GROUP SYMBOLS	TYPICAL NAMES	GROUP SYMBOLS	TYPICAL NAMES
	TOPSOIL		**CONCRETE**
	ASPHALT		**DOLOMITE**
	GRAVEL		**LIMESTONE**
	FILL		**SHALE**
	SUBSOIL		**LIMESTONE/SHALE** - Limestone with shale interbeds
	ALLUVIUM		**SANDSTONE**
	COLLUVIUM		**SILTSTONE**
	RESIDUUM - Soft to firm		**AUGER BORING**
	RESIDUUM - Stiff to very hard		**UNDISTURBED SAMPLE ATTEMPT**

	Undisturbed Sample 1.5-2.0 = Recovered (ft) / Pushed (ft)		
	Split Spoon Sample		Auger Cuttings
	Rock Core 60-100 = RQD / Recovery		Dilatometer
	No Sample		Crandall Sampler
	Rotary Drill		Pressure Meter
▽	Water Table at time of drilling	○	No Recovery
		▼	Water Table after 24 hours

Correlation of Penetration Resistance with Relative Density and Consistency

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 2	Very Soft
5 - 10	Loose	3 - 4	Soft
11 - 20	Firm	5 - 8	Firm
21 - 30	Very Firm	9 - 15	Stiff
31 - 50	Dense	16 - 30	Very Stiff
Over 50	Very Dense	31 - 50	Hard
		Over 50	Very Hard

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

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

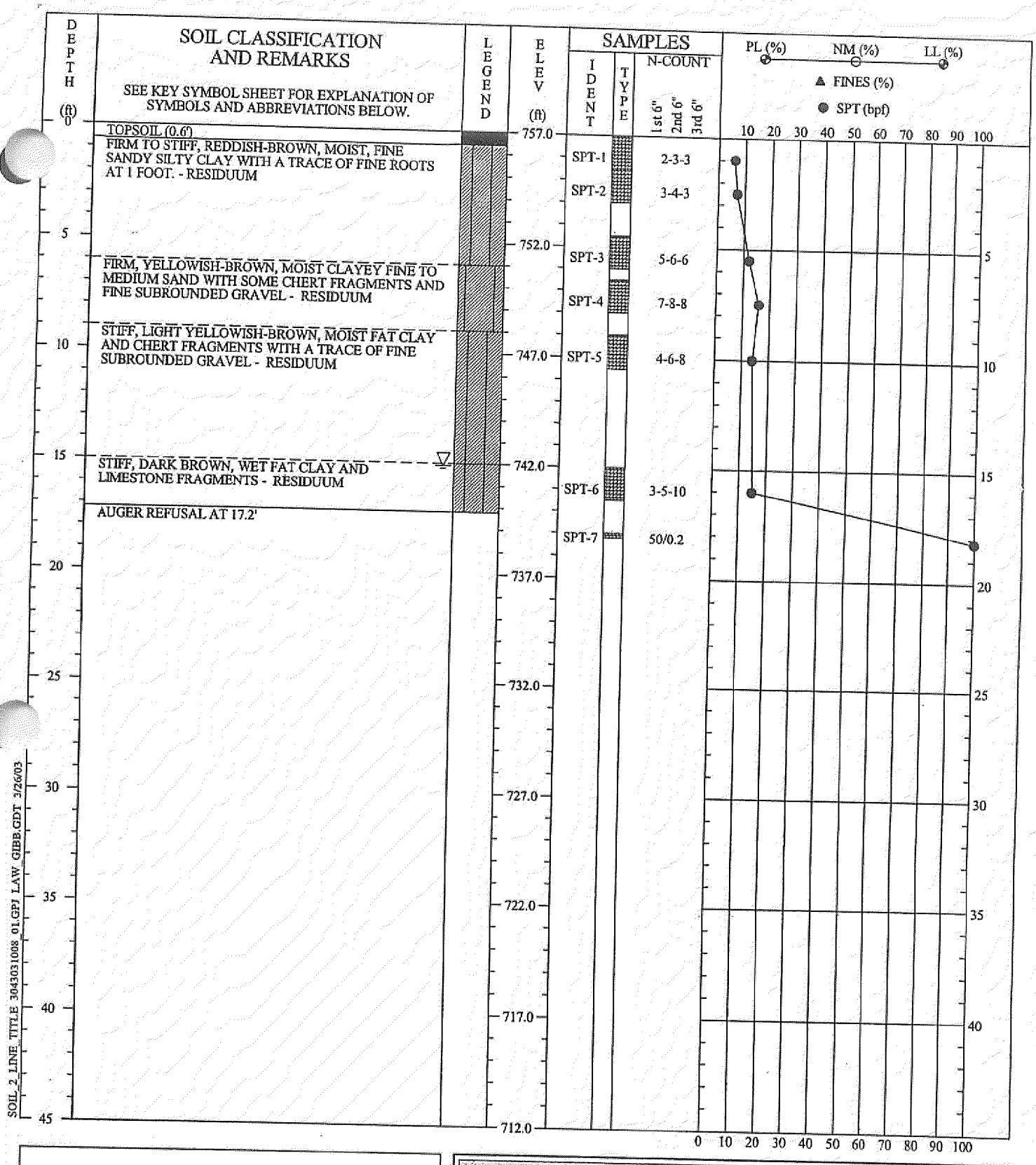
U.S. STANDARD SIEVE SIZE

Reference: The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)

KEY TO SYMBOLS AND DESCRIPTIONS

MACTEC

MACTEC Engineering and Consulting of Georgia, Inc.
1725 Louisville Drive
Knoxville, Tennessee 37921-5904
865-588-8544 • Fax: 865-588-8026



REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

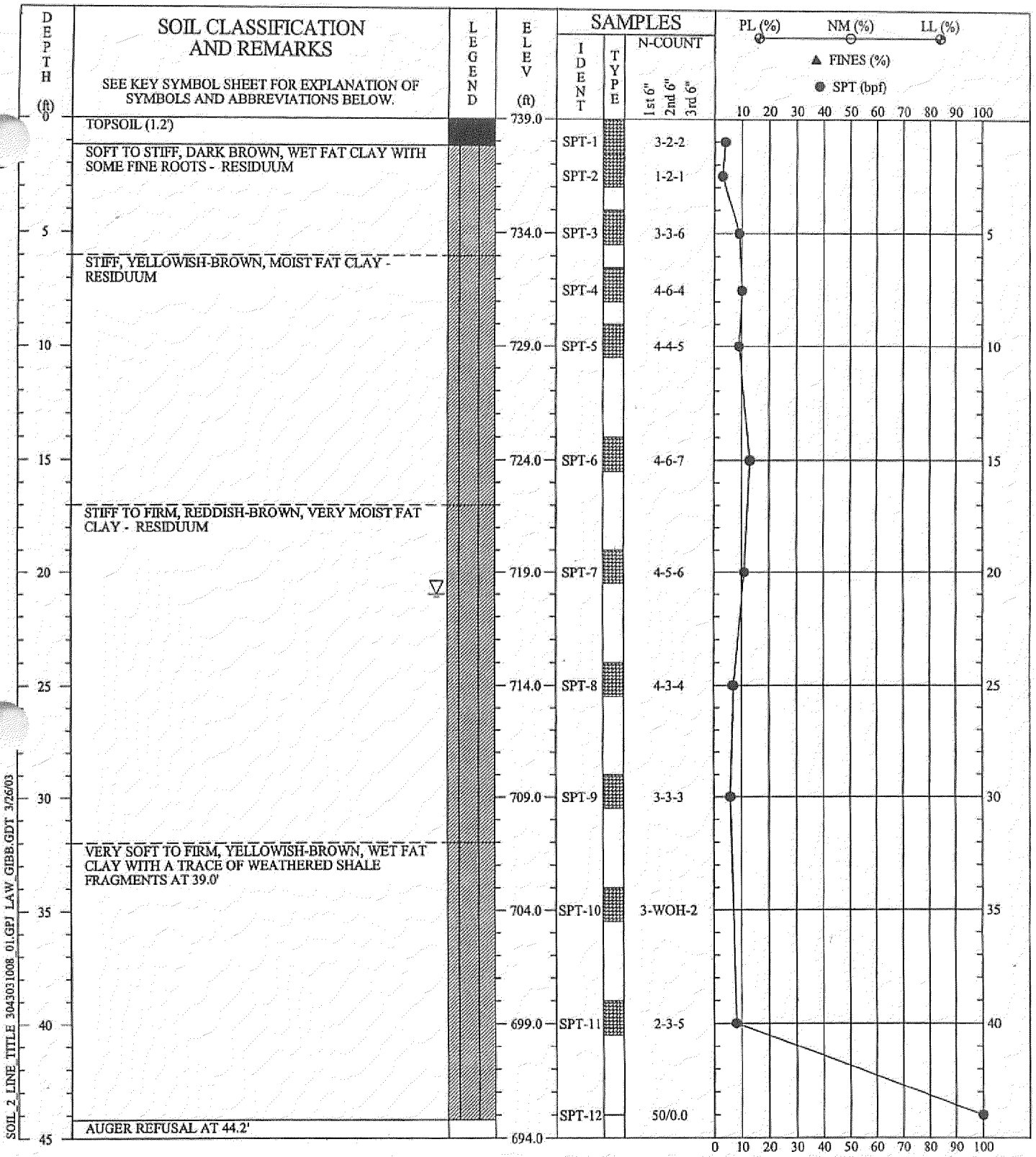
SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: March 10, 2003 **BORING NO.:** B-11

PROJ. NO.: 3043031008/0001 **PAGE 1 OF 1**

MACTEC



SOIL_2_LINE_TITLE 3043031008 01.GPJ LAW_GIBB.GDT 3/26/03

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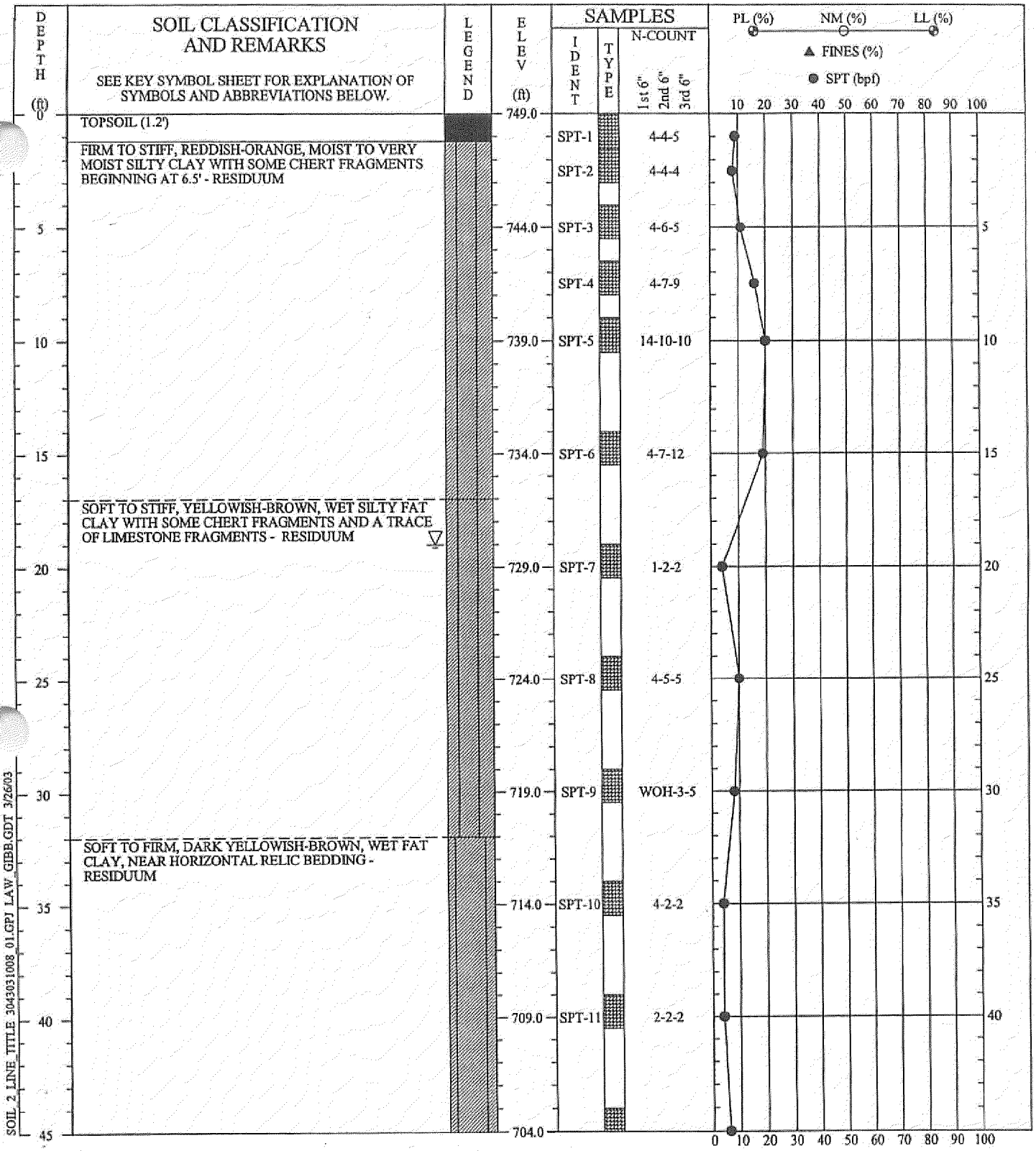
SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: March 6, 2003 **BORING NO.:** B-12

PROJ. NO.: 3043031008/0001 **PAGE 1 OF 1**

MACTEC



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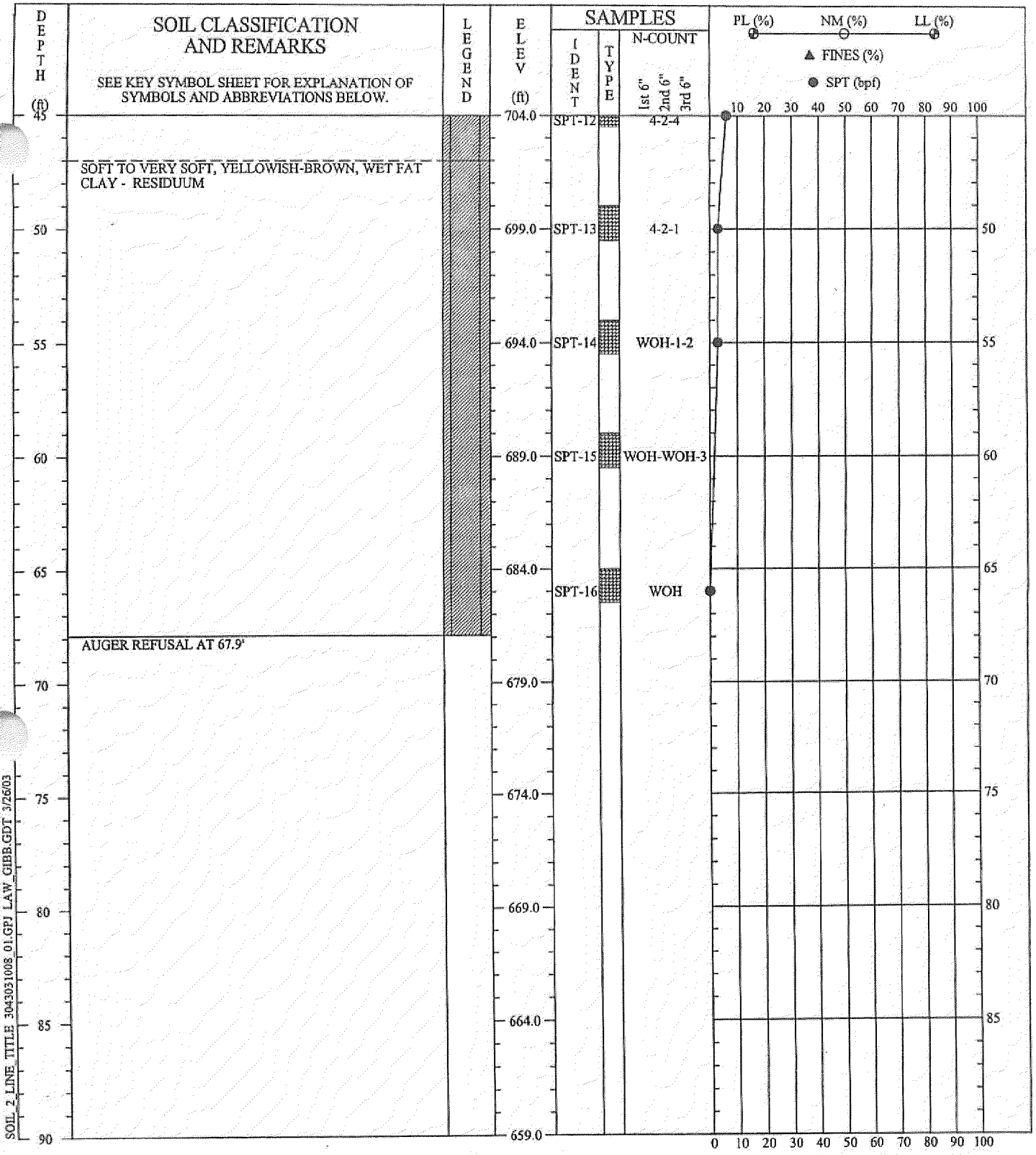
SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: February 5, 2003 **BORING NO.:** B-13

PROJ. NO.: 3043031008/0001 **PAGE 1 OF 2**

MACTEC



REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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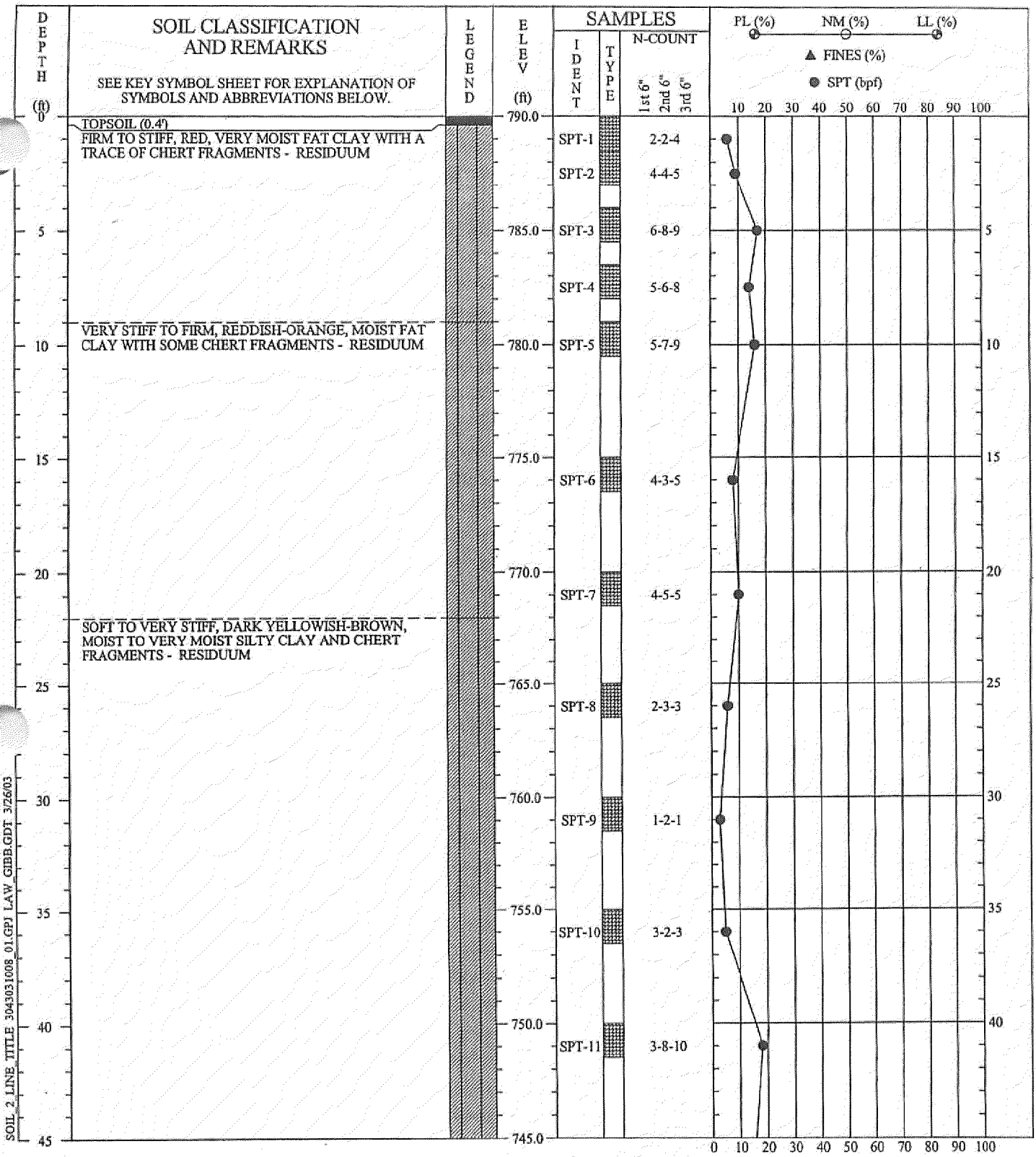
SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: February 5, 2003 **BORING NO.:** B-13

PROJ. NO.: 3043031008/0001 **PAGE 2 OF 2**

MACTEC



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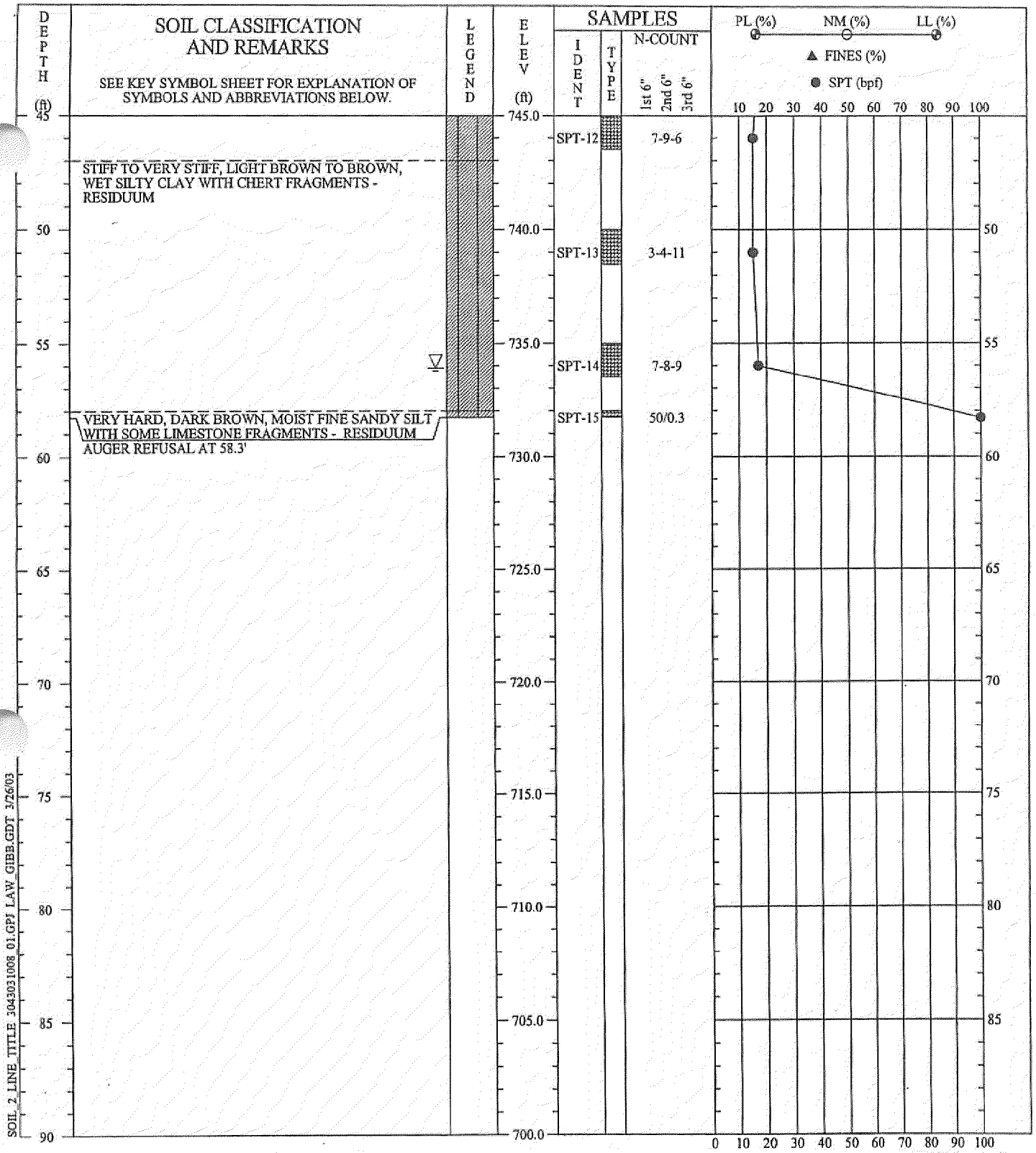
SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: March 10, 2003 **BORING NO.:** B-18

PROJ. NO.: 3043031008/0001 **PAGE** 1 **OF** 2

MACTEC



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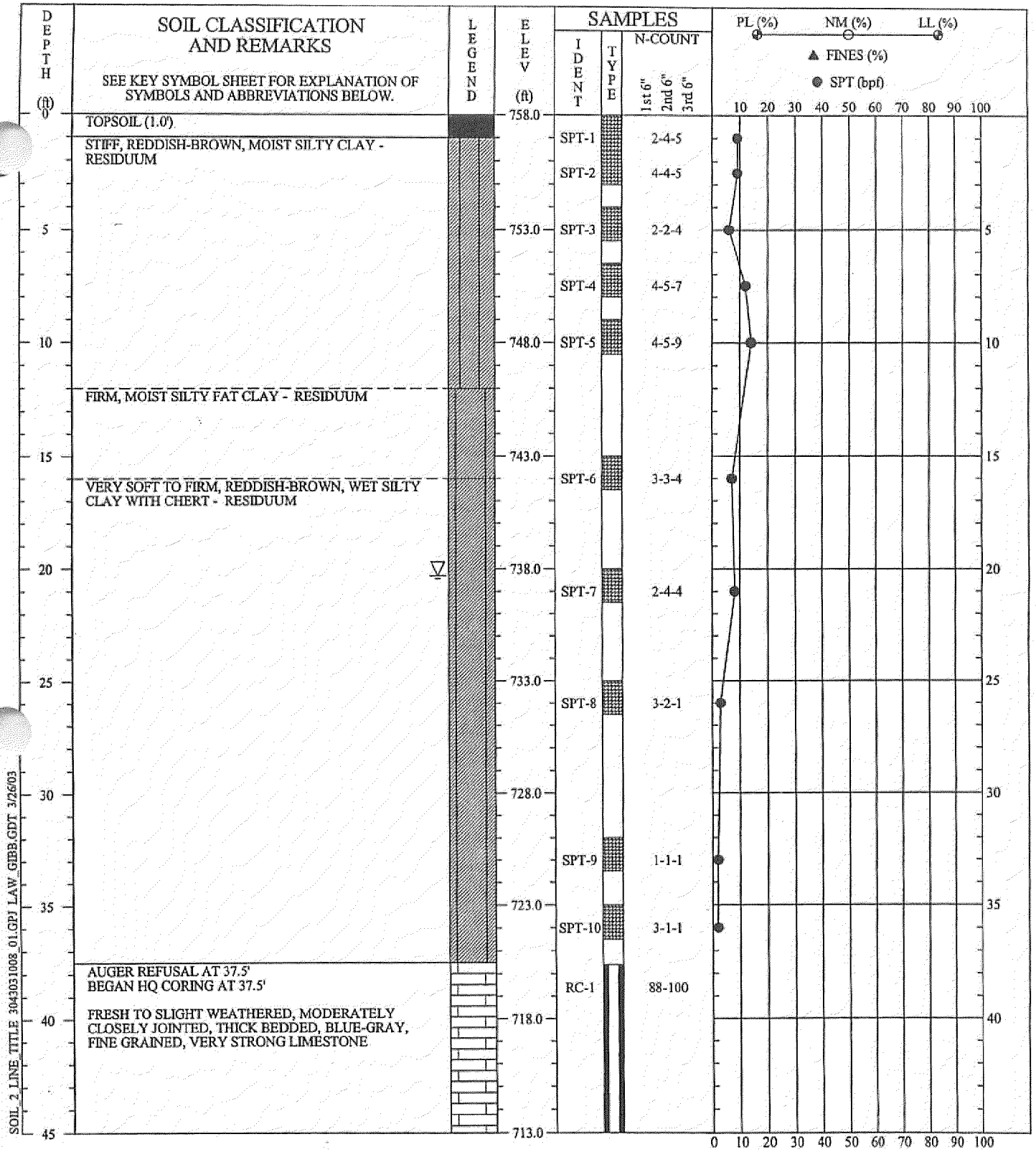
SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: March 10, 2003 **BORING NO.:** B-18

PROJ. NO.: 3043031008/0001 **PAGE 2 OF 2**

MACTEC



SOIL_2 LINE_TITLE 3043031008_01.GPJ LAW_GIBB.GDT 3/26/03

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SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: **BORING NO.:** B-22

PROJ. NO.: 3043031008/0001 **PAGE 1 OF 2**

MACTEC

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES IDENT	SAMPLES TYPE	SAMPLES N-COUNT 1st 6" 2nd 6" 3rd 6"	PL (%) NM (%) LL (%) ▲ FINES (%) ● SPT (bpf) 10 20 30 40 50 60 70 80 90 100
45	AUGER REFUSAL AT 37.5' BEGAN HQ CORING AT 37.5'		713.0				
	FRESH TO SLIGHT WEATHERED, MODERATELY CLOSELY JOINTED, THICK BEDDED, BLUE-GRAY, FINE GRAINED, VERY STRONG LIMESTONE			RC-2		89-100	
50			708.0				50
55			703.0	RC-3		95-100	55
60			698.0				60
65			693.0	RC-4		100-100	65
	CORING TERMINATED AT 68.0'						
70			688.0				70
75			683.0				75
80			678.0				80
85			673.0				85
90			668.0				0 10 20 30 40 50 60 70 80 90 100

SOIL_2_LINE_TITLE 3043031008_01.GPJ LAW_GIBB.GDT 3/26/03

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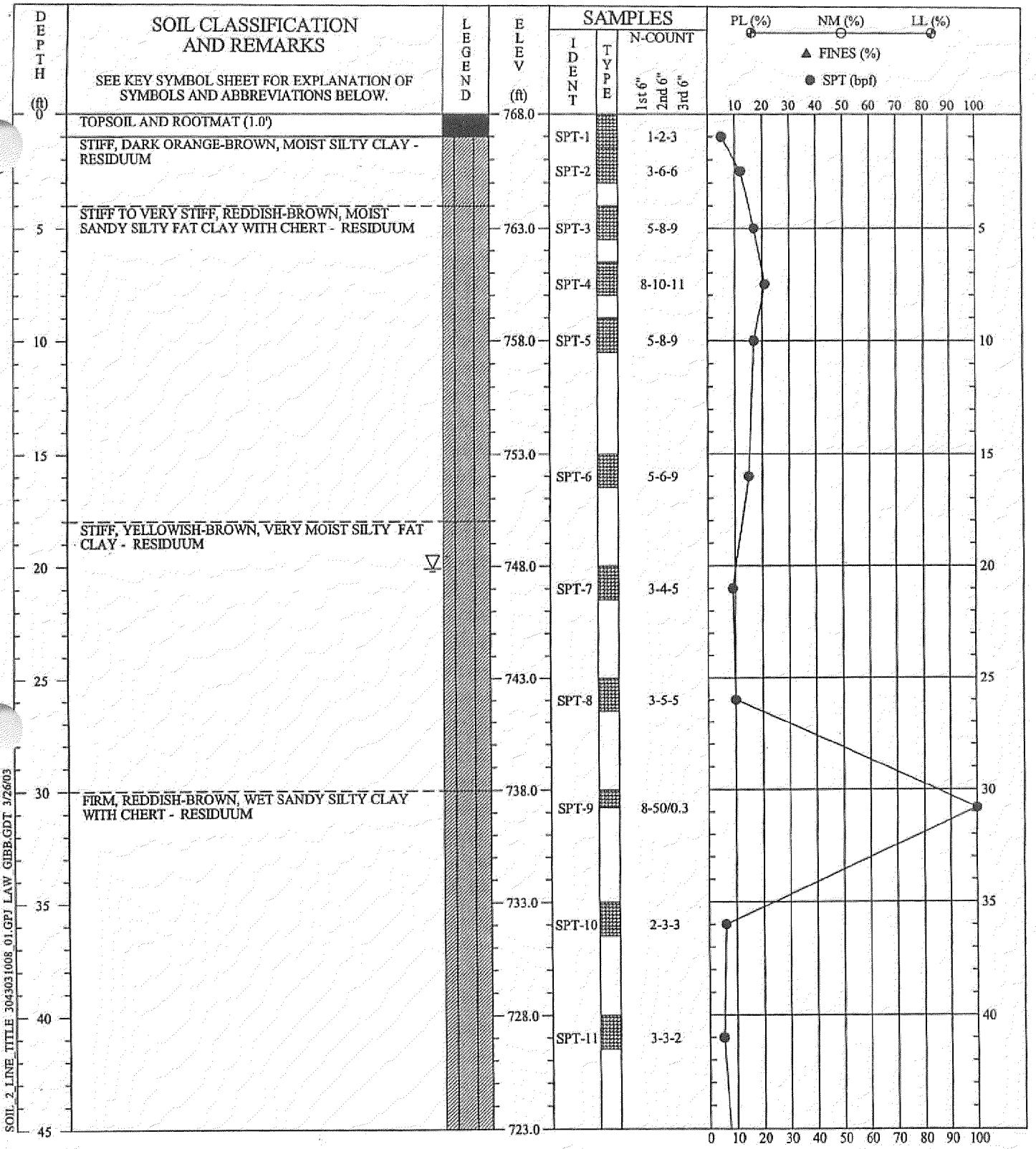
SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: **BORING NO.:** B-22

PROJ. NO.: 3043031008/0001 **PAGE 2 OF 2**

MACTEC



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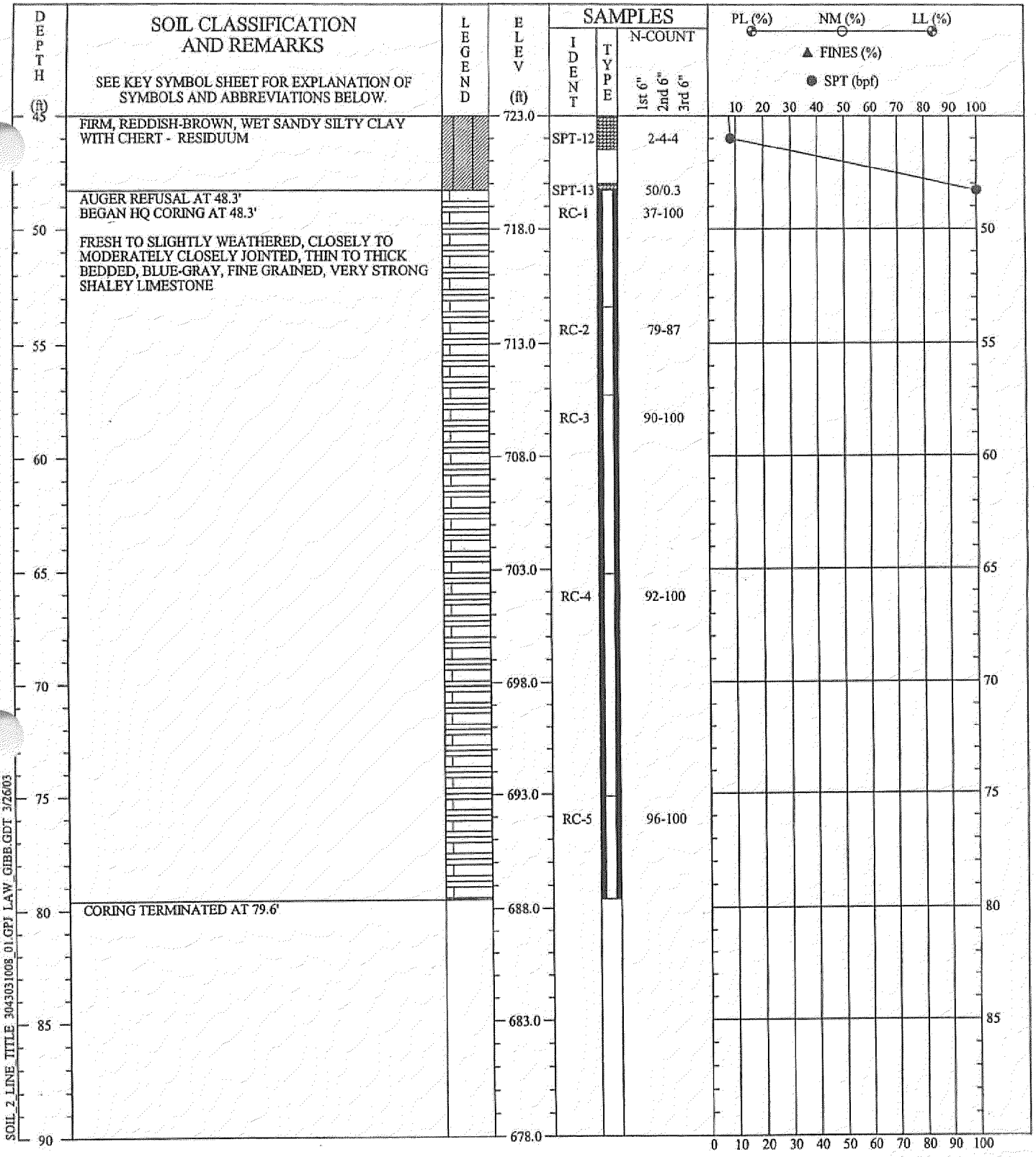
SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: **BORING NO.:** B-23

PROJ. NO.: 3043031008/0001 **PAGE 1 OF 2**

MACTEC



SOIL_2_LINE_TITLE 3043031008_01.GPJ LAW_GIBB.GDT 3/26/03

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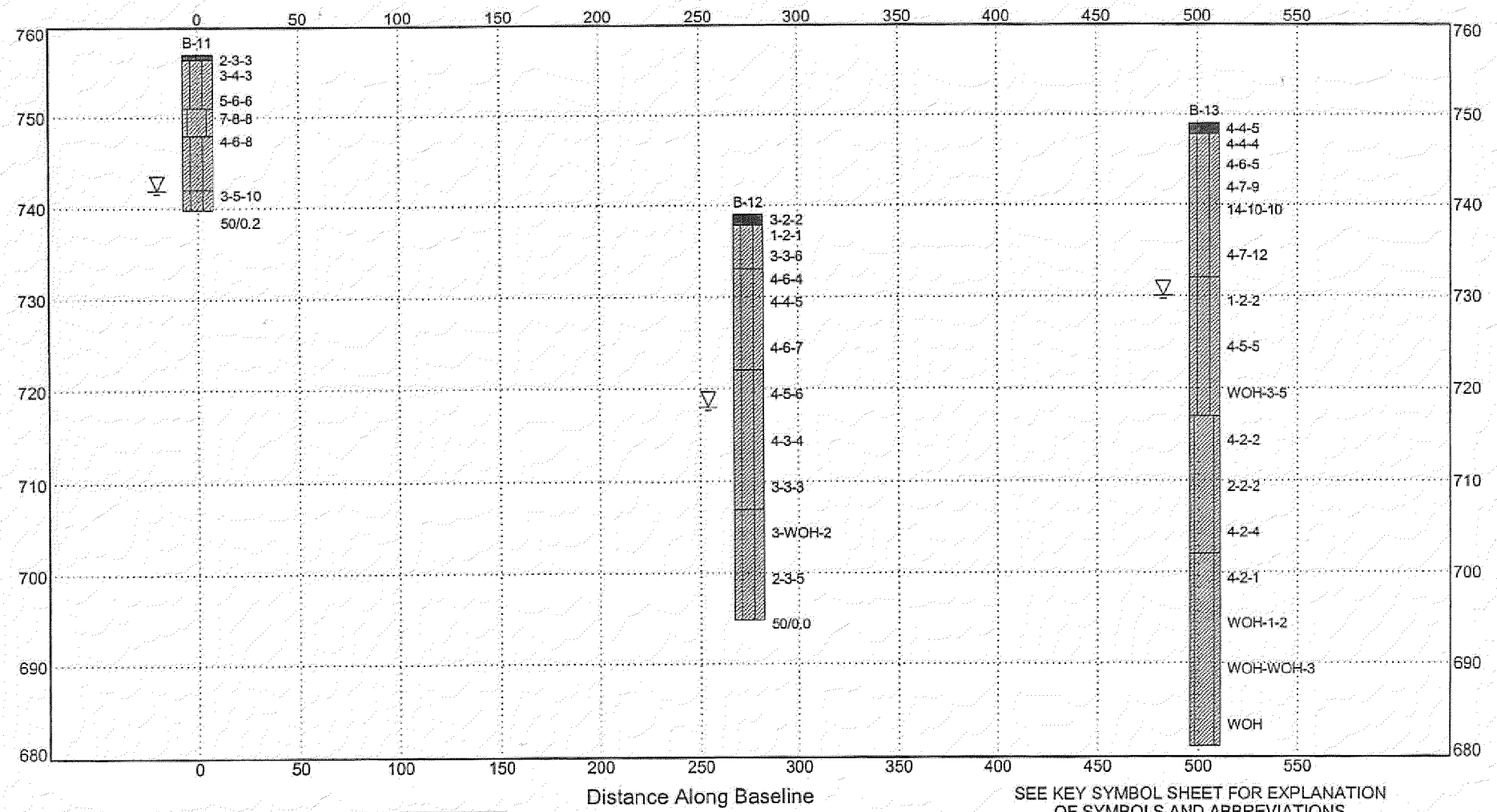
SOIL TEST BORING RECORD

PROJECT: Proposed Scrubber Waste Disposal Area
TVA - Kingston Fossil Plant

DRILLED: **BORING NO.:** B-23

PROJ. NO.: 3043031008/0001 **PAGE 2 OF 2**

MACTEC



SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Borehole	North	East	Elev.	Depth
B-11	1684	1697	757.0	17.2
B-12	1959	1812	739.0	44.2
B-13	2052	2041	749.0	67.9

DISTANCES:
Beginning 0
Ending 550
VIEWING ANGLES (degrees):
Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	1717	1664
Right, Front	2101	2058
Left, Back	1717	1664
Right, Back	2101	2058

SUBSURFACE FENCE DIAGRAM A - A'

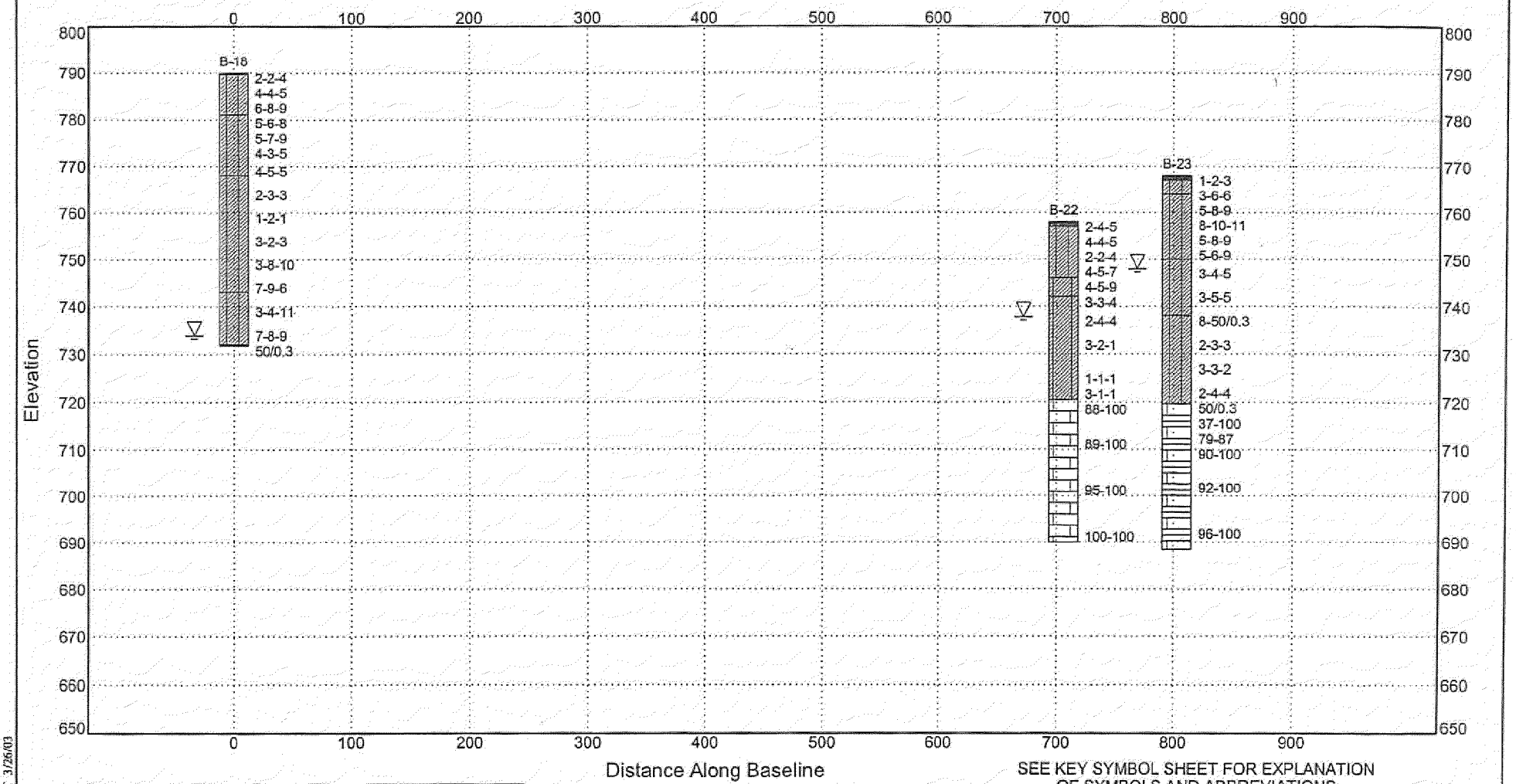
Proposed Scrubber Waste Disposal Area

TVA - Kingston Fossil Plant

PROJECT #	DATE	PLATE
3043031008/0001	Mar 03	1

SECTION2 3043031008_01.GPJ FAGWGN01.GDT 3/26/03

TVA-00024370



SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Borehole	North	East	Elev.	Depth
B-18	1020	2194	790.0	58.3
B-22	1491	2722	758.0	100.0
B-23	1635	2712	768.0	100.0

DISTANCES:
Beginning 0
Ending 900
VIEWING ANGLES (degrees):
Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	1021	2193
Right, Front	1668	2819
Left, Back	1021	2193
Right, Back	1668	2819

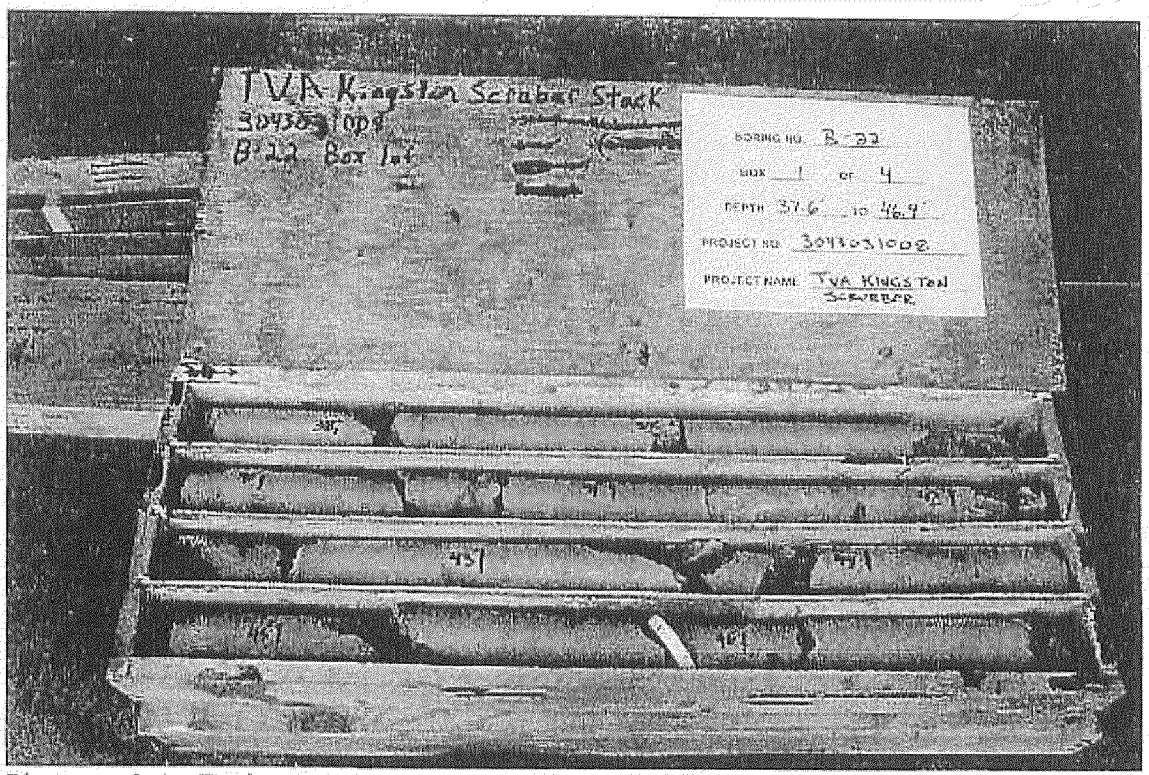
SUBSURFACE FENCE DIAGRAM B - B'

Proposed Scrubber Waste Disposal Area

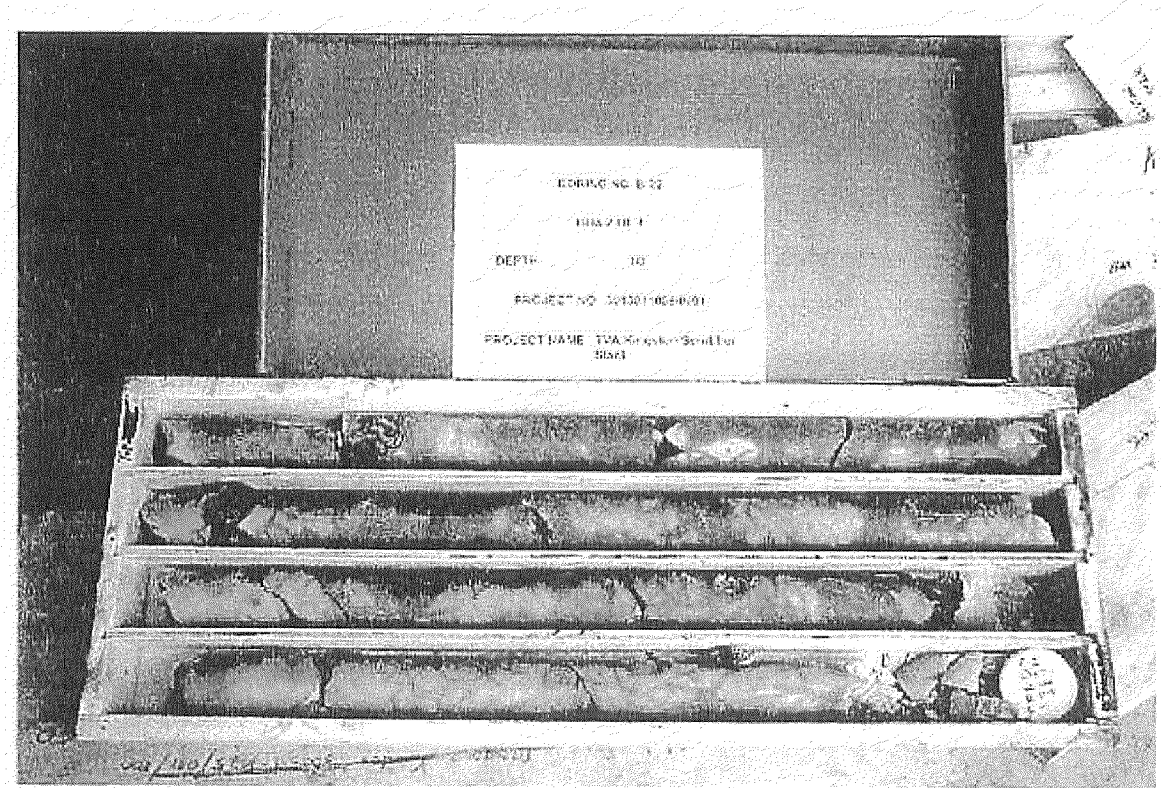
TVA - Kingston Fossil Plant

PROJECT #	DATE	PLATE
3043031008/0001	Mar 03	1

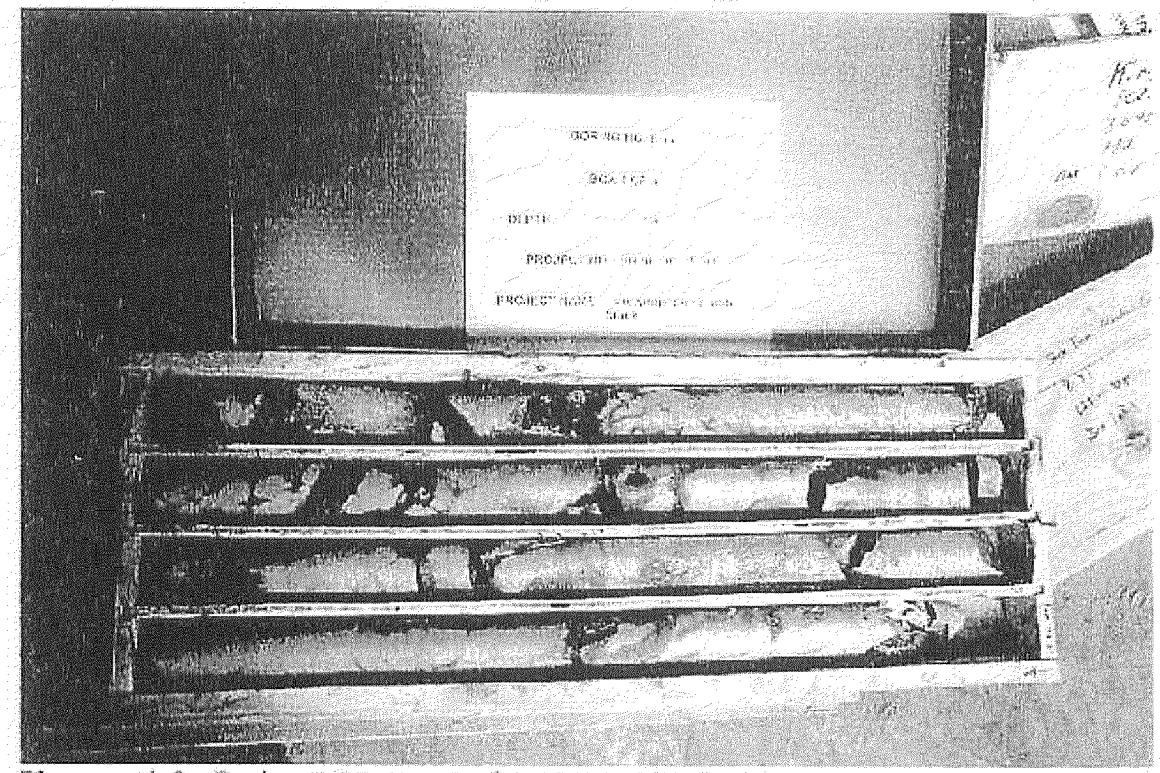
SECTION2 3043031008_01.GPJ FAGWGN0L.GDT 3/26/03



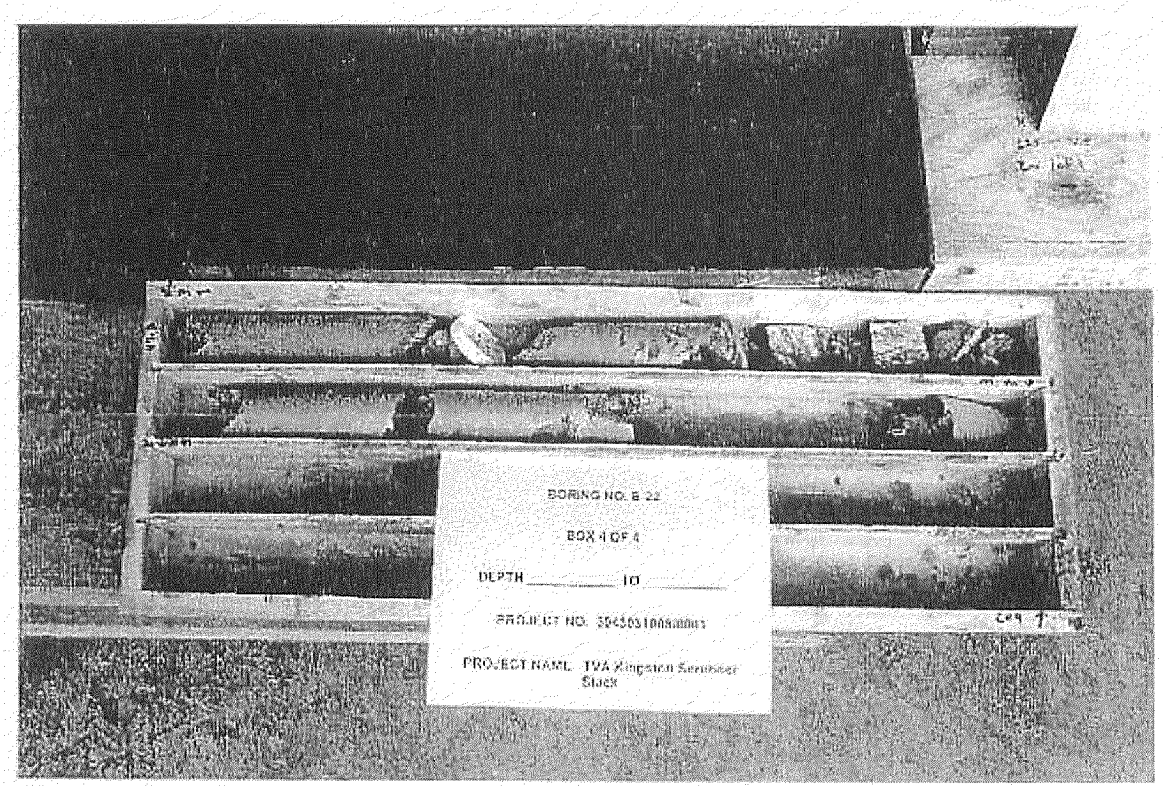
Photograph 1 - Boring B-22, Box 1 of 4, 37.6 to 46.9 Feet.



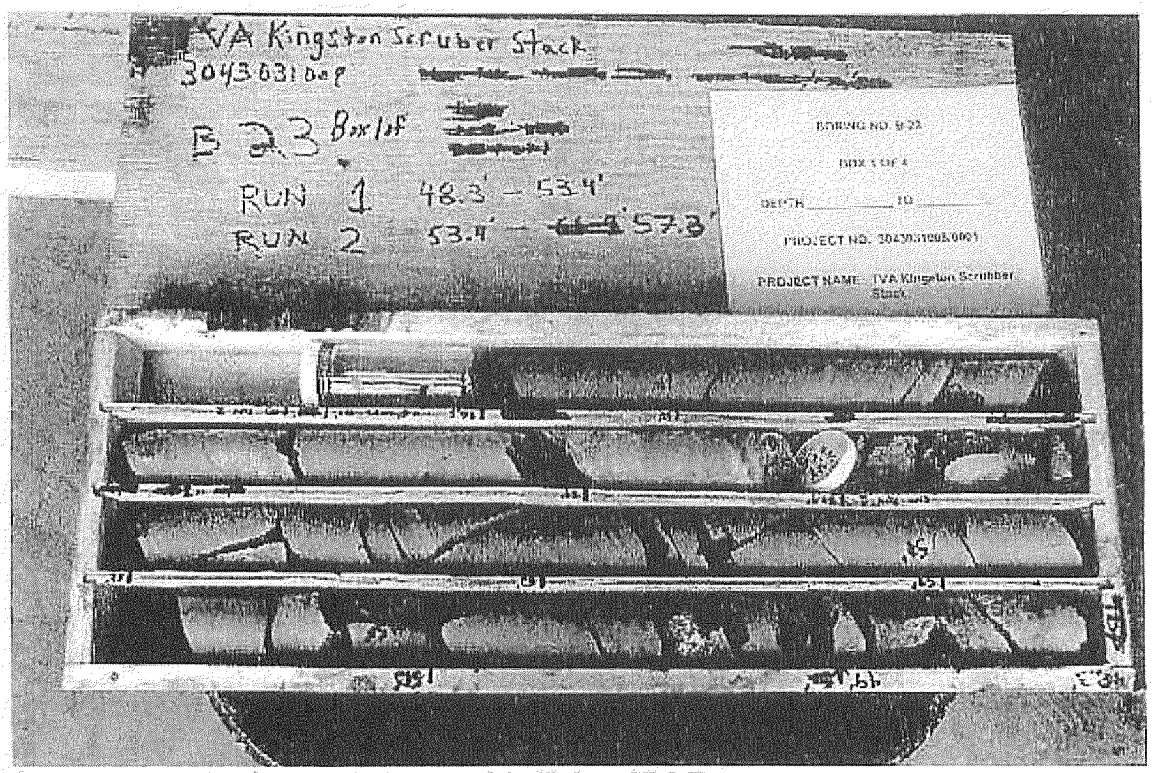
Photograph 2 - Boring B-22, Box 2 of 4, 46.9 to 55.7 Feet.



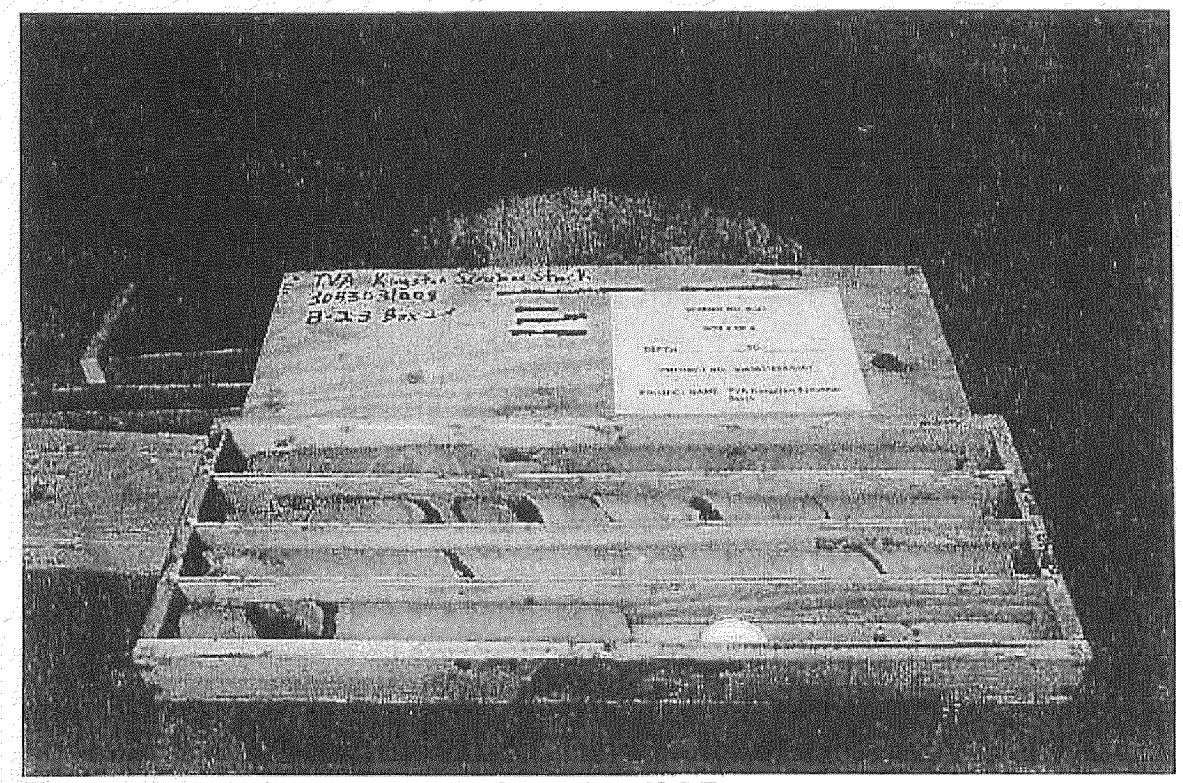
Photograph 3 - Boring B-22, Box 3 of 4, 55.7 to 64.7 Feet.



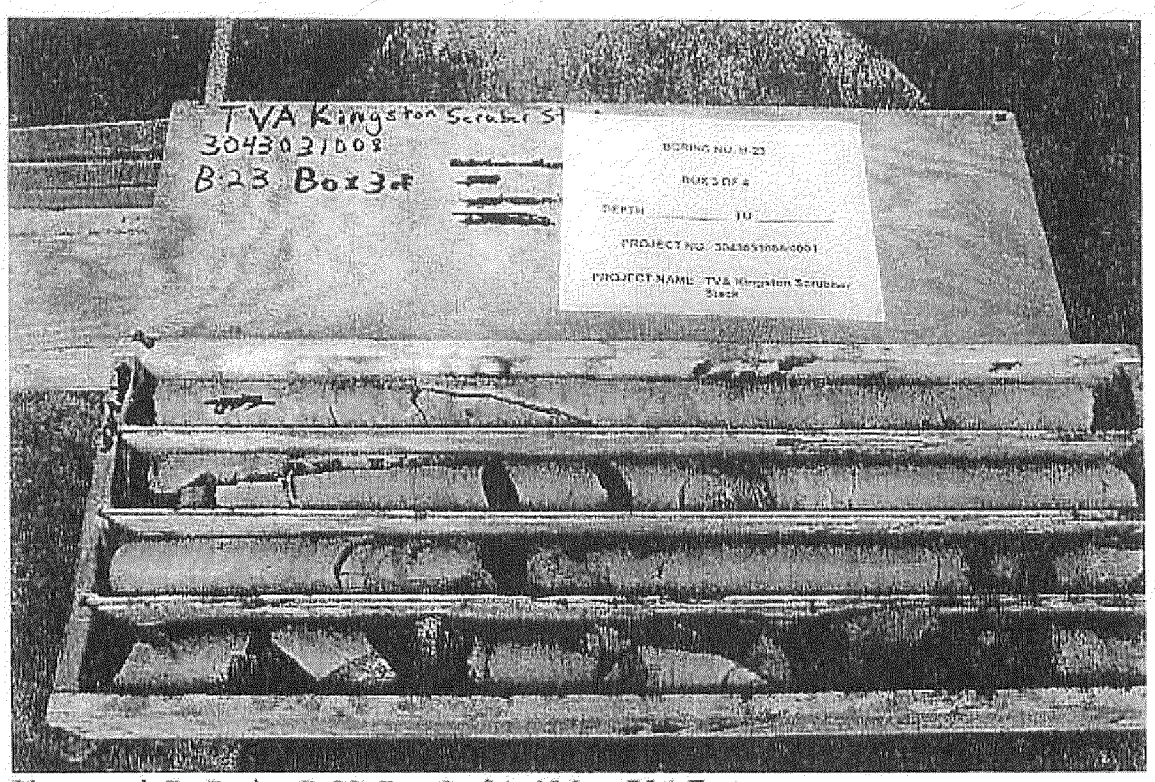
Photograph 4 - Boring B-22, Box 4 of 4, 64.7 to 68.0 Feet.



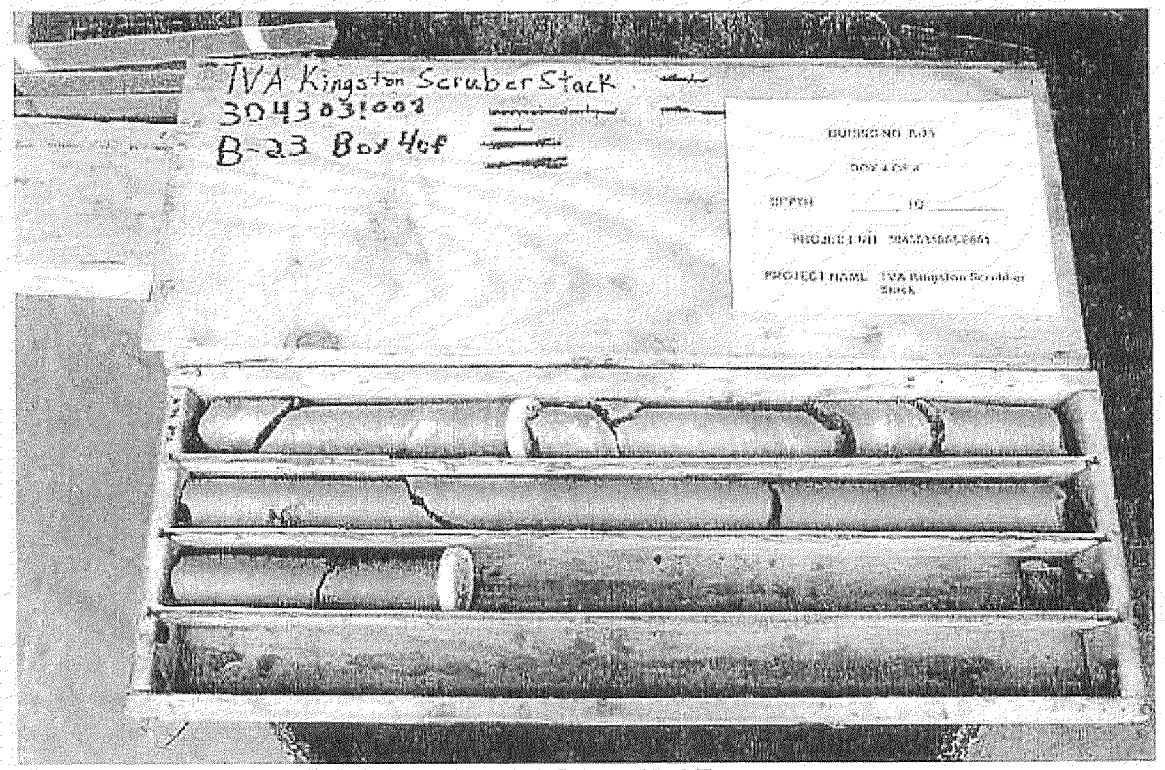
Photograph 5 - Boring B-23, Box 1 of 4, 48.3 to 57.3 Feet.



Photograph 6 - Boring B-23, Box 2 of 4, 57.3 to 65.2 Feet.



Photograph 7 - Boring B-23, Box 3 of 4, 65.2 to 75.1 Feet.



Photograph 8 - Boring B-23, Box 4 of 4, 75.1 to 79.6 Feet.

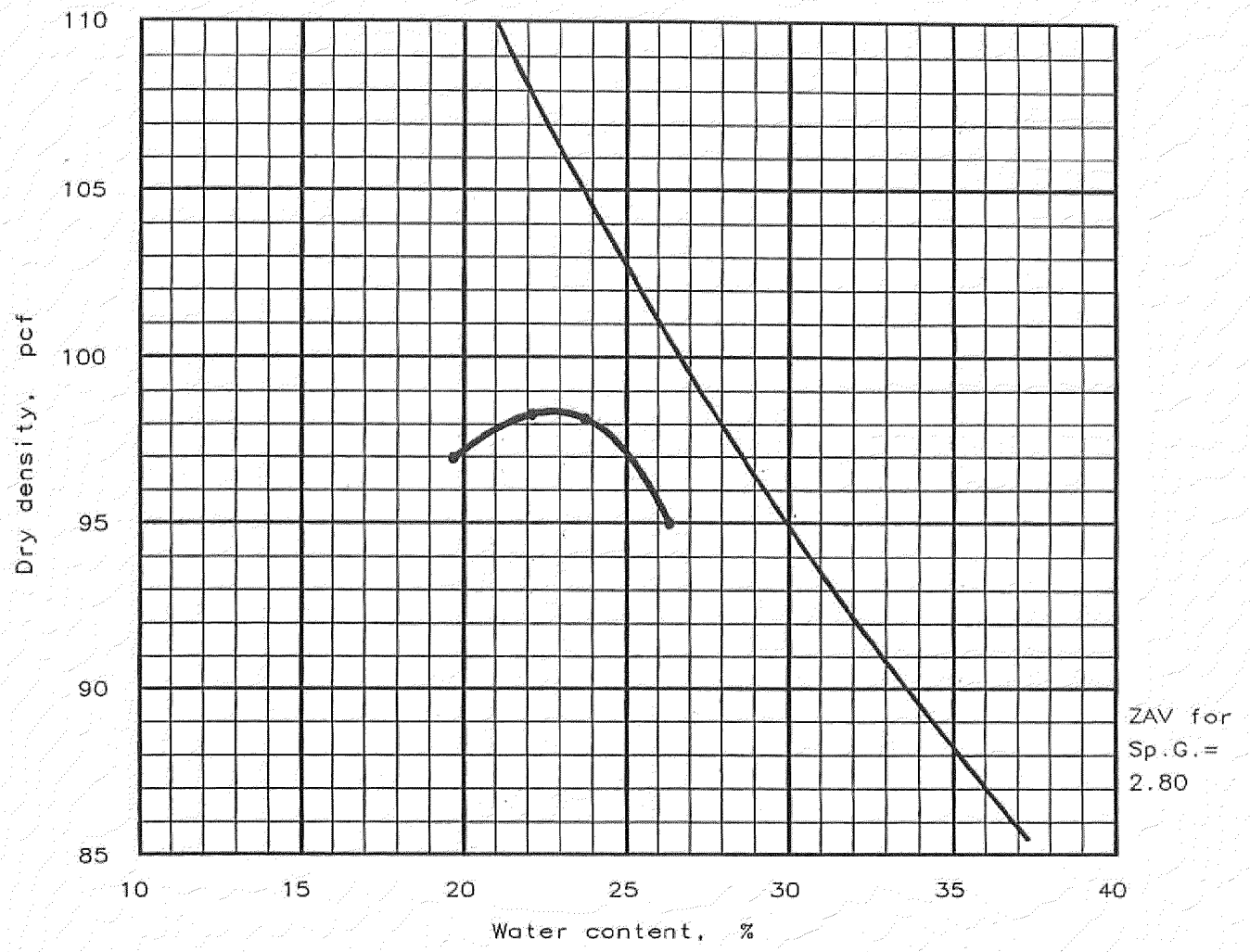
Table C-1
Natural Moisture Content and Atterberg Limits Laboratory Test Results
TVA Kingston Scrubber Stack
MACTEC Project 3043031008/0001

Boring Number	Sample Number	Sample Type	Sample Depth (Feet)	Moisture Content (%)	Atterberg Limits		
					Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
B-13	3	SPT	4 - 5.5	42	88	36	52
B-13	4	SPT	6.5 - 8	37			
B-13	8	SPT	24 - 25.5	39	64	28	36
B-13	9	SPT	29 - 30.5	40			
B-13	10	SPT	34 - 35.5	69	85	44	41
B-13	11	SPT	39 - 40.5	102			
B-13	14	SPT	54 - 55.5	65	77	31	46
B-13	15	SPT	59 - 60.5	60			
B-18	3	SPT	4 - 5.5	29	NT	NT	NT
B-18	8	SPT	25 - 26.5	33	NT	NT	NT
B-18	11	SPT	40 - 41.5	25	NT	NT	NT
B-18	14	SPT	55 - 56.5	29	NT	NT	NT
B-18	NA	Bulk	DNS	25	66	26	40
B-23	2	SPT	DNS	27	NT	NT	NT
B-23	4	SPT	DNS	30	NT	NT	NT
B-23	6	SPT	DNS	38	NT	NT	NT
B-23	7	SPT	DNS	35	71	26	45
B-23	8	SPT	DNS	NT			
B-23	9	SPT	DNS	25	NT	NT	NT
B-23	10	SPT	DNS	48	71	30	41
B-23	11	SPT	DNS	NT			
B-23	12	SPT	DNS	50	NT	NT	NT

DNS - Data Not Submited
NT - Not Tested
SPT - Standard Penetration Test
Bulk - Bulk Sample

Prepared By MMM Date 3\26\03 Checked By [illegible] Date 3/26/03

MOISTURE-DENSITY RELATIONSHIP TEST

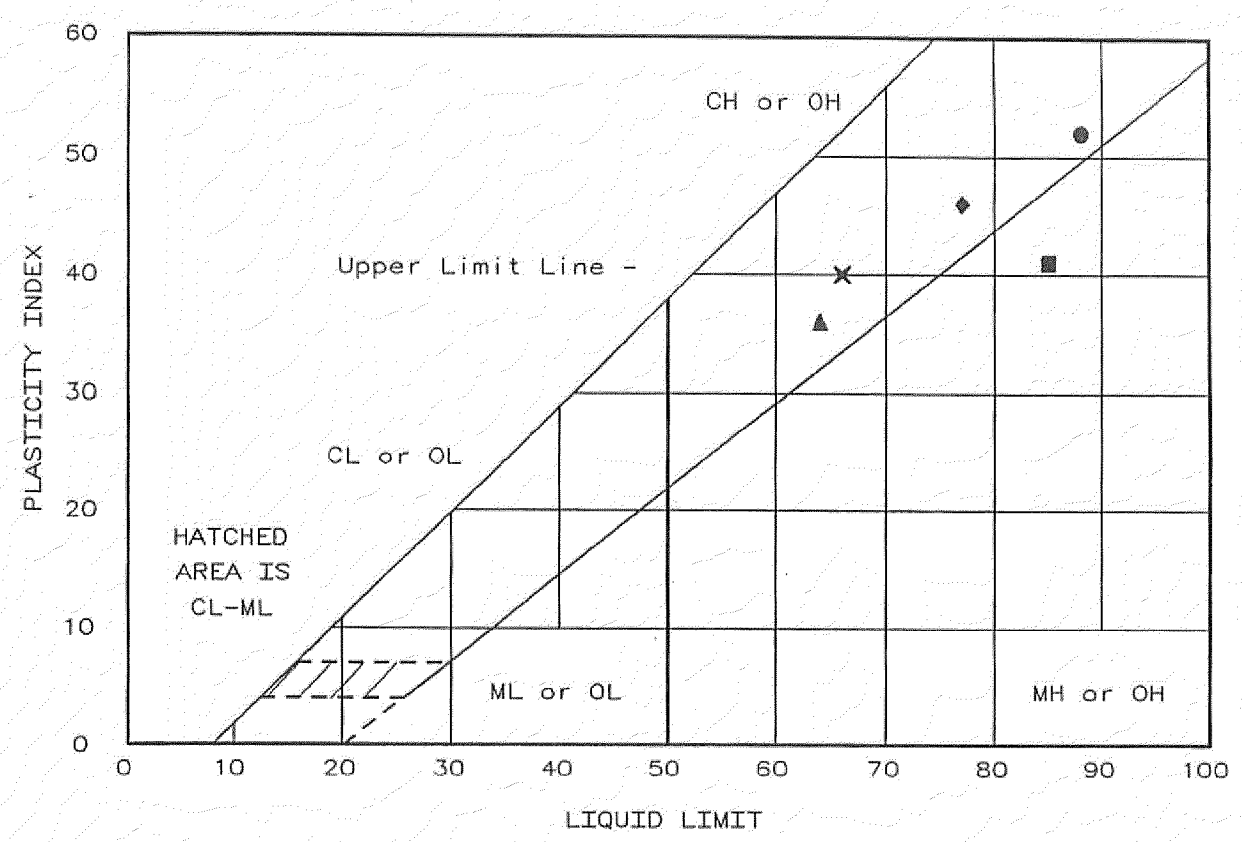


Test specification: ASTM D 698-00a Procedure B, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No.200
	USCS	AASHTO						
DNS	CH	A-7-6(44)	24.5 %	NT	66	40	0 %	95.7 %

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 98.4 pcf Optimum moisture = 22.8 %	Orange brown silty clay
Project No.: 3043031008.0001 Project: TVA Kingston Fossil Scrubber Stack Location: Boring B-18 auger cuttings Date: 3-20-2003	Remarks: Sample Number 2754 NT- No Test DNS- Data Not Submitted
MOISTURE-DENSITY RELATIONSHIP TEST LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.	Fig. No. 2754

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	USCS	AASHTO
●	Boring B-13, 4-5.5' & 6.5 -8'+ Orange brown silty clay	88	36	52	92.2	CH	A-7-5(57)
▲	Boring B-13,24-25.5'& 29-30.5'+ Orange brown clayey sand	64	28	36	48.4	SC	A-7-6(13)
■	Boring B-13, 34-35.5' & 39-40.5'+ Dark brown clayey silt	85	44	41	97.2	MH	A-7-5(52)
◆	Boring B-13, 54-55.5' & 59-60.5'+ Light brown silty clay	77	31	46	95.2	CH	A-7-5(52)
×	Boring B-18 Bulk auger cuttings+ Orange brown silty clay	66	26	40	95.7	CH	A-7-6(44)

Project No.: 3043031008
Project: TVA Kingston Fossil Scrubber Stack

Client: TVA
Location: Kingston, Tennessee

Date: 3-20-2003

LIQUID AND PLASTIC LIMITS TEST REPORT
LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

Remarks:

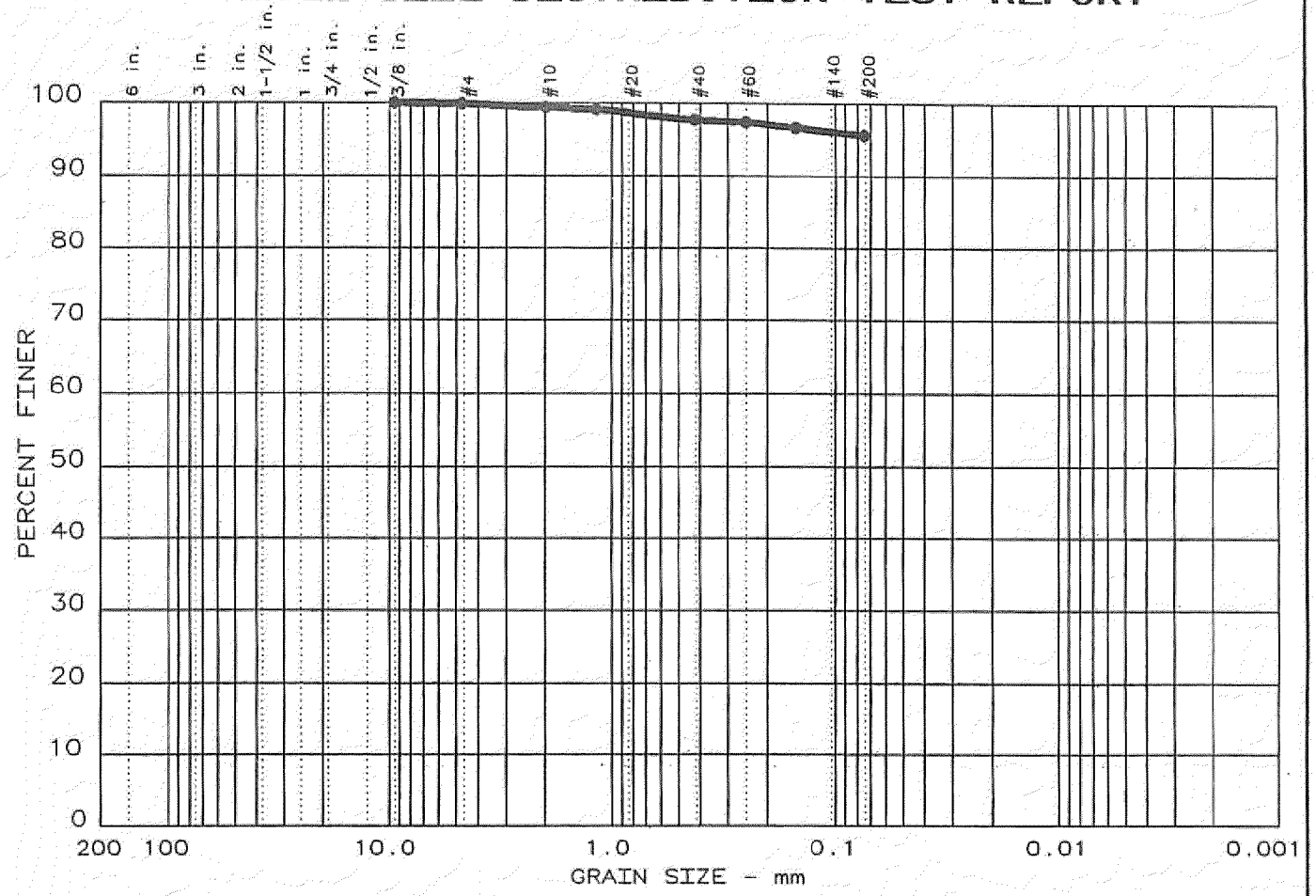
Phase 0001

NT- No Test

DNS- Data Not Submitted

Fig. No. B-13/18

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	11	0.0	0.1	4.2	95.7		CH	66	40

SIEVE inches size	PERCENT FINER ●		
0.375	100.0		
	GRAIN SIZE		
D_{60} D_{30} D_{10}			
	COEFFICIENTS		
C_c C_u			

SIEVE number size	PERCENT FINER ●		
4	99.9		
10	99.4		
16	99.1		
40	97.7		
60	97.4		
100	96.7		
200	95.7		

Sample information:

● B-18, Bulk auger sample
Orange brown silty clay

Remarks:

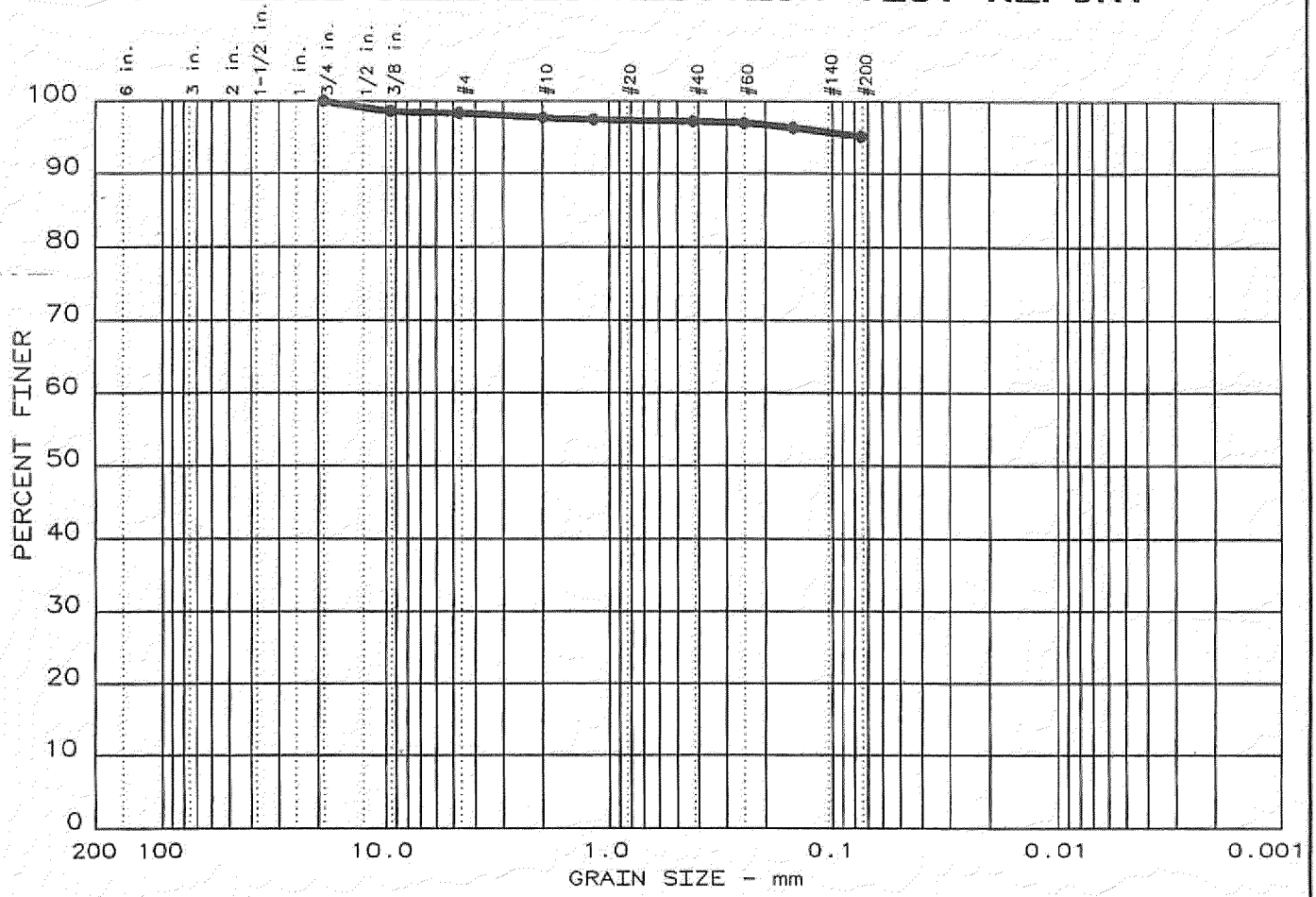
Methods: Particle Size:
ASTM D 422-63(1998);
% < No.200:ASTM D1140-00
LL/PI: ASTM D 4318-00

LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

Project No.: 3043031008.0001
Project: TVA Kingston Fossil Scrubber Stack

Date: 3-20-2003 Fig. No.: B18

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	10	0.0	1.7	3.1	95.2		CH	77	46

SIEVE inches size	PERCENT FINER ●		
0.75	100.0		
0.375	98.6		
X	GRAIN SIZE		
D_{60}			
D_{30}			
D_{10}			
X	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
4	98.3		
10	97.7		
16	97.4		
40	97.2		
60	96.9		
100	96.3		
200	95.2		

Sample information:
● B-13,54-55.5 & 59-60.5'
Light brown silty clay

Remarks:
Methods: Particle Size:
ASTM D 422-63(1998);
% < No.200:ASTM D1140-00
LL/PI: ASTM D 4318-00

LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

Project No.: 3043031008.0001
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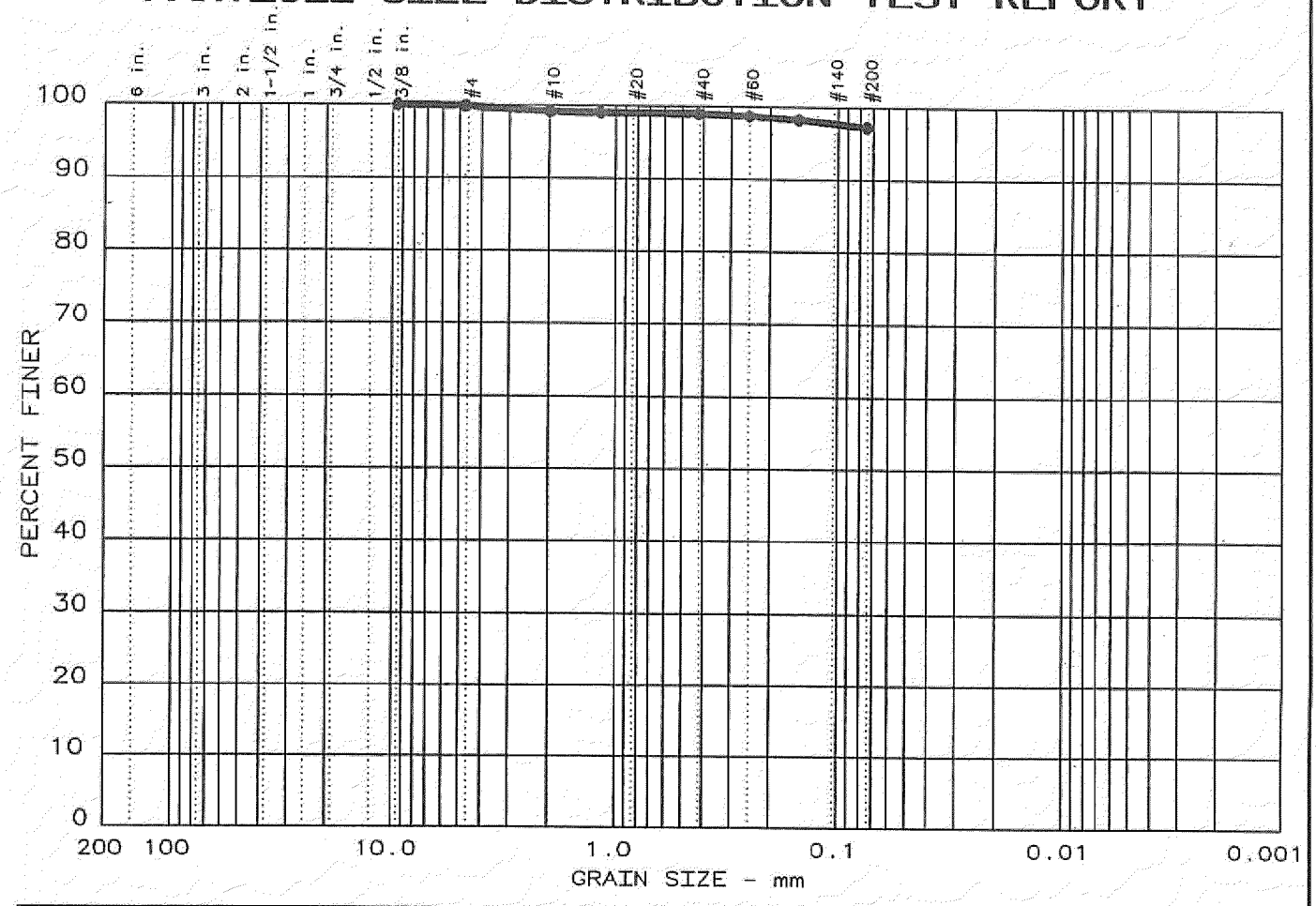
Date: 3-20-2003 Fig. No.: B13

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	9	0.0	0.2	2.6	97.2		MH	85	41

SIEVE inches size	PERCENT FINER ●		
0.375	100.0		
	GRAIN SIZE		
D_{60} D_{30} D_{10}			
	COEFFICIENTS		
C_c C_u			

SIEVE number size	PERCENT FINER ●		
4	99.8		
10	99.2		
16	99.1		
40	98.9		
60	98.7		
100	98.3		
200	97.2		

Sample information:
● B-13, 34-35.5 & 39-40.5'
Dark brown clayey silt

Remarks:
Methods: Particle Size:
ASTM D 422-63(1998);
% < No.200:ASTM D1140-00
LL/PI: ASTM D 4318-00

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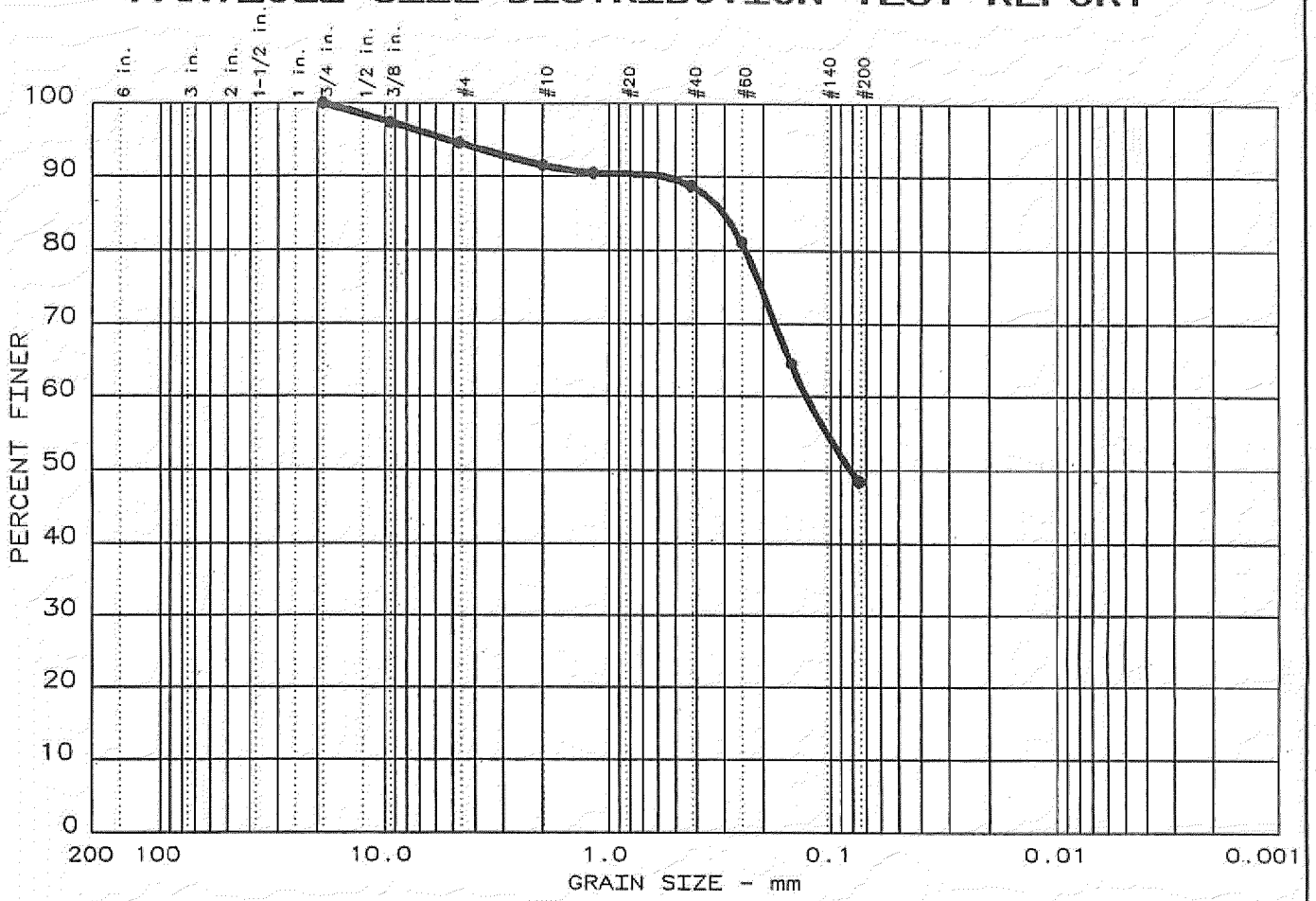
PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	8	0.0	5.4	46.2	48.4		SC	64	36

SIEVE inches size	PERCENT FINER ●		
0.75	100.0		
0.375	97.4		
	GRAIN SIZE		
D_{60}	0.127		
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
4	94.6		
10	91.6		
16	90.5		
40	88.7		
60	81.1		
100	64.5		
200	48.4		

Sample information:

● B-13, 24-25.5 & 29-30.5'
Orange brown clayey sand

Remarks:
Methods: Particle Size: ASTM D 422-63(1998);
% < No.200: ASTM D1140-00
LL/PI: ASTM D 4318-00

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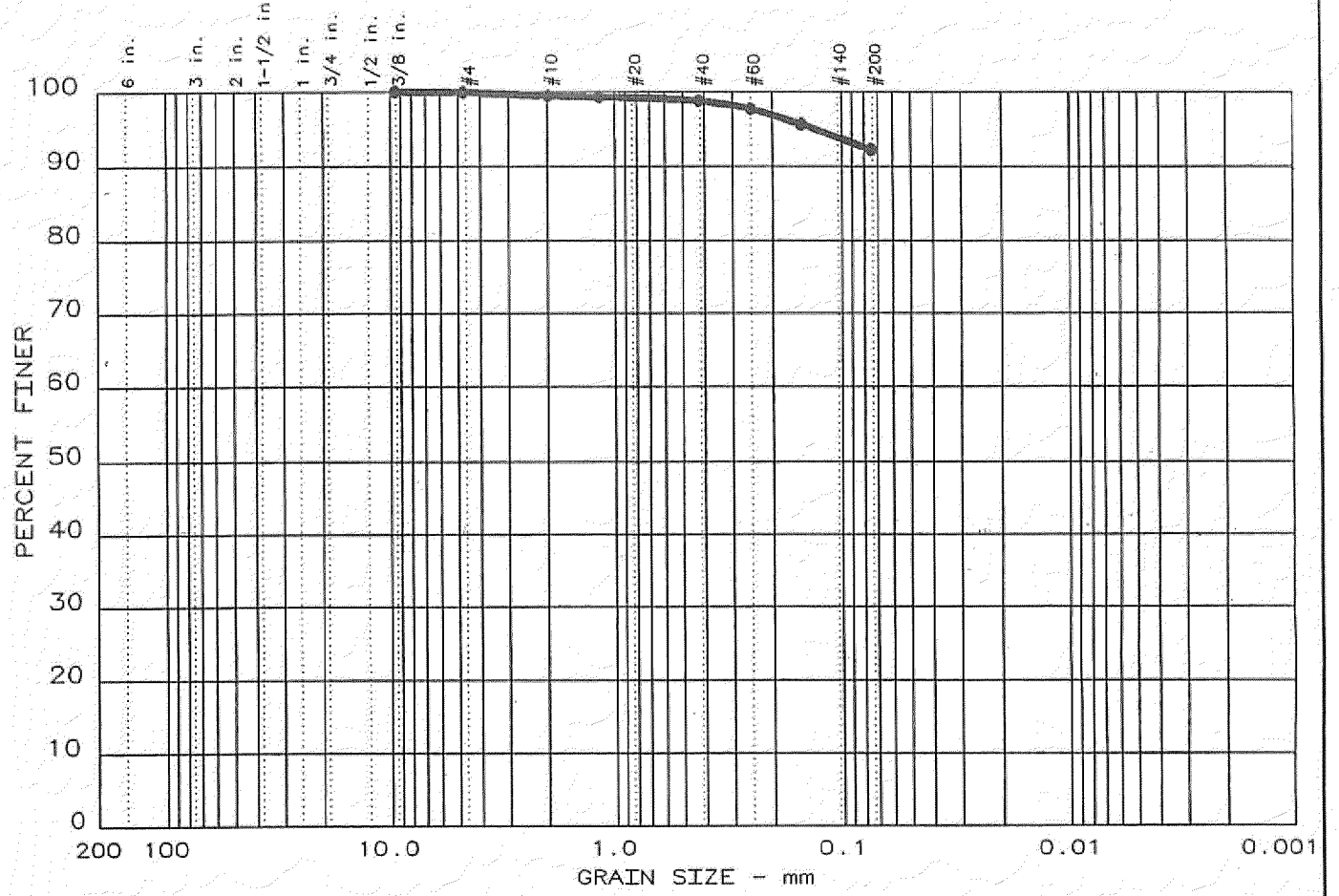
PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	7	0.0	0.1	7.7	92.2		CH	88	52

SIEVE inches size	PERCENT FINER ●		
0.375	100.0		
	GRAIN SIZE		
D_{60} D_{30} D_{10}			
	COEFFICIENTS		
C_c C_u			

SIEVE number size	PERCENT FINER ●
4	99.9
10	99.4
16	99.3
40	98.7
60	97.6
100	95.6
200	92.2

Sample information:
● B-13, 4-5.5' & 6.5-8'
Orange brown silty clay

Remarks:
Methods: Particle Size:
ASTM D 422-63(1998);
% < No.200:ASTM D1140-00
LL/PI: ASTM D 4318-00

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