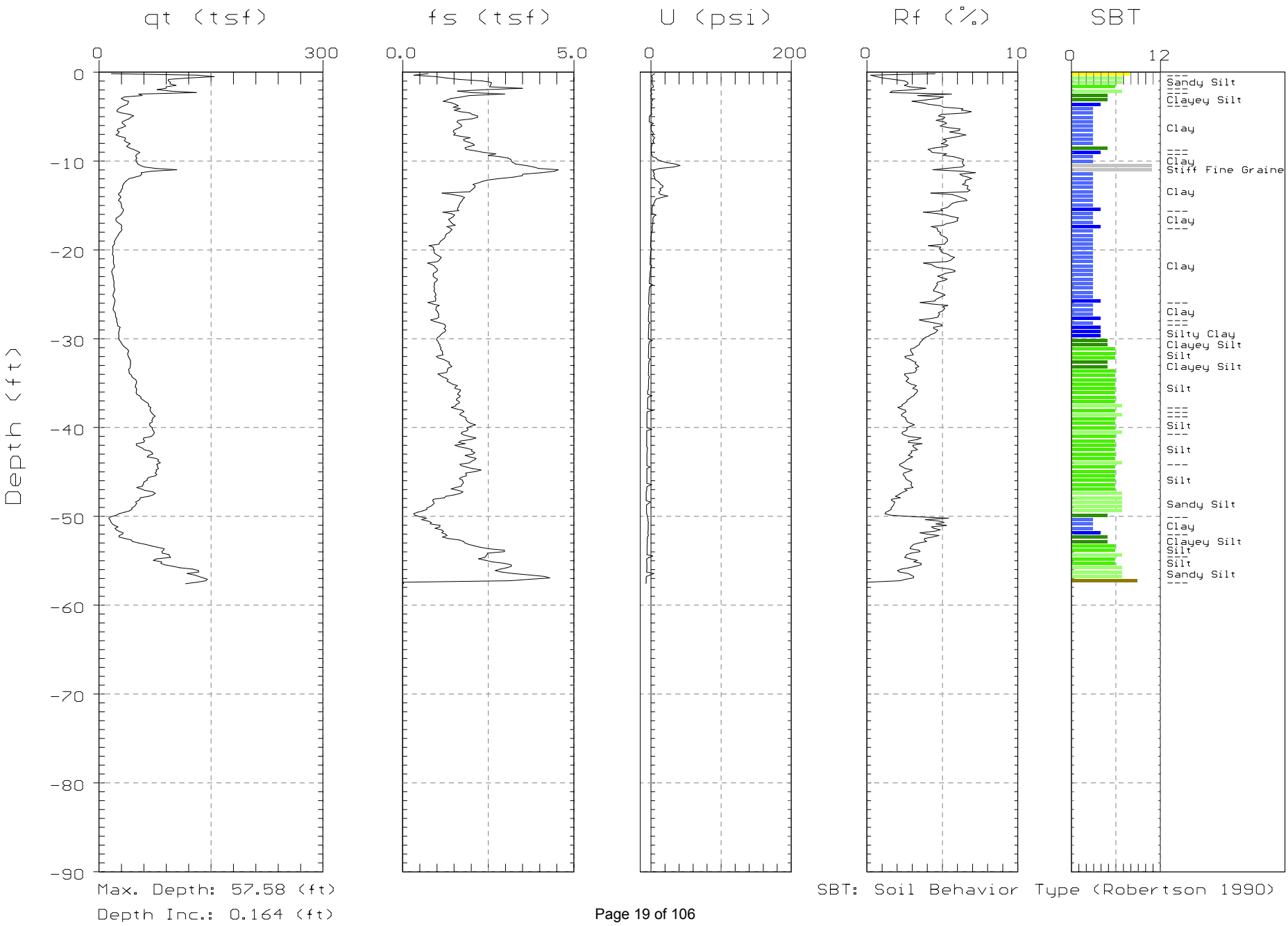


GREGG

MACTEC

Site: N=1165442.267E=1847364.975 Engineer: C.SAMS

Location: CPT-1316L=589.6 Date: 05/15/06 11:15



Max. Depth: 57.58 (ft)

Depth Inc.: 0.164 (ft)

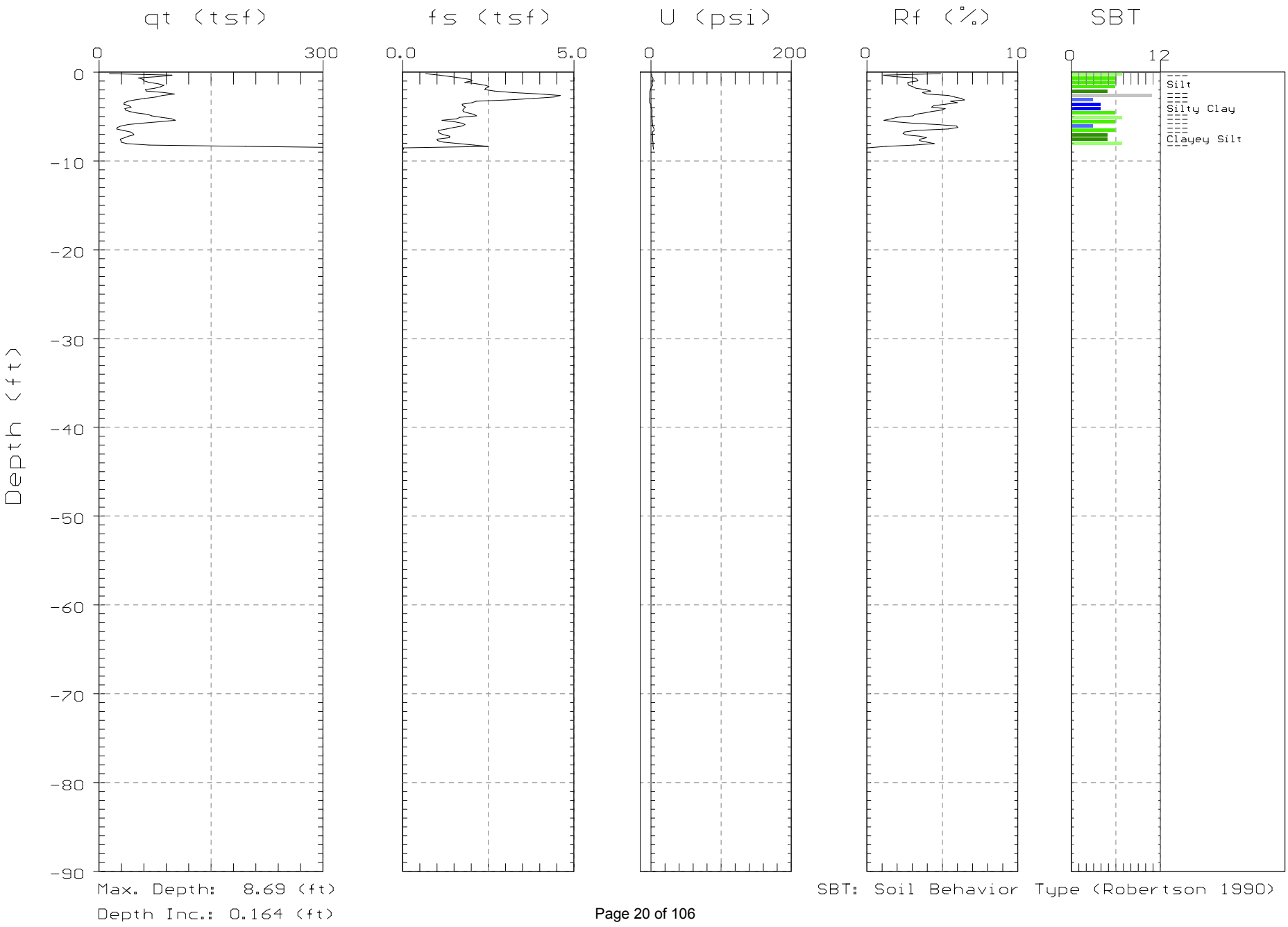
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165480.571E=1847652.112 Engineer: C.SAMS

Location: CPT-1317L=588.7 Date: 05/15/06 10:04



Max. Depth: 8.69 (ft)

Depth Inc.: 0.164 (ft)

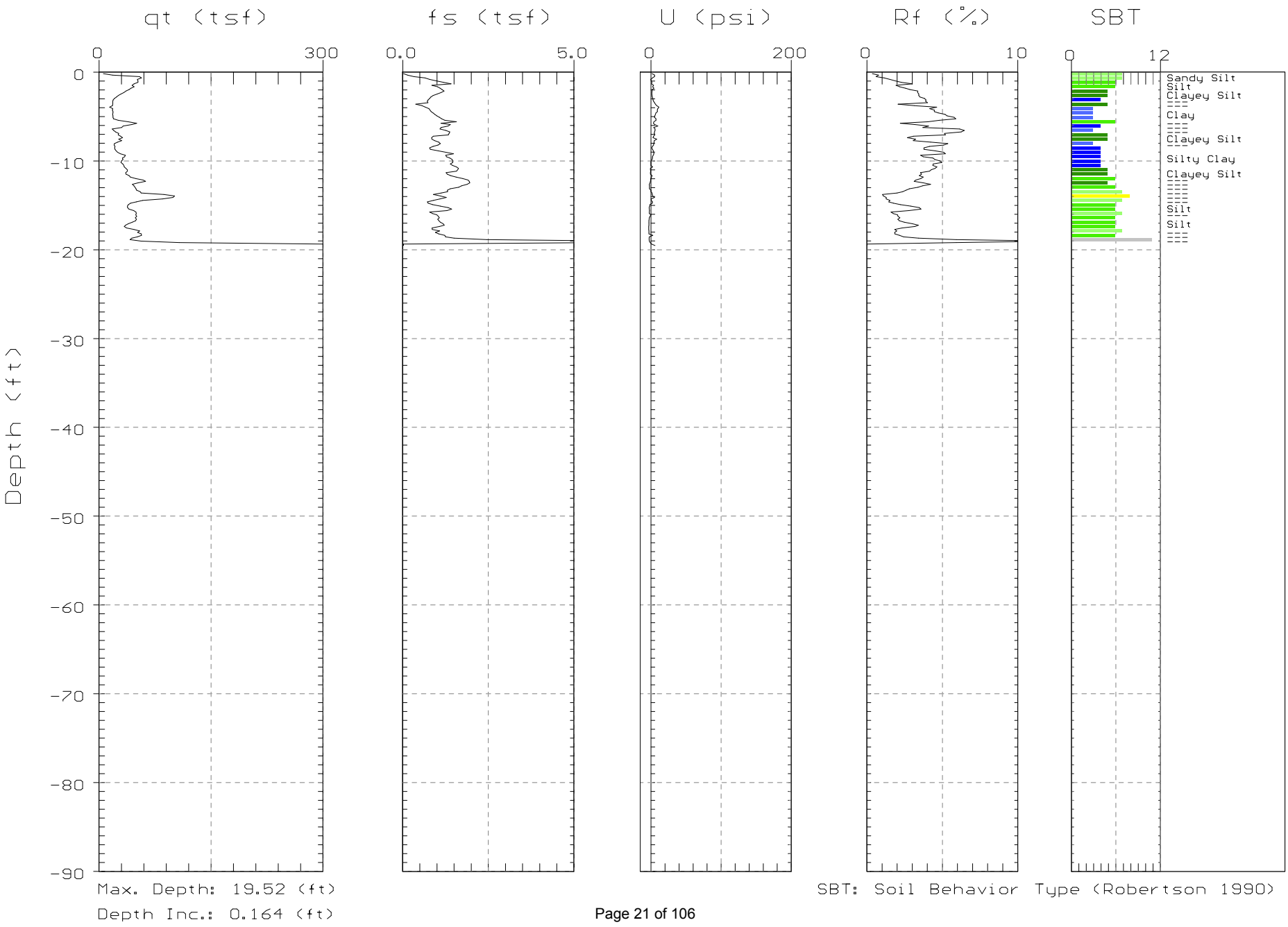
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165481.237E=1847632.773 Engineer: C.SAMS

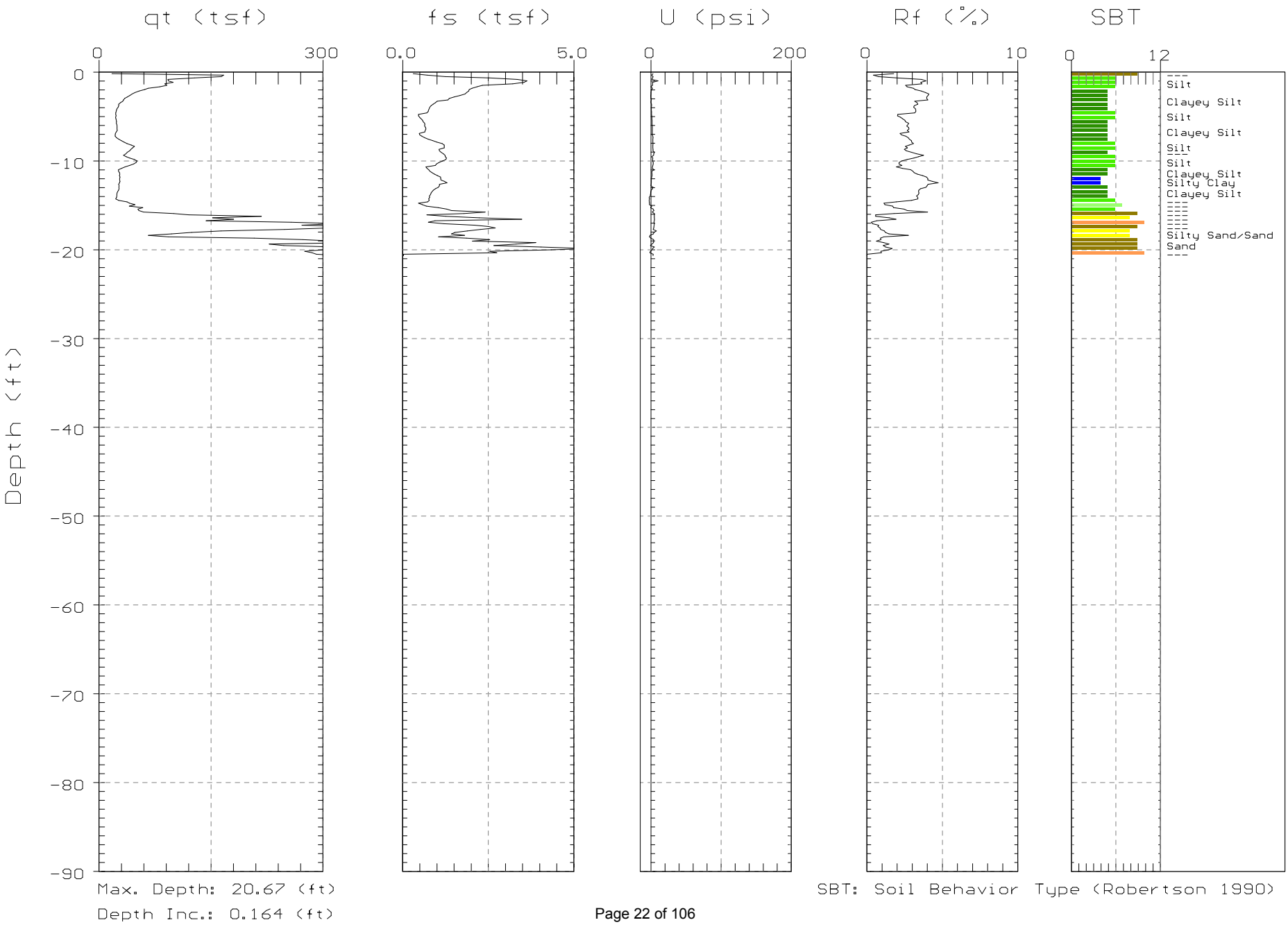
Location: CPT-1317aL=588.6 Date: 05/15/06 10:36



GREGG

MACTEC

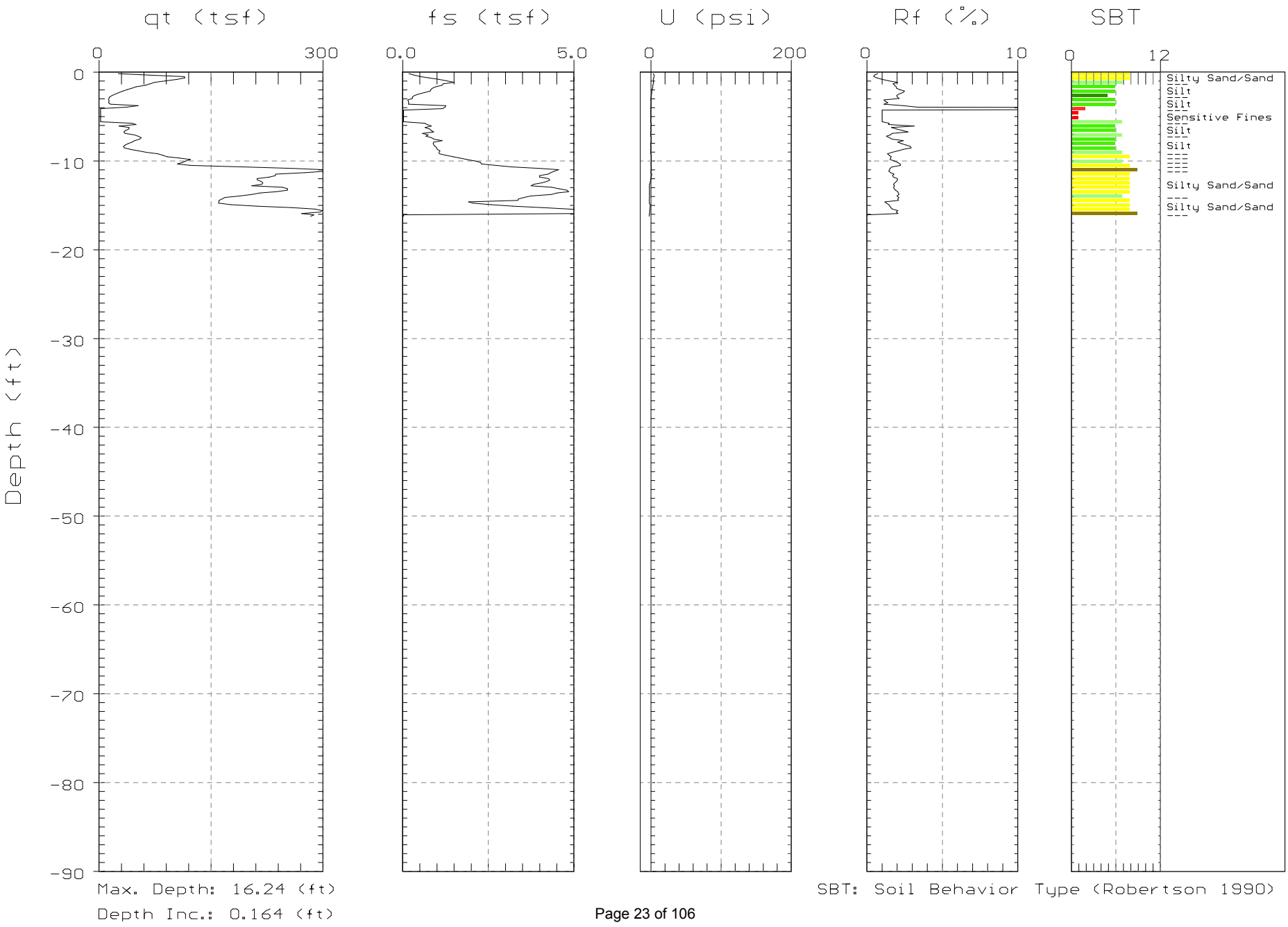
Site: N=1165497.097E=1847636.907 Engineer: C.SAMS
Location: CPT-1317bL=588.8 Date: 05/16/06 09:30



GREGG

MACTEC

Site: N=1167614.444E=1847587.31 Engineer: C.SAMS
Location: CPT-1318L=586.4 Date: 05/15/06 08:10

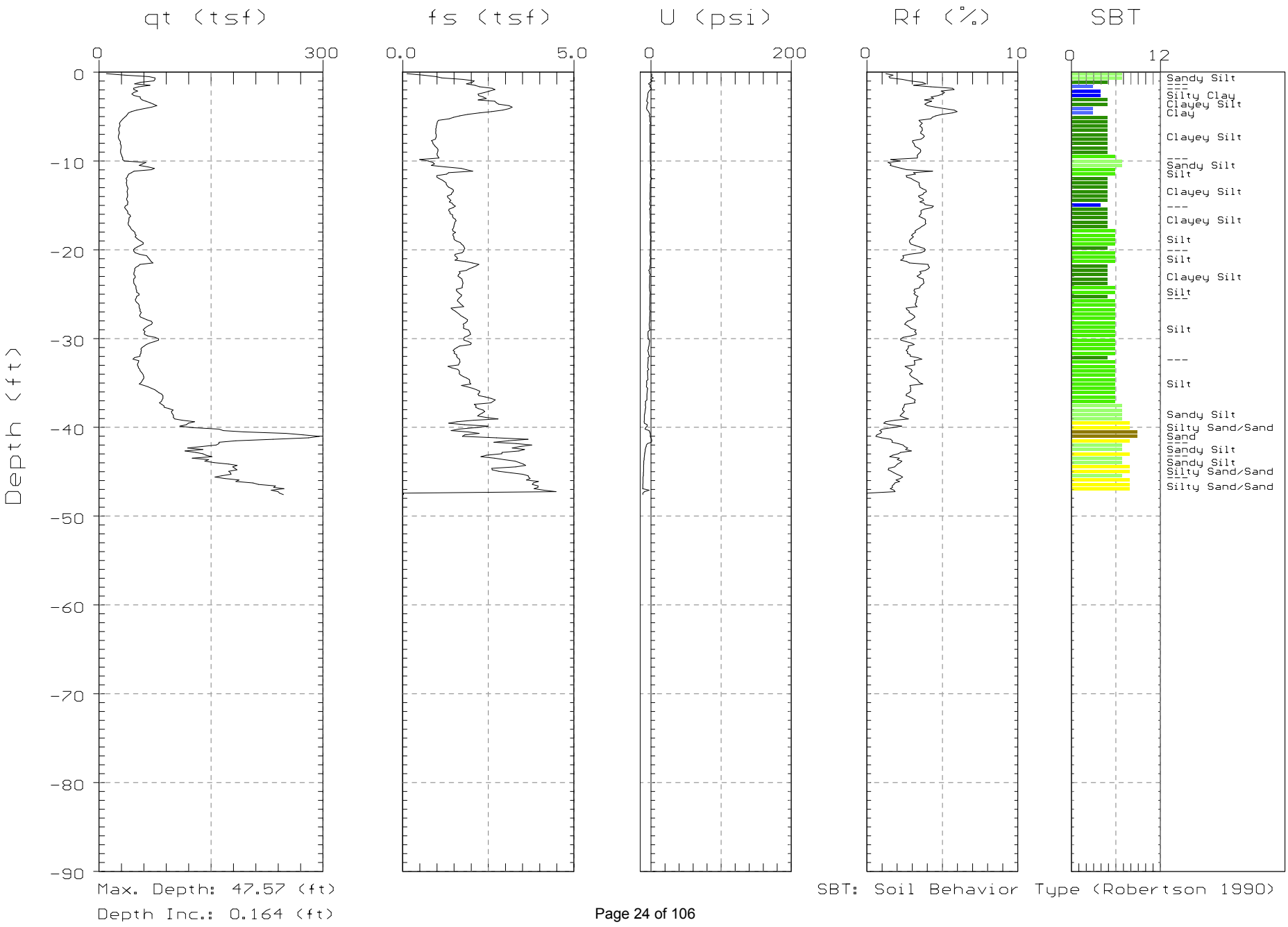


GREGG

MACTEC

Site: N=1167695.014E=1847778.705 Engineer: C.SAMS

Location: CPT-1319L=587.9 Date: 05/15/06 05:50



Max. Depth: 47.57 (ft)

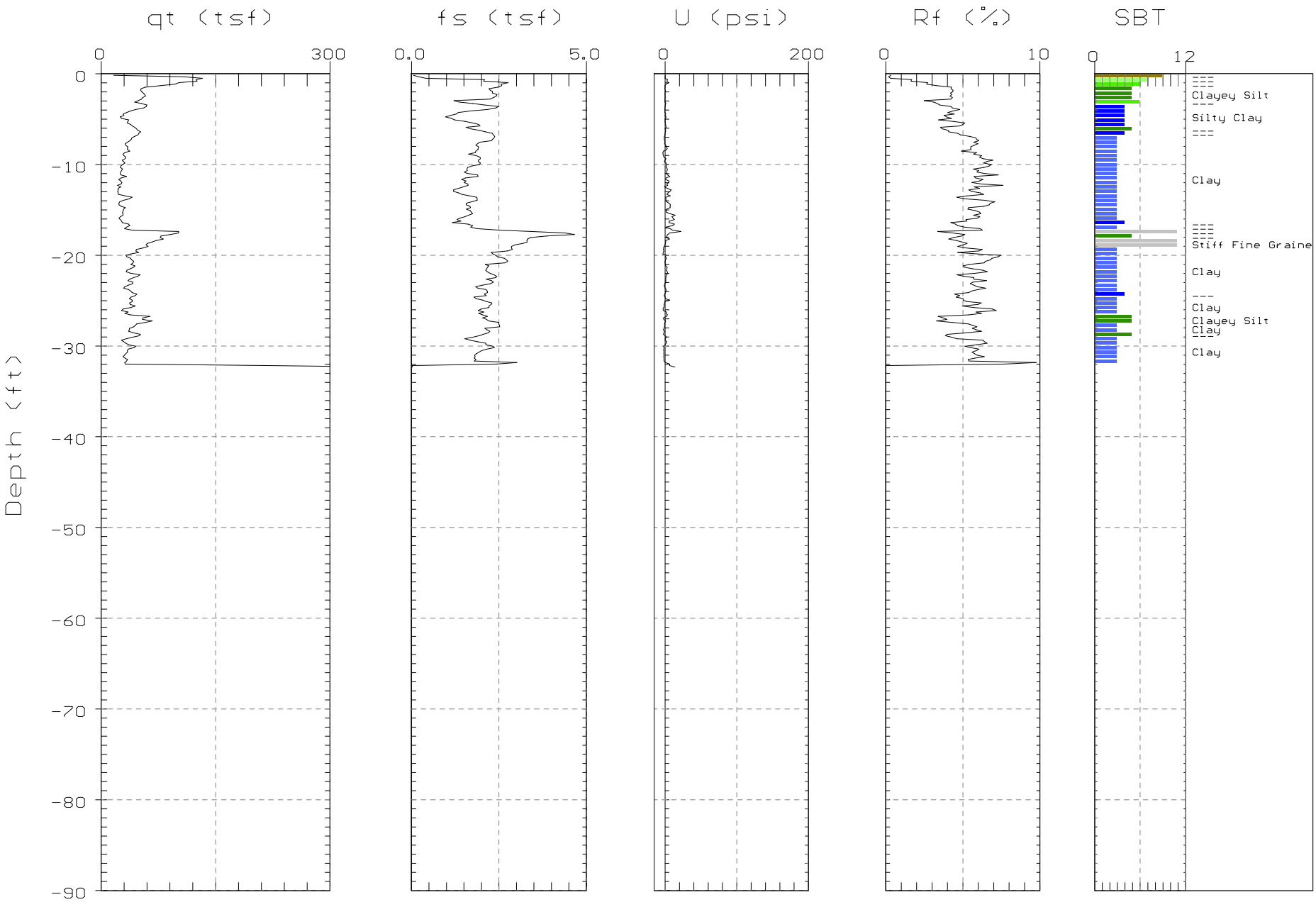
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1164809.635E=1847497.262 Engineer: C.SAMS
Location: CPT-1320L=604.9 Date: 08/20/06 08:56



Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)

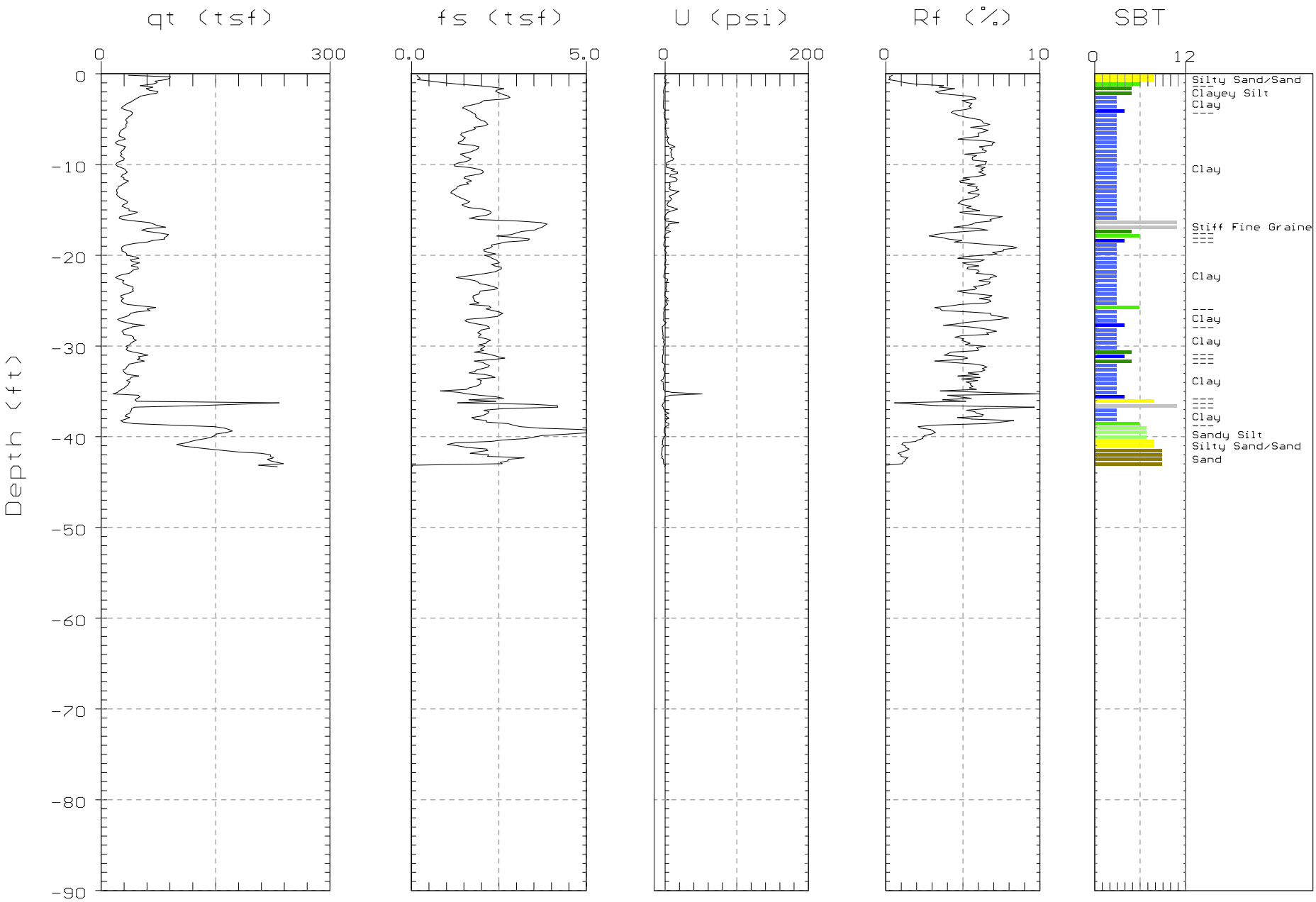
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1164802.258E=1847460.695 Engineer: C.SAMS

Location: CPT-1321L=604.9 Date: 08/20/06 10:17



Max. Depth: 43.31 (ft)

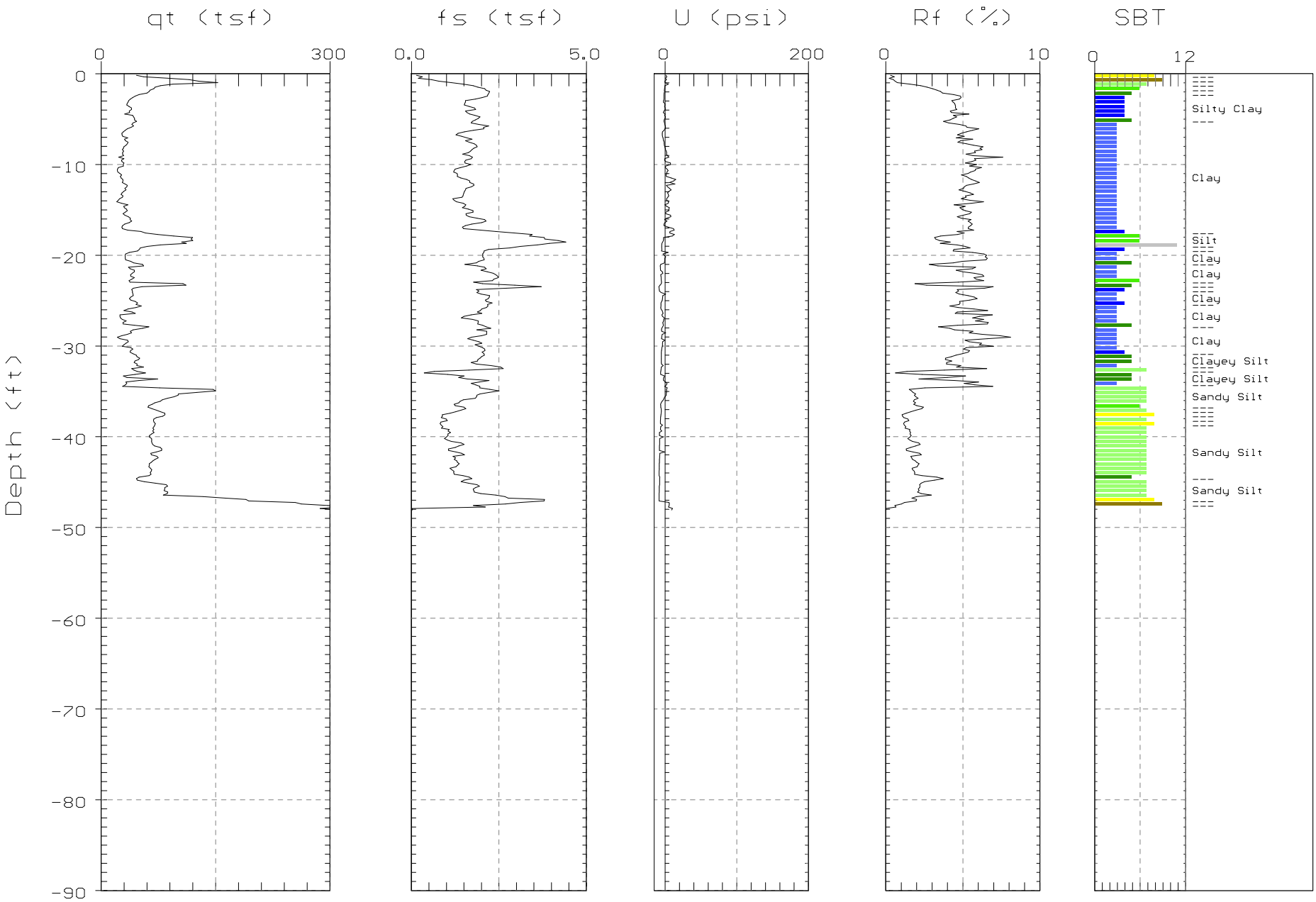
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1164794.98E=1847472.657 Engineer: C.SAMS
Location: CPT-1322L=605.2 Date: 08/20/06 07:01



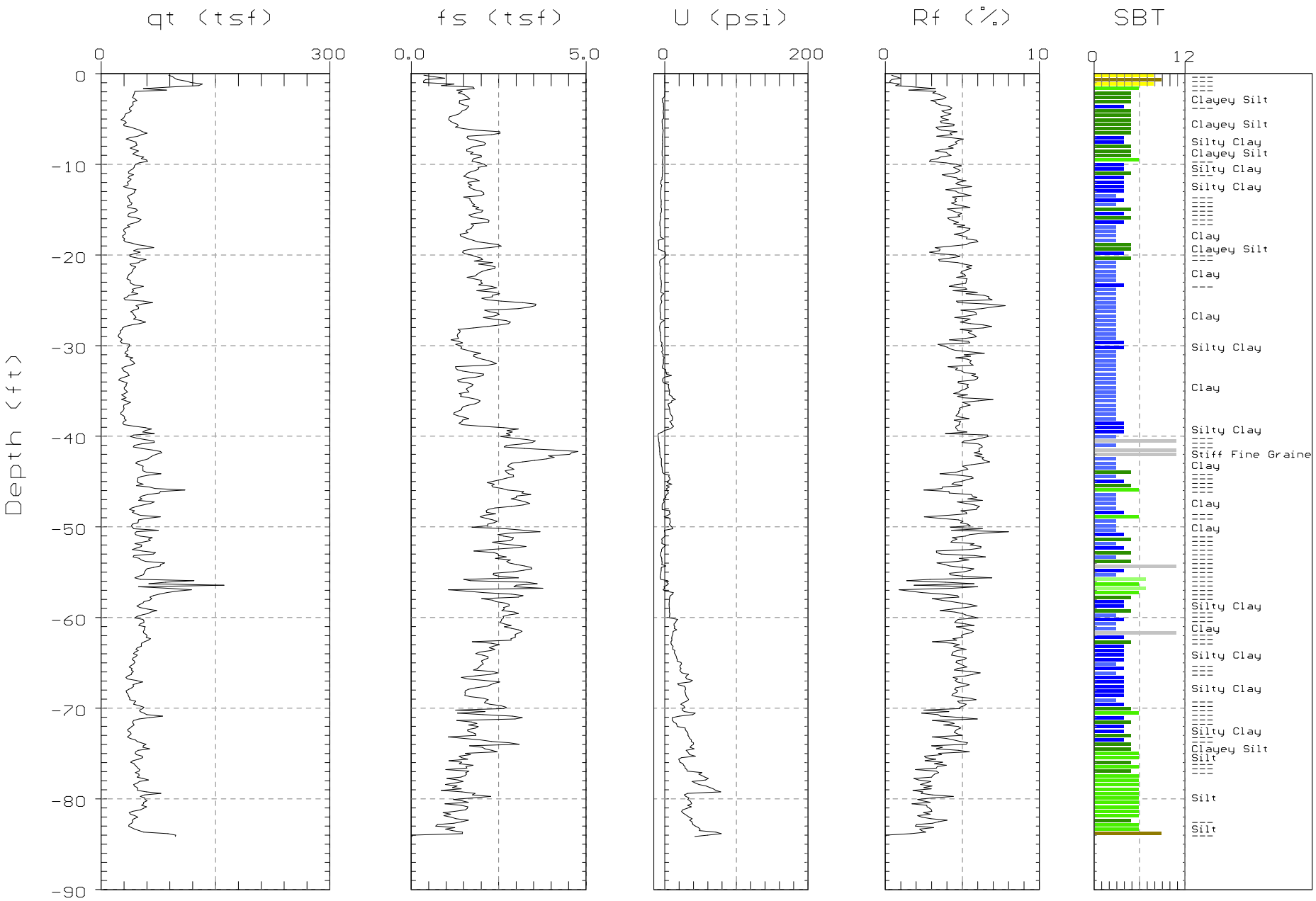
Max. Depth: 48.06 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165679.211E=1848305.418 Engineer: C.SAMS
Location: CPT-1323L=610.5 Date: 08/19/06 05:19



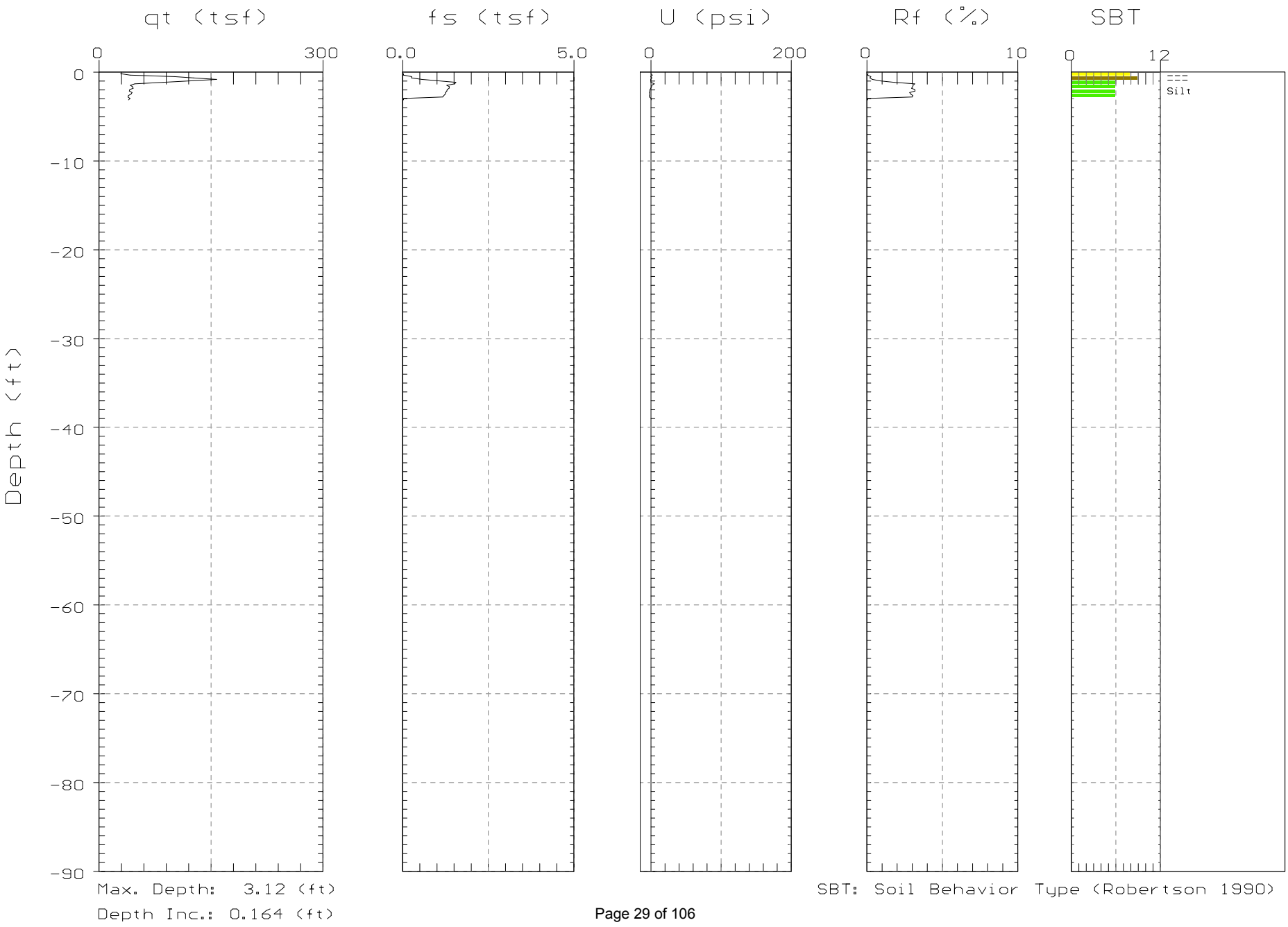
Max. Depth: 84.15 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

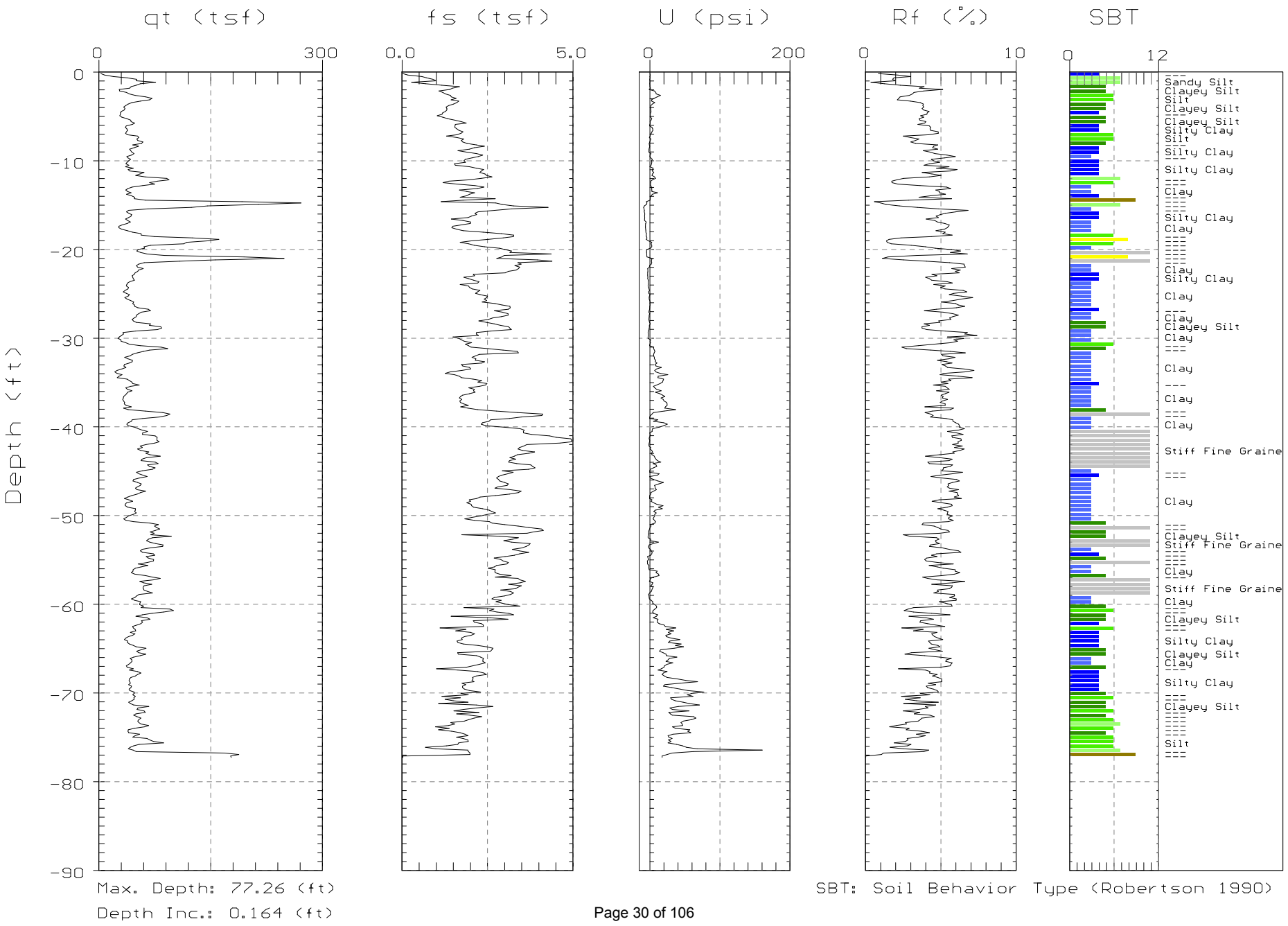
Site: N=1165733.296E=1848334.24 Engineer: C.SAMS
Location: CPT-1324L=610.2 Date: 08/19/06 08:43



GREGG

MACTEC

Site: N=1165733.296E=1848334.24 Engineer: C.SAMS
Location: CPT-1324BL=610.2 Date: 08/19/06 09:02



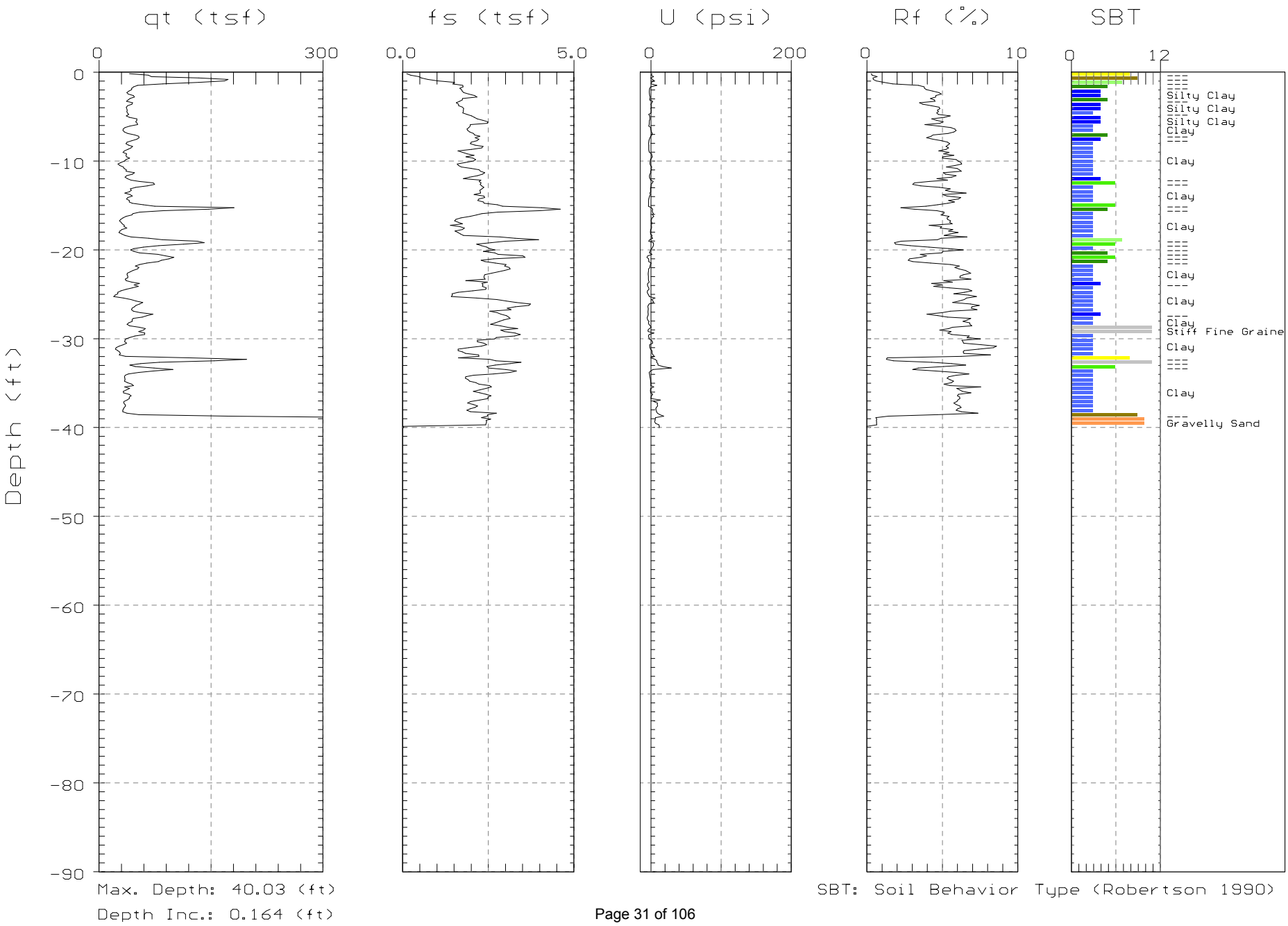
Max. Depth: 77.26 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165730.729E=1848273.937 Engineer: C.SAMS
Location: CPT-1325L=610.3 Date: 08/19/06 11:35



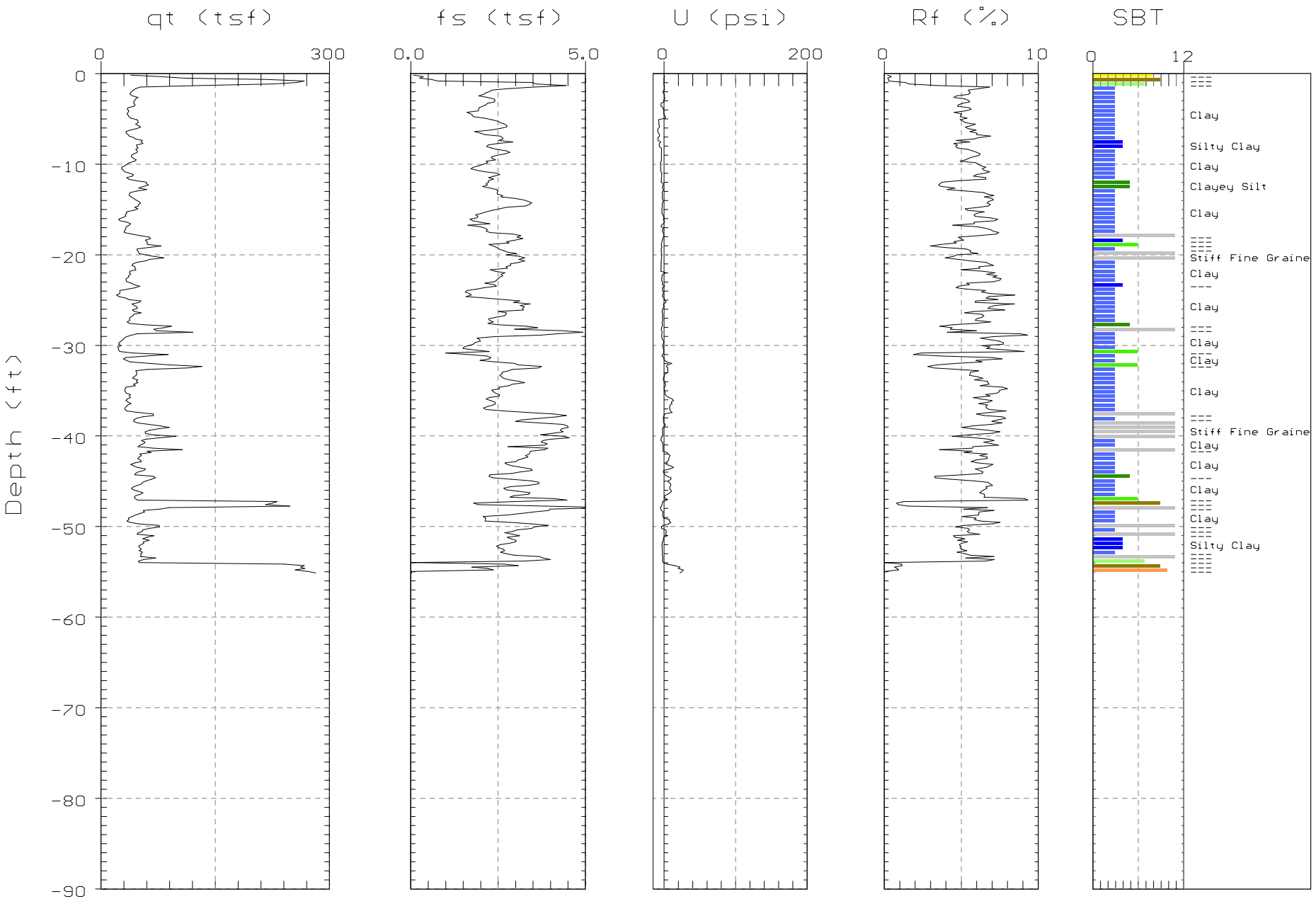
Max. Depth: 40.03 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165728.968E=1848272.952 Engineer: C.SAMS
Location: CPT-1325AL=610.1 Date: 08/19/06 12:39



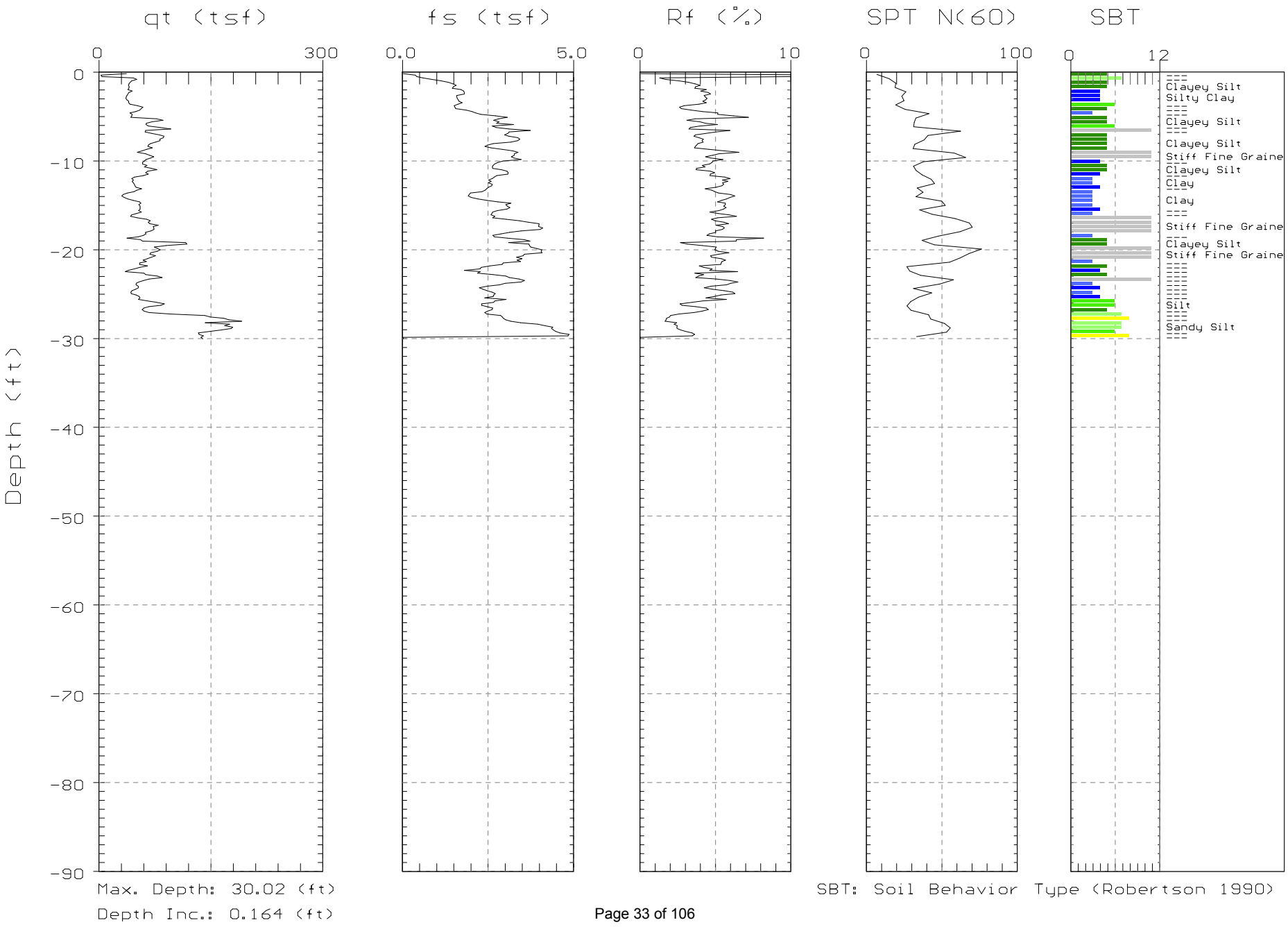
Max. Depth: 55.12 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165285.875E=1845003.07 Engineer: C.SAMS
Location: CPT-1300L=609.2 Date: 05:12:06 06:35



Max. Depth: 30.02 (ft)
Depth Inc.: 0.164 (ft)

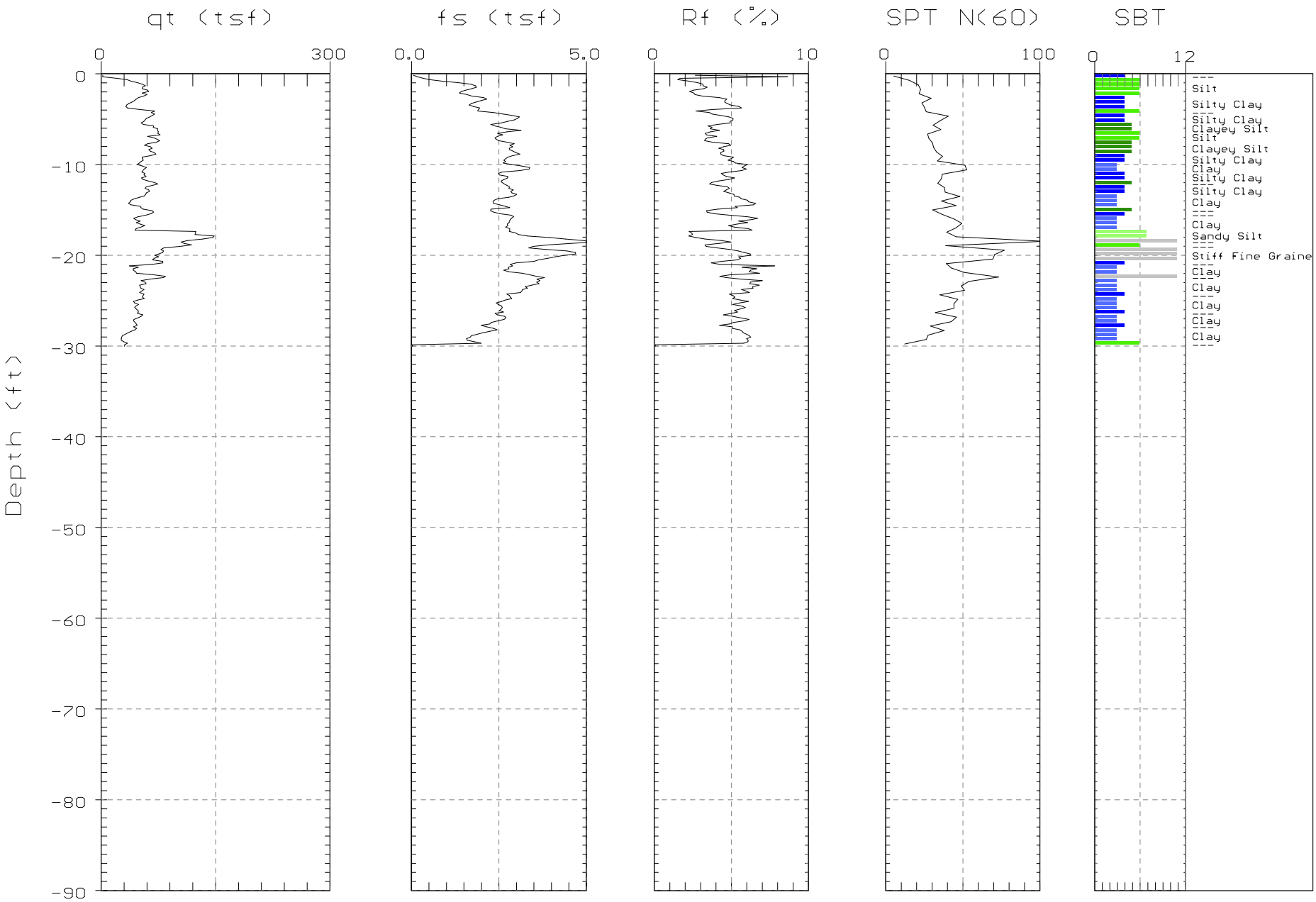
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1164894.228E=1845085.762 Engineer: C.SAMS

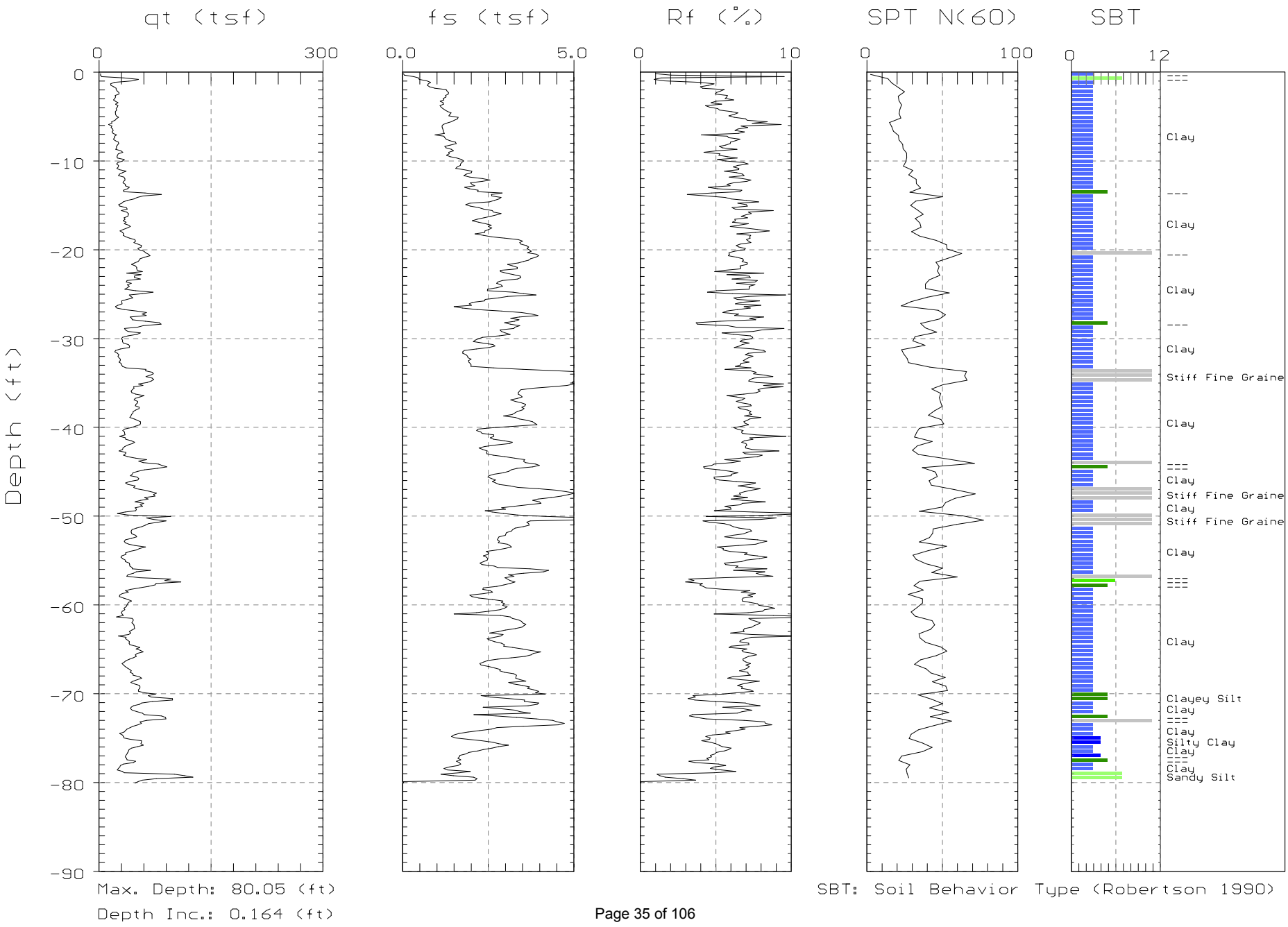
Location: CPT-1301L=609.8 Date: 05/11/06 14:37



GREGG

MACTEC

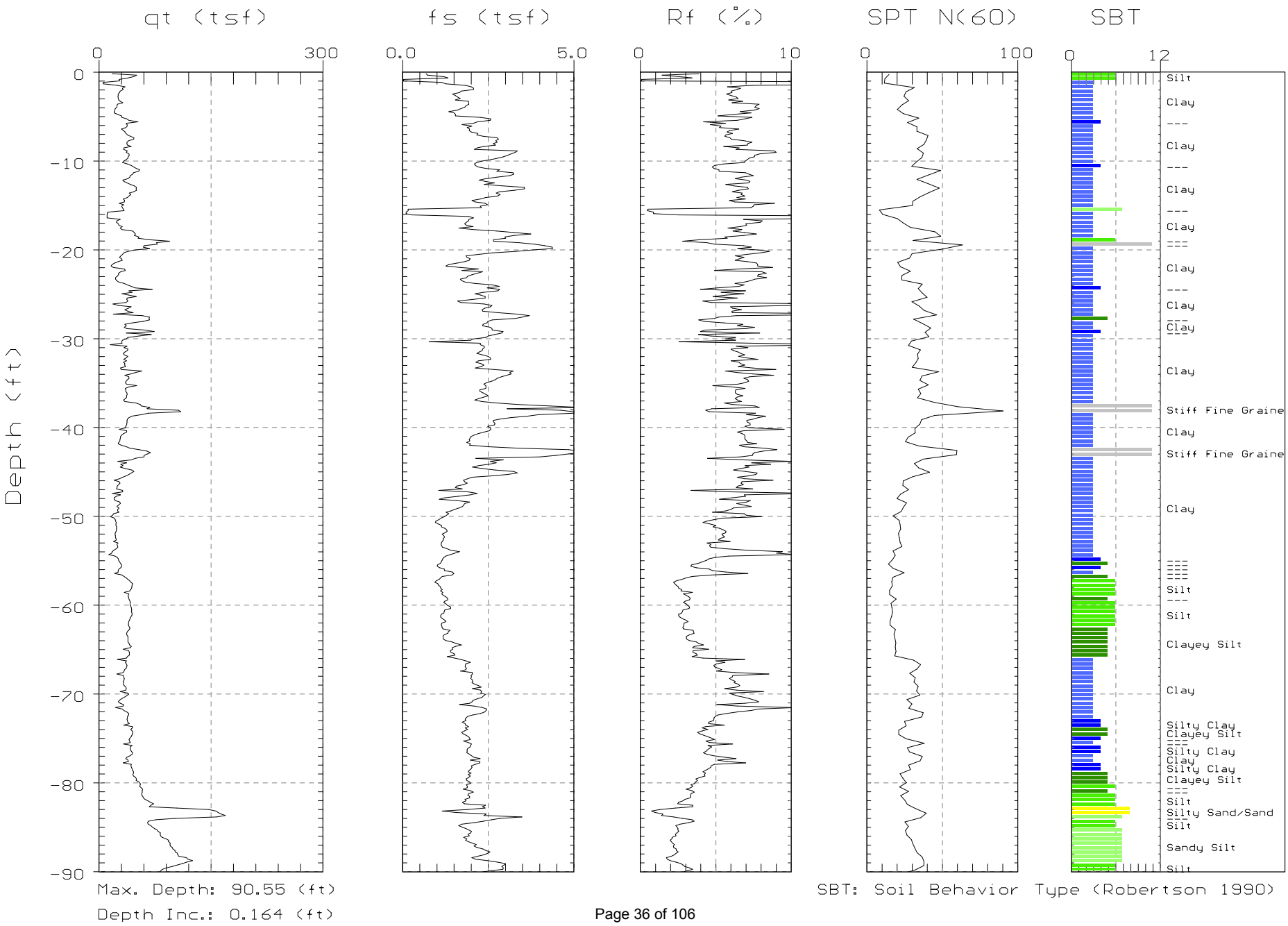
Site: N=1166124.625E=1848040.224 Engineer: C.SAMS
Location: CPT-1302L=609.3 Date: 05/12/06 11:13



GREGG

MACTEC

Site: N=1165582.495E=1848103.244 Engineer: C.SAMS
Location: CPT-1303L=609.6 Date: 05/13/06 08:30



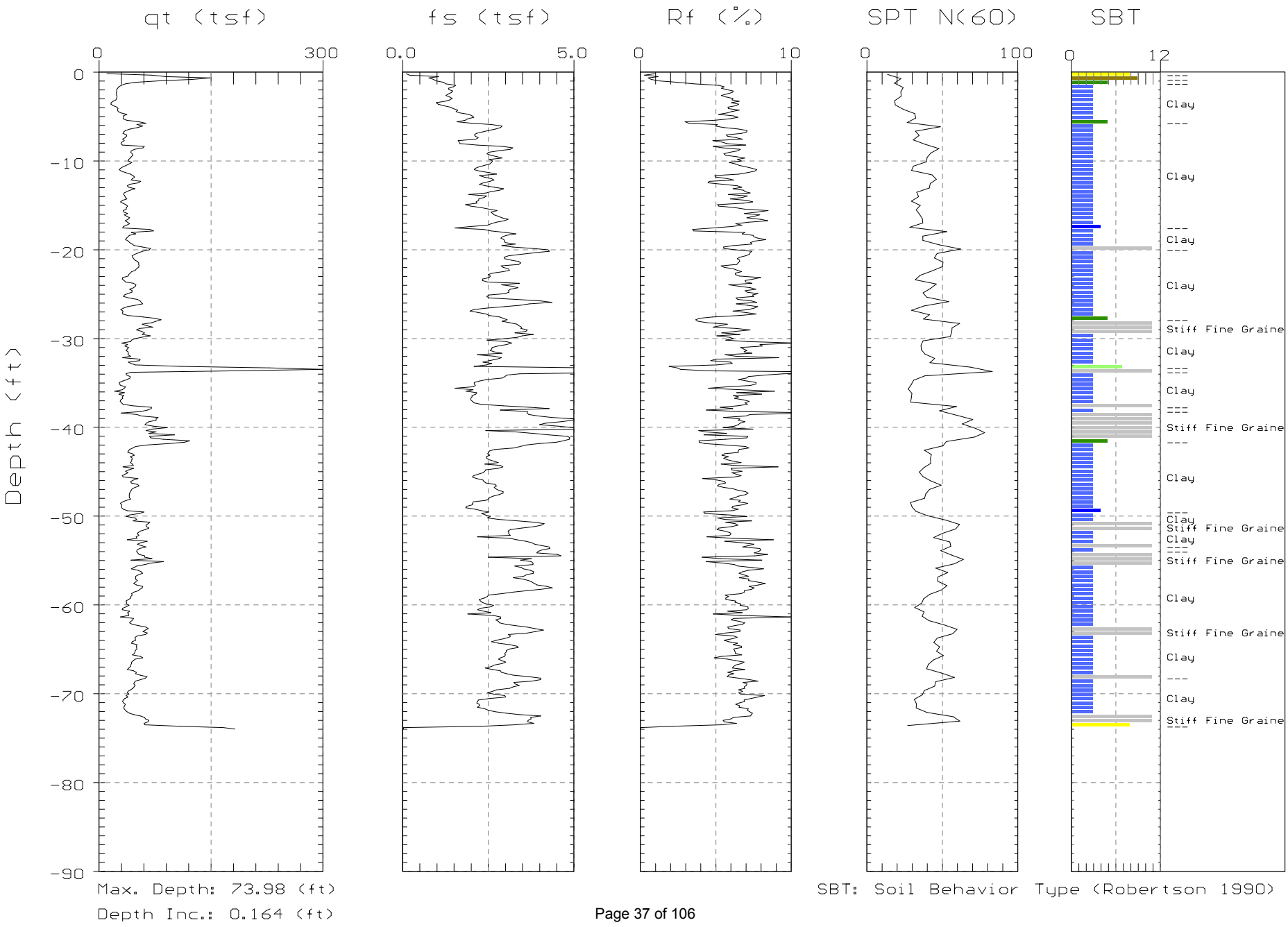
Max. Depth: 90.55 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

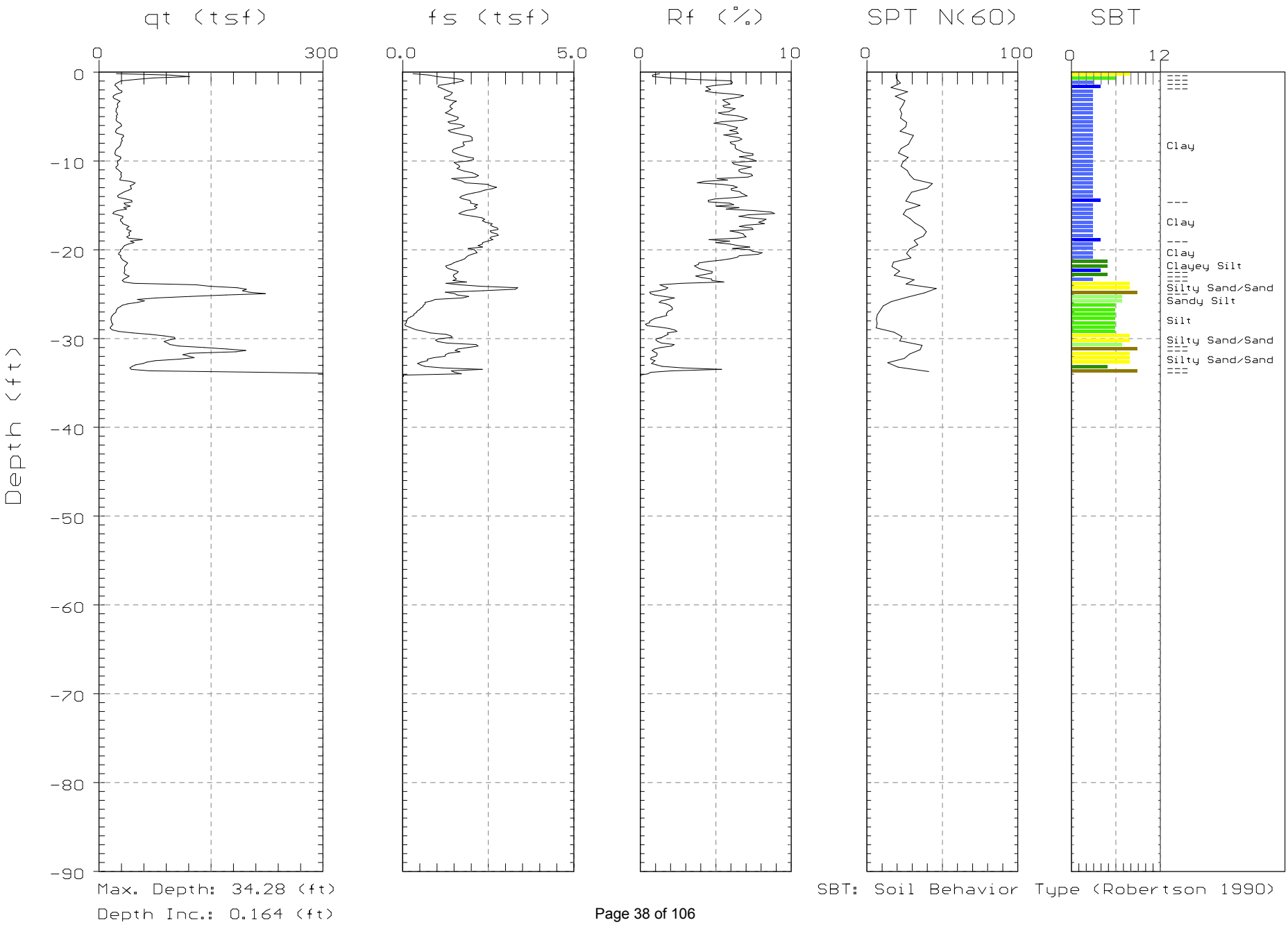
Site: N=1165892.587E=1848181.888 Engineer: C.SAMS
Location: CPT-1304L=609.8 Date: 05/12/06 13:23



GREGG

MACTEC

Site: N=1164732.401E=1847452.326 Engineer: C.SAMS
Location: CPT-1305L=603.7 Date: 05/12/06 08:29

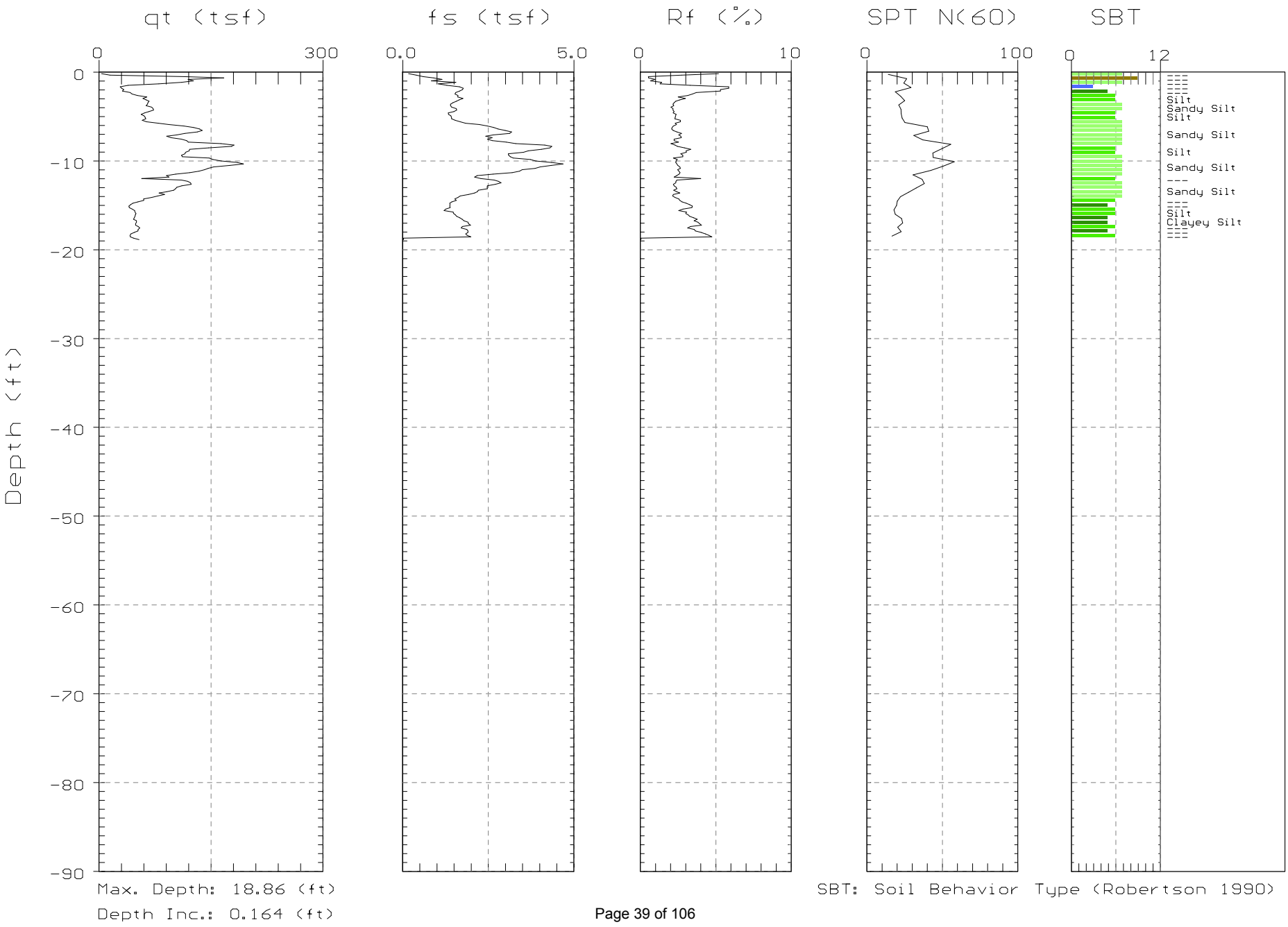


GREGG

MACTEC

Site: N=1164174.233E=1847132.668 Engineer: C.SAMS

Location: CPT-1306L=604.3 Date: 05/12/06 09:37

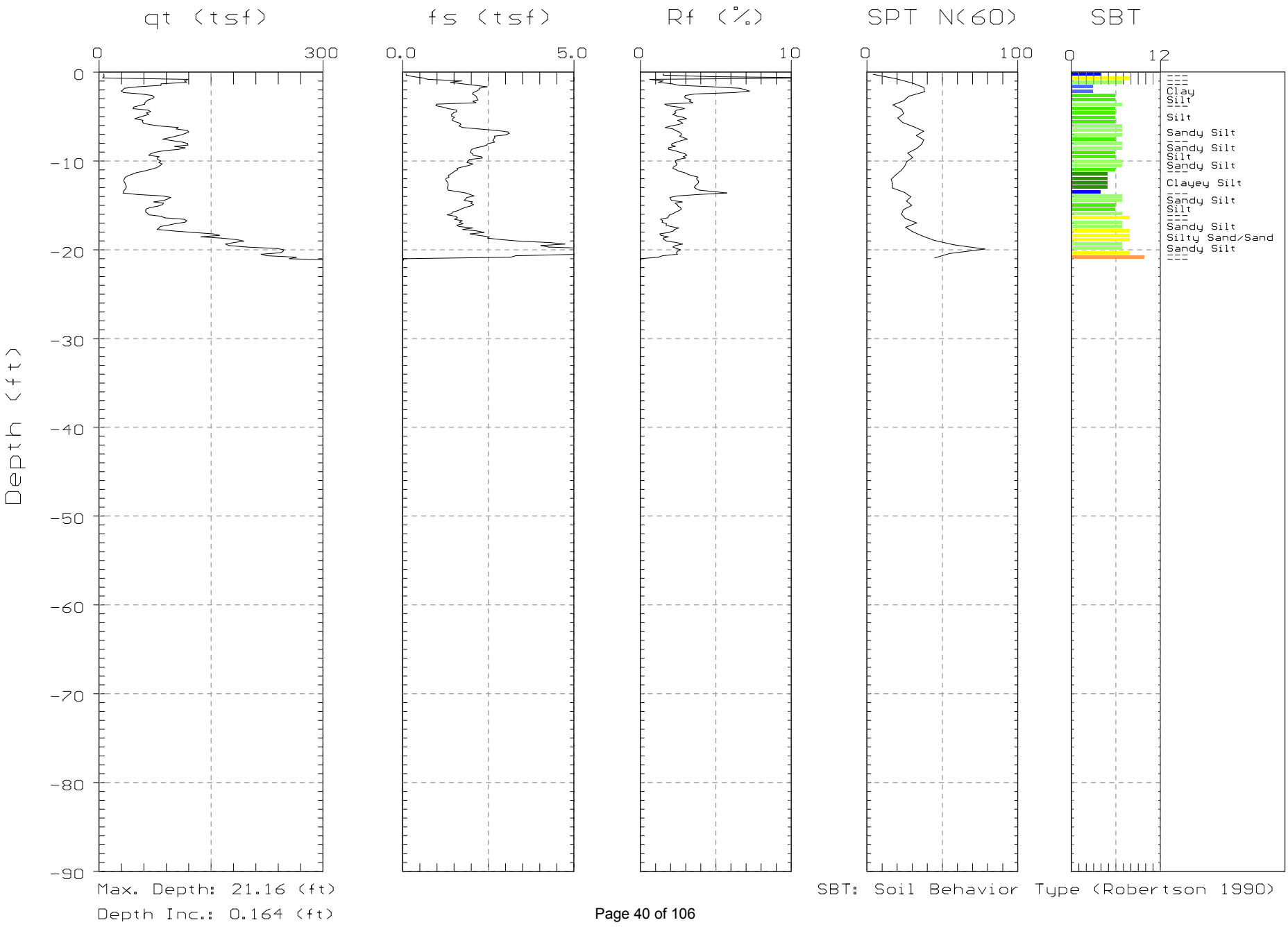


GREGG

MACTEC

Site: N=1164172.987E=1847128.893 Engineer: C.SAMS

Location: CPT-1306AL=604.3 Date: 05/12/06 10:09

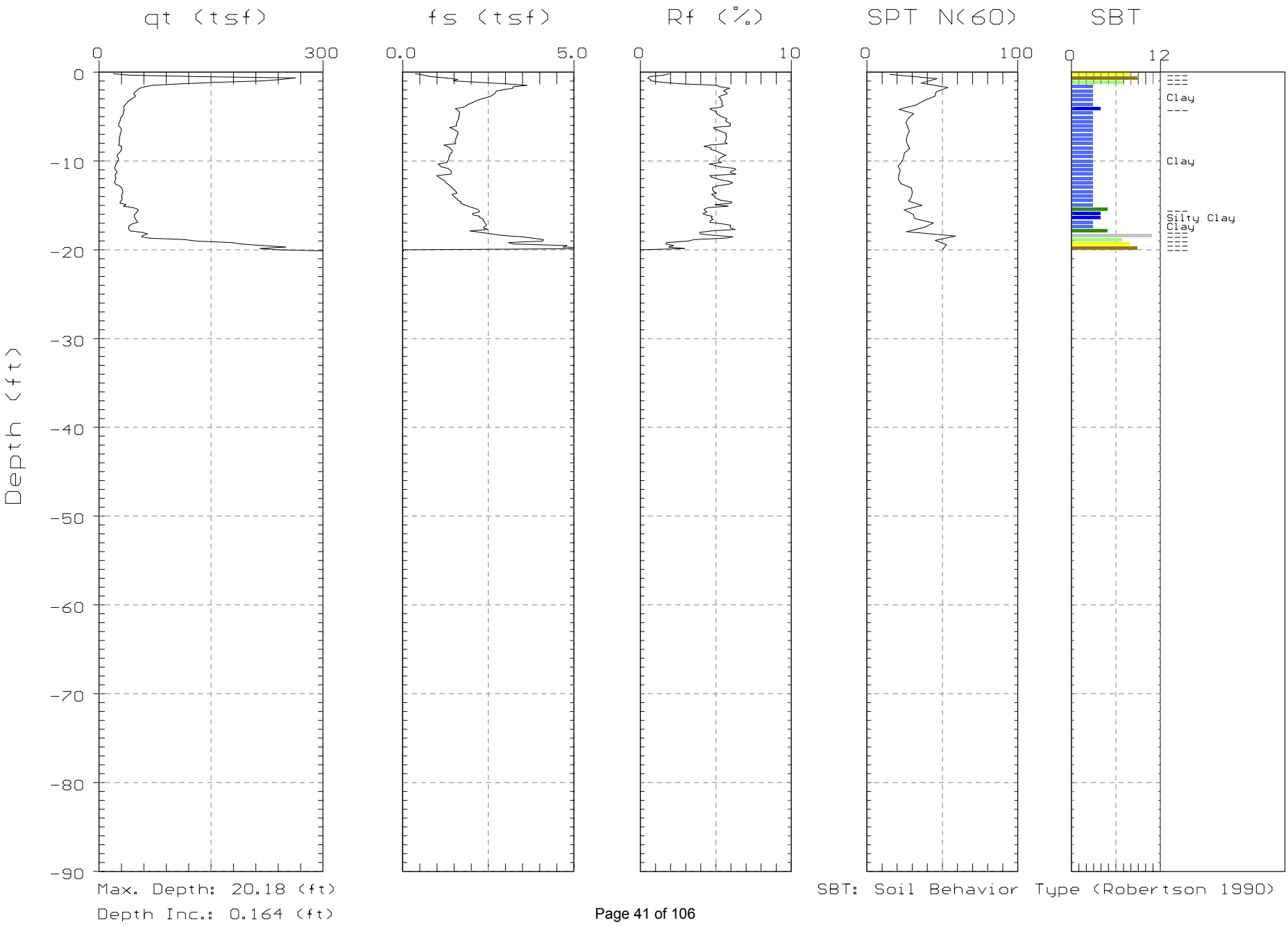


GREGG

MACTEC

Site: N=1166393.067E=1847138.502 Engineer: C.SAMS

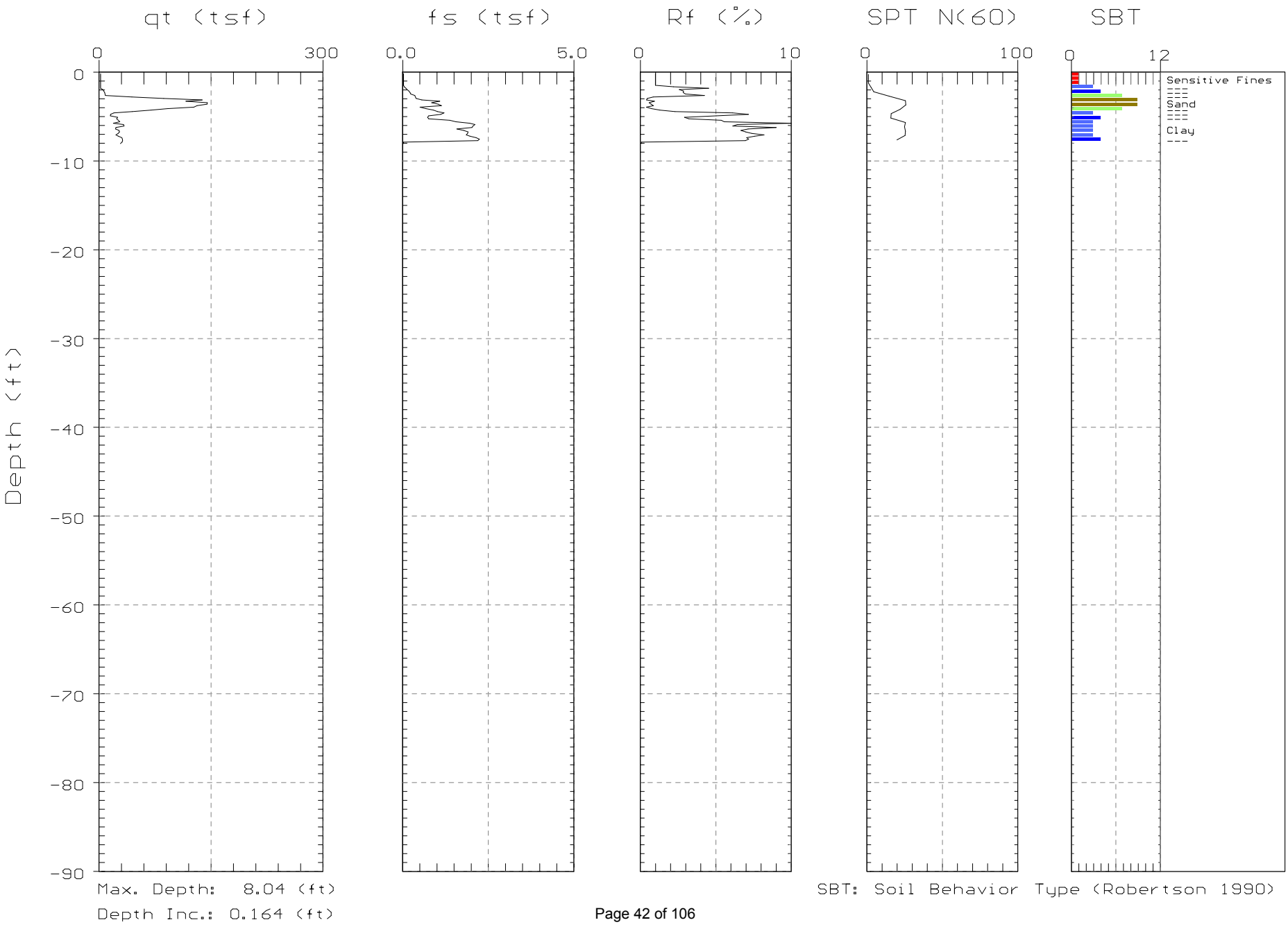
Location: CPT-1307L=589.8 Date: 05/16/06 08:51



GREGG

MACTEC

Site: N=1166994.842E=1844214.37 Engineer: C.SAMS
Location: CPT-1308L=538.0 Date: 05/13/06 11:57

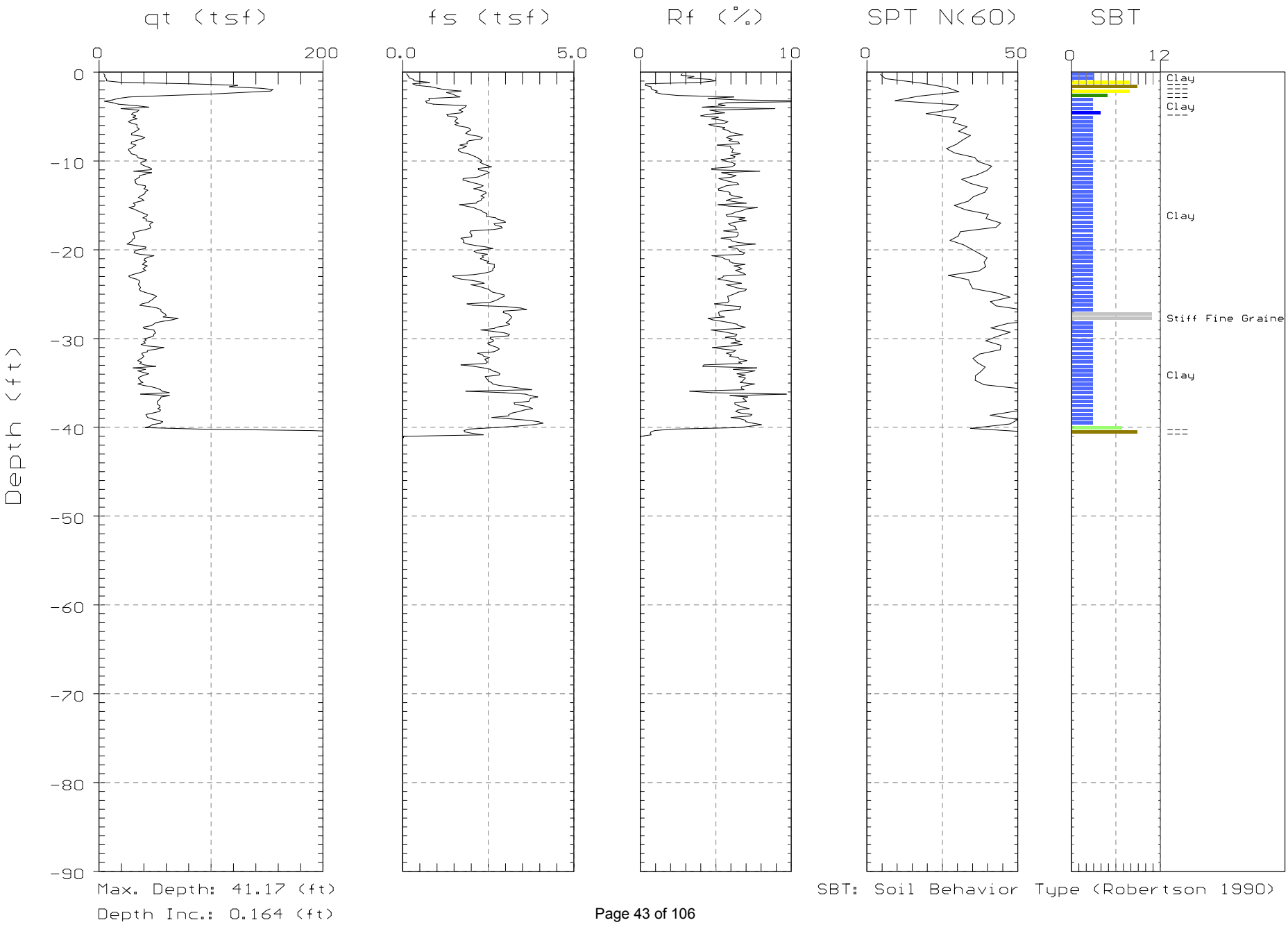


GREGG

MACTEC

Site: N=1167001.502E=1844206.906 Engineer: C.SAMS

Location: CPT-1308AL=538.0 Date: 05/14/06 05:56

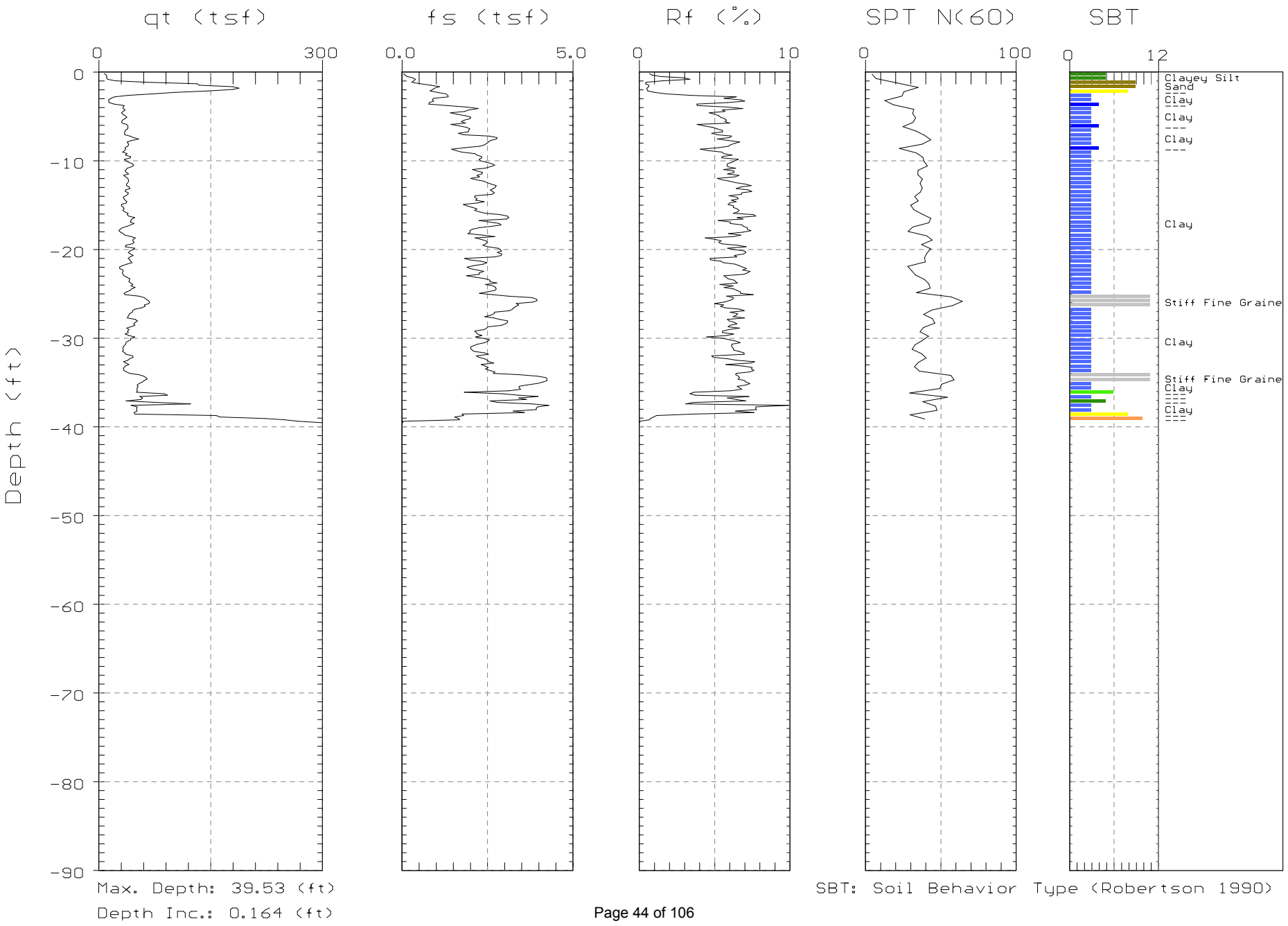


GREGG

MACTEC

Site: N=1167008.152E=1844199.436 Engineer: C.SAMS

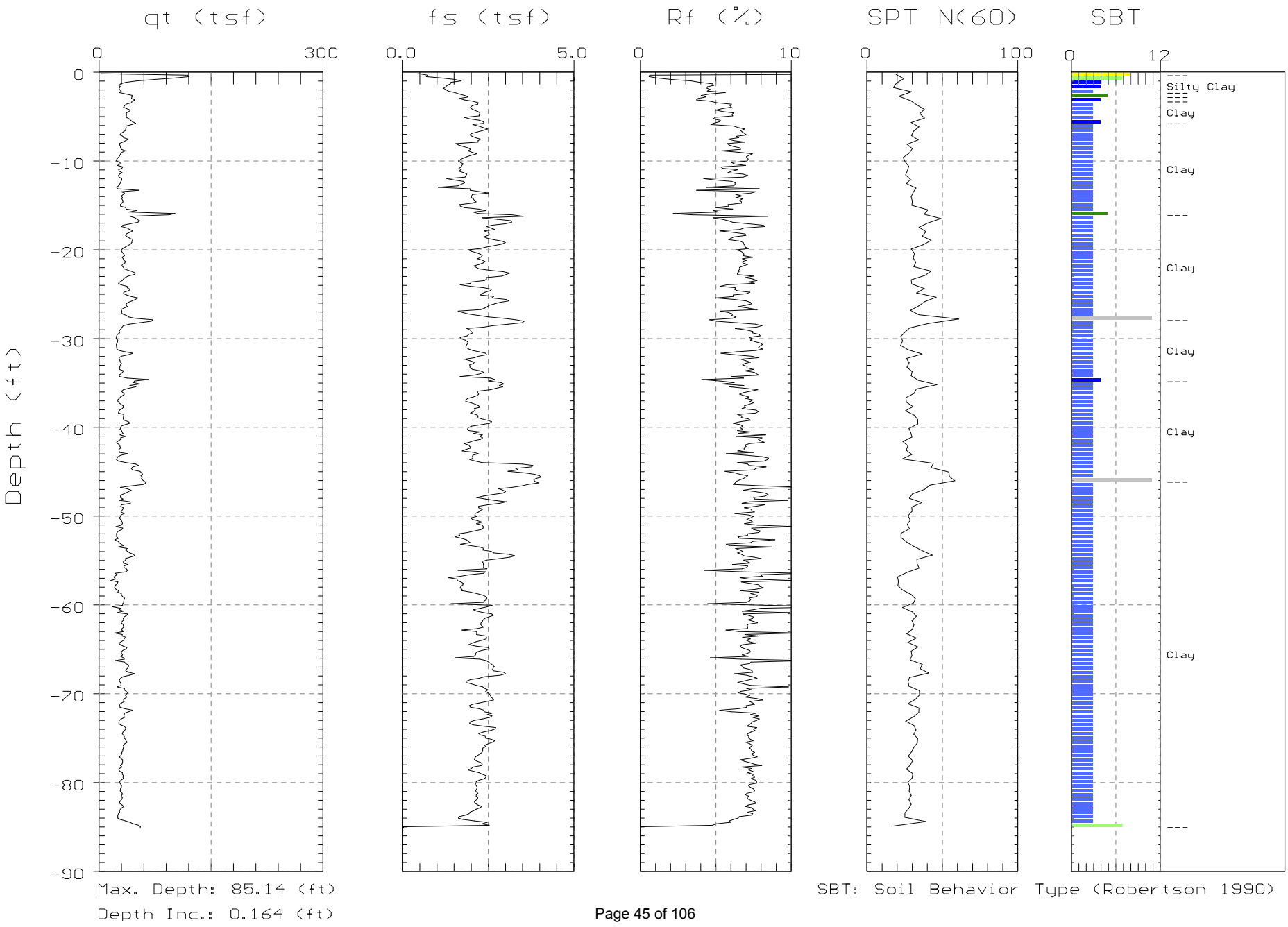
Location: CPT-1308BL=538.0 Date: 05/16/06 06:35



GREGG

MACTEC

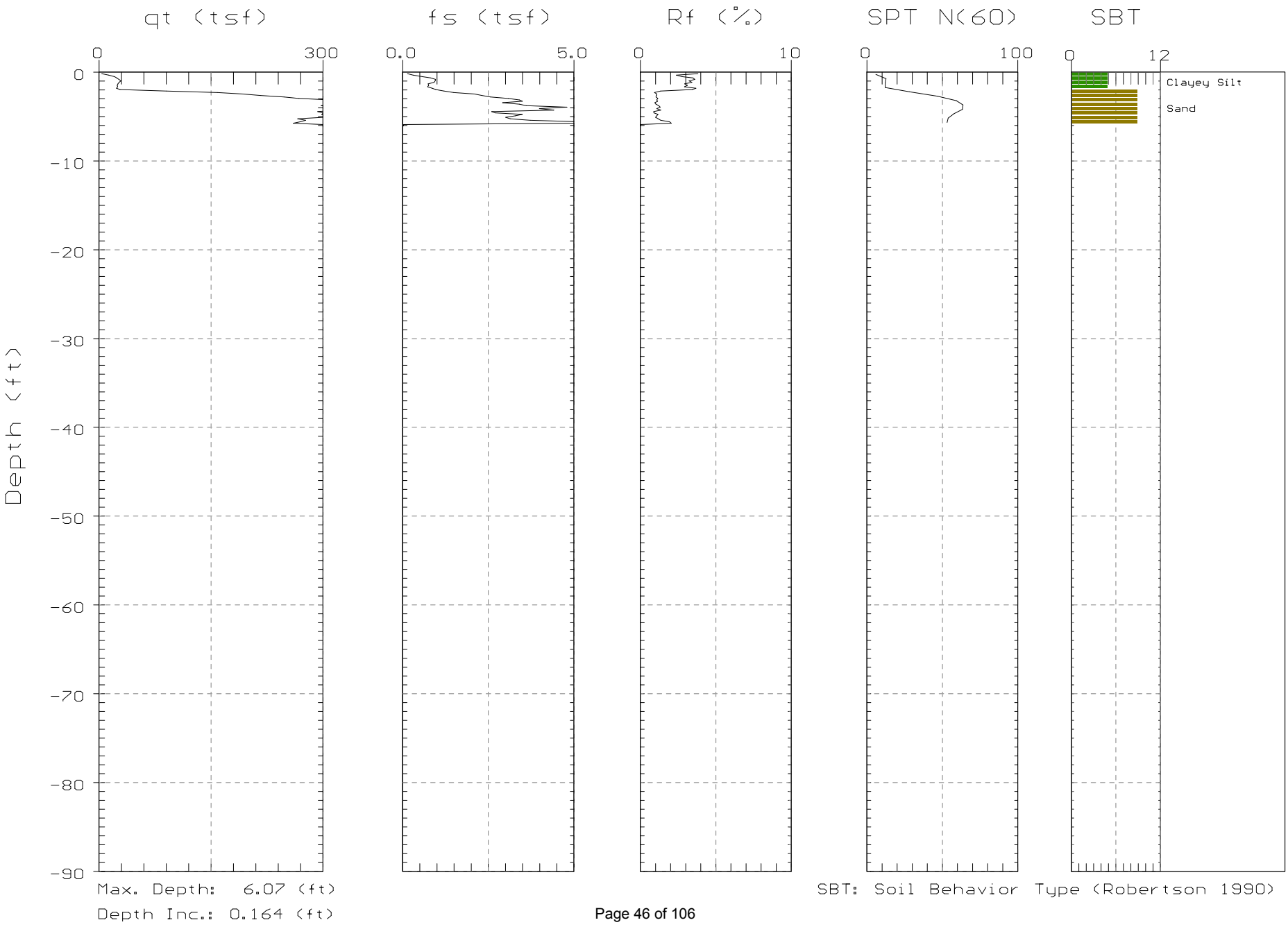
Site: N=1166860.56E=1844074.211 Engineer: C.SAMS
Location: CPT-1309L=591.0 Date: 05/14/06 10:04



GREGG

MACTEC

Site: N=1164932.132E=1846220.577 Engineer: C.SAMS
Location: CPT-1314L=590.0 Date: 05/15/06 13:37



Max. Depth: 6.07 (ft)
Depth Inc.: 0.164 (ft)

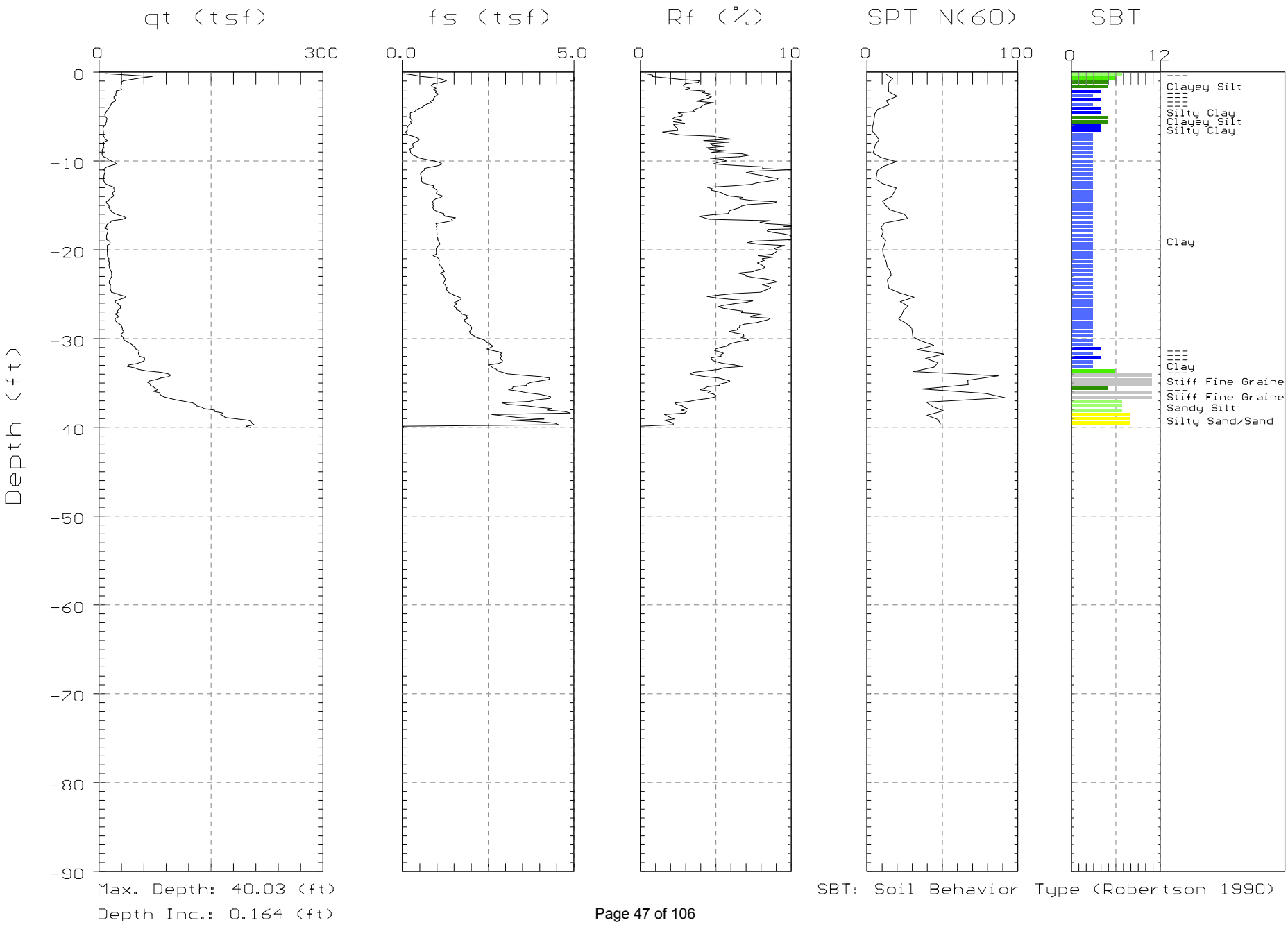
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165032.071E=1846589.827 Engineer: C.SAMS

Location: CPT-1315L=586.9 Date: 05/15/06 12:48



Max. Depth: 40.03 (ft)

Depth Inc.: 0.164 (ft)

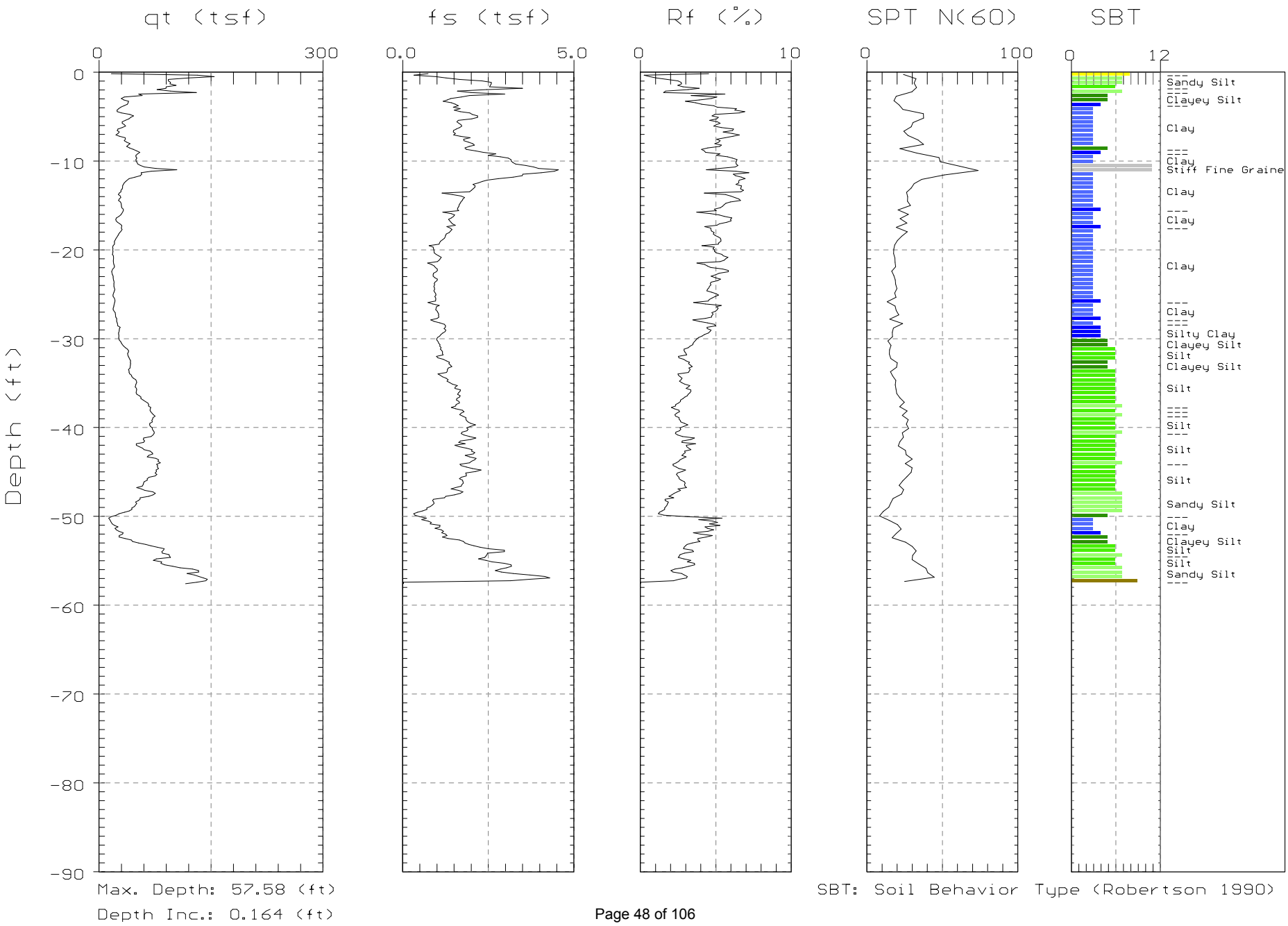
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165442.267E=1847364.975 Engineer: C.SAMS

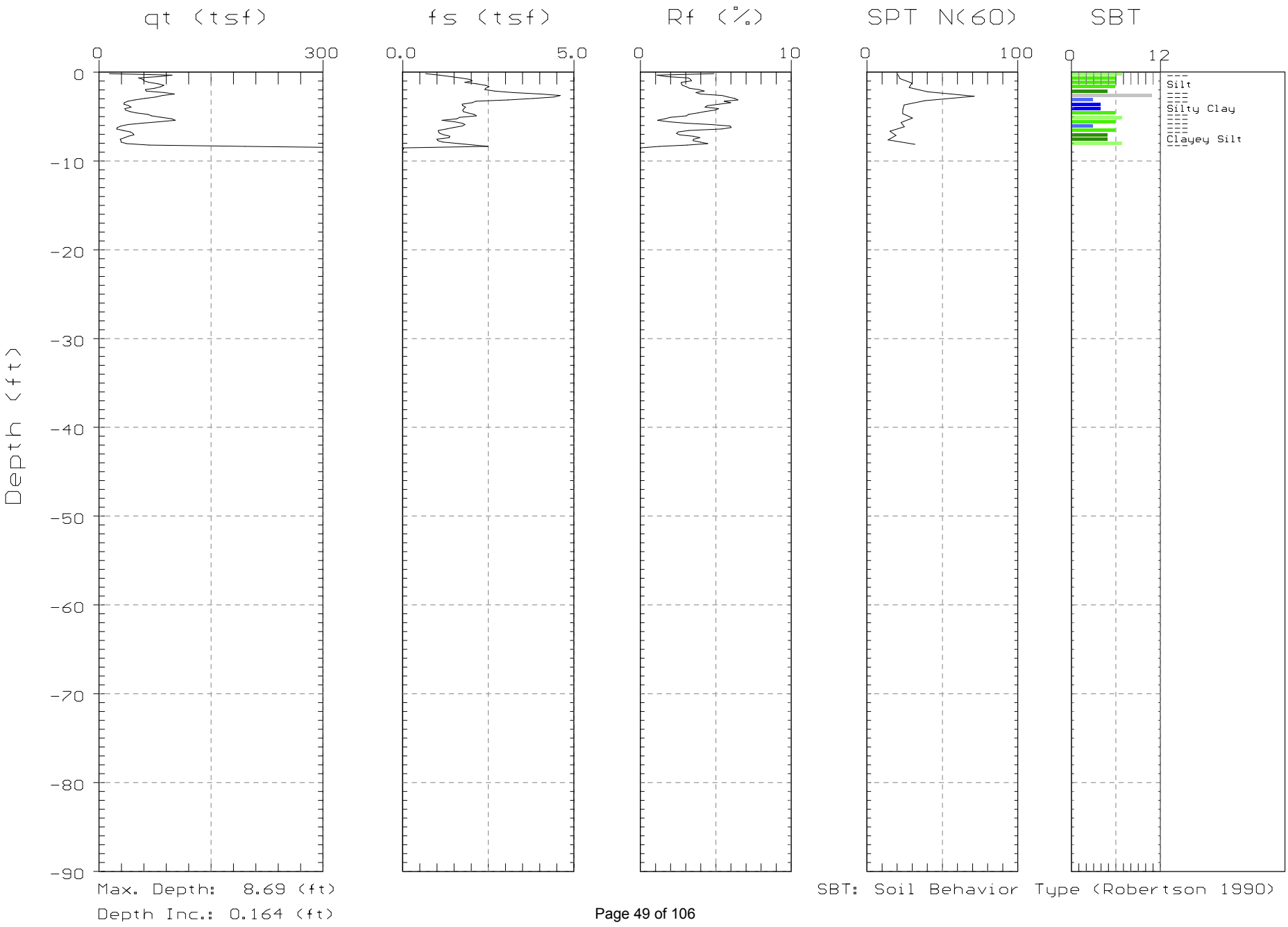
Location: CPT-1316L=589.6 Date: 05/15/06 11:15



GREGG

MACTEC

Site: N=1165480.571E=1847652.112 Engineer: C.SAMS
Location: CPT-1317L=588.7 Date: 05/15/06 10:04

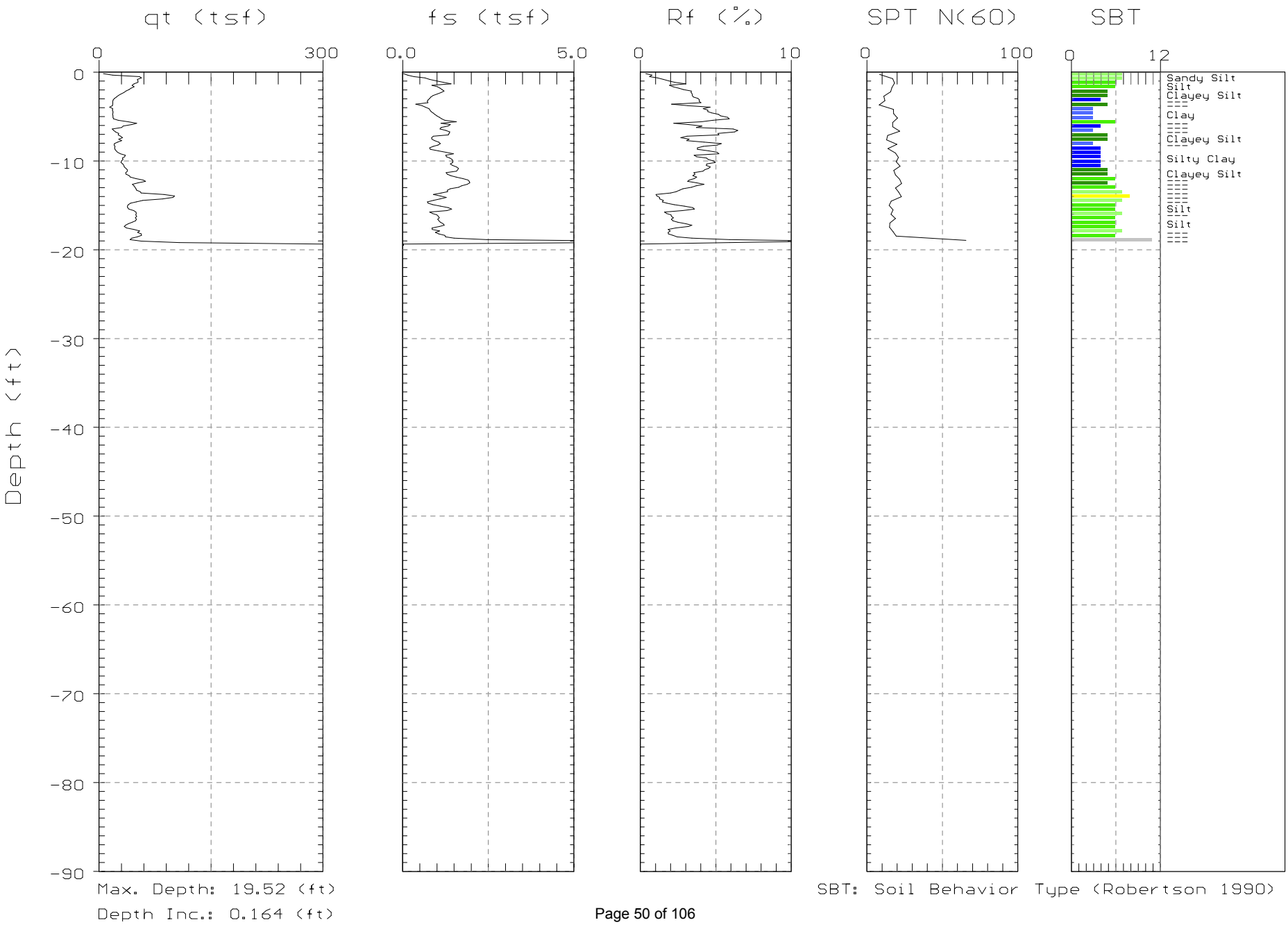


GREGG

MACTEC

Site: N=1165481.237E=1847632.773 Engineer: C.SAMS

Location: CPT-1317aL=588.6 Date: 05/15/06 10:36

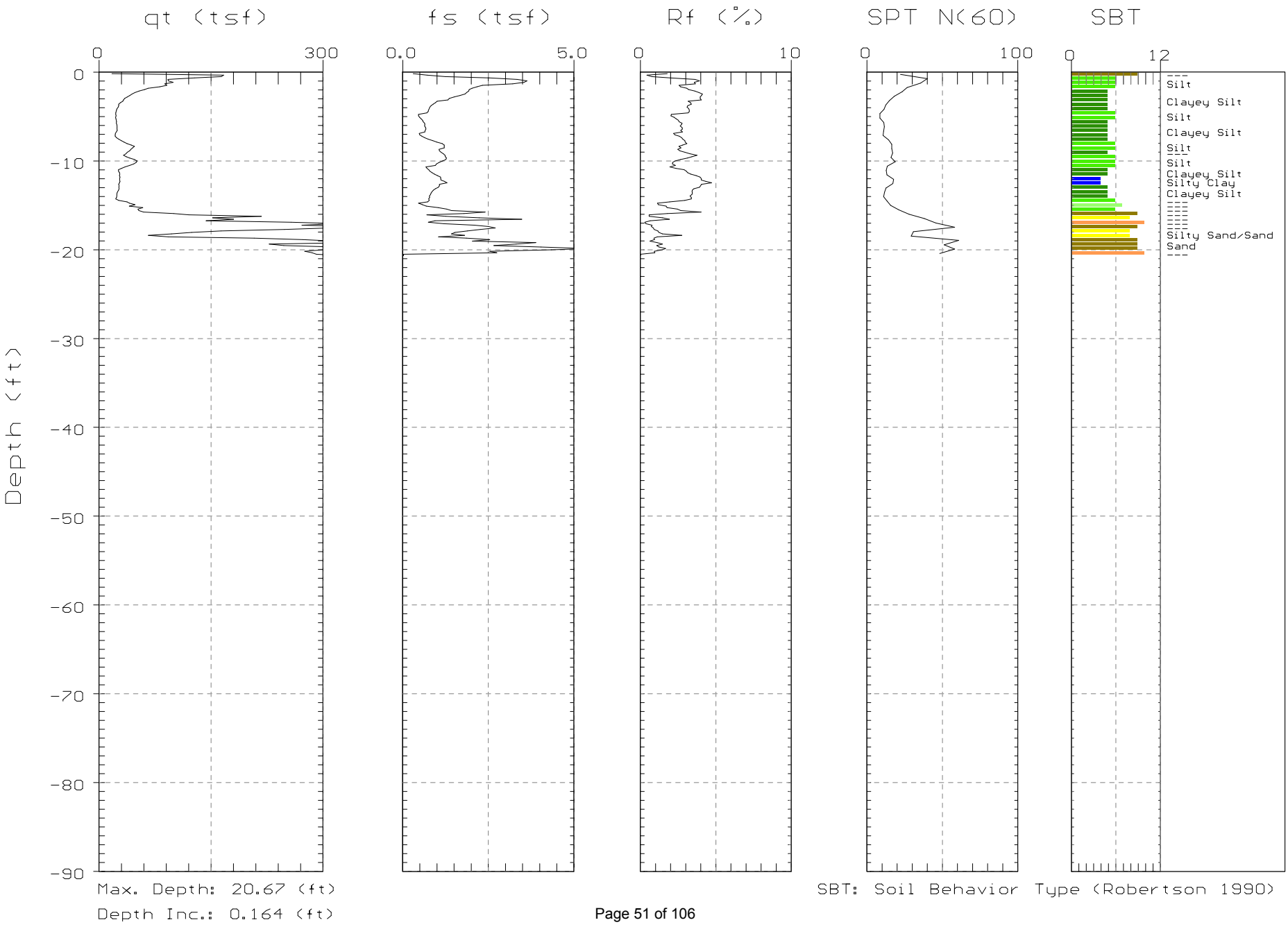


GREGG

MACTEC

Site: N=1165497.097E=1847636.907 Engineer: C.SAMS

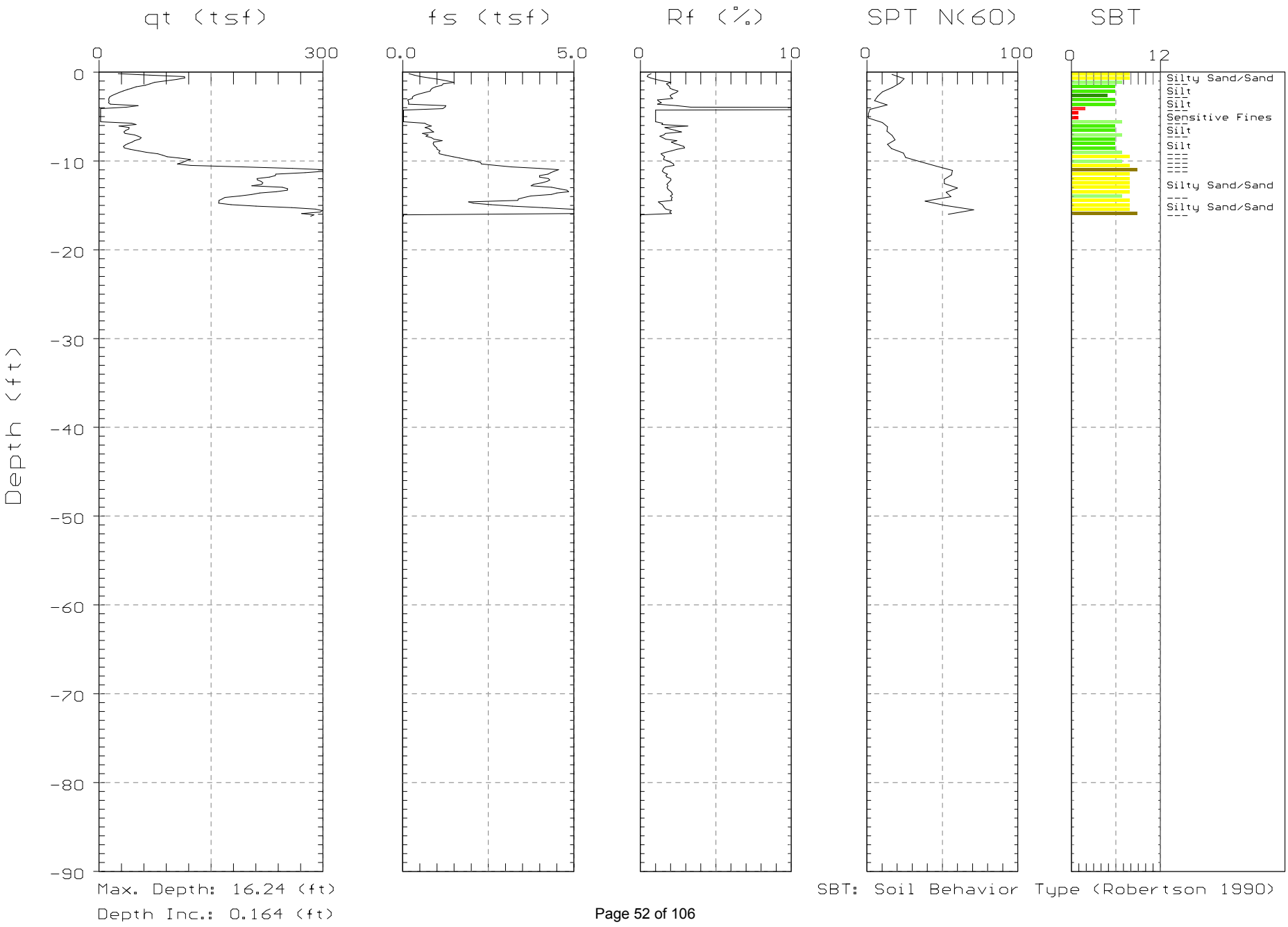
Location: CPT-1317bL=588.8 Date: 05/16/06 09:30



GREGG

MACTEC

Site: N=1167614.444E=1847587.31 Engineer: C.SAMS
Location: CPT-1318L=586.4 Date: 05/15/06 08:10



Max. Depth: 16.24 (ft)
Depth Inc.: 0.164 (ft)

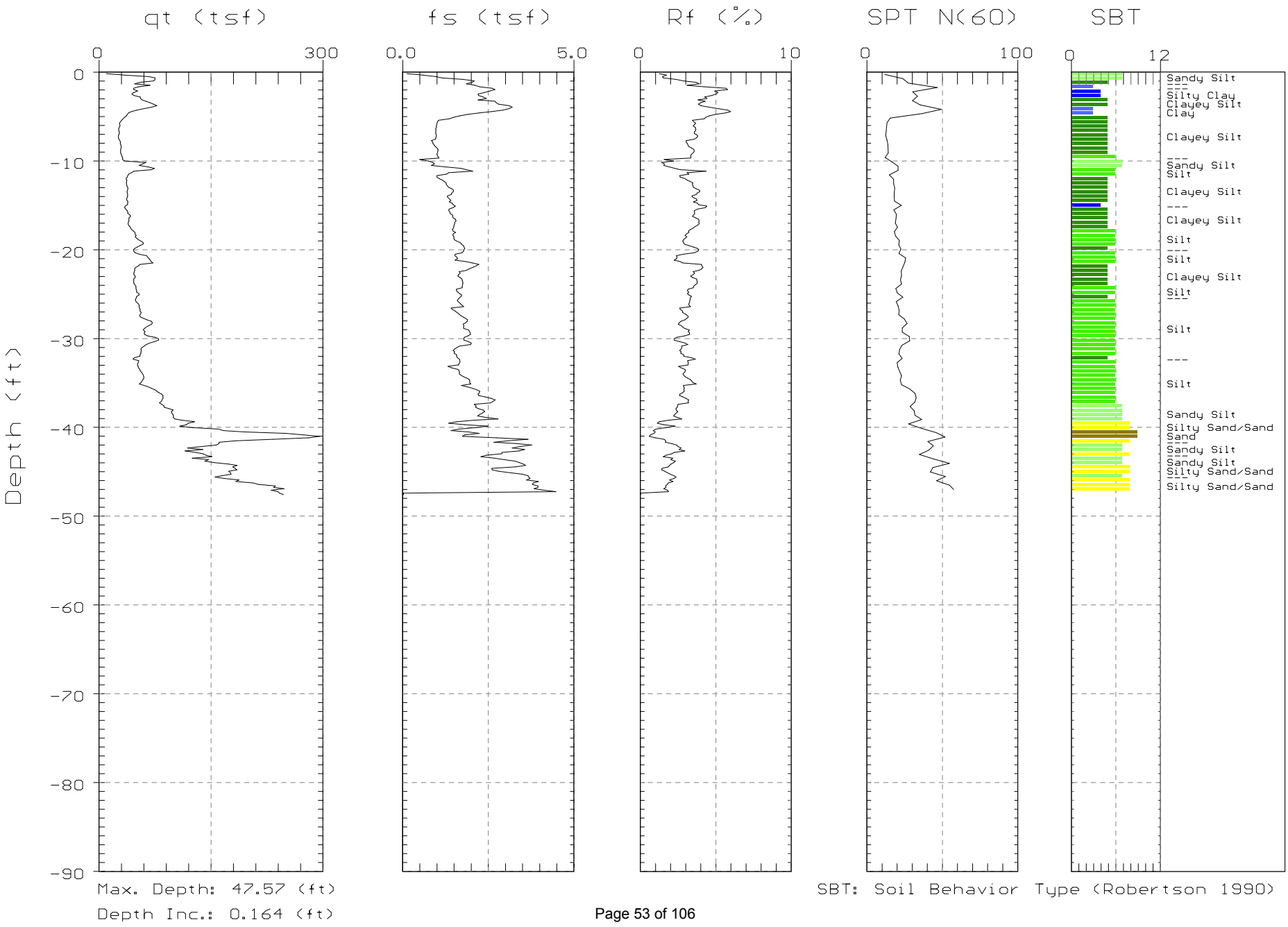
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1167695.014E=1847778.705 Engineer: C.SAMS

Location: CPT-1319L=587.9 Date: 05/15/06 05:50



Max. Depth: 47.57 (ft)

Depth Inc.: 0.164 (ft)

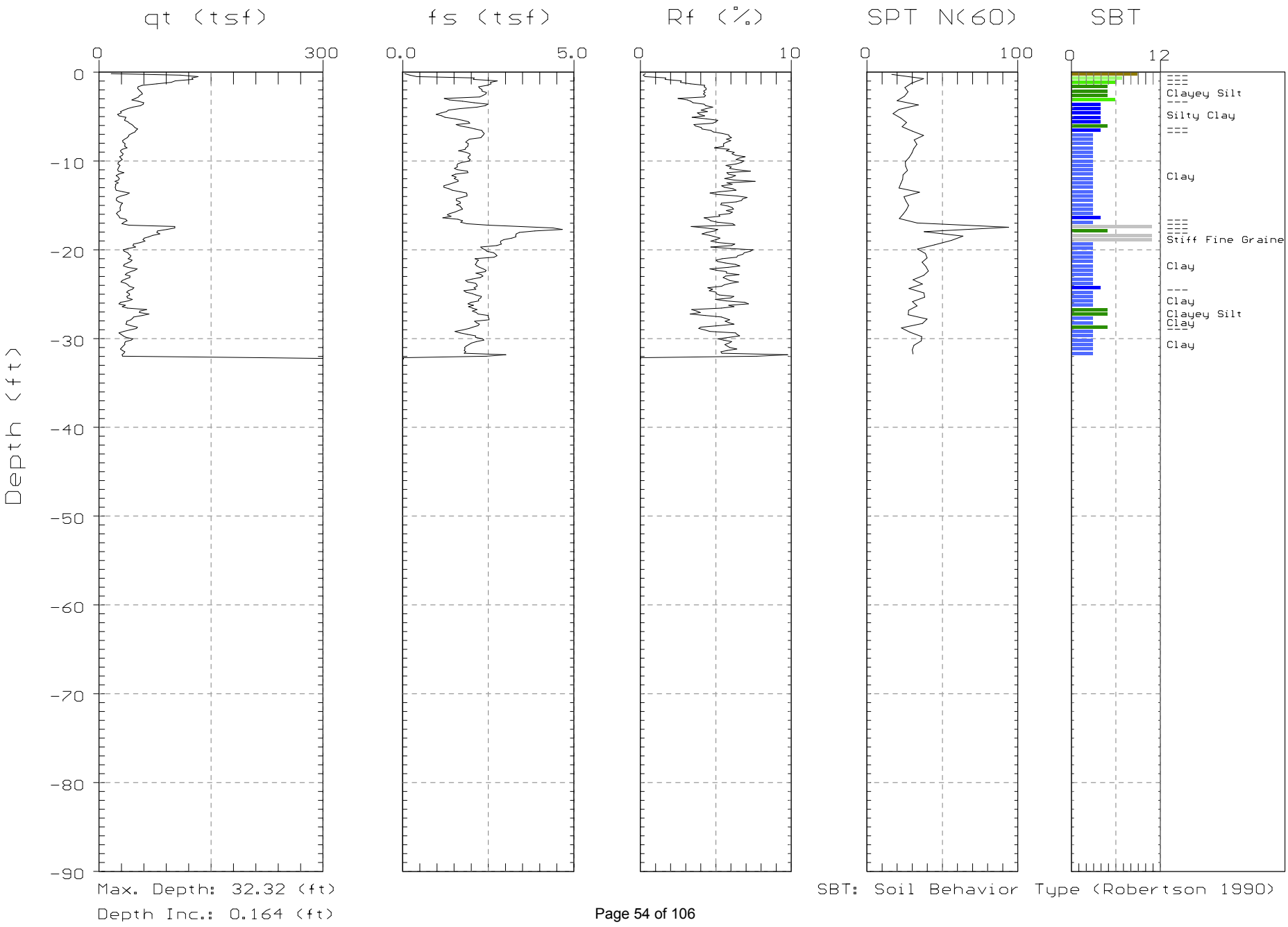
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1164809.635E=1847497.262 Engineer: C.SAMS

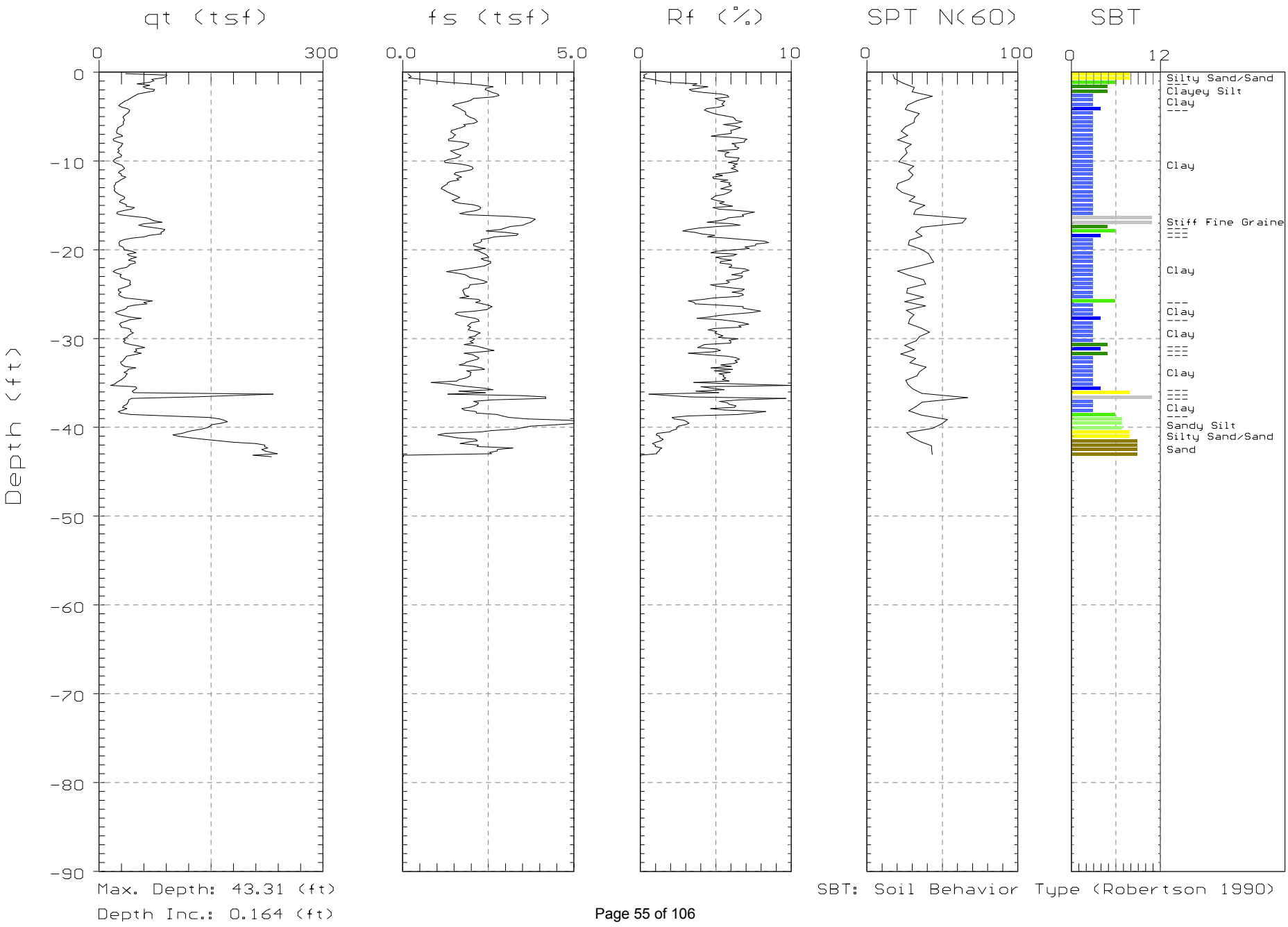
Location: CPT-1320L=604.9 Date: 08/20/06 08:56



GREGG

MACTEC

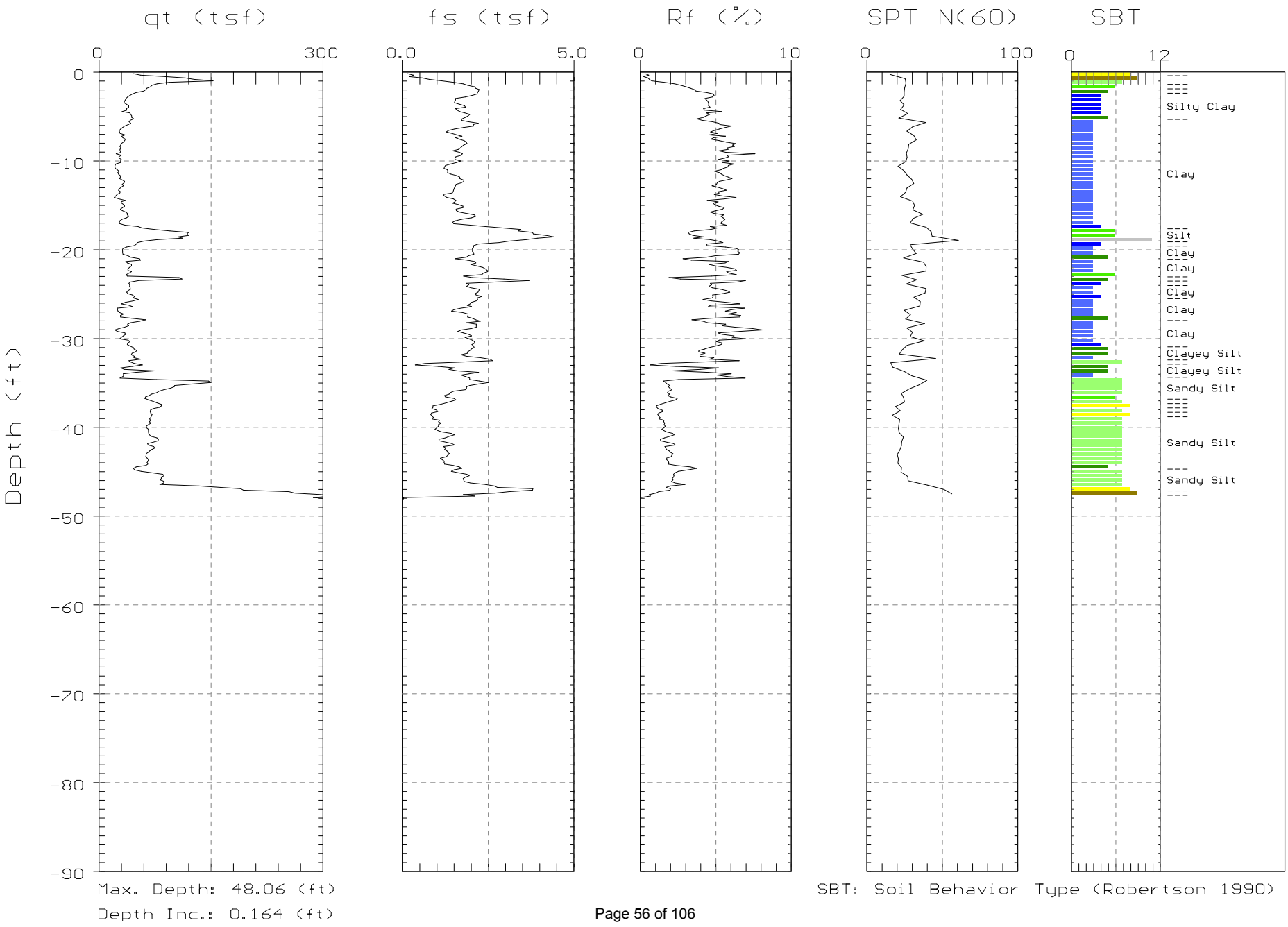
Site: N=1164802.258E=1847460.695 Engineer: C.SAMS
Location: CPT-1321L=604.9 Date: 08/20/06 10:17



GREGG

MACTEC

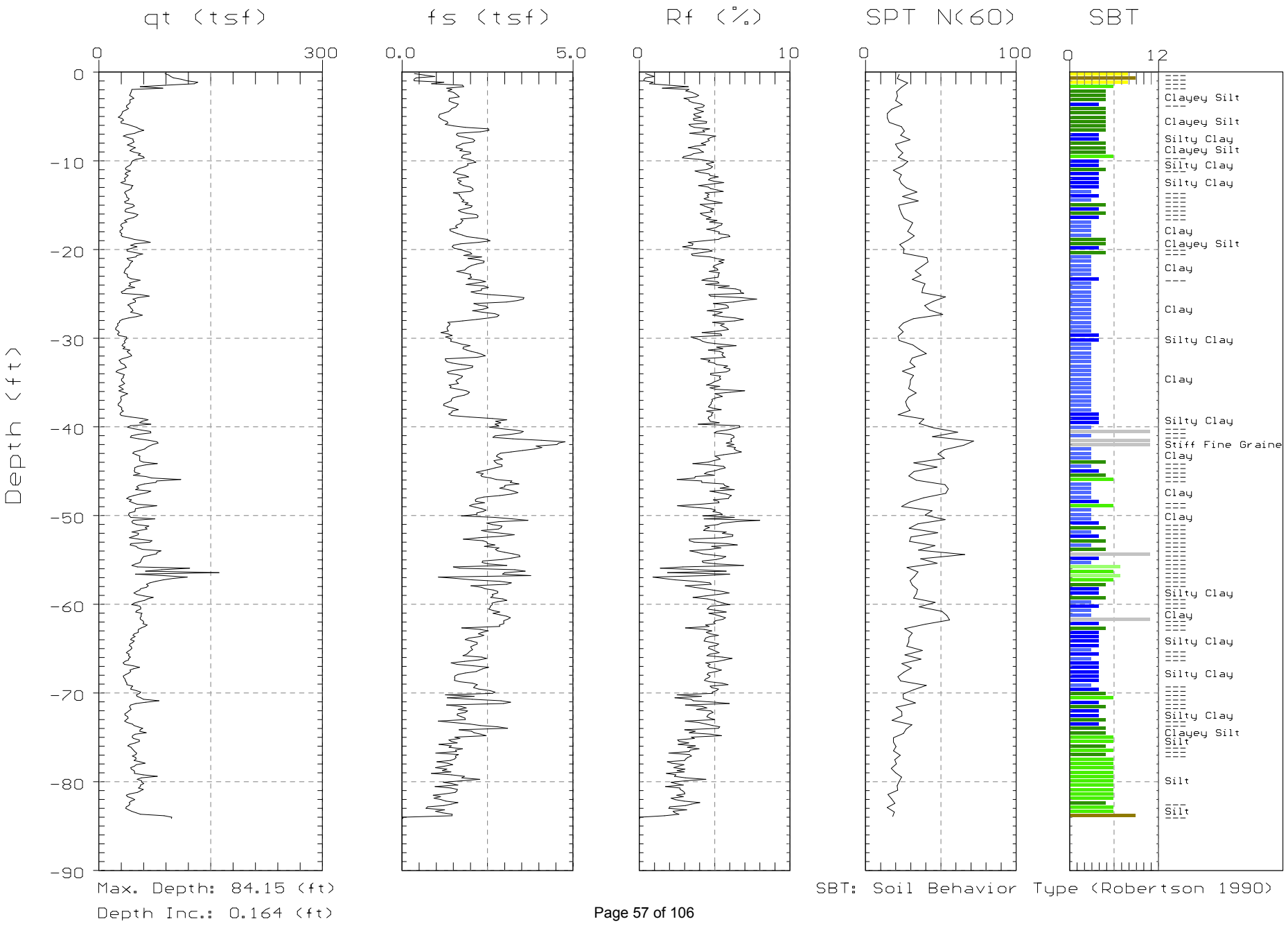
Site: N=1164794.98E=1847472.657 Engineer: C.SAMS
Location: CPT-1322L=605.2 Date: 08/20/06 07:01



GREGG

MACTEC

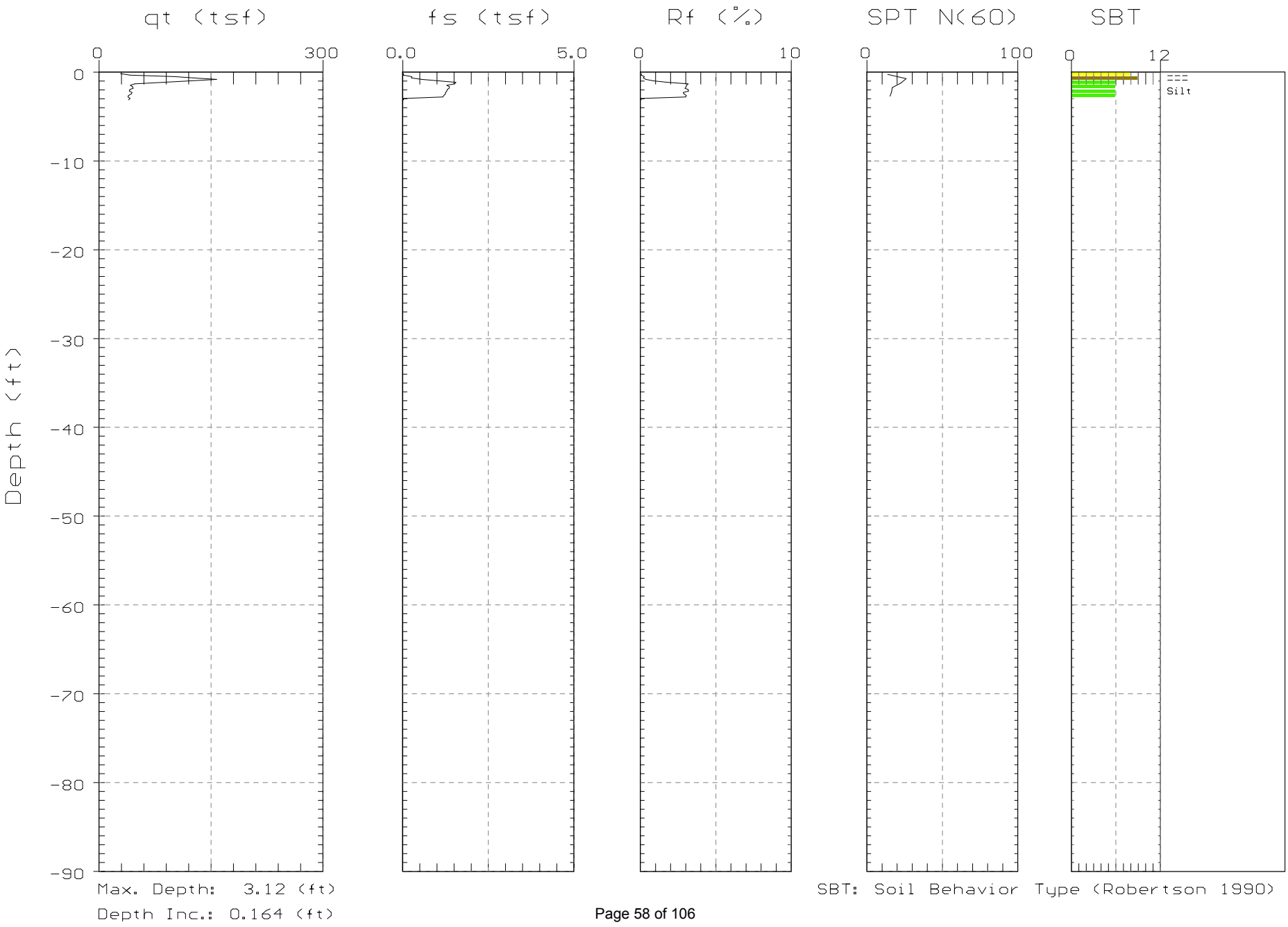
Site: N=1165679.211E=1848305.418 Engineer: C.SAMS
Location: CPT-1323L=610.5 Date: 08/19/06 05:19



GREGG

MACTEC

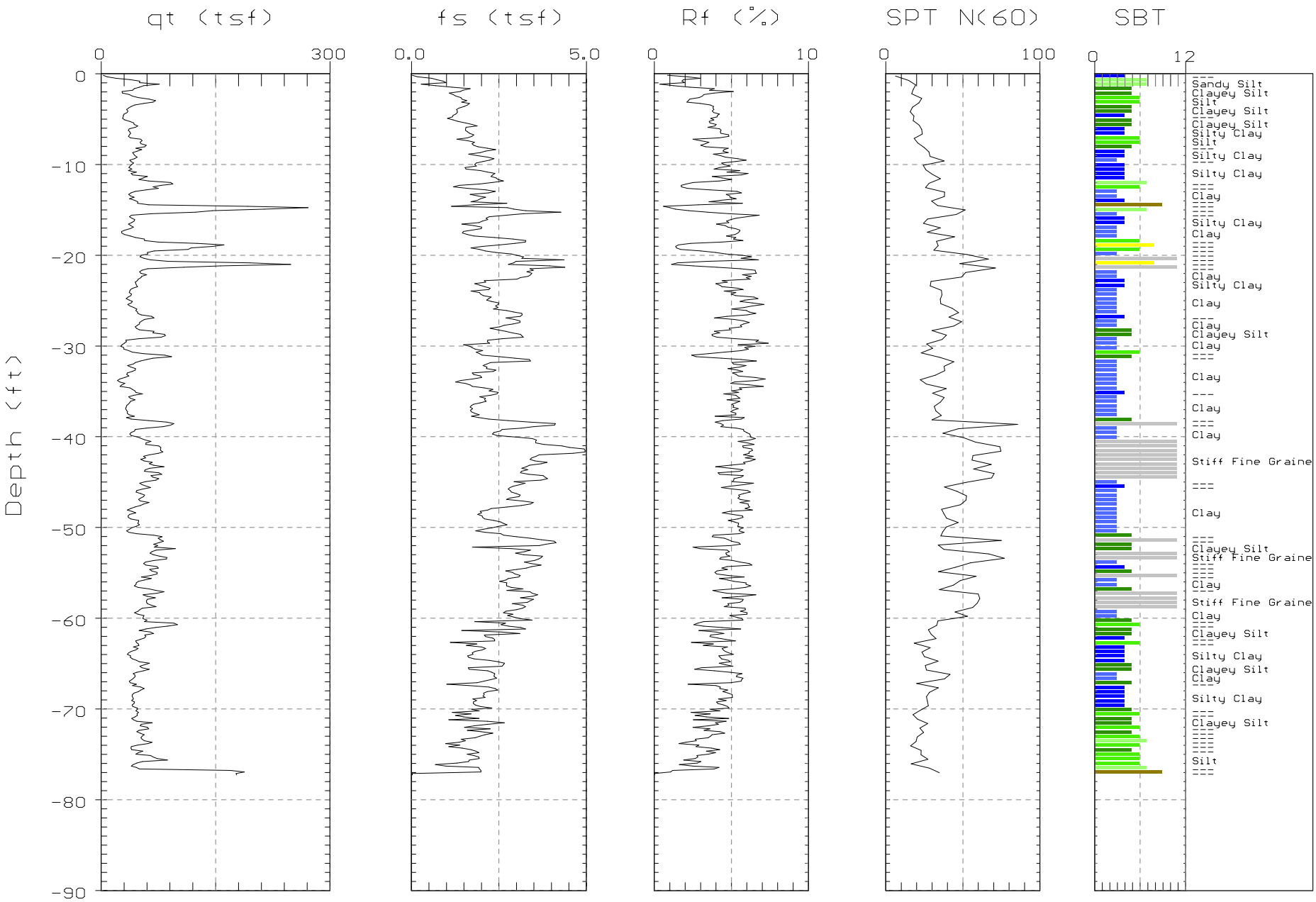
Site: N=1165733.296E=1848334.24 Engineer: C.SAMS
Location: CPT-1324L=610.2 Date: 08/19/06 08:43



GREGG

MACTEC

Site: N=1165733.296E=1848334.24 Engineer: C.SAMS
Location: CPT-1324BL=610.2 Date: 08/19/06 09:02



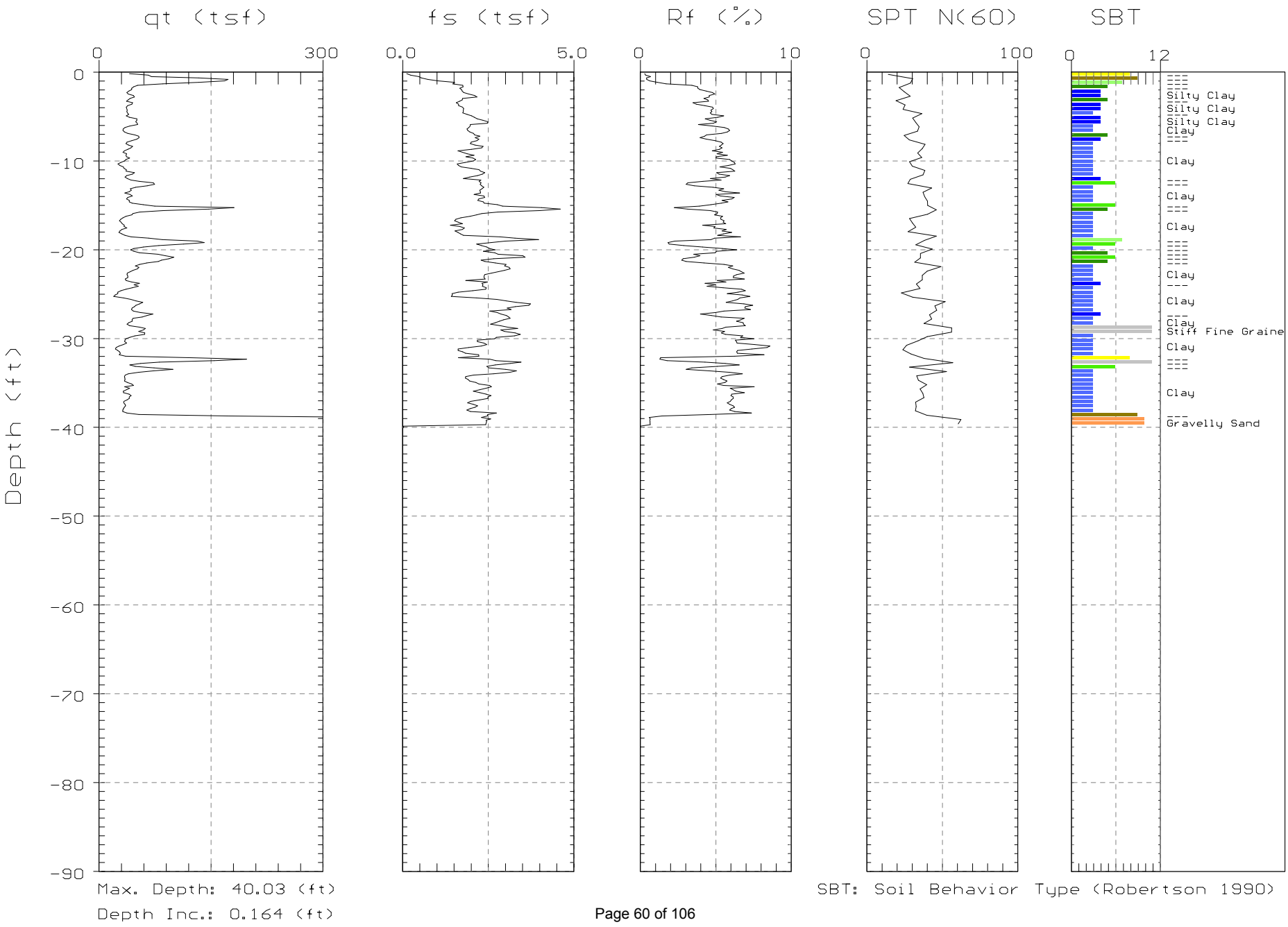
Max. Depth: 77.26 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165730.729E=1848273.937 Engineer: C.SAMS
Location: CPT-1325L=610.3 Date: 08/19/06 11:35

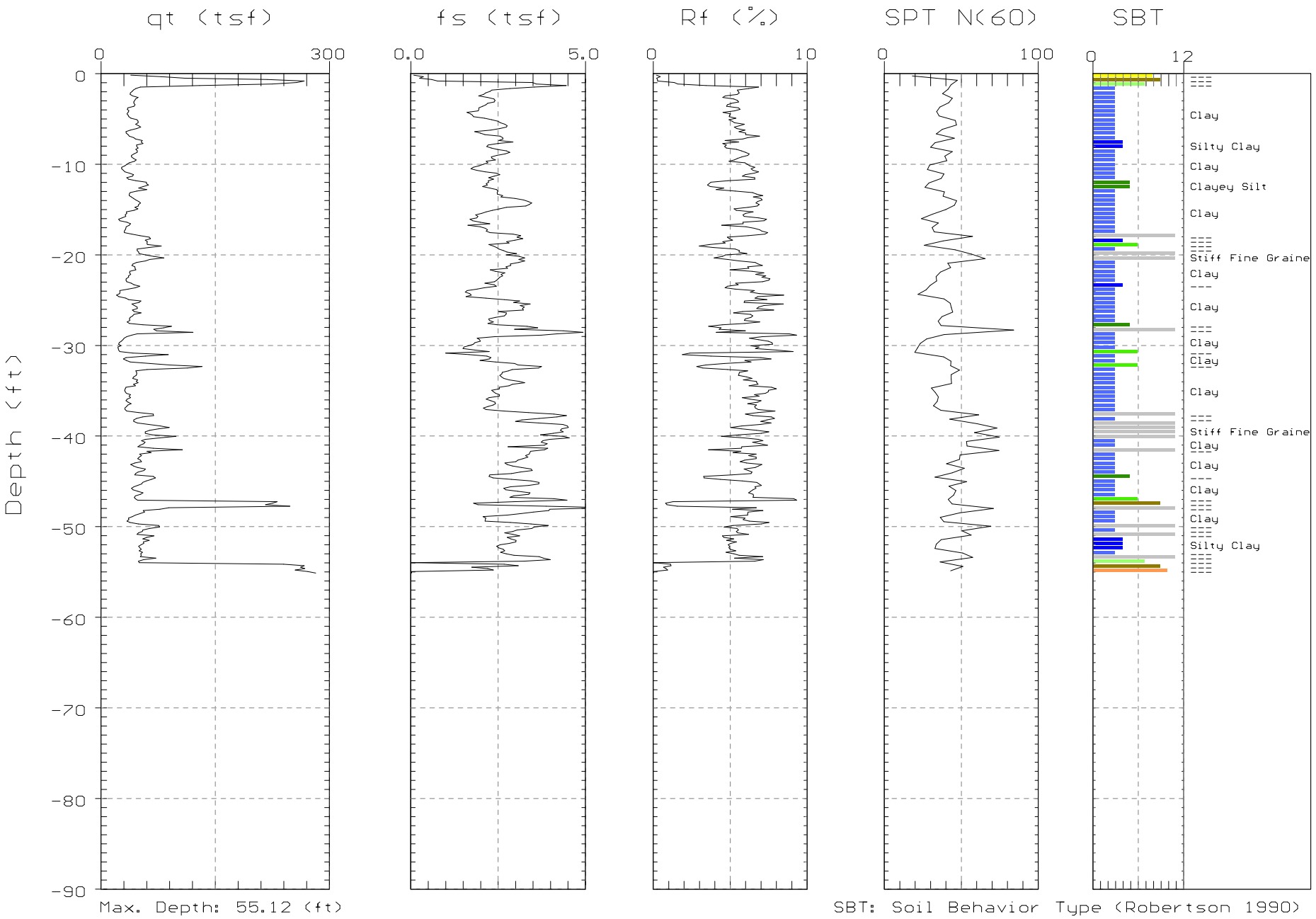


GREGG

MACTEC

Site: N=1165728.968E=1848272.952 Engineer: C.SAMS

Location: CPT-1325AL=610.1 Date: 08/19/06 12:39



Max. Depth: 55.12 (ft)

Depth Inc.: 0.164 (ft)

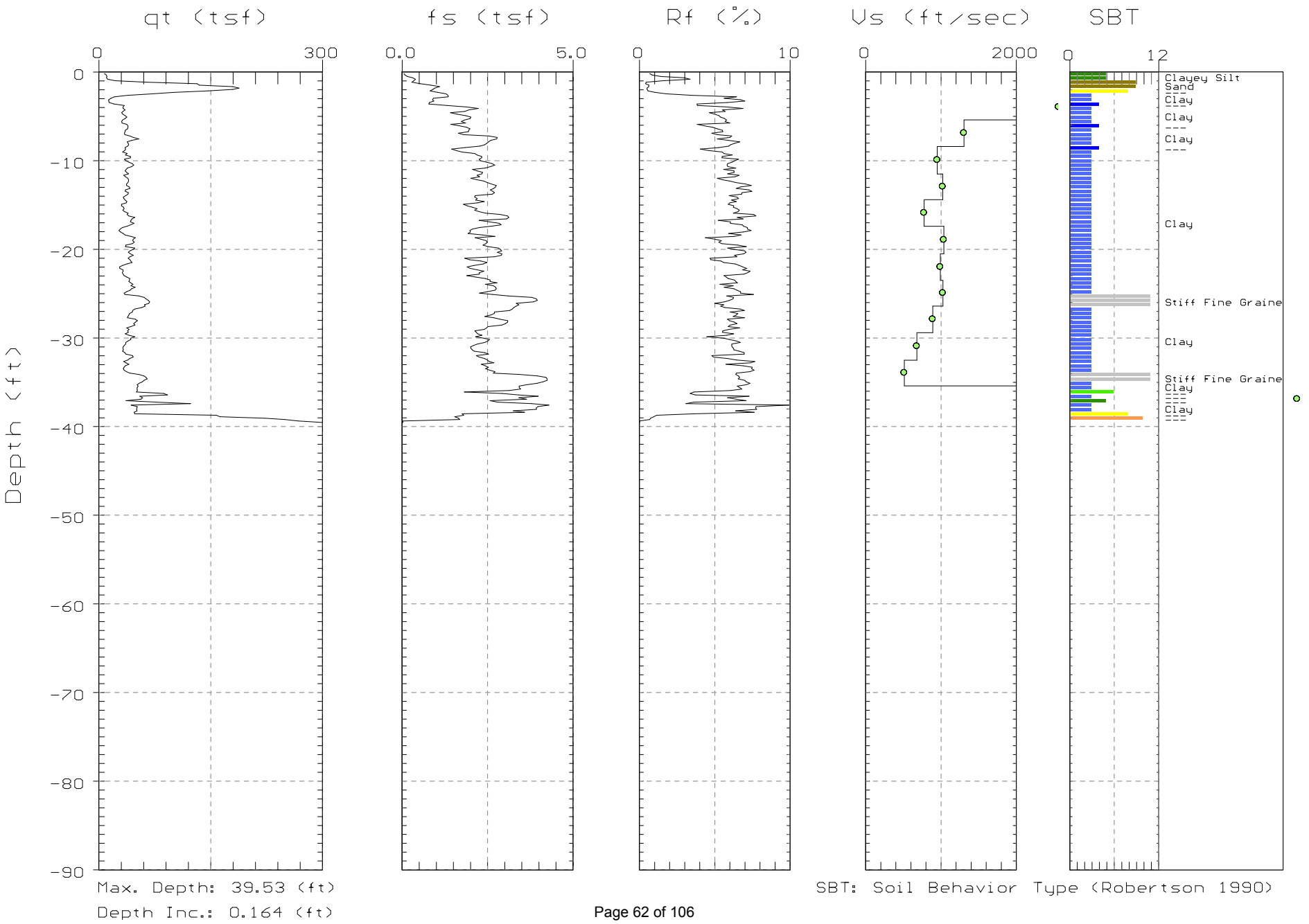
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1167001.502E=1844206.906 Engineer: C.SAMS

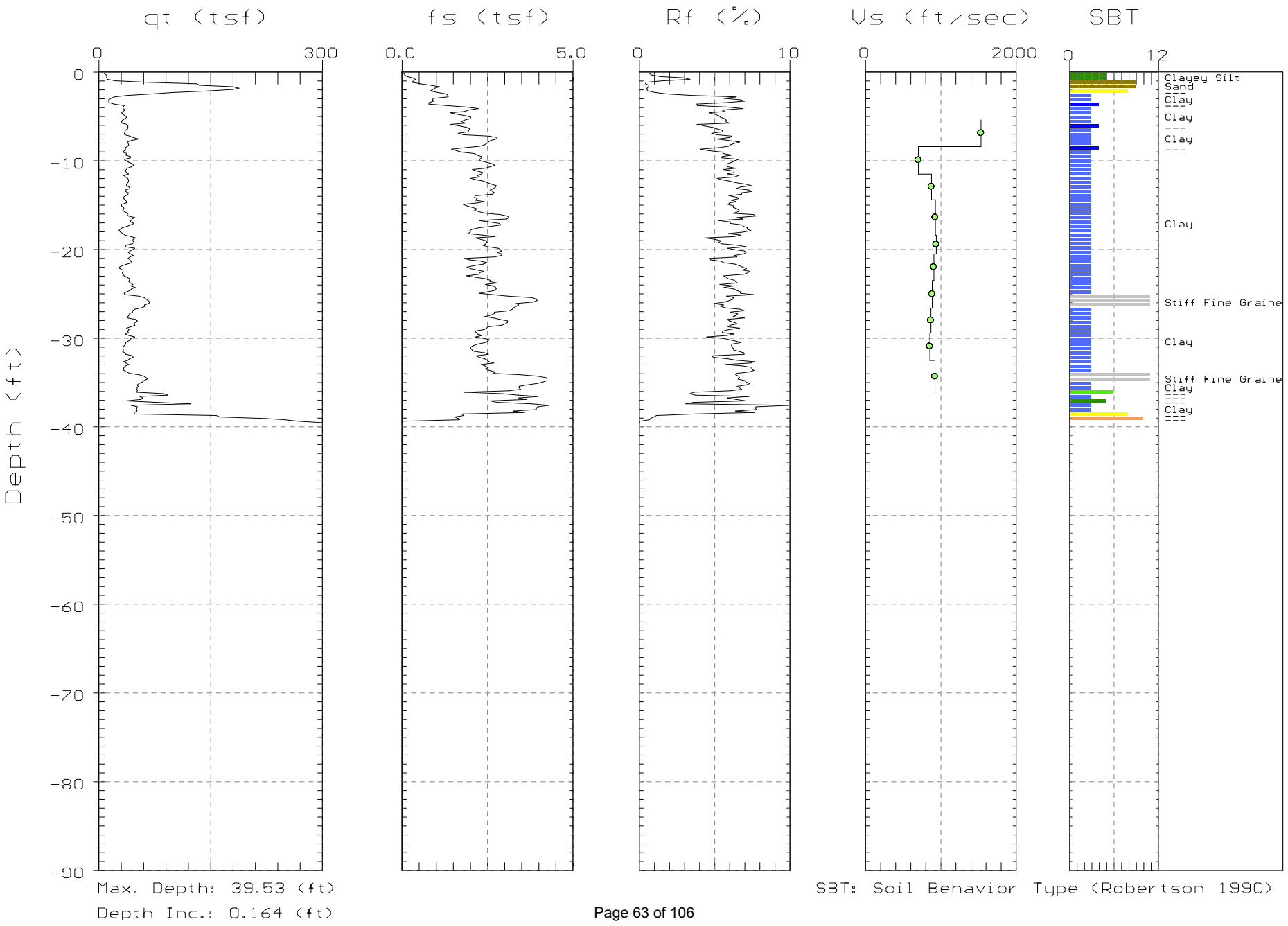
Location: CPT-1308AL=538.0 Date: 05/14/06 05:56



GREGG

MACTEC

Site: N=1167008.152E=1844199.436 Engineer: C.SAMS
Location: CPT-1308BL=538.0 Date: 05/16/06 06:35



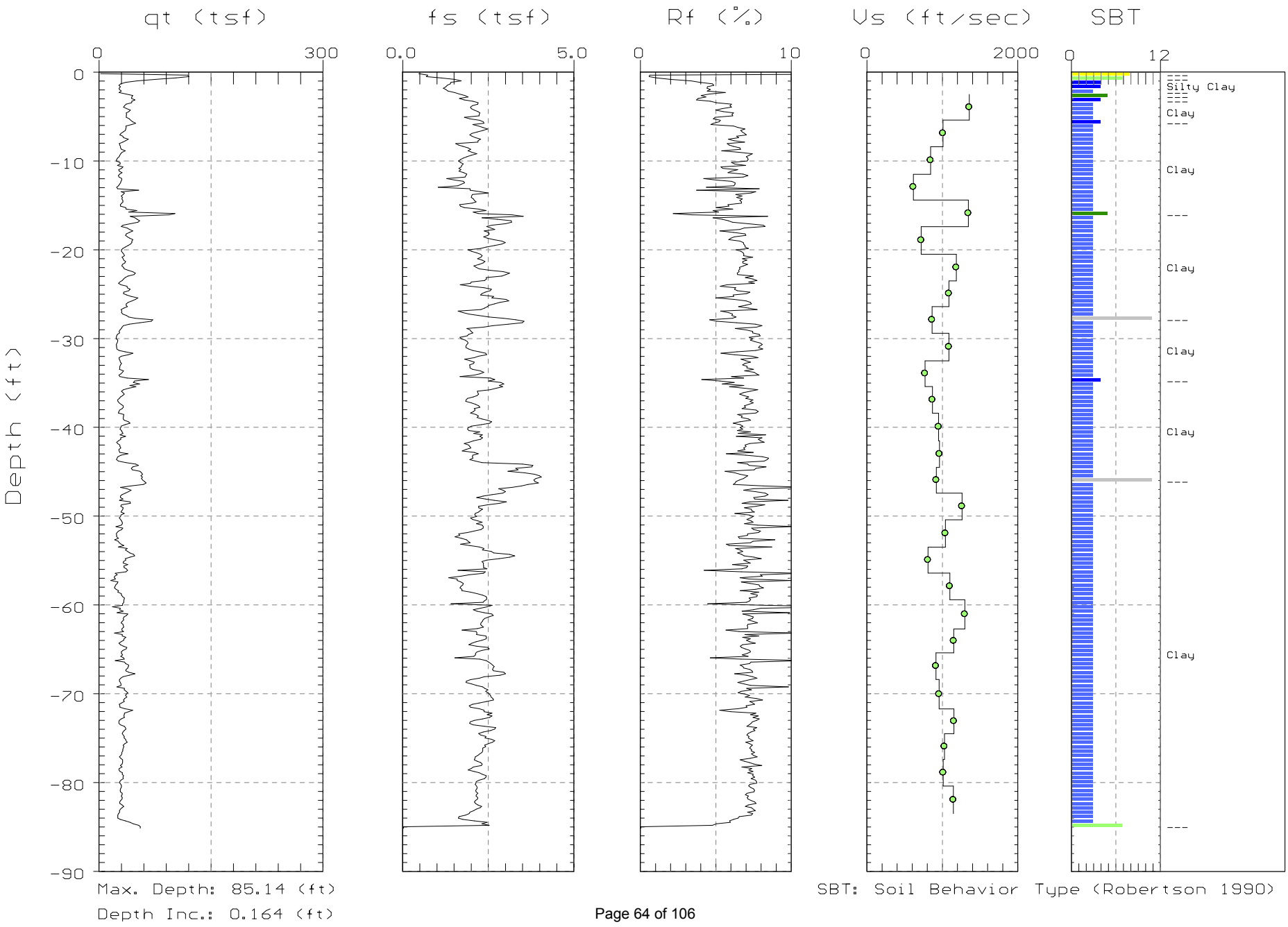
Max. Depth: 39.53 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

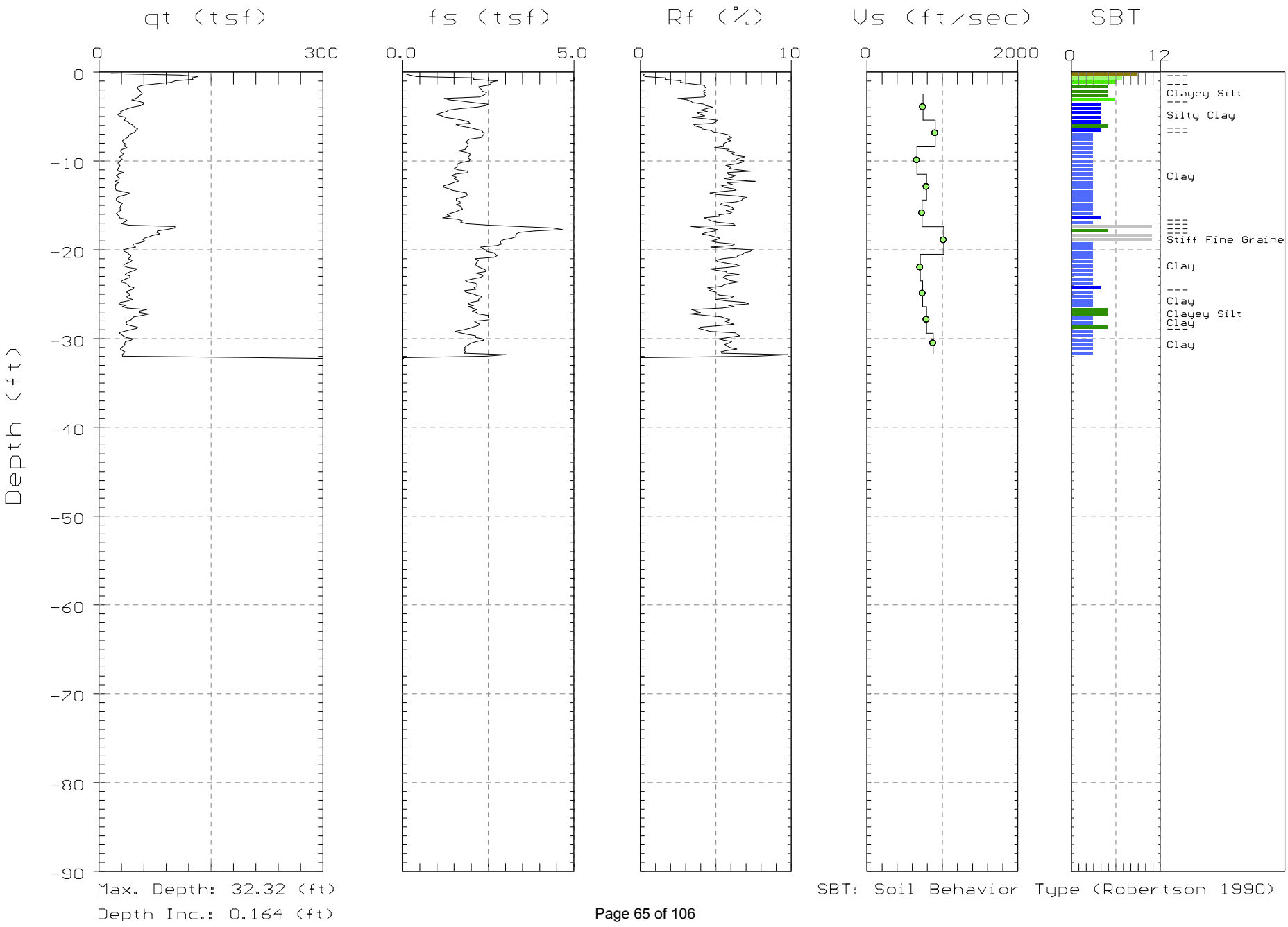
Site: N=1166860.56E=1844074.211 Engineer: C.SAMS
Location: CPT-1309L=591.0 Date: 05/14/06 10:04



GREGG

MACTEC

Site: N=1164809.635E=1847497.262 Engineer: C.SAMS
Location: CPT-1320L=604.9 Date: 08/20/06 08:56



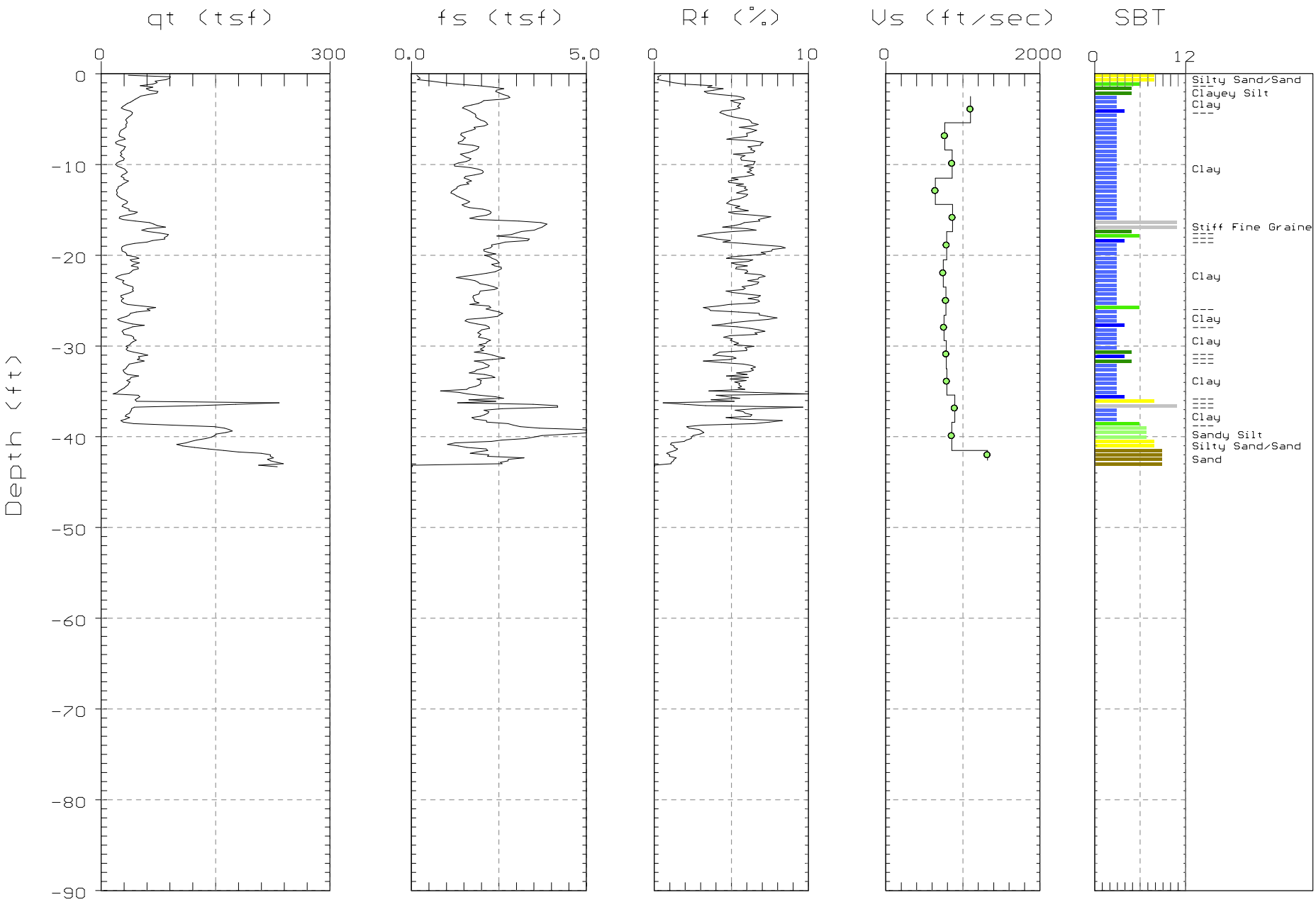
Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1164802.258E=1847460.695 Engineer: C.SAMS
Location: CPT-1321L=604.9 Date: 08/20/06 10:17



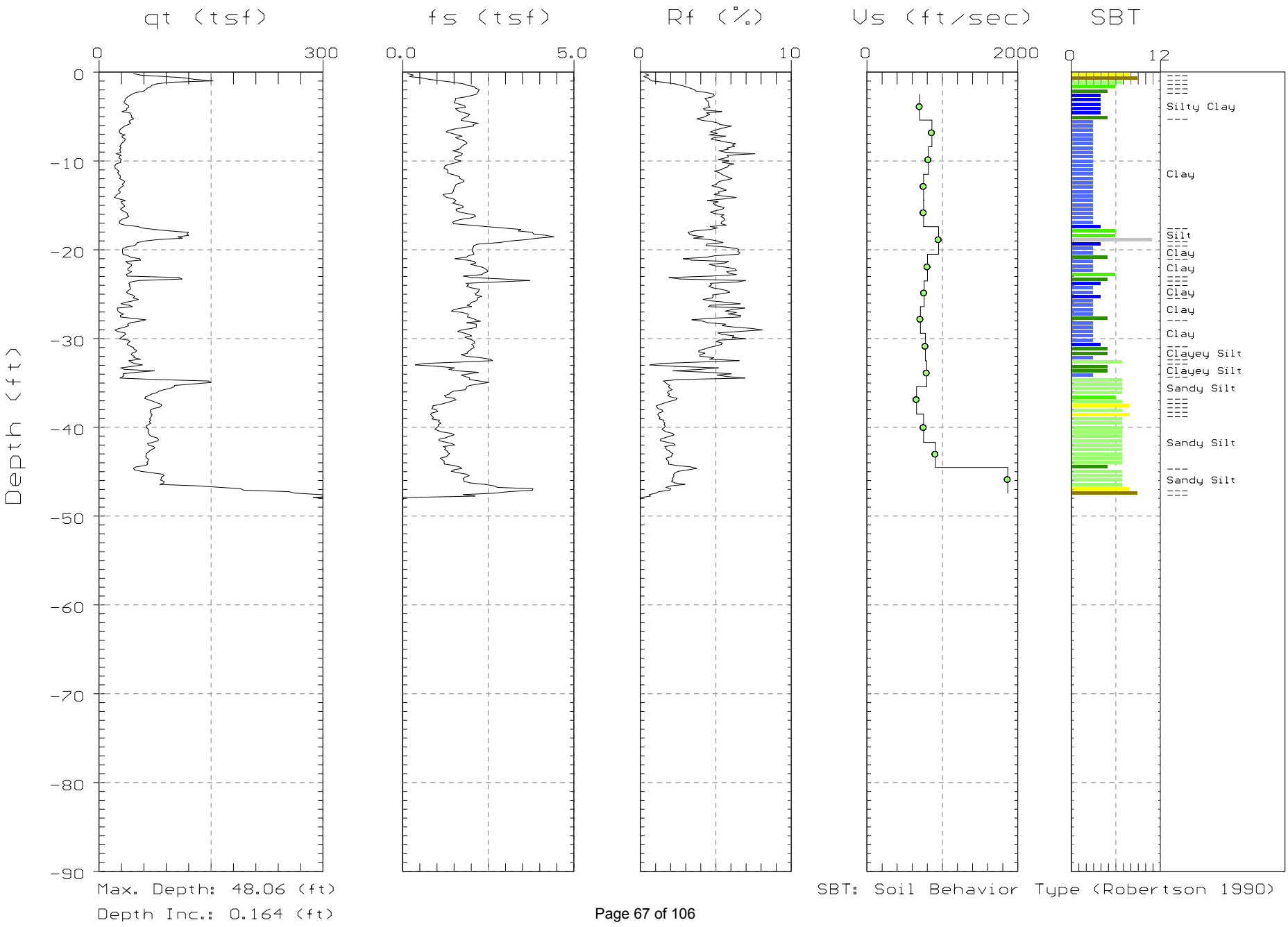
Max. Depth: 43.31 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

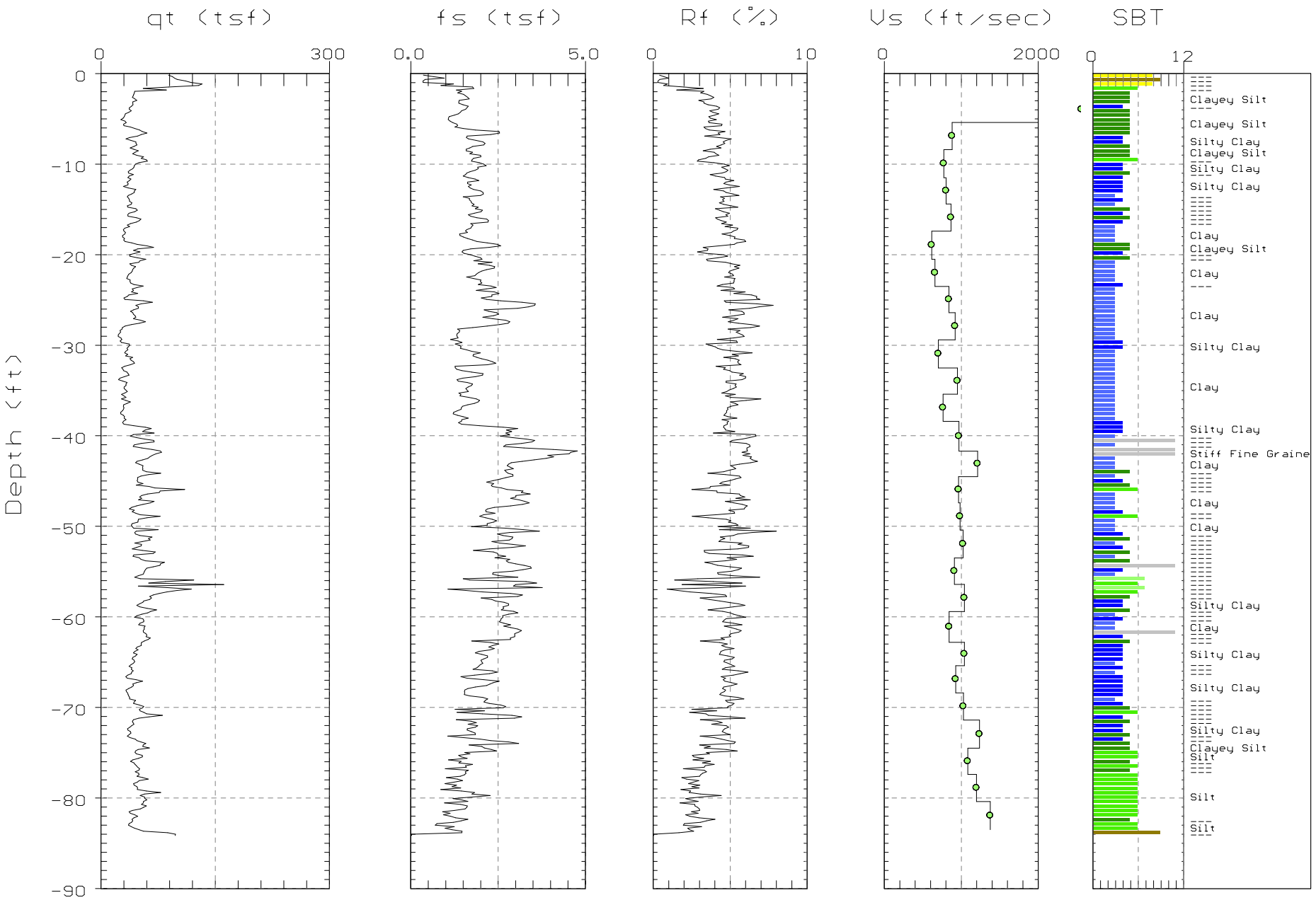
Site: N=1164794.98E=1847472.657 Engineer: C.SAMS
Location: CPT-1322L=605.2 Date: 08/20/06 07:01



GREGG

MACTEC

Site: N=1165679.211E=1848305.418 Engineer: C.SAMS
Location: CPT-1323L=610.5 Date: 08/19/06 05:19



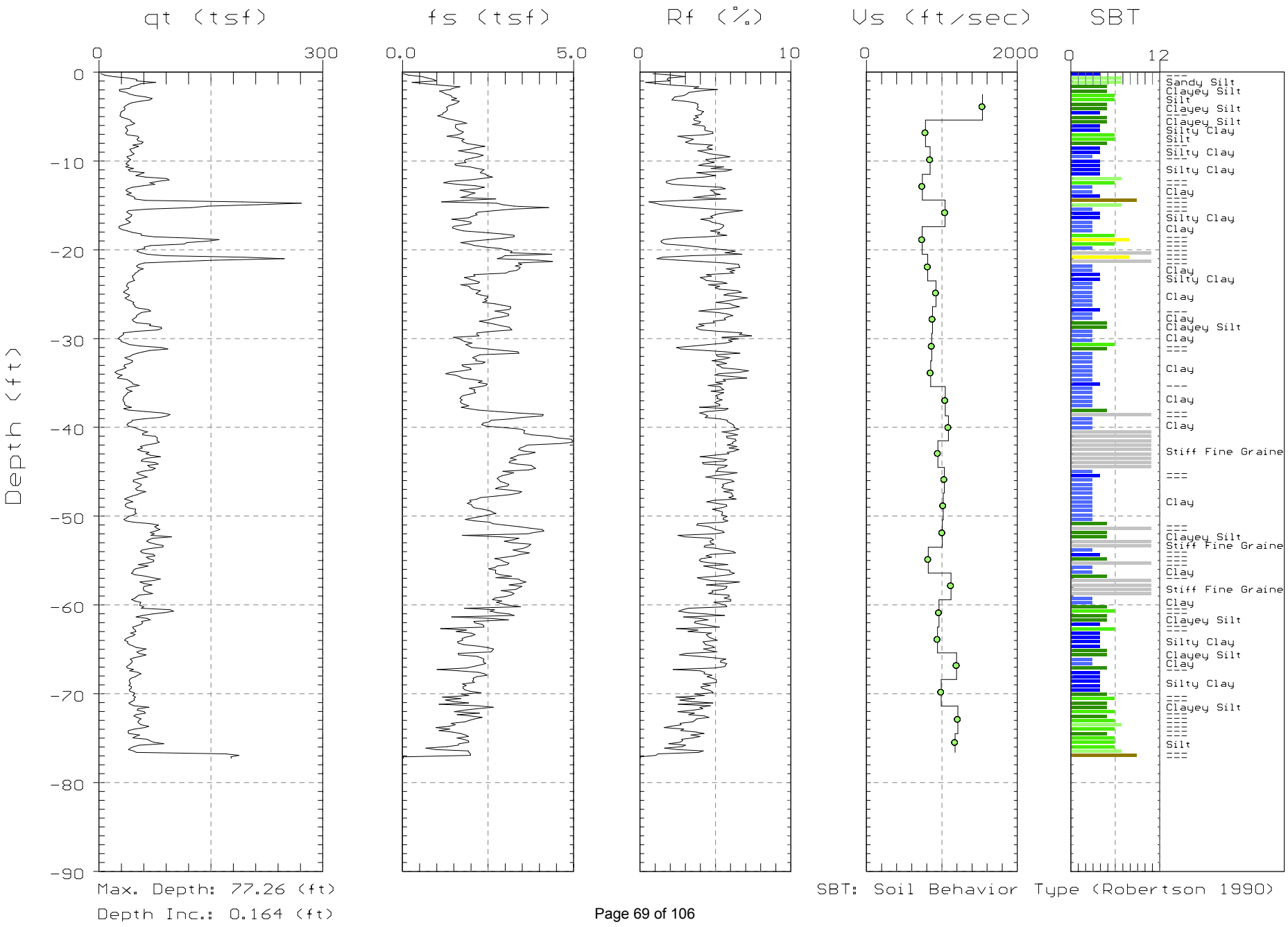
Max. Depth: 84.15 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Site: N=1165733.296E=1848334.24 Engineer: C.SAMS
Location: CPT-1324BL=610.2 Date: 08/19/06 09:02



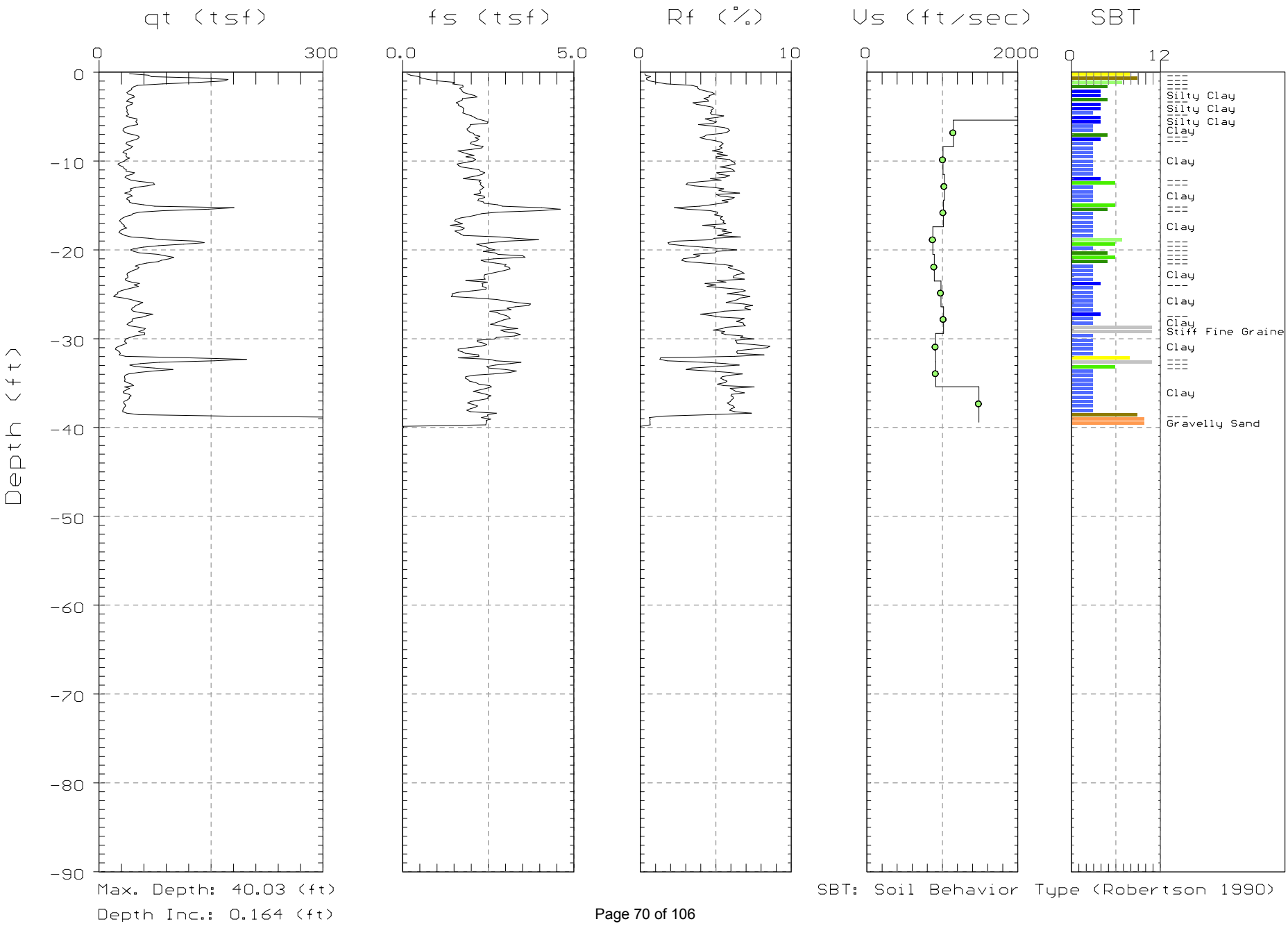
Max. Depth: 77.26 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

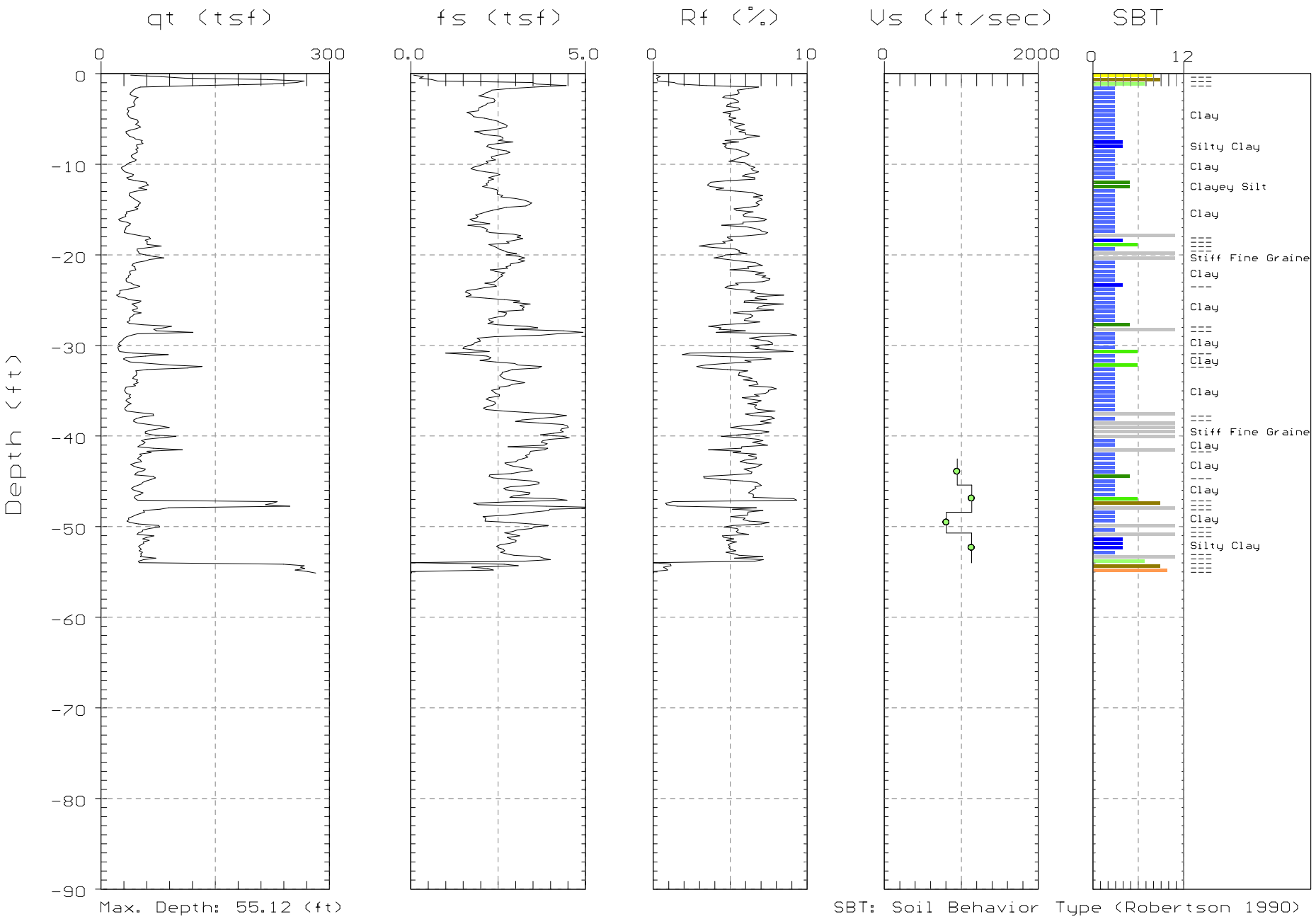
Site: N=1165730.729E=1848273.937 Engineer: C.SAMS
Location: CPT-1325L=610.3 Date: 08/19/06 11:35



GREGG

MACTEC

Site: N=1165728.968E=1848272.952 Engineer: C.SAMS
Location: CPT-1325AL=610.1 Date: 08/19/06 12:39



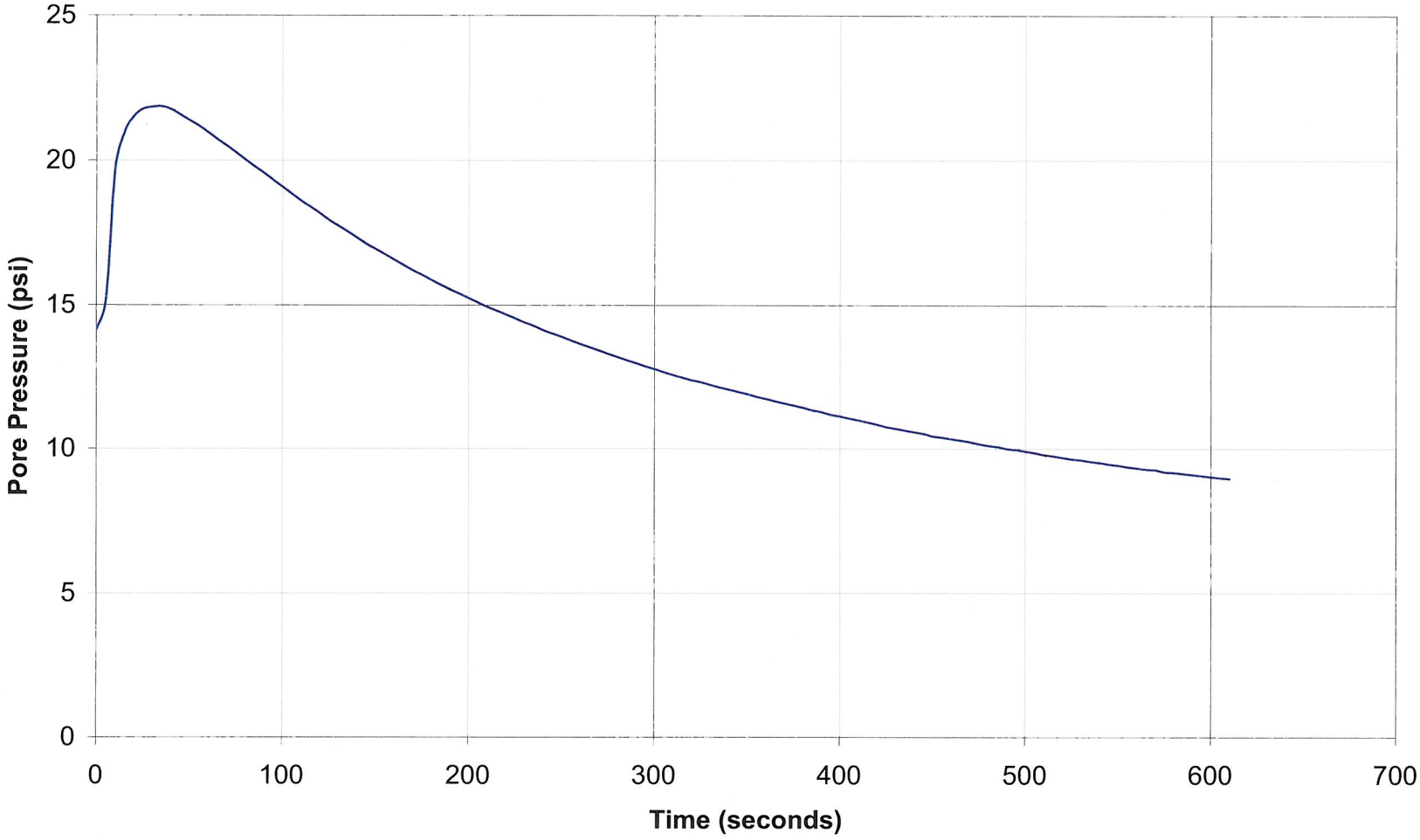
Max. Depth: 55.12 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

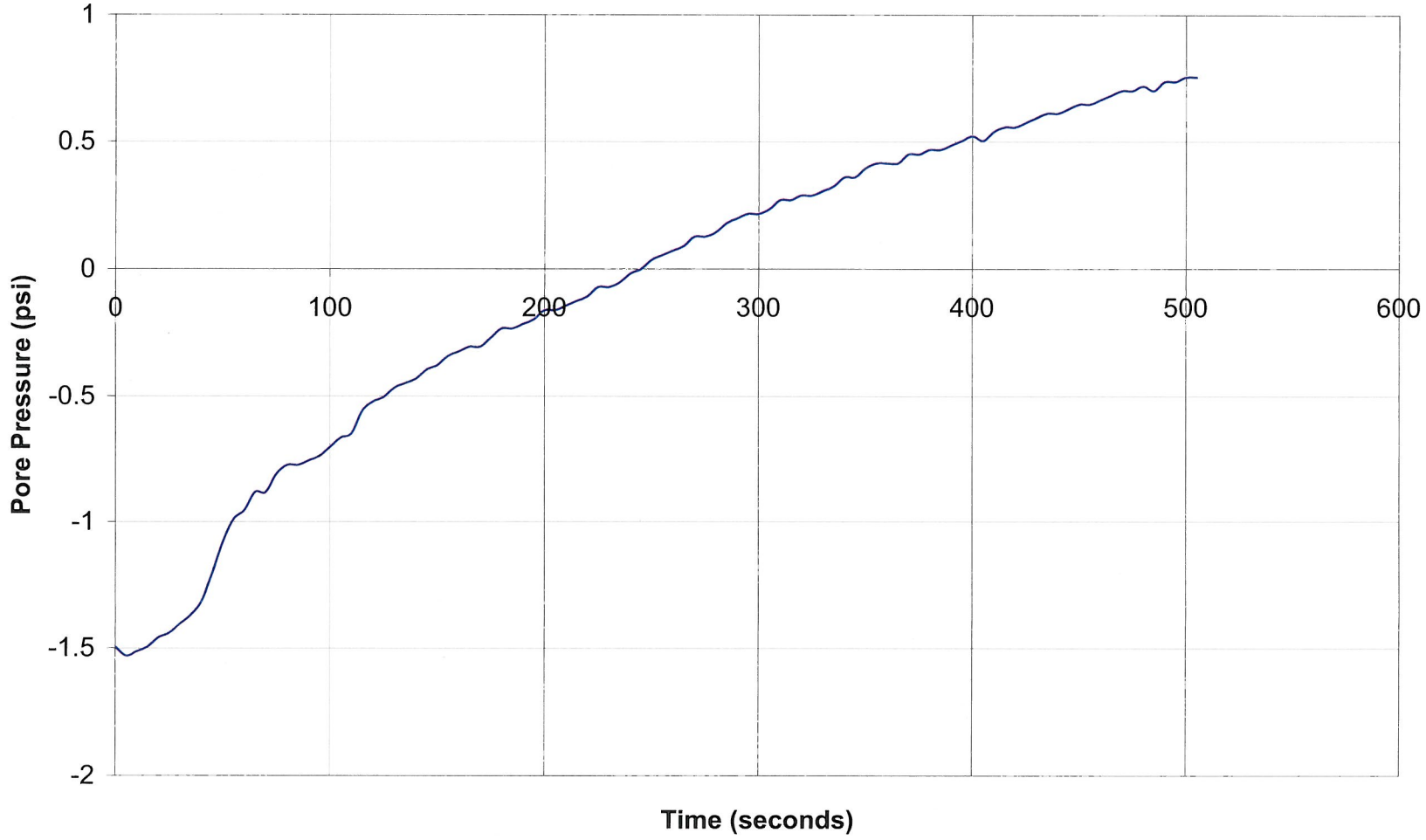
Sounding: cpt-1300
Depth: 18.537
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

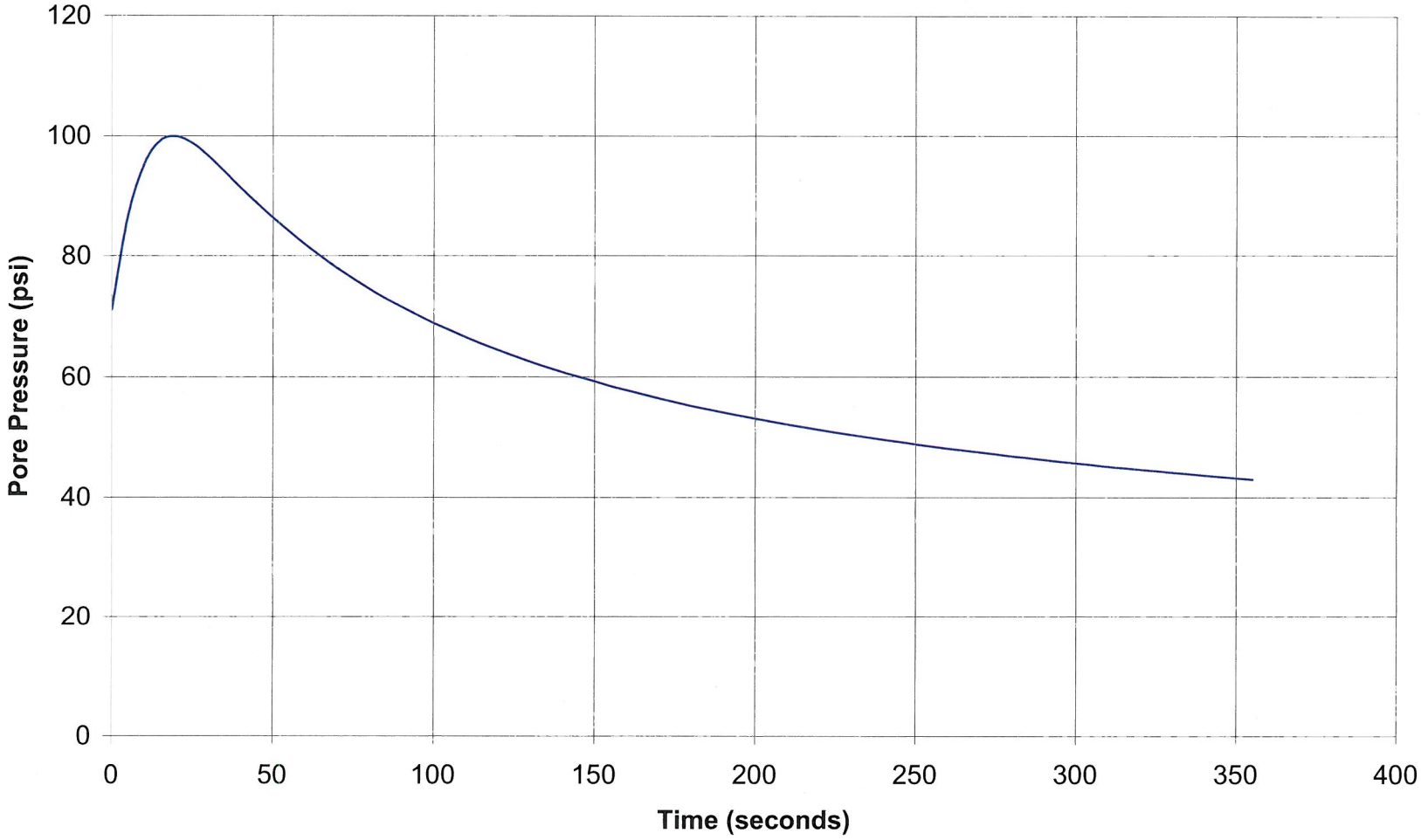
Sounding: cpt-1300
Depth: 30.02
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

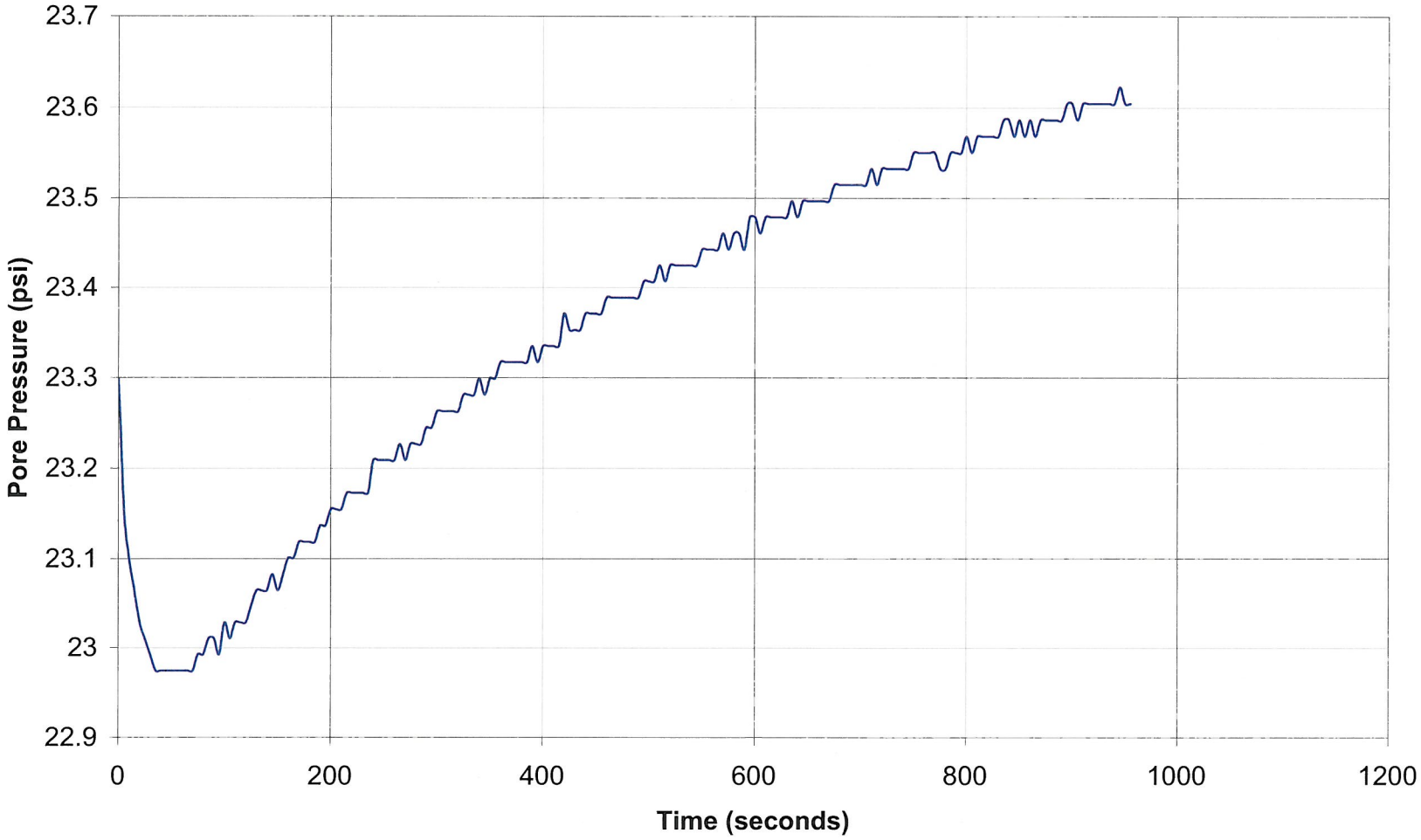
Sounding: cpt-1302
Depth: 34.941
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

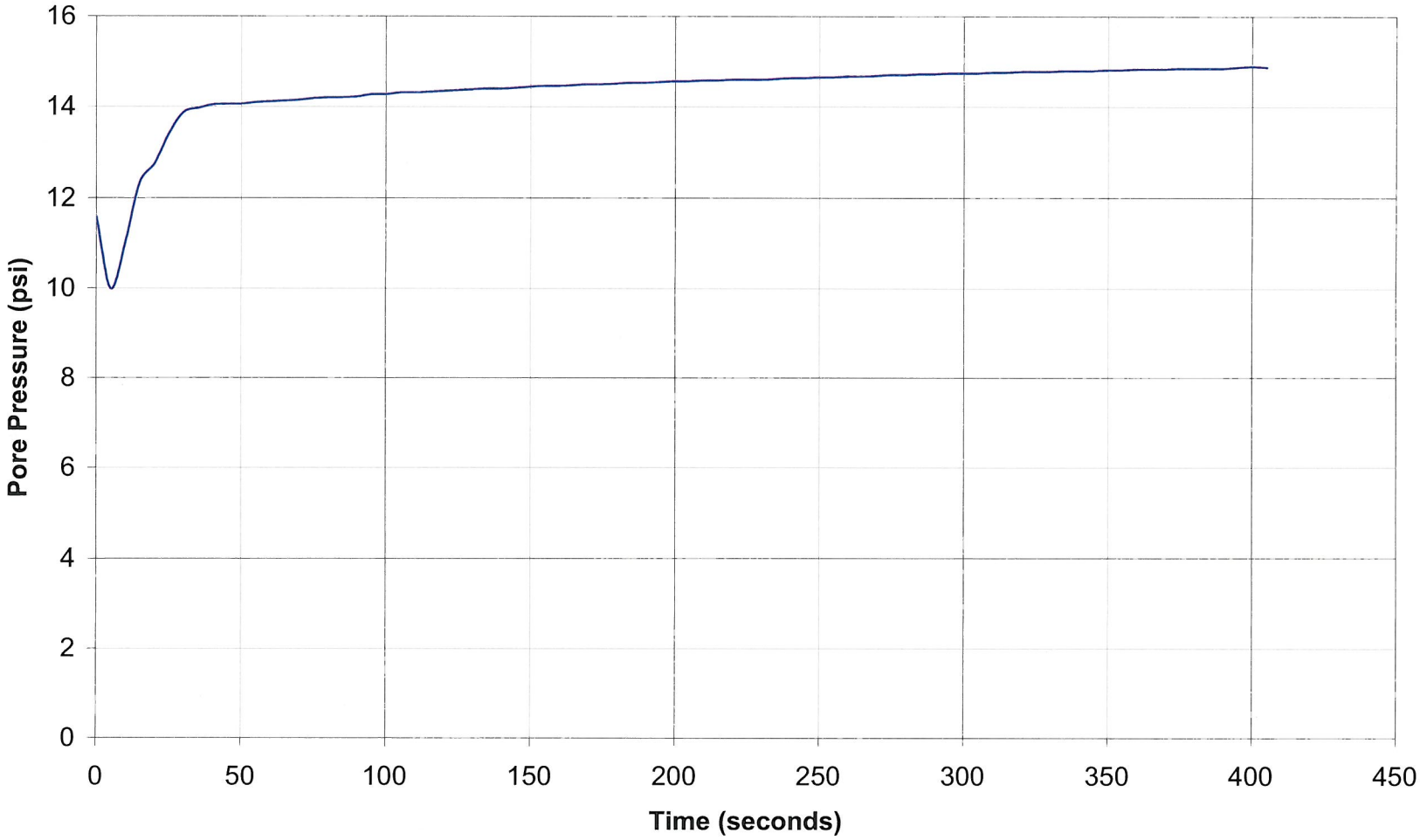
Sounding: cpt-1302
Depth: 80.052
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

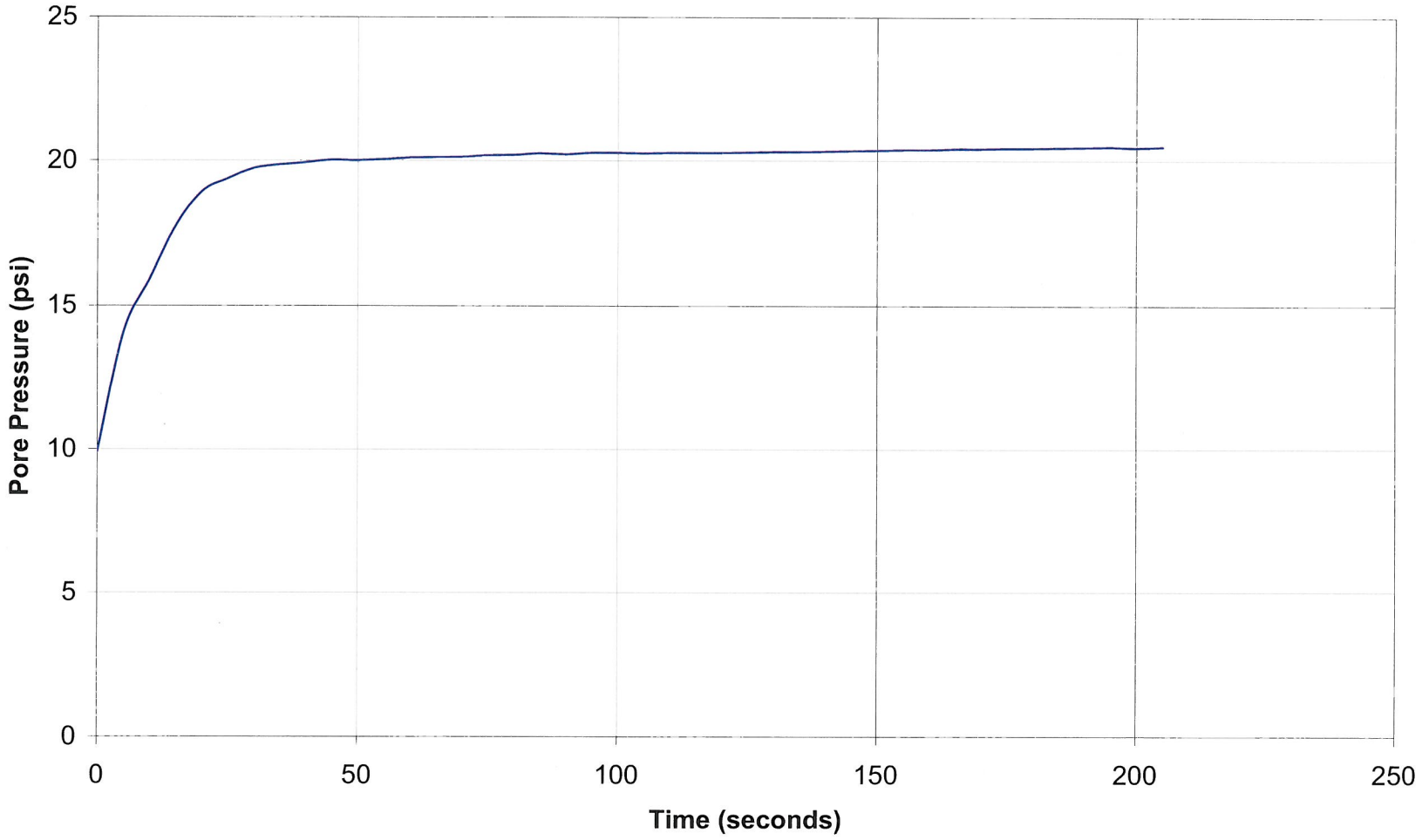
Sounding: cpt-1303
Depth: 65.945
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

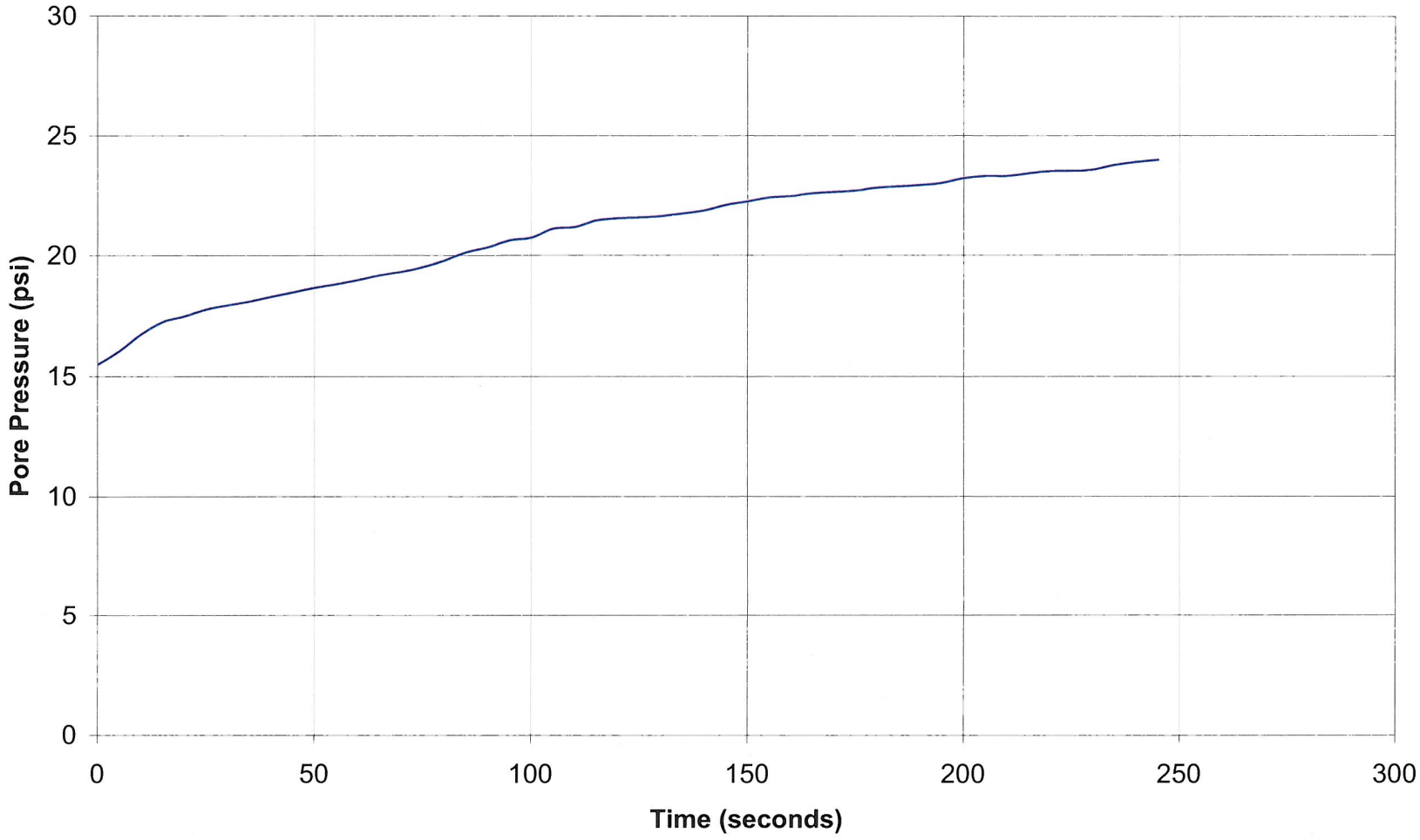
Sounding: cpt-1303
Depth: 80.216
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

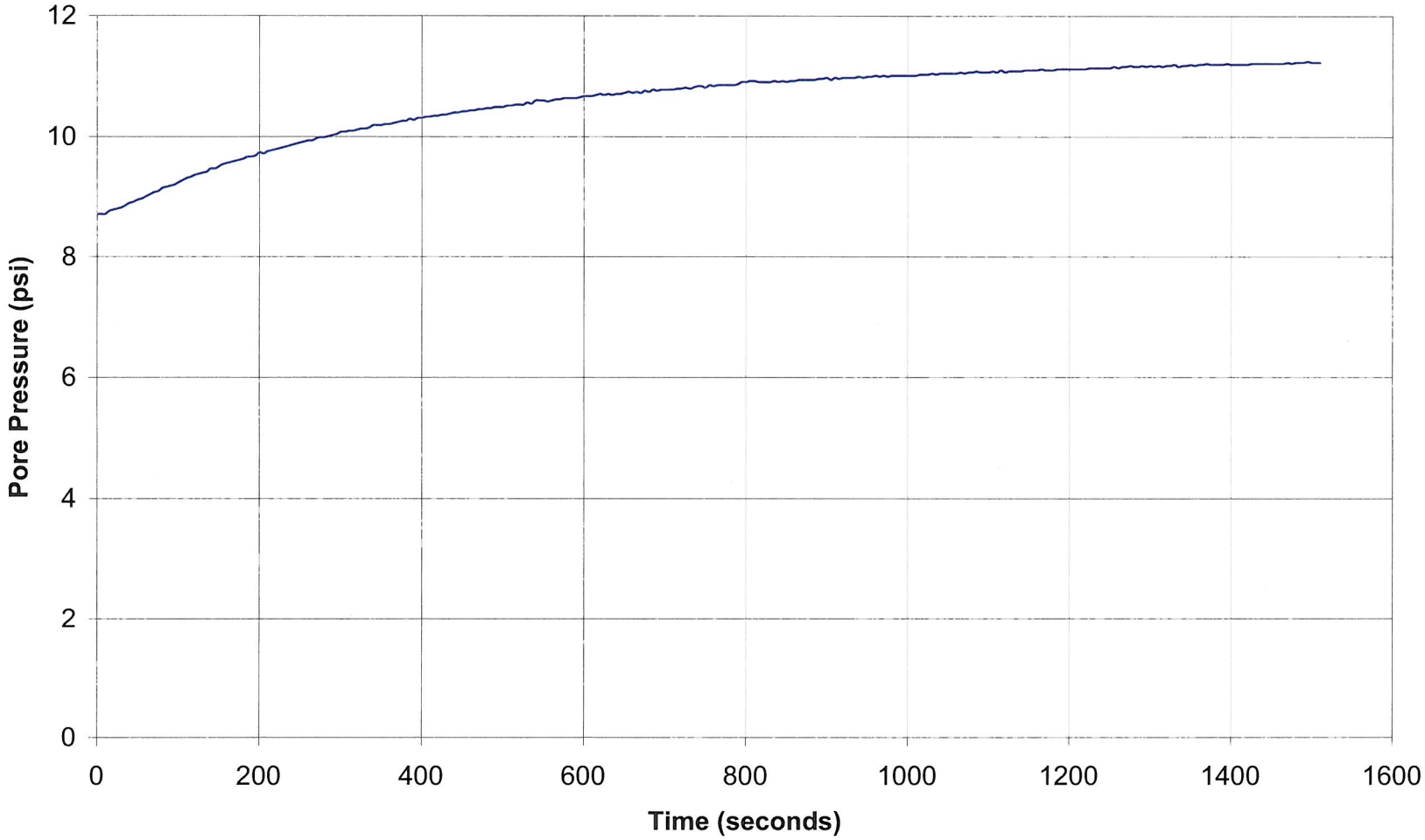
Sounding: cpt-1304
Depth: 73.983
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

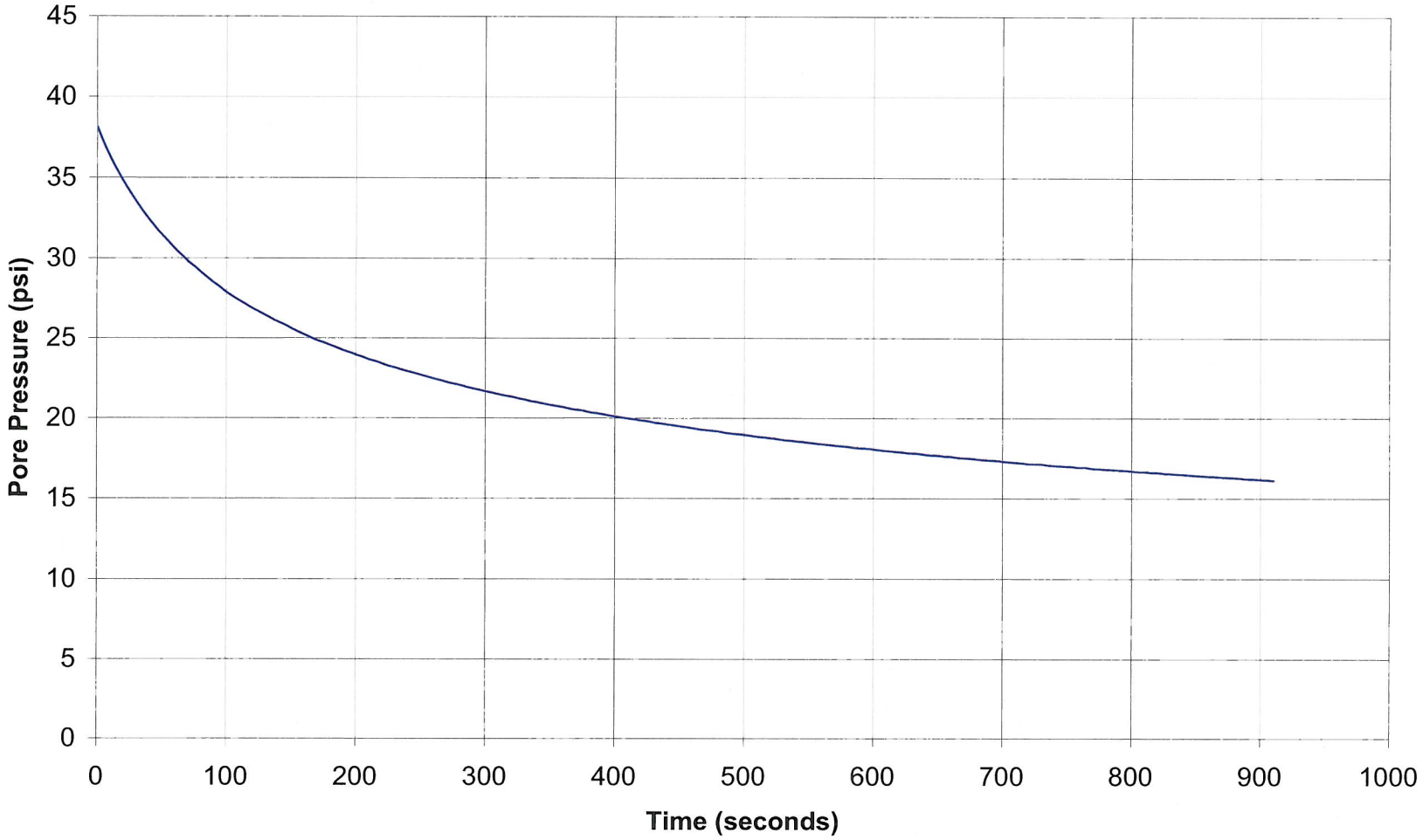
Sounding: cpt-1308a
Depth: 41.174
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

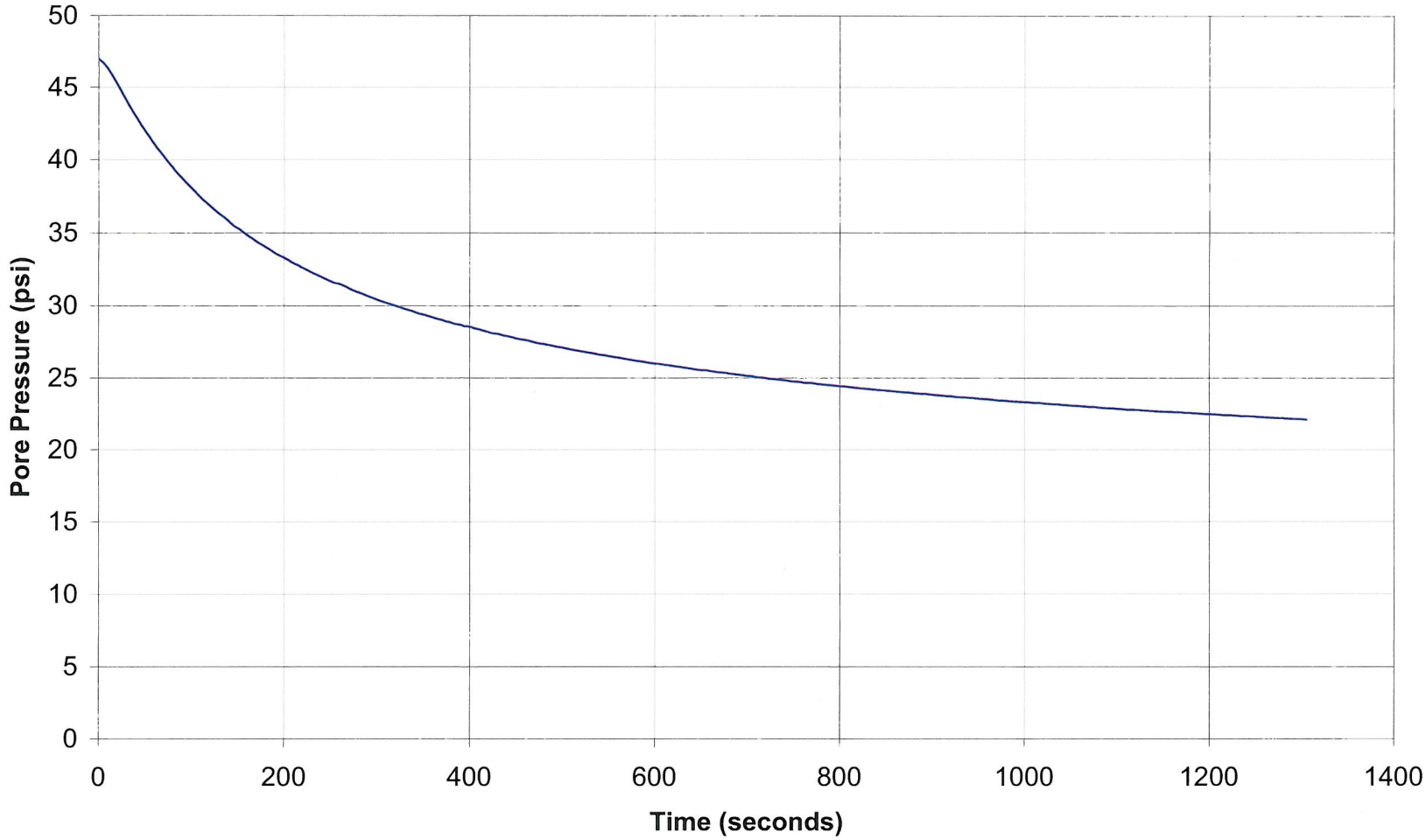
Sounding: cpt-1309
Depth: 60.039
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

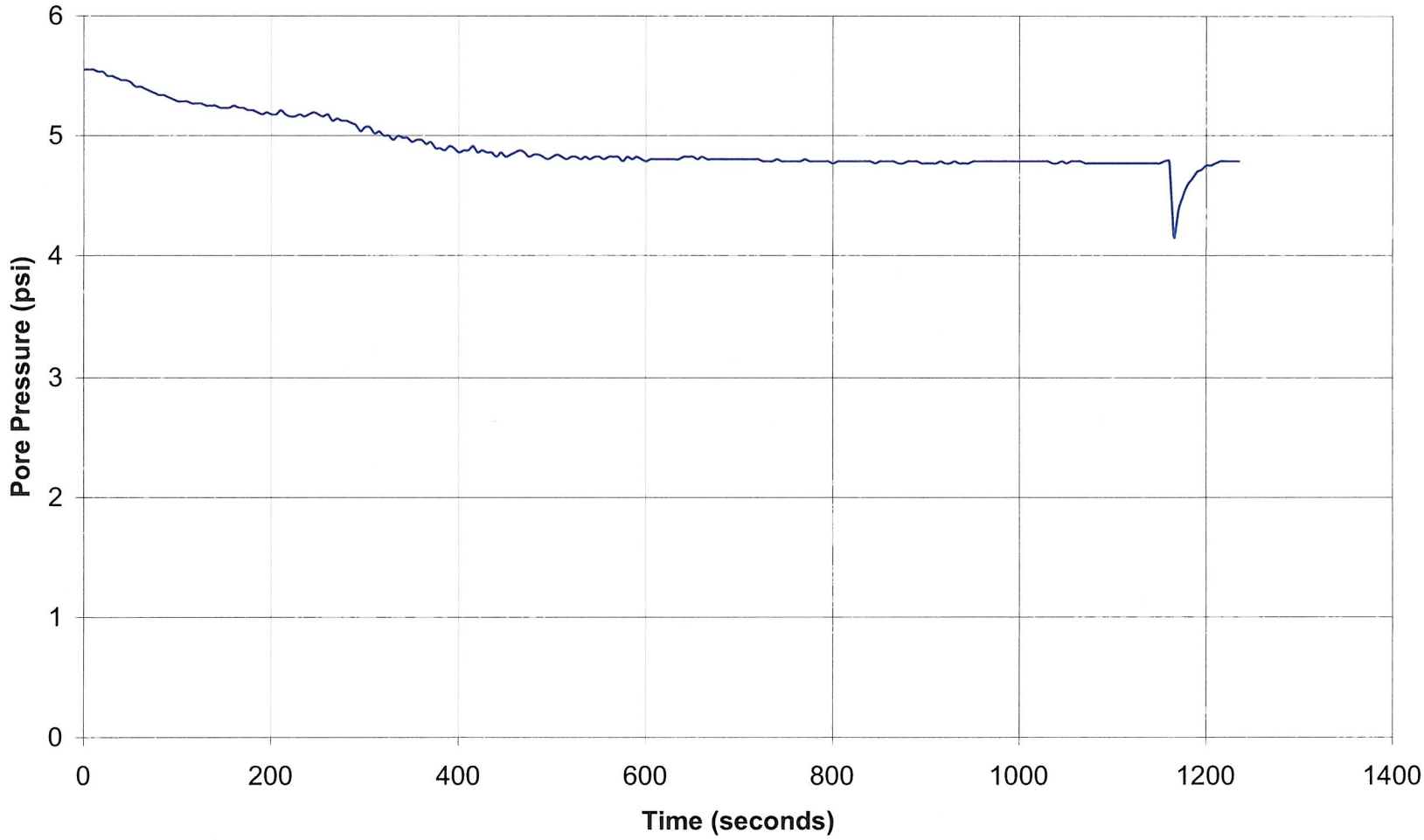
Sounding: cpt-1309
Depth: 85.138
Site: Duke Power
Engineer: C.Sams



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

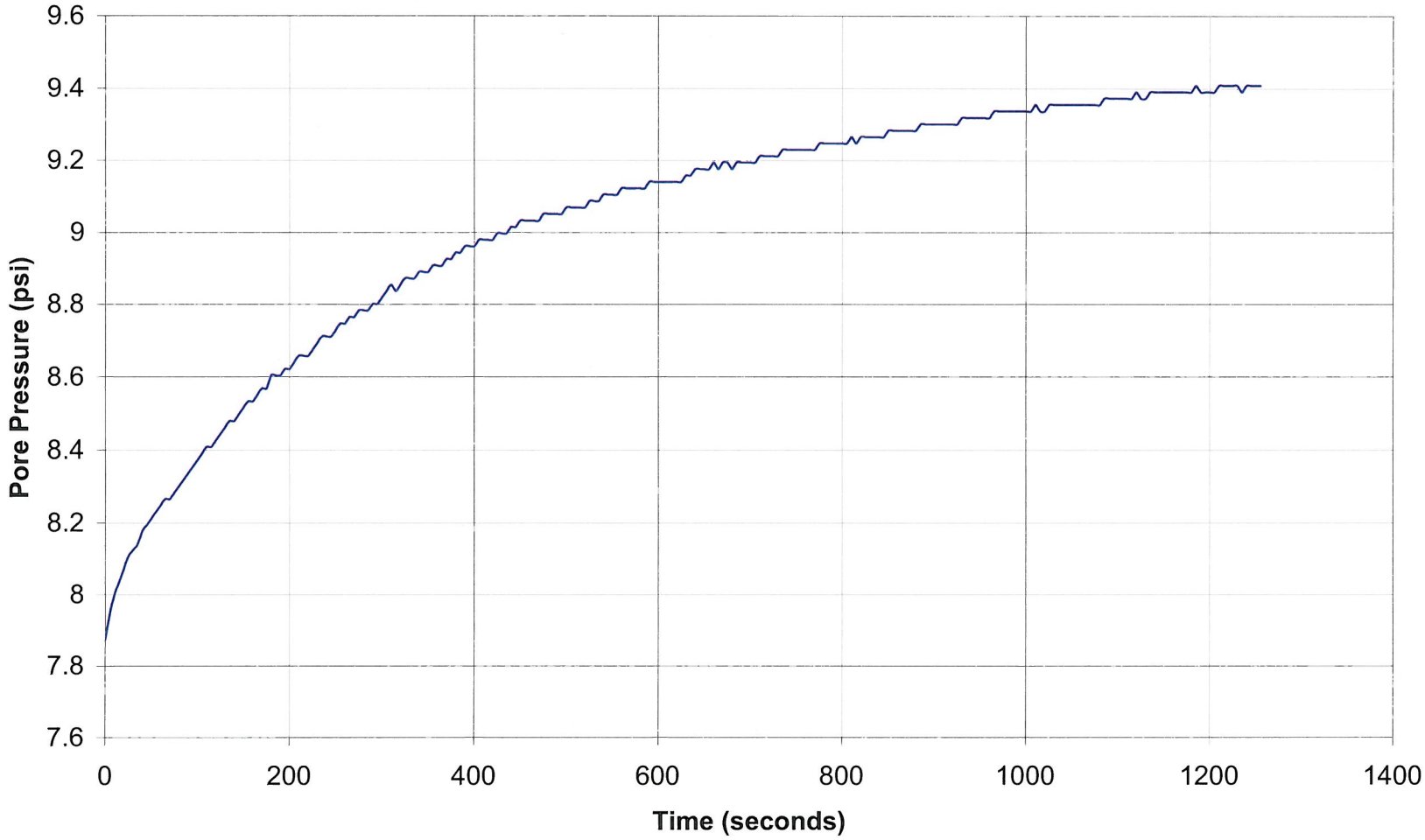
Sounding: cpt-1320
Depth: 32.316
Site: DUKE POWER
Engineer: C.SAMS



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

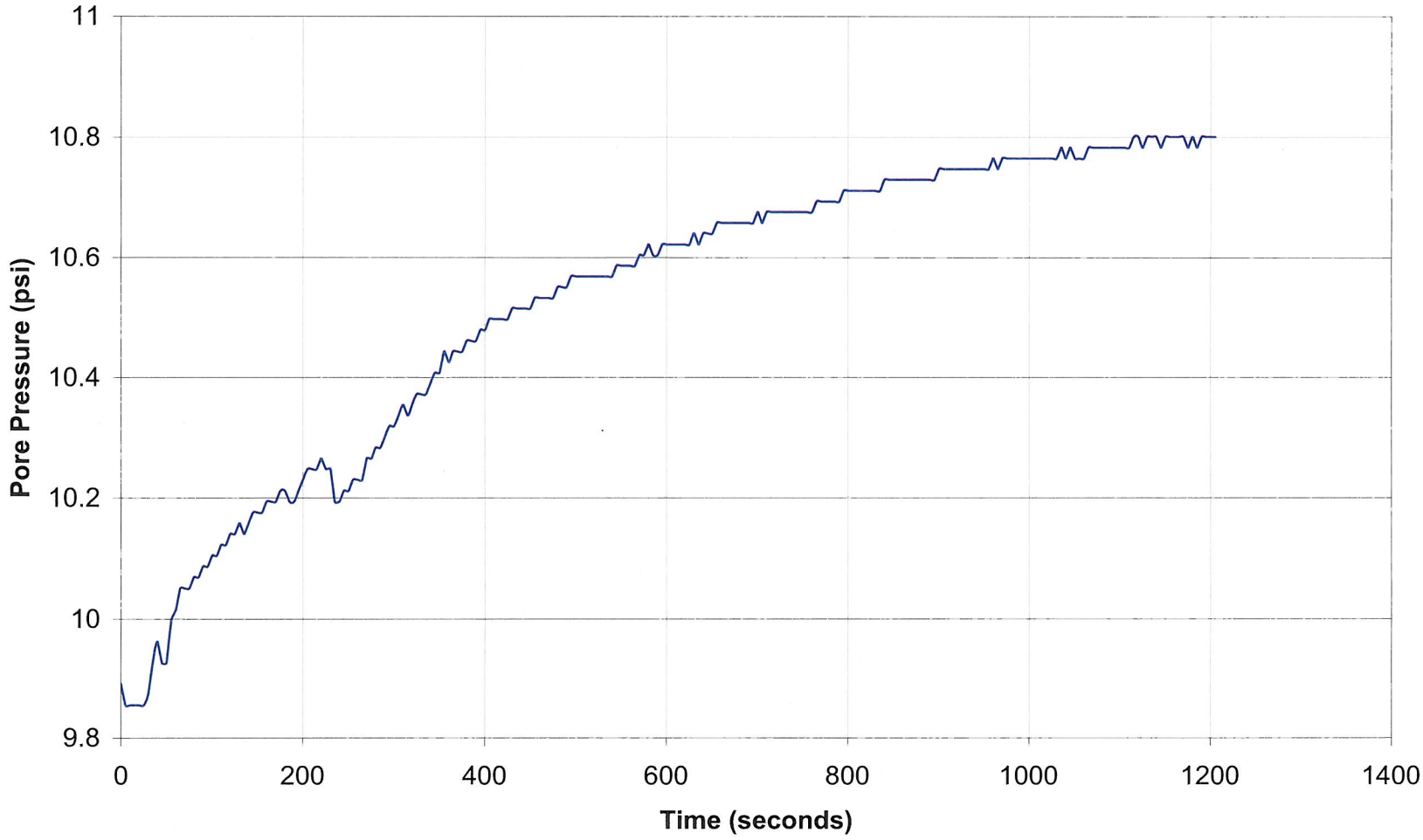
Sounding: cpt-1321
Depth: 43.307
Site: DUKE POWER
Engineer: C.SAMS



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

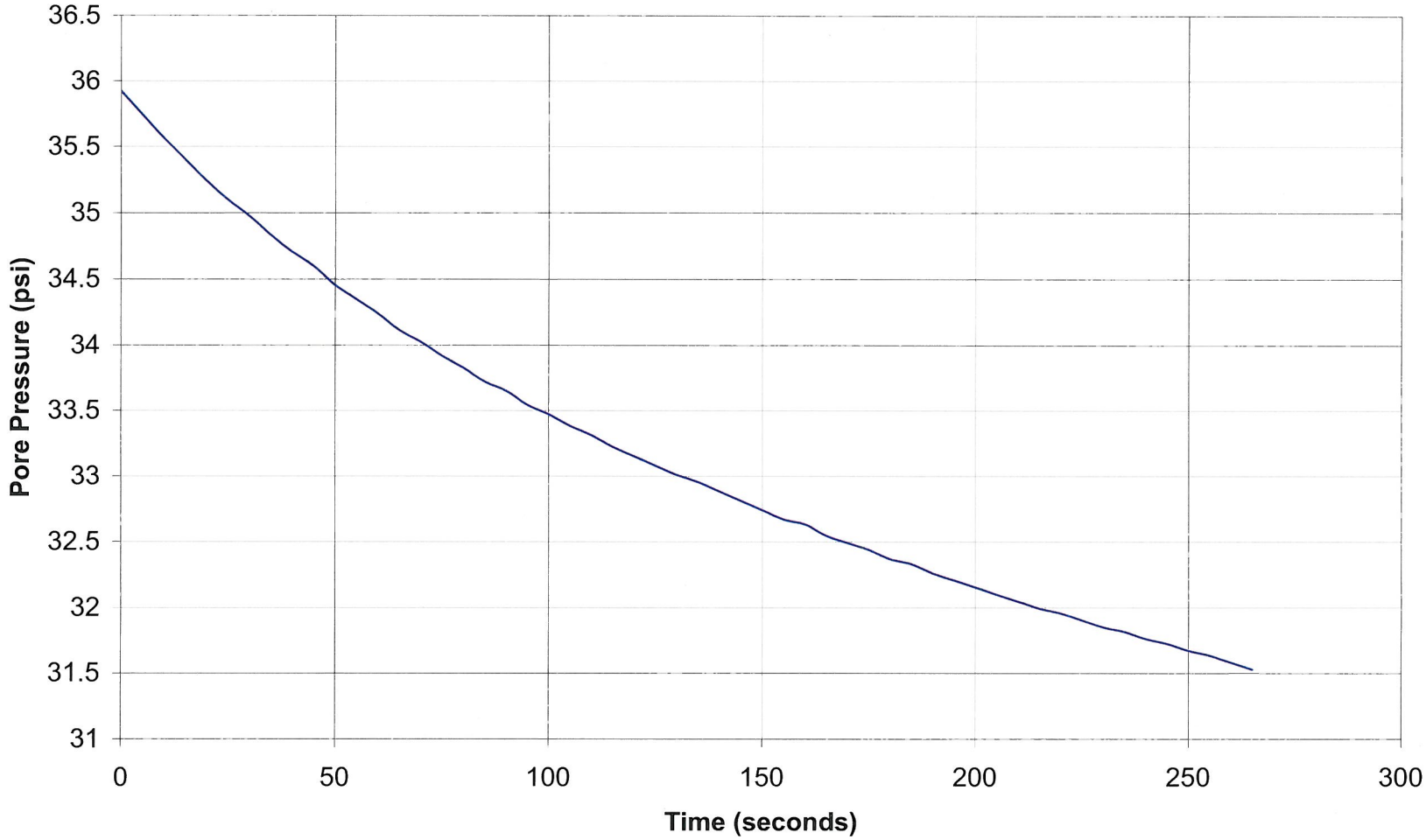
Sounding: cpt-1322
Depth: 48.064
Site: DUKE POWER
Engineer: C.SAMS



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

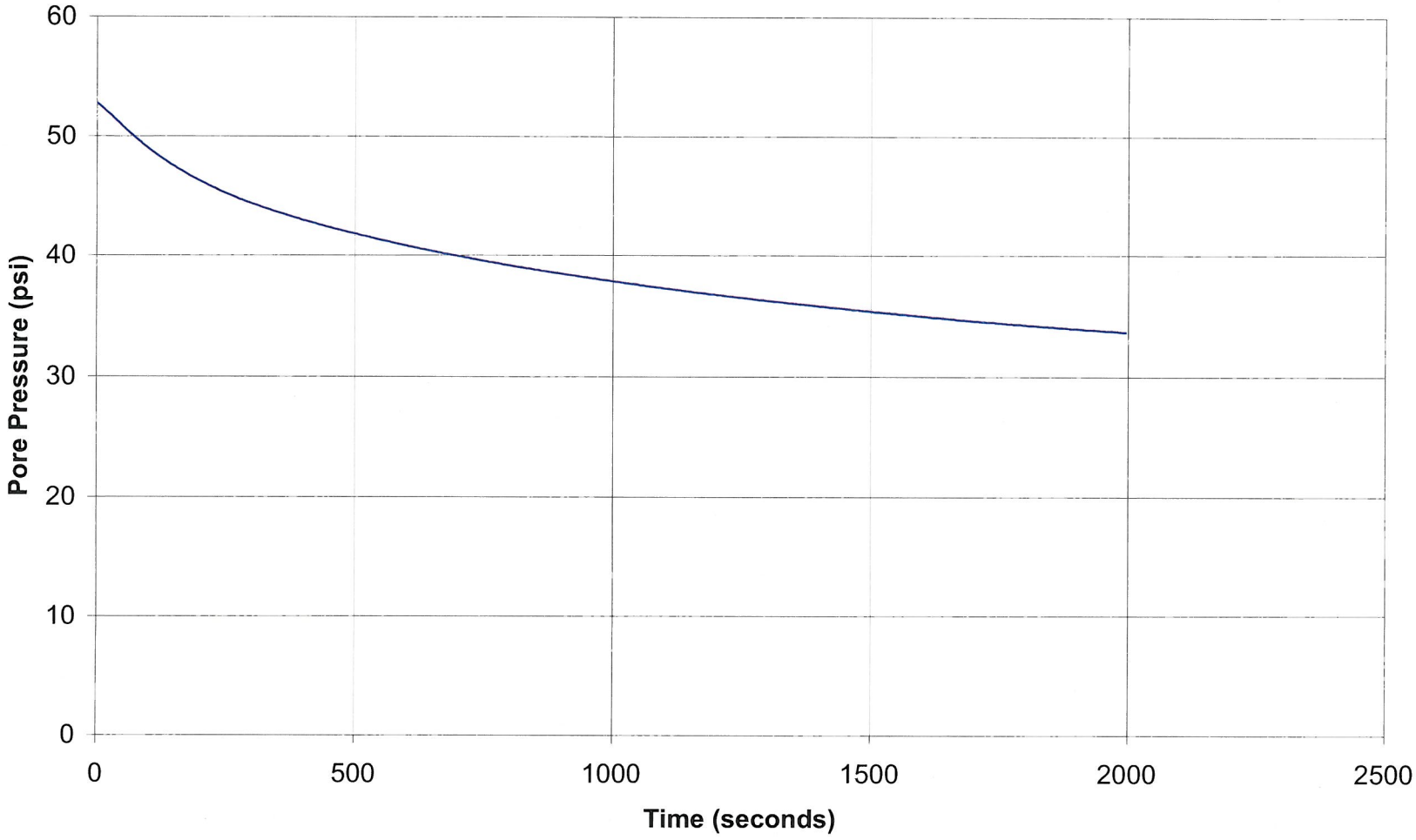
Sounding: cpt-1323
Depth: 81.037
Site: DUKE POWER
Engineer: C.SAMS



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

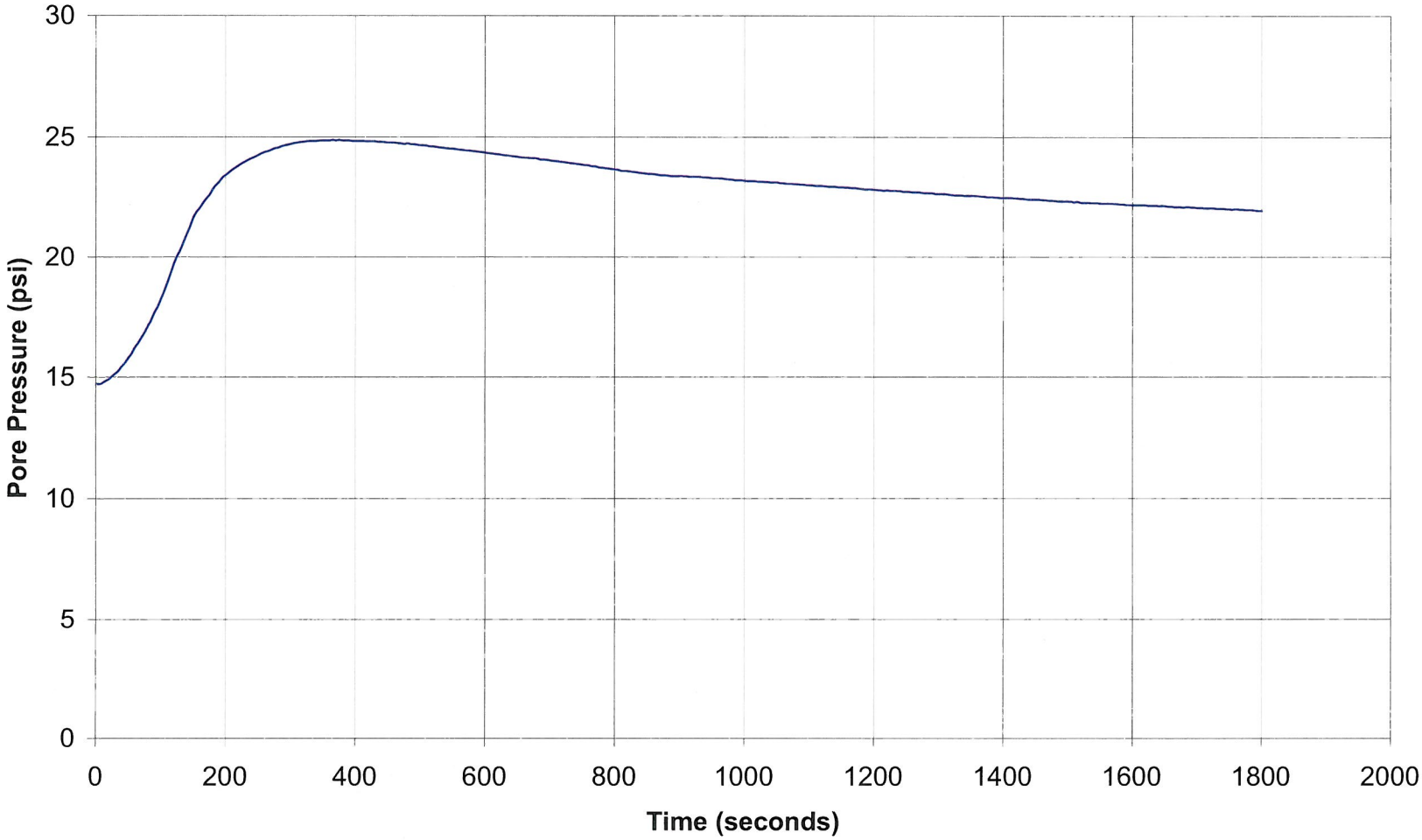
Sounding: cpt-1323
Depth: 84.153
Site: DUKE POWER
Engineer: C.SAMS



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

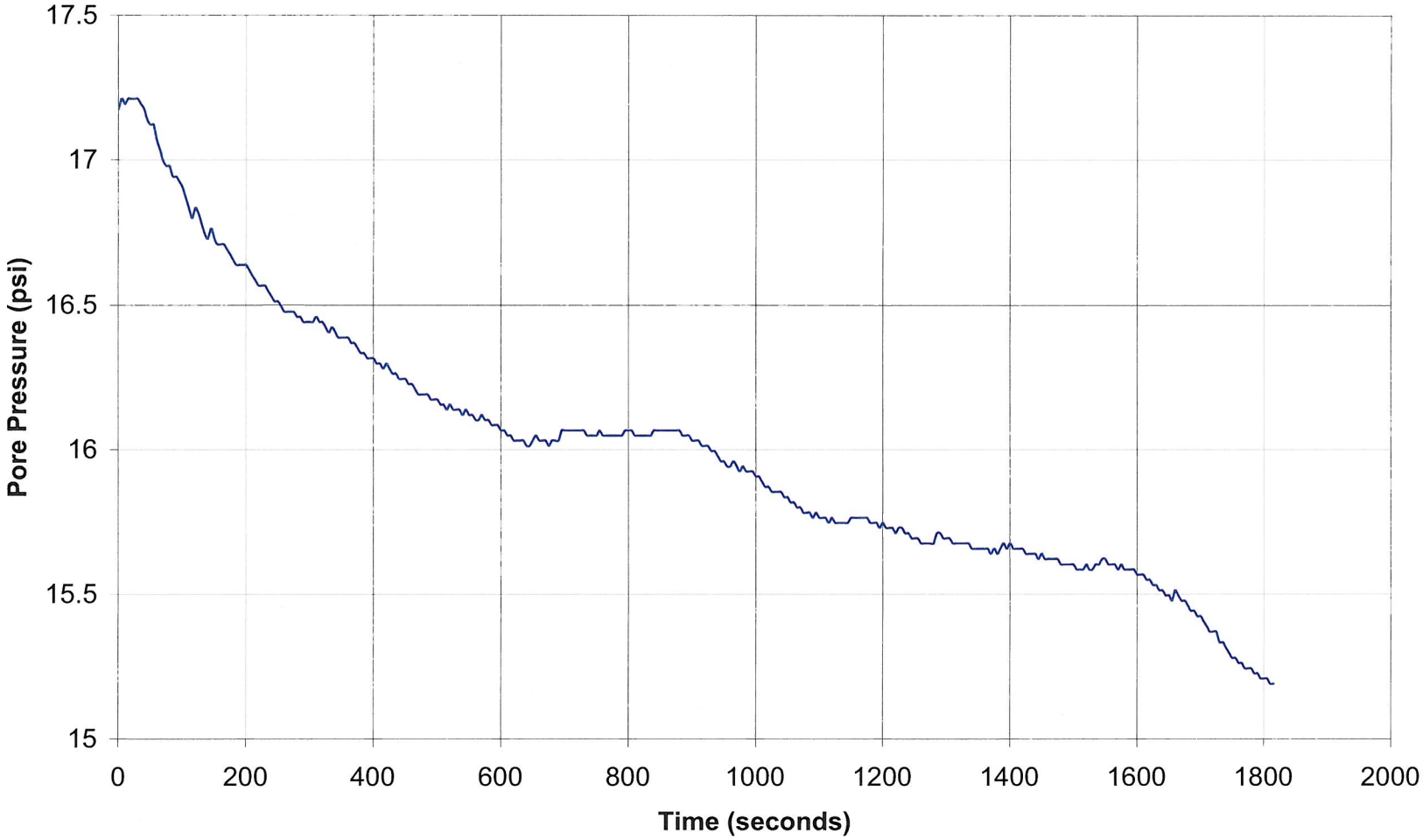
Sounding: cpt-1324b
Depth: 77.264
Site: DUKE POWER
Engineer: C.SAMS



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1325a
Depth: 55.118
Site: DUKE POWER
Engineer: C.SAMS



Shear Wave Velocity Calculations

Duke Power/Cherokee
Mactec

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

5/16/2006 06-061sc
CPT-1308b

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49				
6.07	5.41	10.65	1.15	21.3500			3.93
9.02	8.36	12.41	1.76	22.5000	1.1500	1533.6	6.89
12.14	11.48	14.69	2.28	25.7500	3.2500	702.1	9.92
15.09	14.43	17.10	2.41	28.5000	2.7500	875.1	12.96
19.03	18.37	20.53	3.43	32.2000	3.7000	927.5	16.40
21.16	20.50	22.46	1.93	34.2500	2.0500	940.6	19.44
24.11	23.45	25.18	2.72	37.2500	3.0000	908.1	21.98
27.23	26.57	28.11	2.93	40.5500	3.3000	886.6	25.01
30.02	29.36	30.76	2.65	43.6000	3.0500	868.7	27.97
33.14	32.48	33.75	2.99	47.1000	3.5000	853.7	30.92
36.91	36.25	37.39	3.65	51.0500	3.9500	922.8	34.36

Shear Wave Velocity Calculations

Duke Power/Cherokee
Mactec

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

5/14/2006 06-061sc
CPT-1309

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	16.1500			
6.07	5.41	10.65	1.15	17.0000	0.8500	1356.8	3.93
9.02	8.36	12.41	1.76	18.7500	1.7500	1007.8	6.89
12.14	11.48	14.69	2.28	21.4500	2.7000	845.1	9.92
15.09	14.43	17.10	2.41	25.3500	3.9000	617.1	12.96
18.04	17.38	19.65	2.56	27.2500	1.9000	1345.3	15.91
21.16	20.50	22.46	2.80	31.1500	3.9000	718.9	18.94
24.11	23.45	25.18	2.72	33.4500	2.3000	1184.5	21.98
27.07	26.41	27.95	2.77	36.0000	2.5500	1086.6	24.93
30.02	29.36	30.76	2.80	39.2500	3.2500	863.0	27.88
33.14	32.48	33.75	2.99	42.0000	2.7500	1086.5	30.92
36.09	35.43	36.60	2.85	45.7000	3.7000	770.4	33.95
39.04	38.38	39.46	2.87	49.0000	3.3000	868.3	36.91
42.16	41.50	42.50	3.04	52.2000	3.2000	949.3	39.94
45.11	44.45	45.39	2.89	55.2000	3.0000	962.6	42.98
48.06	47.40	48.28	2.90	58.3500	3.1500	919.2	45.93
51.02	50.36	51.19	2.90	60.6500	2.3000	1261.8	48.88
54.13	53.47	54.25	3.07	63.6000	2.9500	1040.4	51.92
57.09	56.43	57.17	2.91	67.2000	3.6000	809.0	54.95
60.04	59.38	60.08	2.92	69.8500	2.6500	1100.5	57.90
63.32	62.66	63.33	3.24	72.3500	2.5000	1297.7	61.02
66.11	65.45	66.09	2.76	74.7500	2.4000	1150.2	64.05
69.06	68.40	69.01	2.93	77.9500	3.2000	914.2	66.93
72.34	71.68	72.27	3.25	81.3500	3.4000	956.8	70.04
75.13	74.47	75.03	2.77	83.7500	2.4000	1152.9	73.08
78.08	77.42	77.96	2.93	86.6000	2.8500	1028.6	75.95
81.04	80.38	80.90	2.93	89.5000	2.9000	1011.4	78.90
84.15	83.49	84.00	3.10	92.2000	2.7000	1147.2	81.93

Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE
MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1320

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	15.9000			
6.07	5.41	10.65	1.15	17.4500	1.5500	744.1	3.93
9.02	8.36	12.41	1.76	19.4000	1.9500	904.4	6.89
12.14	11.48	14.69	2.28	22.8500	3.4500	661.4	9.92
15.09	14.43	17.10	2.41	25.9000	3.0500	789.1	12.96
18.04	17.38	19.65	2.56	29.4000	3.5000	730.3	15.91
21.16	20.50	22.46	2.80	32.1500	2.7500	1019.6	18.94
24.11	23.45	25.18	2.72	36.0000	3.8500	707.6	21.98
27.07	26.41	27.95	2.77	39.7500	3.7500	738.9	24.93
30.02	29.36	30.76	2.80	43.3000	3.5500	790.0	27.88
32.32	31.66	32.96	2.20	45.8000	2.5000	879.7	30.51

Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE
MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1321

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	17.9000			
6.07	5.41	10.65	1.15	18.9500	1.0500	1098.4	3.93
9.02	8.36	12.41	1.76	21.2500	2.3000	766.8	6.89
12.14	11.48	14.69	2.28	23.9000	2.6500	861.0	9.92
15.09	14.43	17.10	2.41	27.6500	3.7500	641.8	12.96
18.04	17.38	19.65	2.56	30.6000	2.9500	866.5	15.91
21.16	20.50	22.46	2.80	34.1500	3.5500	789.8	18.94
24.11	23.45	25.18	2.72	37.8000	3.6500	746.4	21.98
27.23	26.57	28.11	2.93	41.5500	3.7500	780.2	25.01
30.02	29.36	30.76	2.65	45.0500	3.5000	757.0	27.97
33.14	32.48	33.75	2.99	48.8500	3.8000	786.3	30.92
36.09	35.43	36.60	2.85	52.4500	3.6000	791.8	33.95
39.04	38.38	39.46	2.87	55.6500	3.2000	895.5	36.91
42.16	41.50	42.50	3.04	59.2000	3.5500	855.7	39.94
43.31	42.65	43.62	1.12	60.0500	0.8500	1319.9	42.07

Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE
MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1322

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	15.9500			
6.07	5.41	10.65	1.15	17.6000	1.6500	699.0	3.93
9.02	8.36	12.41	1.76	19.6500	2.0500	860.3	6.89
12.14	11.48	14.69	2.28	22.4500	2.8000	814.9	9.92
15.09	14.43	17.10	2.41	25.6500	3.2000	752.1	12.96
18.04	17.38	19.65	2.56	29.0500	3.4000	751.8	15.91
21.16	20.50	22.46	2.80	32.0000	2.9500	950.5	18.94
24.11	23.45	25.18	2.72	35.4000	3.4000	801.3	21.98
27.07	26.41	27.95	2.77	39.0500	3.6500	759.1	24.93
30.02	29.36	30.76	2.80	43.0000	3.9500	710.0	27.88
33.14	32.48	33.75	2.99	46.8500	3.8500	776.1	30.92
36.09	35.43	36.60	2.85	50.4500	3.6000	791.8	33.95
39.21	38.55	39.62	3.03	55.0500	4.6000	657.6	36.99
42.32	41.66	42.66	3.04	59.1000	4.0500	750.2	40.10
45.11	44.45	45.39	2.73	62.1000	3.0000	909.2	43.06
48.06	47.40	48.28	2.90	63.6500	1.5500	1868.1	45.93

Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE
MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1323

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	17.3500			
6.07	5.41	10.65	1.15	17.8000	0.4500	2562.9	3.93
9.02	8.36	12.41	1.76	19.8000	2.0000	881.8	6.89
12.14	11.48	14.69	2.28	22.7500	2.9500	773.5	9.92
15.09	14.43	17.10	2.41	25.7500	3.0000	802.2	12.96
18.04	17.38	19.65	2.56	28.7000	2.9500	866.5	15.91
21.16	20.50	22.46	2.80	33.2500	4.5500	616.2	18.94
24.11	23.45	25.18	2.72	37.4000	4.1500	656.5	21.98
27.07	26.41	27.95	2.77	40.7000	3.3000	839.6	24.93
30.02	29.36	30.76	2.80	43.7500	3.0500	919.5	27.88
33.14	32.48	33.75	2.99	48.0000	4.2500	703.0	30.92
36.09	35.43	36.60	2.85	51.0000	3.0000	950.1	33.95
39.04	38.38	39.46	2.87	54.7500	3.7500	764.1	36.91
42.32	41.66	42.66	3.20	58.0500	3.3000	969.0	40.02
45.11	44.45	45.39	2.73	60.3000	2.2500	1212.2	43.06
48.06	47.40	48.28	2.90	63.3000	3.0000	965.2	45.93
51.02	50.36	51.19	2.90	66.2500	2.9500	983.8	48.88
54.13	53.47	54.25	3.07	69.2500	3.0000	1023.1	51.92
57.09	56.43	57.17	2.91	72.4500	3.2000	910.1	54.95
60.04	59.38	60.08	2.92	75.2500	2.8000	1041.6	57.90
63.48	62.82	63.49	3.41	79.3000	4.0500	841.2	61.10
66.11	65.45	66.09	2.60	81.8000	2.5000	1039.3	64.14
69.06	68.40	69.01	2.93	84.9500	3.1500	928.7	66.93
72.01	71.35	71.94	2.93	87.8000	2.8500	1027.2	69.88
75.13	74.47	75.03	3.09	90.3000	2.5000	1237.0	72.91
78.08	77.42	77.96	2.93	93.0000	2.7000	1085.7	75.95
81.04	80.38	80.90	2.93	95.4500	2.4500	1197.1	78.90
84.15	83.49	84.00	3.10	97.7000	2.2500	1376.6	81.93

Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE
MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1324b

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	17.4500			
6.07	5.41	10.65	1.15	18.2000	0.7500	1537.7	3.93
9.02	8.36	12.41	1.76	20.4500	2.2500	783.8	6.89
12.14	11.48	14.69	2.28	23.1500	2.7000	845.1	9.92
15.09	14.43	17.10	2.41	26.4000	3.2500	740.5	12.96
18.04	17.38	19.65	2.56	28.8500	2.4500	1043.3	15.91
21.16	20.50	22.46	2.80	32.6500	3.8000	737.9	18.94
24.11	23.45	25.18	2.72	36.0000	3.3500	813.2	21.98
27.07	26.41	27.95	2.77	39.0000	3.0000	923.6	24.93
30.02	29.36	30.76	2.80	42.2000	3.2000	876.4	27.88
33.14	32.48	33.75	2.99	45.6500	3.4500	866.0	30.92
36.09	35.43	36.60	2.85	49.0000	3.3500	850.9	33.95
39.37	38.71	39.78	3.18	52.0500	3.0500	1044.2	37.07
42.16	41.50	42.50	2.72	54.5500	2.5000	1087.4	40.10
45.11	44.45	45.39	2.89	57.6000	3.0500	946.8	42.98
48.06	47.40	48.28	2.90	60.4000	2.8000	1034.1	45.93
51.02	50.36	51.19	2.90	63.2500	2.8500	1018.3	48.88
54.13	53.47	54.25	3.07	66.3000	3.0500	1006.3	51.92
57.09	56.43	57.17	2.91	69.8500	3.5500	820.4	54.95
60.04	59.38	60.08	2.92	72.4500	2.6000	1121.7	57.90
63.16	62.50	63.17	3.08	75.6500	3.2000	963.1	60.94
66.11	65.45	66.09	2.92	78.7500	3.1000	942.9	63.97
69.06	68.40	69.01	2.93	81.2000	2.4500	1194.0	66.93
72.01	71.35	71.94	2.93	84.1500	2.9500	992.4	69.88
75.13	74.47	75.03	3.09	86.7000	2.5500	1212.7	72.91
77.26	76.60	77.15	2.12	88.5000	1.8000	1176.1	75.54

Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE
MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 1.67 Feet

06-094sc
cpt-1325

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	2.97	2.97	15.8500			
6.07	5.41	5.66	2.69	16.7500	0.9000	2989.8	3.93
9.02	8.36	8.53	2.87	19.2500	2.5000	1146.4	6.89
12.14	11.48	11.60	3.07	22.3000	3.0500	1007.4	9.92
15.09	14.43	14.53	2.93	25.1500	2.8500	1027.4	12.96
18.04	17.38	17.46	2.94	28.0500	2.9000	1012.6	15.91
21.16	20.50	20.57	3.10	31.6000	3.5500	874.6	18.94
24.11	23.45	23.51	2.94	34.9000	3.3000	892.2	21.98
27.07	26.41	26.46	2.95	37.9000	3.0000	982.0	24.93
30.02	29.36	29.41	2.95	40.8000	2.9000	1016.4	27.88
33.30	32.64	32.68	3.28	44.4000	3.6000	910.0	31.00
36.09	35.43	35.47	2.79	47.4500	3.0500	913.2	34.03
40.03	39.37	39.40	3.93	50.1000	2.6500	1484.2	37.40

Shear Wave Velocity Calculations

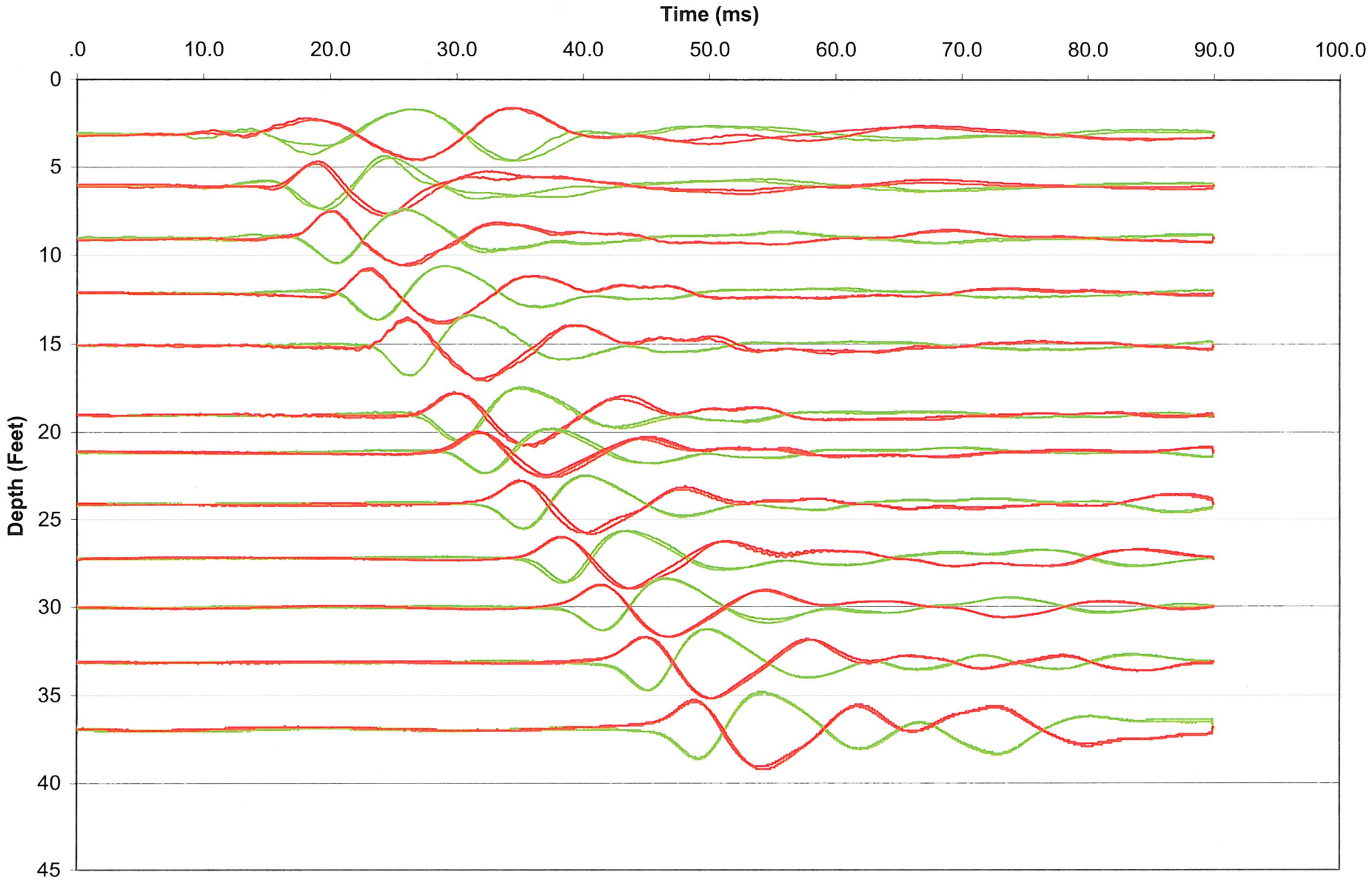
DUKE POWER/CHEROKEE
MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

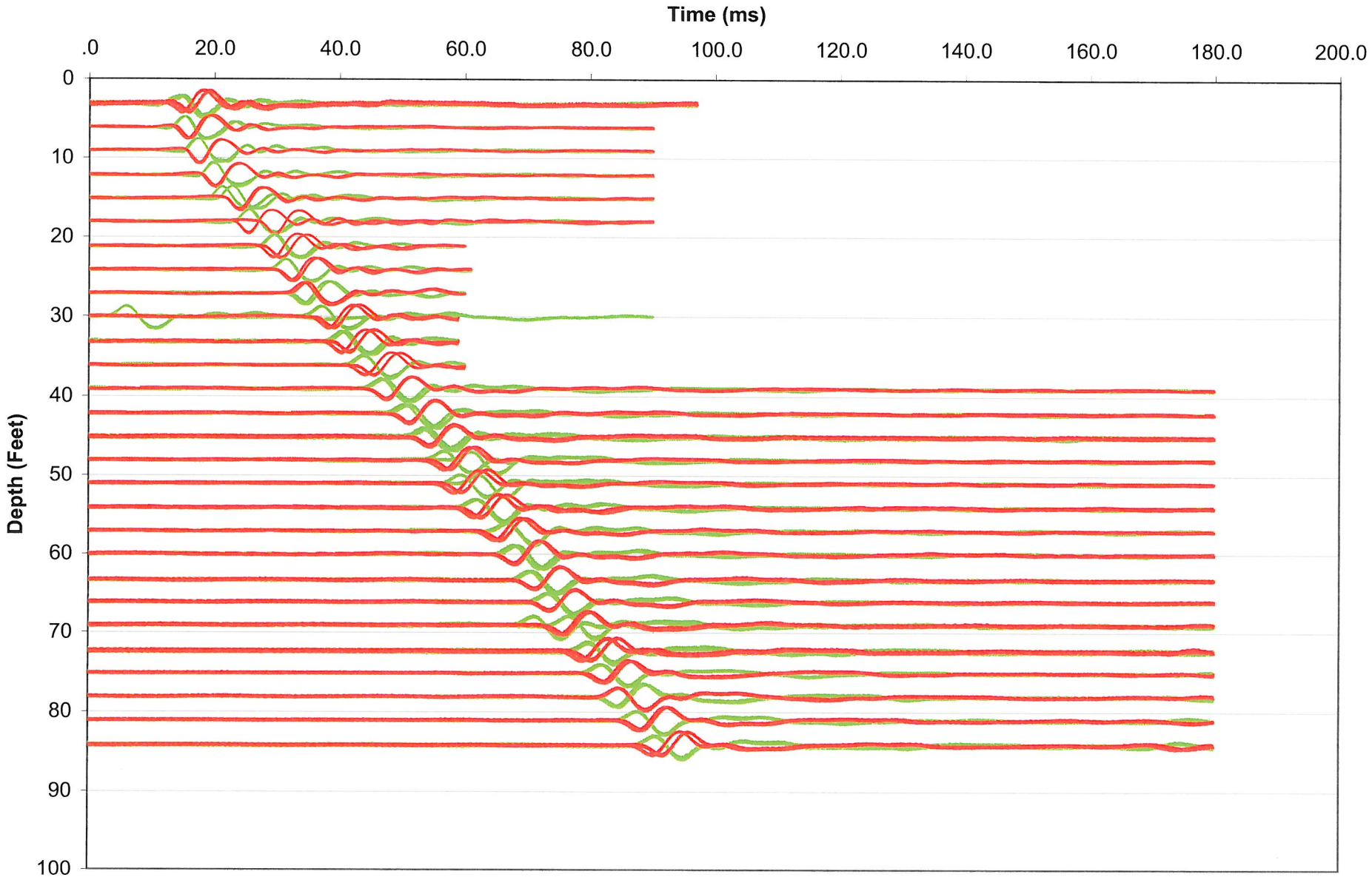
06-094sc
cpt-1325a

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
43.14	42.48	43.46	43.46	56.3000			
46.10	45.44	46.35	2.89	59.3500	3.0500	947.7	43.96
49.05	48.39	49.25	2.90	61.9000	2.5500	1136.4	46.91
51.34	50.68	51.51	2.26	64.7000	2.8000	806.5	49.54
54.63	53.97	54.74	3.23	67.5500	2.8500	1133.9	52.33
55.12	54.46	55.22	0.49				54.21

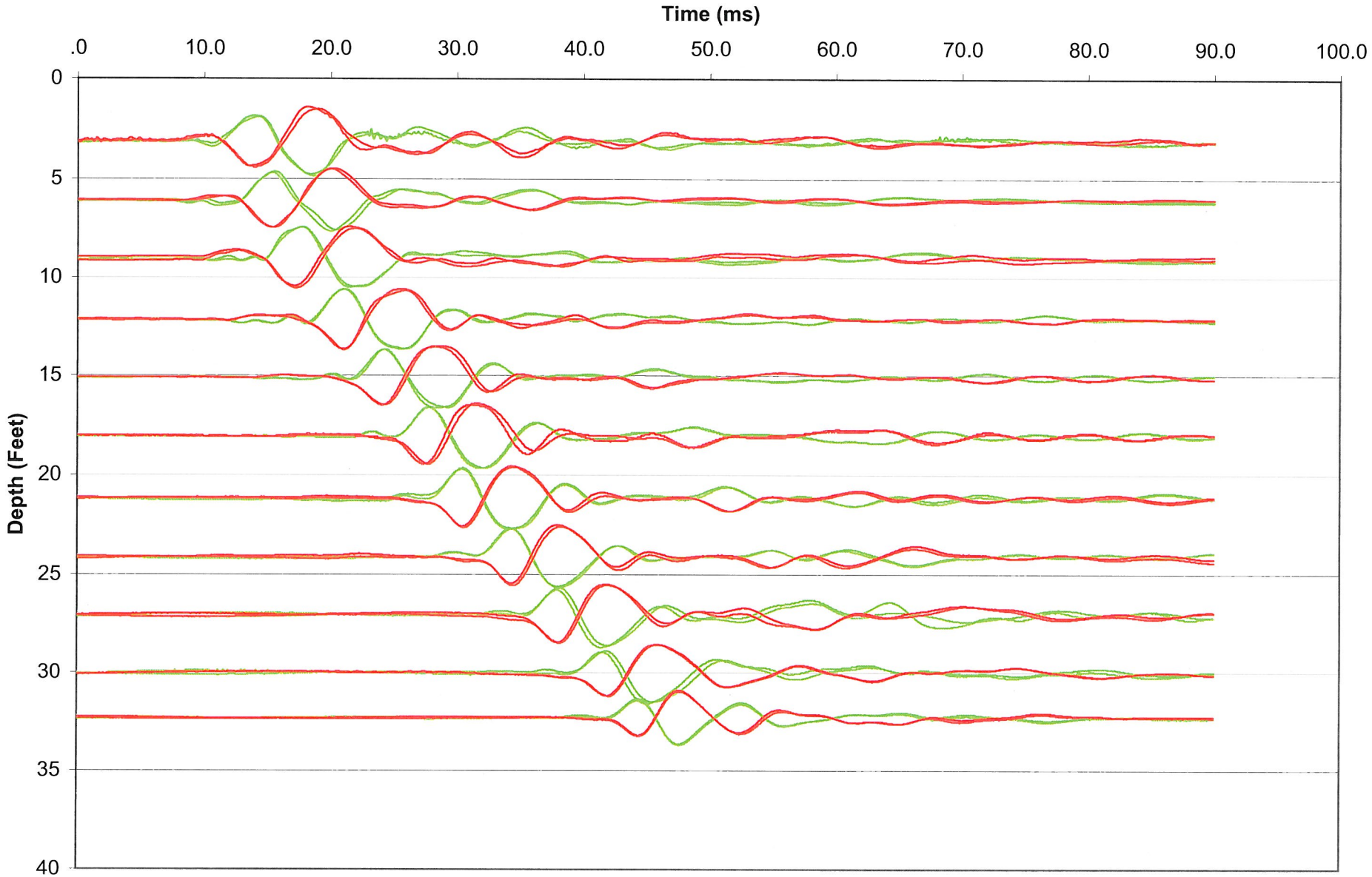
Waveforms for sounding cpt-1308b



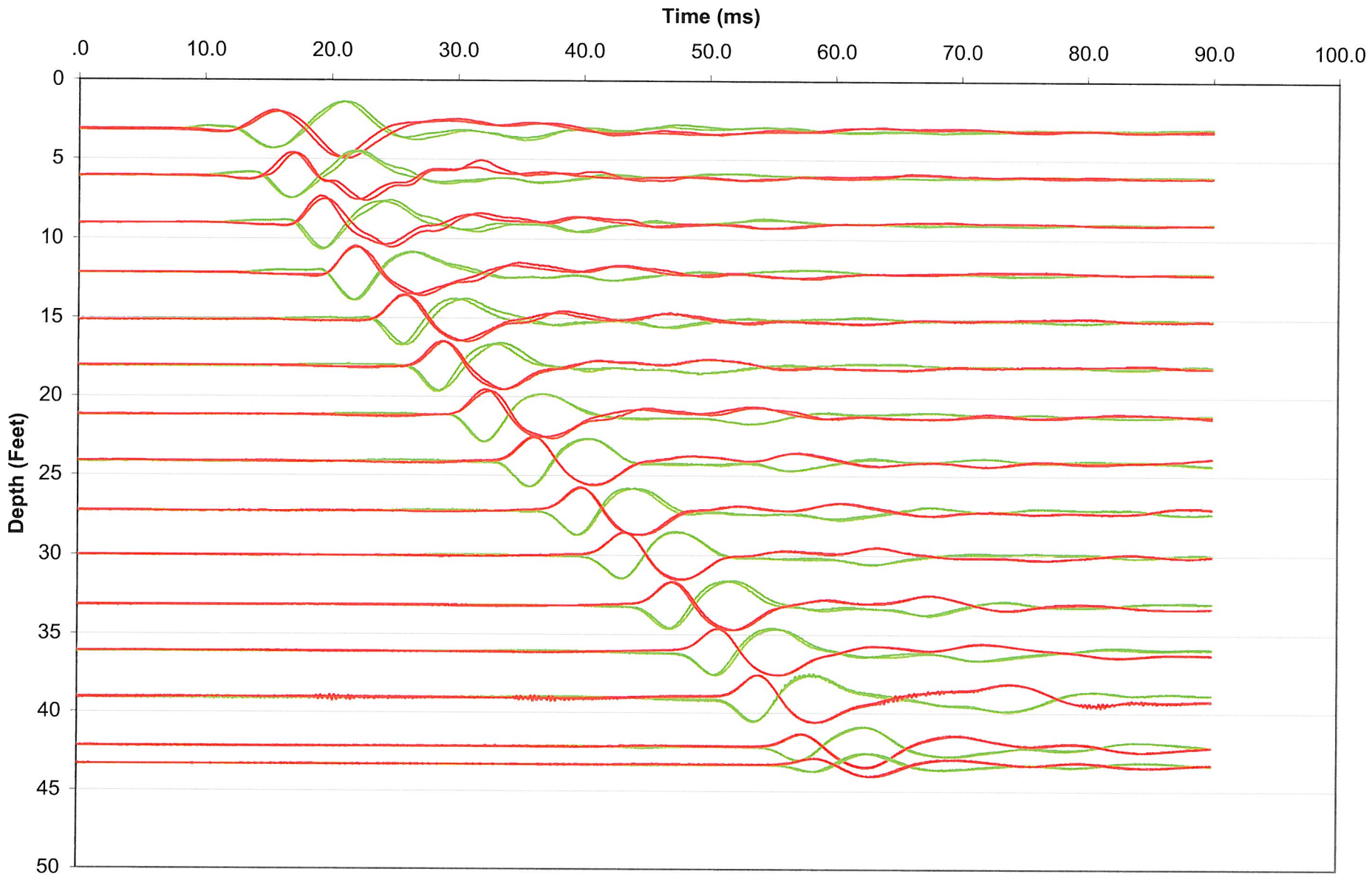
Waveforms for sounding cpt-1309



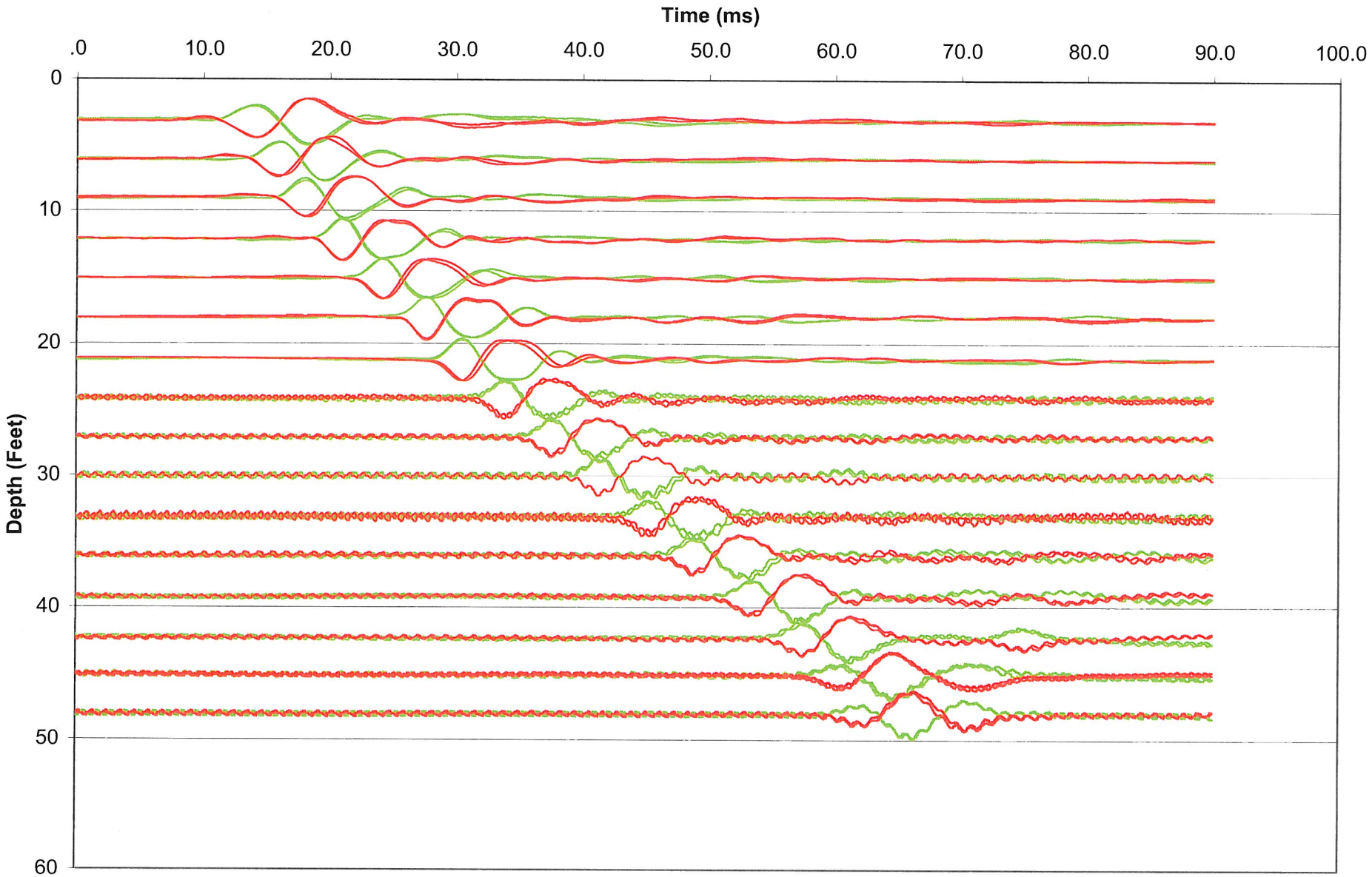
Waveforms for sounding cpt-1320



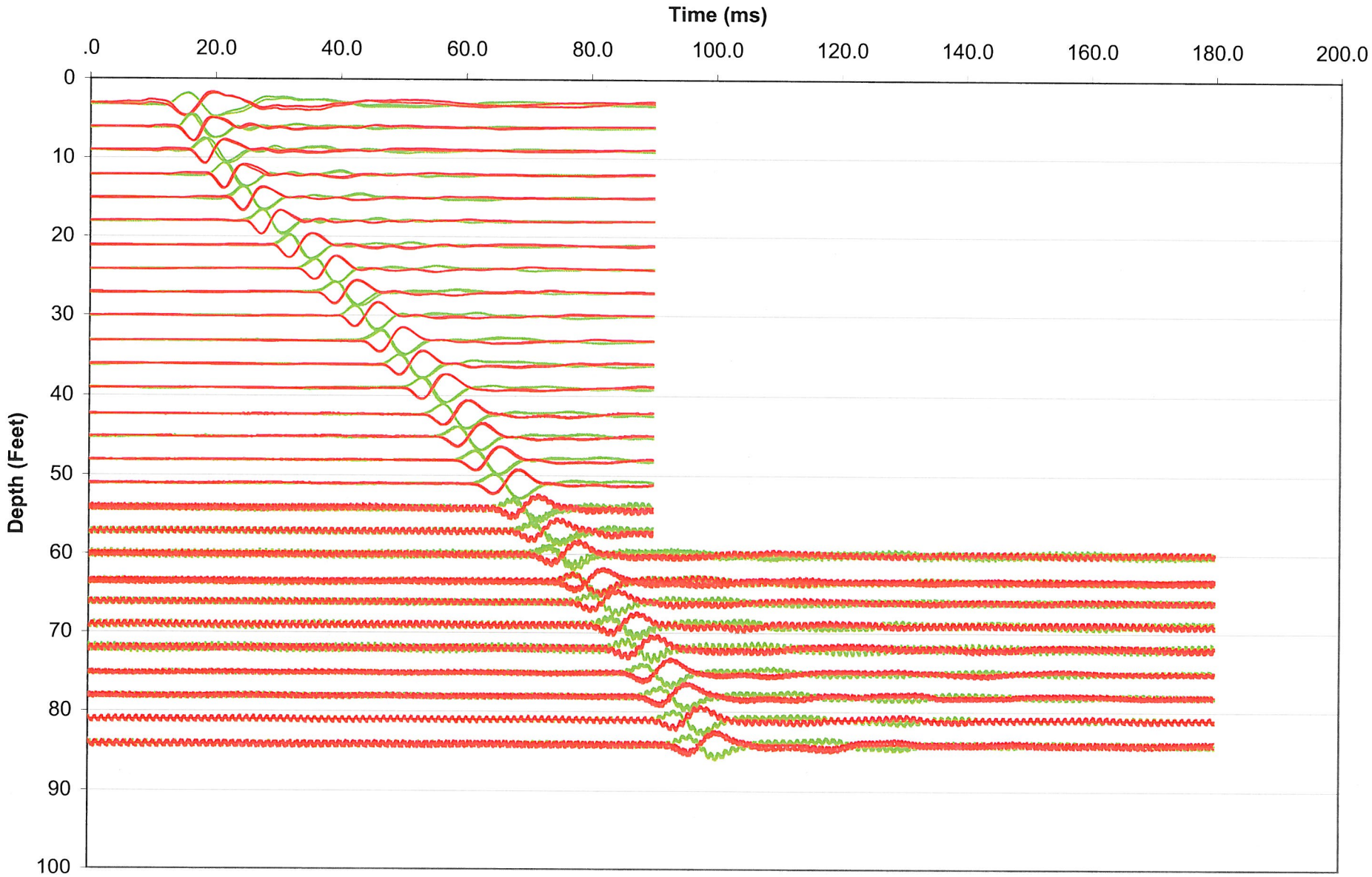
Waveforms for sounding cpt-1321



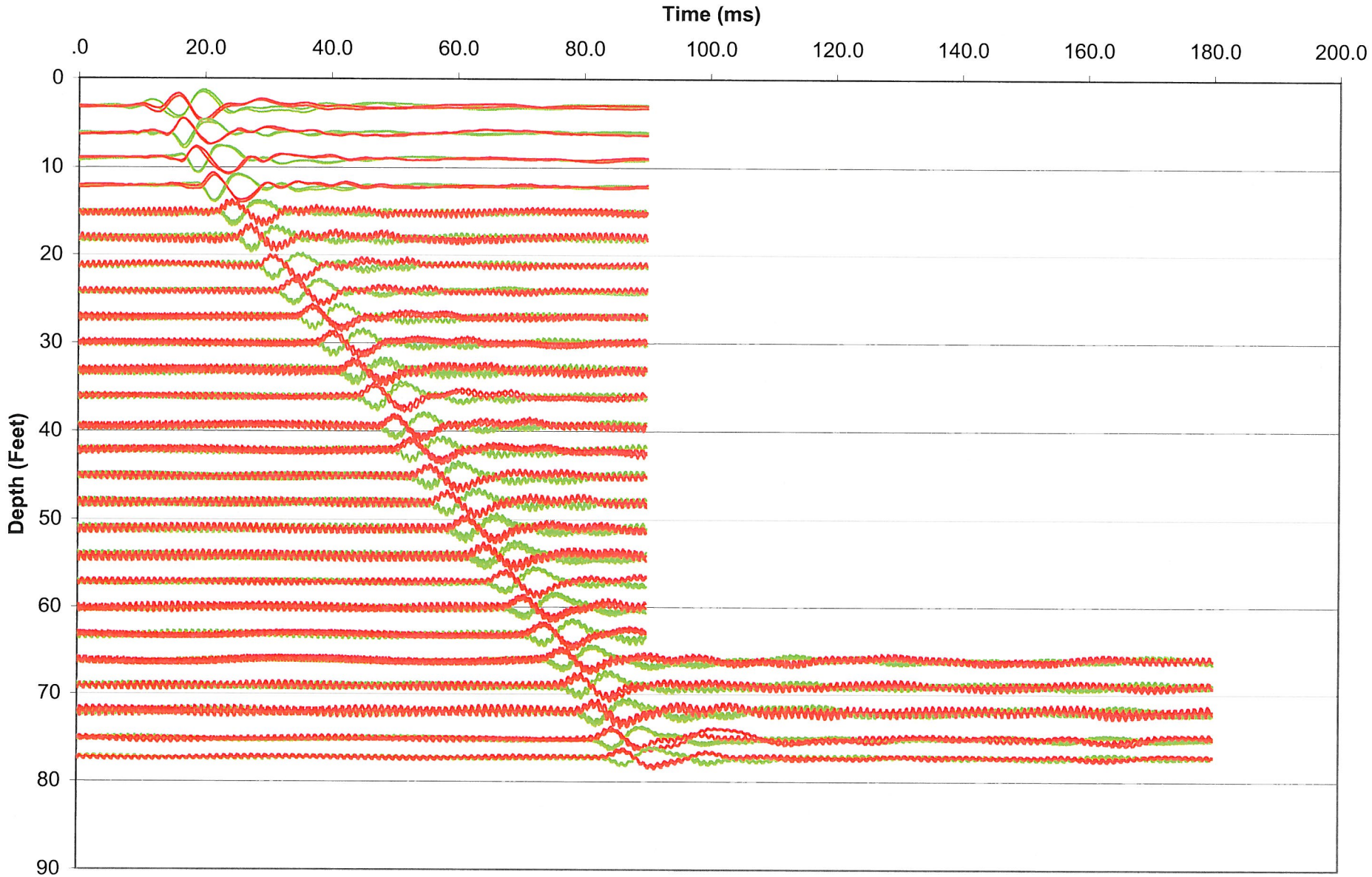
Waveforms for sounding cpt-1322



Waveforms for sounding cpt-1323

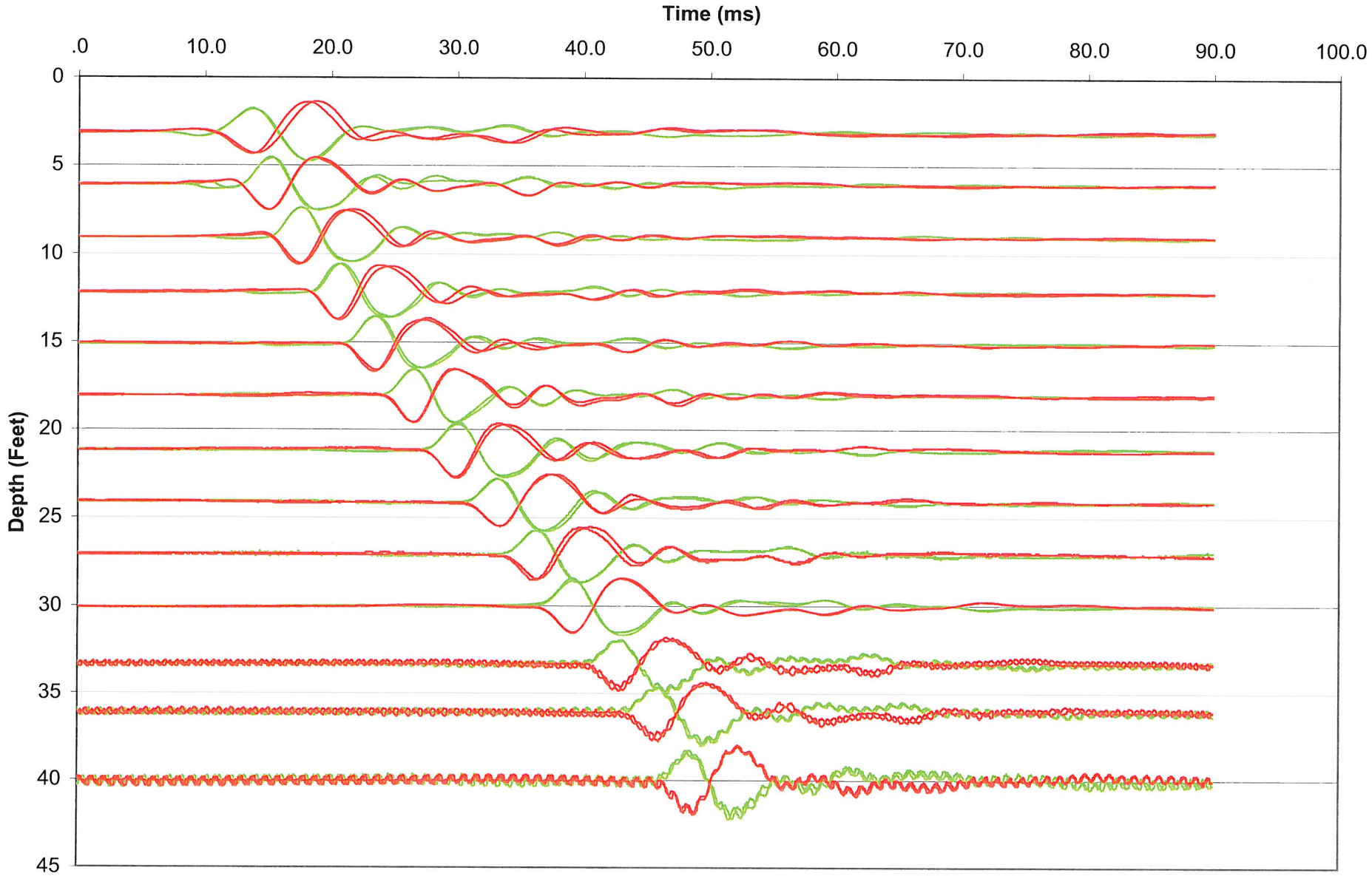


Waveforms for sounding cpt-1324b



GREGG

Waveforms for sounding cpt-1325



Waveforms for sounding cpt-1325a

