

#### NOTE

STRATIGRAPHIC COLUMN OF THE  
PLEISTOCENE DEPOSITS OF ILLINOIS  
IS SHOWN ON FIGURE 2.5-5.

#### REFERENCE:

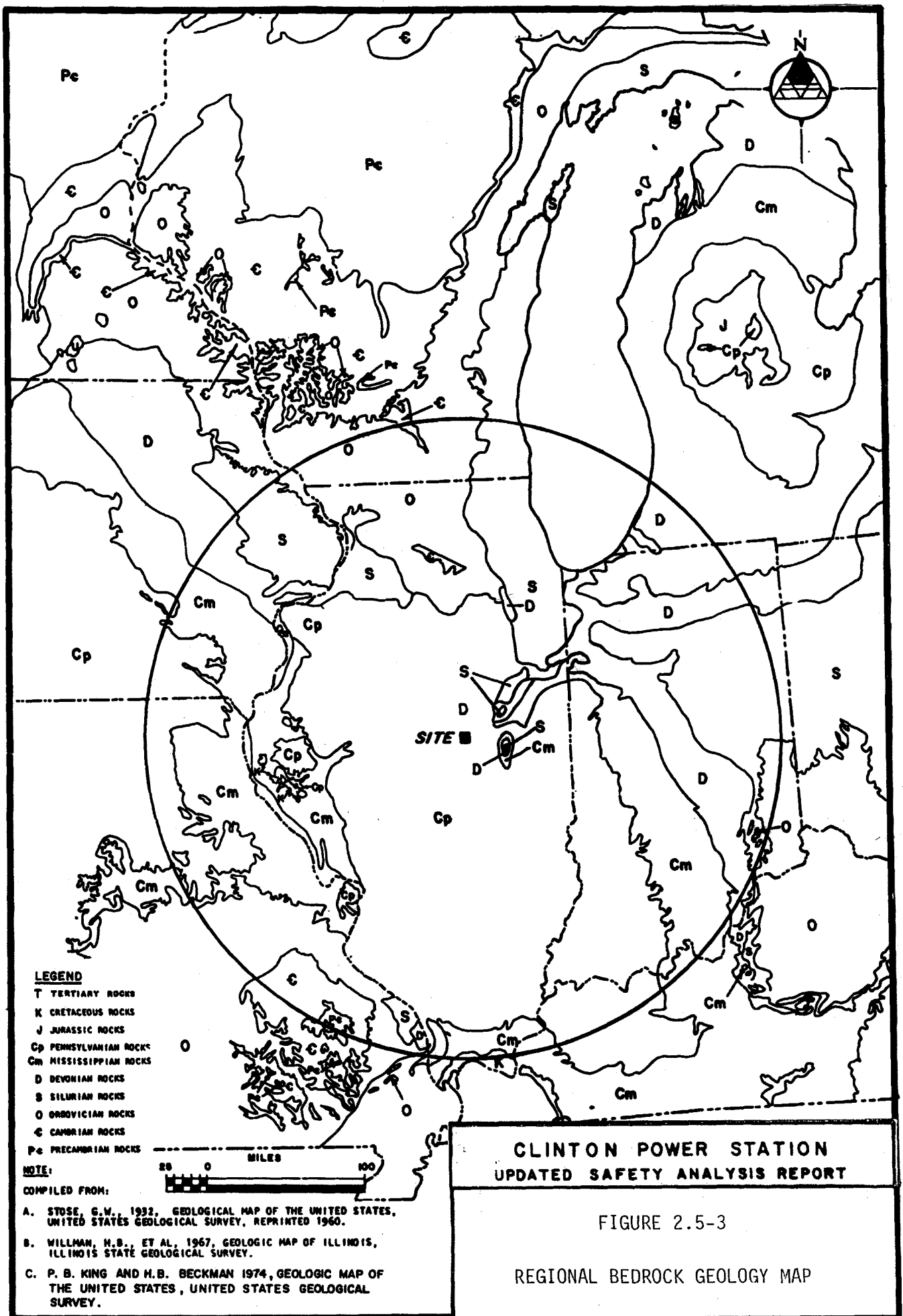
ILLINOIS STATE GEOLOGICAL SURVEY, 1967,  
GEOLOGIC MAP OF ILLINOIS.

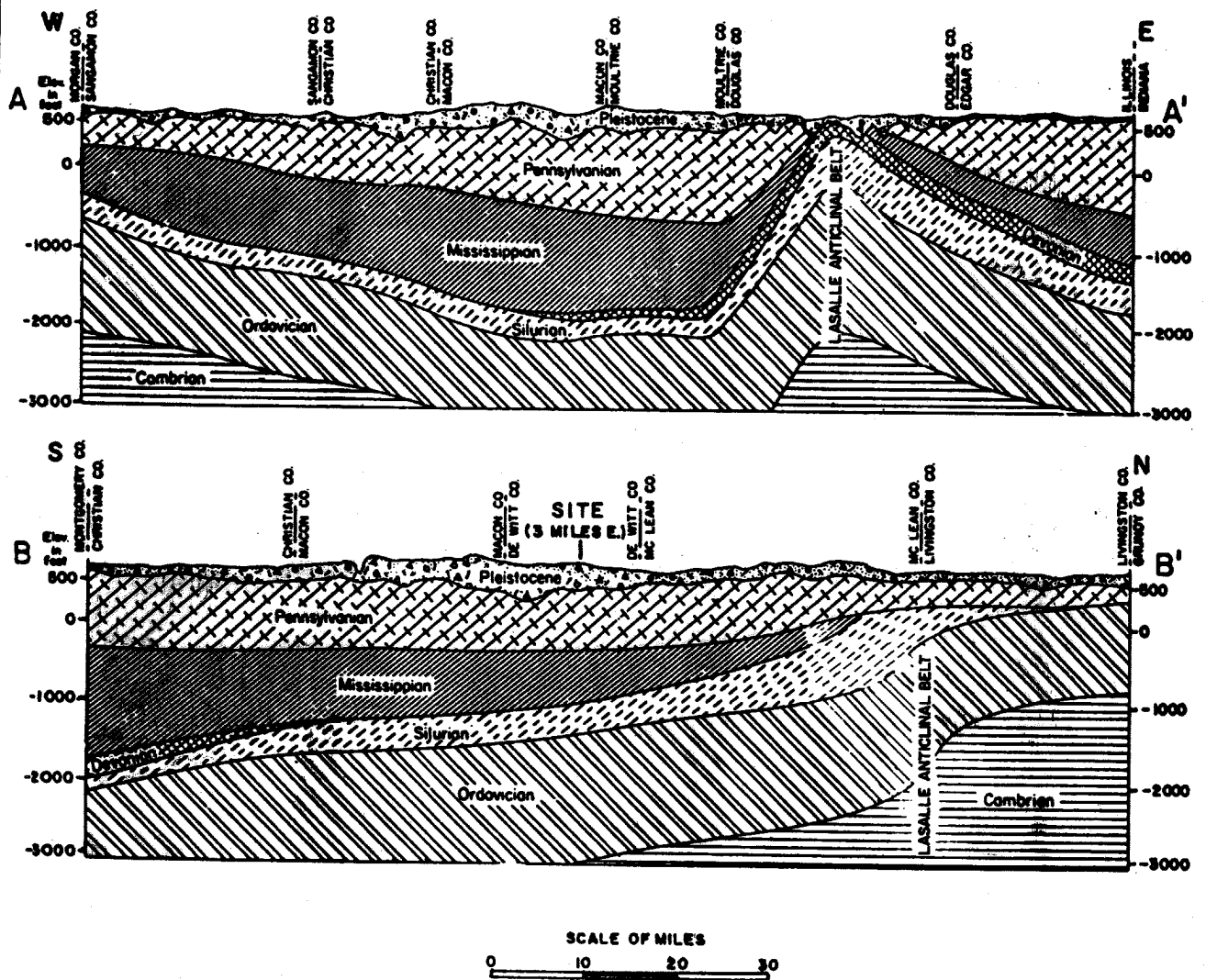
### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-2

REGIONAL STRATIGRAPHIC COLUMN







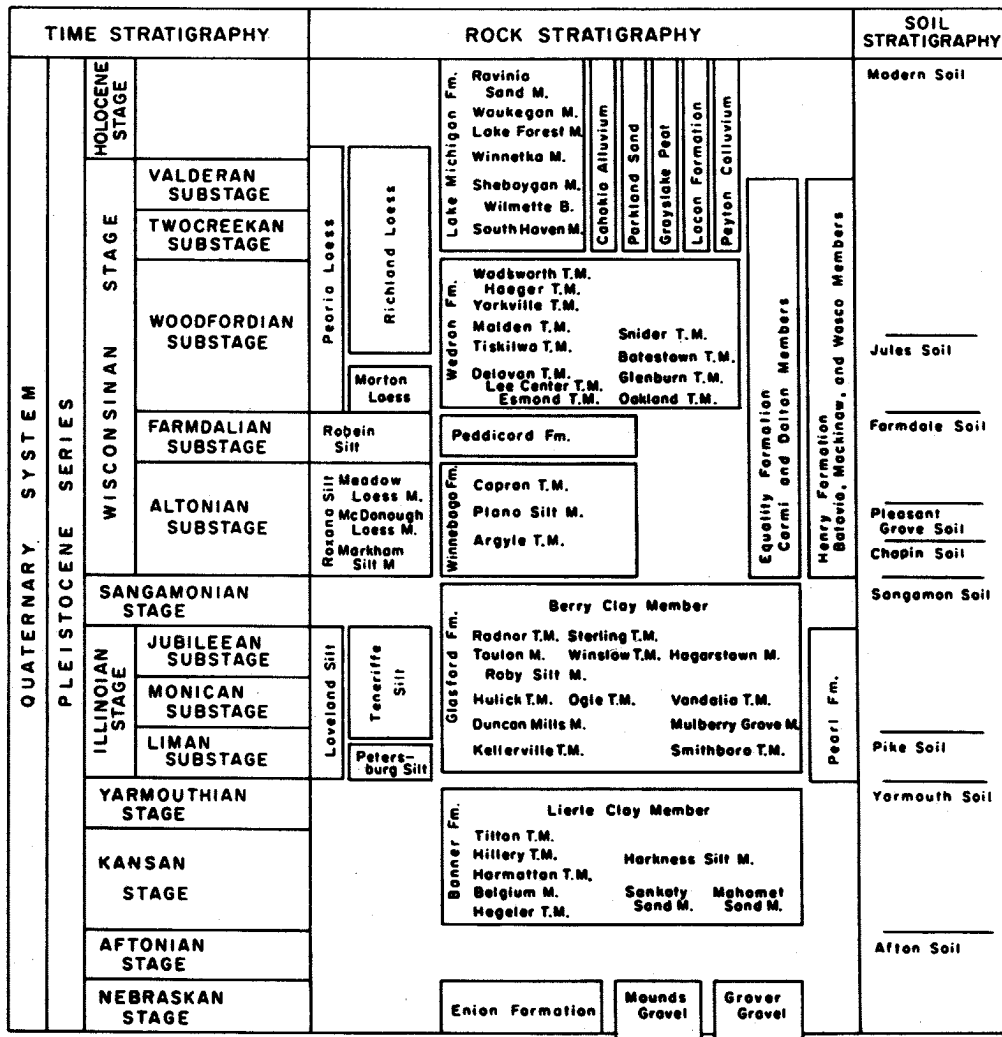
#### NOTES

1. REFER TO FIGURE 2.5-7 FOR LOCATION OF REGIONAL GEOLOGIC CROSS SECTION.
2. MODIFIED FROM: GROUNDWATER GEOLOGY IN EAST CENTRAL ILLINOIS BY L.F. SELKREGG AND J.P. KEMPTON, ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 248, 1958.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-4

REGIONAL GEOLOGIC CROSS SECTIONS



Fm.=Formation M.=Member T.M.=Till Member B.=Bed

#### REFERENCE

1. H.B. WILLMAN, ET. AL., HANDBOOK OF ILLINOIS STRATIGRAPHY, BULLETIN 98, ILLINOIS STATE GEOLOGICAL SURVEY, URBANA, 1975.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-5

STRATIGRAPHIC COLUMN OF THE PLEISTOCENE  
DEPOSITS OF ILLINOIS

**EXPLANATION**

Axis of present valley

Axis of bedrock valley

Present river valley

*Mississippi R.* - and bedrock valley (if present) roughly conform

KEMPION V - Bedrock valley, largely buried

0 10 20 30 40 MILES

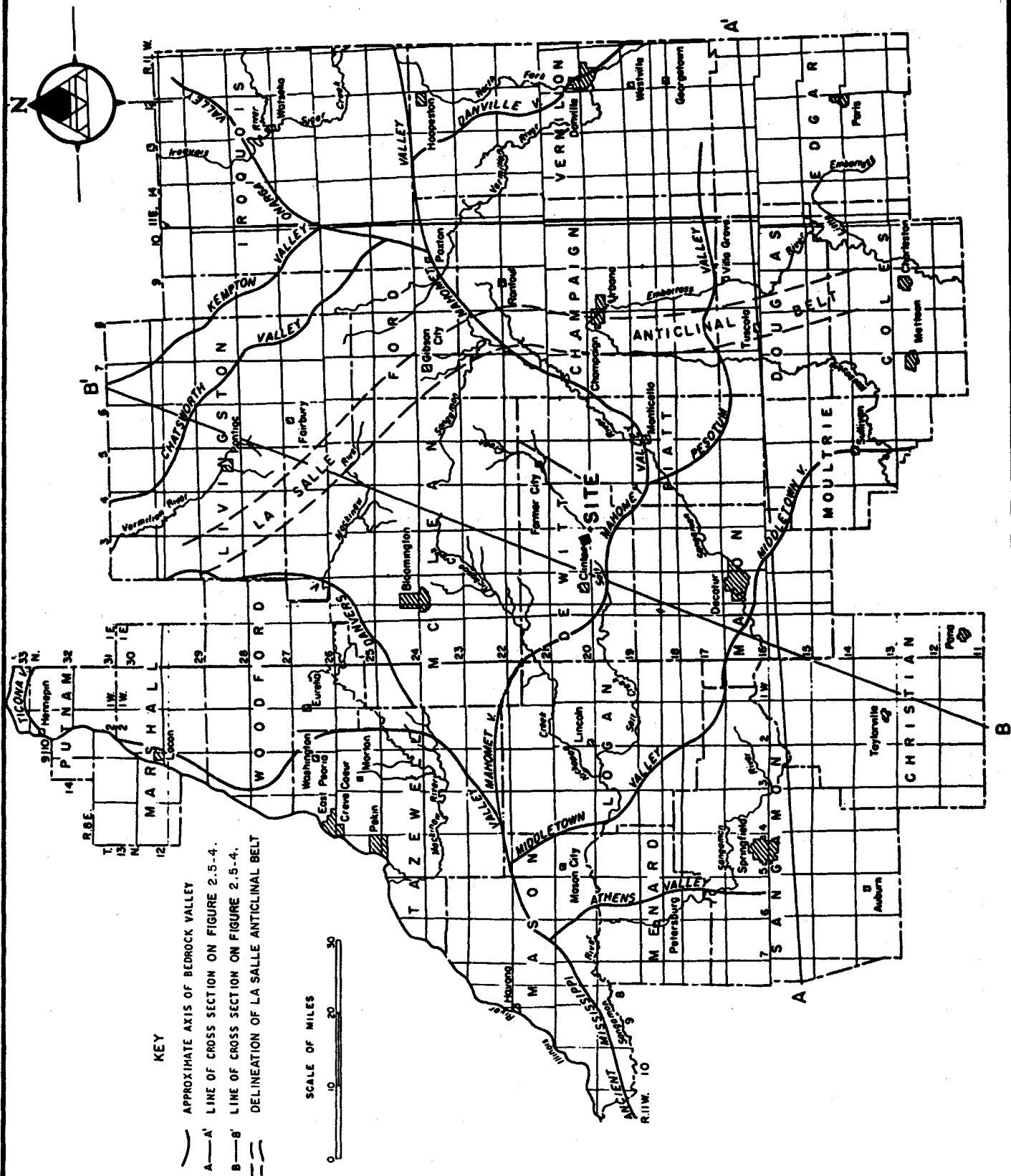
# CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-6

BEDROCK VALLEY MAP OF ILLINOIS

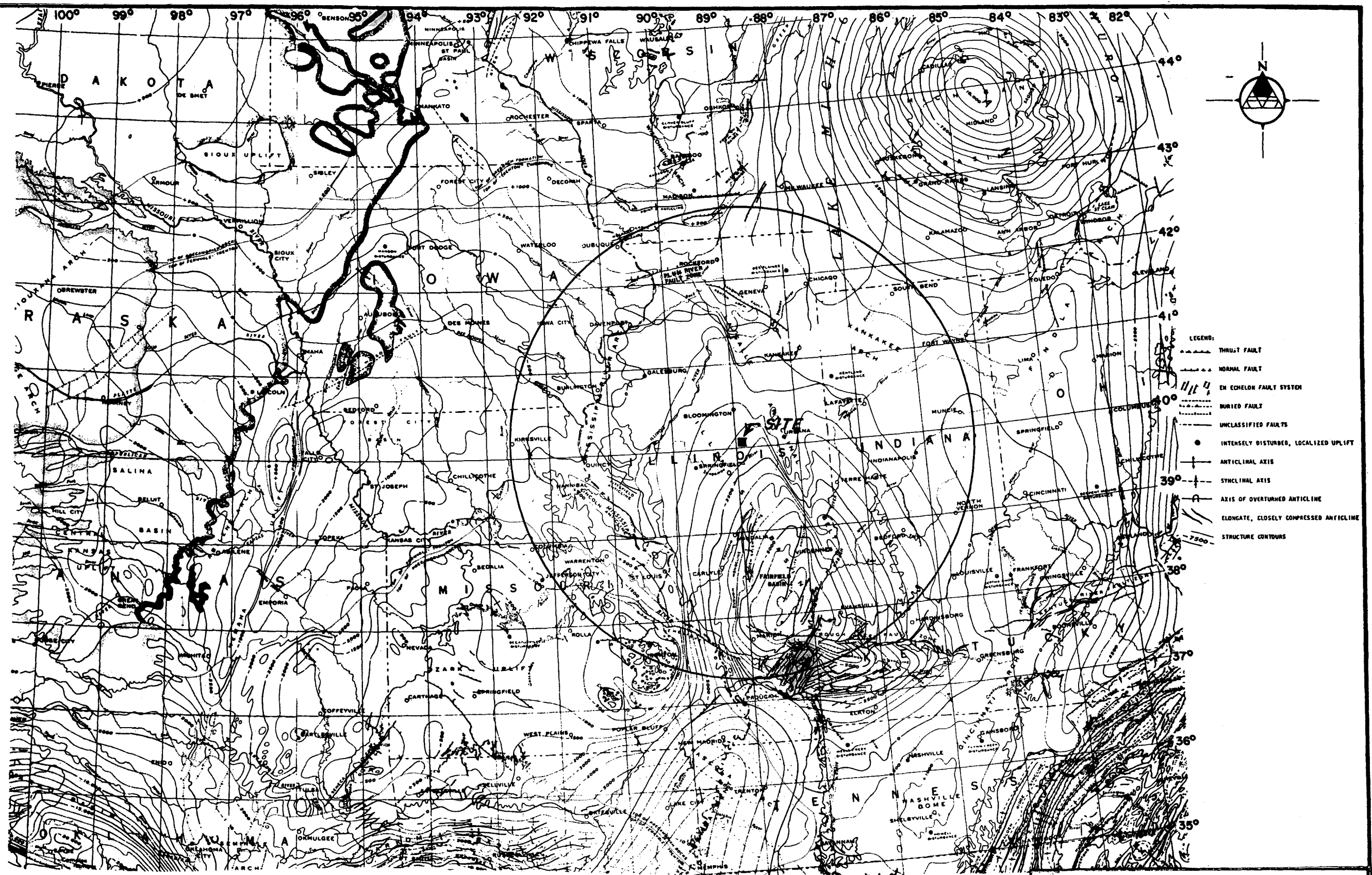
**NOTE:**

MODIFIED FROM: GLACIAL DRIFT IN ILLINOIS: THICKNESS AND CHARACTER, ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 490, URBANA, 1978.



**NOTES:**

1. SEE FIGURE 2.5-4 FOR REGIONAL GEOLOGIC CROSS SECTIONS.
2. MODIFIED FROM: SELKREGG, L.F. AND J.P. KEMPTON, GROUNDWATER IN EAST CENTRAL ILLINOIS, ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 248, 1958.



#### NOTES:

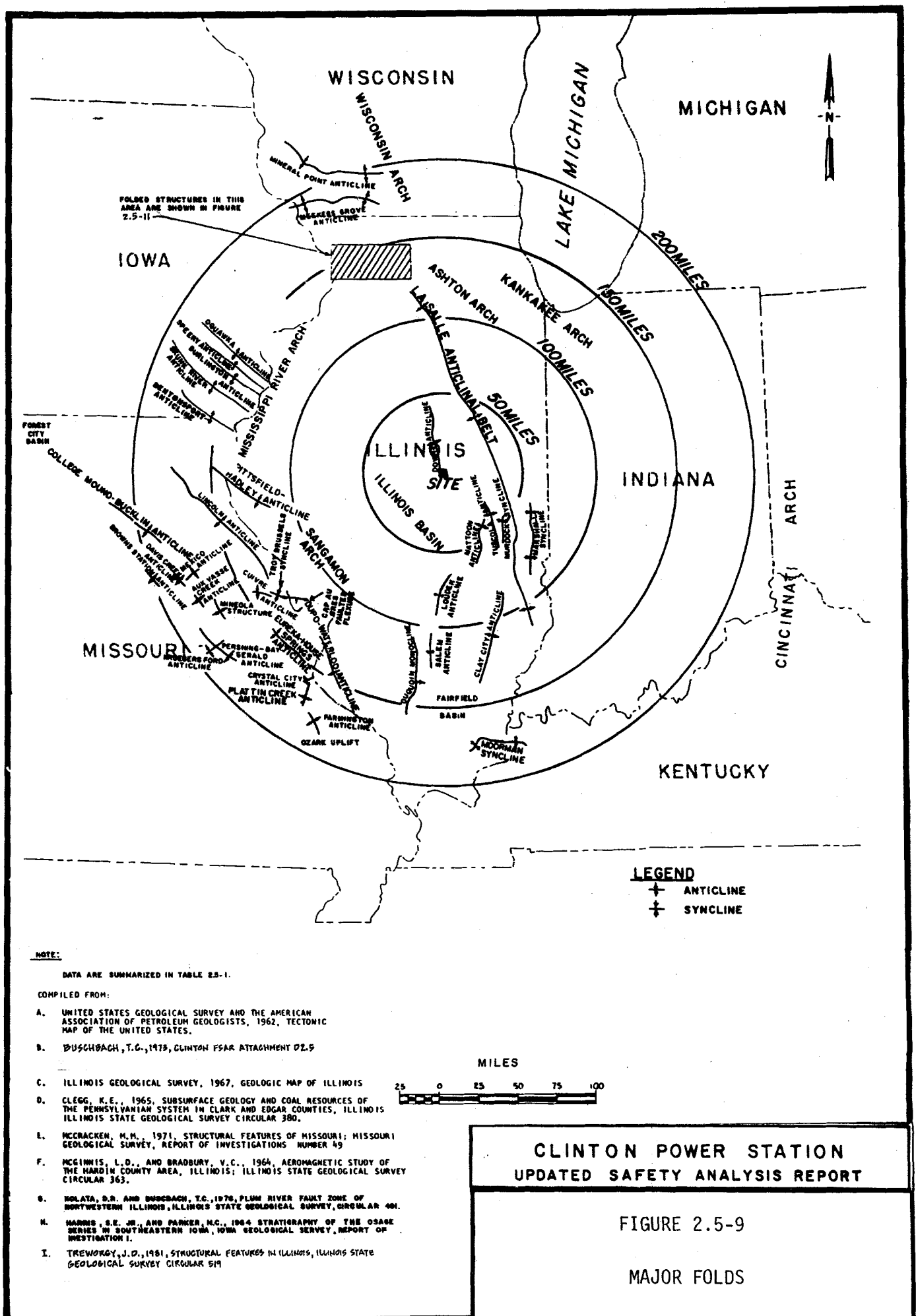
1. STRUCTURE CONTOUR LINES ARE CONSTRUCTED ON THE TOPS OF DIFFERENT LITHOLOGIC UNITS IN DIFFERENT LOCALITIES. THE NAMES AND BOUNDARIES OF THESE CONTOURED UNITS ARE DELINEATED BY DOTTED LINES ON THE MAP.
2. MODIFIED FROM: UNITED STATES GEOLOGICAL SURVEY AND THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, 1962, TECTONIC MAP OF THE UNITED STATES, AND ILLINOIS STATE GEOLOGICAL SURVEY, 1976, CIRCULAR 491, PLUM RIVER FAULT ZONE IN NORTHWESTERN ILLINOIS.
3. FOLDED STRUCTURES IN THE REGIONAL AREA ARE SHOWN IN MORE DETAIL ON FIGURE 2.5-9. FAULTED STRUCTURES IN THE REGIONAL AREA ARE SHOWN IN MORE DETAIL ON FIGURE 2.5-10.

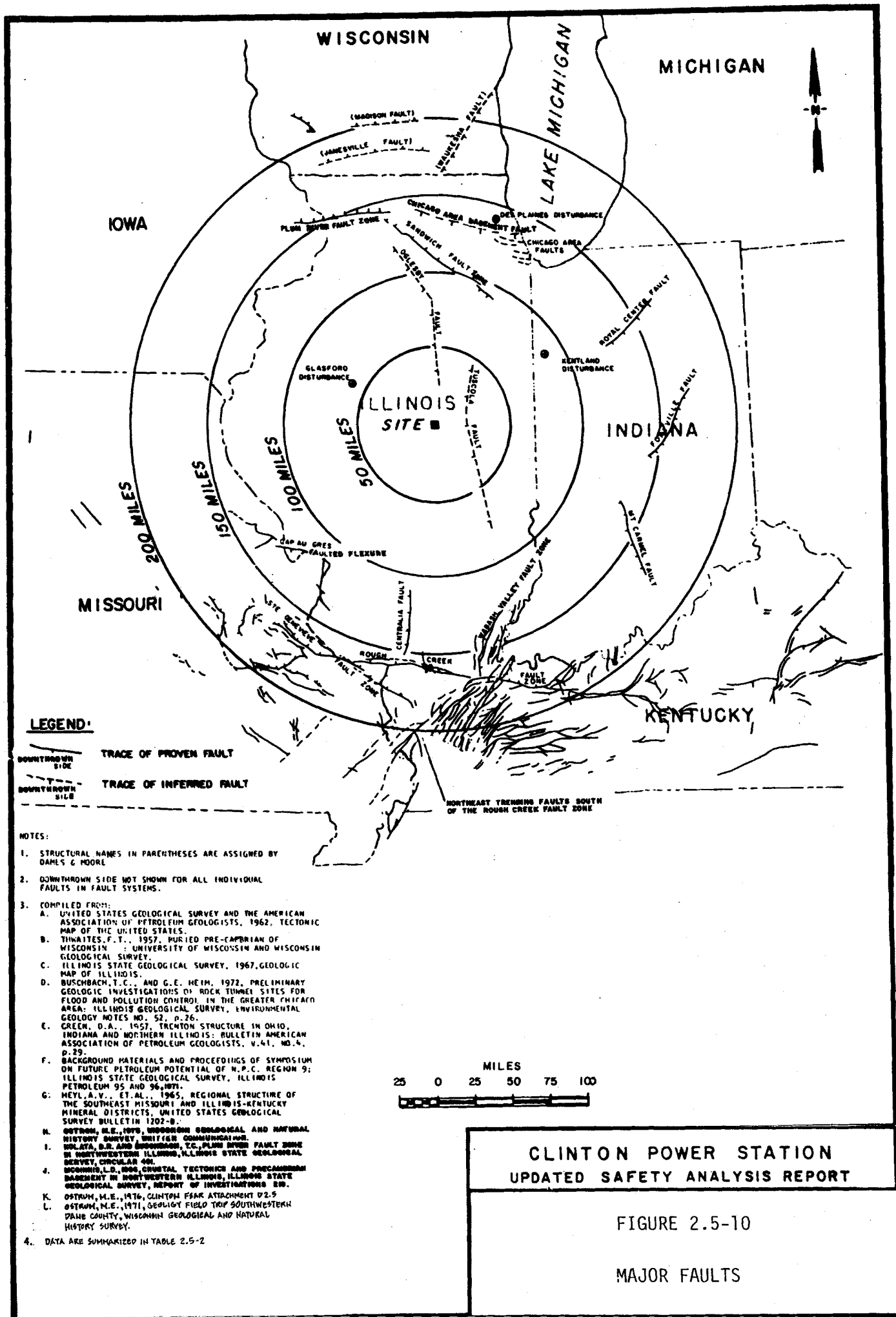
0 25 50 75 100  
MILES  
CONTOUR INTERVAL — 500 AND 1000 FEET

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

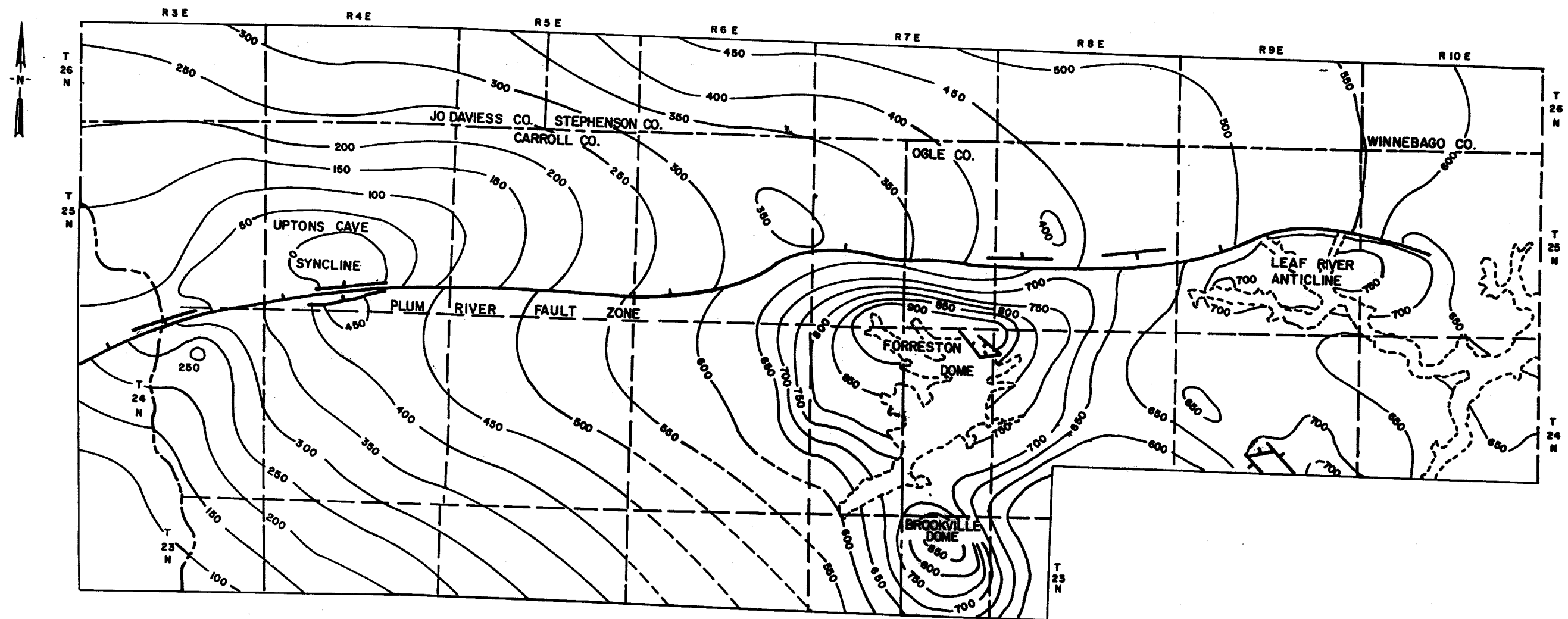
FIGURE 2.5-8

REGIONAL TECTONIC MAP







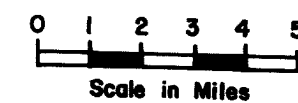


#### LEGEND

- 100— Structure contours on top of Glenwood Formation
- - -100- - Structure contours on top of Glenwood Formation, inferred
- - - - - Top of Glenwood Formation eroded
- - - - - State Line
- - - - - Township Lines
- - - - - County Lines
- - - - - Trace of Fault
- Downthrust  
Side

#### NOTE

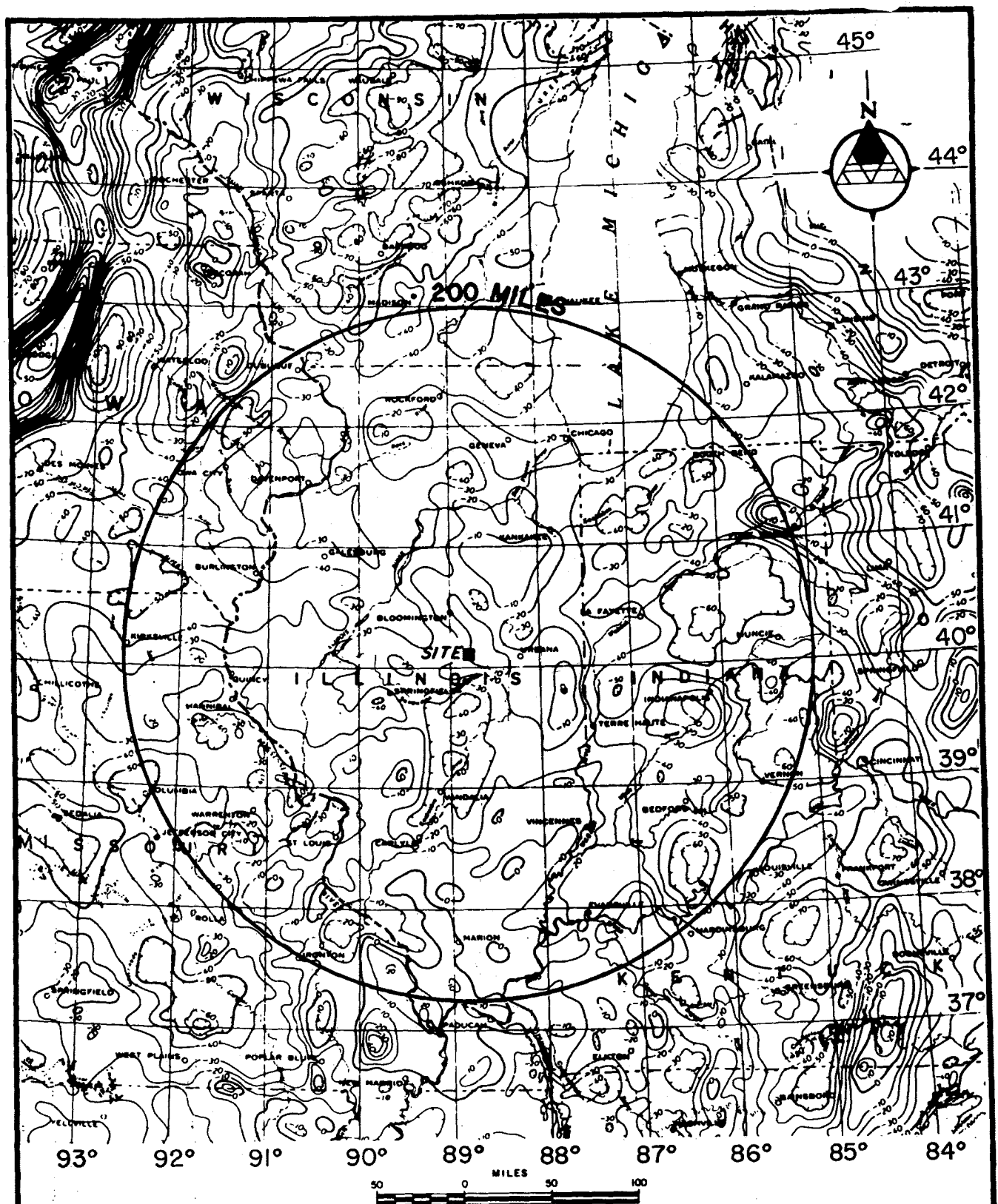
1. Modified from Kolata D.R. and Buschbach T.C., Plum River Fault Zone of Northwestern Illinois, Illinois State Geological Survey Circular 491, 1976.
2. The location of this area with respect to the regional area is shown on Figure 2.5-9.



CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-11

PLUM RIVER FAULT ZONE AND ASSOCIATED  
STRUCTURES IN ILLINOIS



LEGEND:

-60- BOUGUER GRAVITY CONTOUR  
(CONTOUR INTERVAL 10 MILLIGALS)

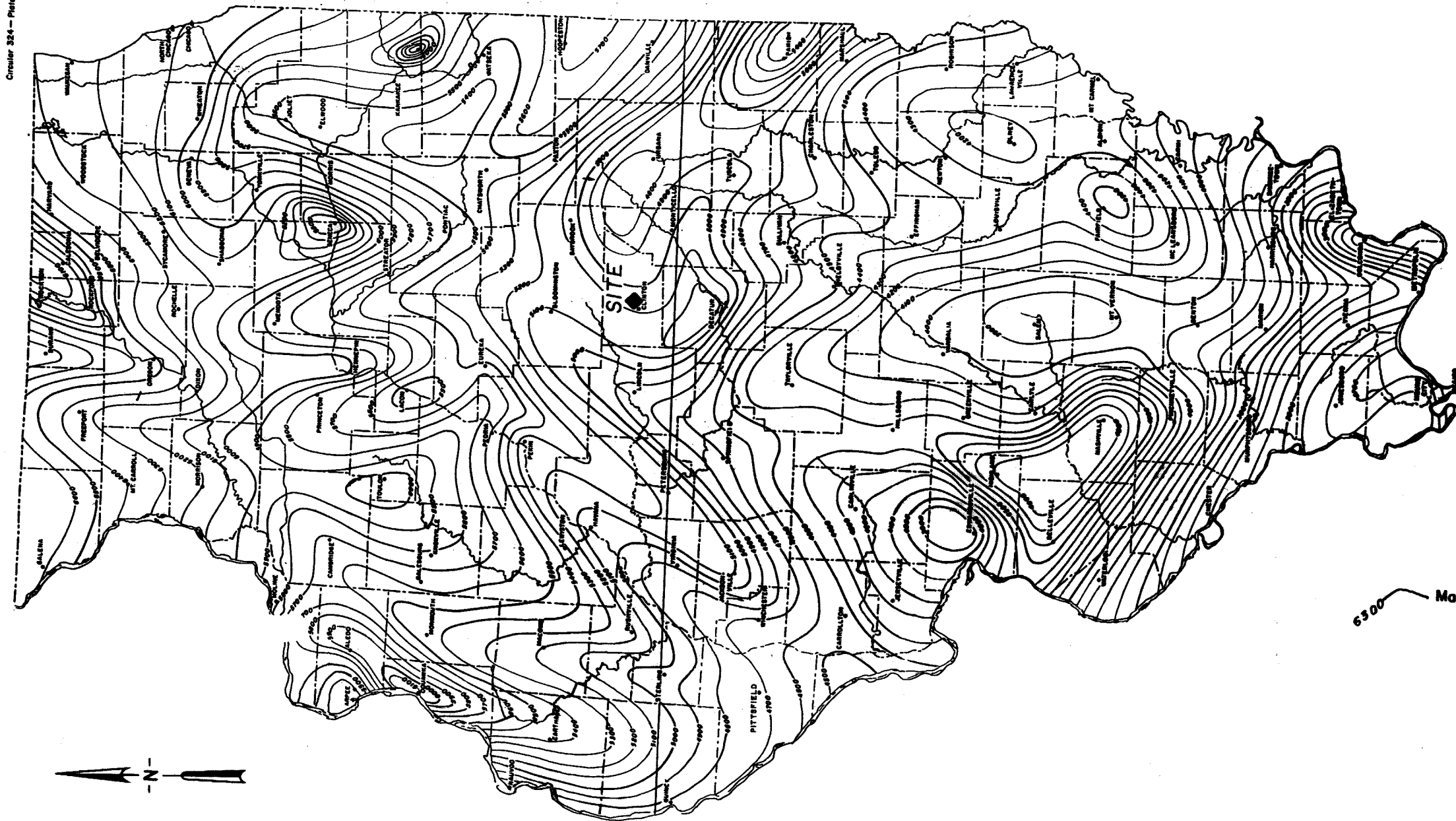
NOTE:

BASE MAP FROM: WOOLARD, G.P. AND JOESTING, H.R.,  
1964, BOUGUER GRAVITY ANOMALY MAP OF THE UNITED  
STATES: AMERICAN GEOPHYSICAL UNION AND UNITED  
STATES GEOLOGICAL SURVEY.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-12

REGIONAL BOUGUER GRAVITY ANOMALY MAP



KEY  
6300 Magnetic contour lines, interval 100 gammas.

0 10 20 30 40  
Scale in Miles

MODIFIED FROM: MCGINNIS, L. D., AND HEIGOLD, P. C., REGIONAL MAPS OF VERTICAL  
MAGNETIC INTENSITY IN ILLINOIS, ILLINOIS STATE GEOLOGICAL SURVEY  
CIRCULAR 324, 1961.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-13

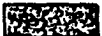


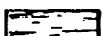

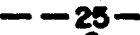


REGIONAL VERTICAL MAGNETIC ANOMALIES





0 8 16 24 32  
MILES

#### LEGEND

-  MORAINIC RIDGES
  -  LAKEBED SEDIMENTS
  -  ICE-CONTACT STRATIFIED DRIFT
  -  ALLUVIATED VALLEYS AND OUTWASH PLAINS
  -  GROUND MORaine
  -  25 —
  -  8 —
  -  4 —
- APPROXIMATE THICKNESS OF LOESS  
25, 8, 4 FOOT CONTOURS

MODIFIED FROM: THORNBURN, T.H., SURFACE DEPOSITS OF ILLINOIS,  
UNIVERSITY OF ILLINOIS ENGINEERING EXPERIMENT STATION, CIVIL  
ENG. STUDIES, SOIL MECHANICS SERIES 3.

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-15

SURFICIAL GEOLOGY MAP

E 354,000

**NOTES:**

1. REFER TO FIGURES 2.5-19 THROUGH 2.5-73 AND FIGURES 2.5-162 THROUGH 2.5-242 FOR LOGS OF BORINGS.
2. REFER TO FIGURE 2.5-284 FOR SUBSURFACE SECTIONS J-J' AND K-K'.

**LEGEND:**

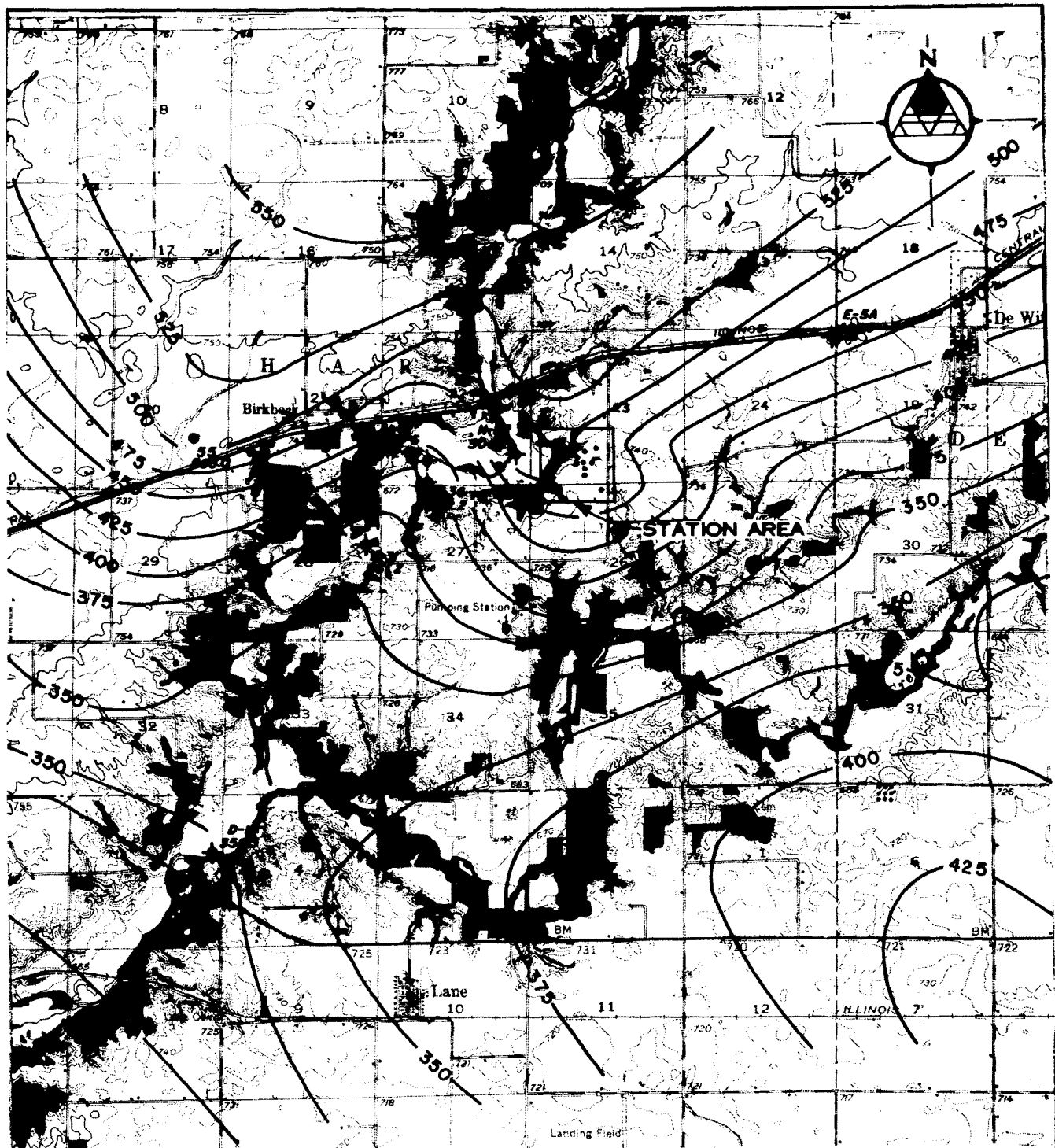
- ◆ LOCATION OF BORINGS THAT EXTEND TO BEDROCK
- ◆ BORING LOCATION
- (P) INDICATES PIEZOMETER INSTALLATION
- INDICATES ALL CATEGORY 1 STRUCTURES
- SUBSURFACE SECTION LOCATION

NOTE: UNIT 2 HAS BEEN CANCELLED.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-16

PLOT PLAN - ULTIMATE HEAT SINK



**LEGEND:**

- ✦ BORING LOCATION
- PRIVATE WATER WELL
- ELEVATION OF TOP OF BEDROCK
- 400— CONTOUR ON TOP OF BEDROCK SURFACE
- CONTOUR INTERVAL 25 FEET

**NOTE:**

1. BASE MAP MODIFIED FROM: MARGA, ILLINOIS 15 MINUTE QUADRANGLE (1:62,500), UNITED STATES GEOLOGICAL SURVEY, 1957.
2. SEE FIGURE 2.5-282 FOR ENLARGED VIEW OF BORINGS IN PLANT AREA.
3. BEDROCK CONTOURS ADOPTED FROM 'GEOLOGICAL SIGNIFICANCE OF THE GRAVITY FIELDS IN THE DEWITT-MCLEAN COUNTY AREA, ILLINOIS BY P.C. HEIGOLD, L.D. MCGINNIS AND R.H. HOWARD, ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 369, 1964, WITH MODIFICATIONS FROM BOREHOLE DATA.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-17

CONTOURS ON BEDROCK SURFACE  
SITE VICINITY



TIME STRATIGRAPHY				STRATIGRAPHIC UNITS	
				UPLAND	VALLEY
Quaternary System	Pleistocene Series	Holocene Stage		Richland Loess	Cahokia
		Wisconsinan Stage	Valderan Substage		Peyton
			Twocreekan Substage		Colluvium
			Woodfordian Substage	Alluvium	
			Farmdalian Substage		
			Altonian Substage	Henry Formation	
		Sangamonian Stage		weathered Glasford Formation	
		Illinoian Stage			
		Yarmouthian Stage		unaltered Glasford Formation	
		Kansan Stage			
		Unconformity		Banner Formation	
		Pennsylvanian System		McLeansboro Group	Bond Formation
				Kewanee Group	Modesto Formation
Carbondale Formation					

STRATIGRAPHIC DESCRIPTION		
STRATIGRAPHIC UNIT	APPROXIMATE THICKNESS*	GENERAL DESCRIPTION
Cahokia Alluvium	0-35 ft.	Alluvium and silty clay (CL,SM or ML)
Peyton Colluvium	0-10 ft.	
Richland Loess	0-10 ft.	Loess, clayey silt (ML or CL), may be leached, soft.
Henry Formation	0-35 ft.	Stratified sand and gravel (SP, GP, SM).
Wedron Formation	20-55 ft.	Till, clayey sandy silt till (ML or CL), stiff to very stiff, with lenses of stratified sand, gravel, or silt.
Robein Silt	0-2 ft.	Silt (ML or CL), black or dark brown, massive, soft.
weathered Glasford Formation	10-15 ft.	Silt and silty clay (ML or CL), weathered, soft; and till (ML or CL), weathered, soft with lenses of sand or silt; black, dark brown, green.
unaltered Glasford Formation	90-140 + ft.	Till, gray sandy silt (ML or SM), hard. Upper part may contain lenses of stratified sand, silt, or gravel.
Banner Formation	25-105 ft.	Complex sequence, variably consisting of glacio-lactustrine silt (ML or CL), hard; clay till (ML), hard; may be undelain by very dense sand (Mahomet Sand Member), 0-140 ft. thick.
McLeansboro Group and Kewanee Group	Not Completely Penetrated	Alternating beds of shale, siltstone, limestone, and coal bedrock.

NOTES:

- The stratigraphic units are discussed in detail in subsection 2.5.1.2 and Attachment C2.5.
- Figure 2.5-274 shows a comparison of stratigraphic nomenclature used in the FSAR, PSAR, and boring logs.
- Excavations for the Clinton Power Station did not extend below the unaltered Glasford Formation.
- Borings for the Clinton Power Station did not extend below rocks of the Carbondale Formation.
- Illinoian-age till of the Glasford Formation was subjected to a significant period of weathering during the Sangamonian Stage and Altonian Substage.
- Deposits of Cahokia Alluvium and Henry Formation were not differentiated; reported approximate thicknesses of each unit represents a combined thickness for both deposits. The Cahokia Alluvium is Holocene and quite possibly, in part, Valderan/Twocreekan in age; the Henry Formation is Woodfordian (probably early) in age. The Wedron Formation is probably early Woodfordian.

- The Holocene Stage is represented by a significant period of weathering and development of agricultural soil profiles.
- Vertical scale does not represent either relative thickness of stratigraphic units or relative duration of time interval.
- Standard Unified Soil Classification symbols are used.
- Locally, the Peyton Colluvium rests directly on Glasford Formation.

\*Based on data from excavations and boring logs.

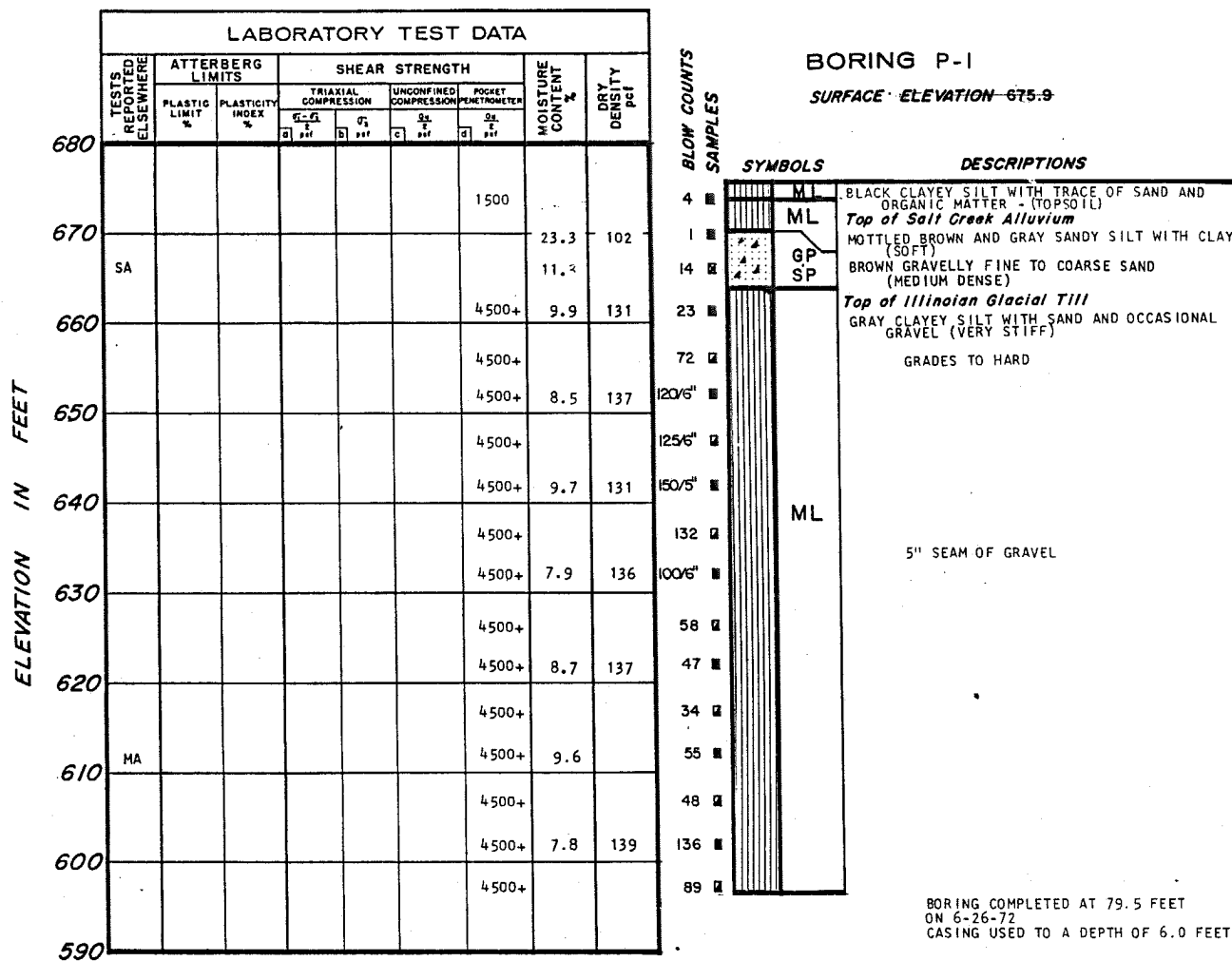
CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-18

SITE STRATIGRAPHIC COLUMN





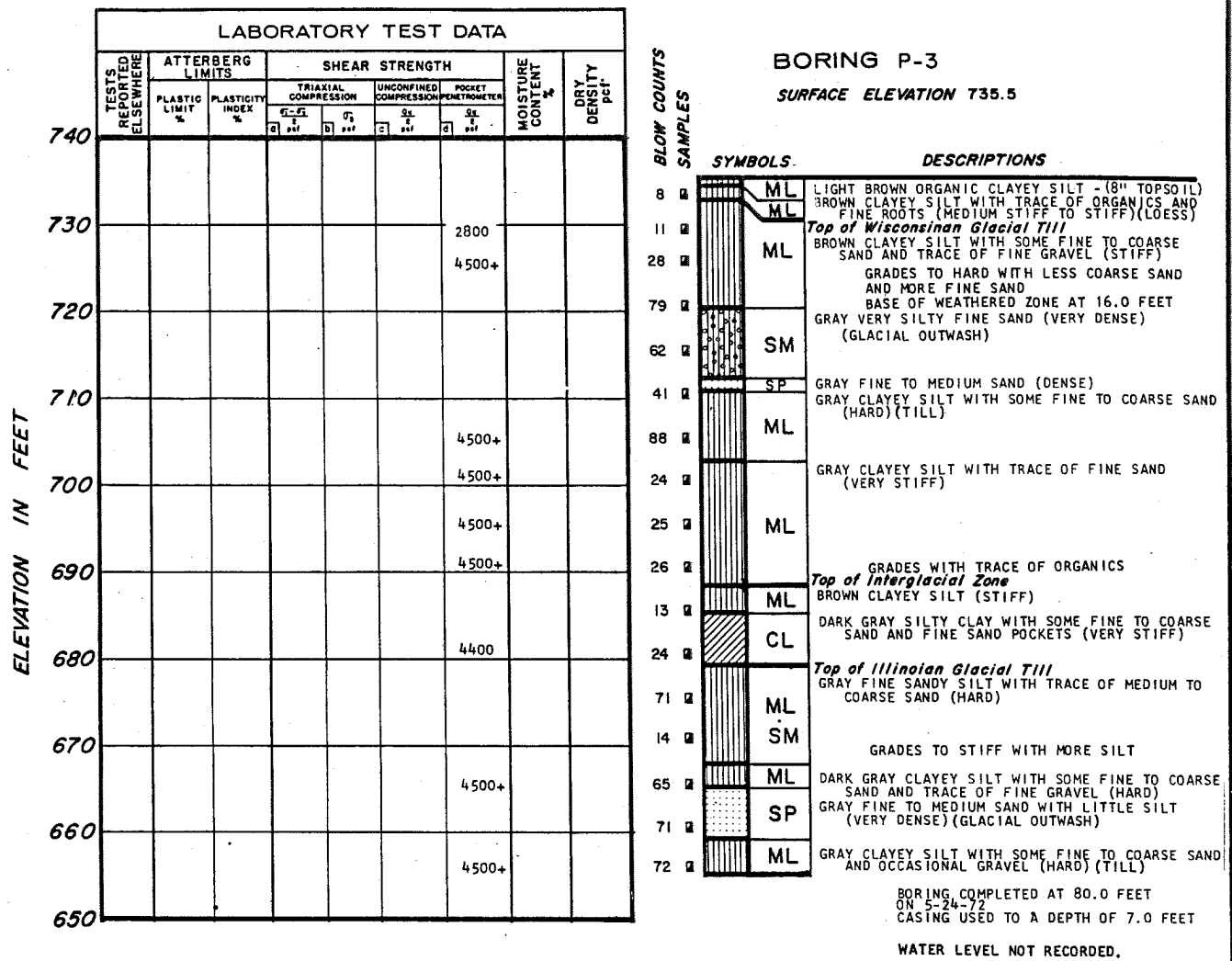
**CLINTON POWER STATION  
 UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-19

LOG OF BORING P-1

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.



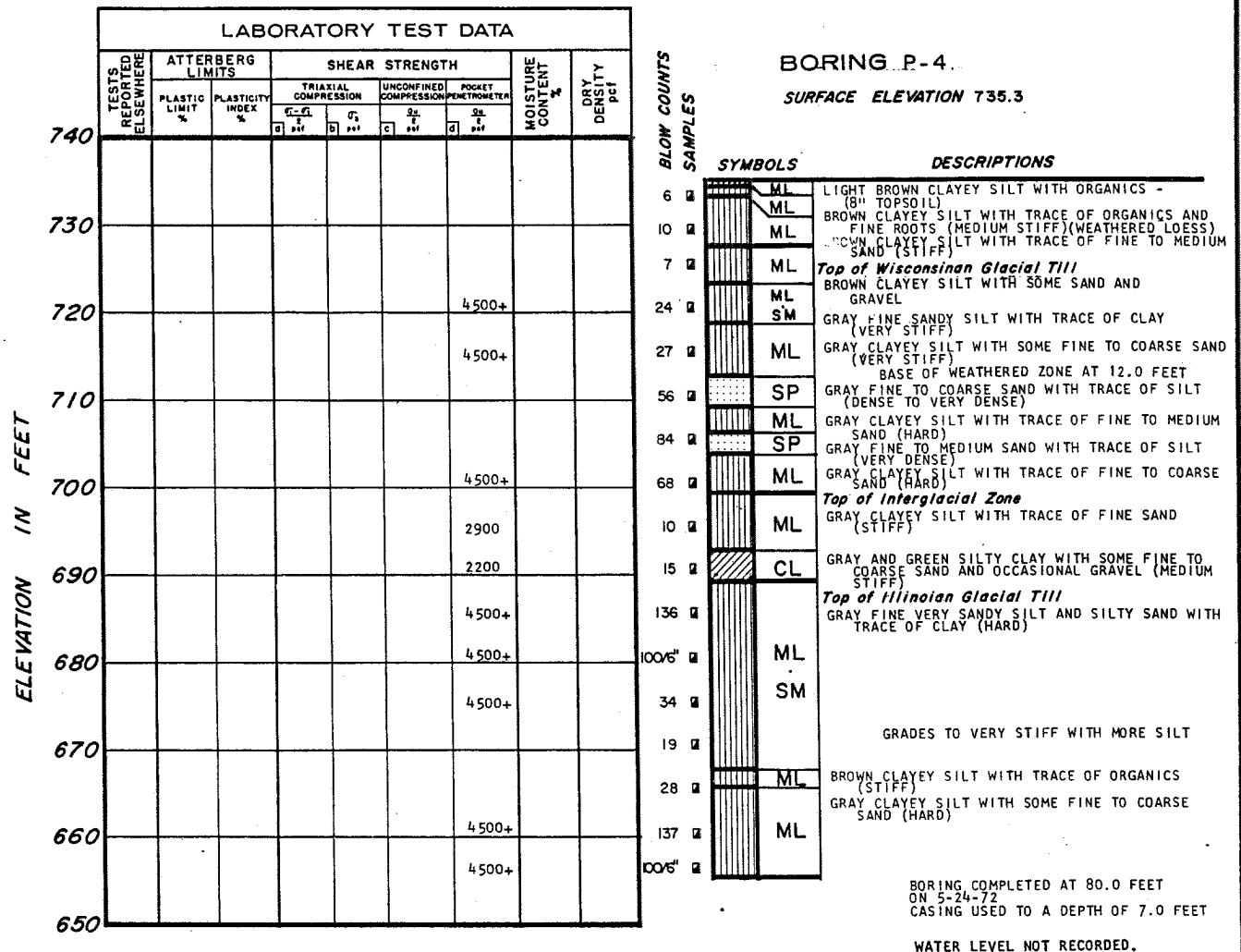
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-20

LOG OF BORING P-3

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



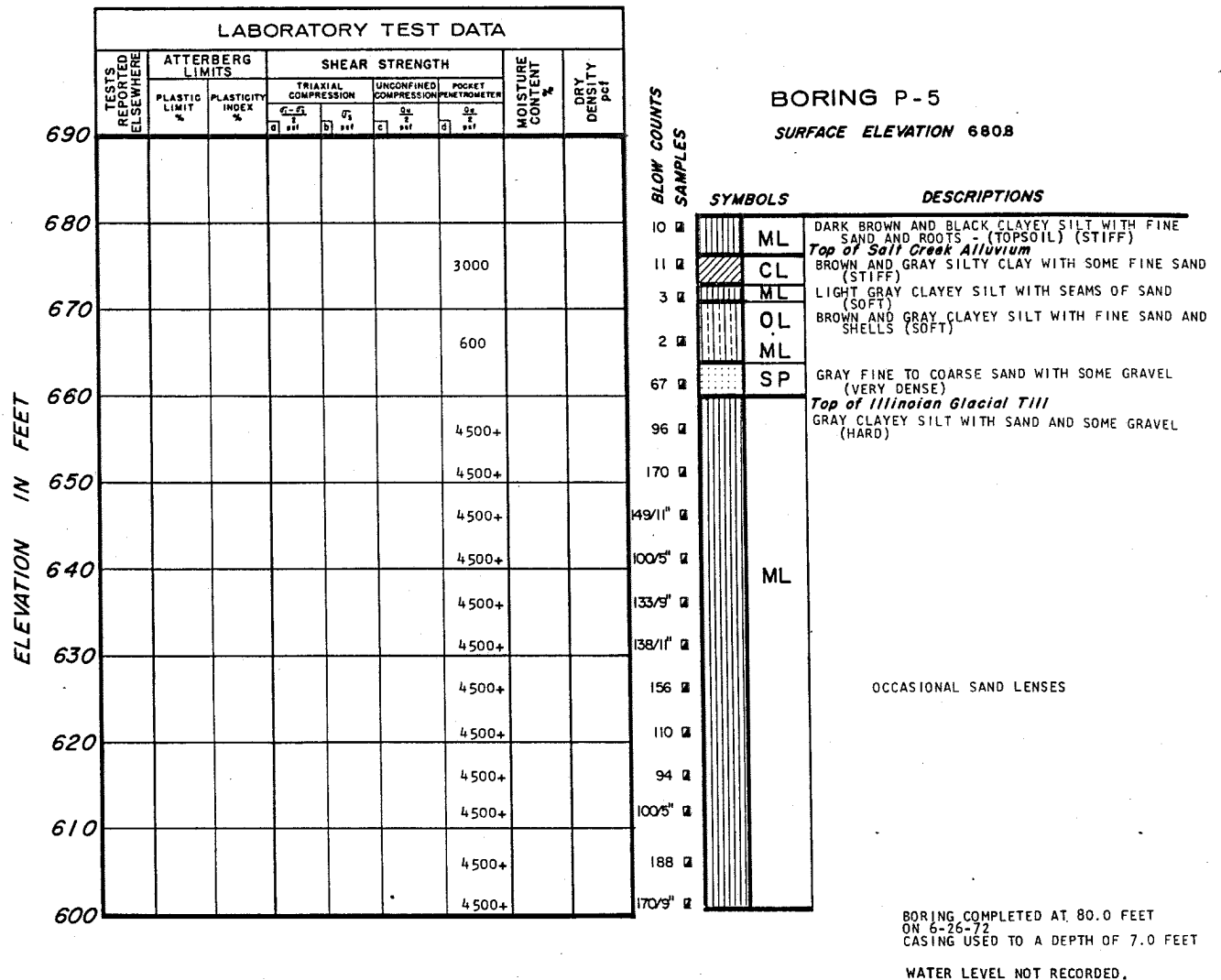
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-21

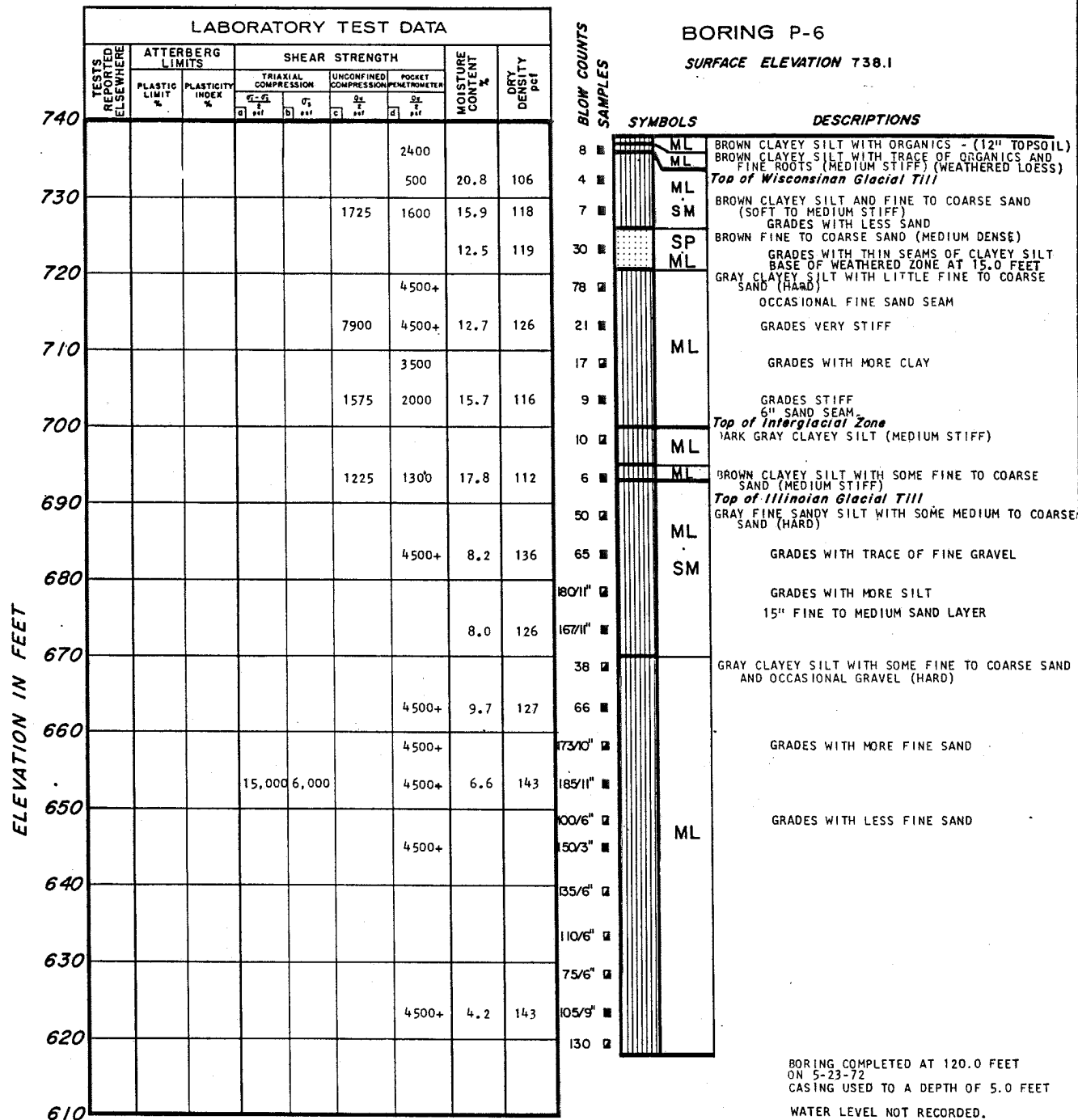
LOG OF BORING P-4



**CLINTON POWER STATION**  
**UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-22

LOG OF BORING P-5



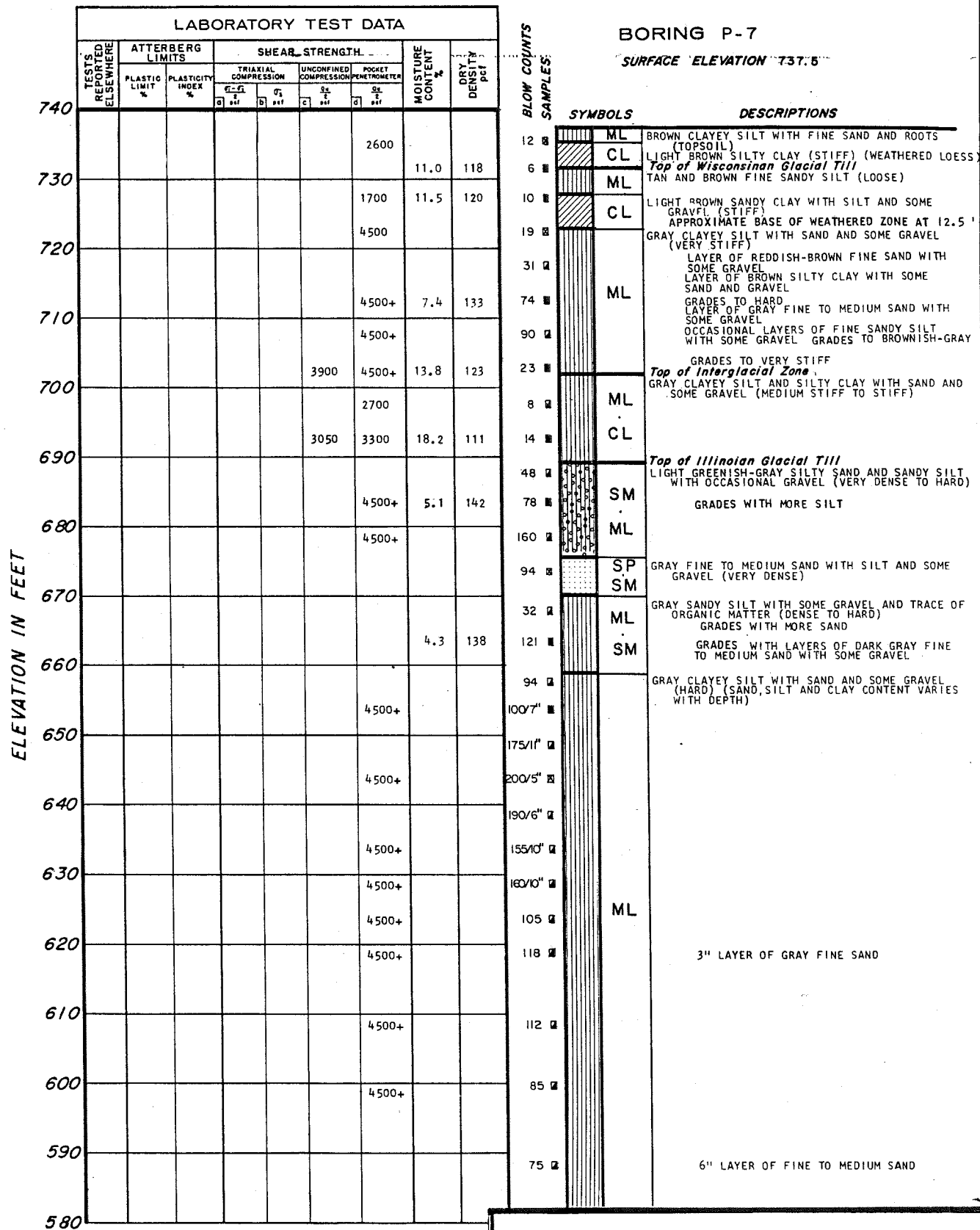
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-23

LOG OF BORING P-6

NOTE:

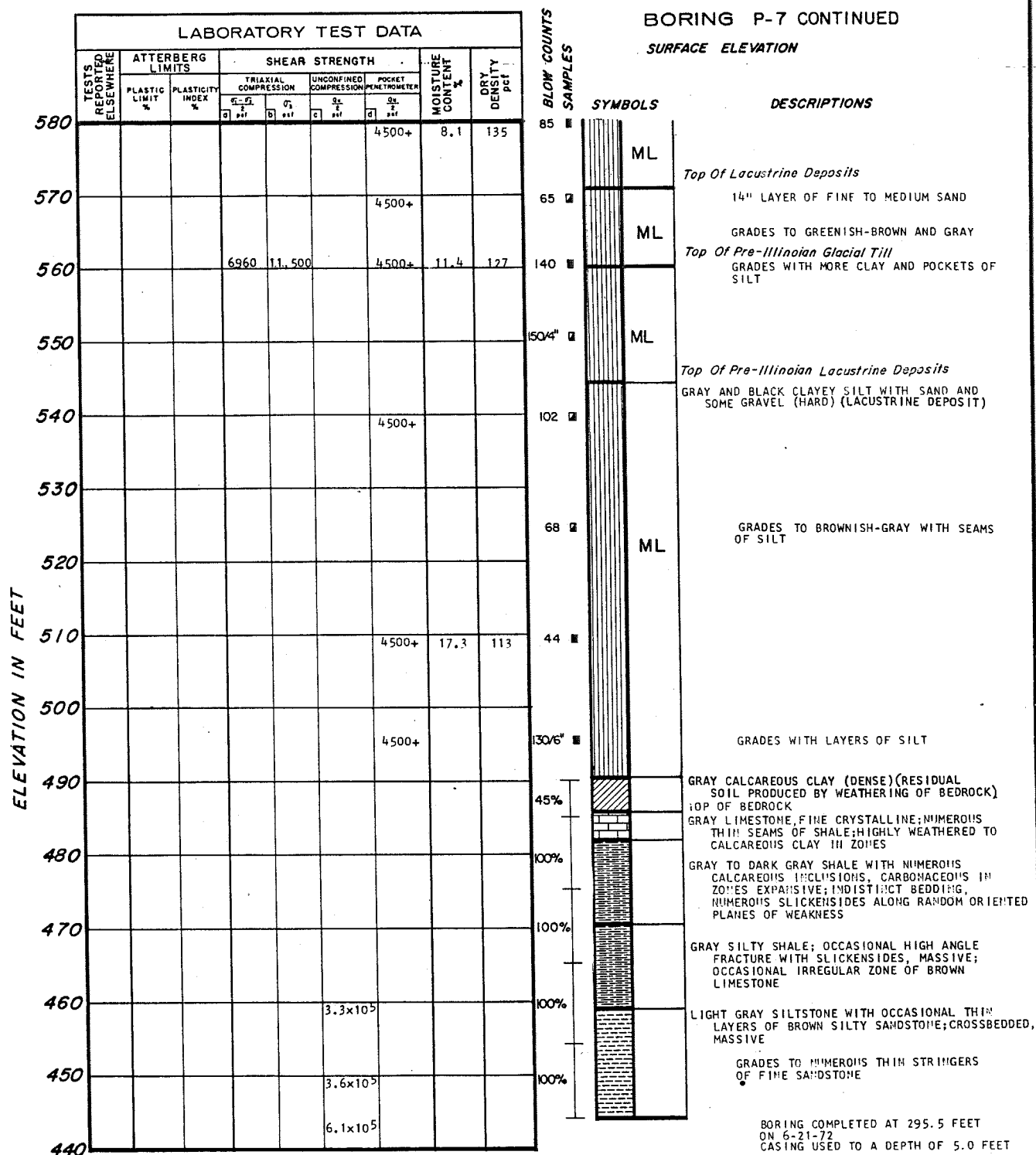
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-24

LOG OF BORING P-7  
(SHEET 1 of 2)



PIEZOMETER INSTALLED ON 7-5-72  
BORING P-7B, LOCATED 10 FEET  
FROM P-7A, WAS DRILLED TO A  
DEPTH OF 78 FEET. A 3/4 INCH  
PVC PIPE WITH AN 18 INCH POROUS  
STONE TIP WAS PLACED TO ELEVATION  
659.5. GRANULAR BACKFILL WAS  
PLACED FROM ELEVATION 659.5 TO  
667.5; A BENTONITE SEAL FROM  
ELEVATION 667.5 TO 669.5 AND  
CEMENT GROUT AND GRAVEL FROM  
ELEVATION 669.5 TO 737.5.

**WATER LEVEL READINGS**

DEPTH BELOW GROUND  
SURFACE IN FEET

52.7

DATE

8-29-72

REFER TO FIGURE 2.4-36 FOR  
WATER LEVEL OBSERVATIONS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

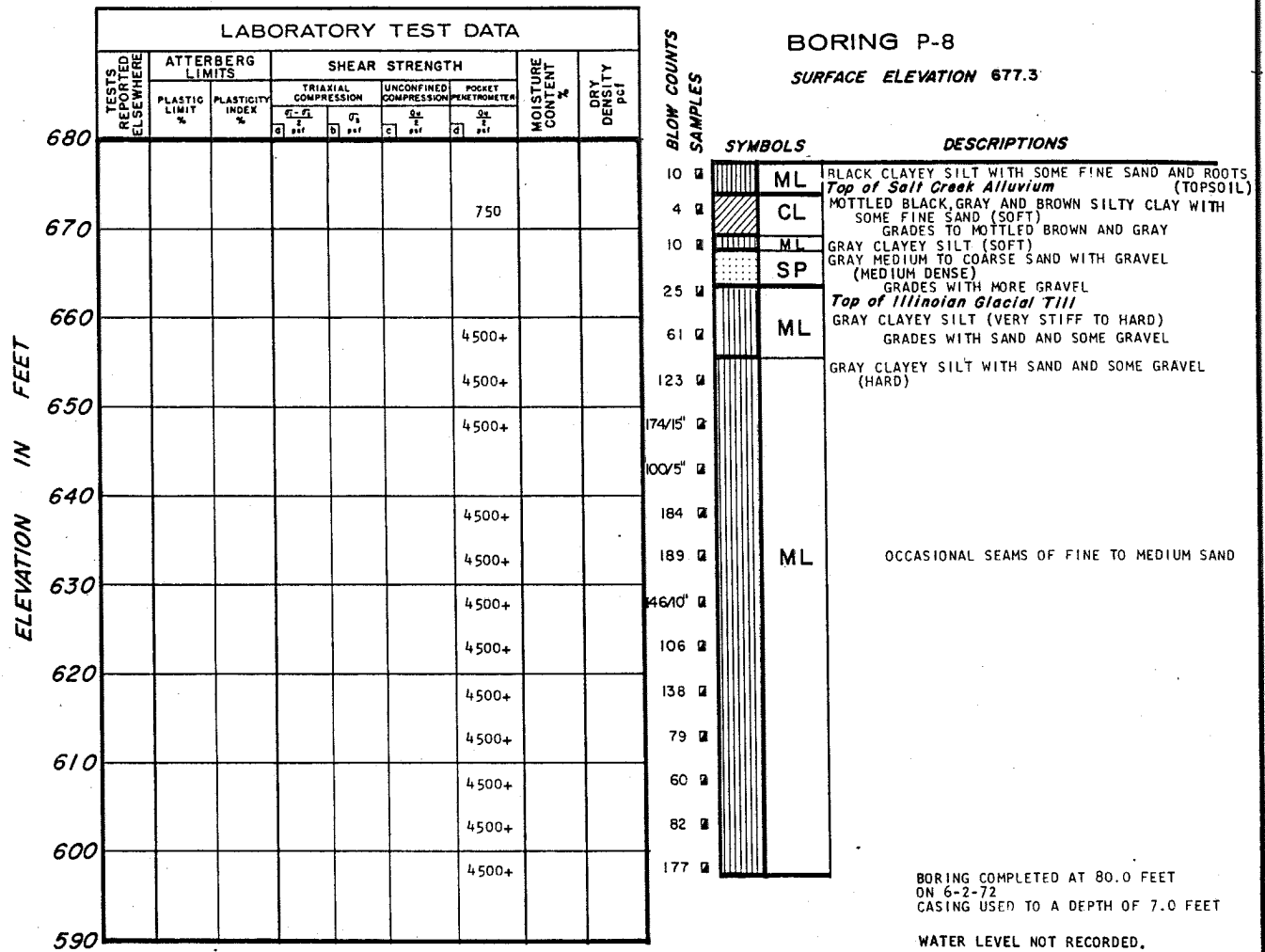
FIGURE 2.5-24

LOG OF BORING P-7

(SHEET 2 of 2)

**NOTE:**

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



NOTE:

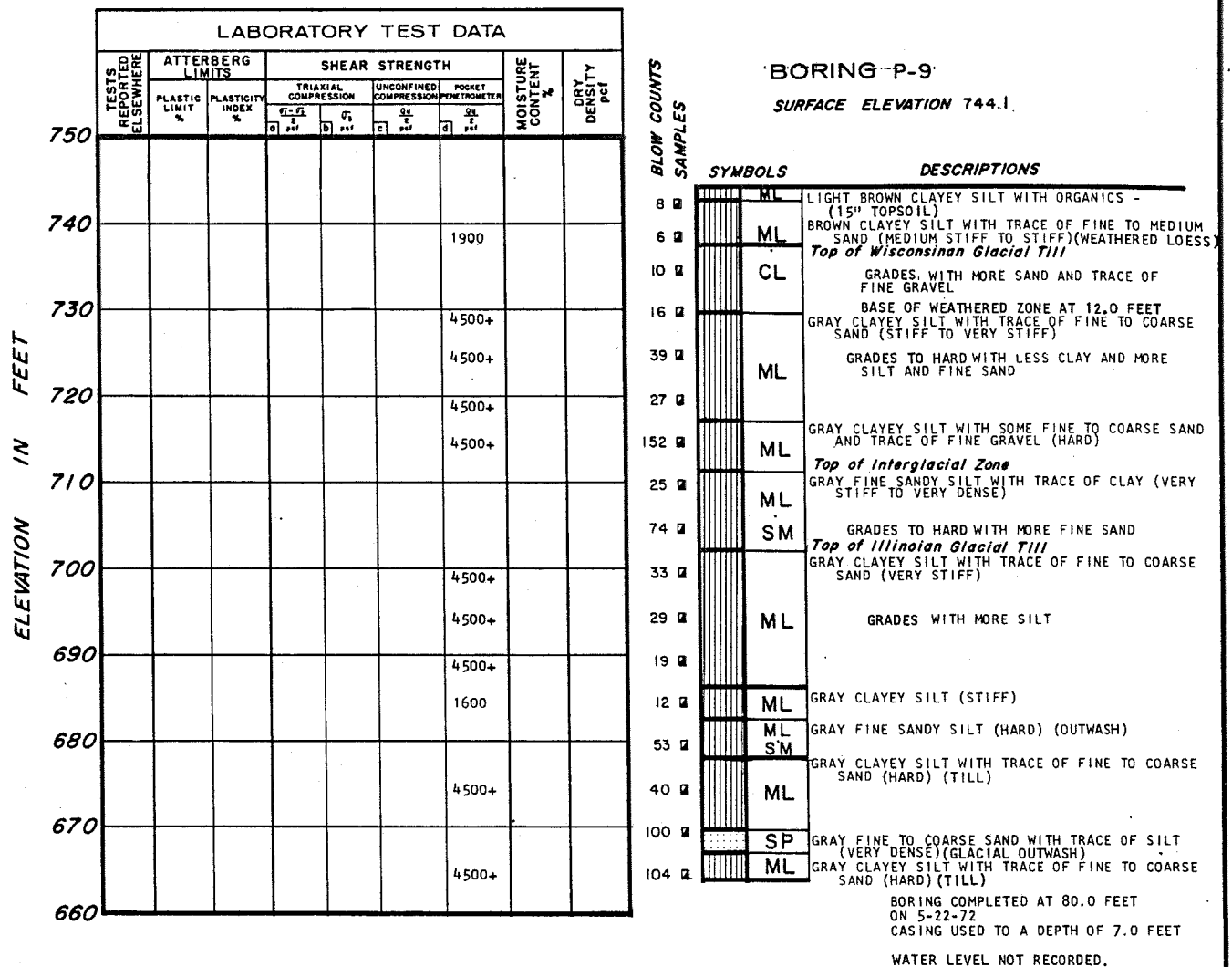
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-25

LOG OF BORING P-8





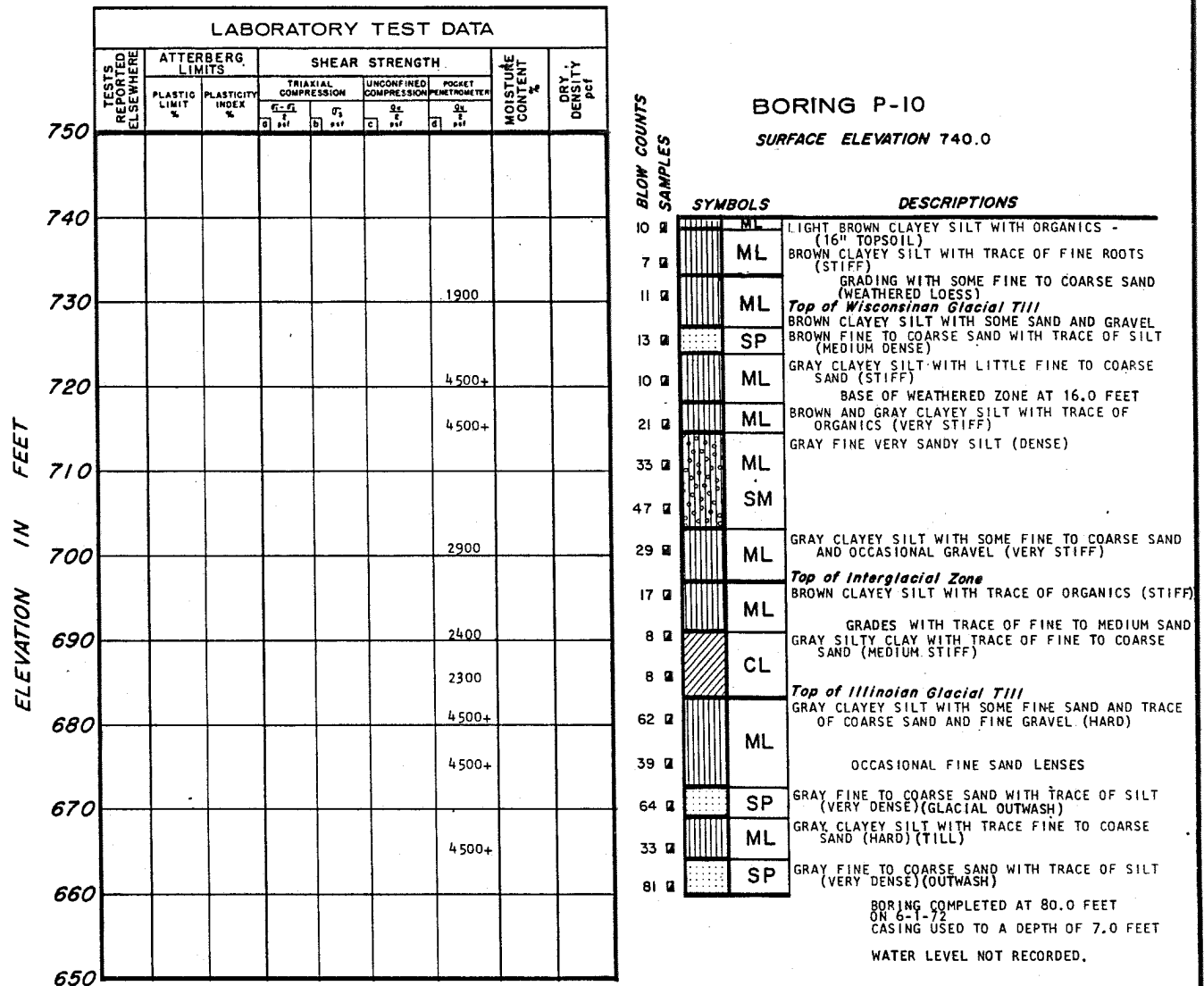
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-26

LOG OF BORING P-9

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



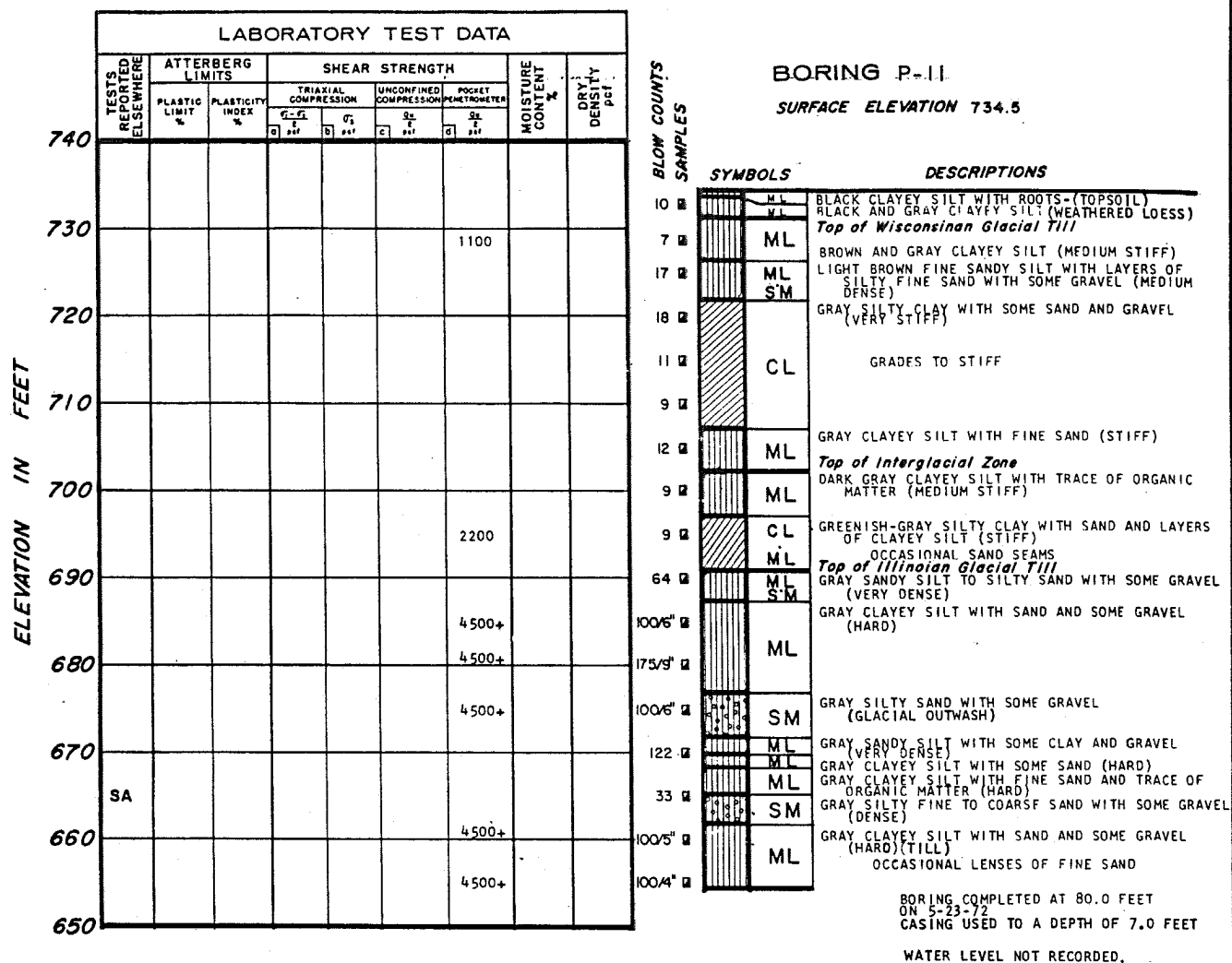
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-27

LOG OF BORING P-10



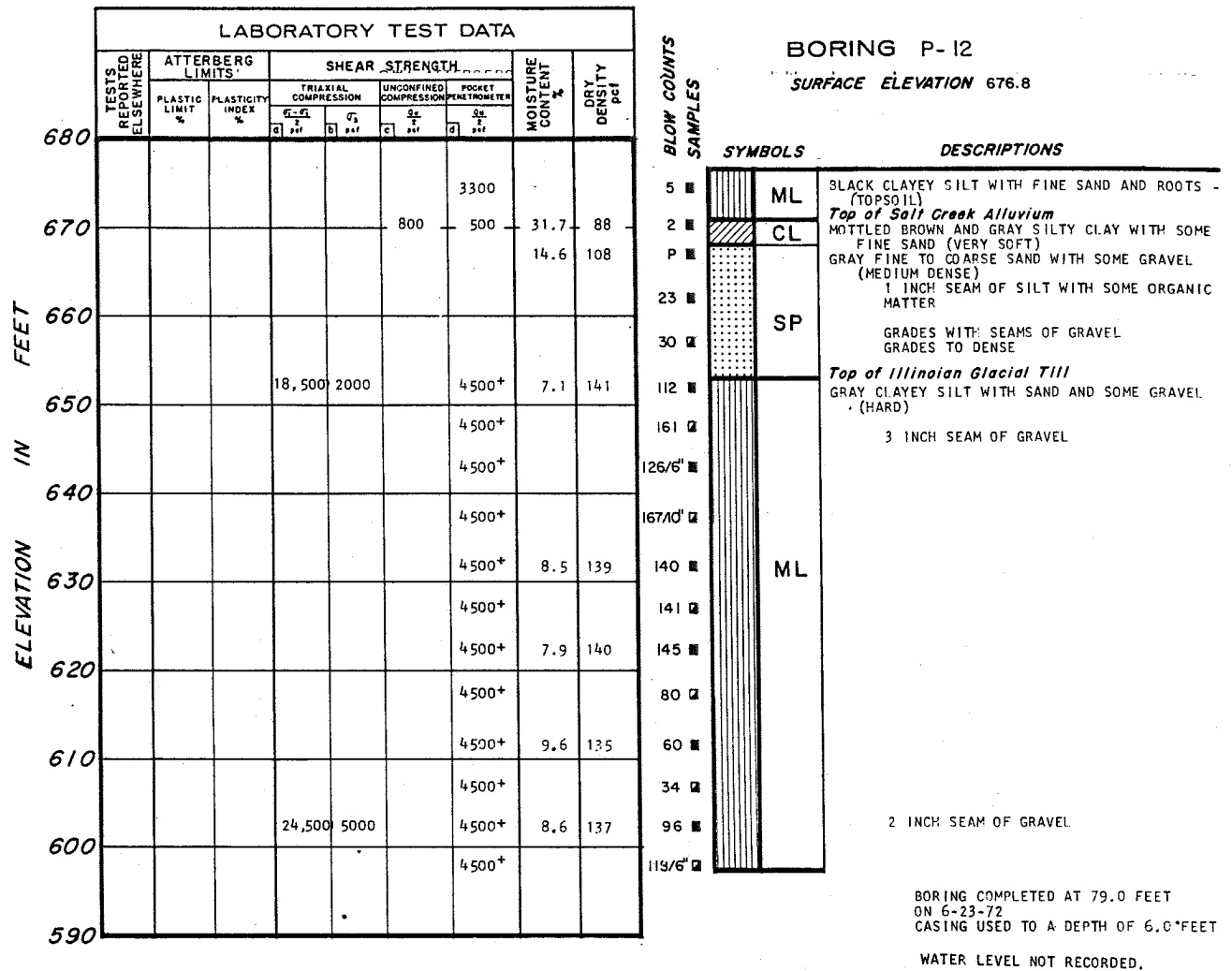
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-28

LOG OF BORING P-11

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

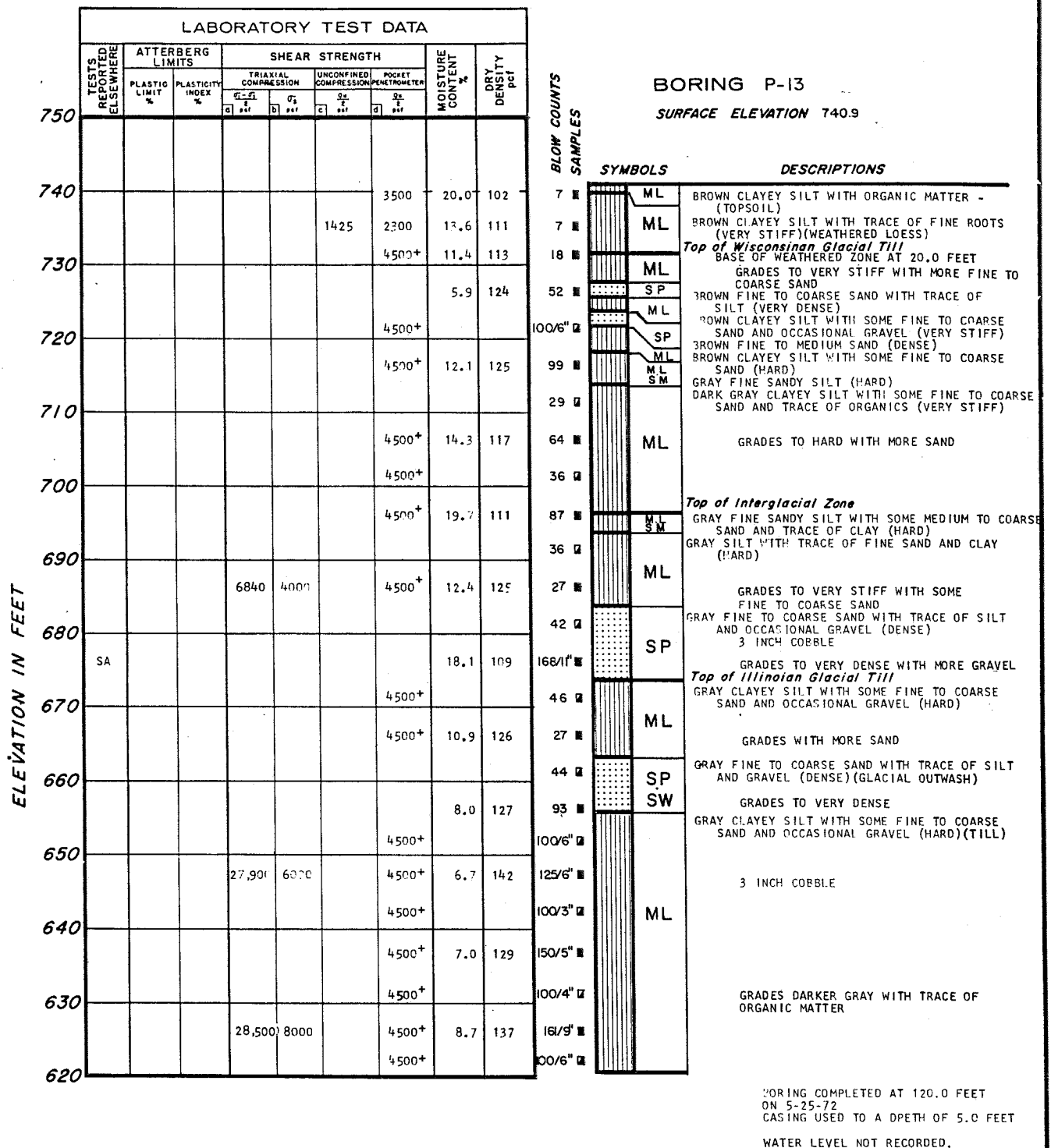


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-29

LOG OF BORING P-12

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



**CLINTON POWER STATION**  
**UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-30

LOG OF BORING P-13

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

ELEVATION IN FEET

LABORATORY TEST DATA									
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf	
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAxIAL COMPRESSION		UNCONFINED COMPRESSION				
			$\sigma_1$ psi	$\sigma_3$ psi	$\sigma_c$ psi	$S_u$ psi			
740						2400			
730			2320	1000		400	18.4	109	
720						2100	14.6	121	
710	TX/DY		880	2500		4500	16.6	117	
700						1200			
690			5880	5000		4500+	17.2	102	
680	C	12.5	12.5			1600	16.2	115	
670	CHEM*		21,700	4000		4500+	8.1	139	
660		11.0	4.0			4500+	5.1	142	
650	SA SA PERM					4500+	9.5	129	
640						4500+			
630			> 15,000	9000		4500+	8.2	139	
620	TX/DY		20,500	9000		4500+	8.3	139	
610	RES. TX/DY		26,300	9000		4500+	7.6	139	
600	SHOCK TX/DY					4500+			
590						4500+			
580									

\* ON WATER SAMPLE OBTAINED ON 10-7-72

# BORING P-14

SURFACE ELEVATION 738.3

BLOW COUNTS  
SAMPLES

## SYMBOLS

## DESCRIPTIONS

8	DL	BROWN CLAYEY SILT WITH SOME ORGANICS - (TOPSOIL)
2	ML	MOTTLED BROWN AND GRAY CLAYEY SILT (VERY STIFF) (WEATHERED LOESS)
8	ML	Top of Wisconsinan Glacial Till line to COARSE BROWN CLAYEY SILT WITH SOME FINE TO COARSE SAND AND OCCASIONAL GRAVEL (STIFF)
35	ML	BASE OF WEATHERED ZONE 17.0 FEET GRAY CLAYEY SILT WITH SOME FINE TO COARSE SAND (STIFF)
65	ML	7" SEAM OF GRAY FINE TO MEDIUM SAND GRAY CLAYEY SILT WITH TRACE OF FINE SAND (HARD)
27	ML	OCCASIONAL FINE SAND STRINGER GRAY CLAYEY SILT WITH SOME FINE TO MEDIUM SAND (HARD)
33	ML	2 INCH SEAM OF BROWN FINE SAND
10	CL	GRAY SILTY CLAY WITH TRACE OF FINE TO MEDIUM SAND (STIFF)
11	ML	GRAY CLAYEY SILT WITH SOME FINE TO COARSE SAND AND OCCASIONAL GRAVEL (STIFF)
16	ML	Top of Interglacial Zone
14	ML	DARK GRAYISH-BROWN CLAYEY SILT WITH ORGANIC ODOR
12	CL	DARK GRAY SILTY CLAY WITH TRACE OF FINE SAND (STIFF)
100/6"	ML	GRADES WITH SOME FINE TO MEDIUM SAND Top of Illinoian Glacial Till
77	ML	GRAY FINE SANDY SILT WITH SOME MEDIUM TO COARSE SAND AND OCCASIONAL GRAVEL (HARD)
118	SM	OCCASIONAL FINE SAND SEAM
106	SM	GRADES CLAYEY
35	SW	BROWN FINE TO MEDIUM SAND WITH TRACE OF SILT (DENSE) (GLACIAL OUTWASH)
100/5"	SW	GRAY CLAYEY SILT WITH SOME FINE TO COARSE SAND AND OCCASIONAL GRAVEL (TILL)
100/6"		
100/4"		
140/6"		
100/4"		
160/10"		
105/6"	ML	
127	ML	TRACE OF ORGANICS
100/5"		
100/6"		
155	SW	GRAY FINE TO COARSE SAND WITH GRAVEL AND TRACE OF SILT (VERY DENSE)

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-31

LOG OF BORING P-14  
(SHEET 1 of 2)

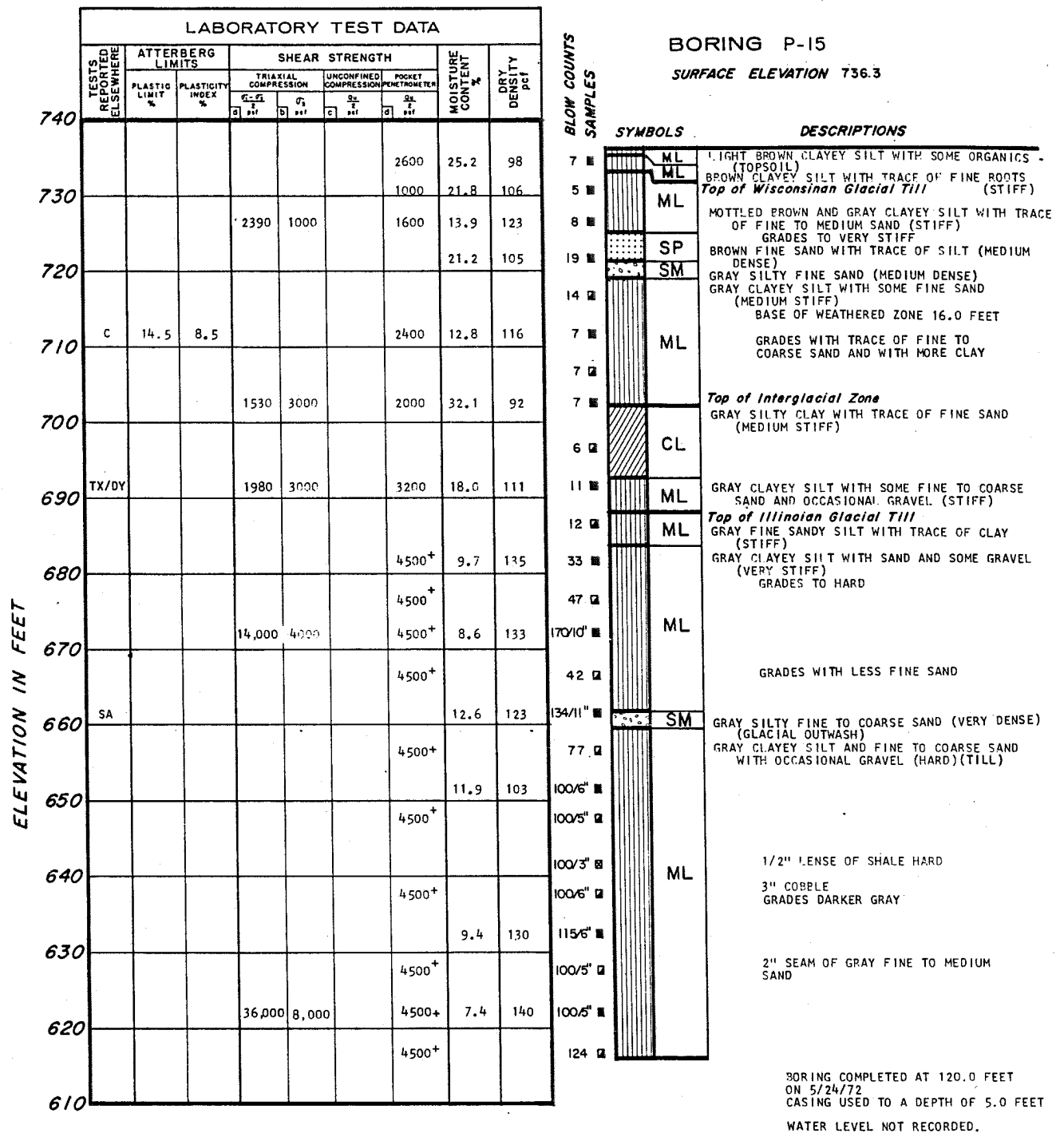
## LABORATORY TEST DATA

PIEZOMETER INSTALLED ON 7-10-72  
BORING WAS REOPENED TO 240 FEET  
AND FLUSHED WITH CLEAN WATER. A  
3/4 INCH PVC PIPE WITH THE LOWER  
END PLUGGED AND THE LOWER 5 FEET  
PERFORATED WAS INSTALLED TO ELEVATION  
578.33 GRANULAR BACKFILL WAS PLACED  
FROM ELEVATION 498.3 TO 589.3;A  
BENTONITE SEAL FROM ELEVATION 589.3  
TO 590.3;AND CEMENT GROUT AND GRAVEL  
FROM ELEVATION 590.3 TO 738.3.

8-3-72  
8-22-72  
9-6-72

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

(SHEET 2 of 2)



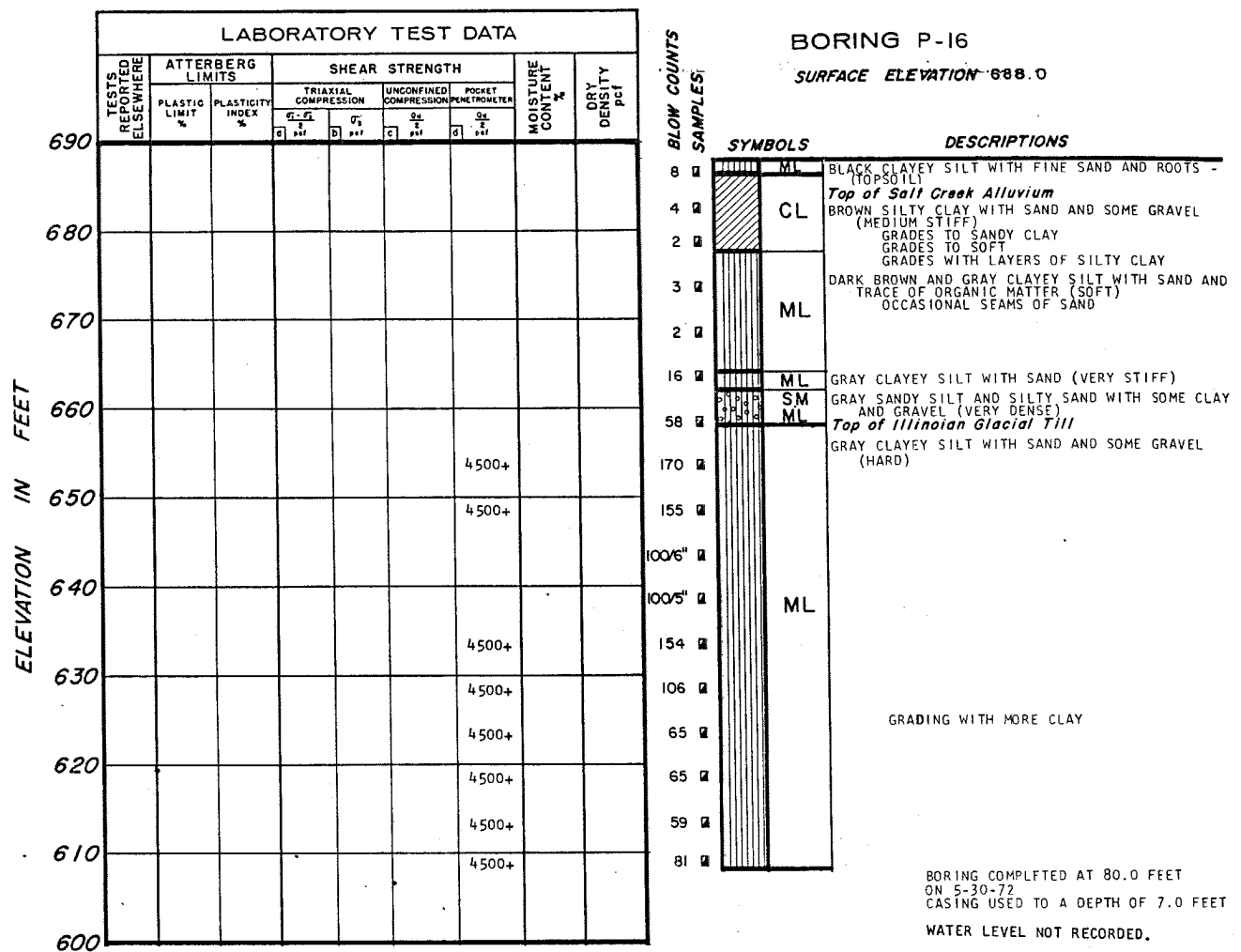
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-32

LOG OF BORING P-15

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





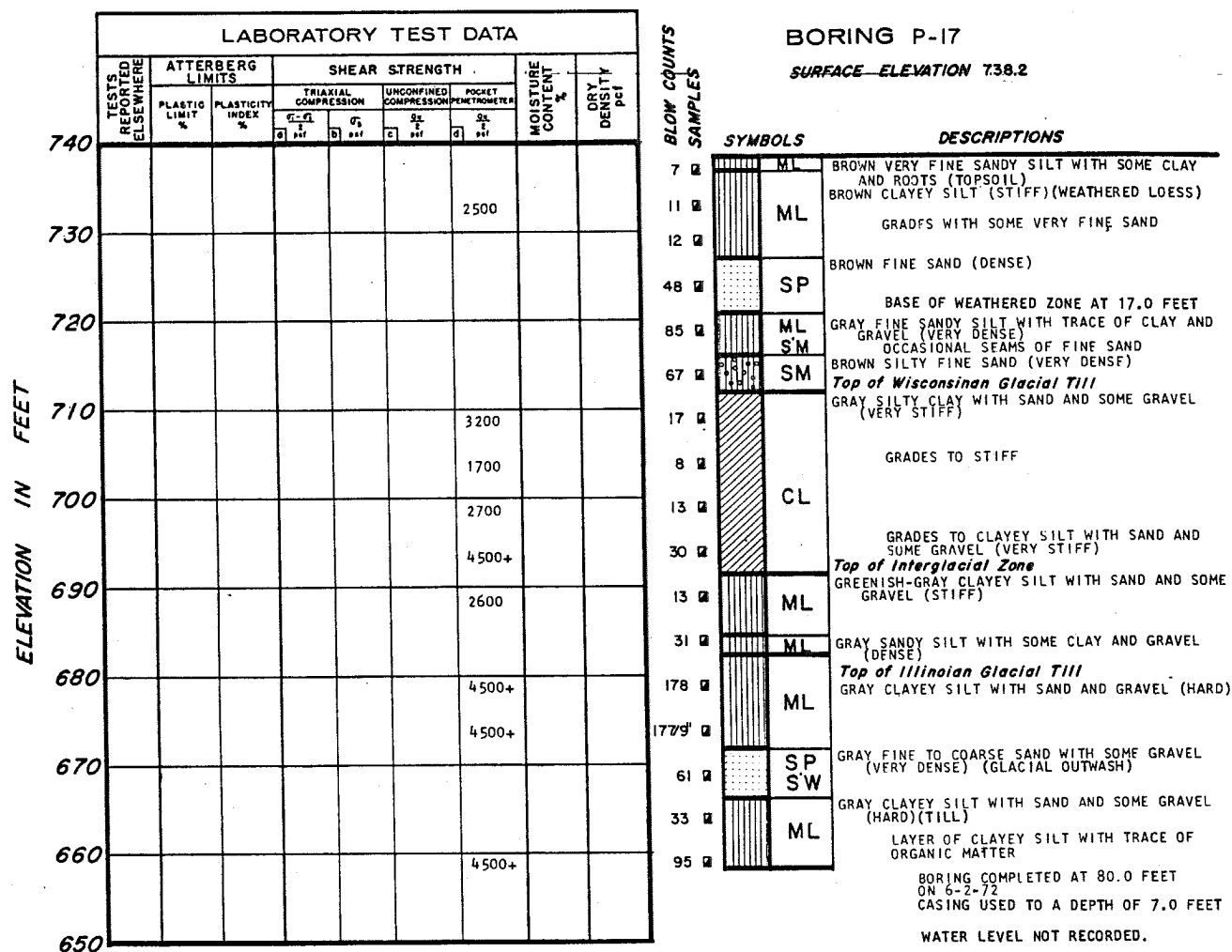
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

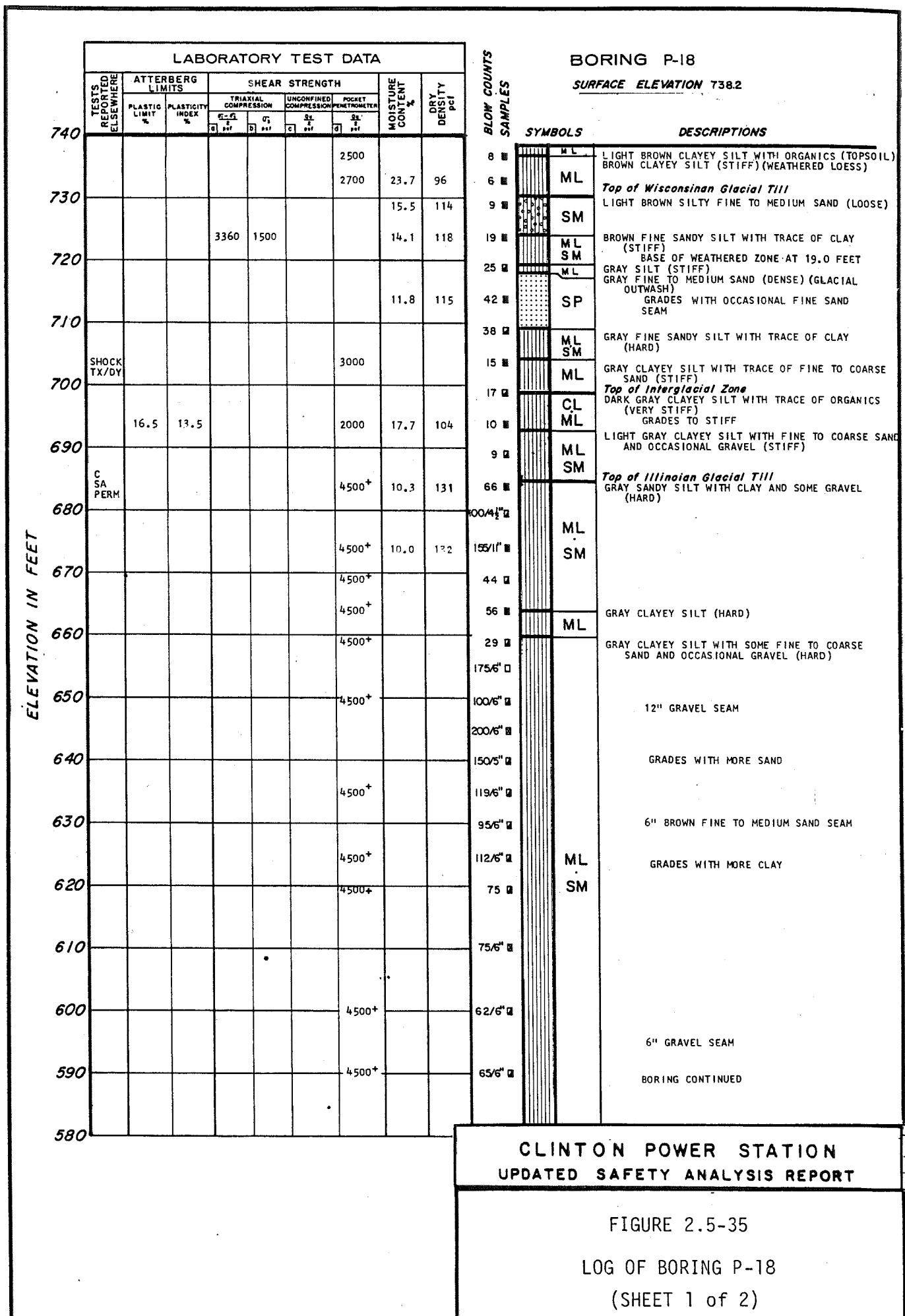
FIGURE 2.5-33

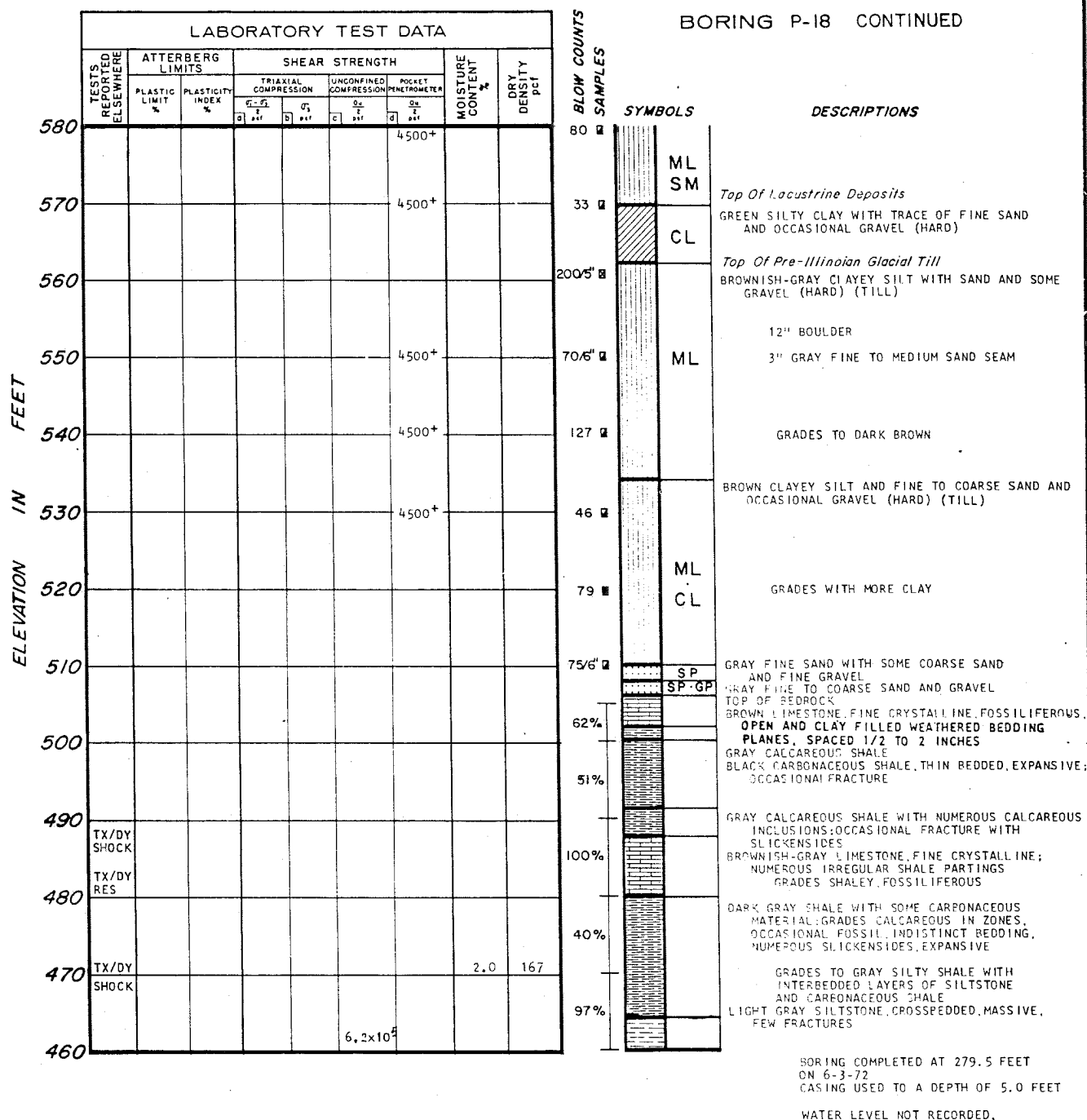
LOG OF BORING P-16



NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

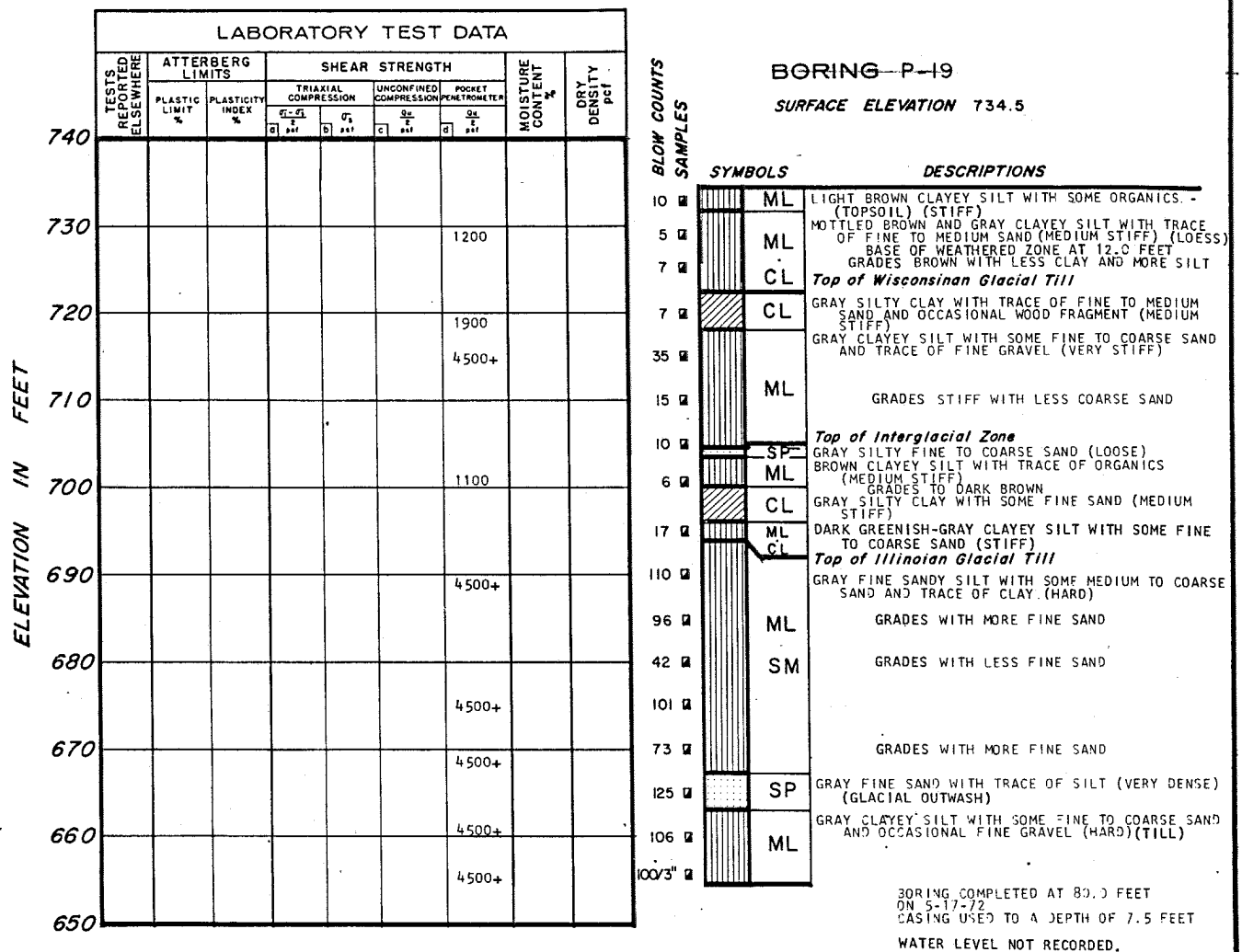




**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-35  
LOG OF BORING P-18  
(SHEET 2 of 2)

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



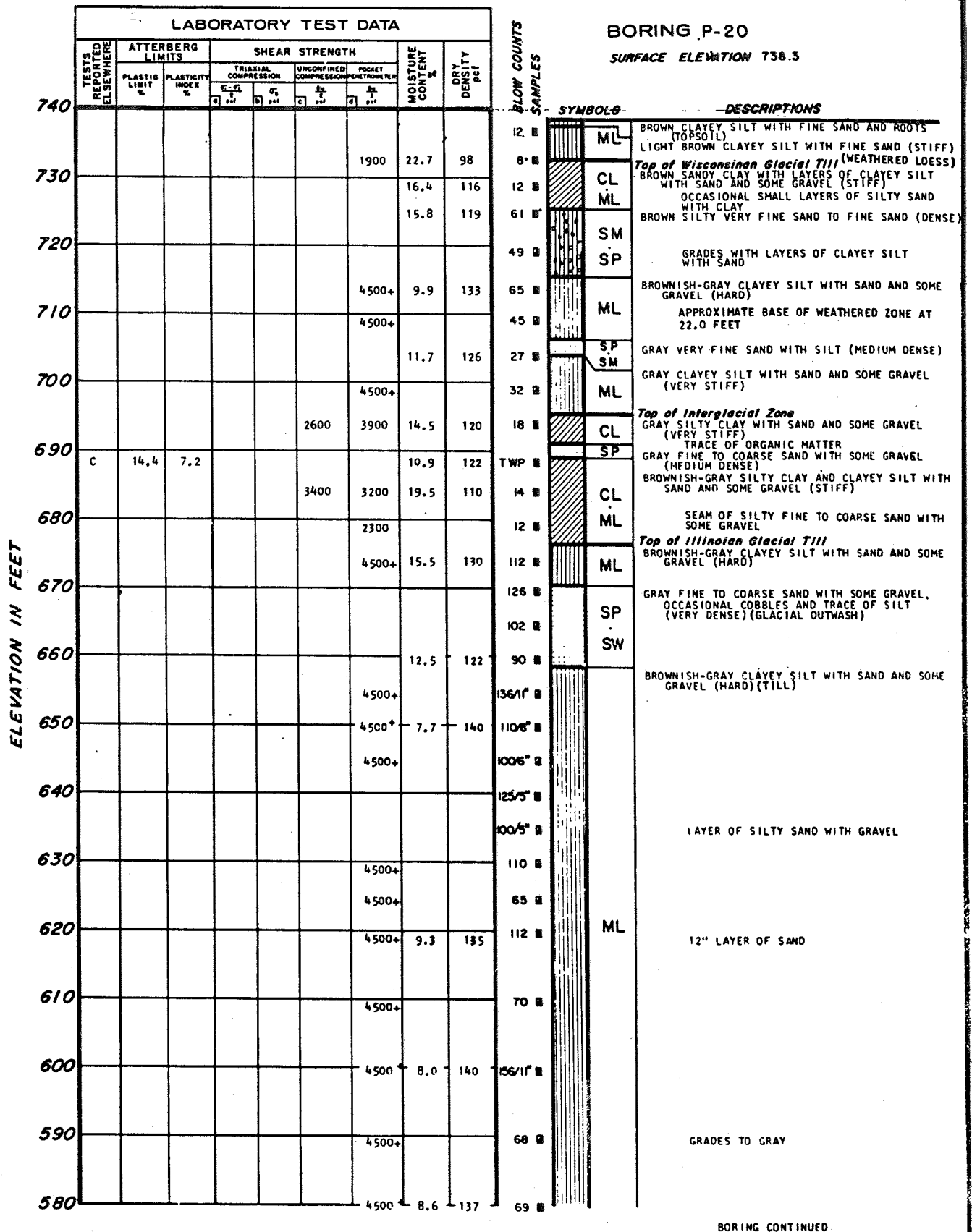
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-36

LOG OF BORING P-19



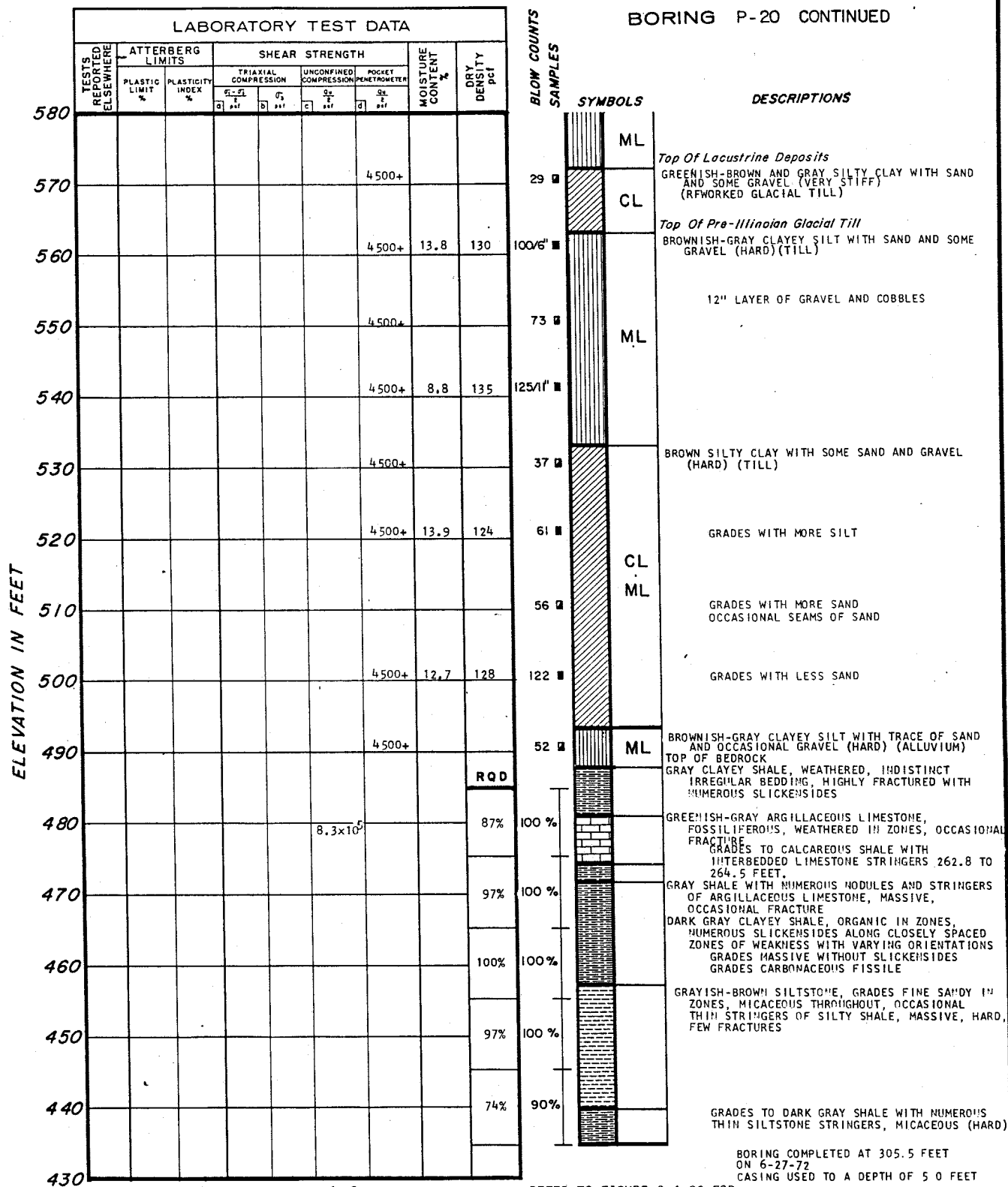
BORING CONTINUED

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-37

LOG OF BORING P-20

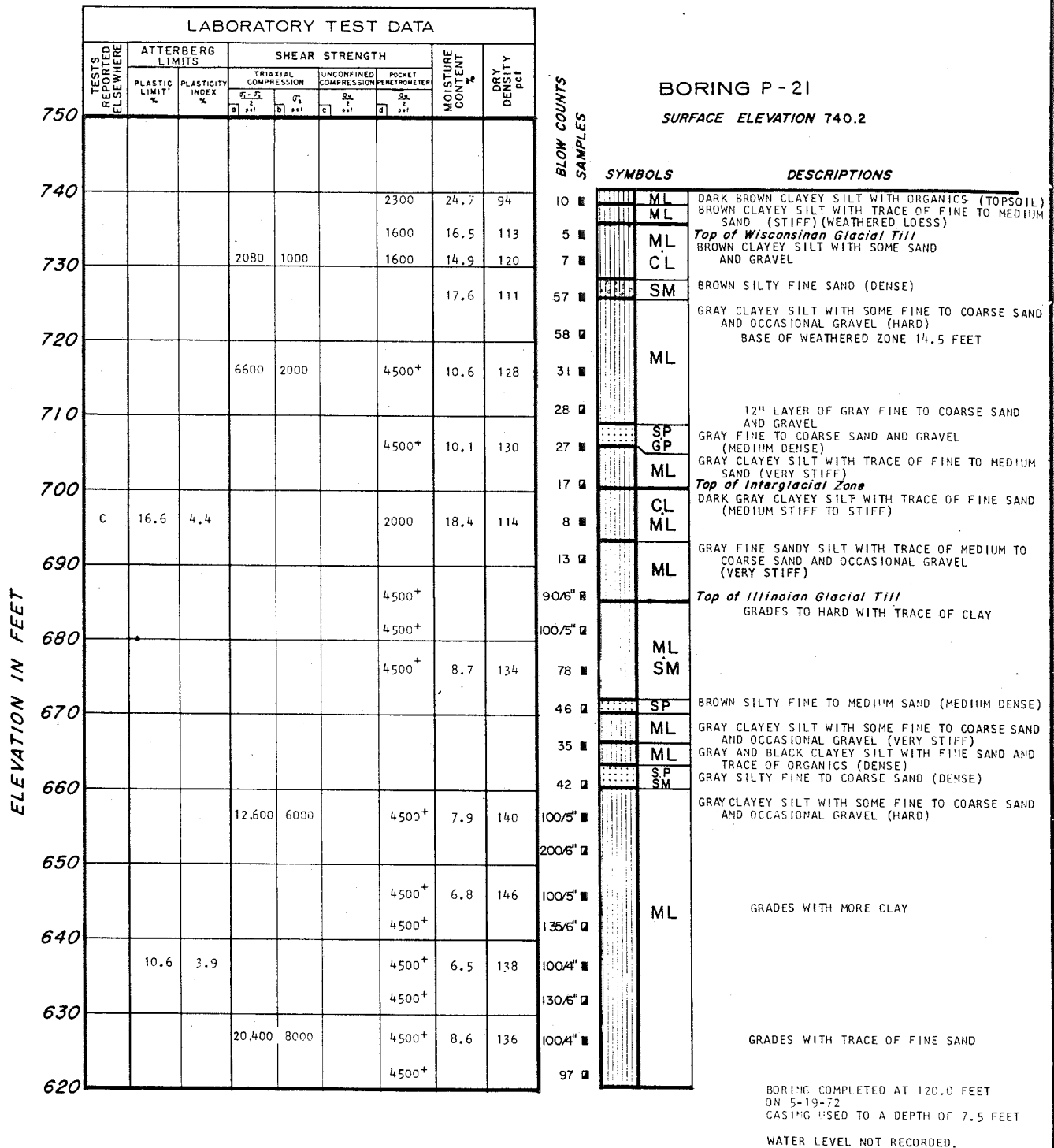
(SHEET 1 of 2)



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-37

LOG OF BORING P-20  
(SHEET 2 of 2)



CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

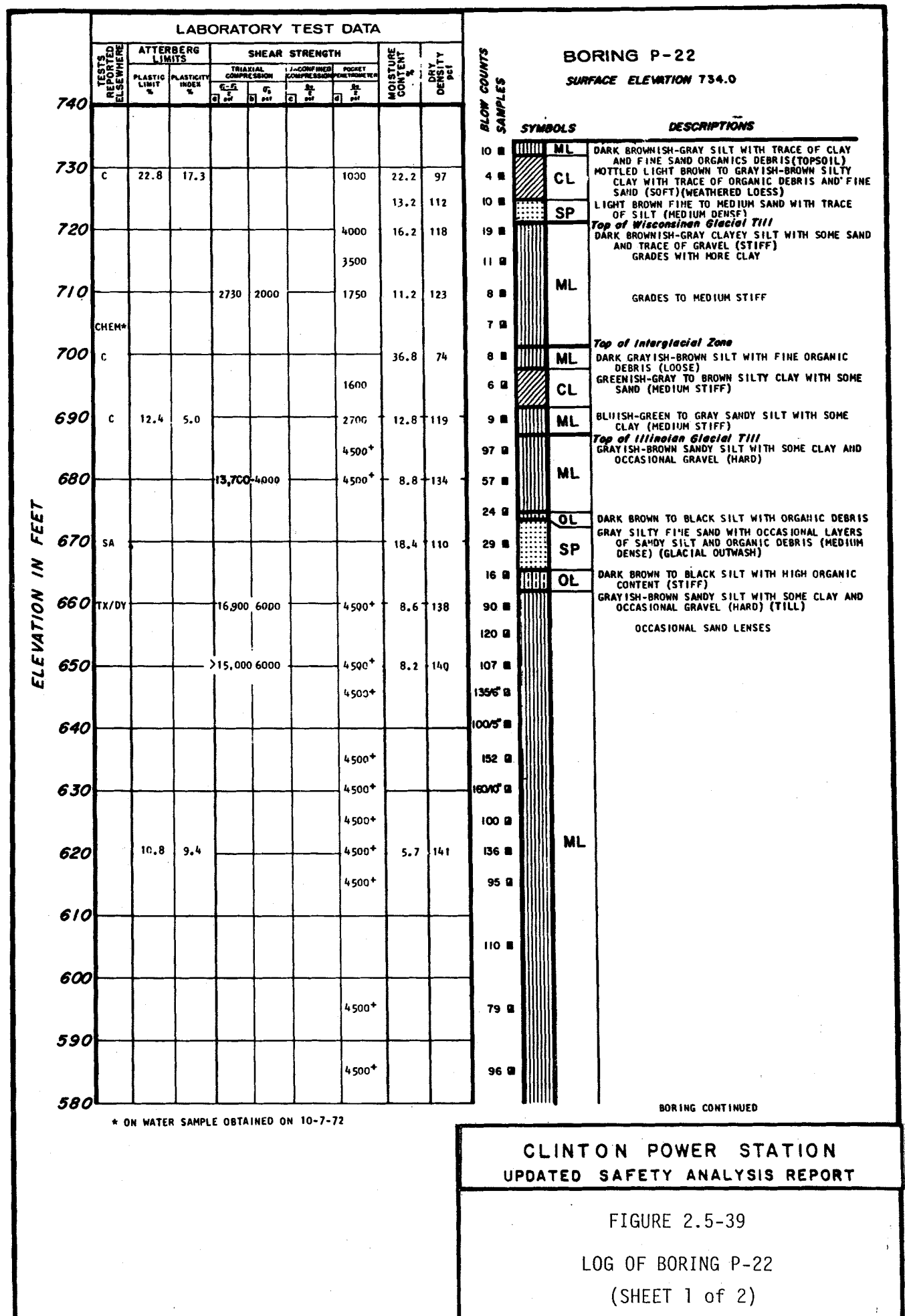
FIGURE 2.5-38

LOG OF BORING P-21

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





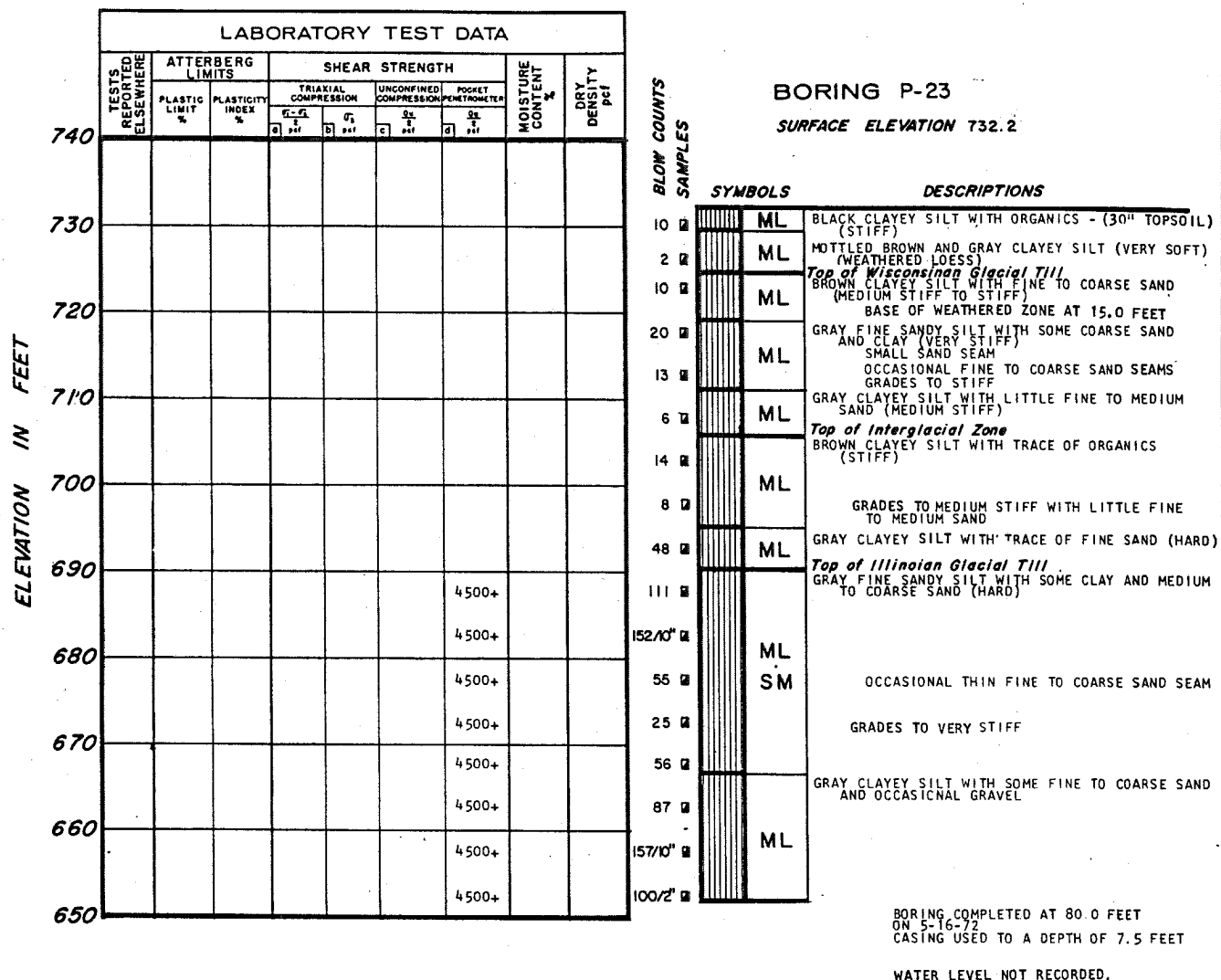
LABORATORY TEST DATA										BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf				
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAxIAL COMPRESSION		UNCONFINED COMPRESSION	POCKET PENETROMETER						
			$\frac{P_1 - P_2}{2}$ psi	$Q_1$ psi	$Q_u$ psi	$Q_p$ psi						
580			19,500	11,000			8.5	137	98	ML	Top Of Lacustrine Deposits	
570									34	CL	GREENISH-BROWN SILTY CLAY WITH SOME SAND (HARD)	
560											Top Of Pre-Illinoian Glacial Till	
550							4500+	8.3	139	156		GRAYISH-BROWN SANDY SILT WITH SOME CLAY AND OCCASIONAL FINE GRAVEL (HARD) TILL GRADES TO BROWNISH-GRAY COLOR
540							4500+			112		
530							4500+	9.6	136	138	ML	GRADES TO BROWN COLOR WITH INCREASED CLAY CONTENT
520							4500+			79		
510							4500+			118		SAND AND FINE GRAVEL FROM 222.0 TO 227.5 FEET
500							4500+			67		BOULDERS AND GRAVEL
490												TOP OF BEDROCK GRAY CALCAREOUS SHALE WITH NUMEROUS CALCAREOUS INCLUSIONS, MASSIVE, WEATHERED, OCCASIONAL FRACTURE GRADES TO GREENISH-GRAY COLOR, NUMEROUS SLICKENSIDES ALONG FRACTURE PLANES
480					4.5 x 10.5					96%		INTERBEDDED IRREGULAR AND GRADATIONAL ZONES OF BROWN LIMESTONE AND GREENISH-GRAY CALCAREOUS SHALE, FOSSILIFEROUS THROUGHOUT WEATHERED
470										44%		DARK GRAY CARBONACEOUS SHALE, IRREGULAR, INDISTINCT BEDDING, NUMEROUS SLICKENSIDES ALONG RANDOM ORIENTED FRACTURE PLANES GRADES SILTY, NON-CARBONACEOUS
460										98%		GRAY SILTSTONE WITH OCCASIONAL NODULE OF BROWN LIMESTONE, OCCASIONAL FRACTURE LIGHT GRAY SILTY SHALE WITH INTERBEDDED IRREGULAR LAYERS AND NODULES OF BROWN LIMESTONE, SOME FRACTURED ZONES WITH NUMEROUS SLICKENSIDES
450										98%		LIGHT GRAY SILTSTONE, MASSIVE, CROSS BEDDED; OCCASIONAL THIN LAYERS OF BROWN SANDSTONE; NUMEROUS THIN SHALE STRINGERS, OCCASIONAL FRACTURE LIGHT GRAY SHALE 283.2 TO 284.2 FEET
440										100%		DARK GRAY SILTY SHALE WITH NUMEROUS THIN SILTSTONE STRINGERS

BORING COMPLETED AT 293.5 FEET  
ON 6-7-72  
CASING USED TO A DEPTH OF 5.0 FEET

<u>DEPTH BELOW GROUND SURFACE IN FEET</u>	<u>DATE</u>
18.2	8-15-72
18.4	8-29-72

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

(SHEET 2 of 2)



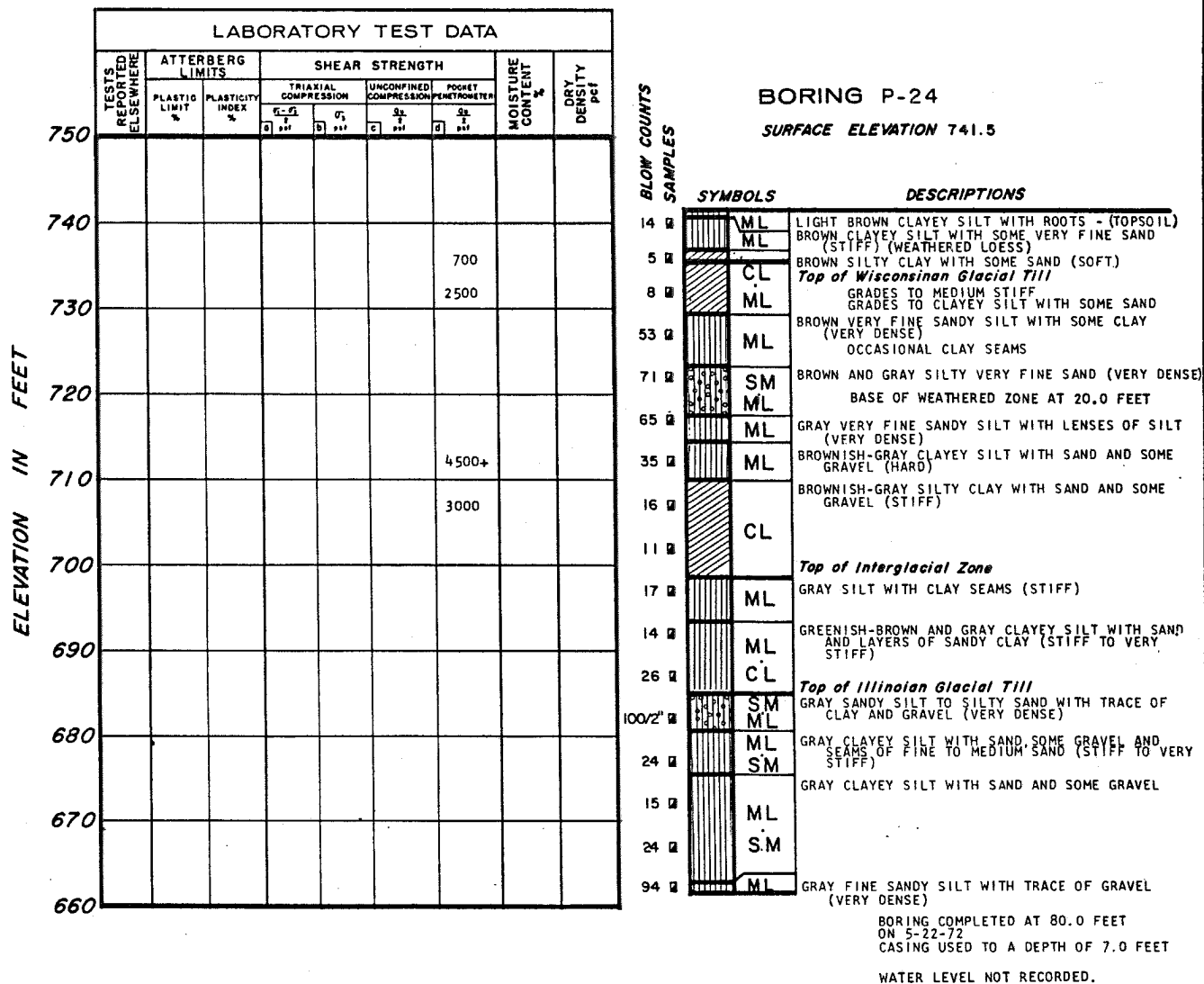
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

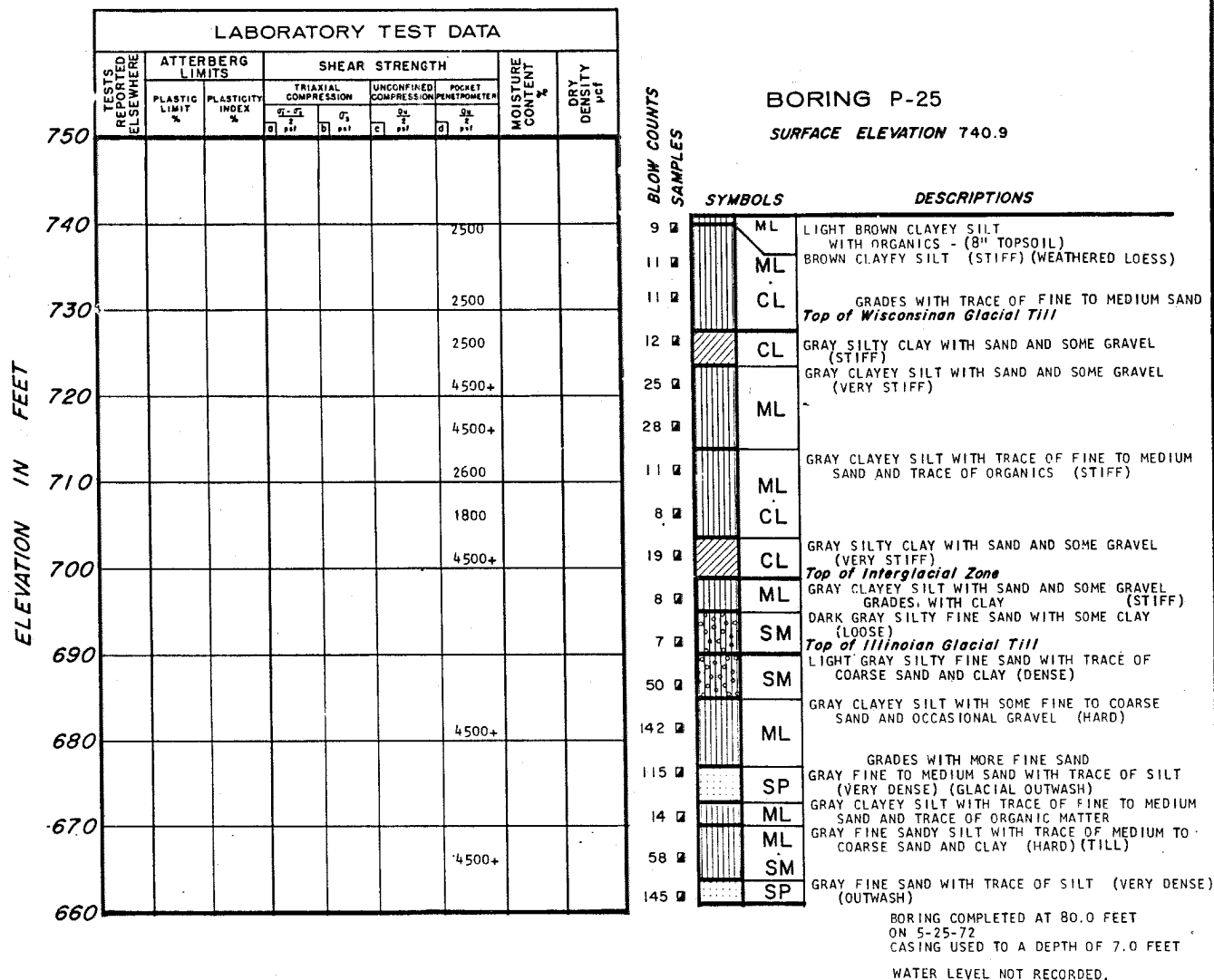
FIGURE 2.5-40

LOG OF BORING P-23



NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



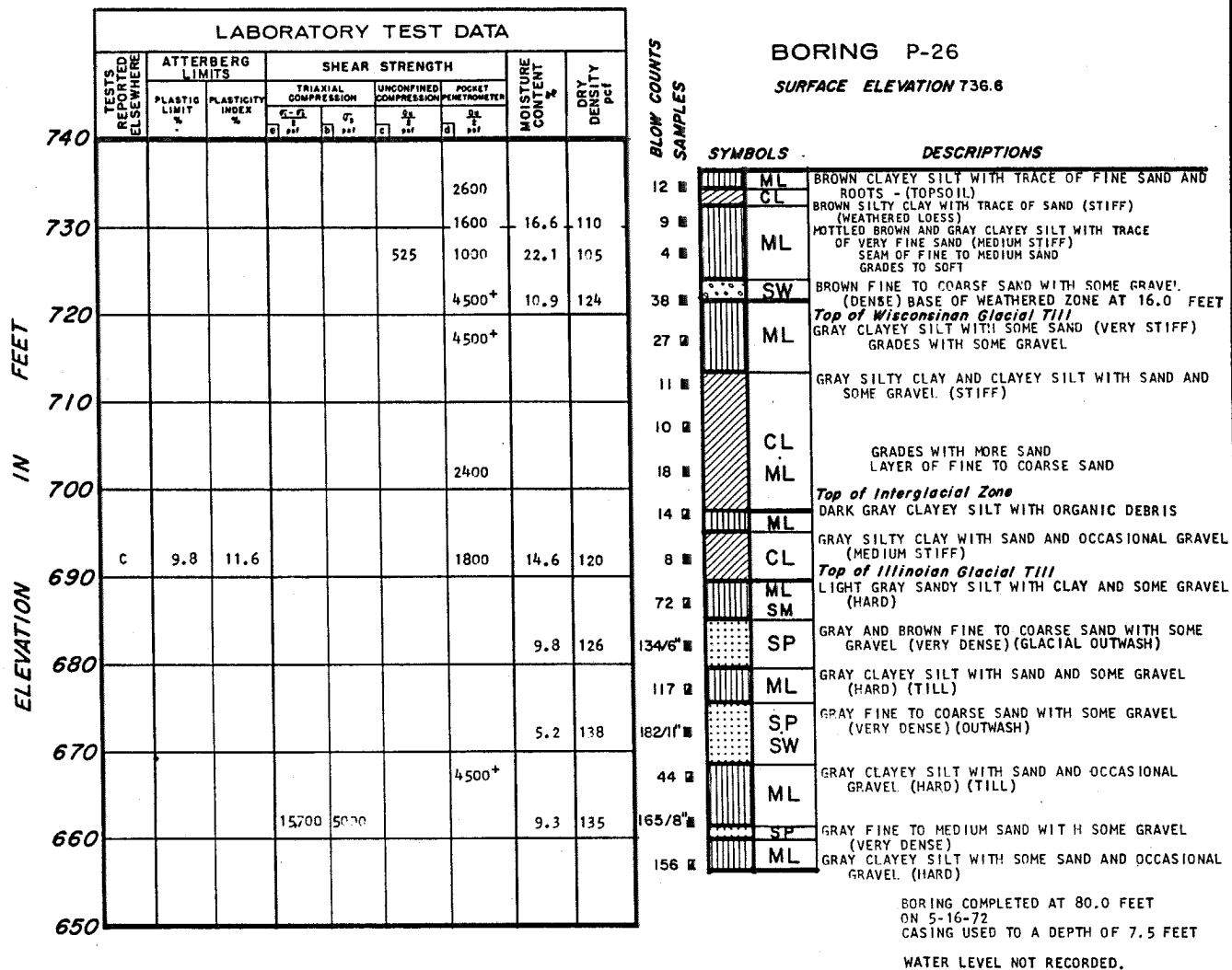
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-42-

LOG OF BORING P-25

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



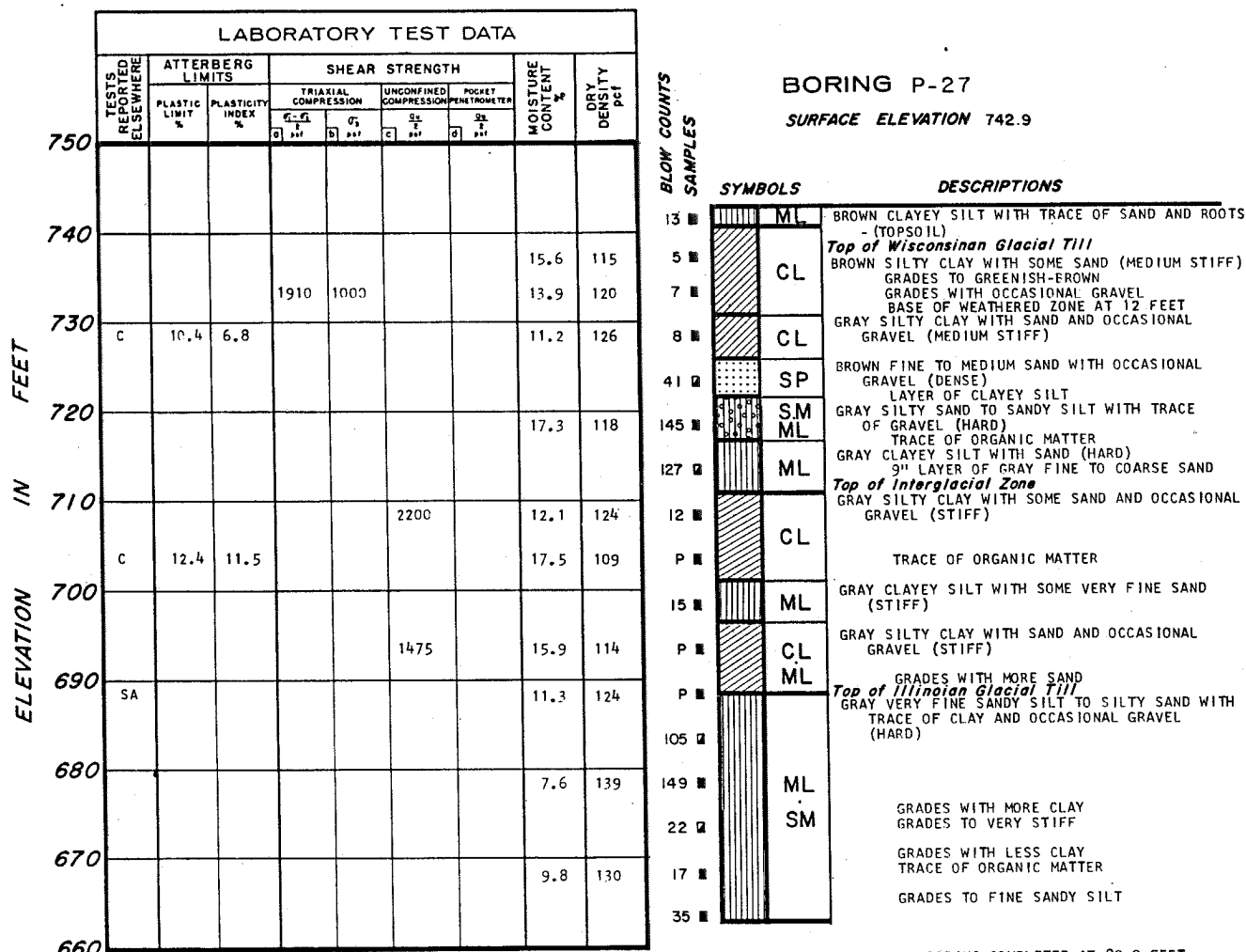
**BORING P-26**  
**SURFACE ELEVATION 736.8**

BLOW COUNTS  
SAMPLES

	SYMBOLS	DESCRIPTIONS
12	ML CL	BROWN CLAYEY SILT WITH TRACE OF FINE SAND AND ROOTS - (TOPSOIL)
9	ML	BROWN SILTY CLAY WITH TRACE OF SAND (STIFF) (WEATHERED LOESS)
4	ML	MOTTLED BROWN AND GRAY CLAYEY SILT WITH TRACE OF VERY FINE SAND (MEDIUM STIFF)
38	SW	SEAM OF FINE TO MEDIUM SAND GRADES TO SOFT
27	ML	BROWN FINE TO COARSE SAND WITH SOME GRAVEL (DENSE) BASE OF WEATHERED ZONE AT 16.0 FEET <i>Top of Wisconsinan Glacial Till</i>
11	ML	GRAY CLAYEY SILT WITH SOME SAND (VERY STIFF) GRADES WITH SOME GRAVEL
10	CL ML	GRAY SILTY CLAY AND CLAYEY SILT WITH SAND AND SOME GRAVEL (STIFF)
18	CL ML	GRADES WITH MORE SAND LAYER OF FINE TO COARSE SAND
14	ML	<i>Top of Interglacial Zone</i> DARK GRAY CLAYEY SILT WITH ORGANIC DEBRIS
8	CL	GRAY SILTY CLAY WITH SAND AND OCCASIONAL GRAVEL (MEDIUM STIFF)
72	ML SM	<i>Top of Illinoian Glacial Till</i> LIGHT GRAY SANDY SILT WITH CLAY AND SOME GRAVEL (HARD)
134/6"	SP	GRAY AND BROWN FINE TO COARSE SAND WITH SOME GRAVEL (VERY DENSE) (GLACIAL OUTWASH)
117	ML	GRAY CLAYEY SILT WITH SAND AND SOME GRAVEL (HARD) (TILL)
182/11"	SP SW	GRAY FINE TO COARSE SAND WITH SOME GRAVEL (VERY DENSE) (OUTWASH)
44	ML	GRAY CLAYEY SILT WITH SAND AND OCCASIONAL GRAVEL (HARD) (TILL)
165/8"	SP	GRAY FINE TO MEDIUM SAND WITH SOME GRAVEL (VERY DENSE)
156	ML	GRAY CLAYEY SILT WITH SOME SAND AND OCCASIONAL GRAVEL (HARD)

BORING COMPLETED AT 80.0 FEET  
ON 5-16-72  
CASING USED TO A DEPTH OF 7.5 FEET  
WATER LEVEL NOT RECORDED.

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



PIEZOMETER INSTALLED ON 6-6-72  
TIP ELEVATION 685.4

#### WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
26.5	8-15-72
26.7	8-29-72

REFER TO FIGURE 2.4-36 FOR  
WATER LEVEL OBSERVATIONS.

BORING COMPLETED AT 80.0 FEET  
ON 6-6-72  
CASING USED TO A DEPTH OF 7.0 FEET

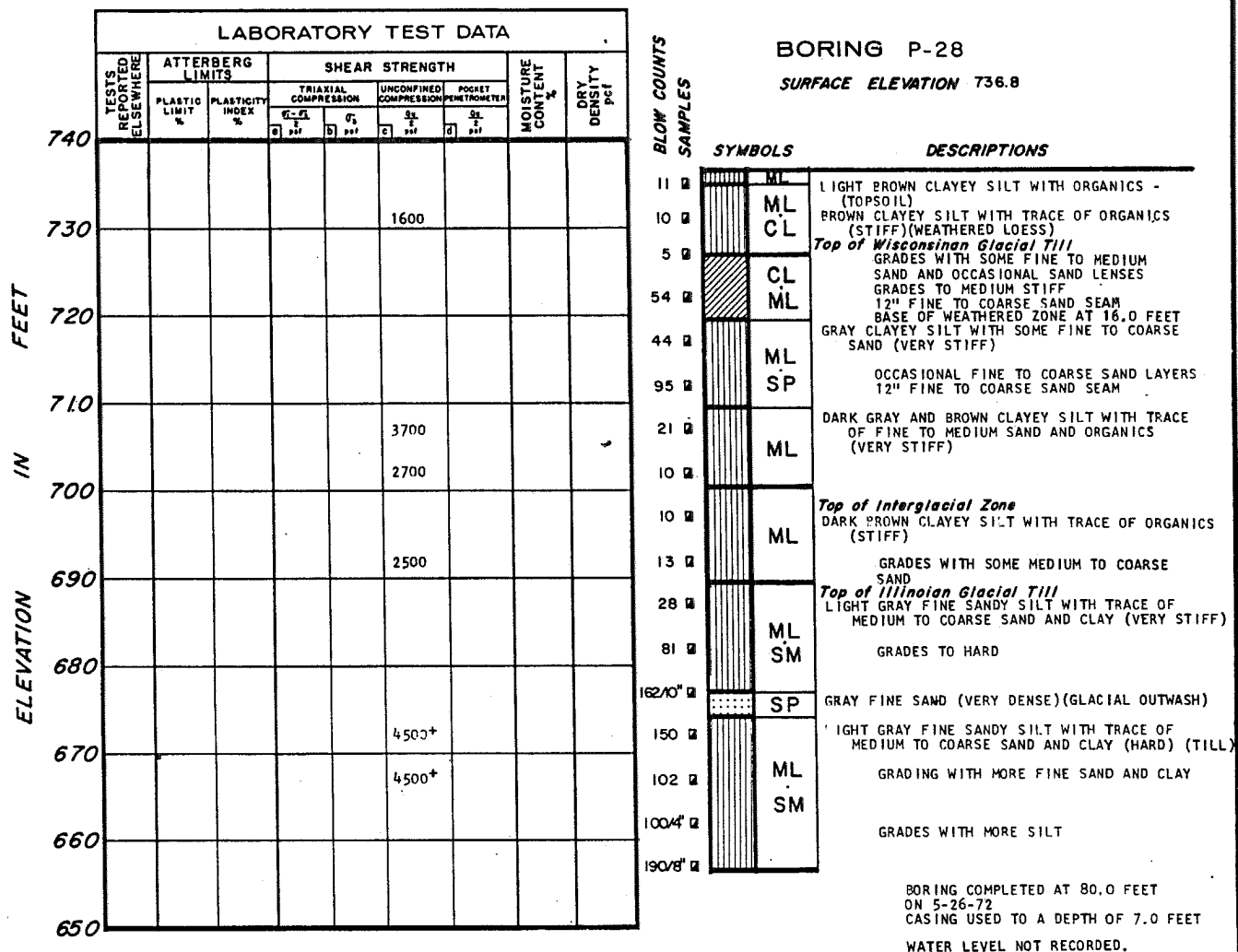
## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-44

LOG OF BORING P-27

#### NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-45

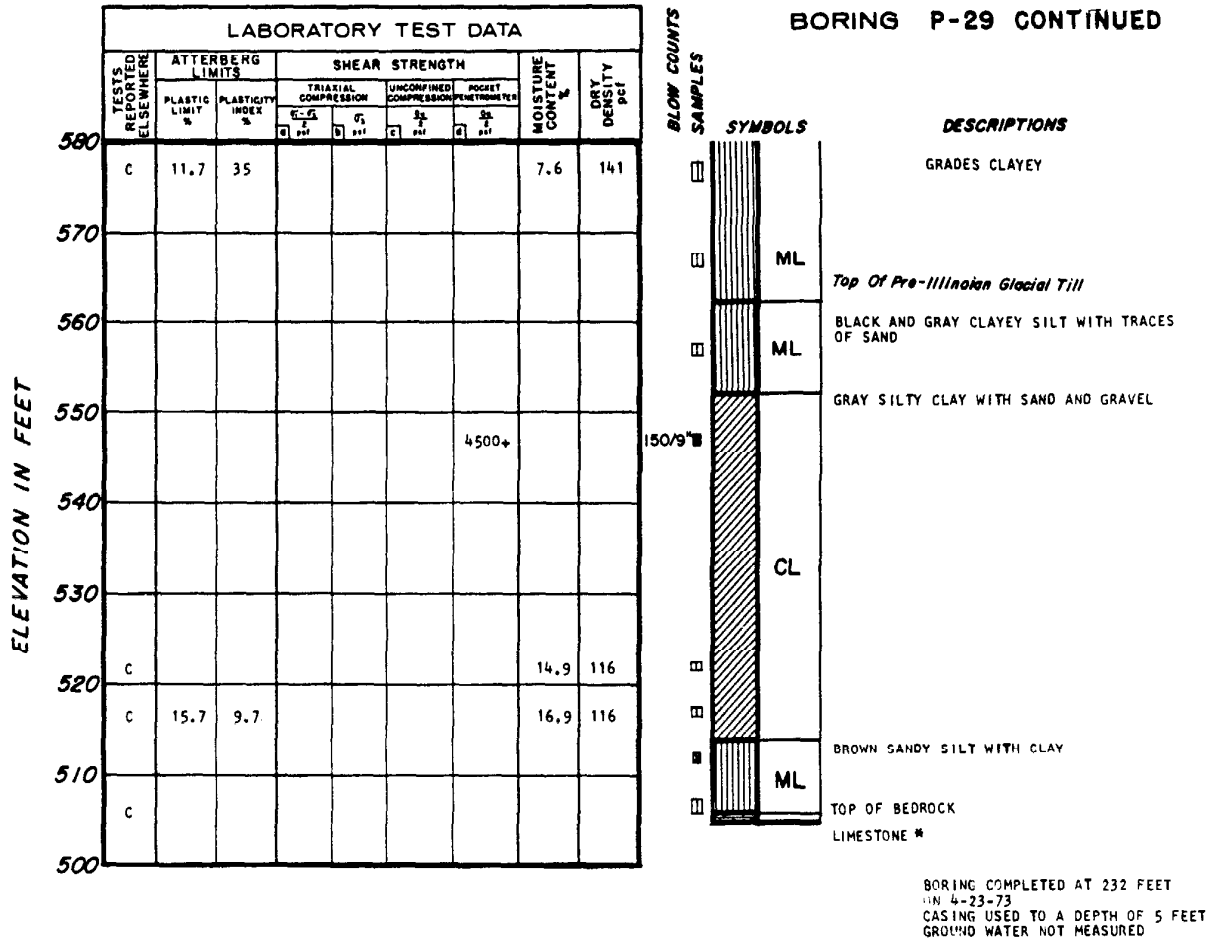
LOG OF BORING P-28

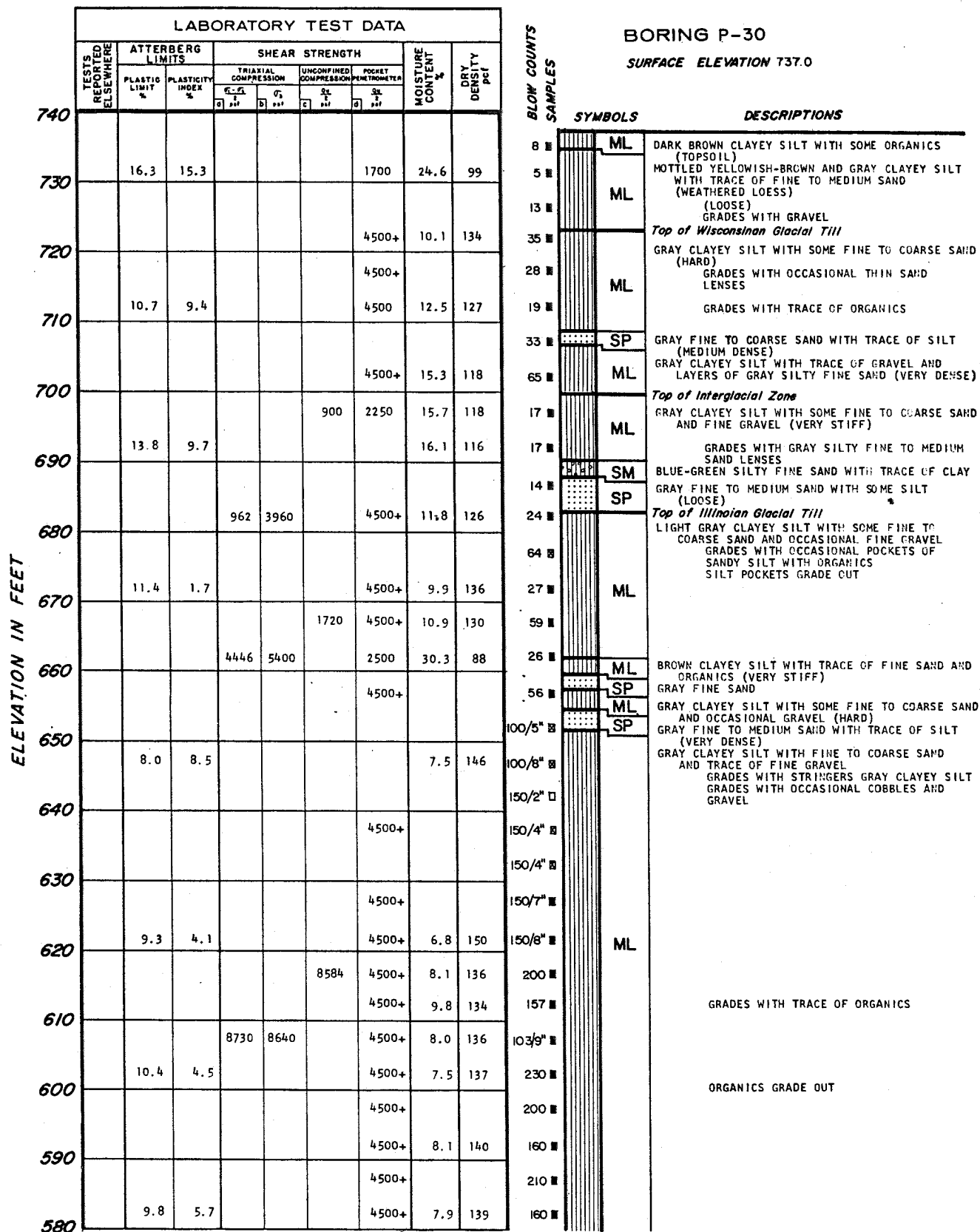
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.







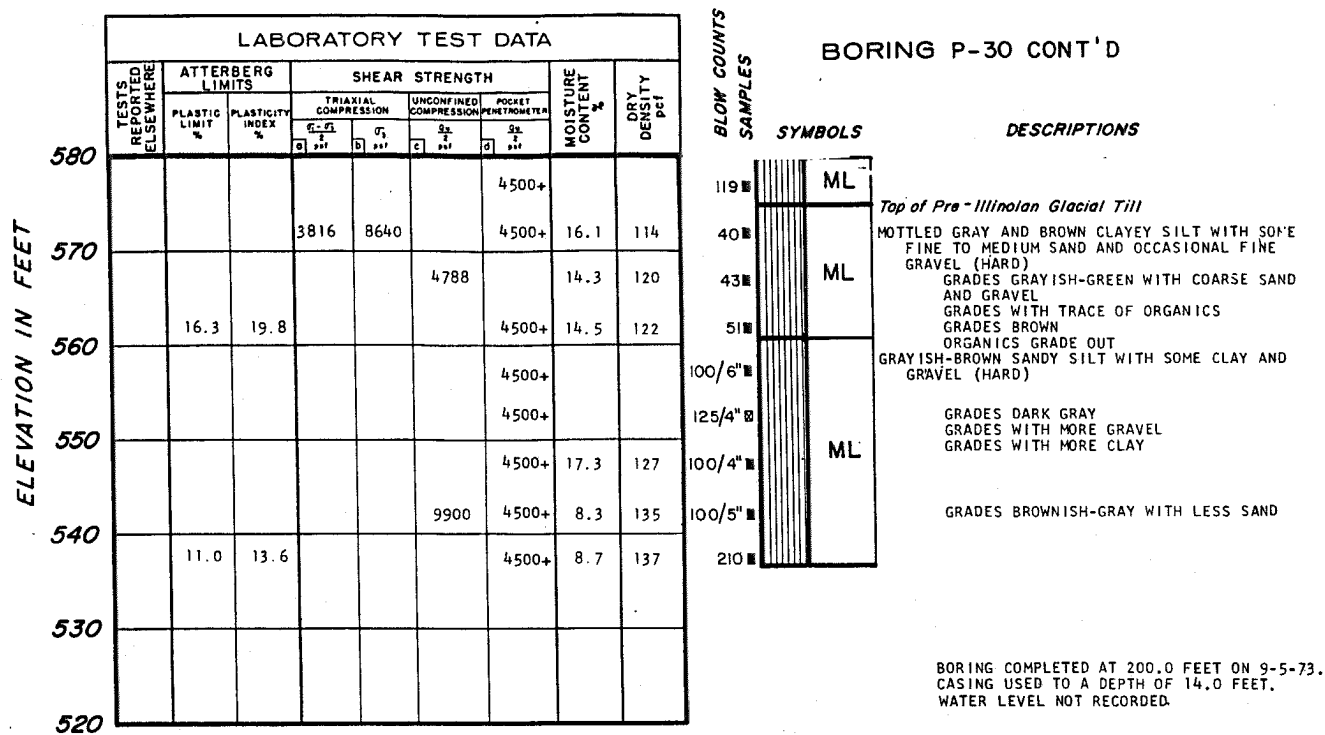


NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

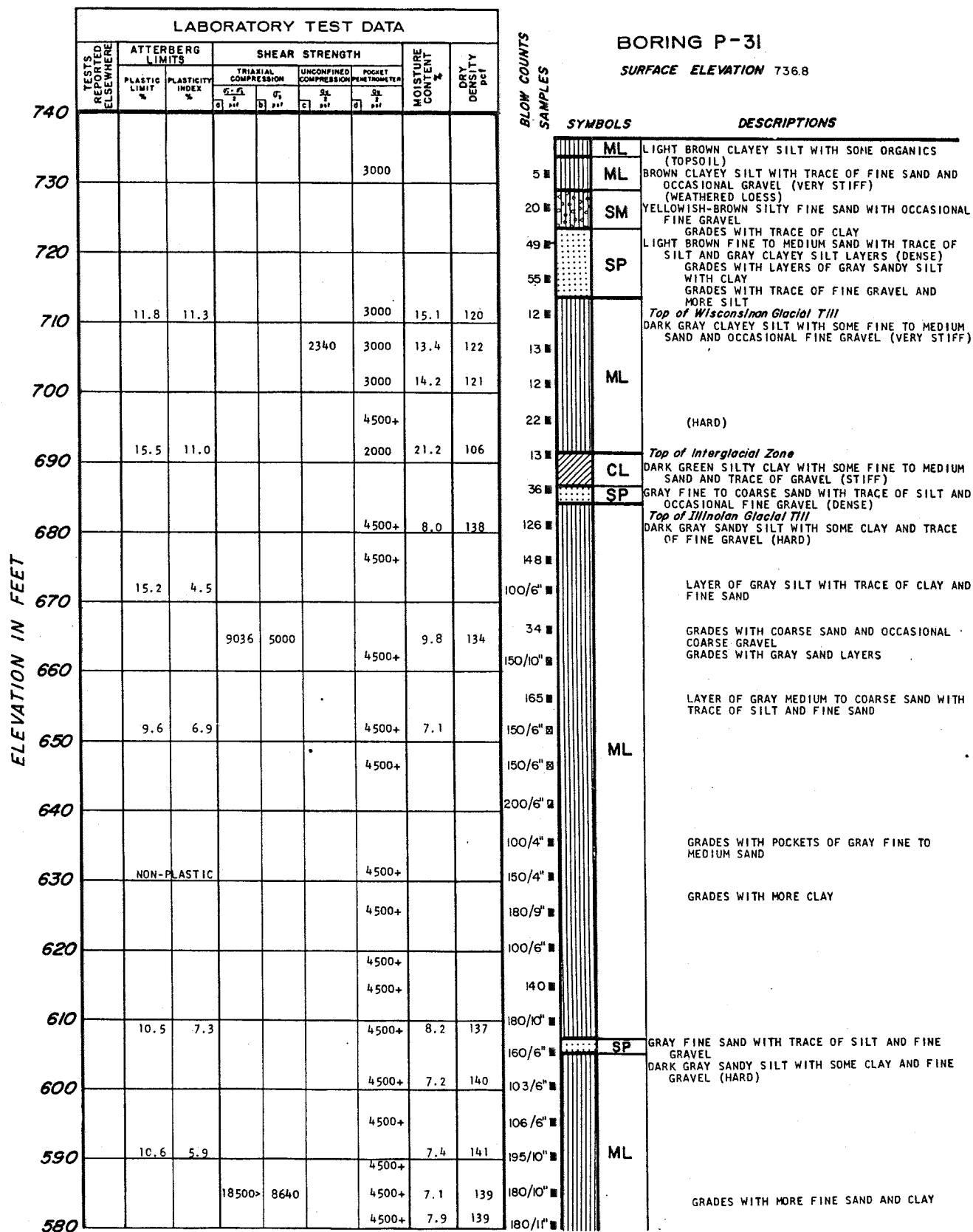
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-47  
LOG OF BORING P-30  
(SHEET 1 of 2)



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-47  
LOG OF BORING P-30  
(SHEET 2 of 2)



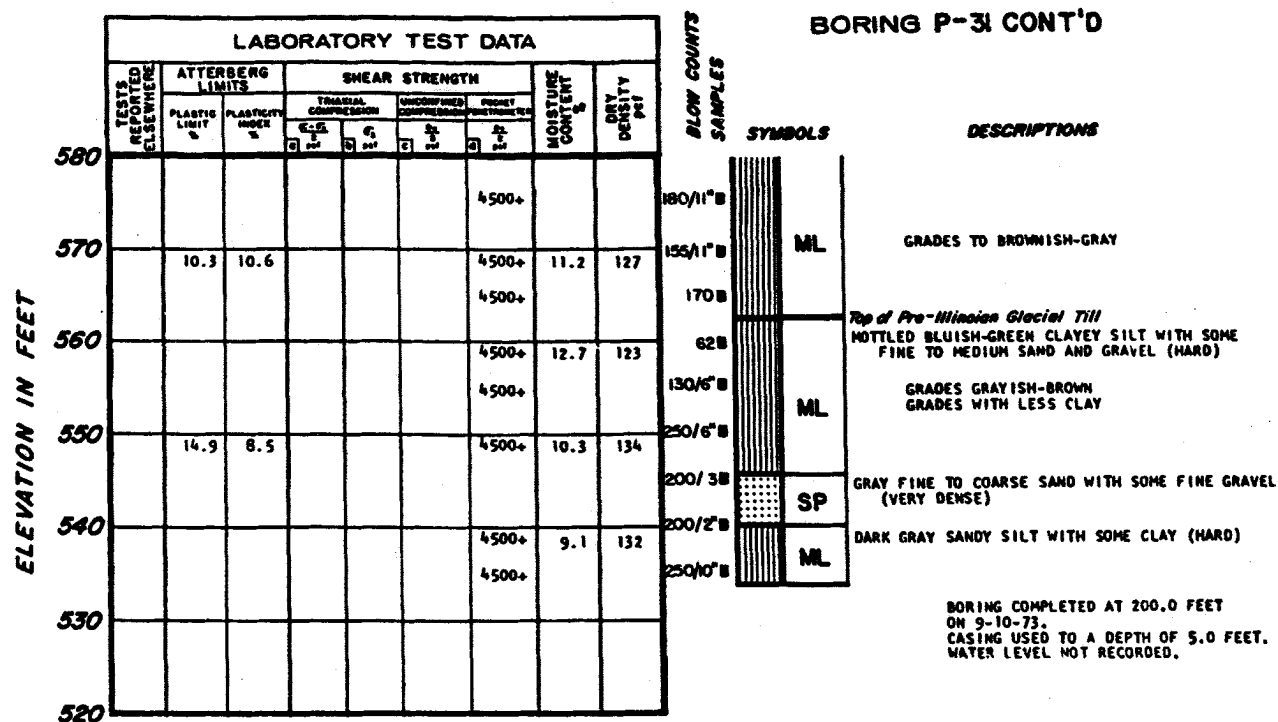
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

# CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-48

LOG OF BORING P-31  
(SHEET 1 of 2)



PIEZOMETER INSTALLED ON 9-11-73. BORING WAS FILLED WITH GRAVEL AND SEALED WITH BENTONITE TO 159.0 FEET AFTER FLUSHING WITH CLEAN WATER. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 109.0 FEET PERFORATED WAS INSTALLED TO ELEVATION 577.8. GRAVULAR BACKFILL WAS PLACED FROM ELEVATION 577.8 TO 686.8. A BENTONITE SEAL FROM ELEVATION 686.8 TO 688.8; AND CEMENT GROUT FROM ELEVATION 688.8 TO 734.8.

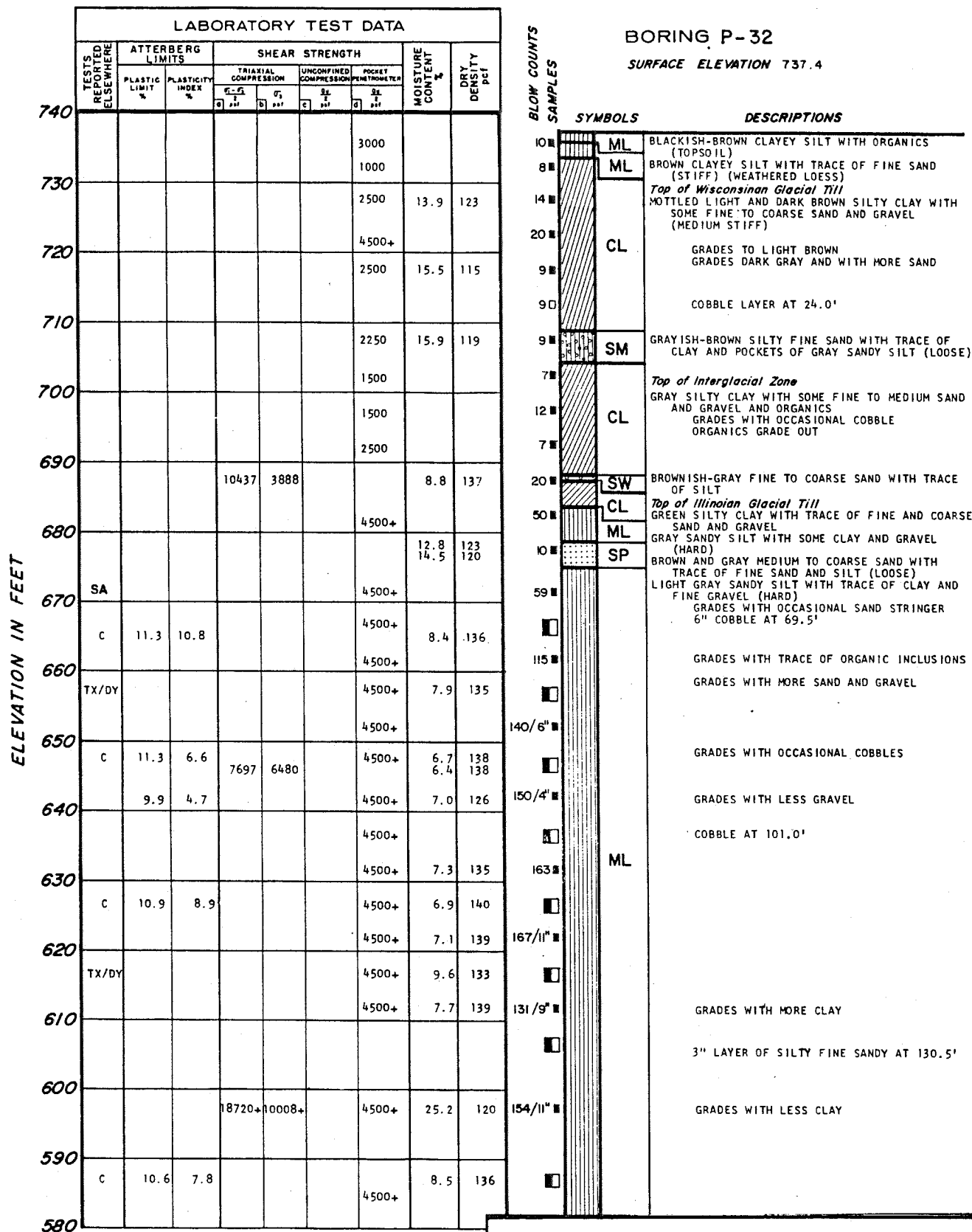
#### WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
25.3	10-29-73
25.3	11-15-73
24.5	12-31-73

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-48

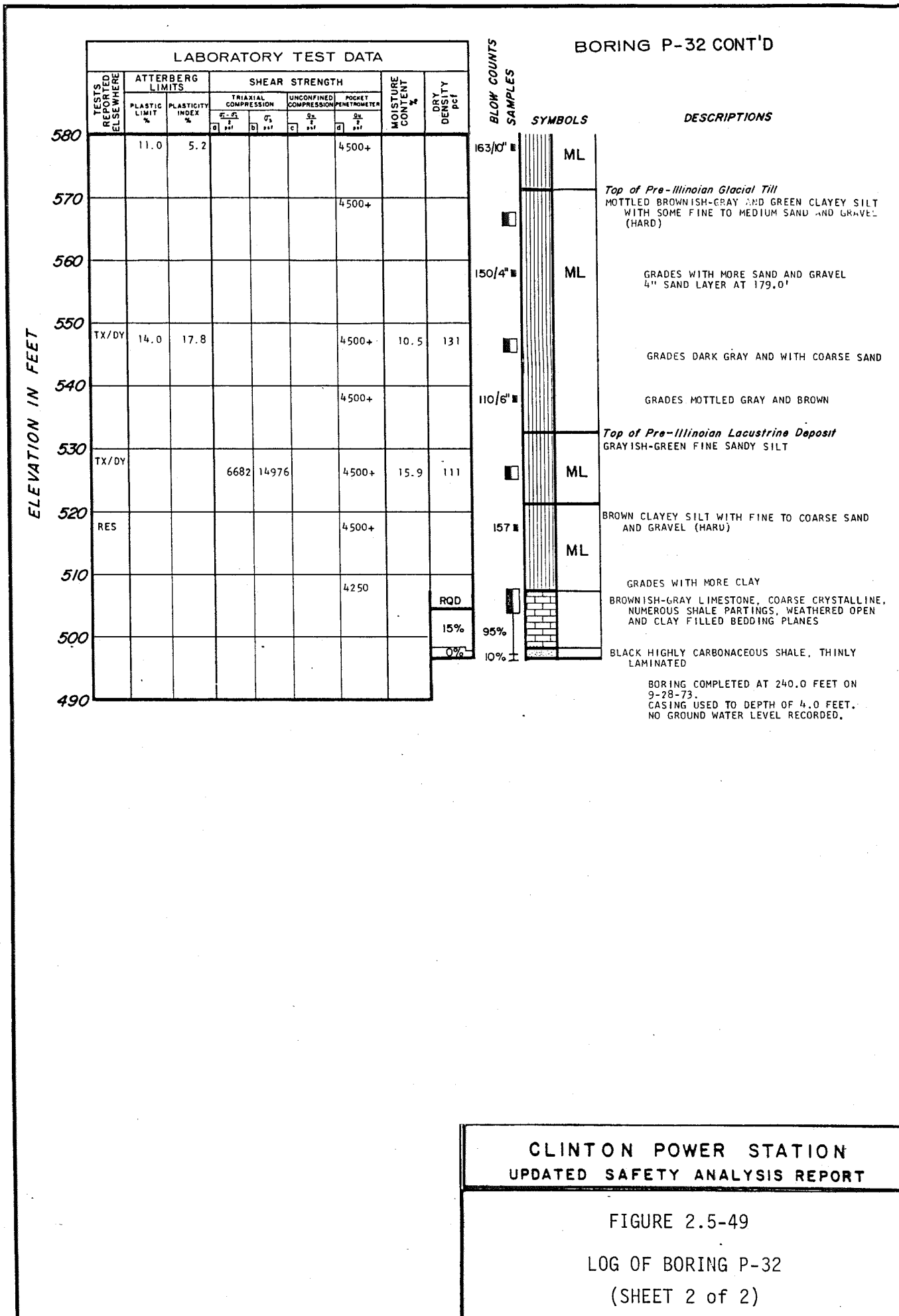
LOG OF BORING P-31  
(SHEET 2 of 2)



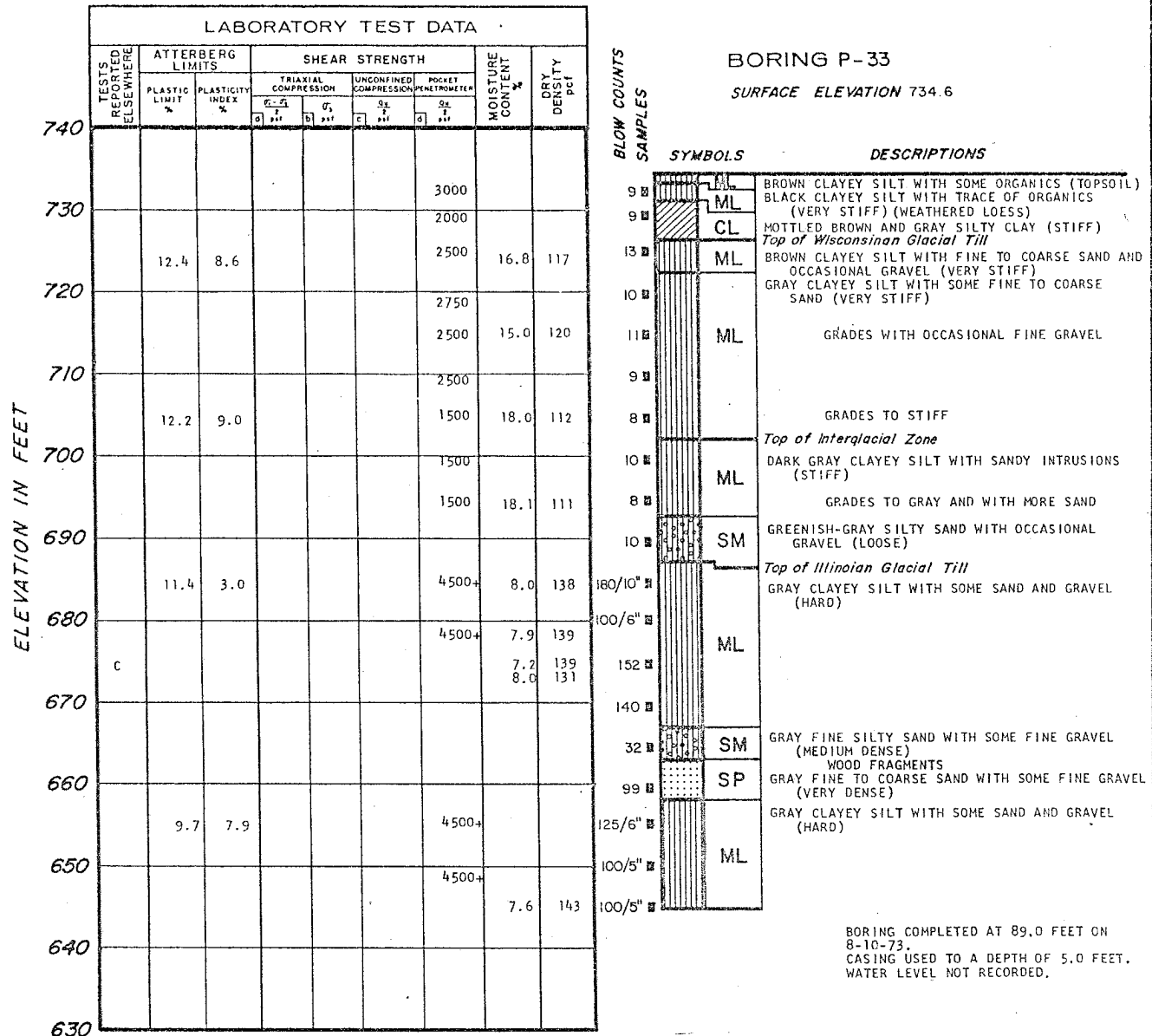
NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-49  
LOG OF BORING P-32  
(SHEET 1 of 2)







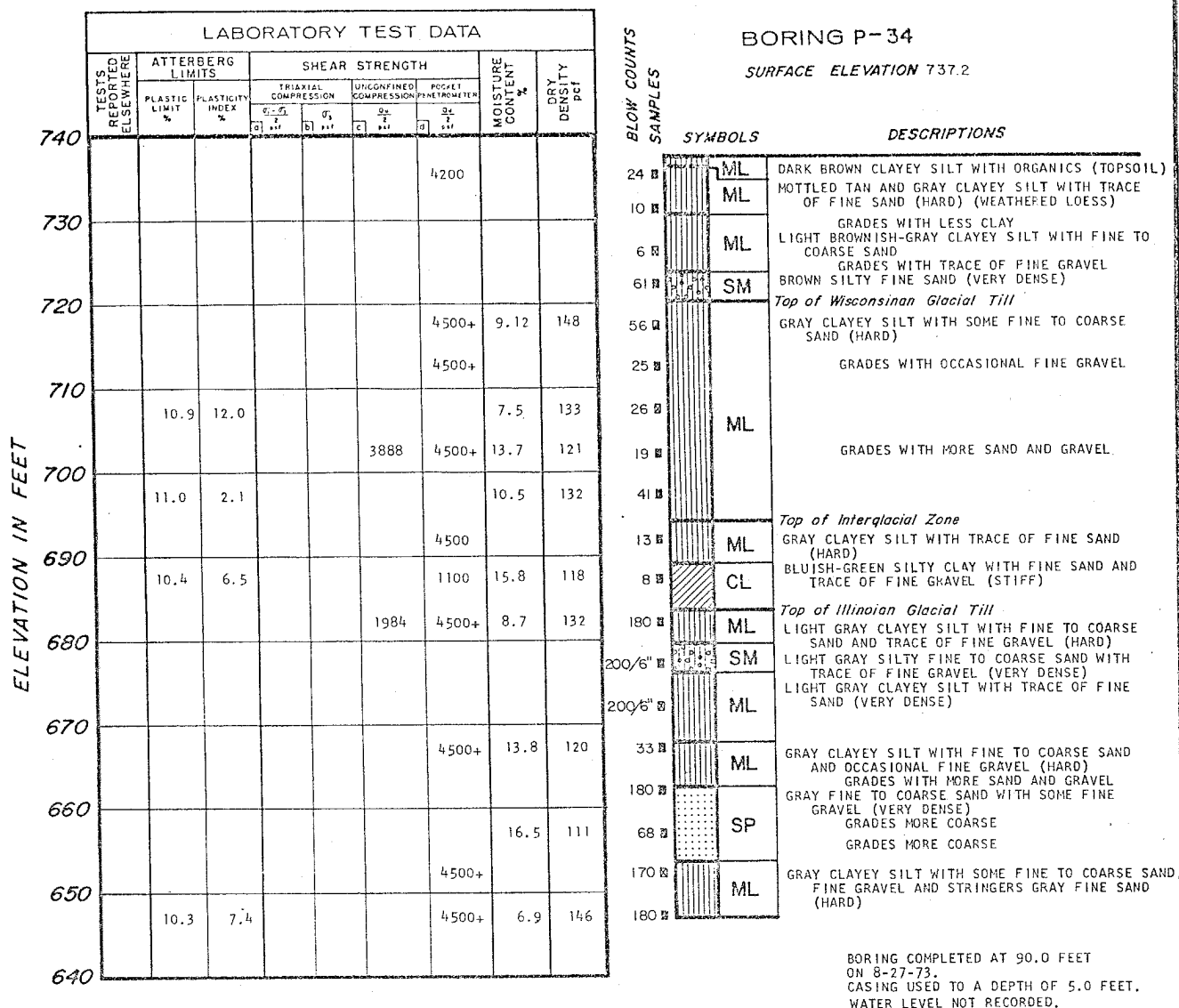
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-50

LOG OF BORING P-33

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-51

LOG OF BORING P-34

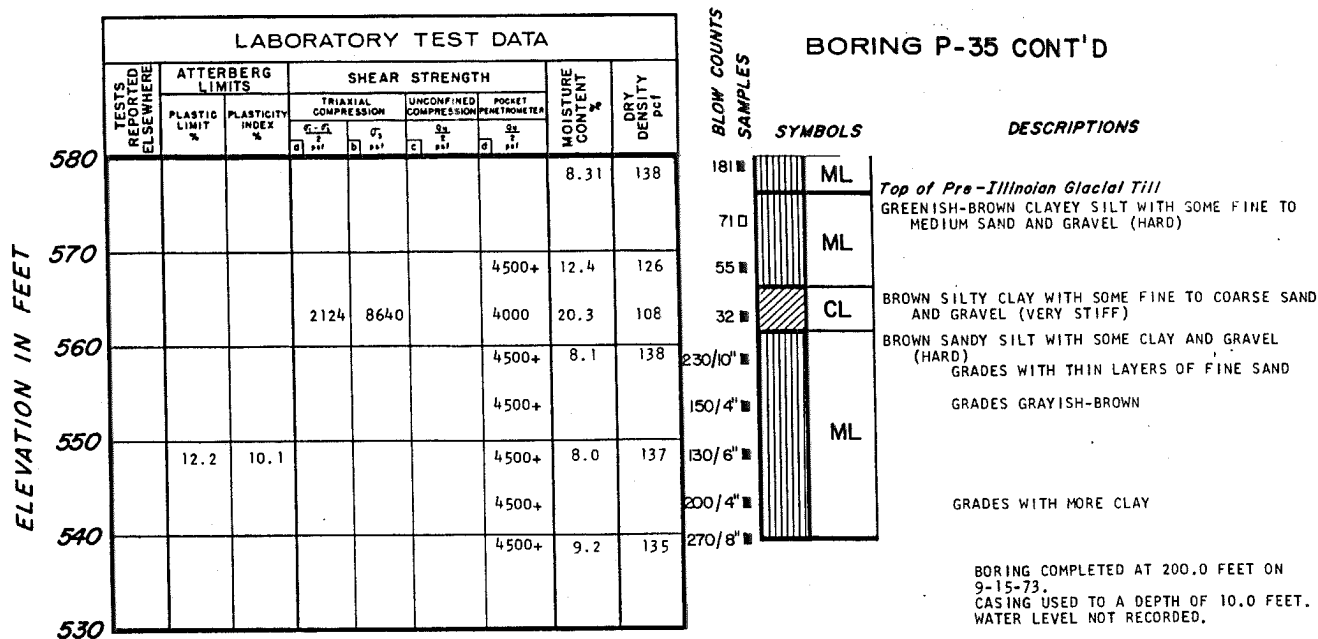
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**SURFACE ELEVATION 737.8**

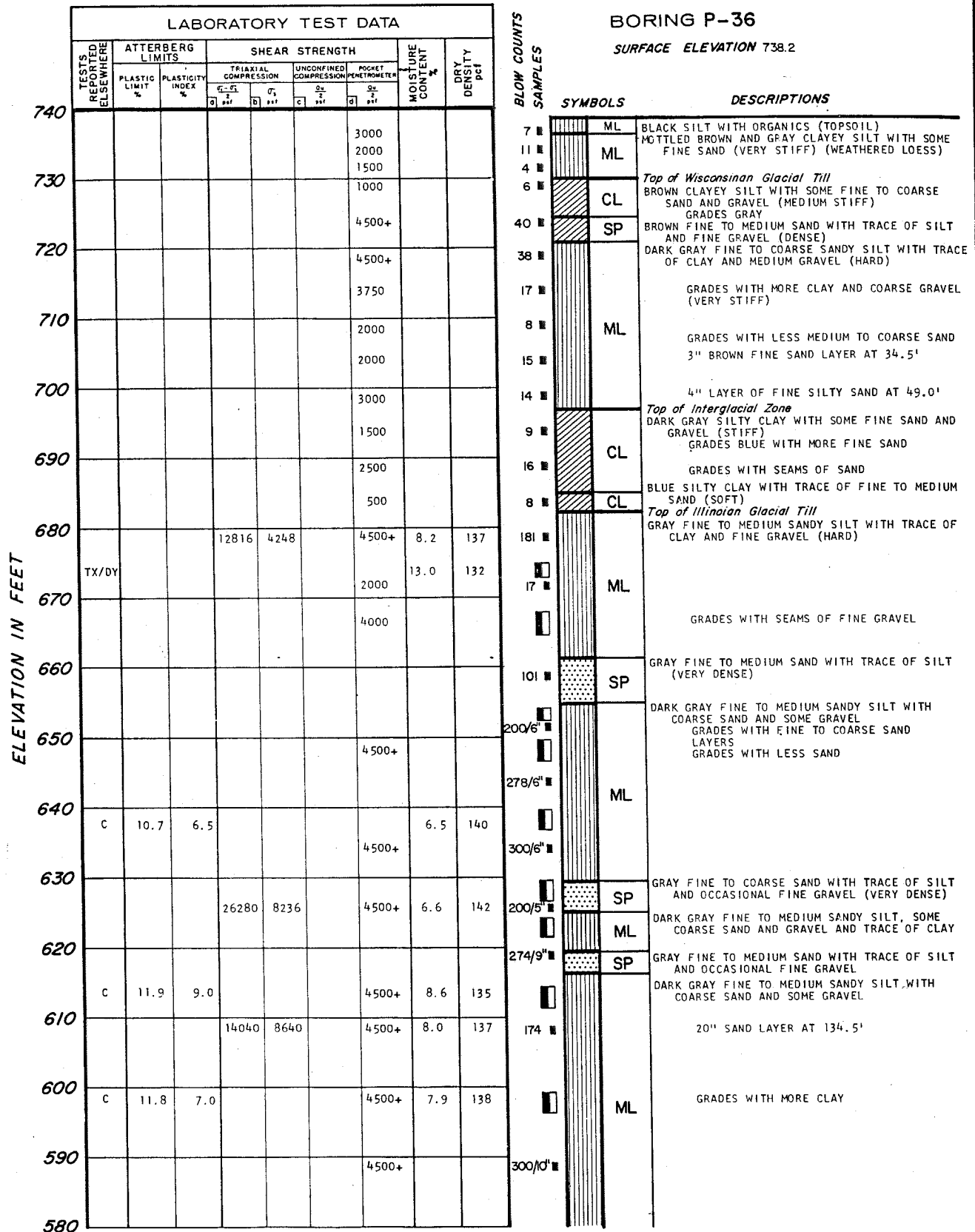
(SHEET 1 of 2)

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



**CLINTON POWER STATION  
 UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-52  
 LOG OF BORING P-35  
 (SHEET 2 of 2)



NOTE:

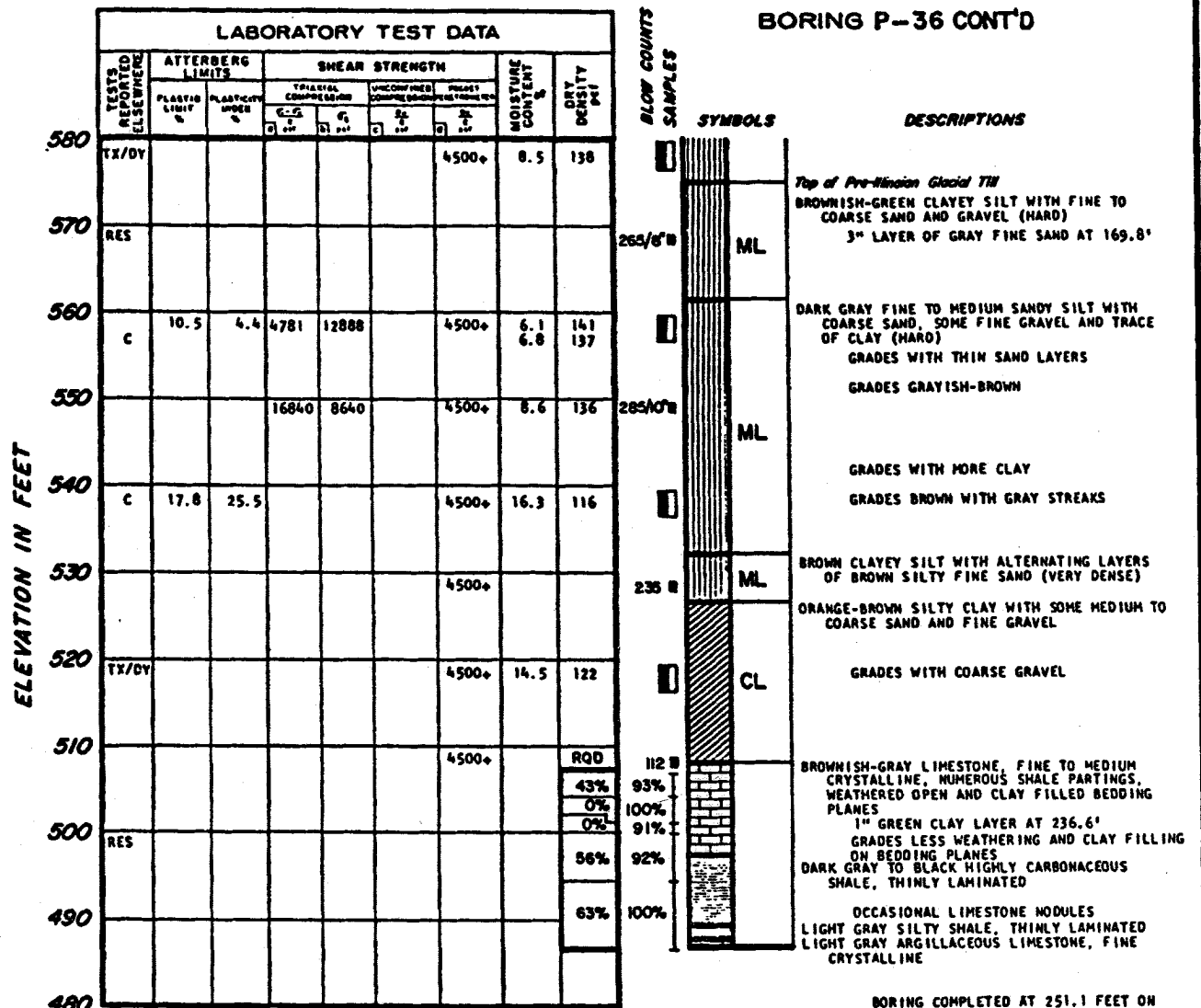
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-53

LOG OF BORING P-36

(SHEET 1 of 2)



PIEZOMETER INSTALLED ON 11-6-73. BORING WAS  
FILLED WITH GRAVEL AND SEALED WITH BENTONITE  
TO 223.0 FEET AFTER FLUSHING WITH CLEAN WATER.  
A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED  
AND THE LOWER 45.0 FEET PERFORATED WAS  
INSTALLED TO ELEVATION 515.2. GRANULAR BACKFILL  
WAS PLACED FROM ELEVATION 515.2 TO 560.2; A  
BENTONITE SEAL FROM ELEVATION 560.2 TO 562.2;  
AND CEMENT GROUT FROM ELEVATION 562.2 TO 738.2.

#### WATER LEVEL READINGS

DEPTH BELOW GROUND  
SURFACE IN FEET

57.8  
56.4

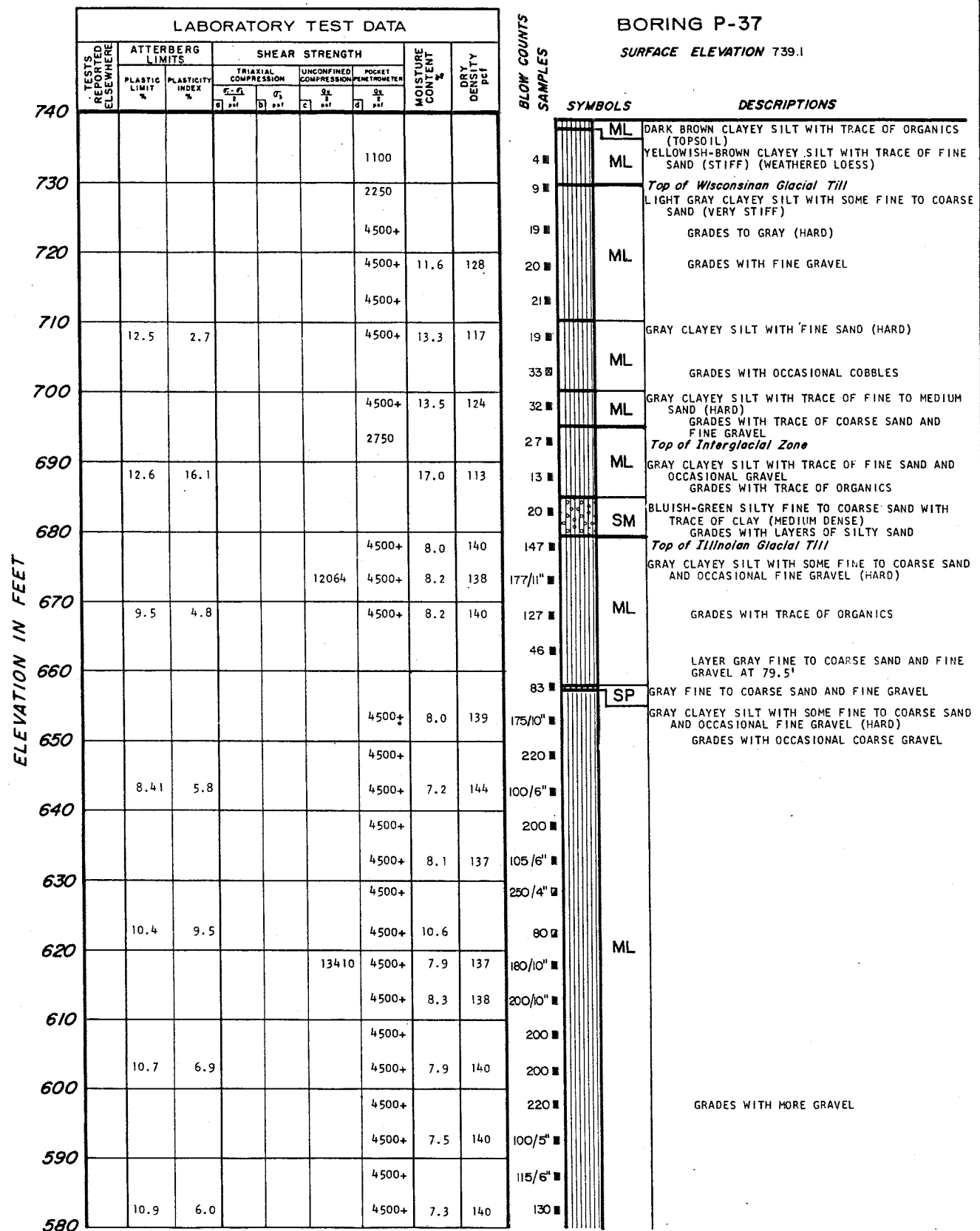
DATE

11-15-73  
12-31-73

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-53

LOG OF BORING P-36  
(SHEET 2 of 2)

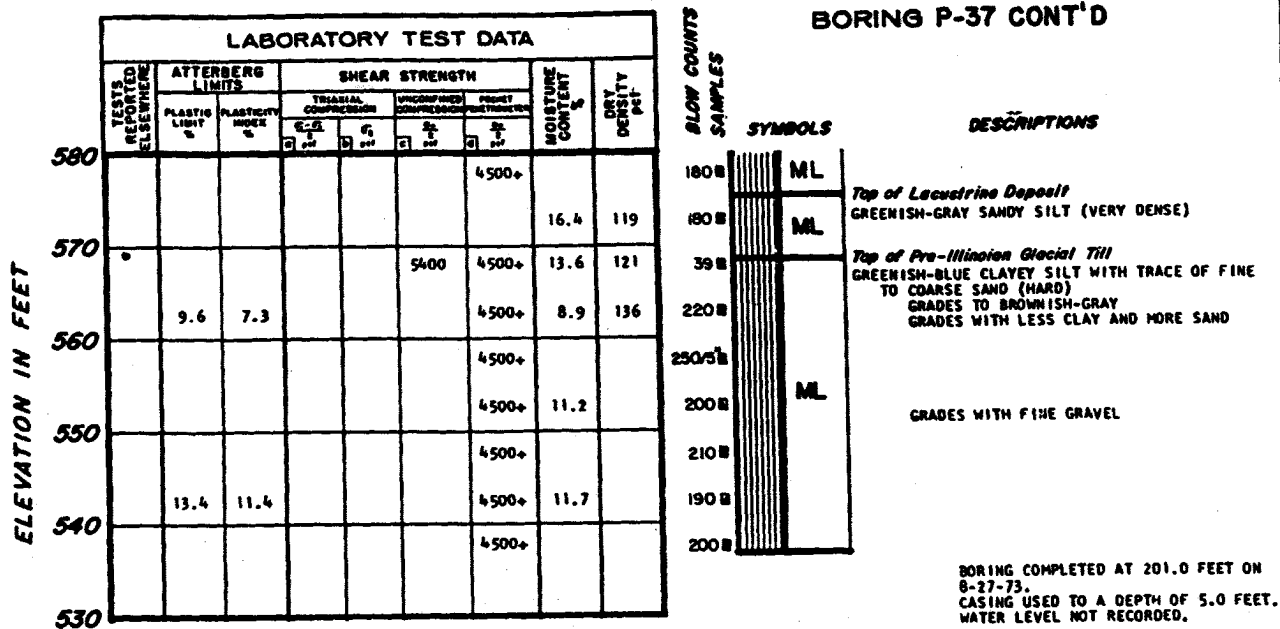


NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-54  
LOG OF BORING P-37  
(SHEET 1 of 2)



PIEZOMETER INSTALLED IN 8-27-73. BORING WAS FILLED WITH GRAVEL AND SEALED WITH BENTONITE TO 41.0 FEET AFTER FLUSHING WITH CLEAN WATER. A 1 1/2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 24.0 FEET PERFORATED WAS INSTALLED TO ELEVATION 699.1 FEET. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 701.1 TO 726.1; A BENTONITE SEAL FROM ELEVATION 726.1 TO 728.1; AND CEMENT GROUT FROM ELEVATION 728.1 TO 739.1.

#### WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
14.2	10-5-73
16.0	10-29-73
15.9	11-15-73

BORING COMPLETED AT 201.0 FEET ON 8-27-73.  
CASING USED TO A DEPTH OF 5.0 FEET.  
WATER LEVEL NOT RECORDED.

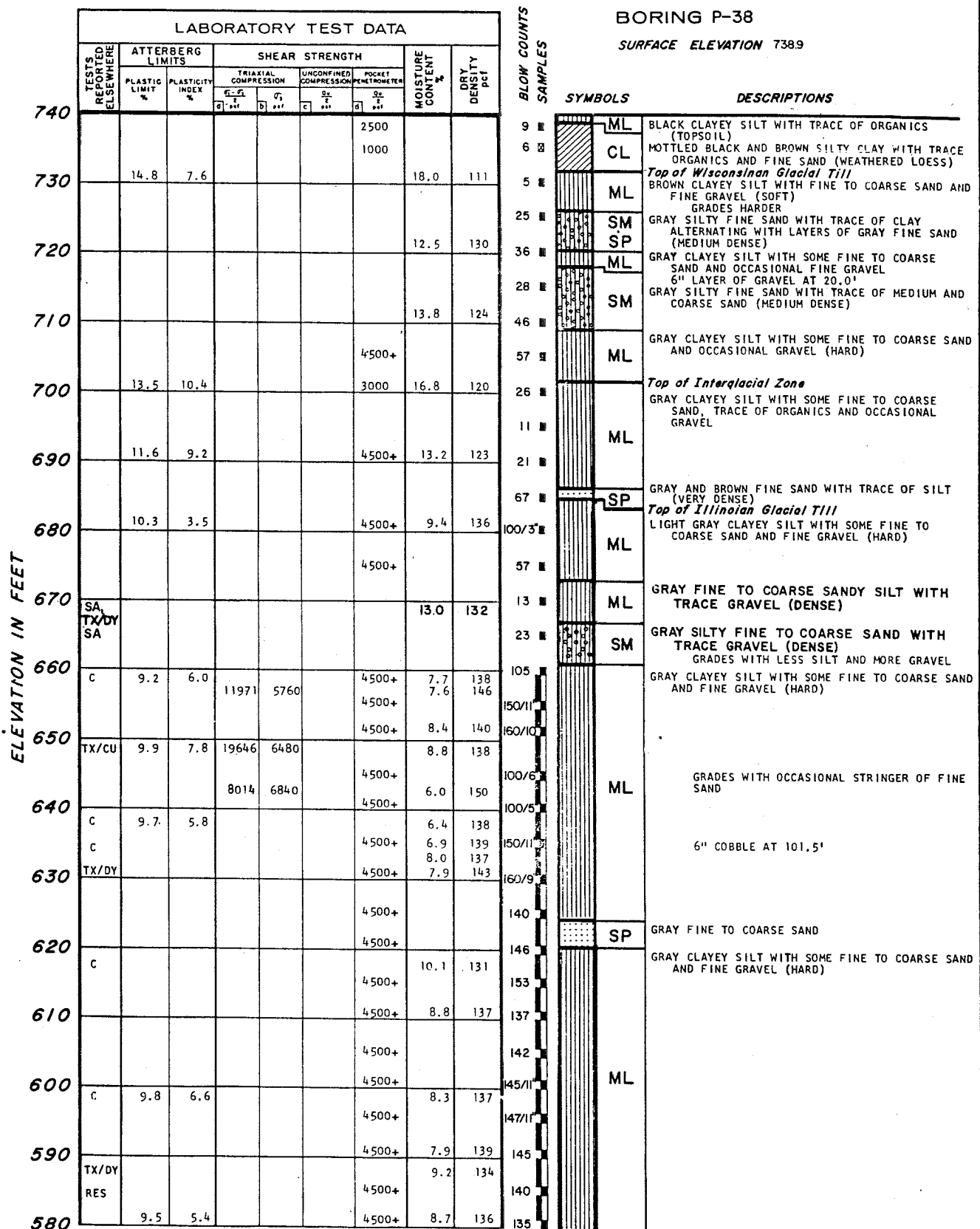
### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-54

LOG OF BORING P-37

(SHEET 2 of 2)



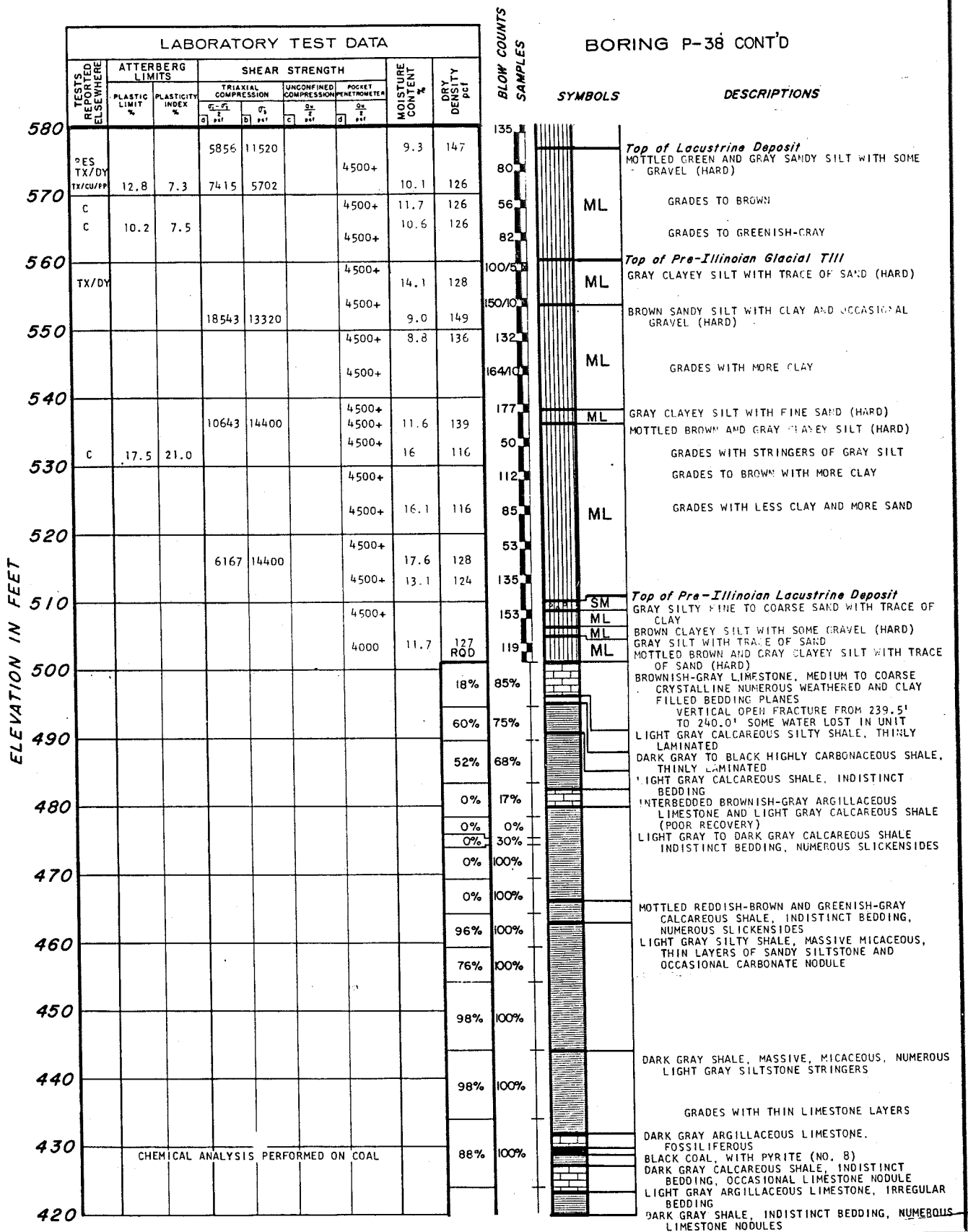


CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-55

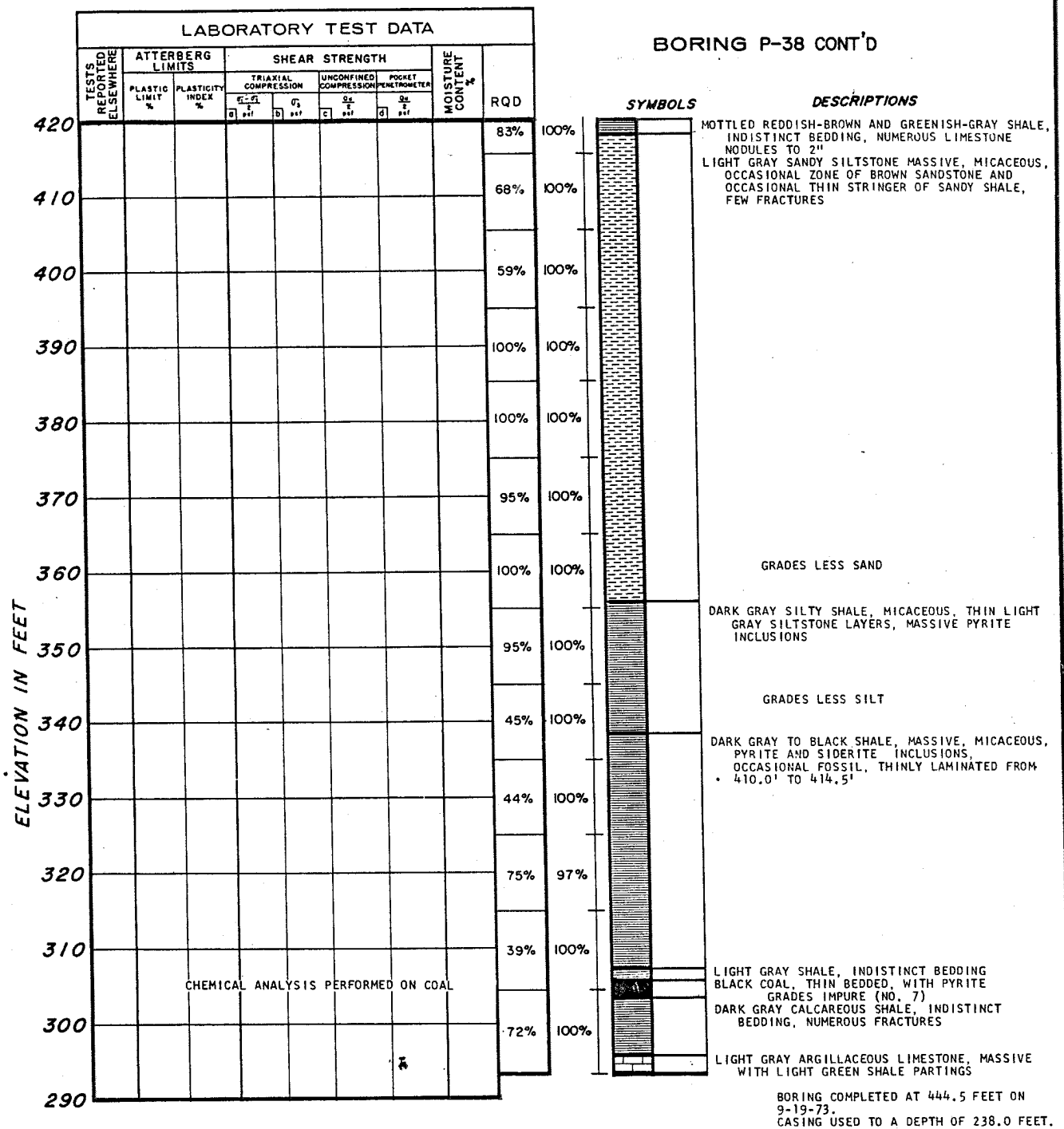
LOG OF BORING P-38  
(SHEET 1 of 3)

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

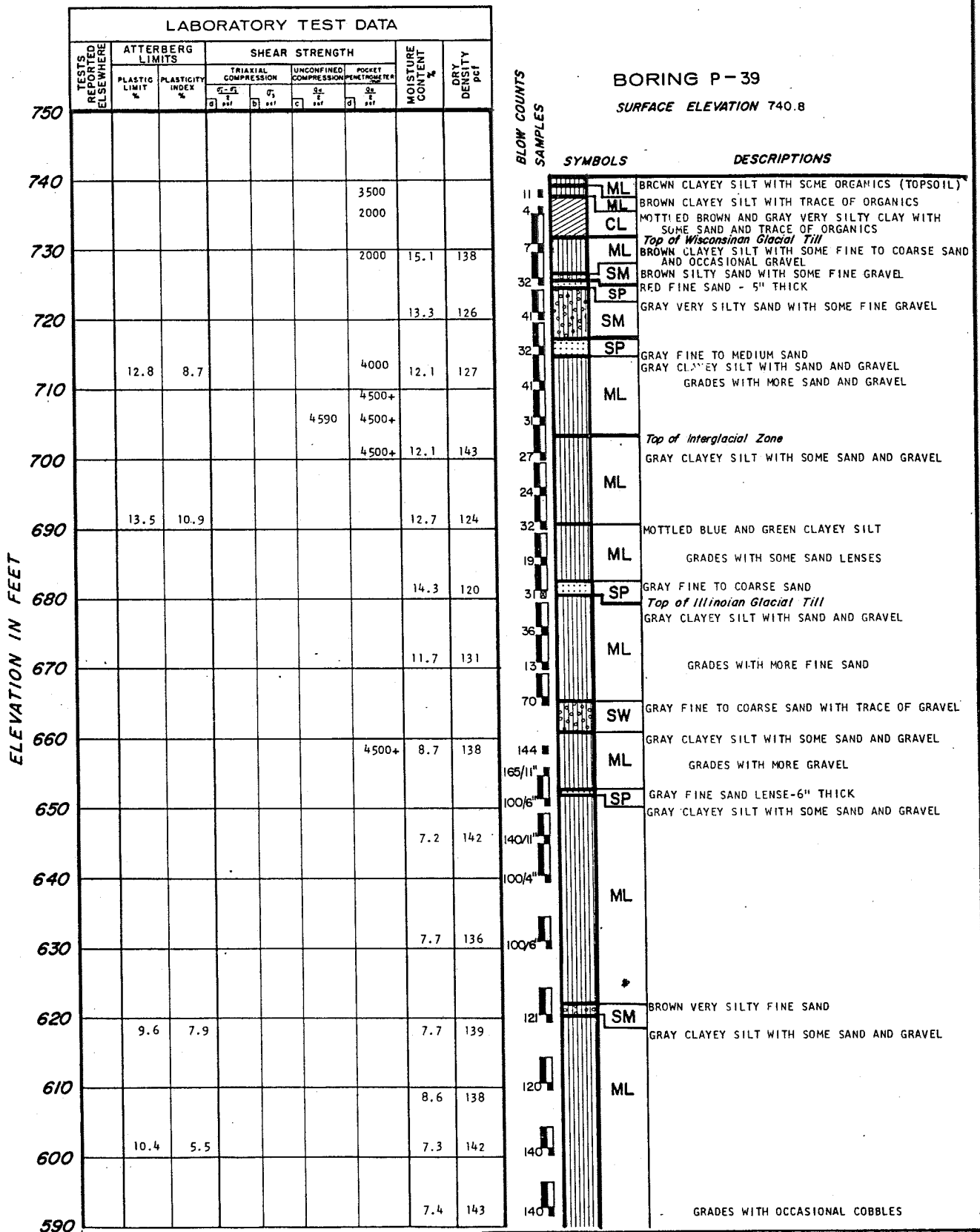
FIGURE 2.5-55  
LOG OF BORING P-38  
(SHEET 2 of 3)



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-55

LOG OF BORING P-38  
(SHEET 3 of 3)



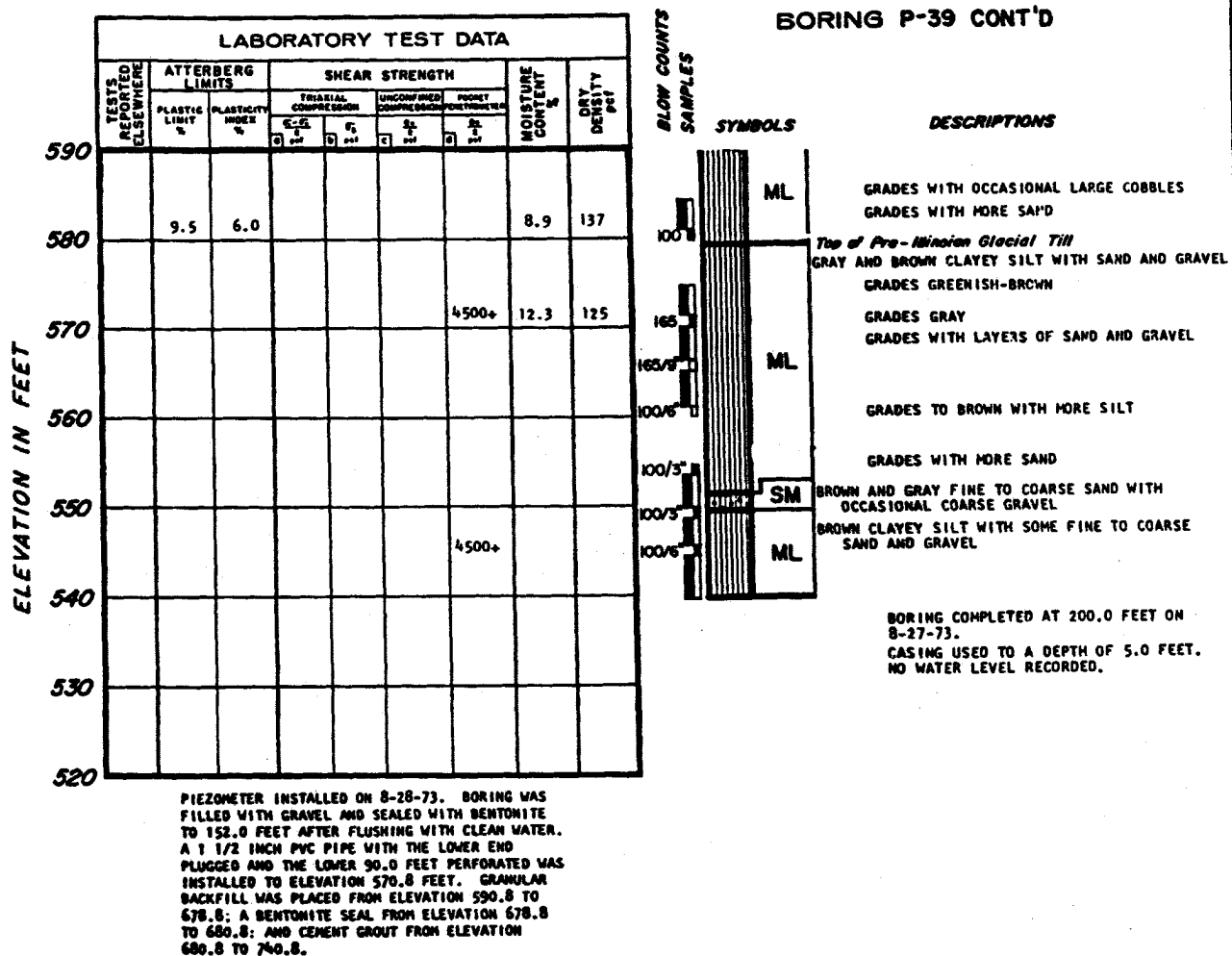
**BORING P-39**  
**SURFACE ELEVATION 740.8**

**CLINTON POWER STATION  
 UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-56

LOG OF BORING P-39  
 (SHEET 1 of 2)

NOTE:  
 SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
 EXPLANATION OF SYMBOLS USED ON BORING LOGS.



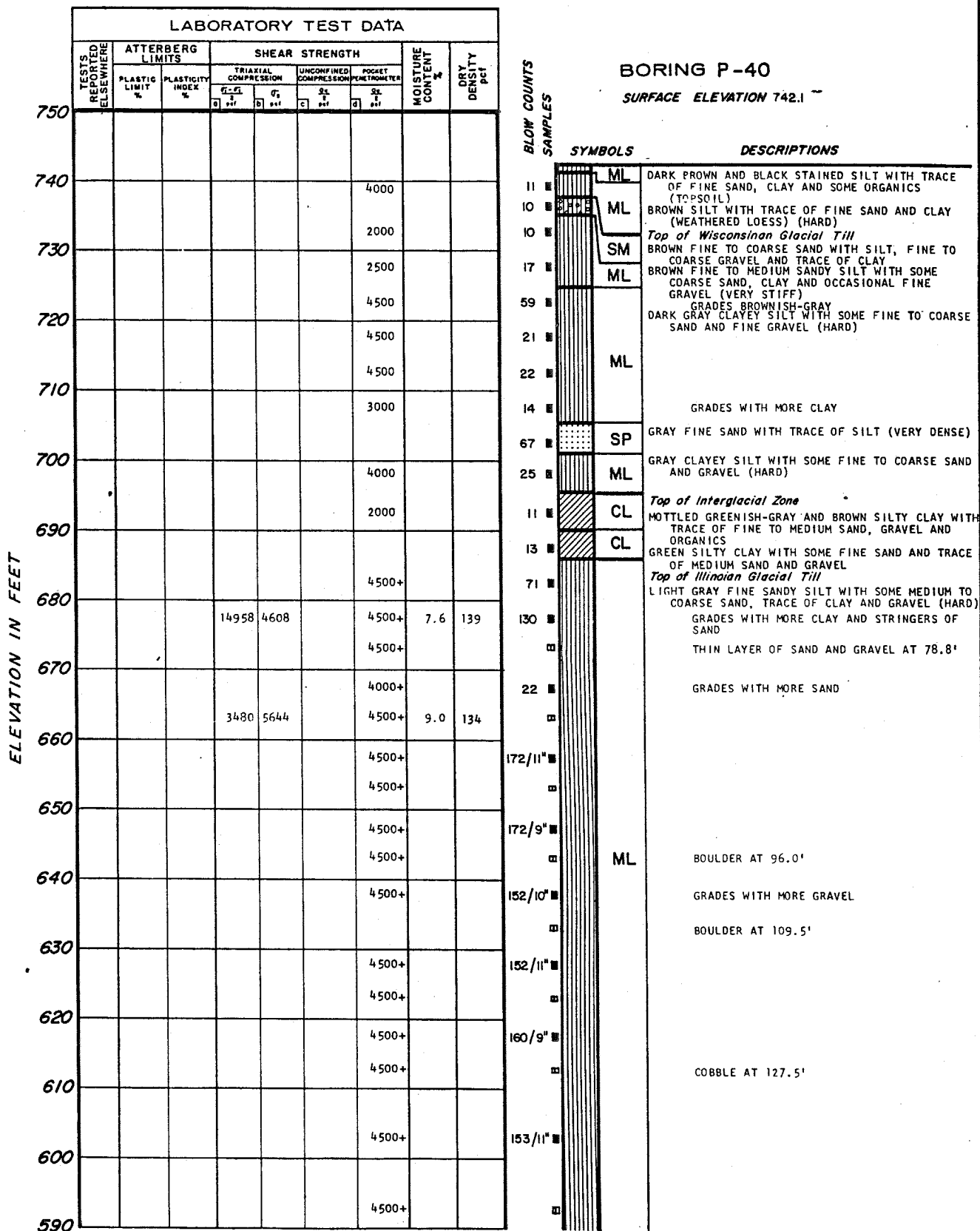
# WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
32.9	9-7-73
33.4	10-29-73
33.2	11-15-73

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-56

LOG OF BORING P-39  
(SHEET 2 of 2)



NOTE:

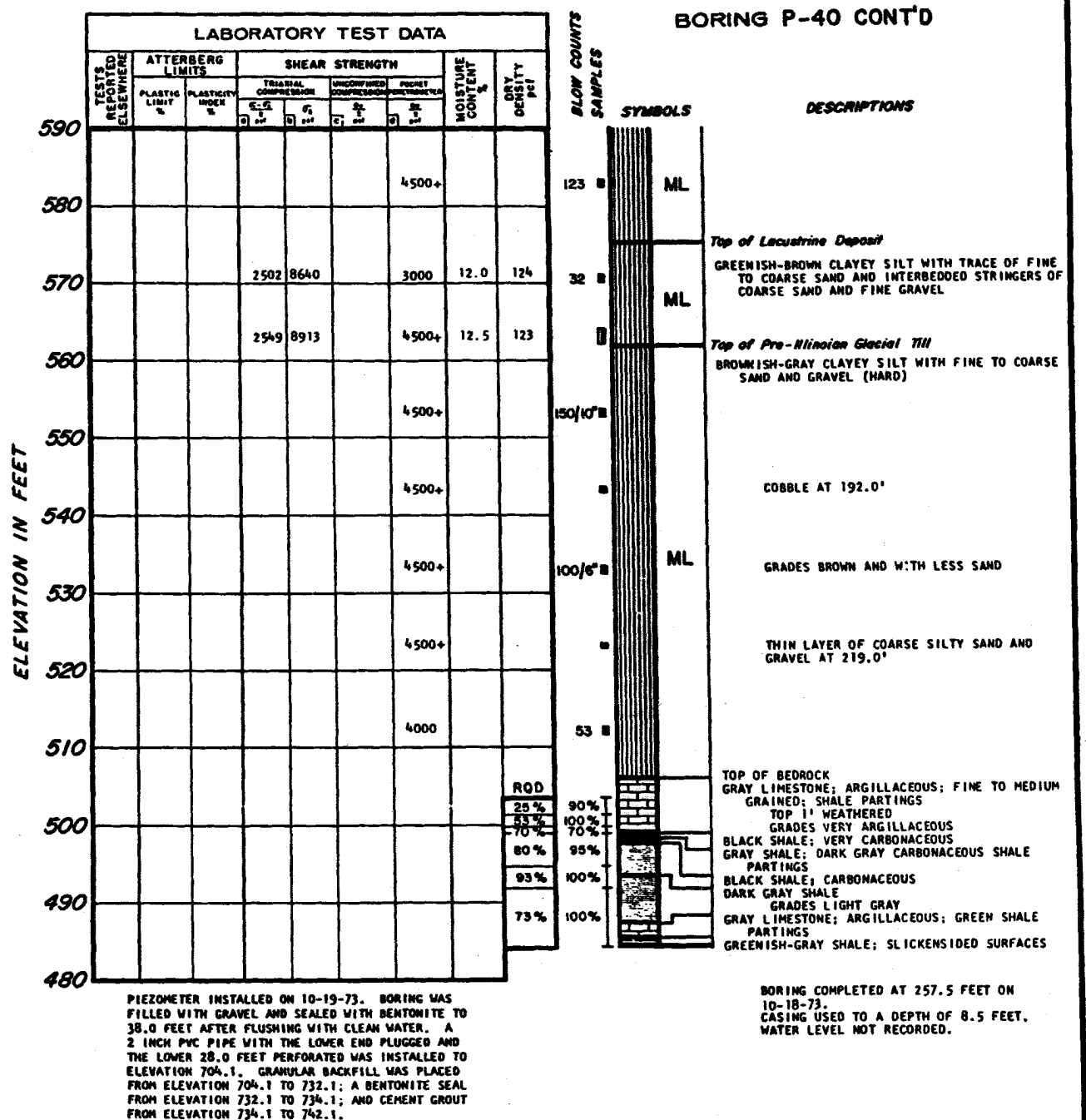
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-57

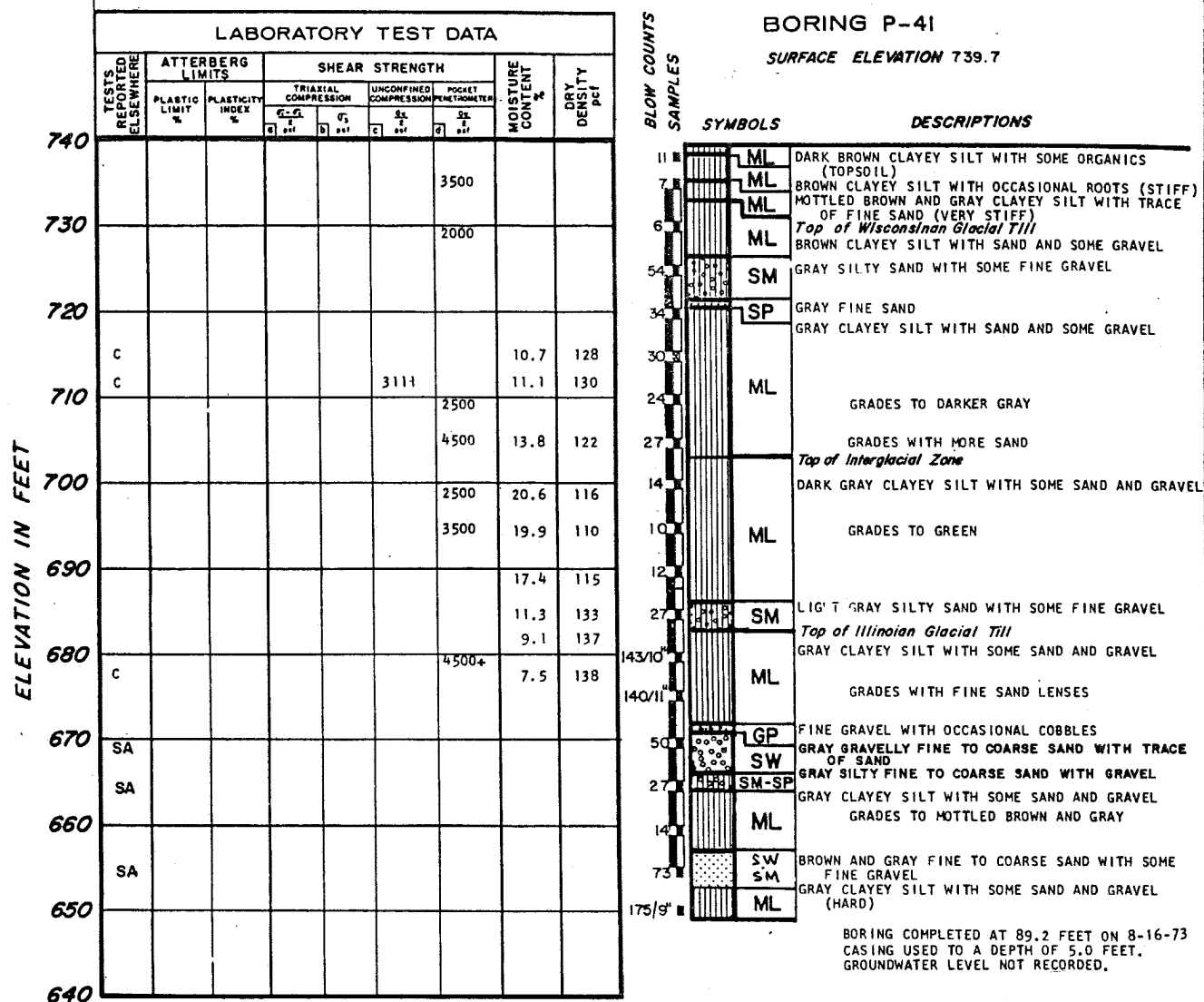
LOG OF BORING P-40

(SHEET 1 of 2)



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-57  
LOG OF BORING P-40  
(SHEET 2 of 2)



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

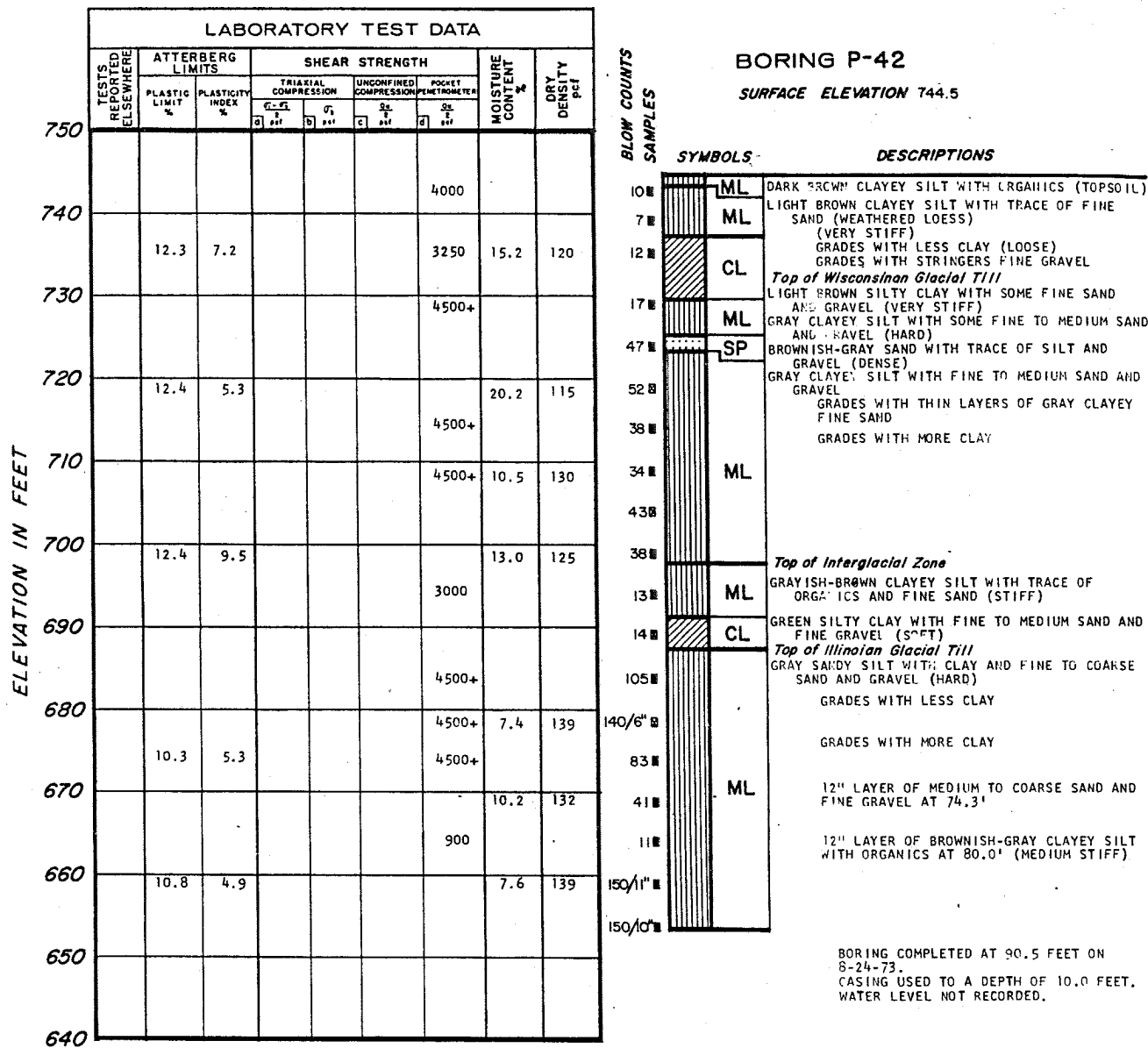
FIGURE 2.5-58

LOG OF BORING P-41

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





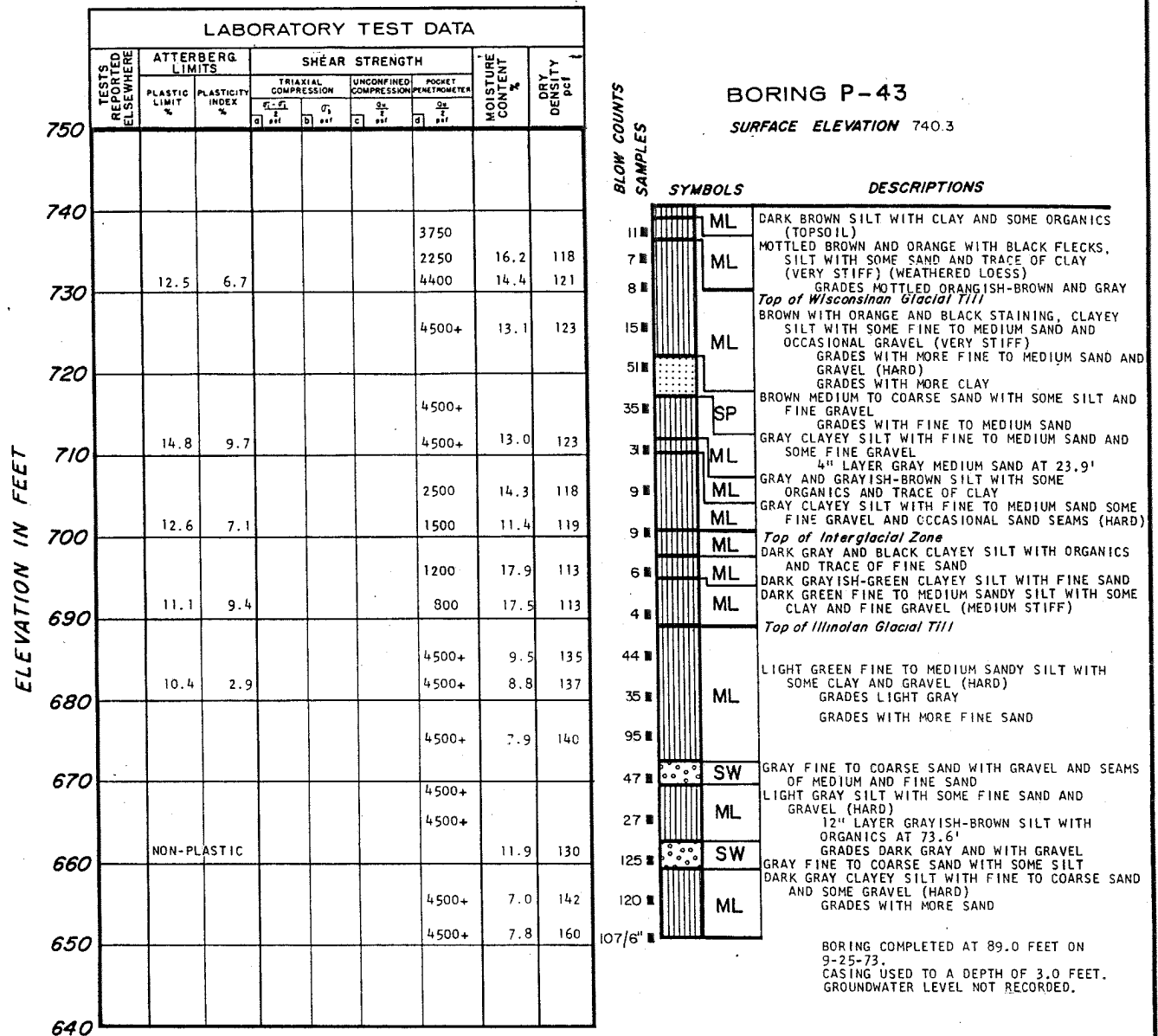
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-59

LOG OF BORING P-42

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



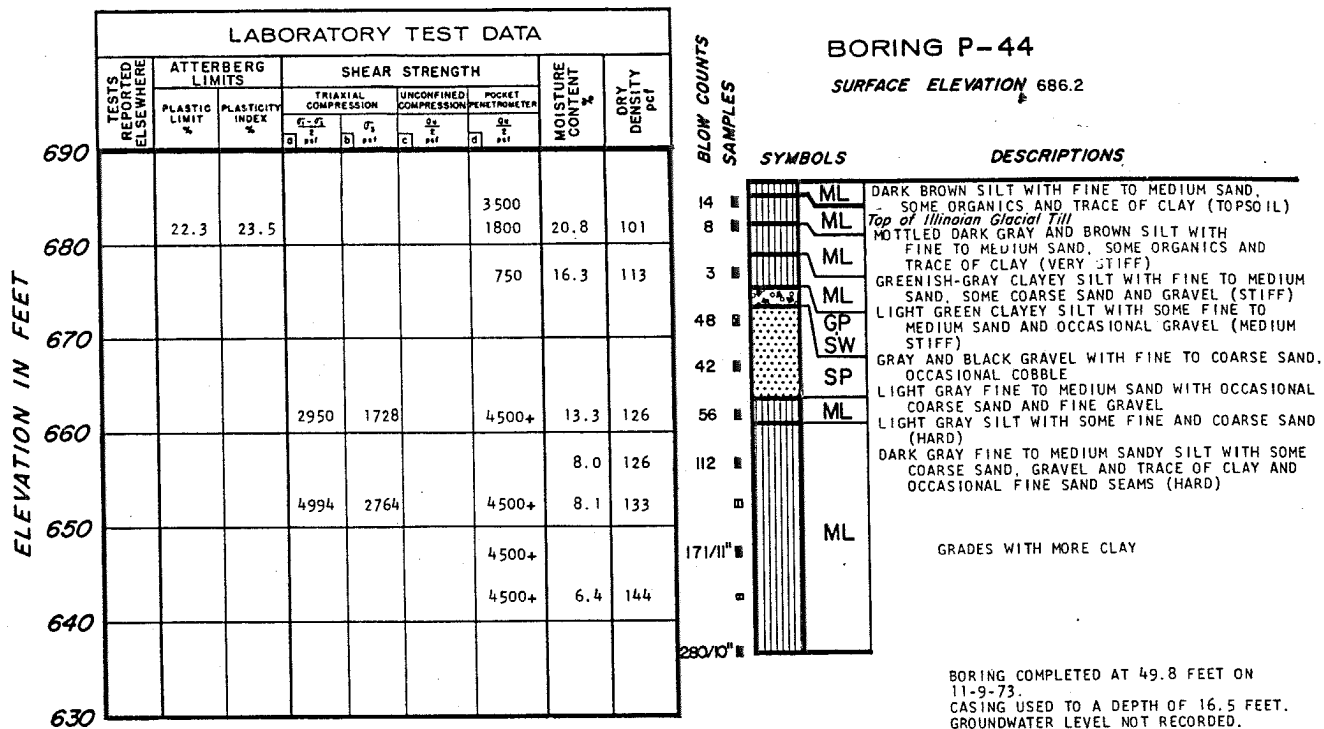
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-60

LOG OF BORING P-43

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

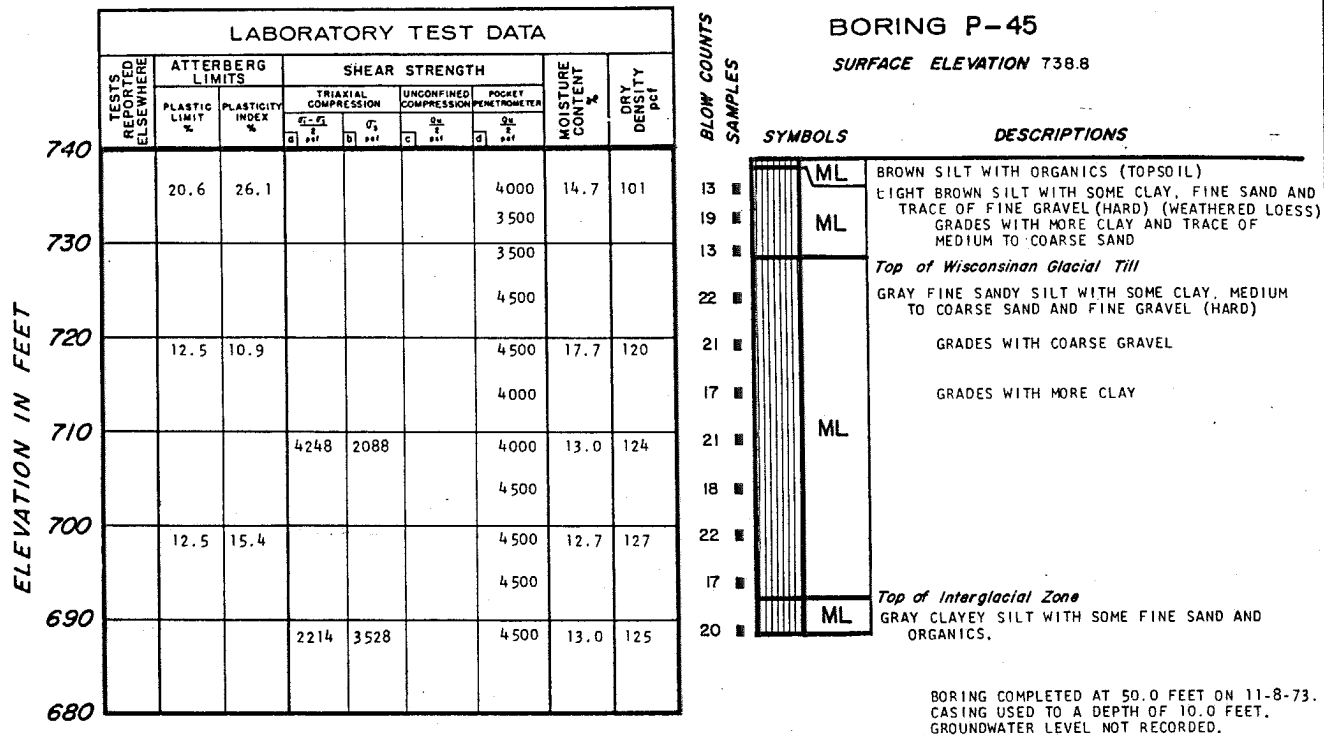


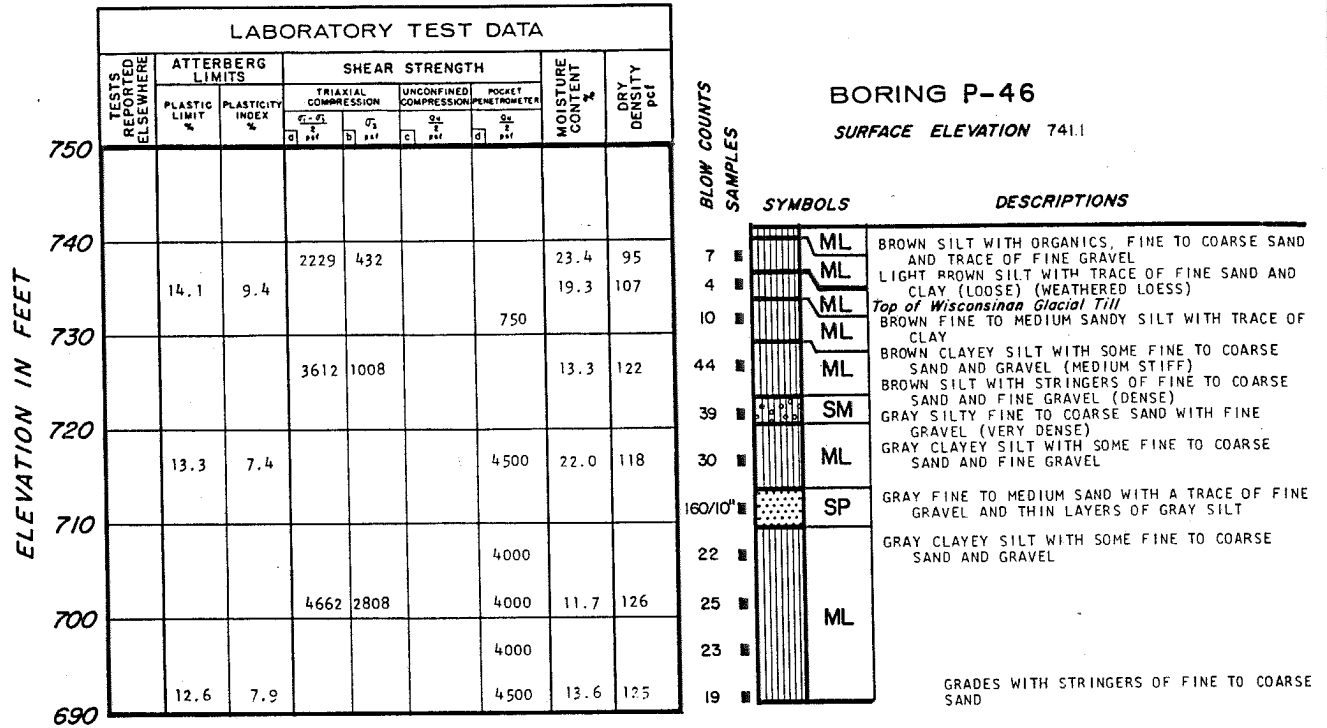
## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-61

LOG OF BORING P-44

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





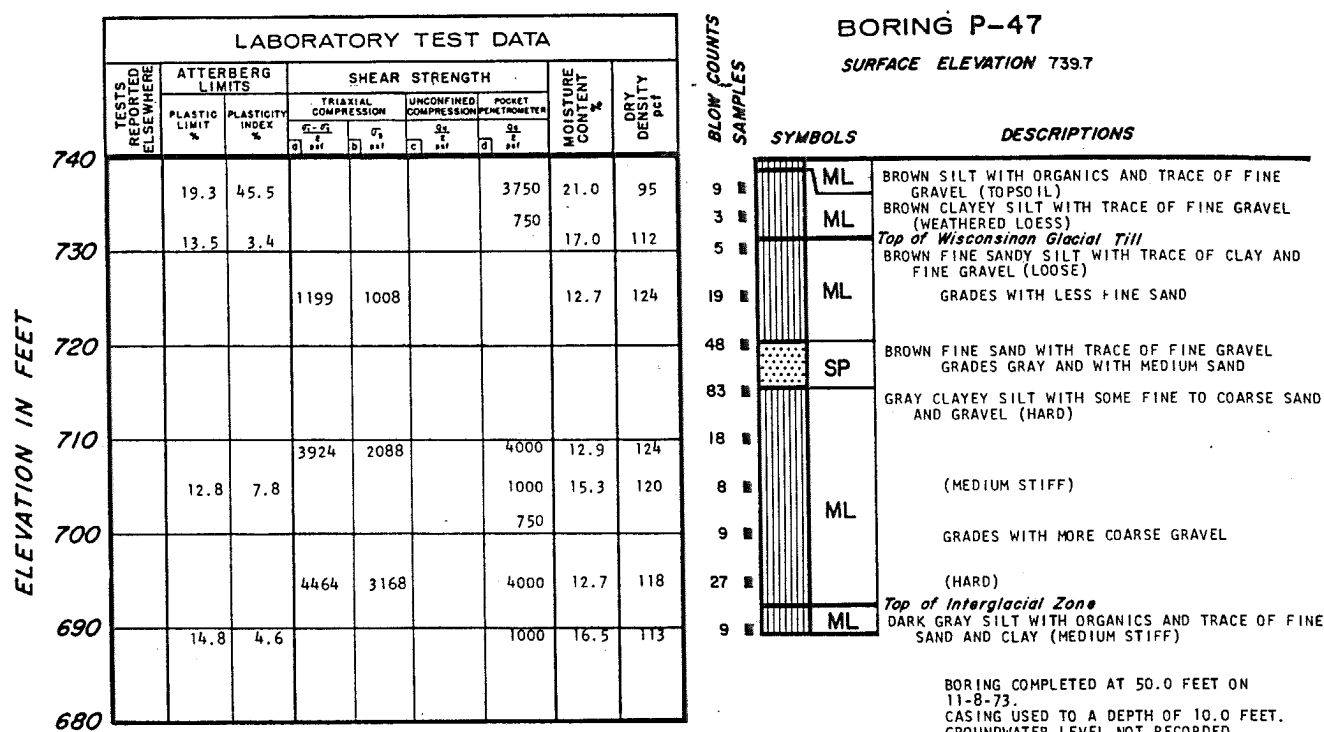
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-63

LOG OF BORING P-46



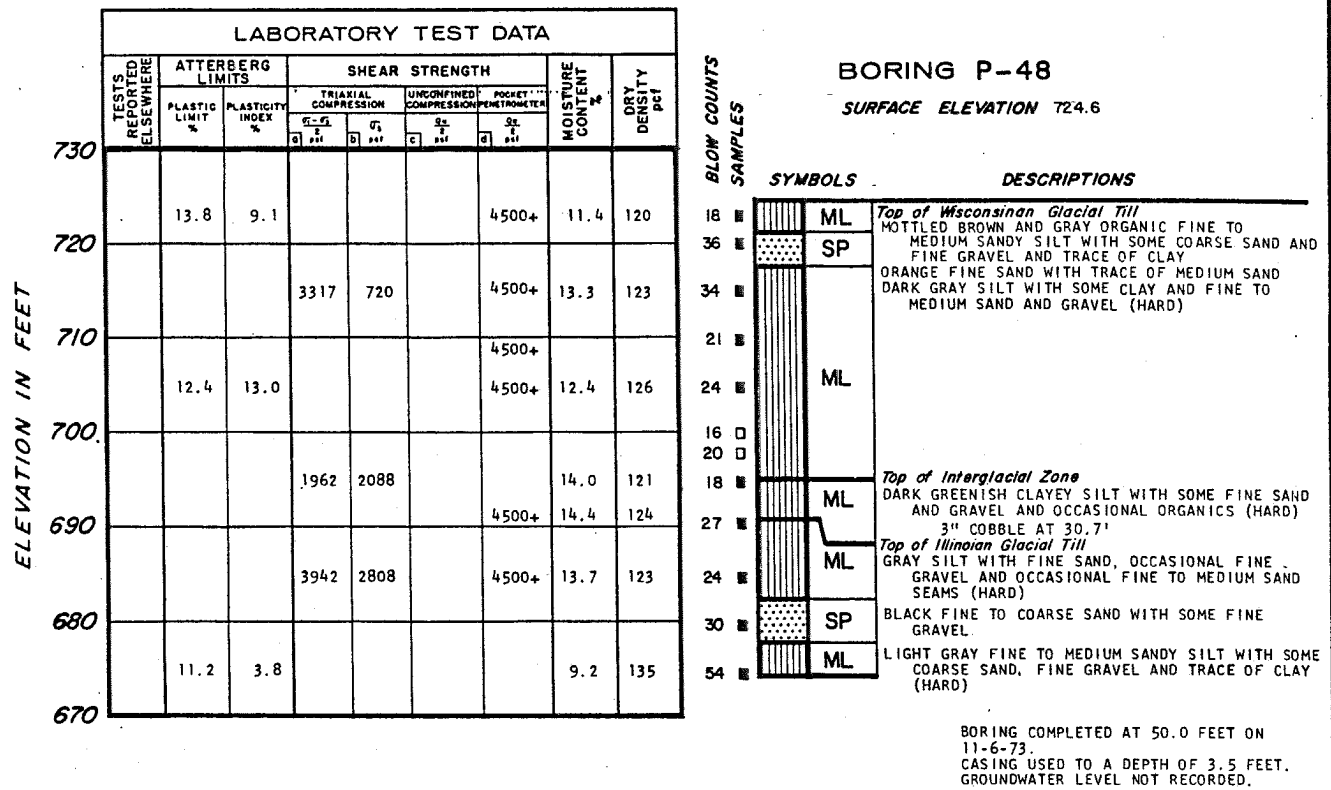
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-64

LOG OF BORING P-47

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



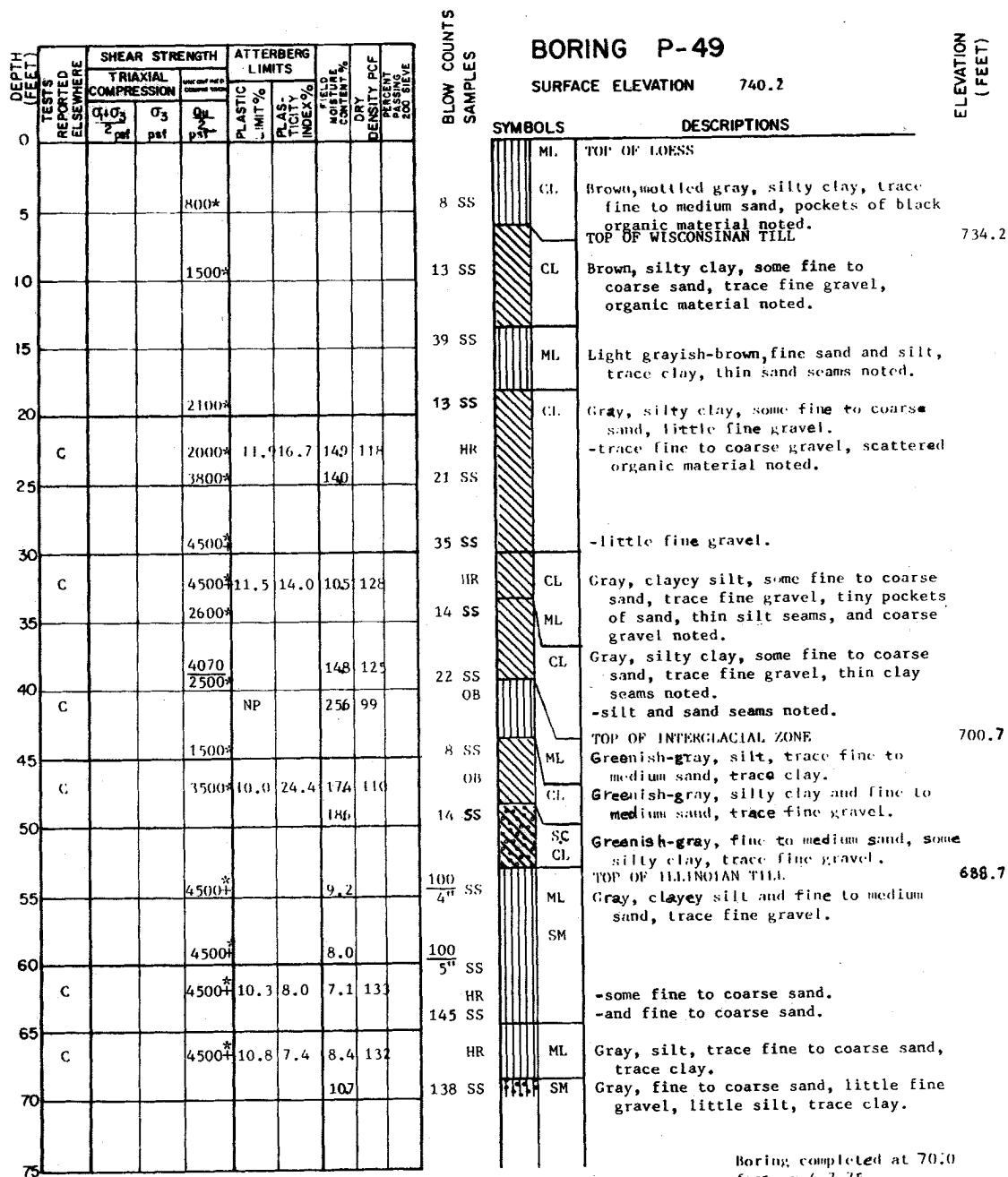
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-65

LOG OF BORING P-48

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



#### NOTES

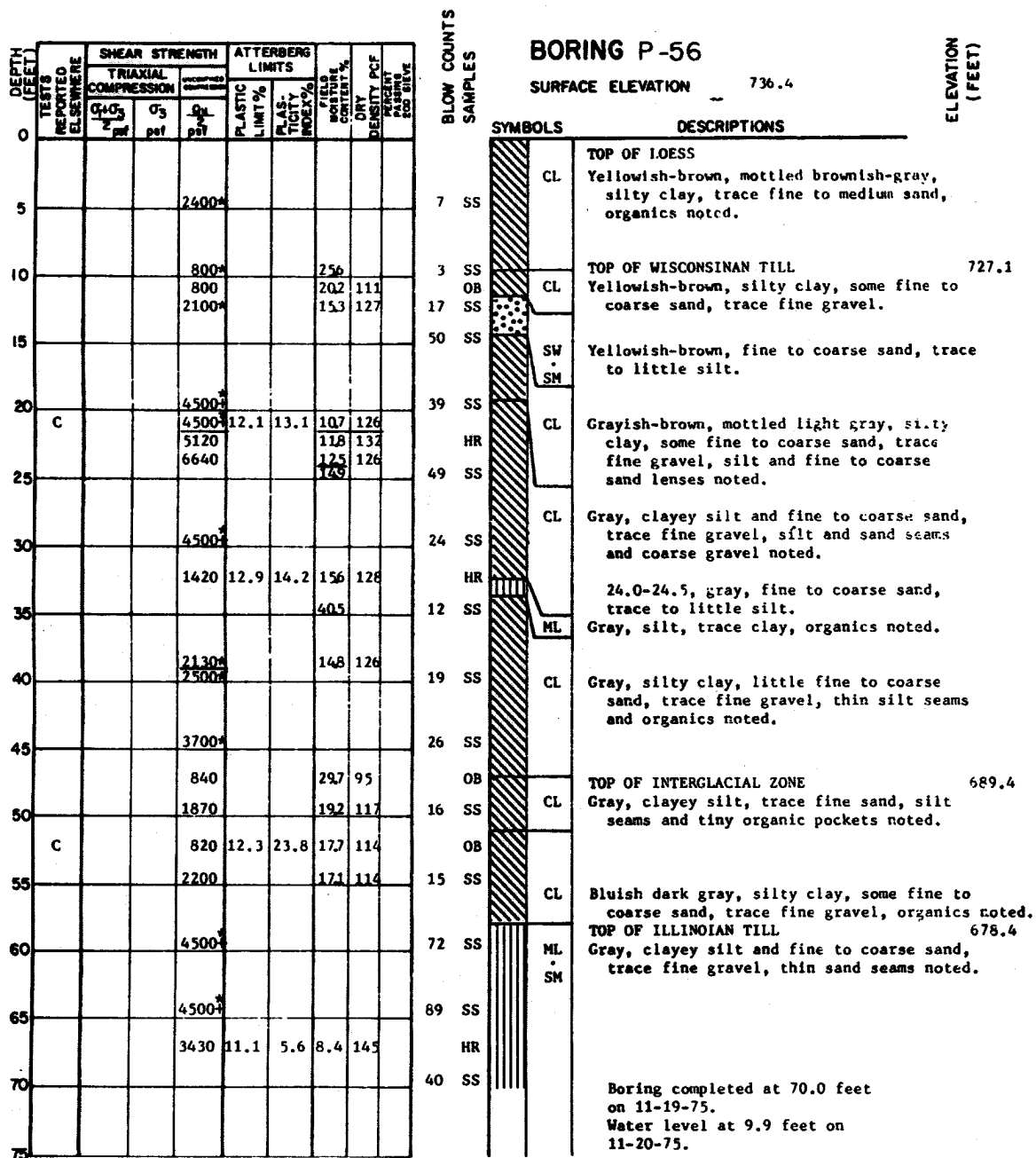
Logged by: Sargent & Lundy Engineers  
Drilled by: Raymond International  
Tested by: Soil Testing Services Inc.

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-66

LOG OF BORING P-49



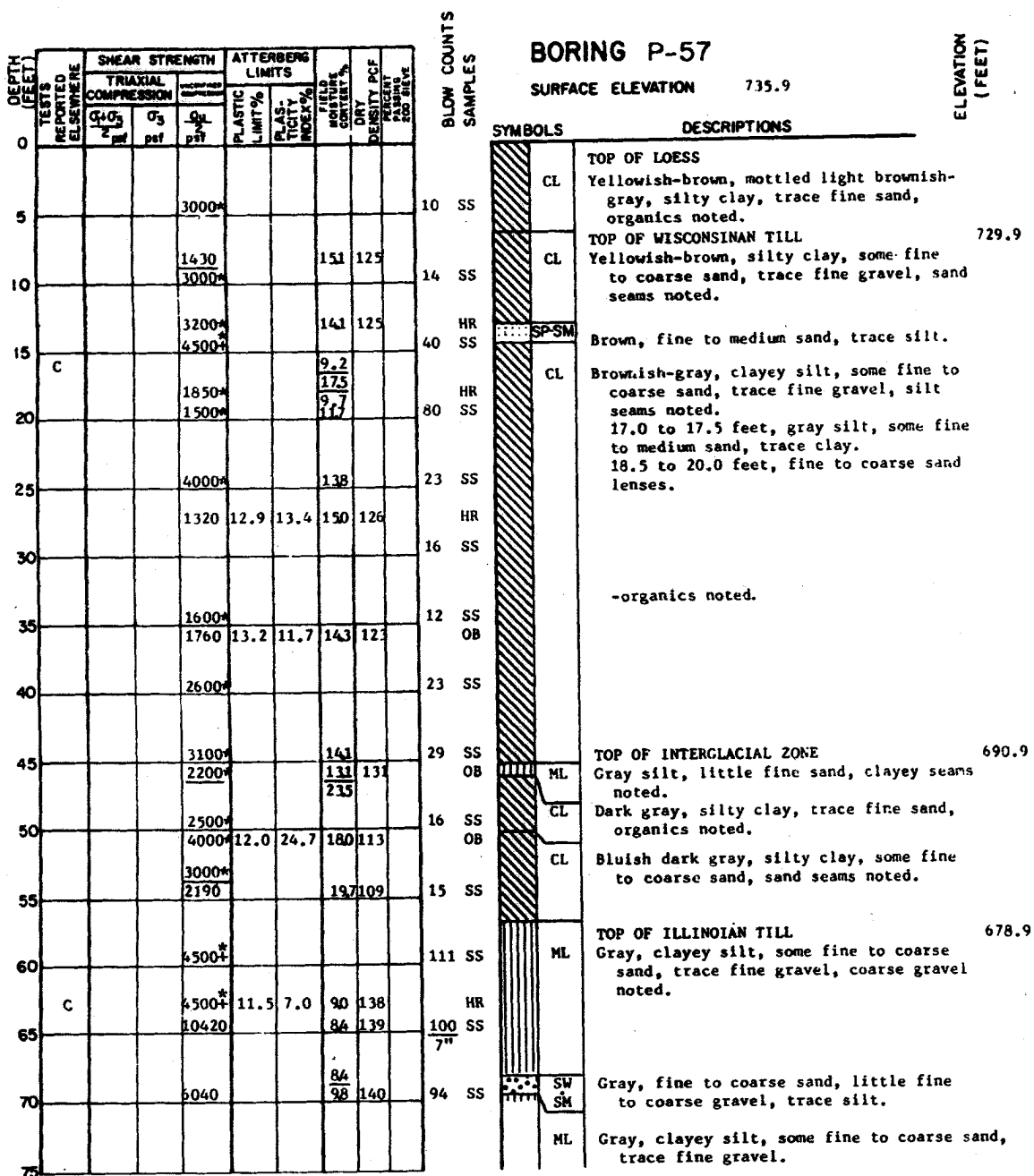


Logged by: Sargent & Lundy Engineers  
 Drilled by: Raymond International  
 Tested by: Westenhoff & Novick, Inc.

**CLINTON POWER STATION  
 UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-67

LOG OF BORING P-56

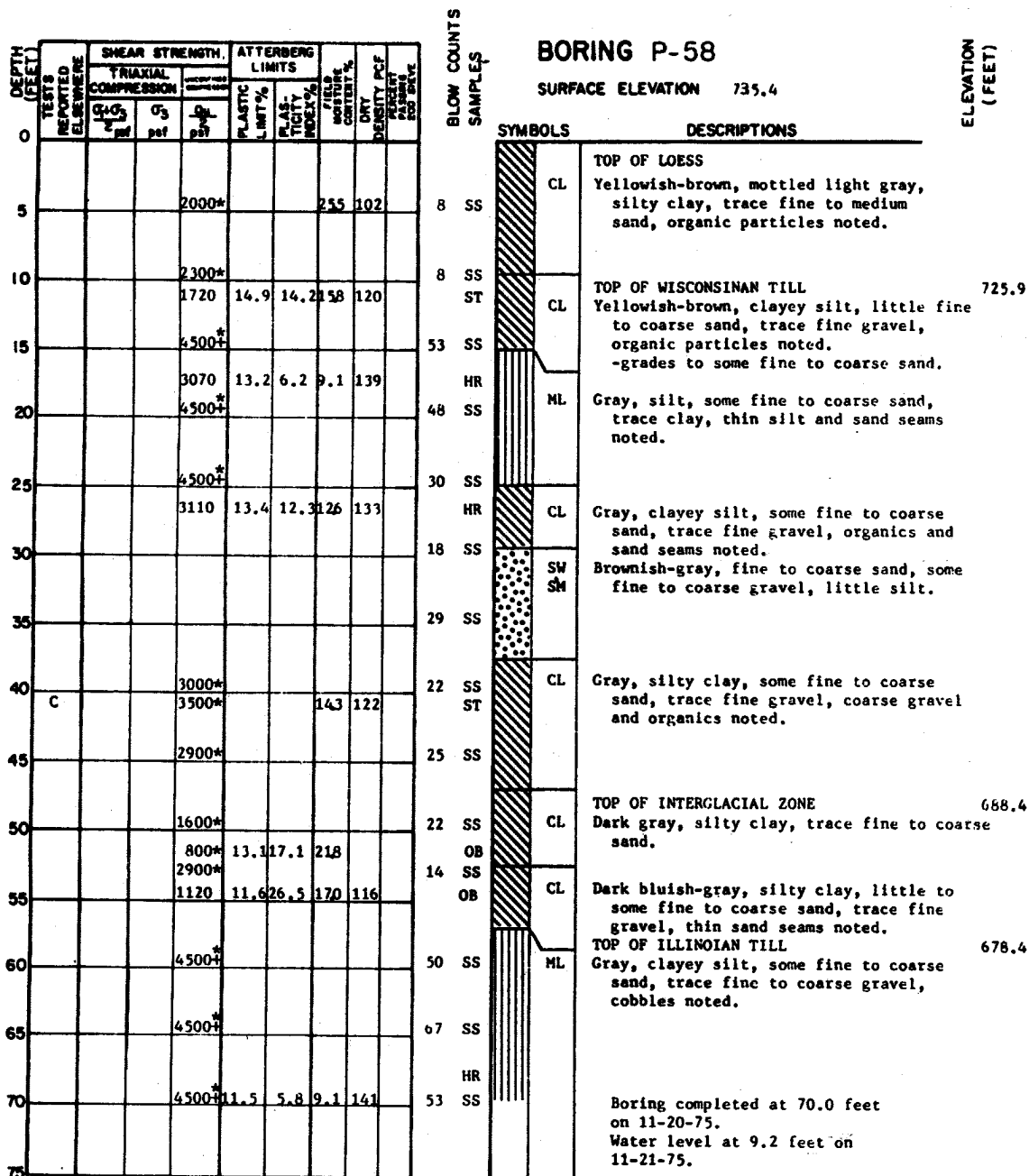


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-68

LOG OF BORING P-57

Logged by: Sargent & Lundy Engineers  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick, Inc.

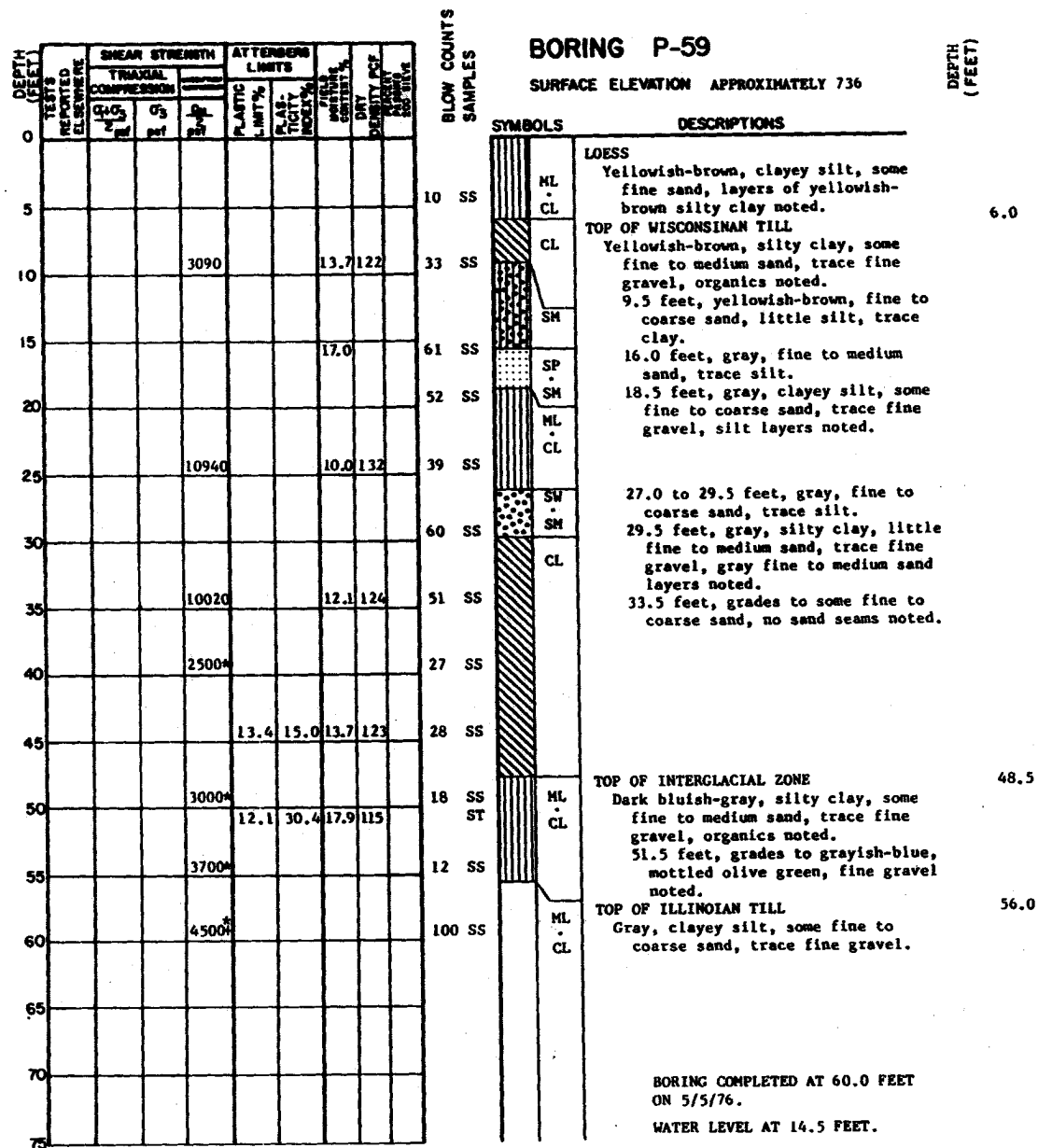


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-69

LOG OF BORING P-58

Logged by: Sargent & Lundy Engineers  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick, Inc.



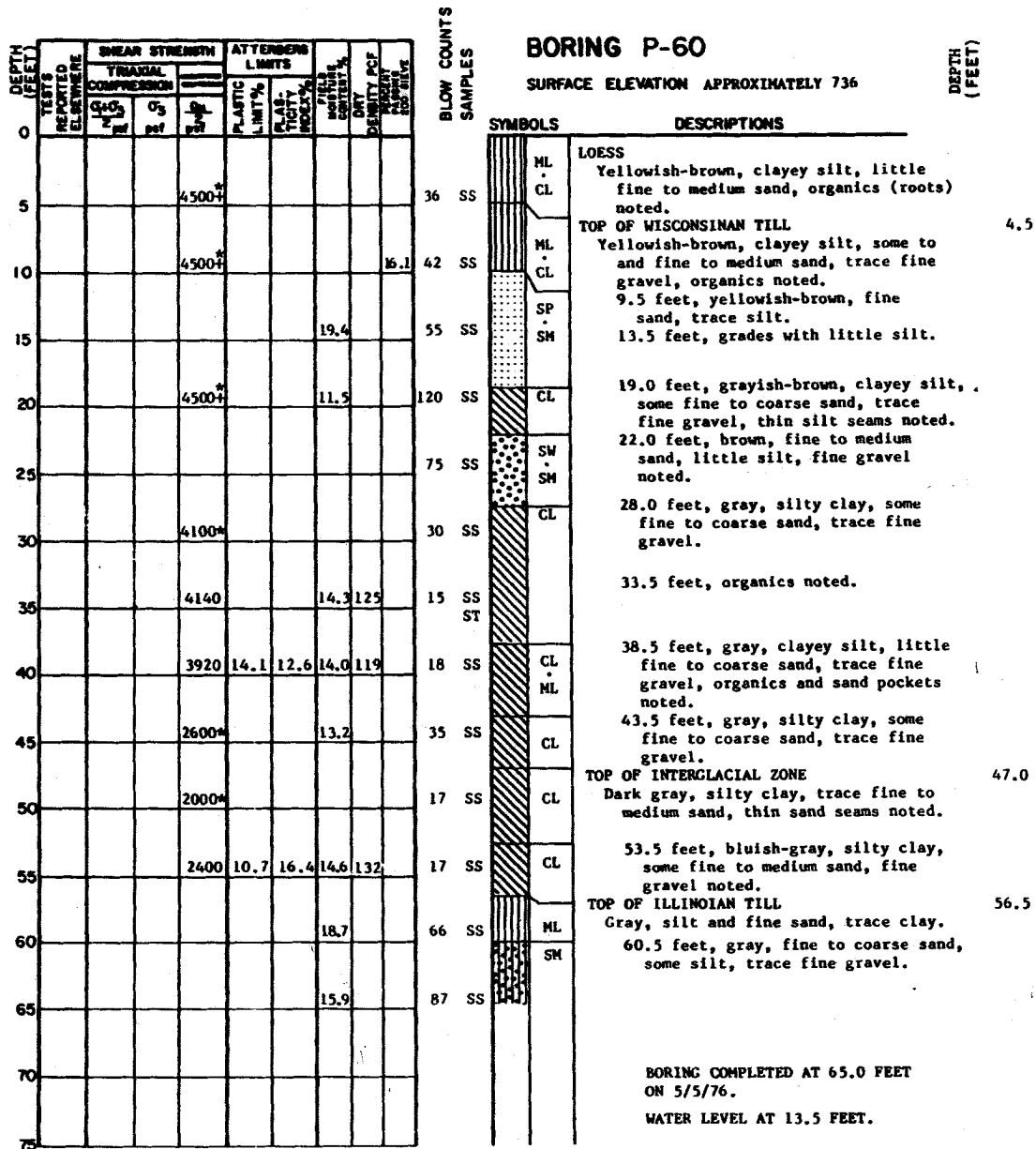
**NOTES**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-70

LOG OF BORING P-59



#### NOTES

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-71

LOG OF BORING P-60

DEPTH (FEET)	TESTS REPORTED ELEVATION	SHEAR STRENGTH			ATTENDING LIMITS			FIELD BORING CORRECTION % DRY DENSITY C/F PERCENT WATER CONTENT % POU WAVE
		TRIAXIAL COMPRESSION			PLASTICITY			
		$\sigma_1$ psi	$\sigma_3$ psi	$\sigma_u$ psi	PLASTIC LIMIT %	PLASTICITY INDEX %	PLASTICITY INDEX %	
		$\sigma_1$ psi	$\sigma_3$ psi	$\sigma_u$ psi	PLASTIC LIMIT %	PLASTICITY INDEX %	PLASTICITY INDEX %	
0				4200			12.2	
5							14.8	
10								
15				6460	13.6	17.1	12.6	128
20				3510			14.0	122
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								

## BORING P-6I

SURFACE ELEVATION APPROXIMATELY 736

DEPTH  
(FEET)

### SYMBOLS

### DESCRIPTIONS

**FILL**  
Brown, silty clay, little fine to coarse sand, trace fine gravel, thin sand lenses and organics noted.  
4.0 feet, mottled brown and gray.  
8.5 feet, brownish-gray, clayey silt, some fine sand, fine gravel and sand seams noted.  
9.5 feet, gray, fine to medium sand, some silt.

**TOP OF WISCONSINAN TILL**  
Brown, silty clay, little fine to coarse sand, trace fine gravel, reddish-brown silt seams noted.  
18.5 feet, black organic material noted in silt seams.

13.5

BORING COMPLETED AT 20.0 FEET  
ON 5/5/76.

WATER LEVEL NOT ENCOUNTERED.

### NOTES

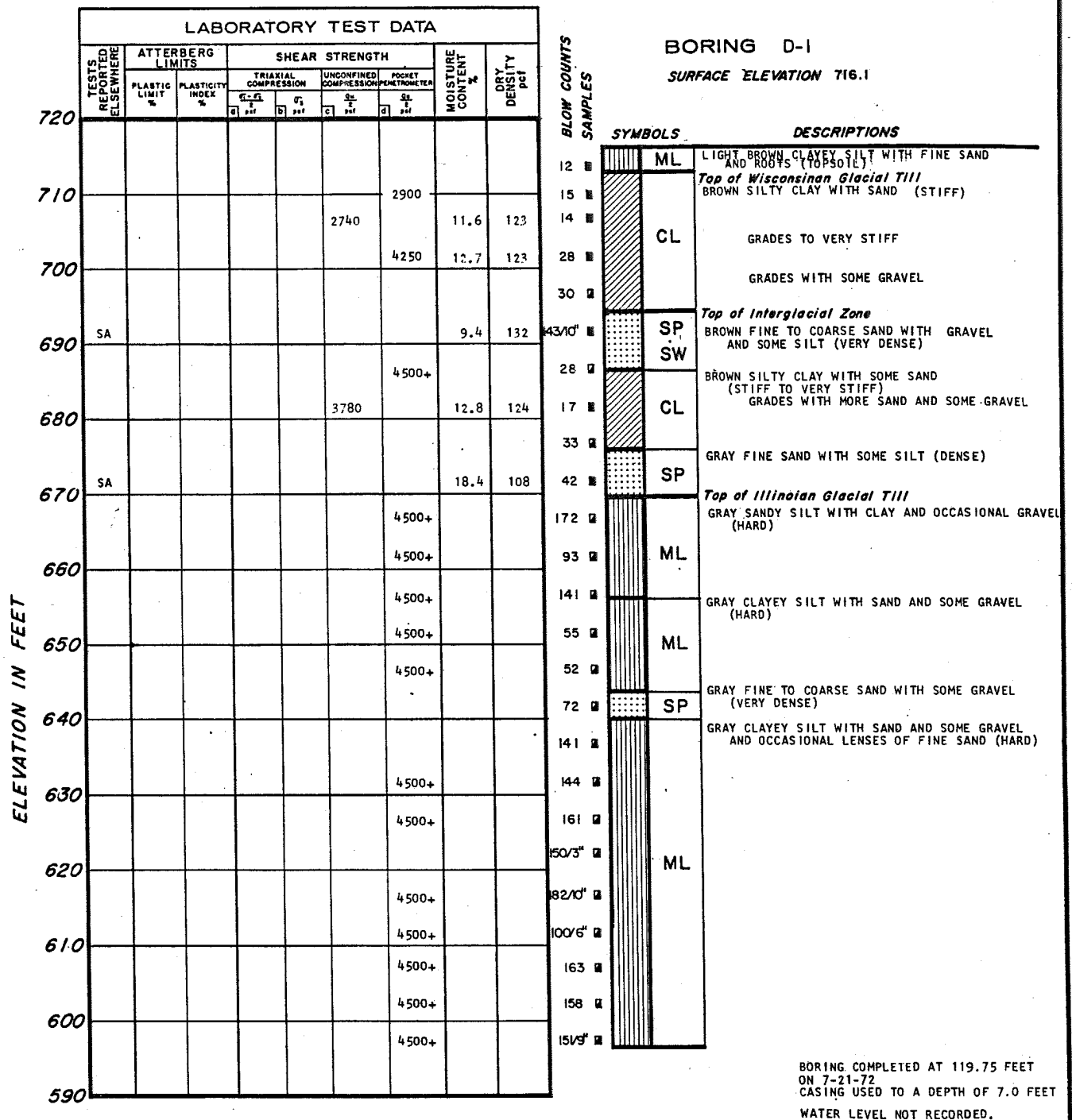
1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-72

LOG OF BORING P-6I

LOG OF BORING P-61A



NOTE:

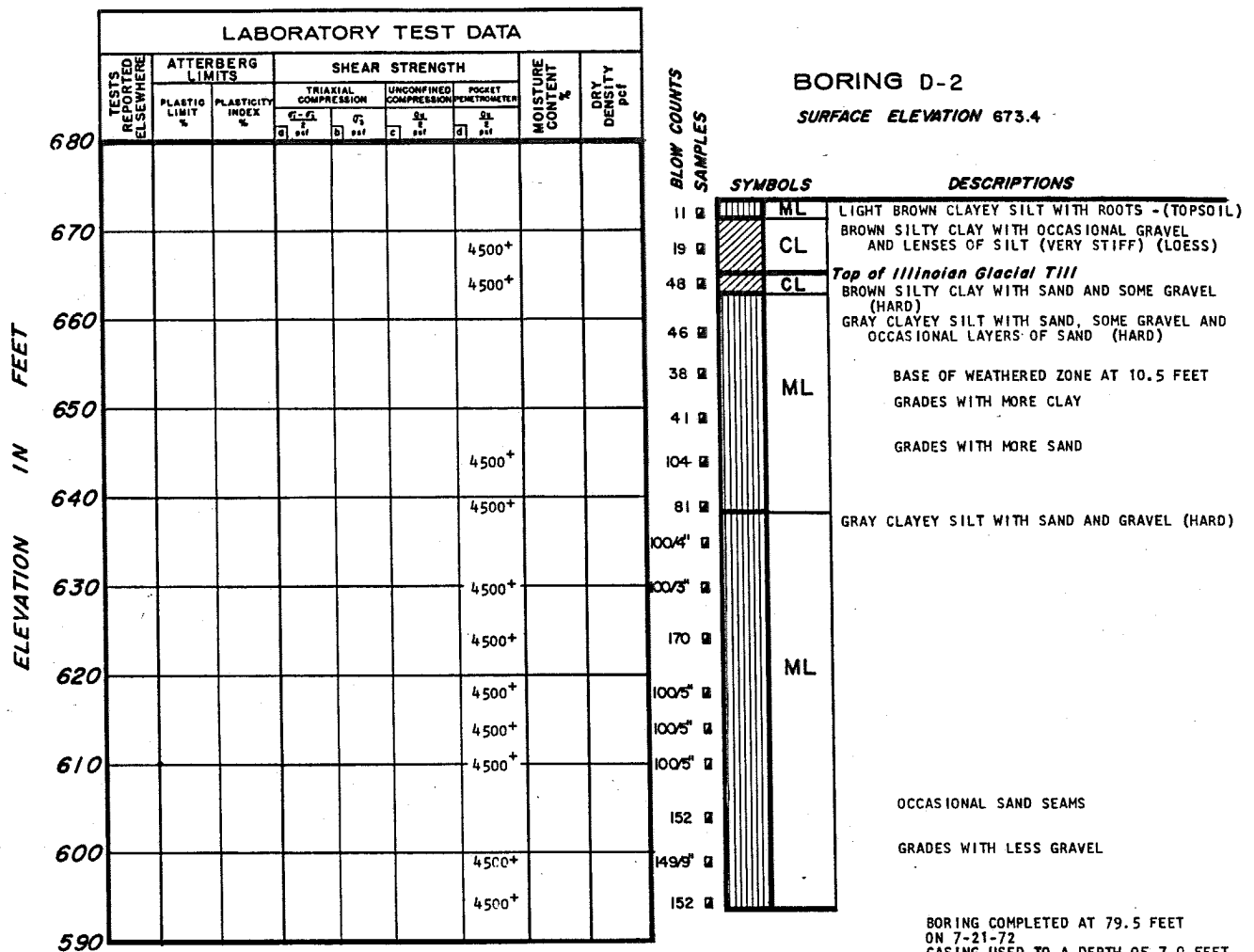
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-74

LOG OF BORING D-1





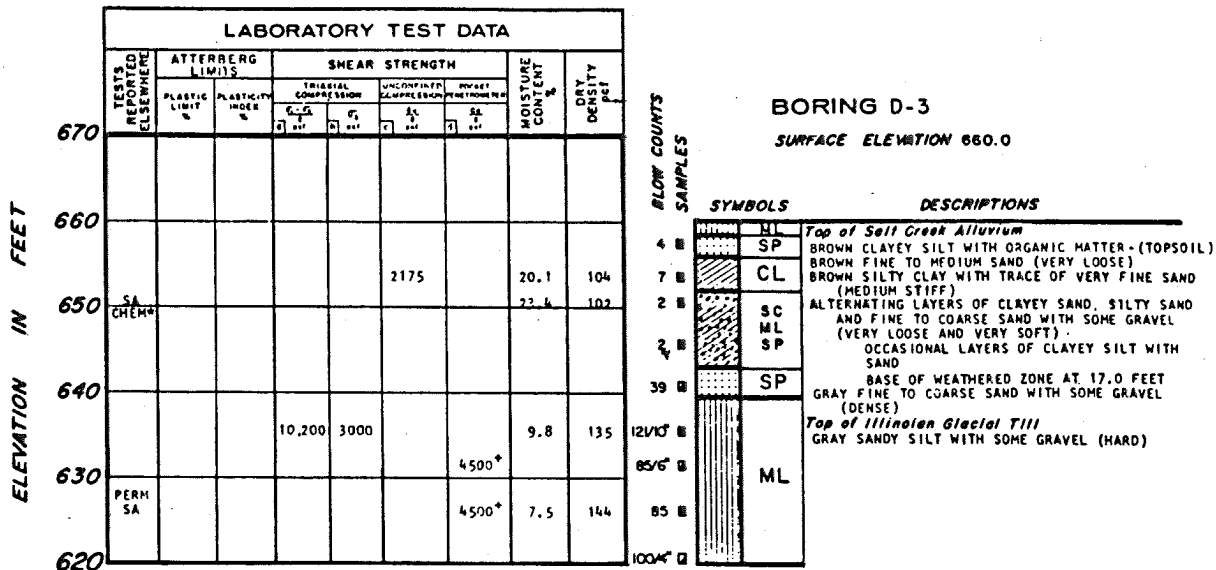
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-75

LOG OF BORING D-2



\* ON WATER SAMPLE OBTAINED ON 10-7-72

PIEZOMETER INSTALLED IN D-3A ON 7-13-72  
A 3/4" INCH PVC PIPE WITH THE LOWER END  
PLUGGED AND THE LOWER 5 FEET PERFORATED WAS  
PLACED AT ELEVATION 620.0. PEA GRAVEL  
WAS PLACED FROM ELEVATION 620.0 TO 630.0;  
A BENTONITE SEAL FROM ELEVATION 630.0 TO  
632.0; AND PEA GRAVEL AND CEMENT GROUT  
FROM ELEVATION 632.0 TO 660.0.

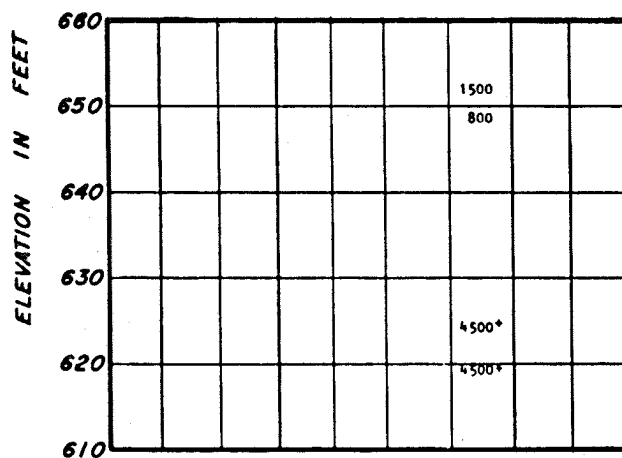
PIEZOMETER INSTALLED IN D-3B ON 7-13-72  
BORING D-3B WAS LOCATED 6 FEET FROM D-3A  
AND WAS DRILLED TO A DEPTH OF 20.5 FEET.  
A 3/4" INCH PVC PIPE WITH THE LOWER END  
PLUGGED AND THE LOWER 5 FEET PERFORATED WAS  
PLACED AT ELEVATION 639.5. PEA GRAVEL  
WAS PLACED FROM ELEVATION 639.5 TO 649.5;  
A BENTONITE SEAL FROM ELEVATION 649.5  
TO 651.5; AND PEA GRAVEL AND CEMENT GROUT  
FROM ELEVATION 651.5 TO 660.0.

WATER LEVEL READINGS

DEPTH BELOW GROUND  
SURFACE IN FEET

TIP ELEVATION 620.0	TIP ELEVATION 639.5	DATE
9.7	9.9	8-3-72
10.0	10.3	8-15-72
11.0	11.5	9-6-72

REFER TO FIGURE 2.4-37 FOR  
WATER LEVEL OBSERVATIONS.

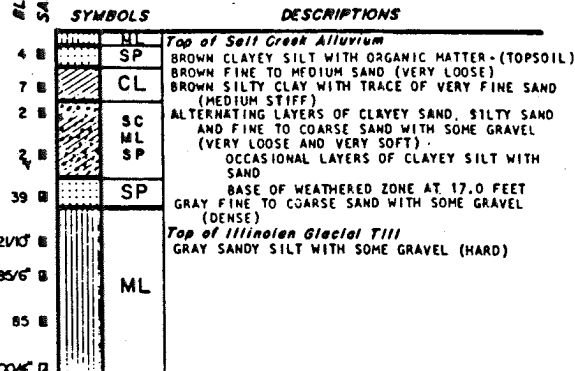


NOTE:

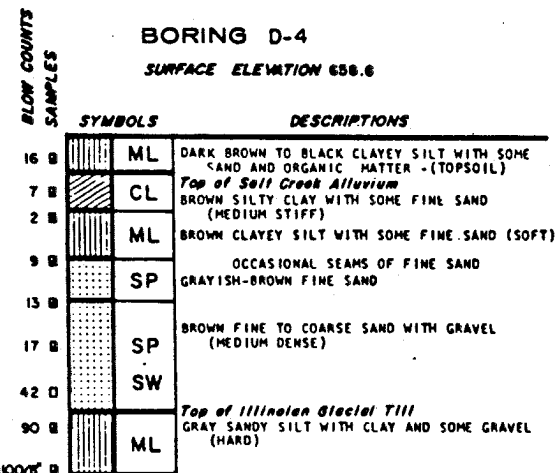
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## BORING D-3

SURFACE ELEVATION 660.0



BORING COMPLETED AT 40.0 FEET  
ON 7-13-72  
CASING USED TO A DEPTH OF 20.0 FEET



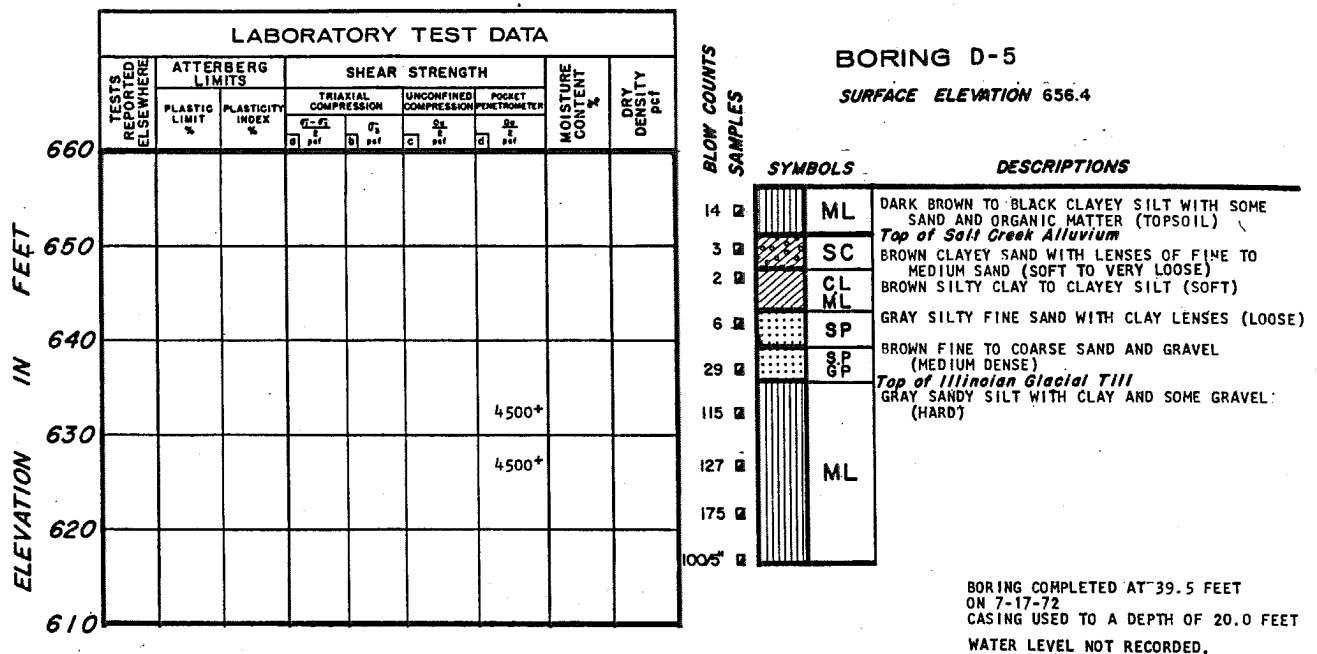
BORING COMPLETED AT 39.5 FEET  
ON 7-14-77  
CASING USED TO A DEPTH OF 20.0 FEET  
WATER LEVEL NOT RECORDED.

## CLINTON POWER STATION

### UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-76

LOG OF BORINGS D-3 AND D-4



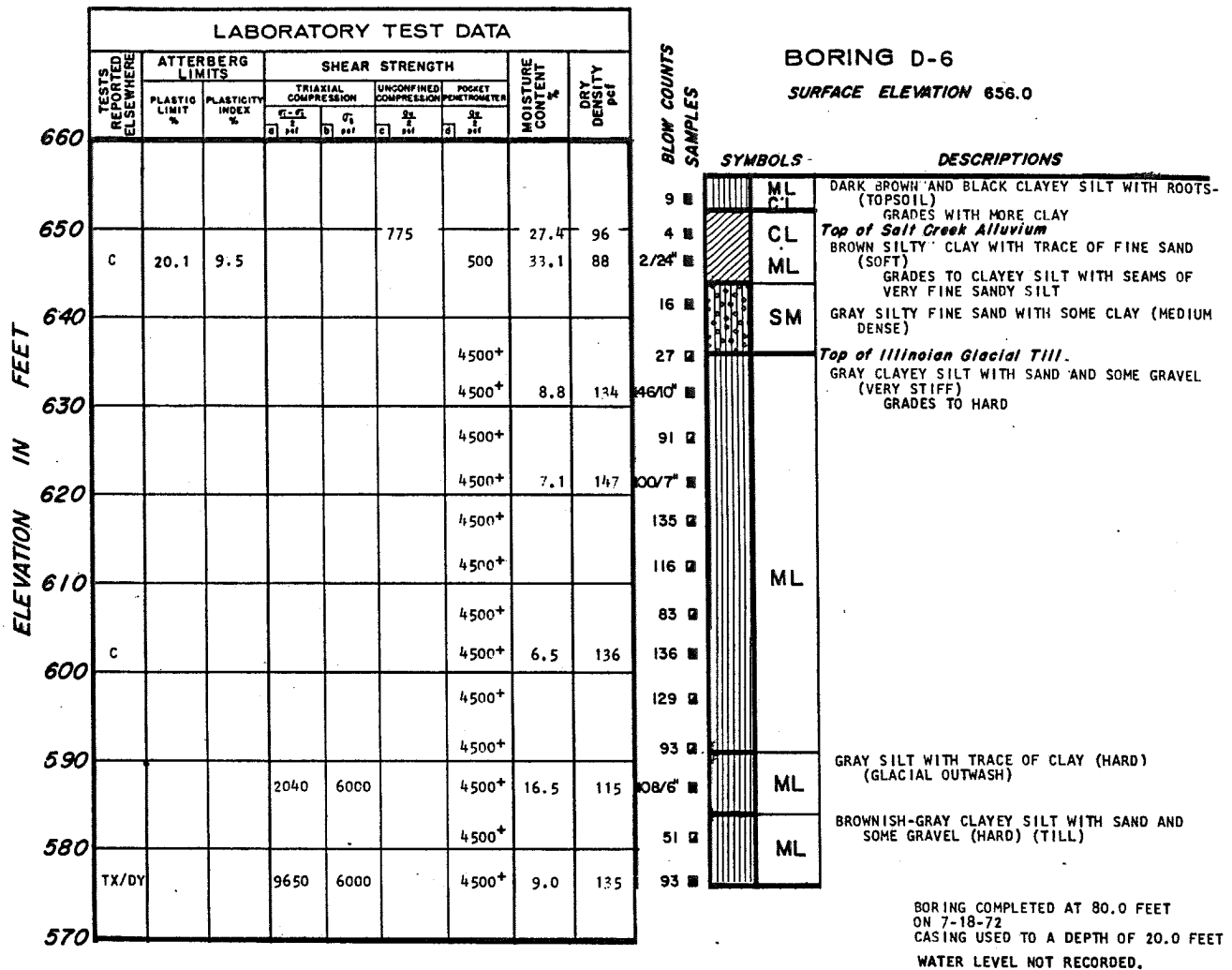
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-77

LOG OF BORING D-5

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



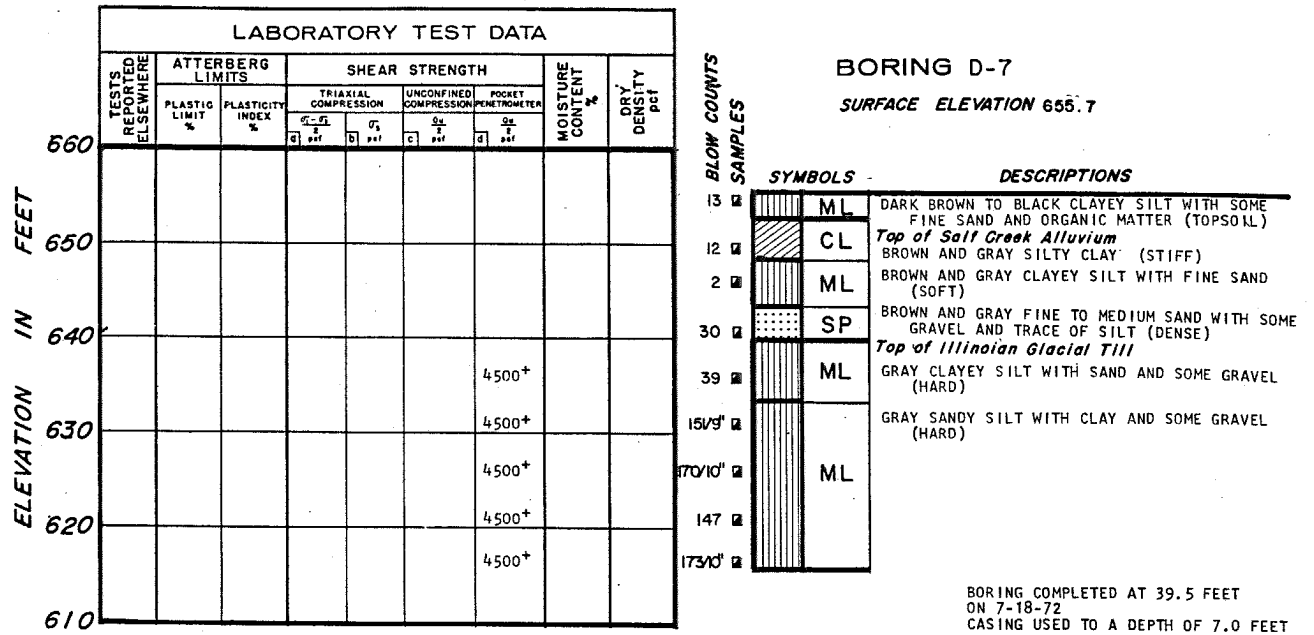
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-78

LOG OF BORING D-6



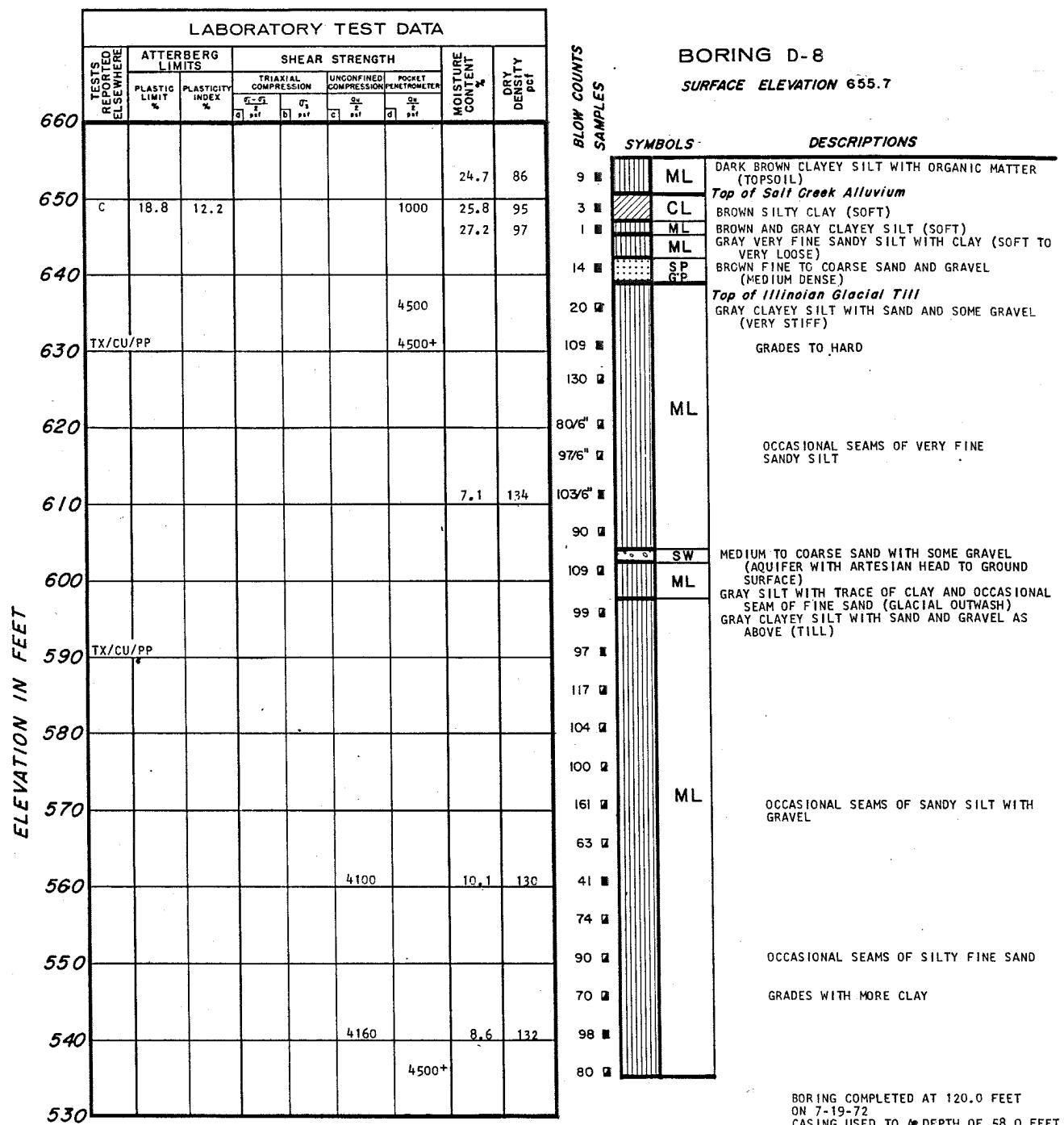
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-79

LOG OF BORING D-7



PIEZOMETER INSTALLED IN D-8 ON 7-19-72  
BORING D-88 WAS LOCATED ADJACENT TO  
8A AND WAS DRILLED TO A DEPTH OF 16.0 FEET  
A 3/4 INCH PVC PIPE WITH THE LOWER END  
PLUGGED AND THE LOWER 5 FEET PERFORATED  
WAS PLACED AT ELEVATION 639.7. PEA  
GRAVEL WAS PLACED FROM ELEVATION 639.7  
TO 654.2 AND CEMENT GROUT FROM ELEVATION  
654.2 TO 655.7.

#### WATER LEVEL READINGS

DEPTH BELOW GROUND  
SURFACE IN FEET

5.9  
6.2  
7.8

DATE

8-3-72  
8-15-72  
9-6-72

REFER TO FIGURE 2.4-37 FOR  
WATER LEVEL OBSERVATIONS.

#### NOTE:

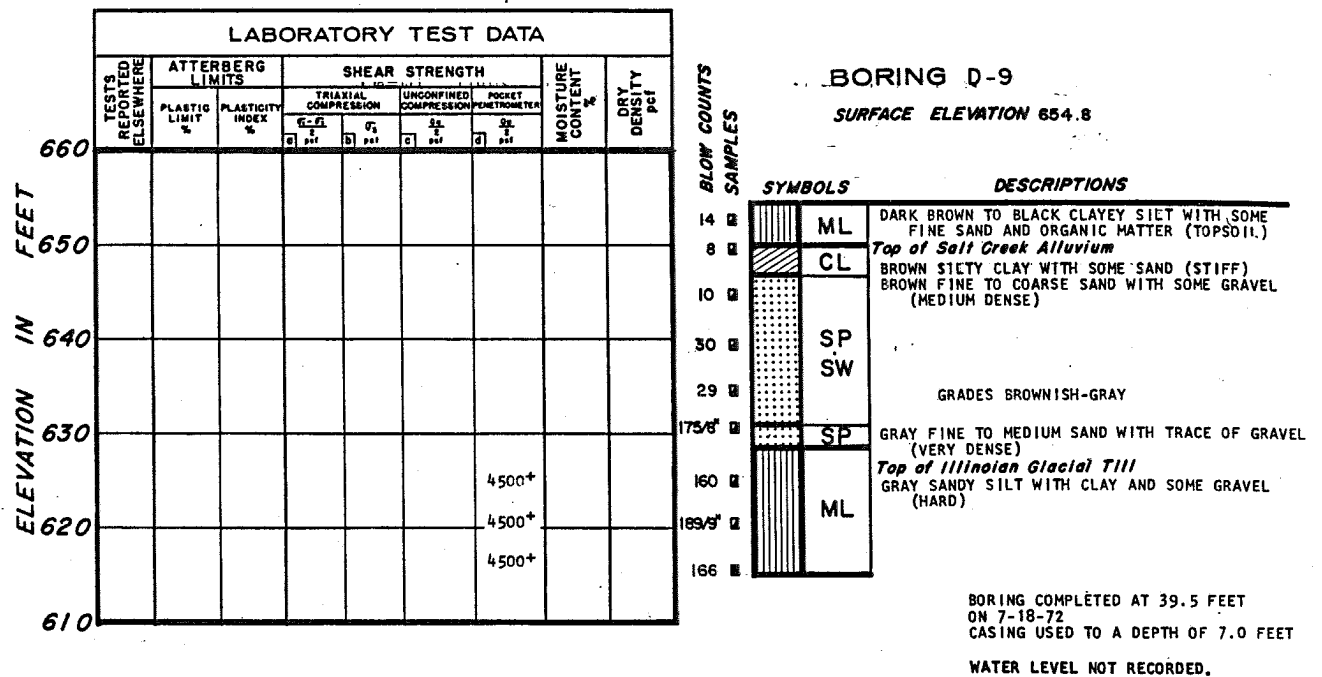
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-80

LOG OF BORING D-8

BORING COMPLETED AT 120.0 FEET  
ON 7-19-72  
CASING USED TO A DEPTH OF 58.0 FEET



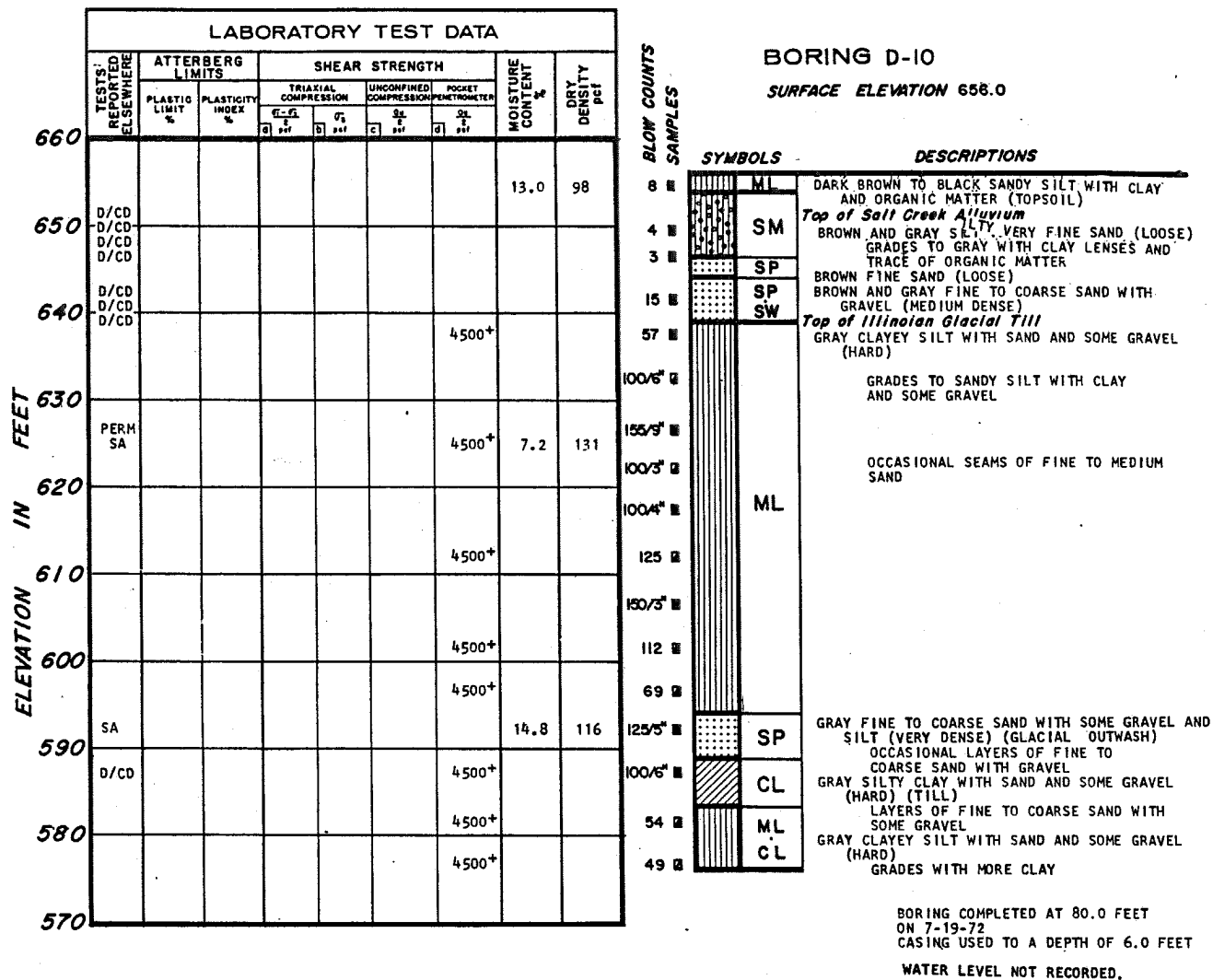
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-81

LOG OF BORING D-9

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

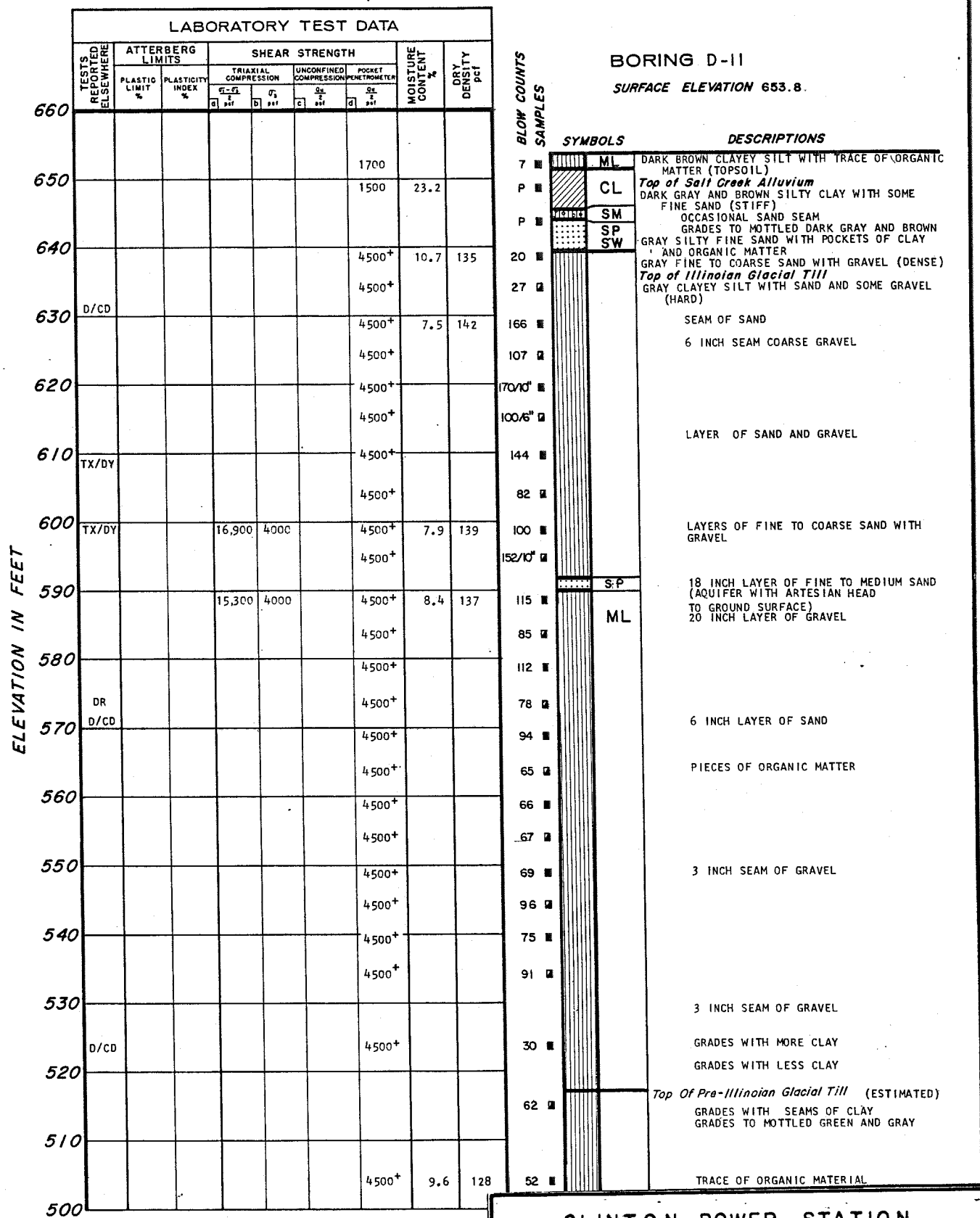
FIGURE 2.5-82

LOG OF BORING D-10

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





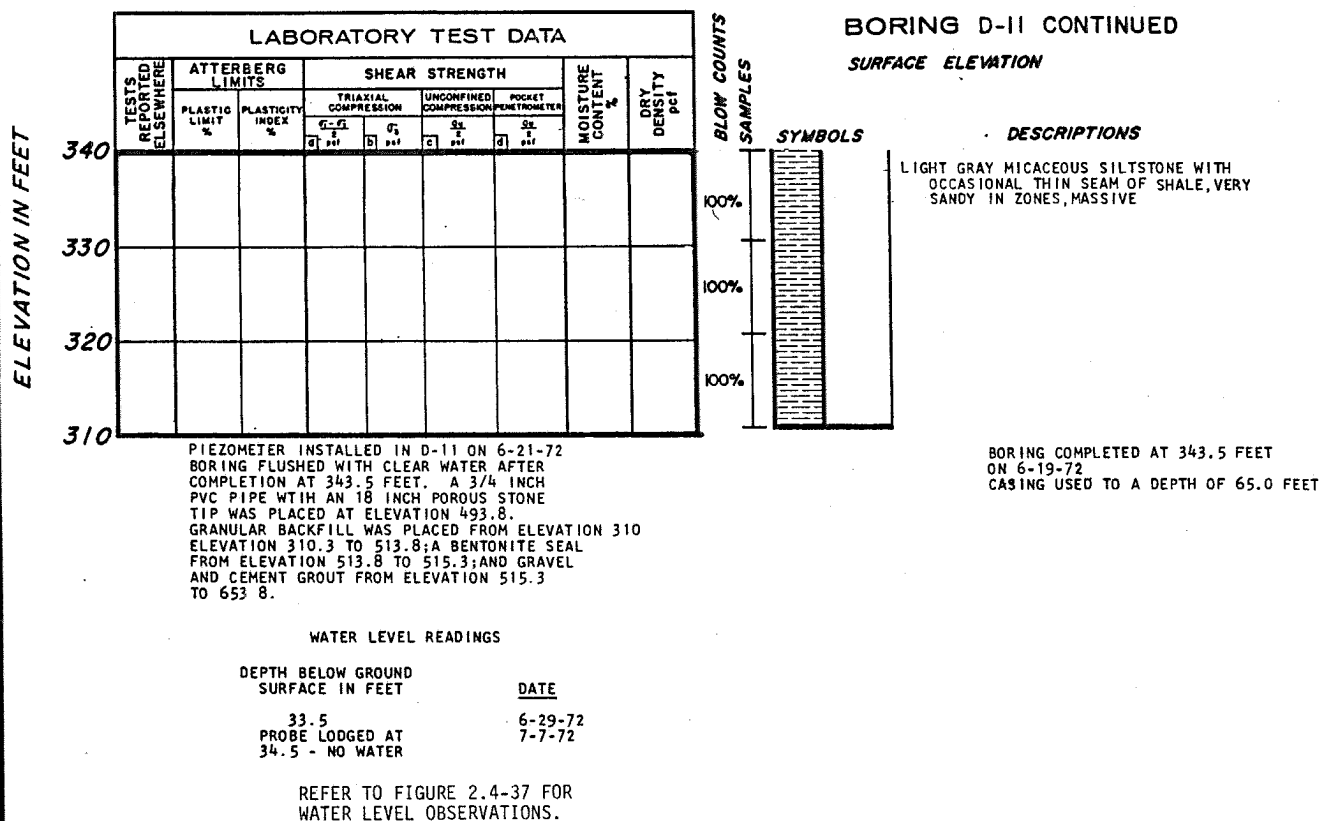
BORING CONTINUED

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-83

LOG OF BORING D-11  
(SHEET 1 of 3)



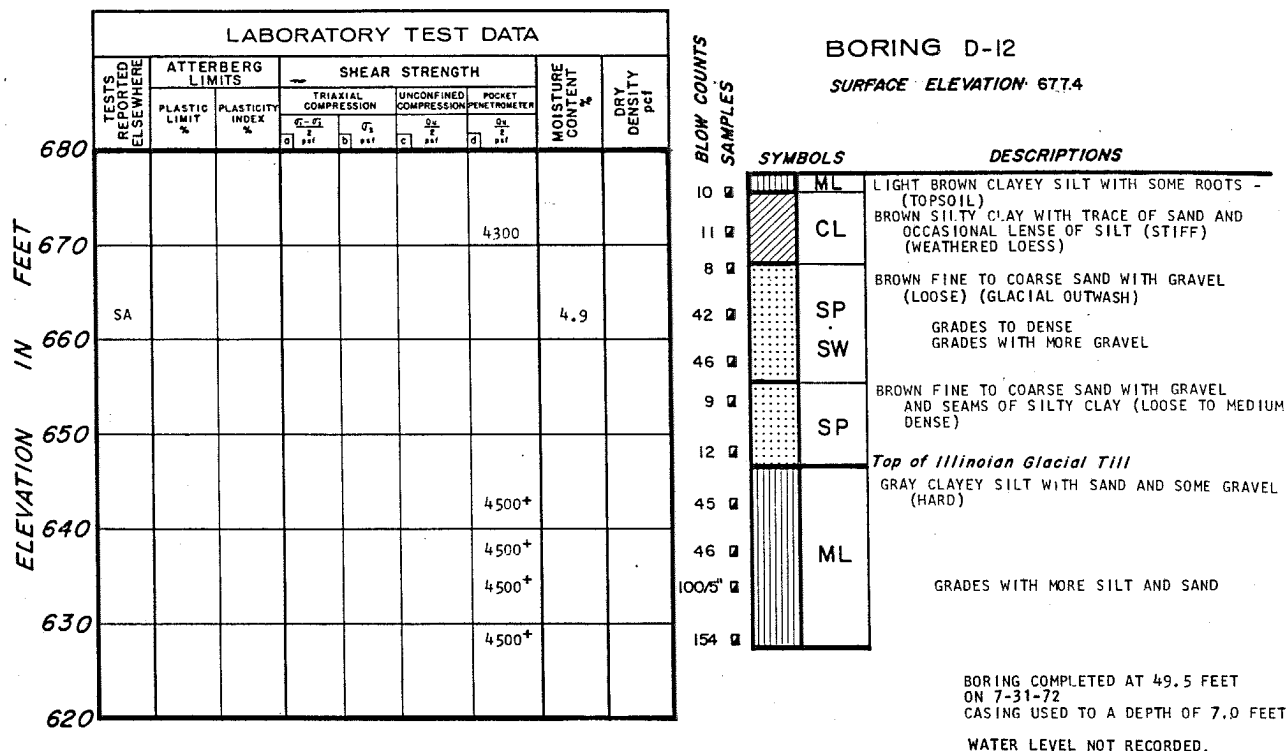


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-83

LOG OF BORING D-11  
(SHEET 3 of 3)

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

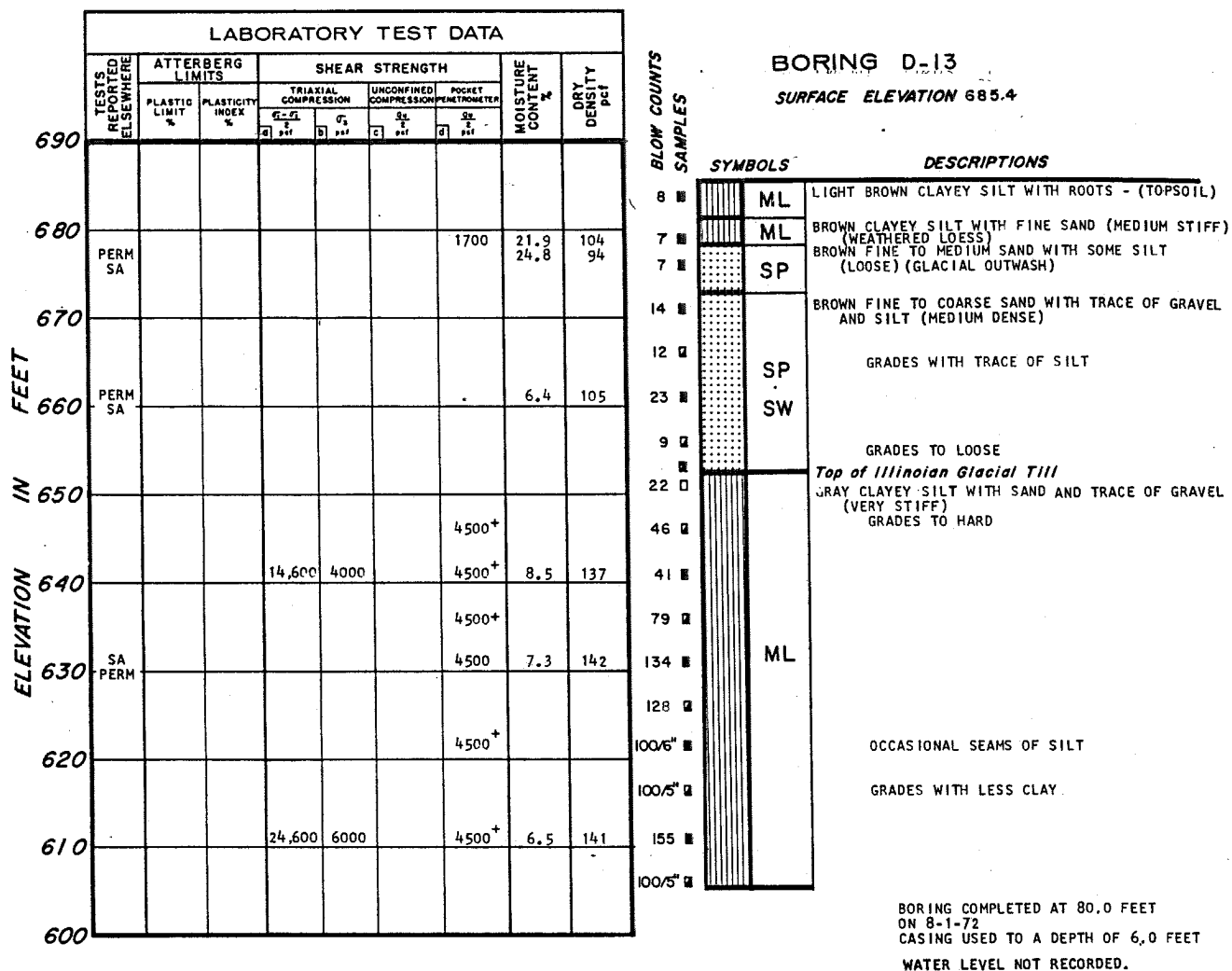


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-84

LOG OF BORING D-12

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



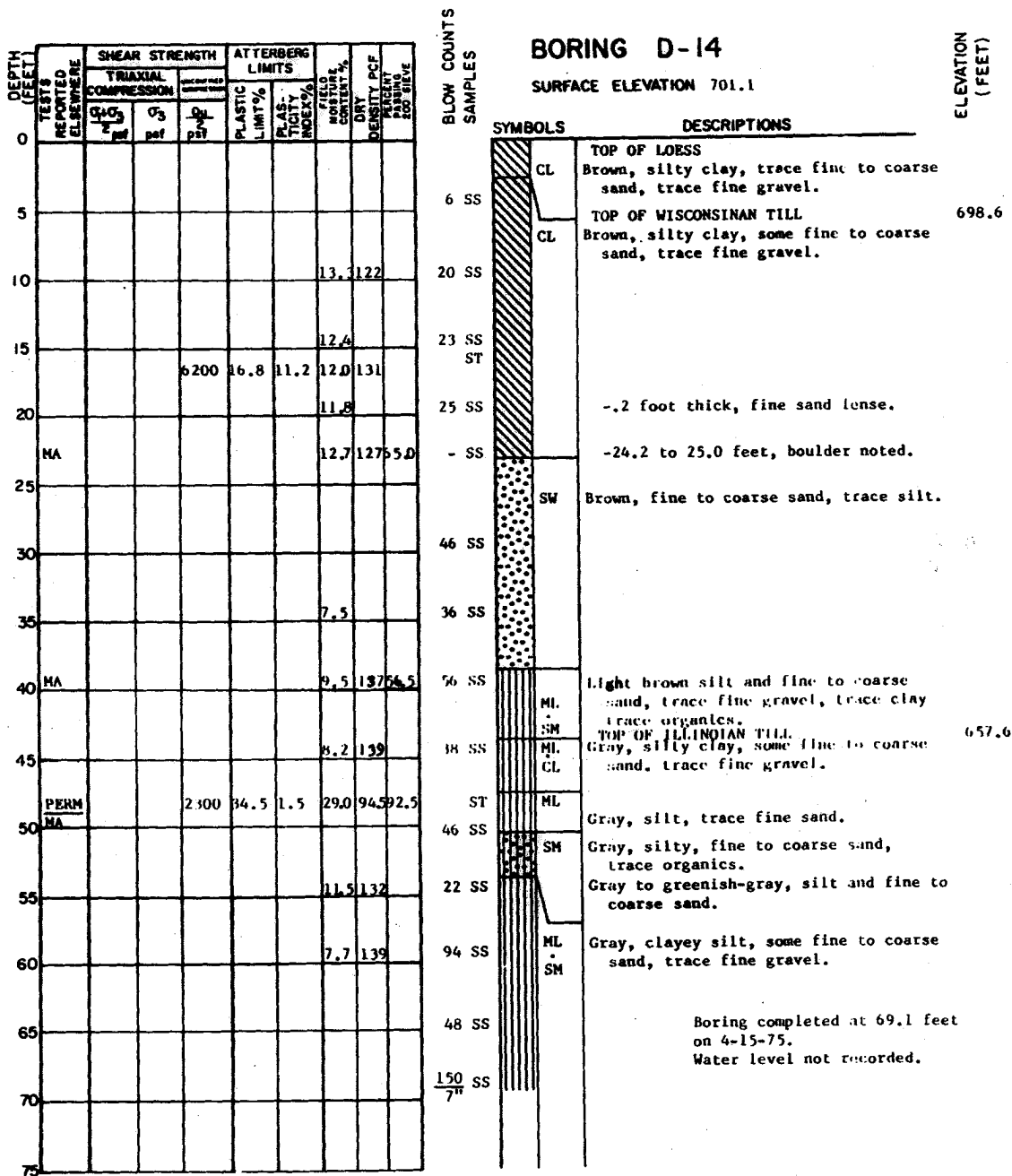
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-85

LOG OF BORING D-13

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



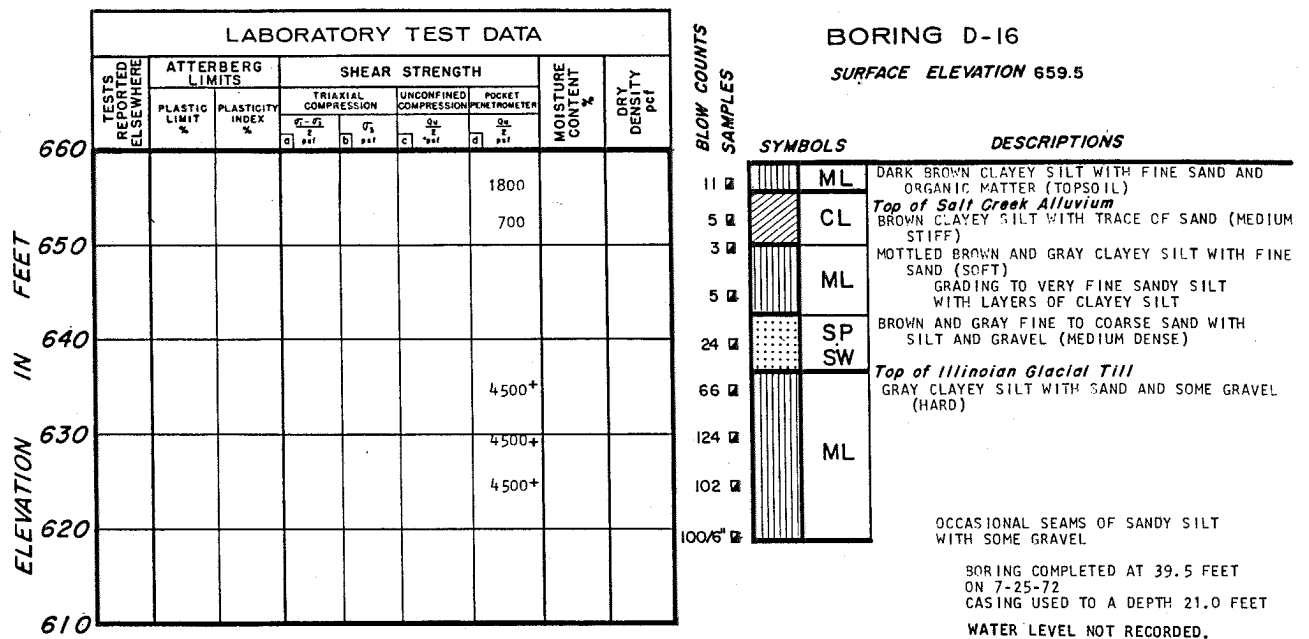
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-86

LOG OF BORING D-14



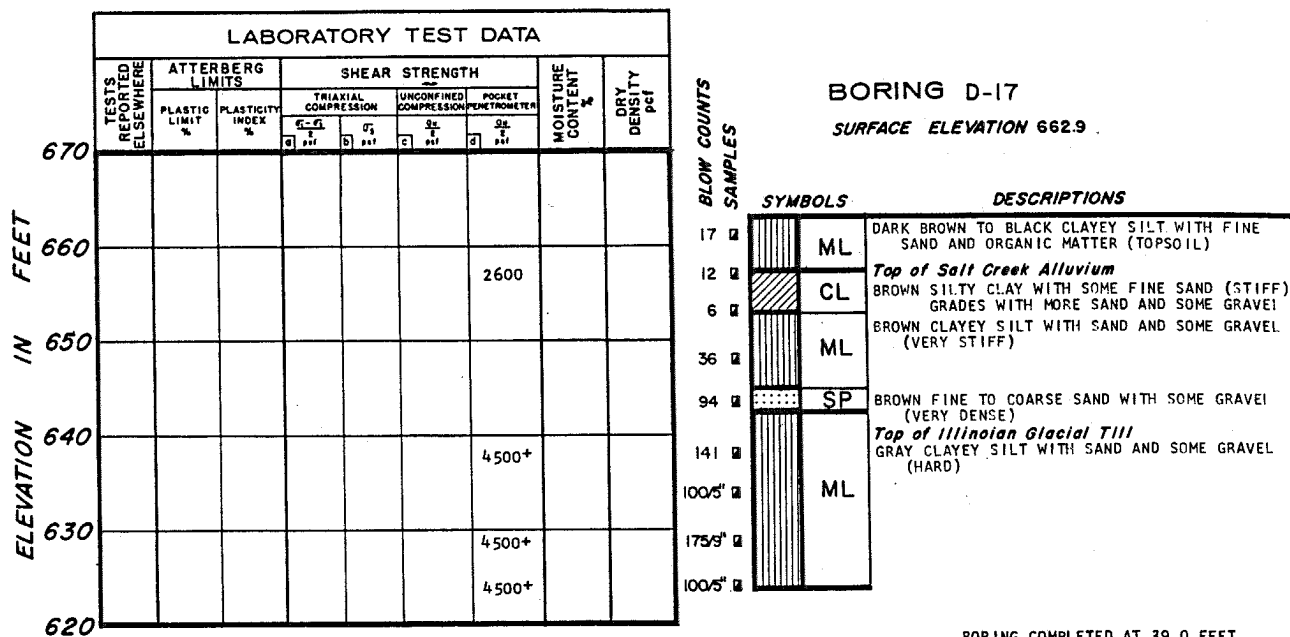
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-87

LOG OF BORING D-16

**NOTE:**

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



BORING COMPLETED AT 39.0 FEET  
ON 7-13-72  
CASING USED TO A DEPTH OF 7.0 FEET  
WATER LEVEL NOT RECORDED.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-88

LOG OF BORING D-17

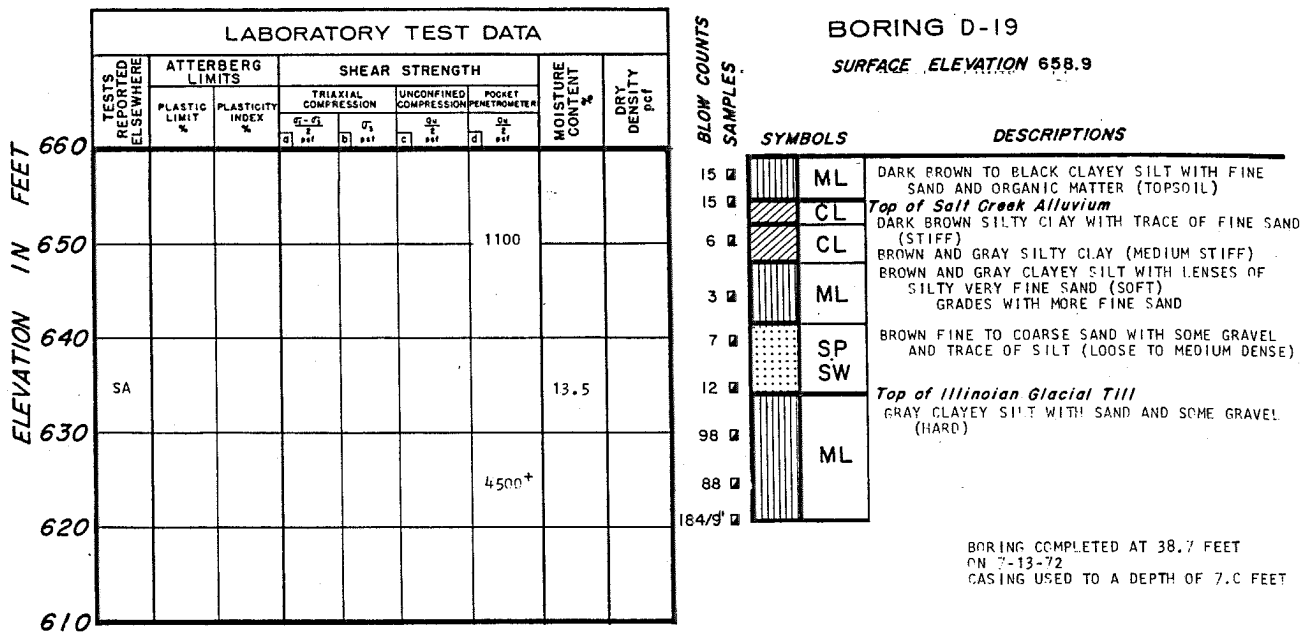
NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



# CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

LOG OF BORING D-18

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



PIEZOMETERS INSTALLED IN D-19B ON 7-13-72  
BORING D-19B WAS DRILLED TO 38.0 FEET  
ADJACENT TO D-19A AND WAS FLUSHED WITH  
CLEAN WATER AFTER COMPLETION. A 3/4  
INCH PVC PIPE WITH A POROUS STONE TIP WAS  
PLACED AT ELEVATION 620.9. PEA GRAVEL  
WAS PLACED FROM ELEVATION 620.9 TO 625.9.  
A BENTONITE SEAL FROM 625.9 TO 628.9,  
AND PEA GRAVEL FROM 628.9 TO 630.9.  
A 3/4 INCH PVC PIPE WITH A POROUS STONE TIP  
WAS PLACED AT ELEVATION 630.9. PEA  
GRAVEL WAS PLACED FROM ELEVATION 630.9  
TO 635.9; A BENTONITE SEAL FROM ELEVATION  
635.9 TO 637.1; AND GRAVEL FROM ELEVATION  
637.1 TO 658.9.

#### WATER LEVEL READINGS

DEPTH BELOW GROUND  
SURFACE IN FEET

TIP ELEVATION 620.9	TIP ELEVATION 630.9	DATE
8.9	8.8	8-8-72
9.7	10.0	8-22-72
10.5	10.5	9-6-72

REFER TO FIGURE 2.4-37 FOR  
WATER LEVEL OBSERVATIONS.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT












FIGURE 2.5-90

LOG OF BORING D-19

#### NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

A blank graph grid for plotting elevation data. The vertical axis is labeled "ELEVATION IN FEET" and ranges from 610 to 660 in increments of 10. The horizontal axis is labeled "DISTANCE IN KILOMETERS" and ranges from 0 to 10 in increments of 1. The grid consists of 10 columns and 5 rows of squares.

BLOW COUNTS BLOW SAMPLES	SYMBOLS		DESCRIPTIONS
9		ML	DARK BROWN CLAYEY SILT WITH ORGANIC MATTER -(TOPSOIL)
		CL	<i>Top of Salt Creek Alluvium</i>
2		ML	BROWN SILTY CLAY WITH SOME SAND (STIFF)
1		CL	MOTTLED BROWN AND GRAY CLAYEY SILT AND SILTY CLAY (SOFT)
		SP	BROWN AND GRAY FINE TO COARSE SAND WITH SOME GRAVEL (VERY LOOSE)
29		SW	GRADES TO MEDIUM DENSE GRADES WITH MORE GRAVEL
33		ML	<i>Top of Illinoian Glacial Till</i> GRAY CLAYEY SILT WITH SAND AND SOME GRAVEL (HARD)
100/7"			OCCASIONAL SEAMS OF SAND
100/2"			SEAMS OF SILTY VERY FINE SAND GRAY CLAYEY SILT WITH SAND AND SOME GRAVEL (HARD)
100/4"			
105/4"		ML	

BORING COMPLETED AT 40.0 FEET  
ON 7-25-72  
CASING USED TO A DEPTH OF 21.0 FEET  
WATER LEVEL NOT RECORDED.

BLOW COUNTS SAMPLES		BORING D-21		SURFACE ELEVATION 656.0	
		SYMBOLS		DESCRIPTIONS	
11	█		ML	DARK BROWN TO BLACK CLAYEY SILT WITH FINE SAND AND ORGANIC MATTER - (TOPSOIL)	
12	█		CL	<i>Top of Salt Creek Alluvium</i> BROWN AND GRAY SILTY CLAY (STIFF)	
10	█		SP	BROWN FINE TO MEDIUM SAND WITH TRACE OF COARSE SAND AND GRAVEL (MEDIUM DENSE)	
42	█		ML	<i>Top of Illinoian Glacial Till</i> GRAY CLAYEY SILT WITH SAND AND SOME GRAVEL (HARD)	
80	█			GRADES WITH OCCASIONAL SEAMS OF SAND AND GRAVEL	
89	█				
185	█				
100/6"	█				
188	█				

BORING COMPLETED AT 40.0 FEET  
ON 7-14-72  
CASING USED TO A DEPTH OF 7.0 FEET,  
WATER LEVEL NOT RECORDED.

## LOG OF BORINGS D-20 AND D-21

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

LABORATORY TEST DATA									
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf	
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION				POCKET PENETROMETER
			$\frac{\sigma_1 - \sigma_3}{2}$ psf	$\sigma_3$ psf	$\frac{S_u}{2}$ psf	$\frac{S_u}{2}$ psf			
660									
650							900		
640									
630									
620							4500 <sup>+</sup>		
							4500 <sup>+</sup>		
							4500 <sup>+</sup>		
610									

## BORING D-22

SURFACE ELEVATION 654.7

BLOW COUNTS  
SAMPLES

### SYMBOLS

### DESCRIPTIONS

8	ML	DARK BROWN TO BLACK CLAYEY SILT WITH SOME FINE SAND AND ORGANIC MATTER - (TOPSOIL)
1	CL	Top of Salt Creek Alluvium
1	SP	BROWN SILTY CLAY WITH SOME SAND (VERY SOFT TO SOFT)
23	SP	BROWN FINE TO MEDIUM SAND WITH TRACE OF SILT (VERY LOOSE)
20	SW	BROWN AND GRAY FINE TO COARSE SAND WITH GRAVEL (MEDIUM DENSE)
95	SM	Top of Illinoian Glacial Till
105	SM	GRAY SILTY FINE TO COARSE SAND WITH SOME GRAVEL AND TRACE OF CLAY (VERY DENSE)
100/9'	ML	GRAY CLAYEY SILT WITH SAND AND SOME GRAVEL (HARD)
100/6"	ML	

BORING COMPLETED AT 39.5 FEET  
ON 7-21-72  
CASING USED TO A DEPTH OF 19.0 FEET  
WATER LEVEL NOT RECORDED.

660									
650							1300		
640									
630							4500 <sup>+</sup>		
620							4500 <sup>+</sup>		
610							4500 <sup>+</sup>		

BLOW COUNTS  
SAMPLES

## BORING D-23

SURFACE ELEVATION 655.8

### SYMBOLS

### DESCRIPTIONS

7	ML	DARK BROWN TO BLACK CLAYEY SILT WITH FINE SAND AND ORGANIC MATTER - (TOPSOIL)
9	CL	Top of Salt Creek Alluvium
2	ML	BROWN AND GRAY SILTY CLAY WITH SOME VERY FINE SAND (MEDIUM STIFF)
18	SP	BROWN AND GRAY CLAYEY SILT (VERY SOFT TO SOFT)
29	SP	BROWN FINE TO COARSE SAND WITH SOME GRAVEL (MEDIUM DENSE)
45	SP	Top of Illinoian Glacial Till
160/9'	ML	GRAY CLAYEY SILT WITH SAND AND SOME GRAVEL (HARD)
135	ML	GRADES WITH LESS CLAY
100/5"	ML	
100/6"	ML	

BORING COMPLETED AT 39.0 FEET  
ON 7-14-72  
CASING USED TO A DEPTH OF 7.0 FEET

PIEZOMETERS INSTALLED IN D-23 ON 7-14-72  
BORING D-23B WAS DRILLED TO 35.0 FEET  
ADJACENT TO D-23A AND WAS FLUSHED WITH  
CLEAN WATER AFTER COMPLETION. A BENTONITE  
SEAL WAS PLACED FROM ELEVATION 620.8 TO  
624.3, AND A 3/4 INCH PVC PIPE WITH A POROUS STONE  
STONE TIP WAS PLACED AT ELEVATION 624.3.  
PEA GRAVEL WAS PLACED FROM ELEVATION 624.3  
TO 630.8 AND A BENTONITE SEAL FROM ELEVATION  
630.8 TO 639.8. A 3/4 INCH PVC PIPE WITH  
A POROUS STONE TIP WAS PLACED AT ELEVATION  
641.0. PEA GRAVEL WAS PLACED FROM ELEVATION  
639.8 TO 644.3; A BENTONITE SEAL FROM ELEVATION  
644.3 TO 652.8; AND CONCRETE FROM ELEVATION  
652.8 TO 655.8.

### WATER LEVEL READINGS

DEPTH BELOW GROUND  
SURFACE IN FEET

TIP ELEVATION 624.3

T+P ELEVATION 641.0

DATE

4.9  
5.3  
6.0

6.4  
6.9  
8.4

8-8-72  
8-22-72  
9-6-72

REFER TO FIGURE 2.4-37 FOR  
WATER LEVEL OBSERVATIONS.

### NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-92

LOG OF BORINGS D-22 AND D-23

LABORATORY TEST DATA									
ELEVATION IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf
		PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION	POCKET PENETROMETER		
				$\frac{\sigma_1 - \sigma_3}{2}$ a psi	$\sigma_3$ b psi	$\frac{\sigma_u}{2}$ c psi	$\frac{q_u}{1}$ d psi		
660									
650	D/CD D/CD D/CD D/CD								
640	D/CD D/CD								
630	PERM SA						4500 <sup>+</sup>	7.4	123
620							4500 <sup>+</sup> 4500 <sup>+</sup>		
610							4500 <sup>+</sup>		

**BORING D-24**  
SURFACE ELEVATION 655.0

BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS
8	ML	DARK BROWN CLAYEY SILT WITH SAND AND ORGANIC MATTER - (TOPSOIL)
2	ML	<i>Top of Salt Creek Alluvium</i>
5	SP	DARK BROWN SANDY SILT WITH CLAY (MEDIUM STIFF)
7	SP	BROWN FINE SAND WITH TRACE OF SILT (VERY LOOSE)
70	SP	GRAY FINE SAND WITH SEAMS OF CLAY (LOOSE)
76	SP	BROWNISH-GRAY FINE TO COARSE SAND WITH GRAVEL (LOOSE)
150	SP	LAYER OF CLAYEY SILT WITH SAND AND SOME GRAVEL
100/5"	SP	GRAY FINE TO MEDIUM SAND (VERY DENSE)
94/6"	ML	<i>Top of Illinoian Glacial Till</i> GRAY CLAYEY SILT WITH SAND AND TRACE OF GRAVEL (HARD)

BORING COMPLETED AT 39.5 FEET  
ON 7-24-72  
CASING USED TO A DEPTH OF 18.5 FEET  
WATER LEVEL NOT RECORDED.

ELEVATION IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS	SHEAR STRENGTH	MOISTURE CONTENT %	DRY DENSITY PCF
660					
650					
640					
630					
620					
610					

BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS
8	ML	DARK BROWN TO BLACK CLAYEY SILT WITH FINE SAND AND ORGANIC MATTER (TOPSOIL)
12	CL	<i>Top of Salt Creek Alluvium</i>
12	ML	BROWN AND GRAY SILTY CLAY (STIFF)
18	SM	BROWN CLAYEY SILT (SOFT)
60	SP	GRAY FINE SAND WITH SILT AND TRACE OF CLAY (MEDIUM DENSE)
154	SP	GRAY FINE TO COARSE SAND WITH SOME GRAVEL (MEDIUM DENSE)
180/9"	SP	GRADES TO VERY DENSE
161/9"	ML	<i>Top of Illinoian Glacial Till</i> GRAY CLAYEY SILT WITH SAND AND SOME GRAVEL (HARD)
100/6"	ML	

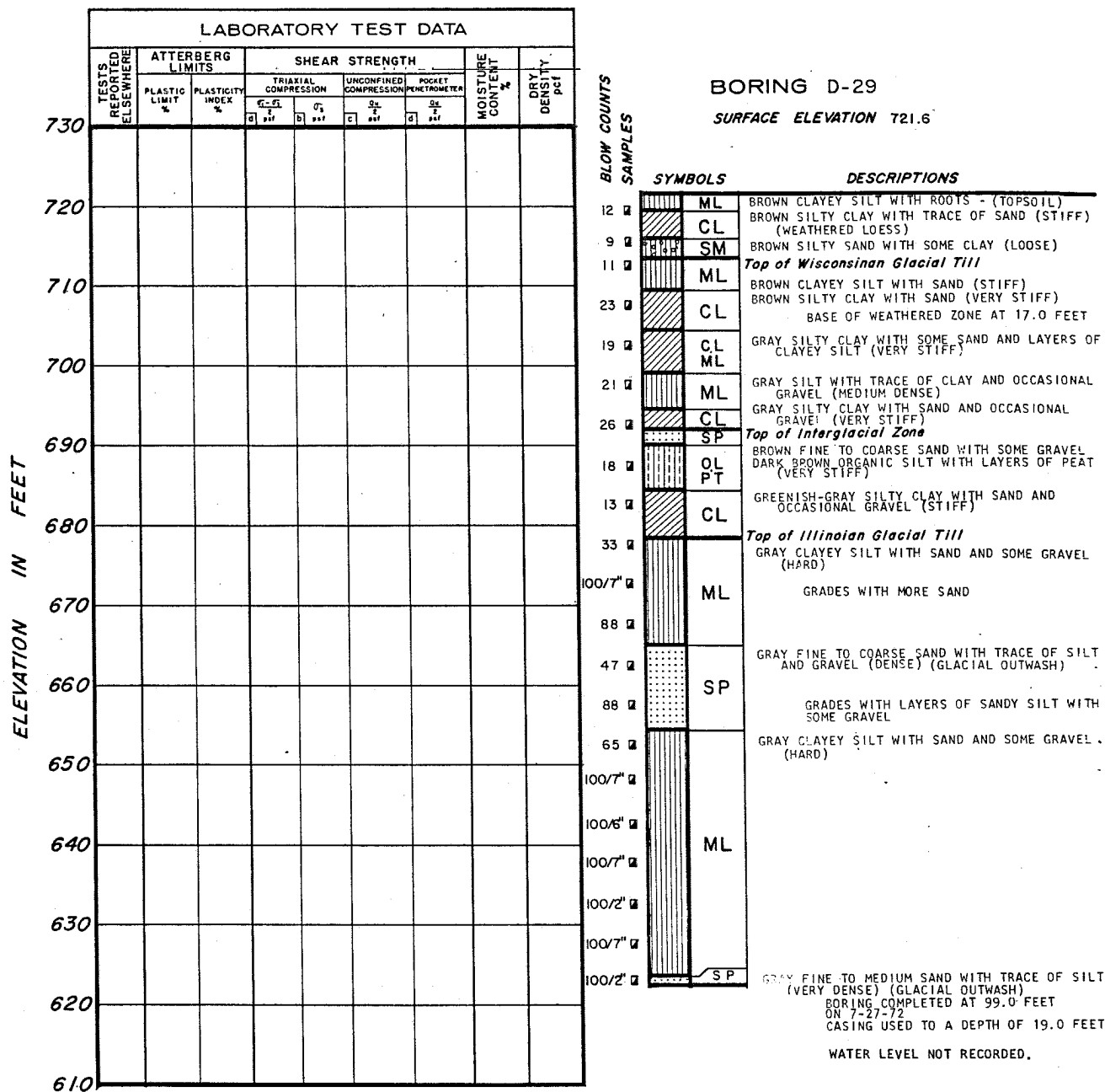
BORING COMPLETED AT 39.0 FEET  
ON 7-19-72  
CASING USED TO A DEPTH OF 7.0 FEET  
WATER LEVEL NOT RECORDED.

**CLINTON POWER STATION  
FINAL SAFETY ANALYSIS REPORT**

FIGURE 2.5-93

LOG OF BORINGS D-24 AND D-25

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



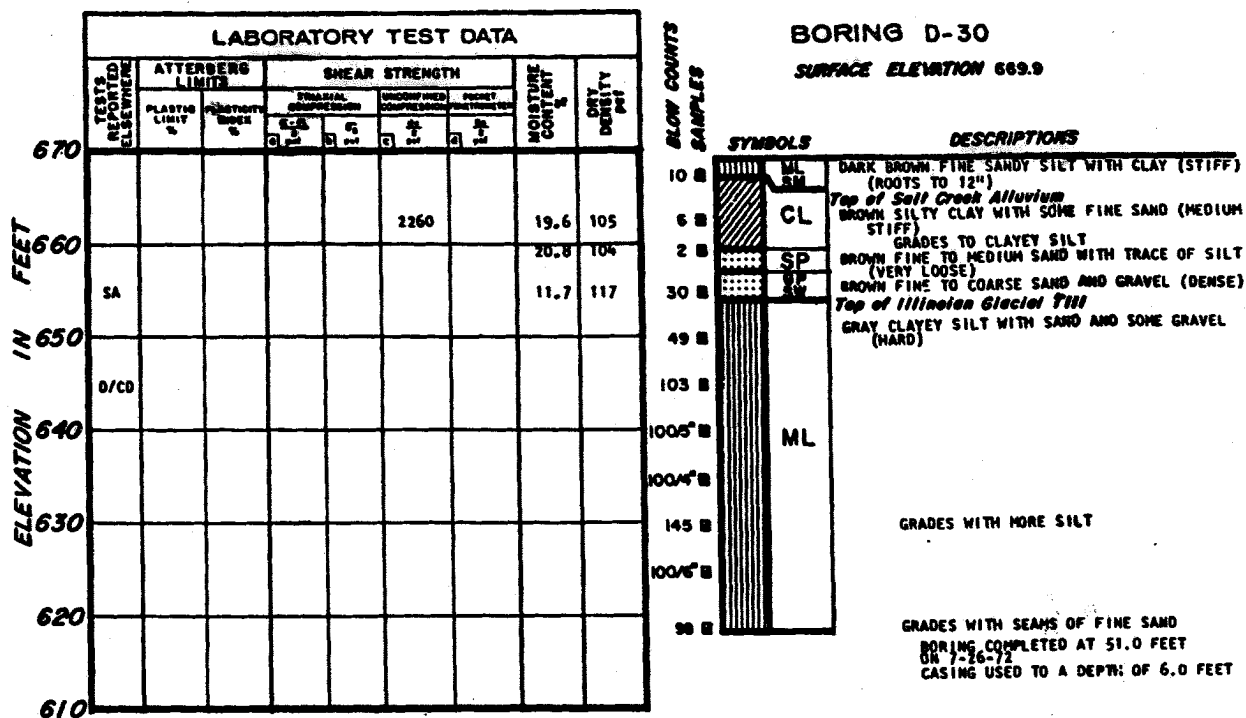
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-94

LOG OF BORING D-29

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



PIEZOMETER D-30A INSTALLED IN BOREING D-30 ON 7-27-72. A 3/4 INCH PVC PIPE WITH A POROUS STONE TIP WAS PLACED AT ELEVATION 620. PEA GRAVEL WAS PLACED FROM ELEVATION 620 TO 625. BENTONITE PLACED FROM 625 TO 627 AND CEMENT GROUT FROM ELEVATION 627 TO 669.9.

PIEZOMETER D-30B INSTALLED IN BOREING D-30B (DRILLED ADJACENT TO D-30A) ON 7-27-72. A 3/4 INCH PVC PIPE WITH A POROUS STONE TIP WAS PLACED AT ELEVATION 658. PEA GRAVEL WAS PLACED FROM ELEVATION 658 TO 666.4 AND CEMENT GROUT FROM ELEVATION 666.4 TO 669.9.

PIEZOMETER D-30C INSTALLED IN BOREING D-30C (DRILLED ADJACENT TO D-30A) ON 8-3-72. 15 FEET OF 4 INCH CASING WAS USED TO SEAL OFF THE SALT CREEK ALLUVIUM. A 3/4 INCH PVC PIPE WITH A POROUS STONE TIP WAS PLACED FROM ELEVATION 680. PEA GRAVEL WAS PLACED FROM ELEVATION 620 TO 625. A BENTONITE SEAL FROM ELEVATION 625 TO 627 AND CEMENT GROUT FROM ELEVATION 627 TO 669.9.

#### WATER LEVEL READINGS

(DEPTH BELOW GROUND SURFACE IN FEET)

D-30A	D-30B	D-30C	DATE
9.7	9.6	42.3	8-8-72
10.0	10.0	41.9	8-22-72
10.0	10.0	41.8	9-6-72

REFER TO FIGURE 2.4-37 FOR  
WATER LEVEL OBSERVATIONS.

**CLINTON POWER STATION**  
**UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-95

LOG OF BOREING D-30

\* ON WATER SAMPLE OBTAINED ON 10-7-72

BORING CONTINUED

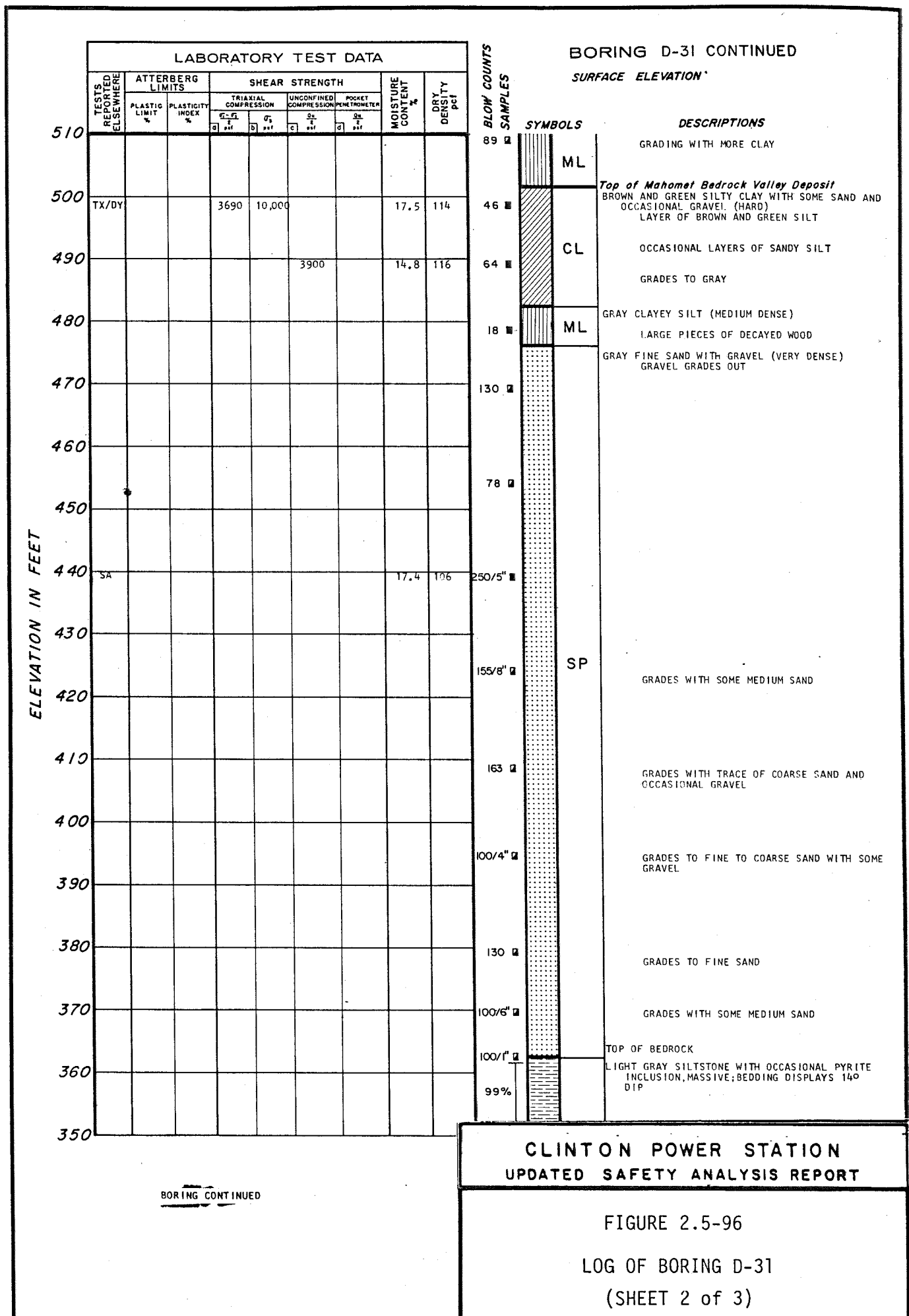
# CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

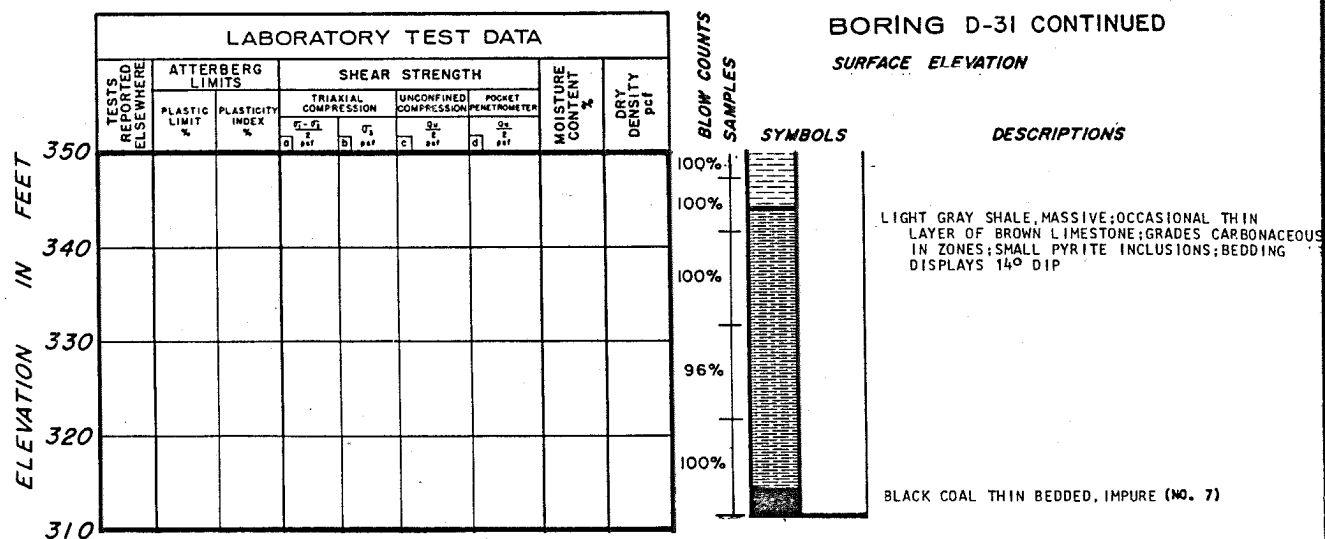
FIGURE 2.5-96

LOG OF BORING D-31

(SHEET 1 of 3)







PIEZOMETER INSTALLED IN D-31 ON 6-16-72  
BORING WAS FLUSHED WITH CLEAN WATER  
AFTER COMPLETION AT 356.5 FEET. A 3/4  
INCH PVC PIPE WITH AN 18 INCH POROUS STONE  
TIP WAS PLACED AT ELEVATION 461.7. GRANULAR  
BACKFILL WAS PLACED FROM ELEVATION 311.2  
TO 509.7; A BENTONITE SEAL FROM ELEVATION  
509.7 TO 511.2; AND CEMENT GROUT AND GRAVEL  
FROM 511.2 TO 667.7.

BORING COMPLETED AT 356.5 FEET  
ON 6-14-72  
CASING USED TO A DEPTH OF 14.0 FEET

#### WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
54.8	8-3-72
54.3	8-15-72
54.7	9-6-72

REFER TO FIGURE 2.4-37 FOR  
WATER LEVEL OBSERVATIONS.

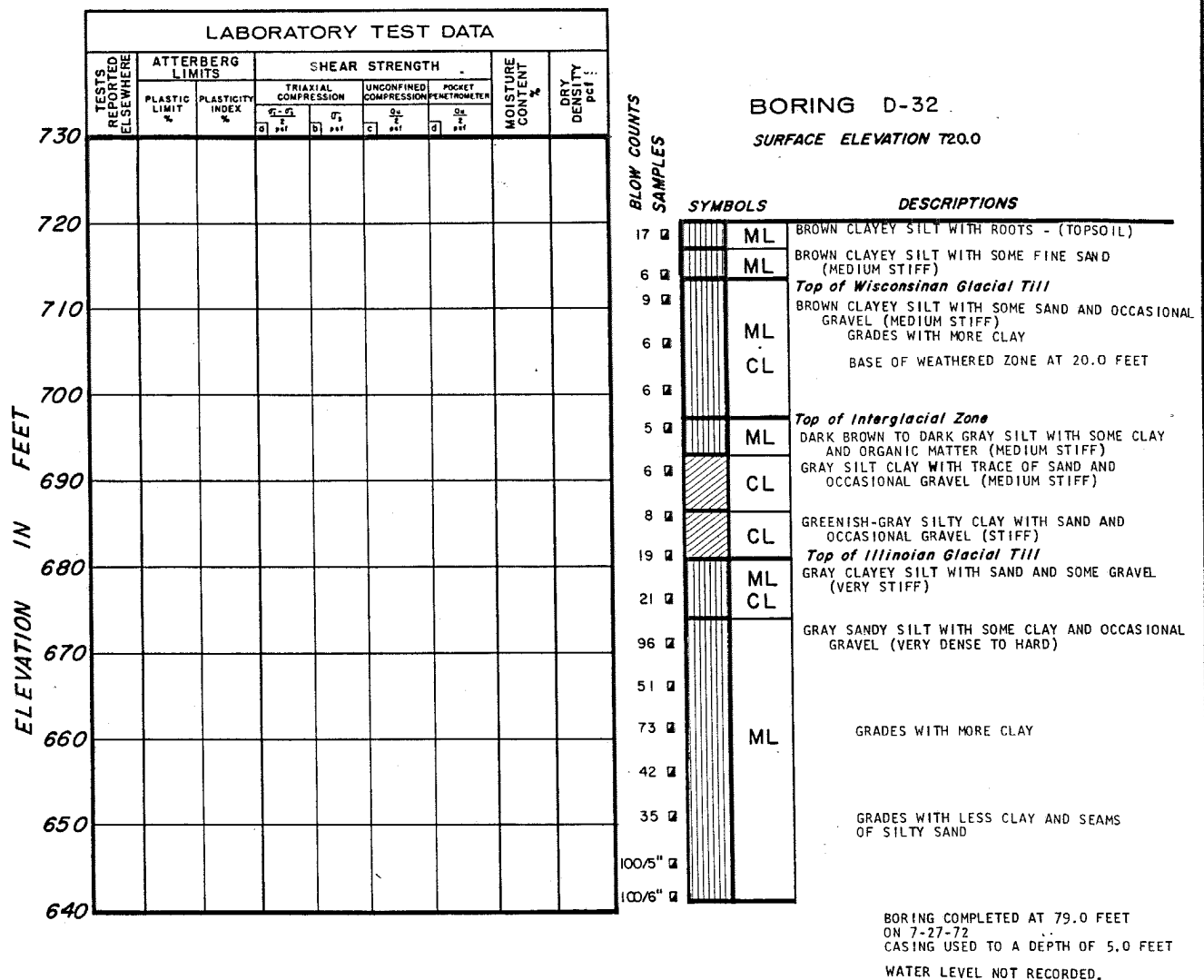
## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-96

LOG OF BORING D-31  
(SHEET 3 of 3)

#### NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



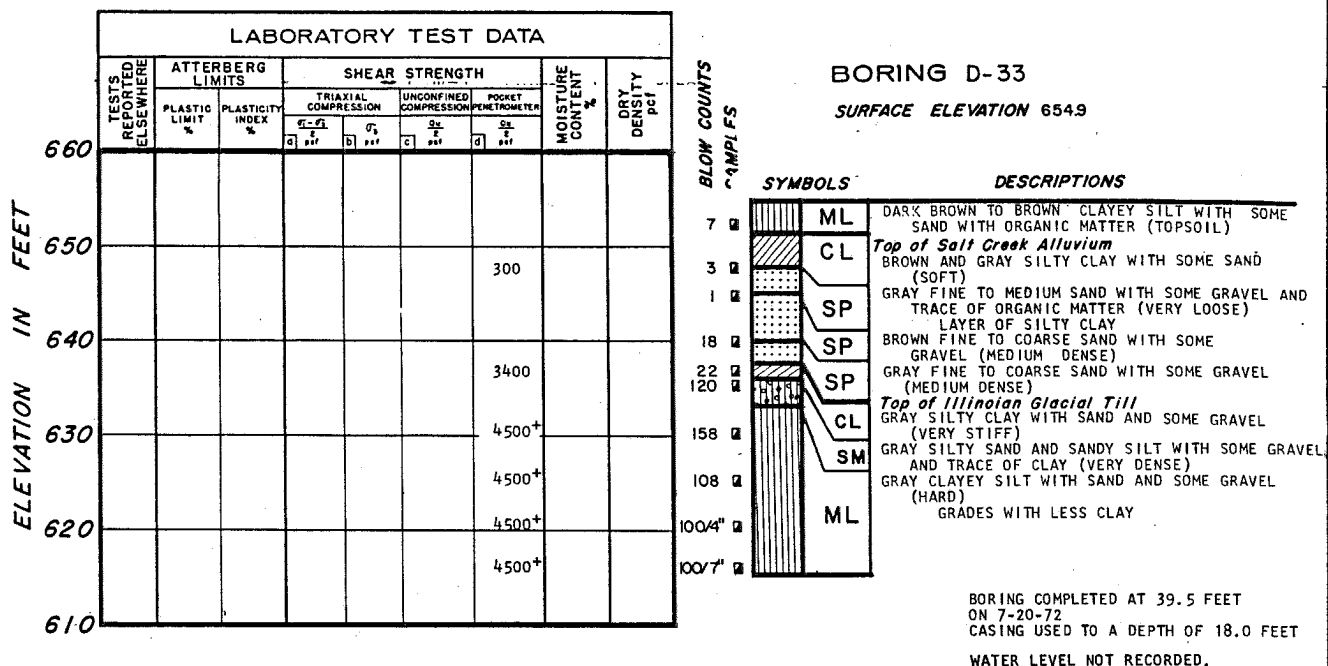
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-97

LOG OF BORING D-32

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.



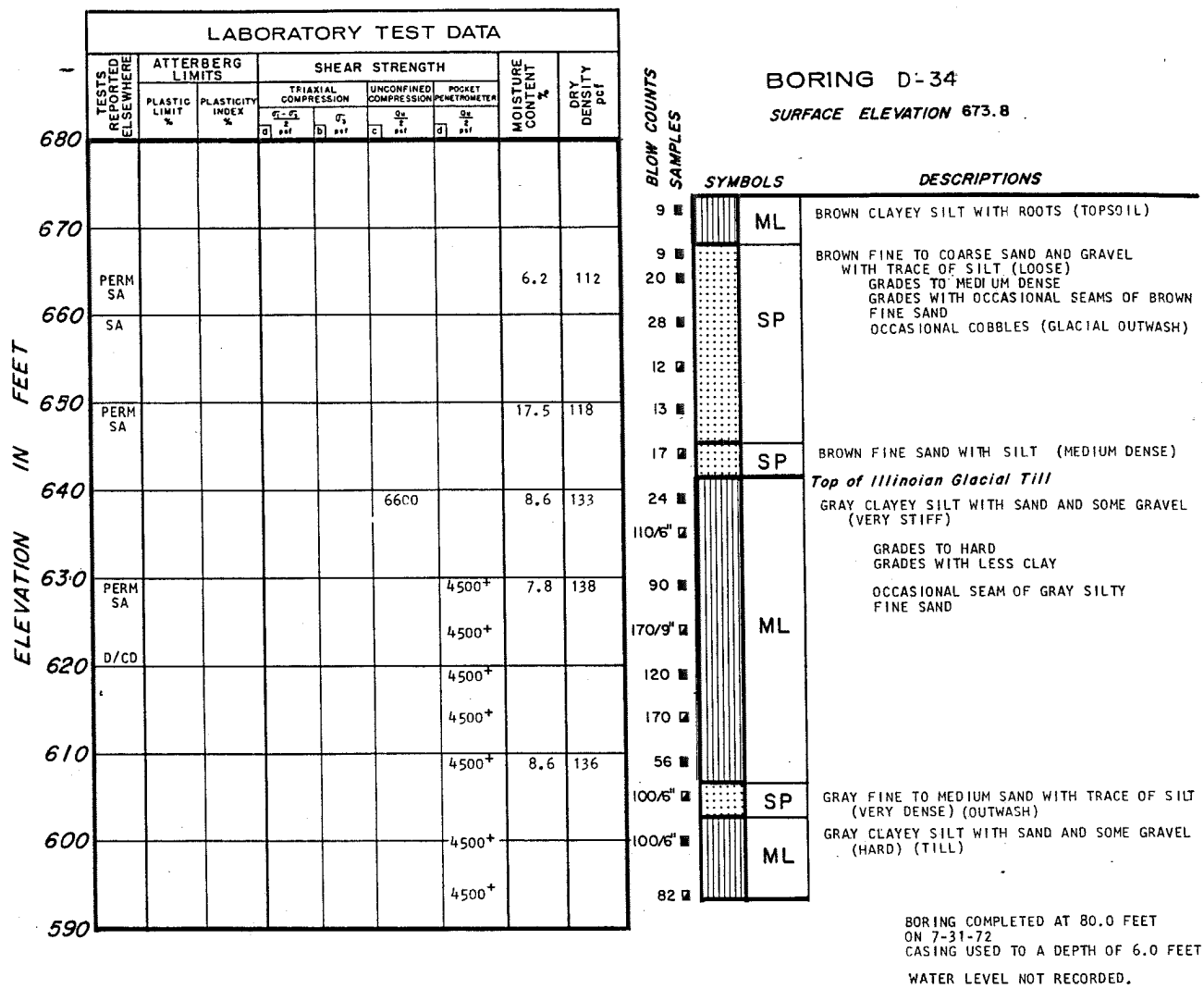
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-98

LOG OF BORING D-33

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



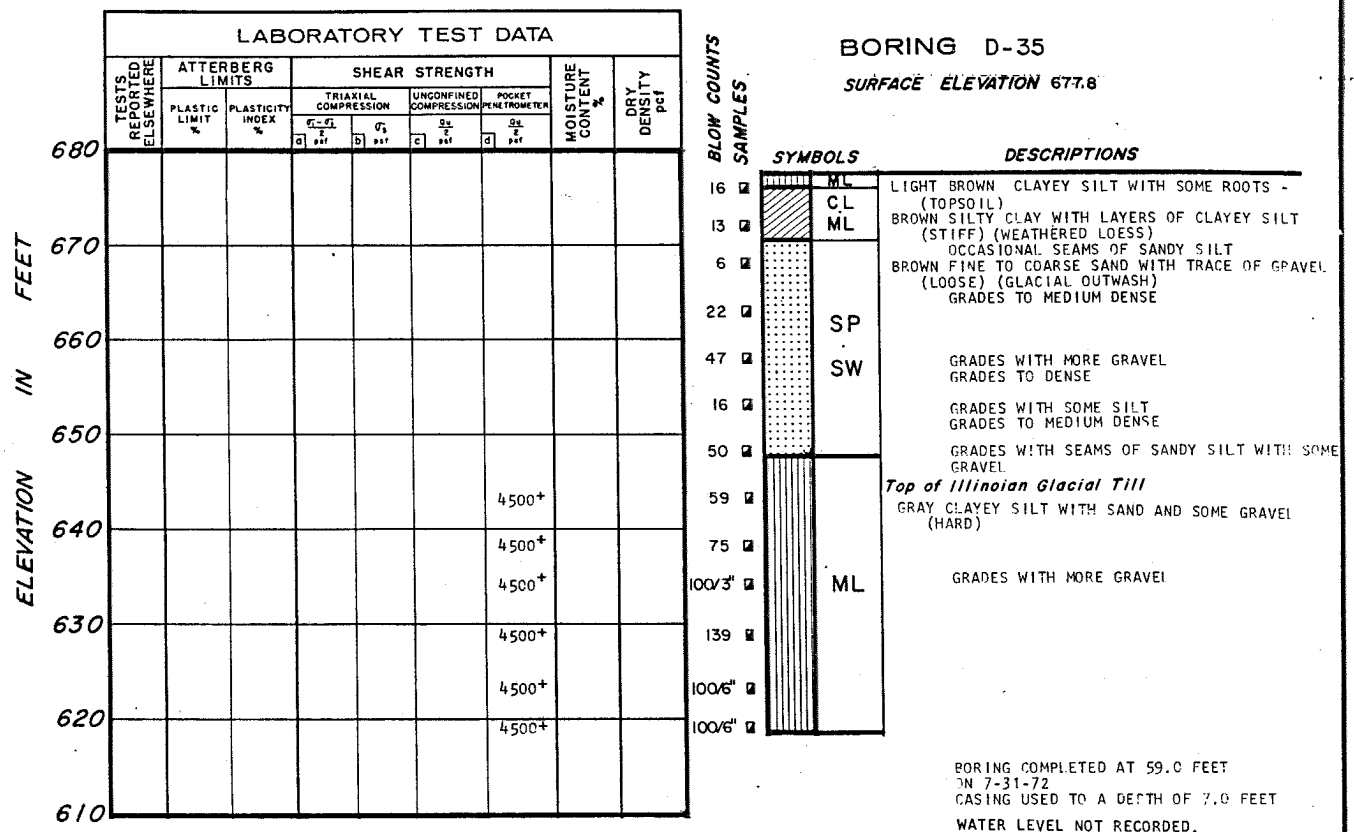
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-99

LOG OF BORING D-34



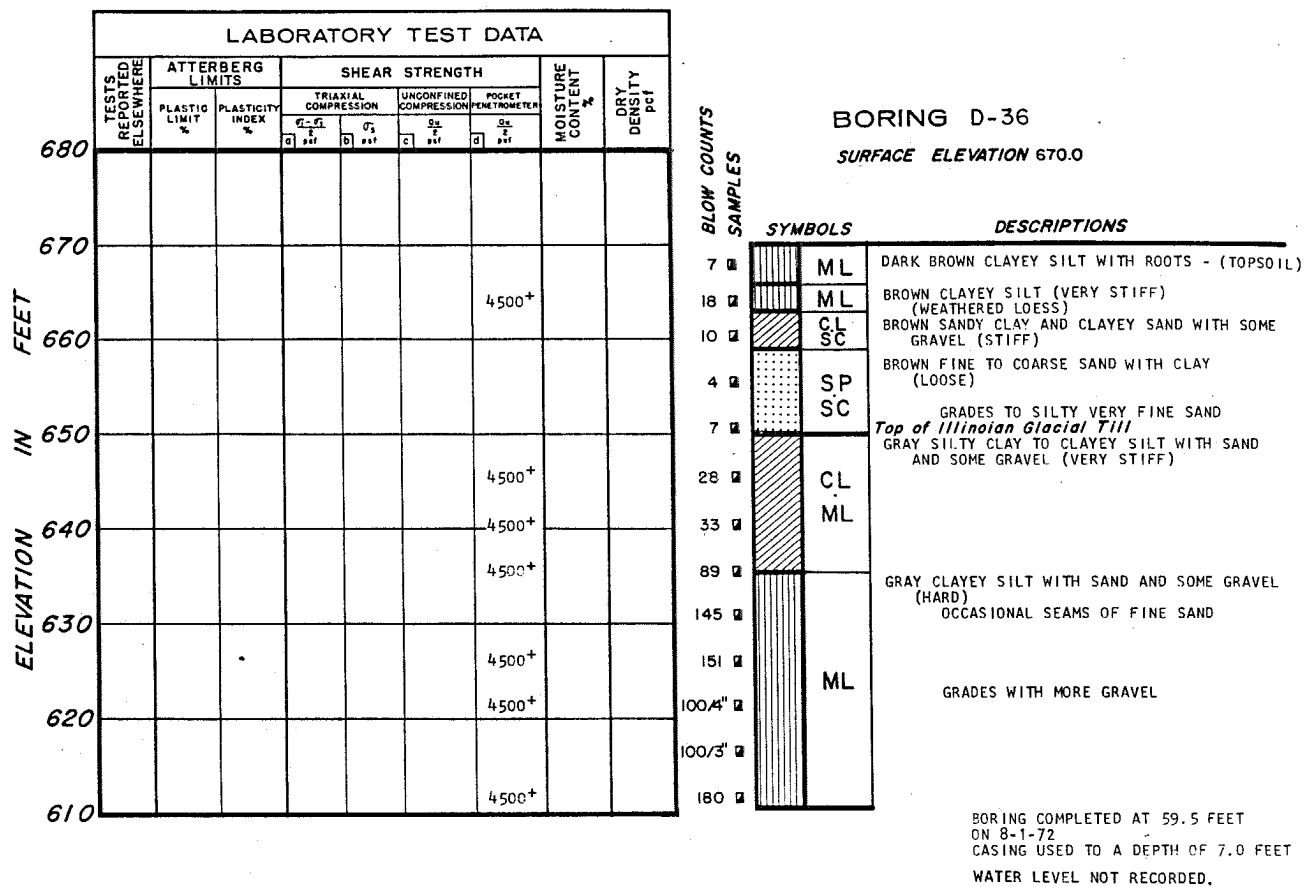
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-100

LOG OF BORING D-35



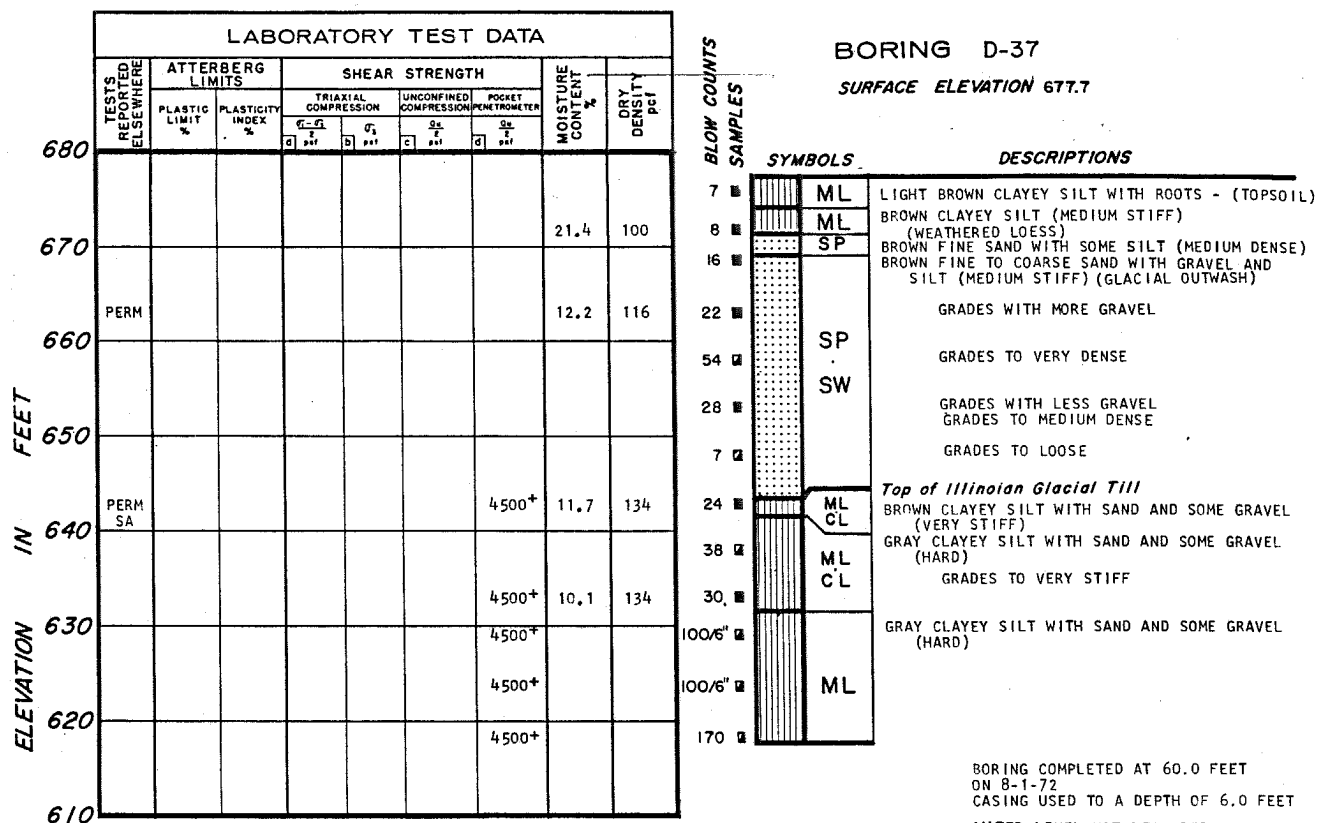
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-101

LOG OF BORING D-36



NOTE:

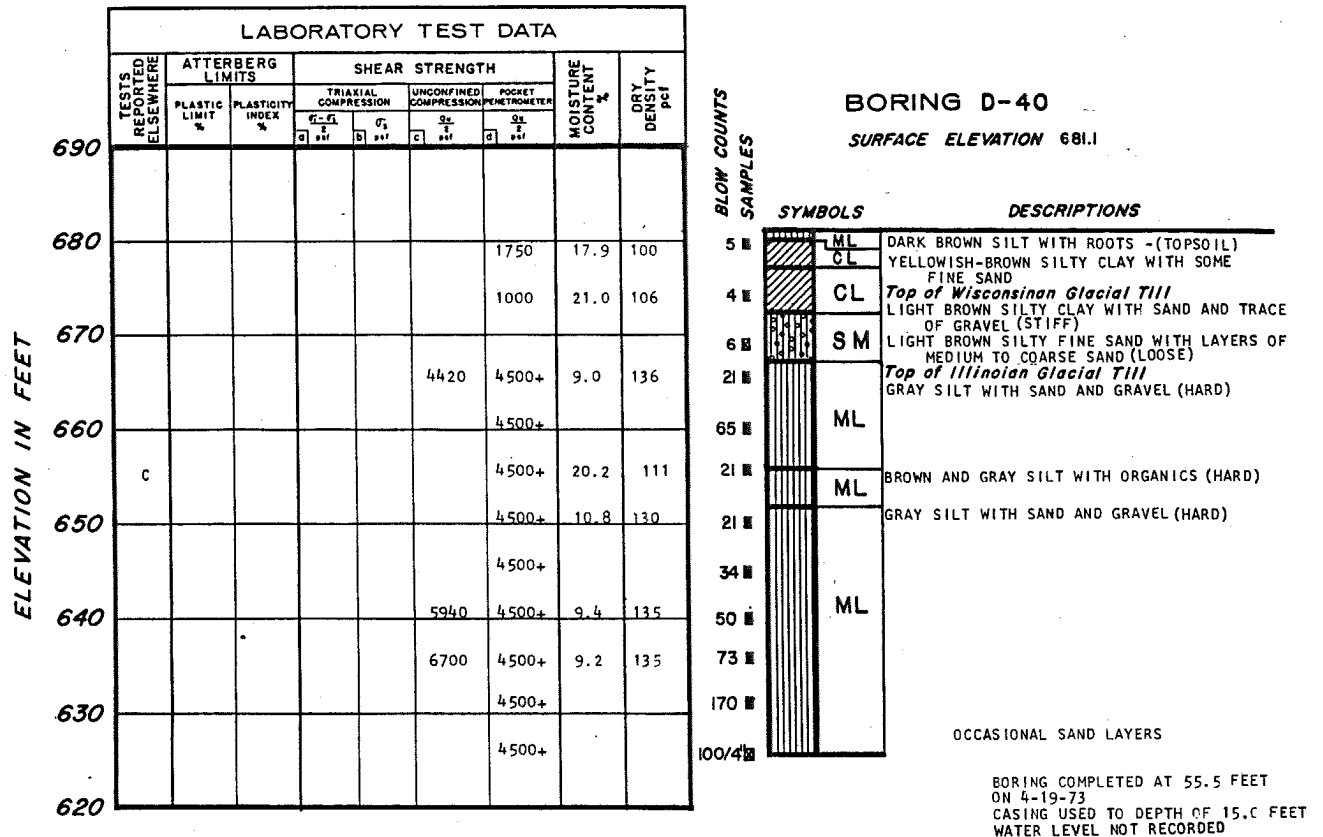
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-102

LOG OF BORING D-37





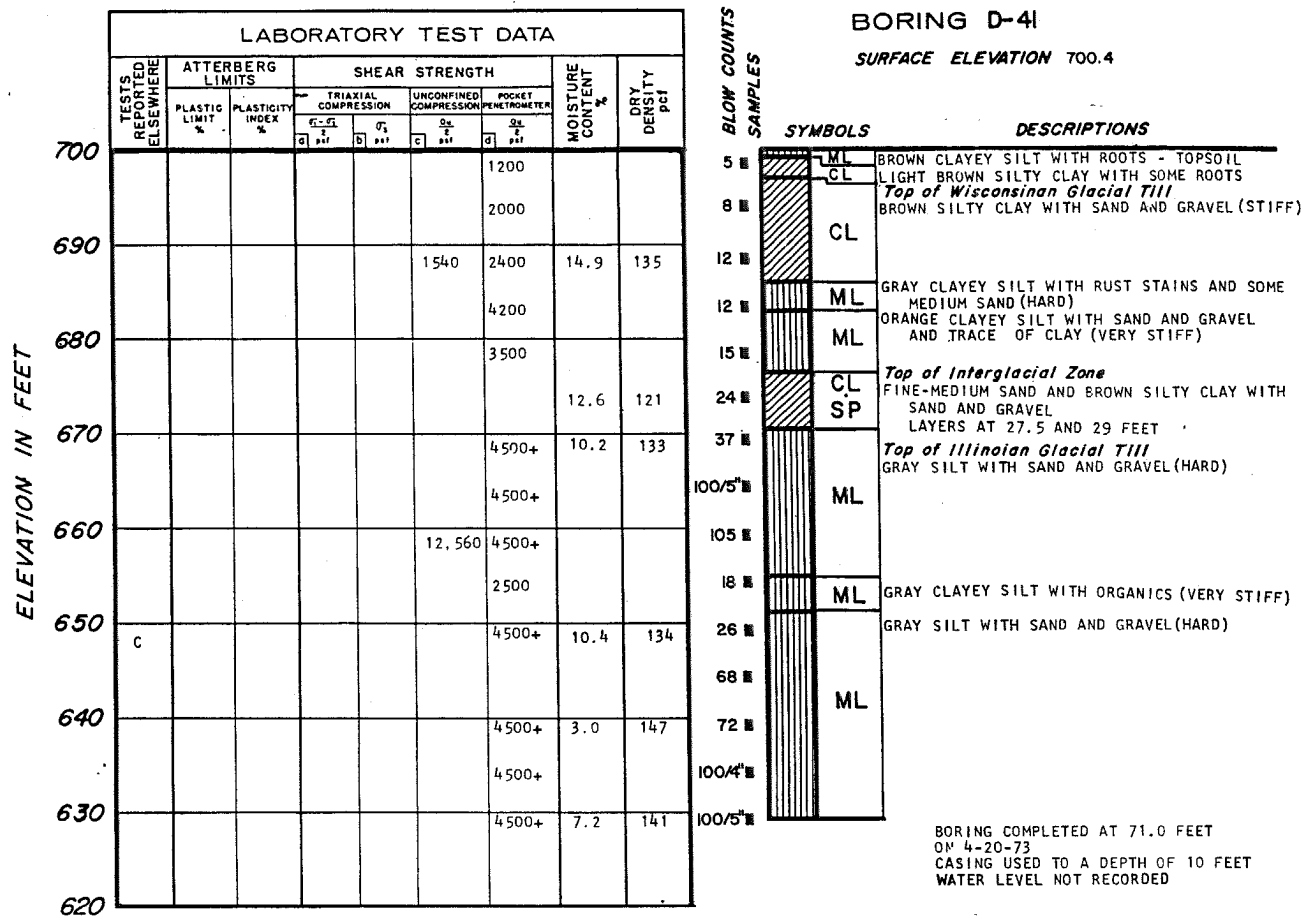
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-103

LOG OF BORING D-40

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.



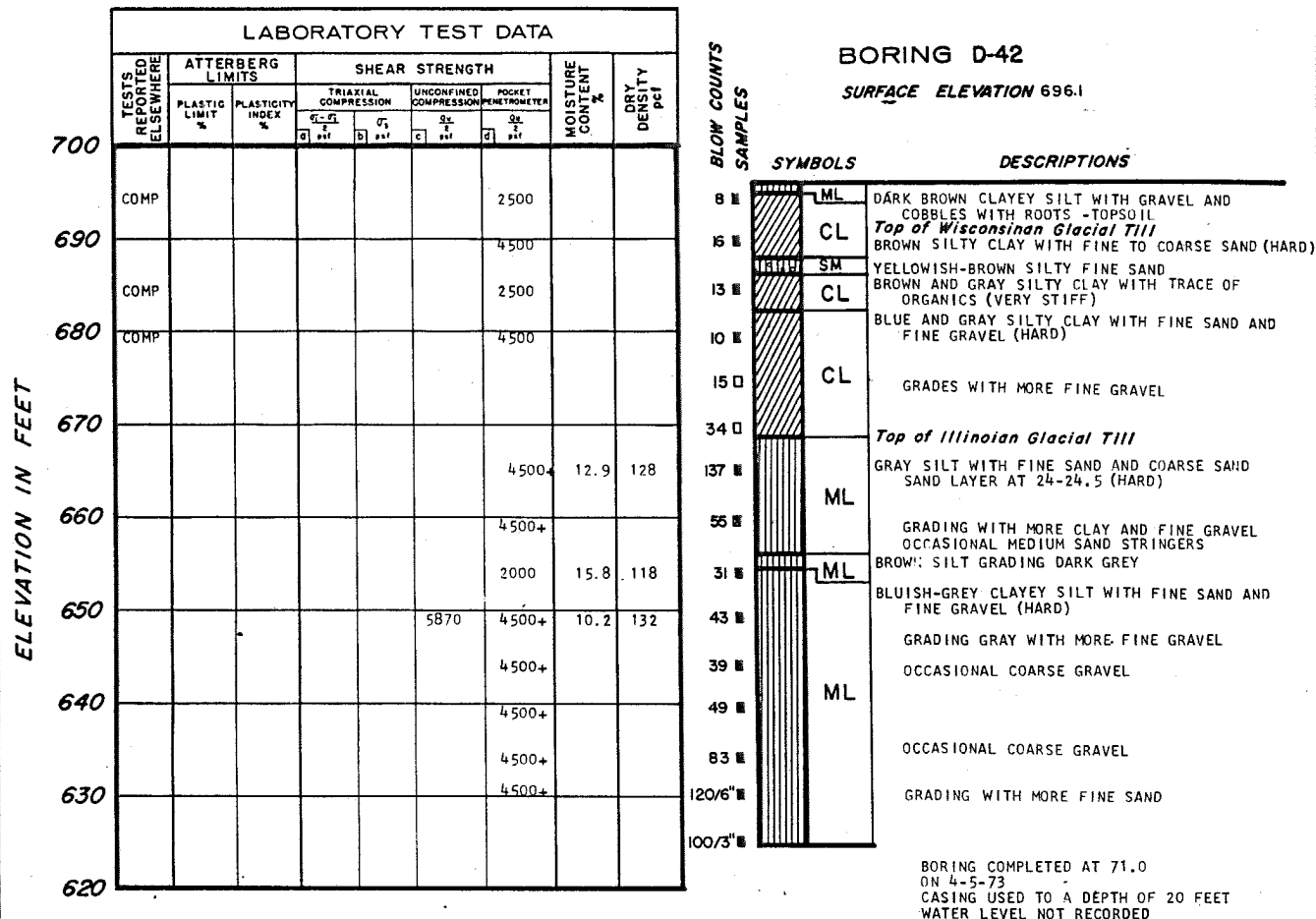
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-104

LOG OF BORING D-41



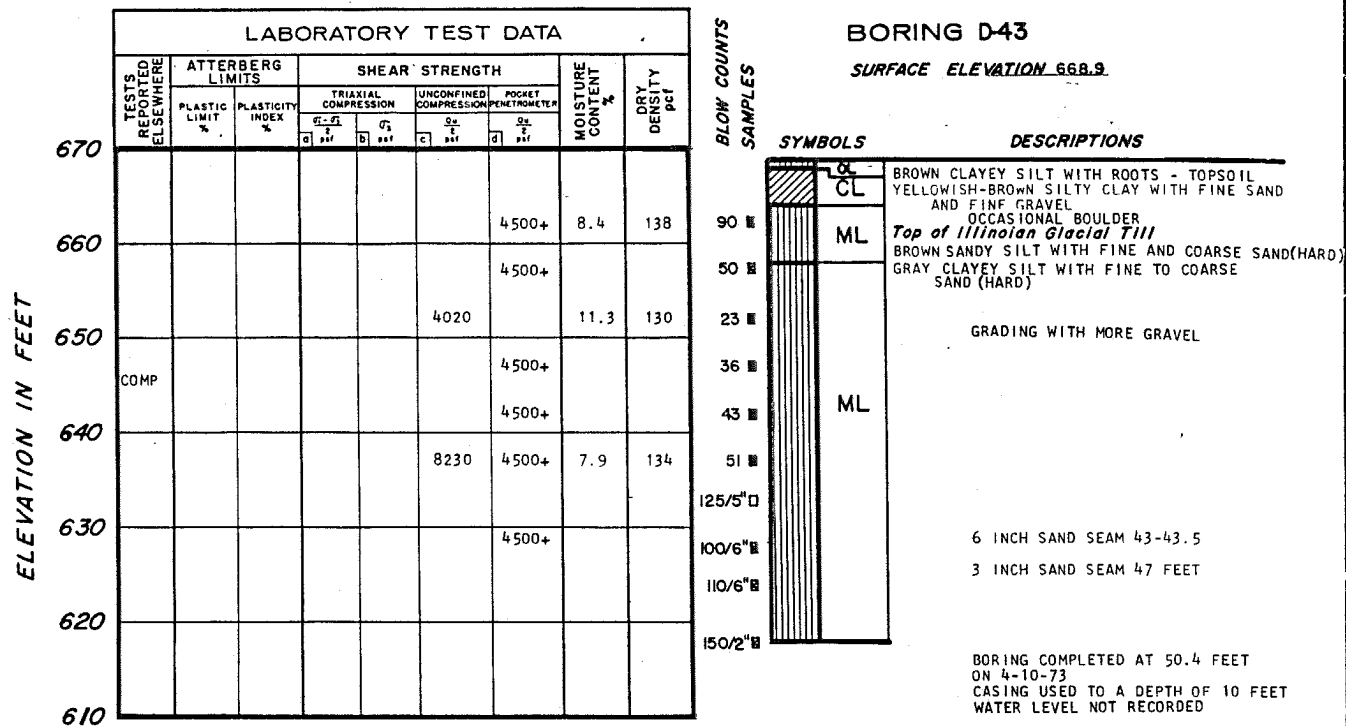
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-105

LOG OF BORING D-42



CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-106

LOG OF BORING D-43

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

ELEVATION IN FEET

LABORATORY TEST DATA									
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf	
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION	POCKET PENETROMETER			
			$\frac{\sigma_1 - \sigma_3}{2}$ psi	$\sigma_3$ psi	$\frac{\sigma_u}{2}$ psi	$q_u$ psi			
							2000		
							1000	31.0	92
							1000		
							4500+		
					10,640		4500+	7.1	140

BLOW COUNTS  
SAMPLES

BORING D-44  
SURFACE ELEVATION 660.0

SYMBOLS	DESCRIPTIONS
CL	LIGHT BROWN SANDY CLAY WITH OCCASIONAL GRAVEL <i>Top of Salt Creek Alluvium</i>
ML	DARK GRAY CLAYEY SILT WITH SAND
CL	DARK GRAY TO BLACK CLAY WITH SILTY SAND AND TRACE OF GRAVEL AND ORGANICS (STIFF)
CL	GRADES WITH MORE SAND
SC	LIGHT BROWN CLAYEY SAND
CL	LIGHT BROWN SANDY CLAY
SC	GRAY CLAYEY SAND
	<i>Top of Wignan Glacial Till</i>
ML	GRAY CLAYEY SILT WITH SAND AND OCCASIONAL GRAVEL (HARD)
	GRADES VERY SANDY

BORING COMPLETED AT 32.8 FEET  
ON 4-24-73  
NO CASING USED  
WATER LEVEL NOT RECORDED

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-107

LOG OF BORING D-44

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

ELEVATION IN FEET

LABORATORY TEST DATA									
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf	
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION	POCKET PENETROMETER			
			$\frac{\sigma_1 - \sigma_3}{2}$ pcf	$\sigma_3$ pcf	$\frac{\sigma_u}{2}$ pcf	$\frac{q_u}{2}$ pcf			
670									
660									
650							1000		
							1500	29.2	
							1000		
640							4000		
							4500+	7.3	
630								142	

## BORING D-45

SURFACE ELEVATION 660.4

BLOW COUNTS  
SAMPLES

### SYMBOLS

### DESCRIPTIONS

7	CL	Top of Salt Creek Alluvium BLACK SANDY CLAY WITH OCCASIONAL GRAVEL GRAVEL GRADES OUT GRADES WITH LESS SAND
4	CL	BROWN CLAY WITH SILT, SOME FINE SAND AND ORGANICS (STIFF)
2	SC	GRAYISH-BROWN CLAYEY SAND WITH SILT
16	ML	Top of Illinoian Glacial Till GRAY CLAYEY SILT WITH SAND AND OCCASIONAL GRAVEL (H <sub>2</sub> O)
100/3	SC	GRAY CLAYEY FINE TO COARSE SAND WITH SILT BORING COMPLETED AT 30.5 FEET ON 4-24-73
100/6		NO CASING USED WATER LEVEL NOT RECORDED

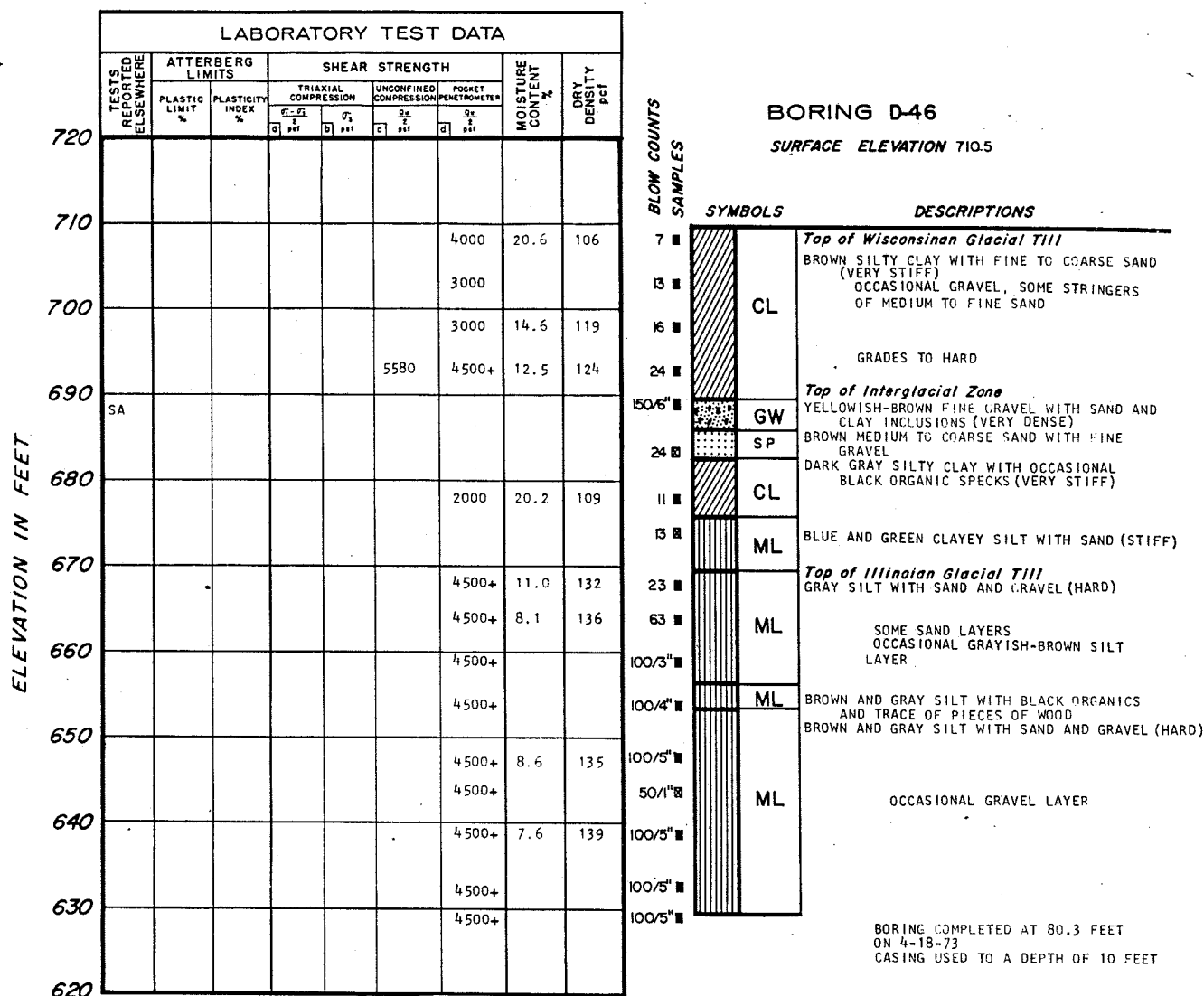
## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-108

LOG OF BORING D-45

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



A PIEZOMETER WAS INSTALLED IN D-46A ON 4-24-73. BOREING D-46A WAS AUGURED TO 29.0 FEET ADJACENT TO D-46. A 3/4 INCH CPVC PIPE WITH A CAPPED TIP WAS PLACED AT ELEVATION 681.5. THE PIPE WAS SLOTTED FROM ELEVATION 681.5 TO 701.5. PEA GRAVEL WAS PLACED FROM ELEVATION 681.5 TO 708.5. A CONCRETE SEAL WAS PLACED FROM ELEVATION 708.5 TO 710.5.

#### WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
18.6	4-25-73
18.2	4-27-73
18.8	4-30-73
20.0	6-12-73
20.3	7-3-73

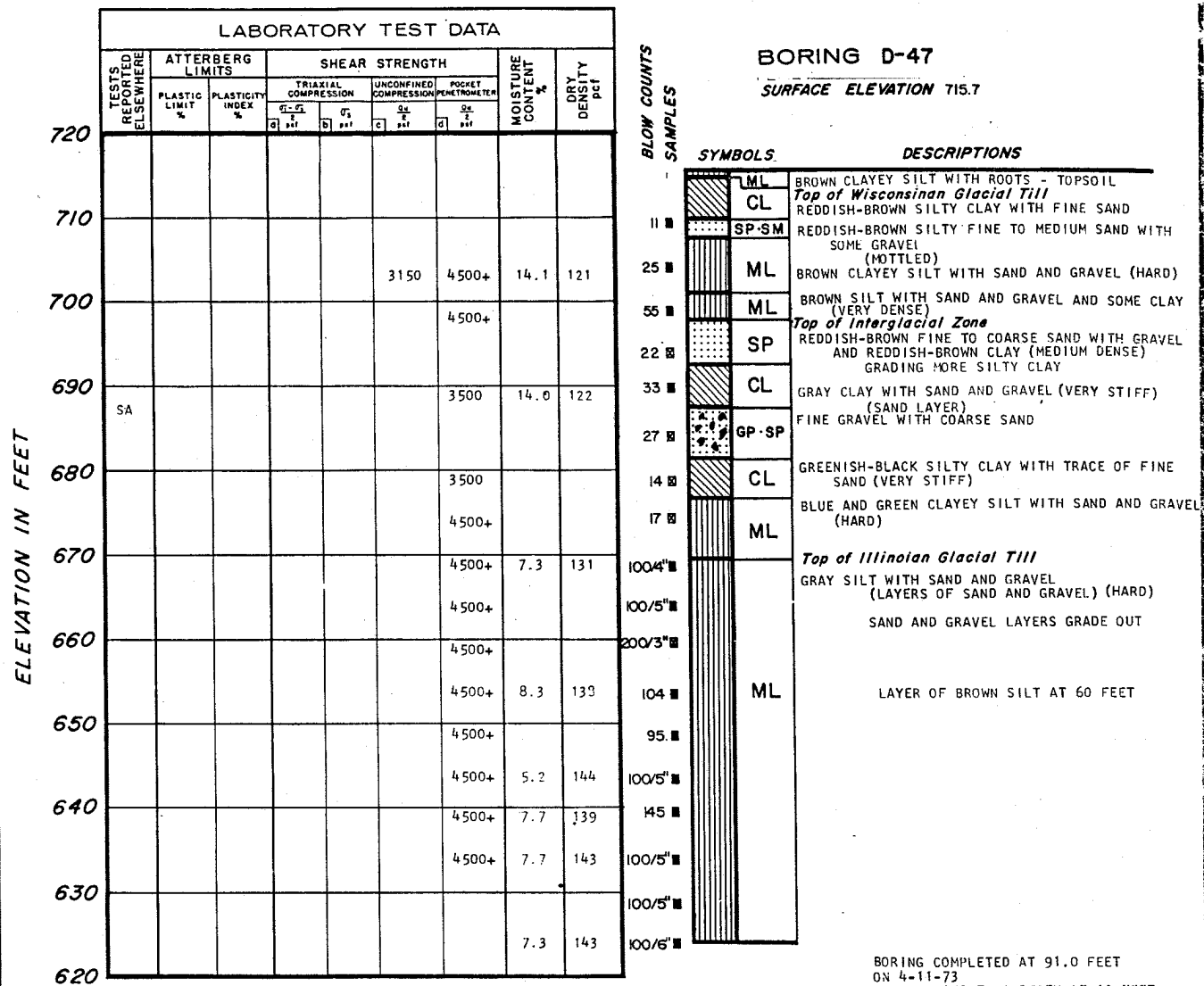
#### NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-109

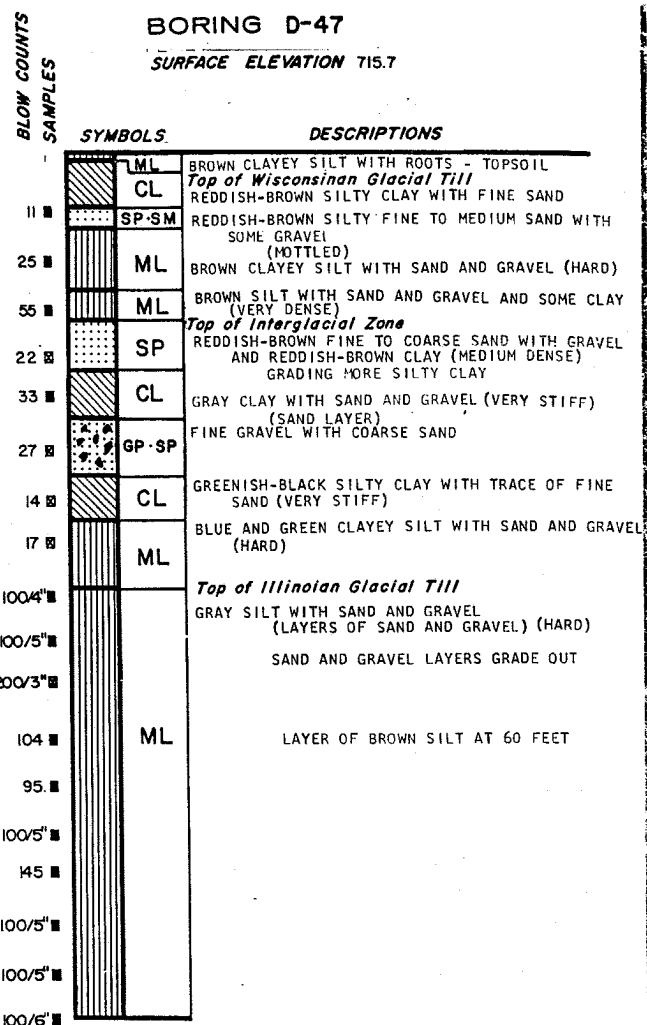
LOG OF BORING D-46



NOTE:

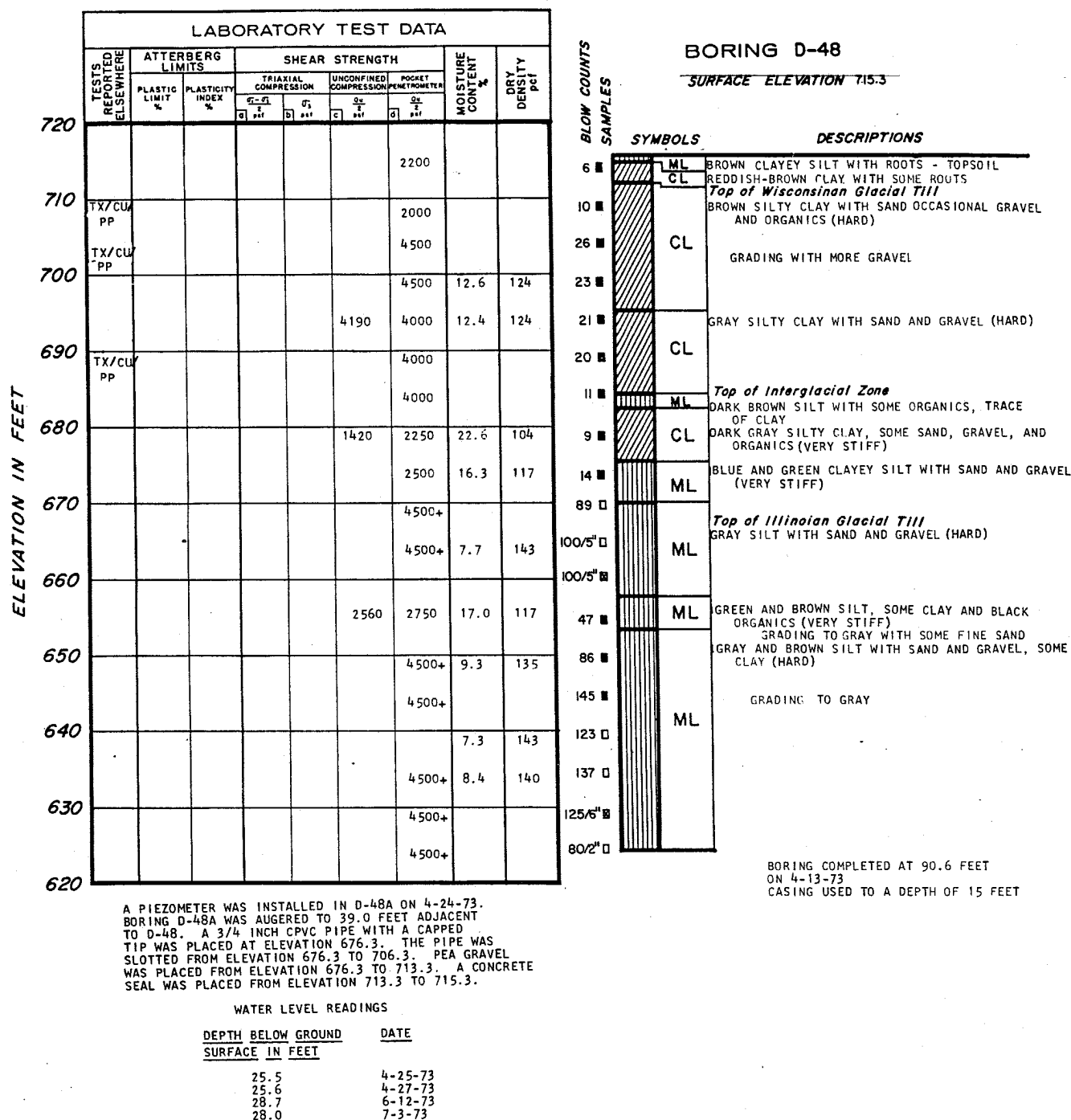
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**BORING D-47**  
**SURFACE ELEVATION 715.7**



BORING COMPLETED AT 91.0 FEET  
ON 4-11-73  
CASING USED TO A DEPTH OF 10 FEET





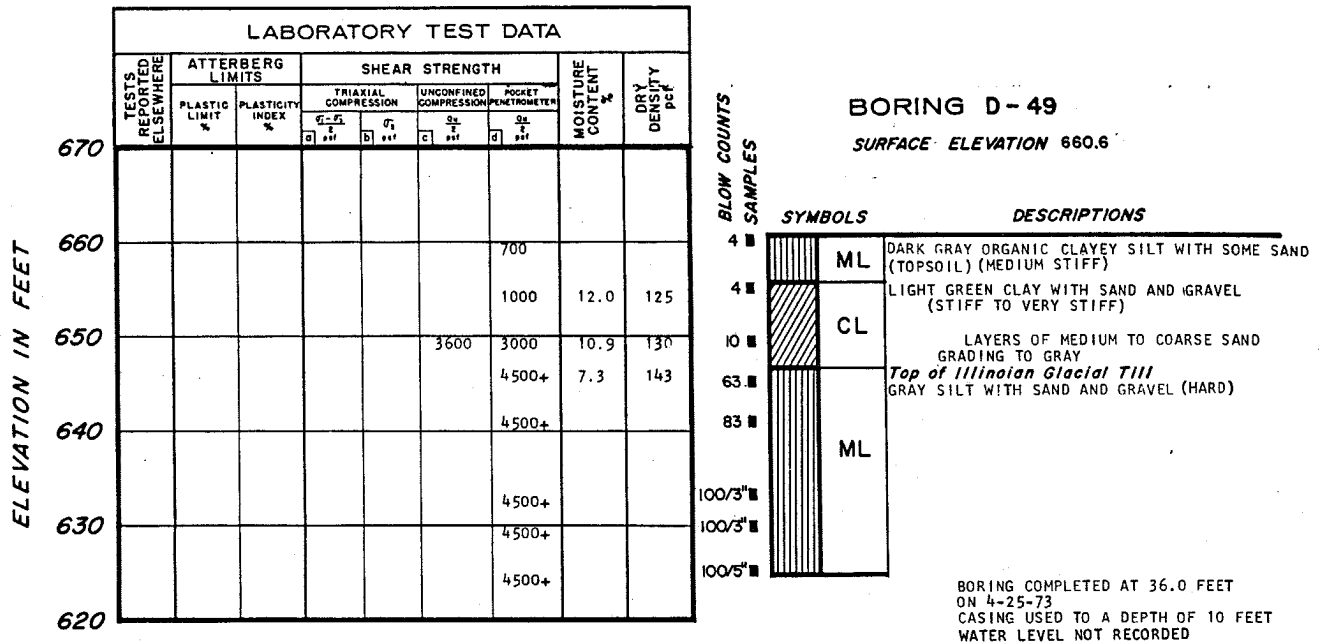
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-111

LOG OF BORING D-48

**NOTE:**

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.



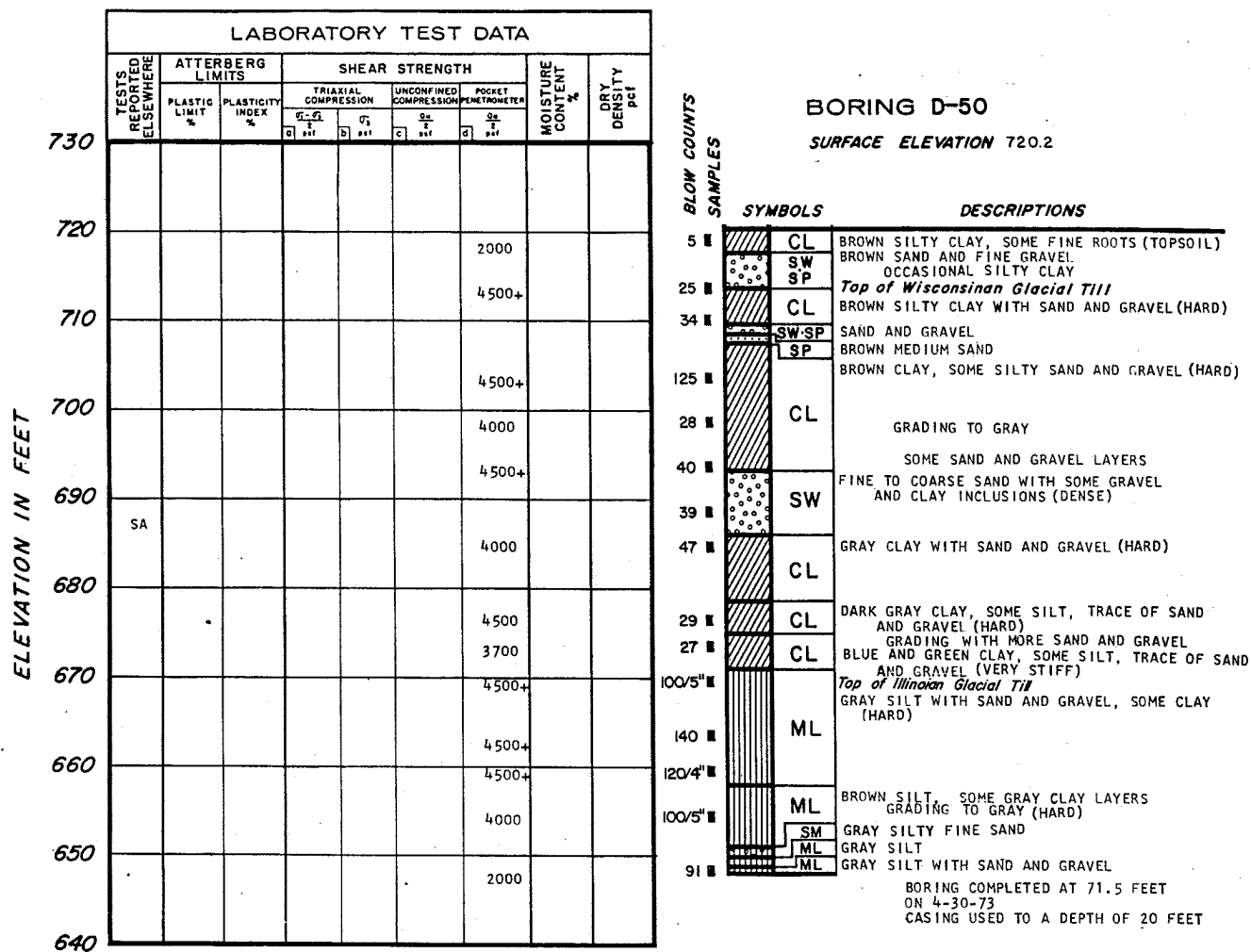
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-112

LOG OF BORING D-49

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



A PIEZOMETER WAS INSTALLED IN D-50A ON 4-30-73. BORING D-50A WAS AUGERED TO 37.0 FEET ADJACENT TO D-50. A 3/4 INCH CPVC PIPE WITH A CAPPED TIP WAS PLACED AT ELEVATION 683.2. THE PIPE WAS SLOTTED FROM ELEVATION 683.2 TO 713.2. PEA GRAVEL WAS PLACED FROM ELEVATION 783.2 TO 718.2. A CONCRETE SEAL WAS PLACED FROM ELEVATION 718.2 TO 720.2.

WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
20.0	4-30-73
20.3	6-12-73
20.8	7-3-73

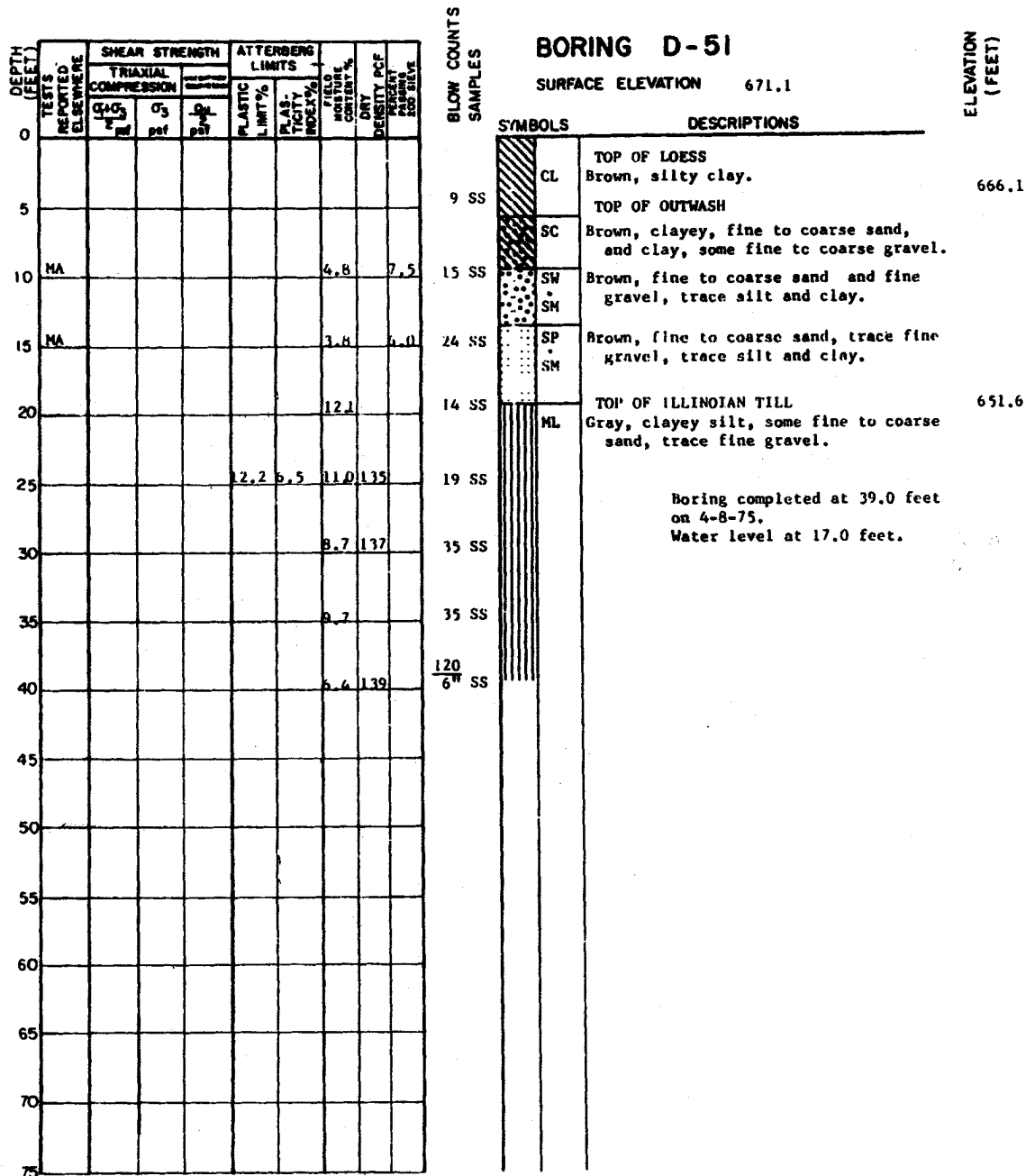
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-113

LOG OF BORING D-50

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.



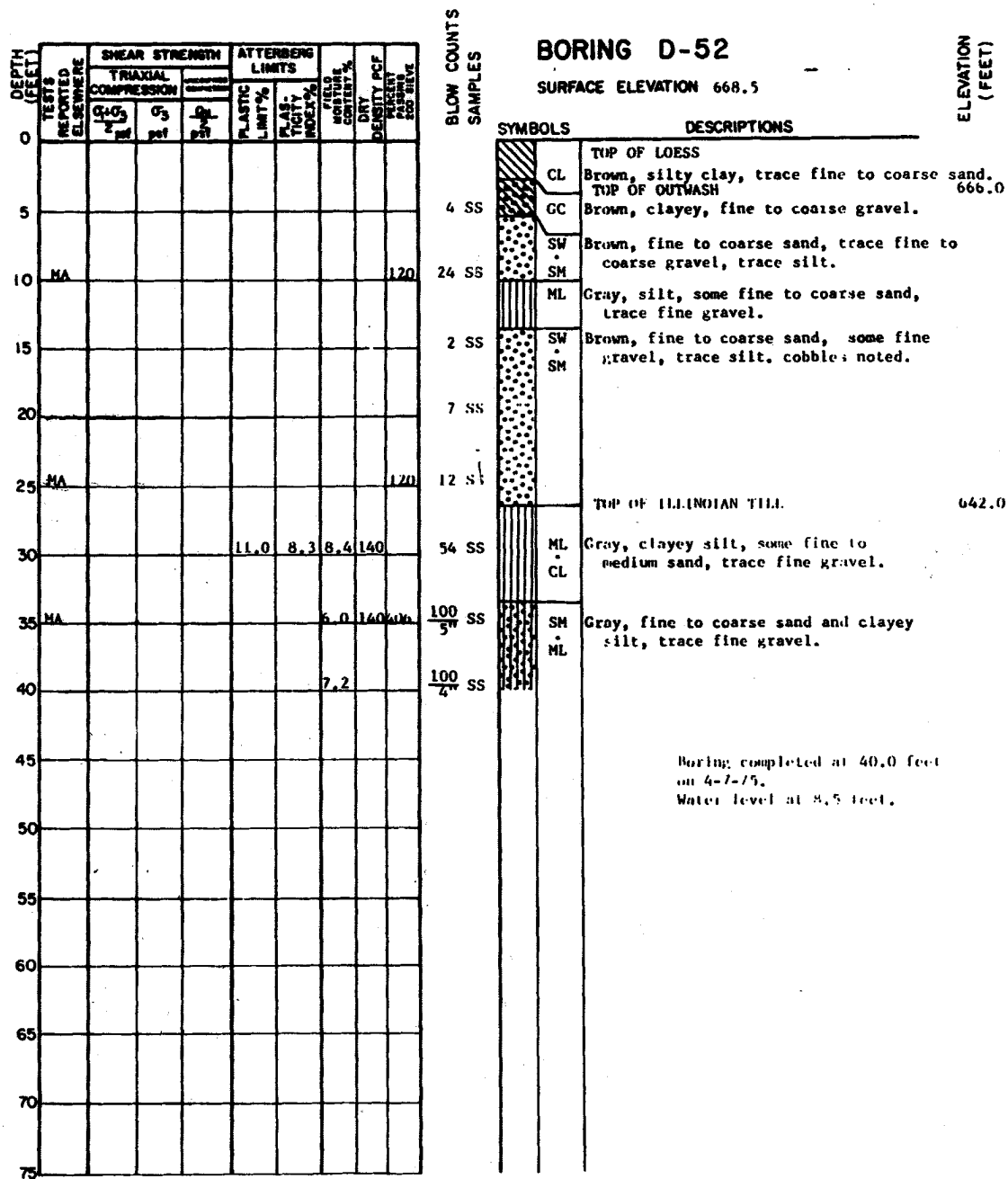
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-114

LOG OF BORING D-51



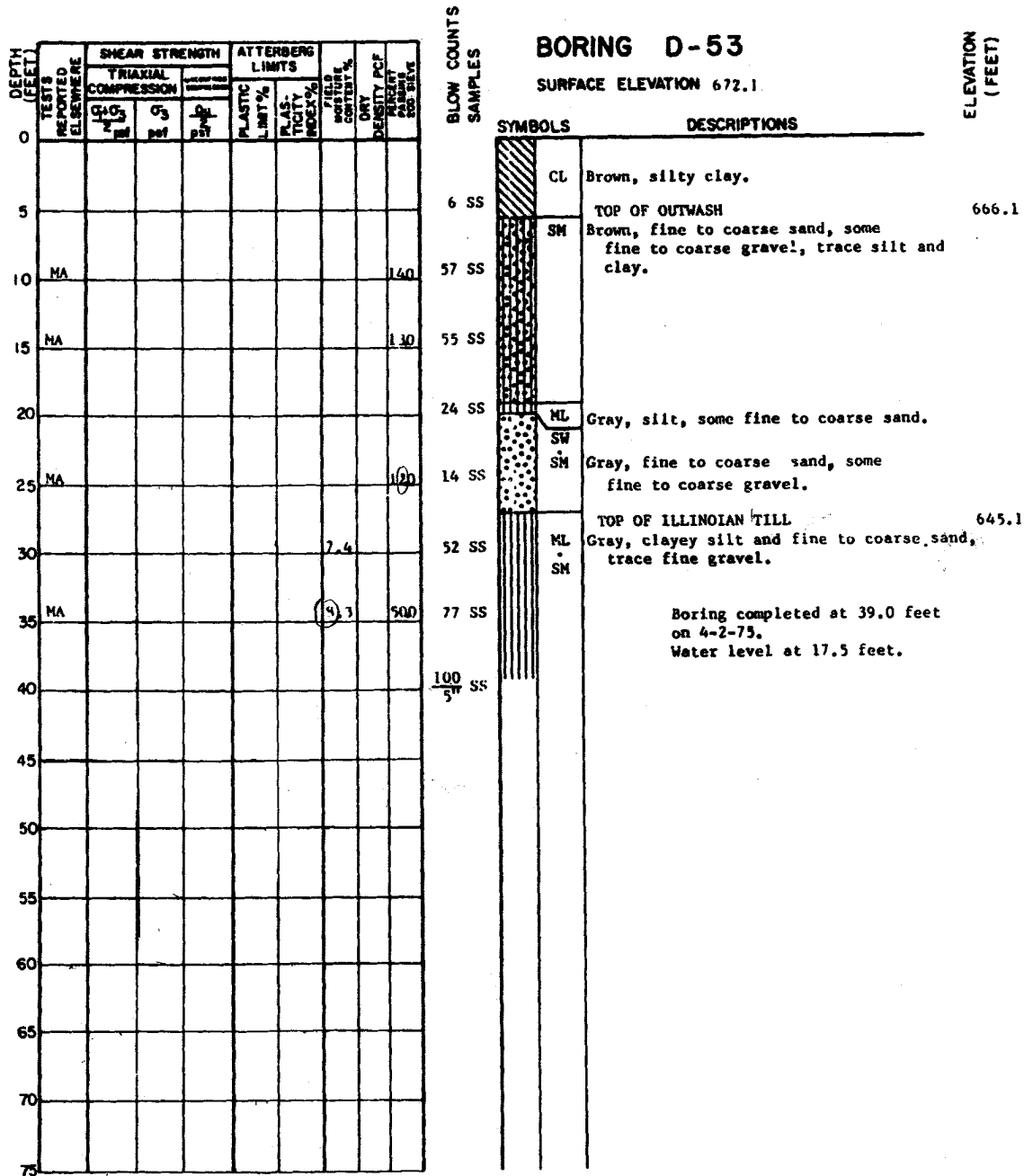
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-115

LOG OF BORING D-52



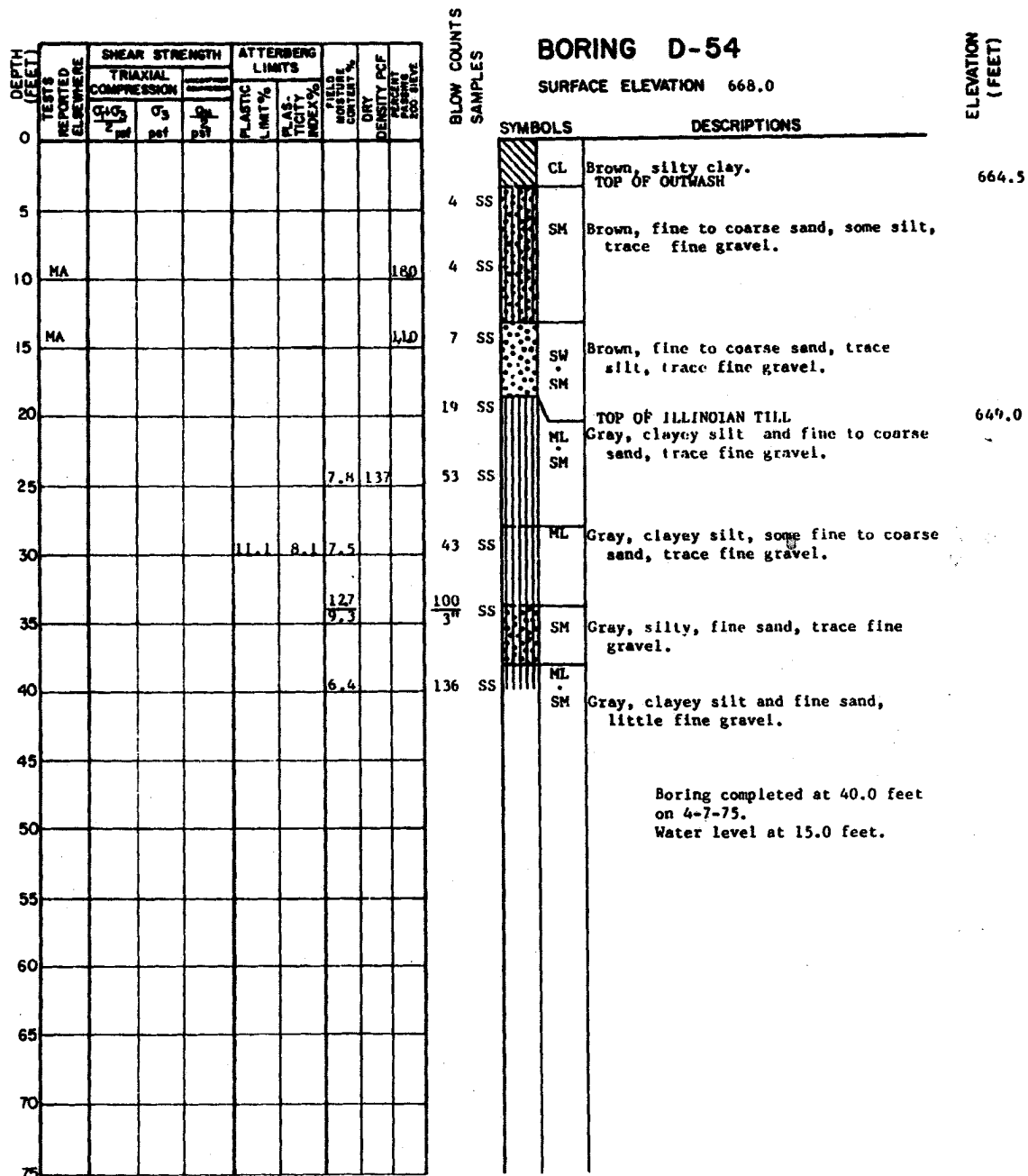
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-116

LOG OF BORING D-53



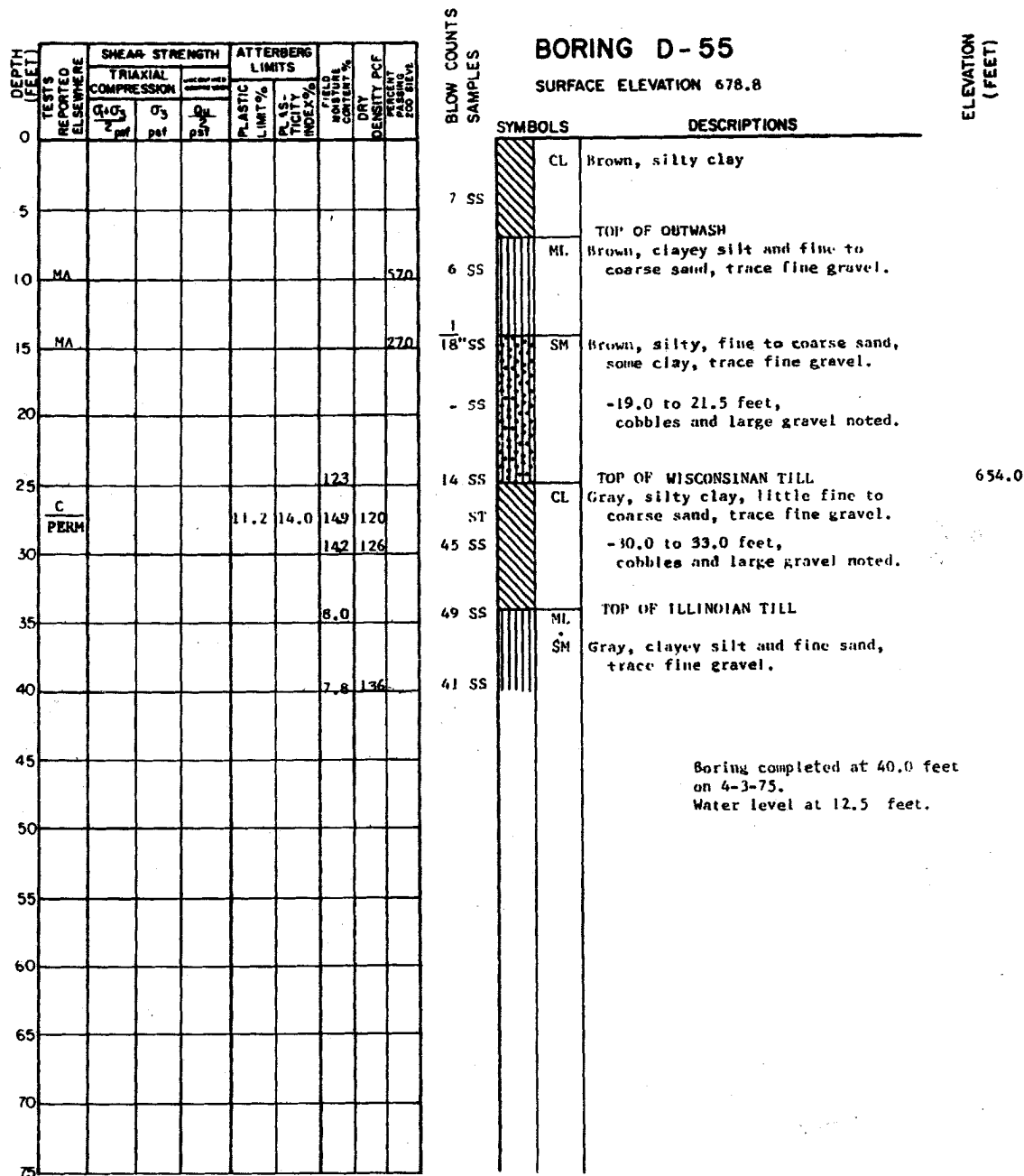
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-117

LOG OF BORING D-54



#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-118

LOG OF BORING D-55



DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS			FIELD WATER CONTENT %	DRY DENSITY PCF	PERCENT FINE SAND		
		TRIAXIAL COMPRESSION		UNCONSOLIDATED SAND	PLASTIC LIMIT %	PLAS- TICITY INDEX %						
		$\sigma_1 - \sigma_3$ psi	$\sigma_3$ psi									
											$\sigma_1$ psi	$\sigma_3$ psi
0												
5												
10												
15	MA								190			
20												
25												
30	MA								100			
35							237					
40							112					
45							7.5	138				
50												
55												
60												
65												
70												
75												

BLOW COUNTS  
SAMPLES

## BORING D-56

SURFACE ELEVATION 686.8

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
	CL	Brown, silty clay.	
6	SS	TOP OF OUTWASH	682.3
	SM	Brown, fine to coarse sand, some silt and clay.	
4	SS	-trace fine gravel.	
13	SS		
20	SS	SP Brown, fine sand.	
28	SS	SW Brown, fine to coarse sand, some fine to coarse gravel, trace silt.	
5	SS	SM	
10	SS	SP Light brown, fine sand, trace fine gravel, trace silt.	
26	SS	SW Gray, fine to coarse sand, some fine to coarse gravel, trace silt.	
	SM	TOP OF ILLINOIAN TILL	647.3
	ML	Gray, clayey silt and fine to coarse sand, trace fine gravel.	
78	SS	SM	
55	SS	ML Gray, clayey silt, some fine to coarse sand, trace fine gravel.	

Boring completed at 50.0 feet  
on 4-4-75.  
Water level at 29.0 feet.

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-119

LOG OF BORING D-56

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING NO. 100 SIEVE
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %				
		$\frac{\sigma_1 + \sigma_3}{2}$ psf	$\sigma_3$ psf	$\frac{\sigma_1 - \sigma_3}{2}$ psf						
0										
5							236			
10							229			
15							127	124		
20										
25	MA									5.0
30					12.6	8.2	7.9	135		
35								7.1	137	
40										
45	MA							149		525
50	MA							8.4	140	475
55								7.0		
60										
65										
70										
75										

BLOW COUNTS  
SAMPLES

## BORING D-57

SURFACE ELEVATION 694.0

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
6 SS	CL	Brown, silty clay, trace fine to coarse sand.	
		TOP OF WISCONSINAN TILL	687.5
2 SS	ML CL	Brown, clayey silt, trace fine to coarse sand.	
21 SS		-some fine to coarse sand, trace fine gravel.	
52 SS	SW SM	Brown, fine to coarse sand, some fine to coarse gravel, trace silt.	
29 SS		-26.0 to 27.0 feet, cobbles and large gravel noted.	
		TOP OF ILLINOIAN TILL	
69 SS	ML	Gray, clayey silt, some fine to coarse sand, trace fine gravel.	
79 SS		-37.0 feet, cobbles noted.	
54 SS	ML SM	Gray, clayey silt and fine to medium sand.	
25 SS			
58 SS	SM ML	Gray, clayey silt and fine to coarse sand, trace fine gravel.	
95 SS		Boring completed at 60.0 feet on 4-8-75.	
		Water level at 12.5 feet.	
80 SS			

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-120

LOG OF BORING D-57

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF	WATER CONTENT PCF
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	LIQUID LIMIT %	PLASTICITY INDEX %			
		Q <sub>1</sub> +Q <sub>2</sub> psi	Q <sub>3</sub> psi	Q <sub>u</sub> psi						
0										
5										
10	MA							207		255
15								227	115	
20								218		
25	MA				13.1 NP	14.2		148 108	124	160
30					11.9	7.1		117	143	
35								103	134	
40								103		
45	MA							132		465
50	MA							112	135	510
55								9.1	141	
60								110		
65										
70										
75										

BLOW COUNTS  
SAMPLES

## BORING D-58

SURFACE ELEVATION 695.7

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
	CL	TOP OF LOESS	
6 SS		Brown, silty clay, trace fine sand.	
		TOP OF OUTWASH	688.2
4 SS	SM	Brown, silty, fine to coarse sand, trace fine gravel.	
		TOP OF WISCONSINAN TILL	682.2
20 SS	CL	Brown, silty clay, trace fine to coarse sand, trace fine gravel.	
9 SS		- 18.5 feet color grades to gray.	
15 SS	SM	Reddish brown, fine to coarse sand, some fine gravel, some silt and clay.	
		TOP OF ILLINOIAN TILL	669.7
33 SS	ML	Gray, clayey silt, trace fine to coarse sand, trace fine gravel.	
79 SS			
26 SS	ML • SM	Gray, clayey silt and fine to coarse sand, trace fine gravel.	
37 SS	SM • ML	Gray, clayey silt and fine to medium sand.	
23 SS	ML • SM	Greenish gray to gray, clayey silt and fine to coarse sand, trace fine gravel.	
68 SS		- 53.3 feet color grades to gray.	
42 SS	ML	Gray, clayey silt, some fine to coarse sand, trace fine gravel.	
		Boring completed at 60.0 feet on 4-7-75.	
		Water level at 6.5 feet.	

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-121

LOG OF BORING D-58

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF PRESENT AND 200-SIEVE
		TRIAXIAL COMPRESSION		$\frac{Q_1}{2}$ psi	PLASTIC LIMIT %	PLAS- TICITY INDEX %			
		$\frac{Q_1+Q_3}{2}$ psi	$Q_3$ psi						
0									
5									
10							208	115	
15	MA						134	126620	
20	MA						133	125620	
25							130	122	
30				5600			8.9	138	
35							124		
35	MA						8.0	136525	
40									
45							223	116	
50	$\frac{C}{\text{PERM}}$ MA				27.0	26.7	269	102980	
55							104		
60							8.7		
65									
70									
75									

BLOW COUNTS  
SAMPLES

## BORING D-59

SURFACE ELEVATION 697.2

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
	CL	TOP OF LOESS	
		Brown, silty clay.	
6 SS		TOP OF WISCONSINAN TILL	692.2
	CL	Brown, silty clay, little fine to coarse sand, trace fine gravel.	
6 SS		-13.5 to 14.0 feet, fine to coarse sand lense noted.	
14 SS	ML		
	CL	Brown, clayey silt, some fine to coarse sand, trace fine gravel.	
27 SS			
	CL	TOP OF INTERGLACIAL ZONE	675.2
		Greenish-gray, silty clay, some fine to coarse sand, trace fine gravel.	
14 SS			
36 SS	SM	Gray, silty, fine sand, trace fine gravel.	
57 SS	ML	TOP OF ILLINOIAN TILL	663.7
	SM	Gray, clayey silt and fine to coarse sand, trace fine gravel.	
63 SS			
39 SS	MH	Gray, silt, varved.	
20 SS	SM	Gray, fine to coarse sand, silt lenses noted.	
80 SS	ML	Gray, clayey silt, some fine to coarse sand, trace fine gravel.	
58 SS			

Boring completed at 60.0 feet  
on 4-10-75.  
Water level at 23.0 feet.

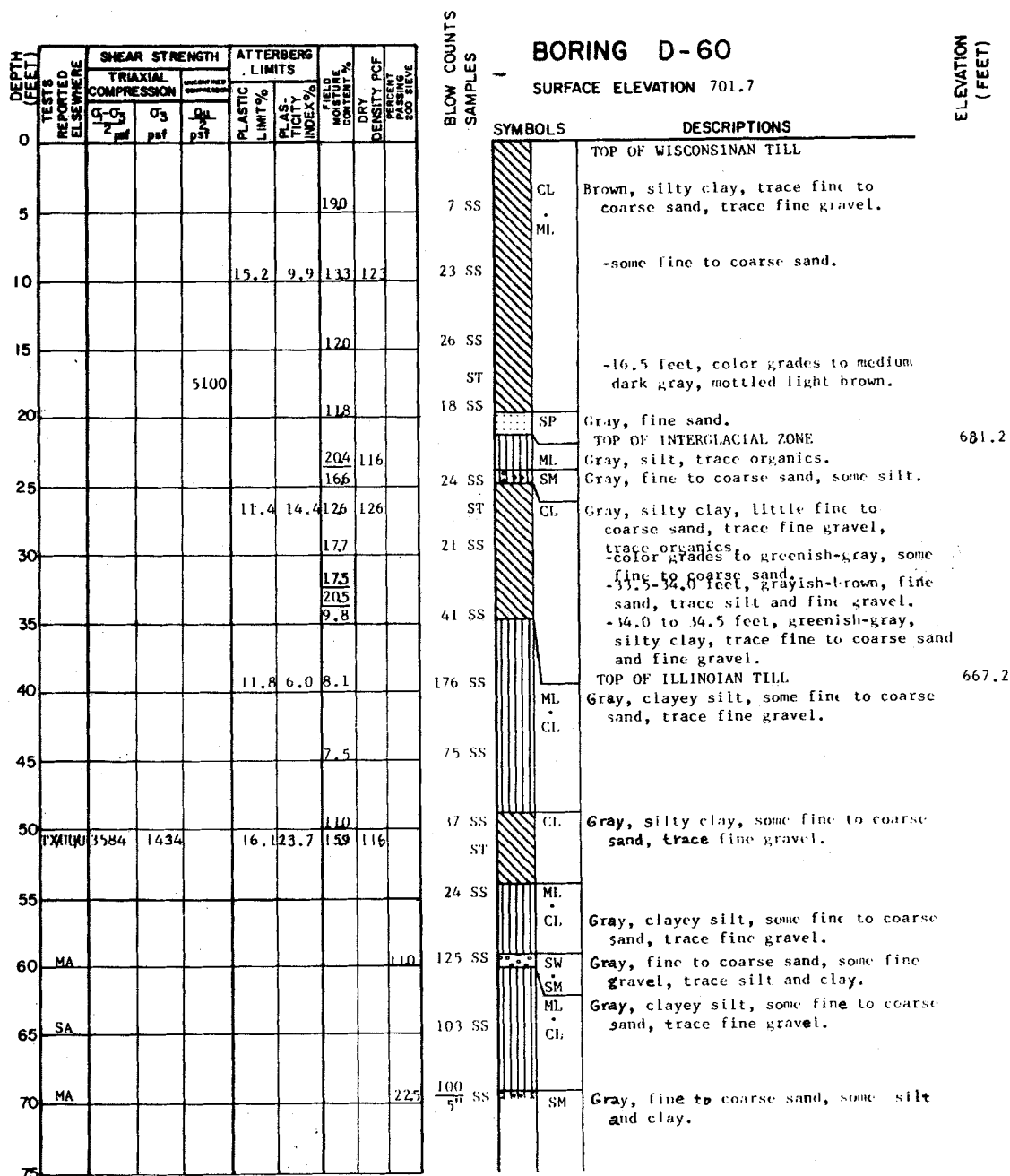
### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-122

LOG OF BORING D-59



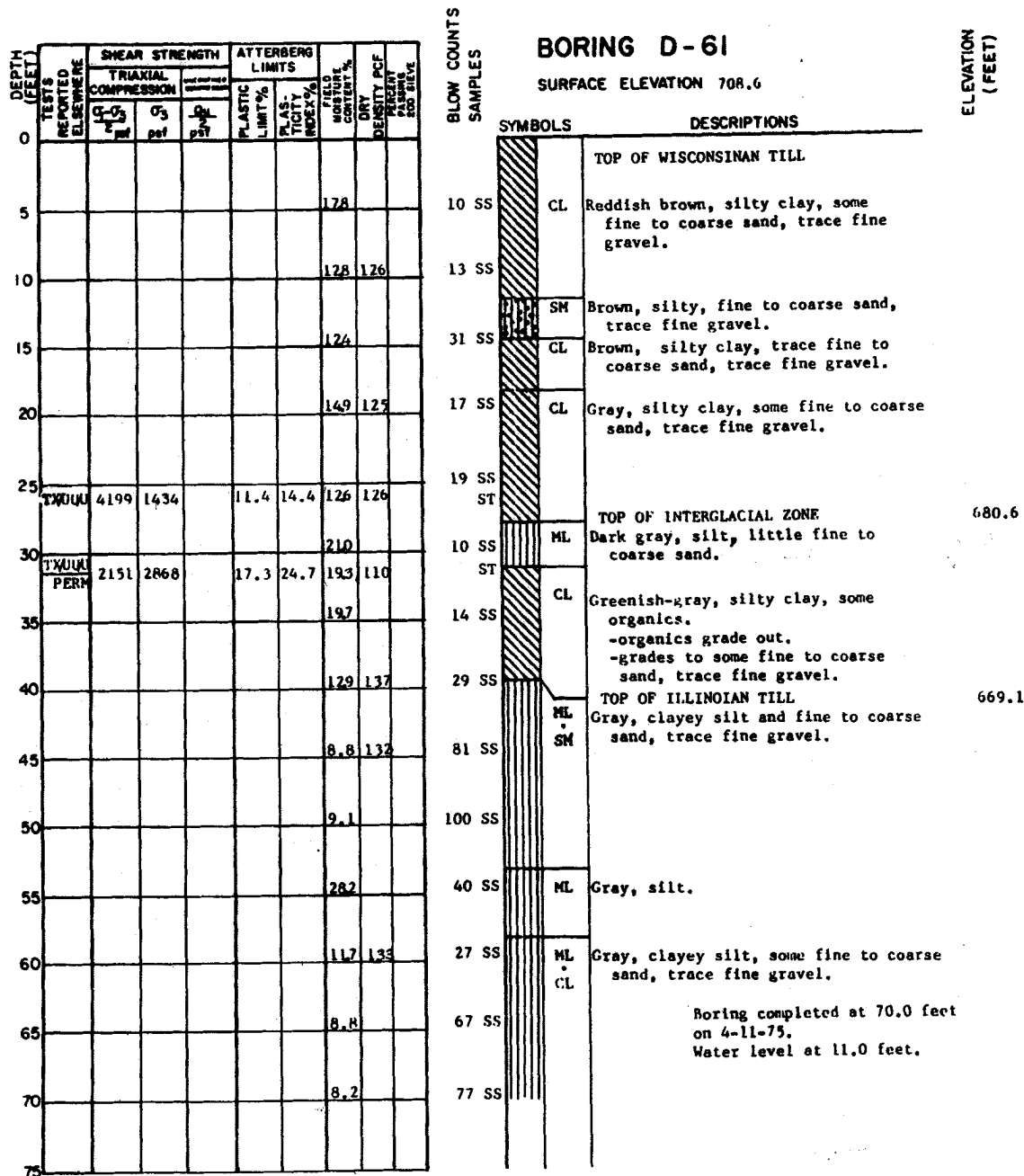
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-123

LOG OF BORING D-60



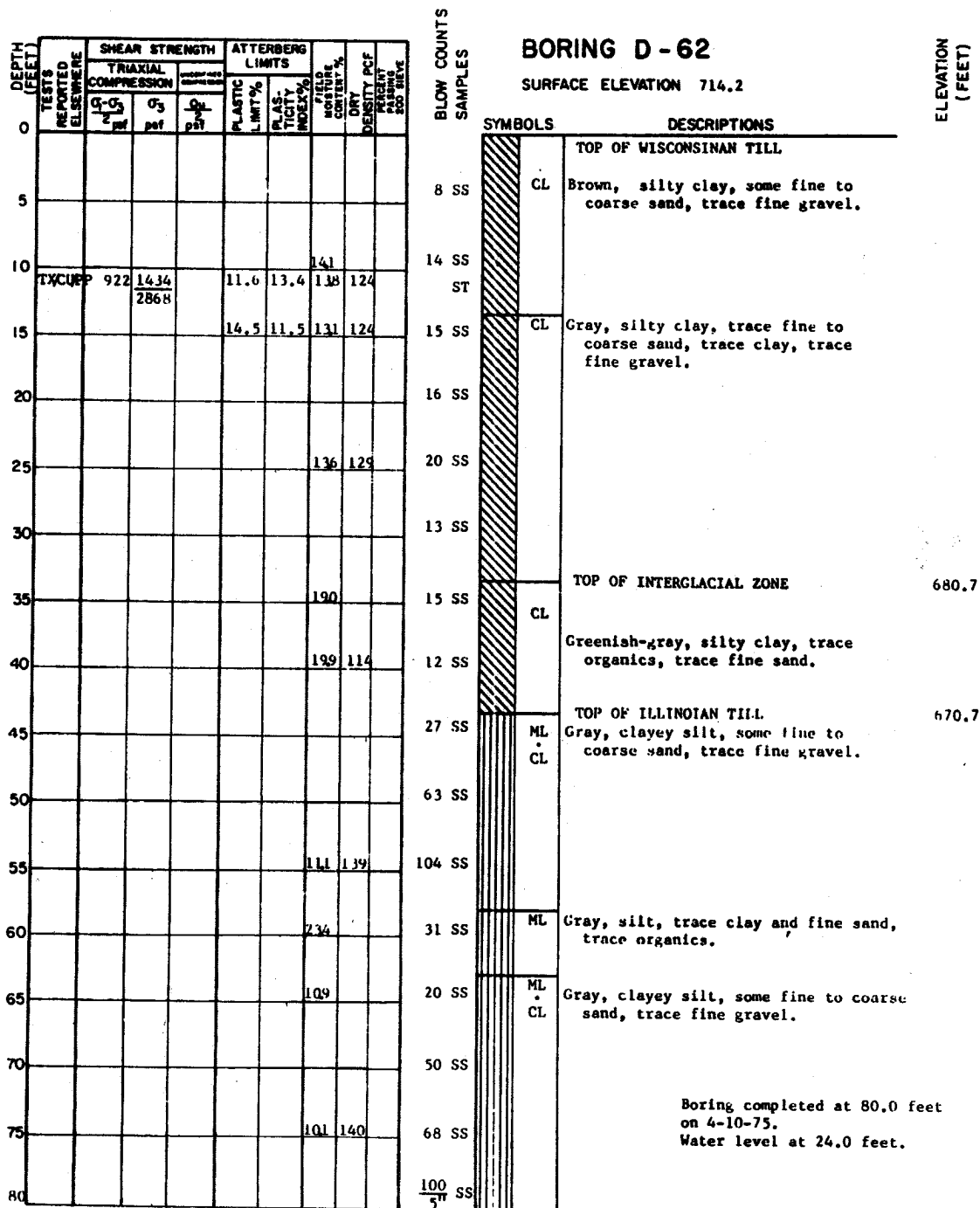
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-124

LOG OF BORING D-61



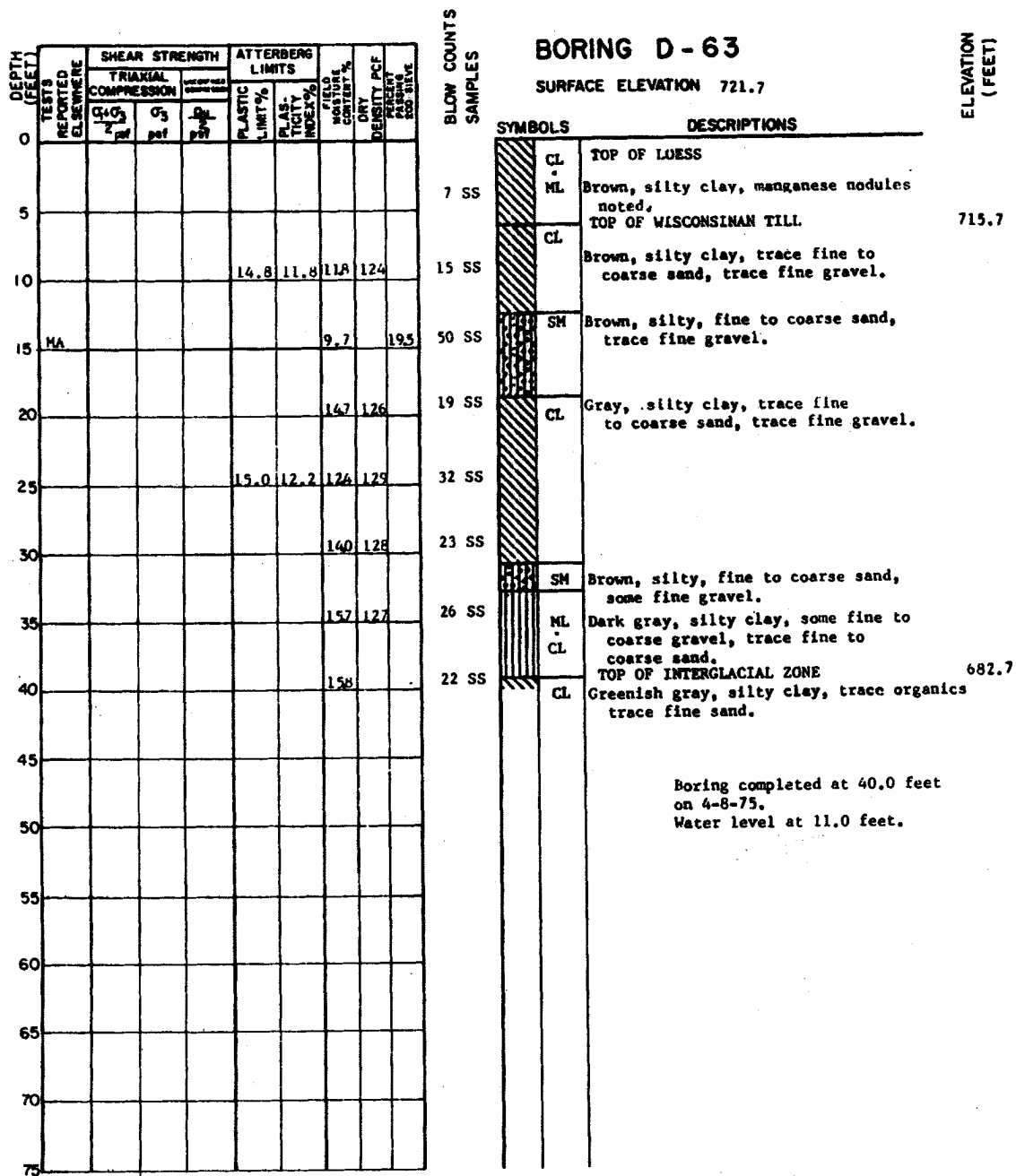
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-125

LOG OF BORING D-62



#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-126

LOG OF BORING D-63





DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS		FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING NO. 200 SIEVE
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %			
		$\frac{\sigma_1 + \sigma_3}{2}$ psi	$\sigma_3$ psi	$\frac{\sigma_1 - \sigma_3}{2}$ psi					
0									
5							17.3		
10	HA						11.6		51.5
15					15.5	11.5	125	125	
20							10.7		
25					11.8	15.8	116	130	
30									
35							136		
40							338		
45							196	108	
50							128		
55							9.5		
60									
65							7.5		
70									
75									

BLOW COUNTS  
SAMPLES

## BORING D-65

SURFACE ELEVATION 724.1

ELEVATION  
(FEET)

### SYMBOLS

### DESCRIPTIONS

0	CL	TOP OF LOESS	
10	SS	Brown, silty clay	
		TOP OF WISCONSINAN TILL	721.6
	CL	Brown, silty clay, some fine to coarse sand, trace fine gravel.	
20	SS	SC	Brown, silty clayey sand, trace fine gravel.
30	SS	CL	Brown, silty clay, some fine to coarse sand, trace fine gravel.
50	SS	SM	Gray, silty, fine sand, trace clay.
47	SS	CL	Gray, silty clay, trace fine to coarse sand, trace fine gravel.
36	SS		
18	SS		
17	SS	ML	TOP OF INTERGLACIAL ZONE Greenish brown, clayey silt, some organics, trace fine to coarse sand.
16	SS	ML	Greenish-gray, silt, little fine to coarse sand, trace organics.
22	SS		-trace fine gravel. TOP OF ILLINOIAN TILL
147	SS	ML SM	Gray, clayey silt and fine to coarse sand, trace fine gravel.
113	SS		
99	SS	ML CL	Gray, clayey silt, some fine to coarse sand, trace fine gravel.
33	SS	ML	Gray, silt, trace fine sand, trace clay, varved.

BORING CONTINUED

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Service\*, Inc.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-128

LOG OF BORING D-65

(SHEET 1 of 2)

ELEVATION  
(FEET)

Boring completed at 100.0 feet  
on 4-15-75.  
Water level at 12.0 feet.

1. Logged by: Sargent & Lundy Engineers  
2. Drilled by: Raymond International  
3. Tested by: Soil Testing Services, Inc.

FIGURE 2.5-128  
LOG OF BORING D-65  
(SHEET 2 of 2)

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING NO. 200 SIEVE
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %	FIELD MOISTURE CONTENT %			
		$\sigma_1 - \sigma_3$ psi	$\sigma_3$ psi	$\sigma_1$ psi						
0										
5					12.3	21.5	105			
10	MA				14.5	14.5	120		680	
15										
20					13.4	14.8	178			
25										
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										

BLOW COUNTS  
SAMPLES

## BORING S-2

SURFACE ELEVATION 704.9

ELEVATION  
(FEET)

### SYMBOLS

### DESCRIPTIONS

AG	CL	Grayish brown, silty clay (topsoil). TOP OF WISCONSINAN TILL
BC	CL	Reddish brown, silty clay, trace fine to coarse sand, trace fine gravel.
BG	CL	Brown, clayey silt, some fine to coarse sand.
BG		16.0 feet, color grades to gray, trace fine gravel.

703.9

Boring completed at 20.0 feet  
on 4-3-75.  
Water level not recorded.

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-129

LOG OF BORING S-2

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF	TEST NUMBER AND DATE			
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %							
		$\sigma_1 - \sigma_3$ psf	$\sigma_3$ psf	$\frac{\sigma_1}{2}$ psf									
0													
5								16.3					
10								13.0					
15													
20	COMP MA UC/R							8.8		600			
25													
30													
35													
40													
45													
50													
55													
60													
65													
70													
75													

BLOW COUNTS  
SAMPLES

**BORING S-3**  
SURFACE ELEVATION 725.0

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS
AG	ML	TOP OF LOESS
		Brown, clayey silt, manganese nodules noted.
	ML	Yellow, silt, trace fine sand and clay.
BG		
		TOP OF WISCONSINAN TILL
BK	CL	Brown, silty clay, little fine to coarse sand.
	CL	Gray, clayey silt, some fine to coarse sand, trace fine gravel.
BN		

714.0

Boring completed at 20.0 feet  
on 4-3-75.  
Water level at 11.0 feet.

**NOTES**

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-130

LOG OF BORING S-3

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE		
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %						
		TEST METHOD TO COMPLY WITH										
		$\sigma_1 - \sigma_3$	$\sigma_3$	$\frac{Q_u}{2}$			FIELD MOISTURE CONTENT %				DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
		psf	psf	psf								
0												
5					12.6	11.2	134					
10												
15	COMP UC/R				13.8	13.2	9.4					
20												
25												
30												
35												
40												
45												
50												
55												
60												
65												
70												
75												

BLOW COUNTS  
SAMPLES

## BORING S-4

SURFACE ELEVATION 722.8

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
AG	CL • ML	TOP OF LOESS Brown, silty clay, manganese nodules noted.	
		TOP OF WISCONSINAN TILL	718.3
BC	CL	Brown, clayey silt, some fine to coarse sand, trace fine gravel.	
BC			
	ML	Gray, silt, trace fine to coarse sand, trace fine gravel.	
Boring completed at 20.0 feet on 4-4-75. Water level at 16.5 feet.			

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-131

LOG OF BORING S-4

LABORATORY TEST DATA									
ELEVATION IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH					
		PLASTIC LIGHT %	PLASTICITY INDEX %	TRIAxIAL COMPRESSION			UNCONFINED COMPRESSION		
				$\bar{C}$	$\bar{A}$	$\bar{D}$	$\bar{C}$	$\bar{A}$	$\bar{D}$
720									
710	C C SA COMP								
700									
690									

**BORING S-5**  
SURFACE ELEVATION 719.0

BLOW COUNTS  
SAMPLES

BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS
7	ML	LIGHT BROWN CLAYEY SILT WITH SOME ROOTS (TOPSOIL)
7	CL	BROWN SILTY CLAY WITH SAND AND OCCASIONAL GRAVEL (MEDIUM STIFF)
17	CL	GRADES TO STIFF
19	CL	
23	CL	GRAY SILTY CLAY WITH SAND AND OCCASIONAL GRAVEL (VERY STIFF)

BORING COMPLETED AT 20.0 FEET  
ON 7-28-72  
NO CASING USED  
WATER LEVEL NOT RECORDED.

ELEVATION IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS	SHEAR STRENGTH	MOISTURE CONTENT %	DRY DENSITY P.C.F.
680					
670					
660				700	21.3
650				4500	91
				4500+	9.4
				4500+	132

BLOW COUNTS  
SAMPLES

BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS
4	ML	DARK BROWN CLAYEY SILT WITH SOME SAND AND ORGANIC MATTER - (TOPSOIL)
2	ML	DARK GRAY AND BROWN SILTY CLAY AND CLAYEY SILT
30	CL	WITH SOME GRAVEL AND OCCASIONAL SEAMS OF SILTY SAND. (SOFT)
19	ML	GRAY SANDY SILT WITH CLAY AND SOME GRAVEL (VERY STIFF)
17	ML	GRADES WITH MORE SAND

BORING COMPLETED AT 20.0 FEET  
ON 7-28-72  
NO CASING USED  
WATER LEVEL NOT RECORDED.

**CLINTON POWER STATION**  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-132

LOG OF BORINGS S-5 AND S-6

**NOTES**

1. LOGGED BY: DAMES & MOORE
2. DRILLED BY: RAYMOND INTERNATIONAL
3. TESTED BY: DAMES & MOORE

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS		FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING NO. 20 SIEVE
		TRIAXIAL COMPRESSION		$\frac{p}{p_u}$	PLASTIC LIMIT %	PLAS- TICITY INDEX %			
		$\frac{\sigma_1 + \sigma_3}{2}$ psi	$\sigma_3$ psi						
0									
5							14.6		
10	COMP PERM				12.8	10.0	10.9		
15								10.5	
20	COMP PERM UC/R				25.5	12.7	10.5		
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BLOW COUNTS  
SAMPLES

## BORING S-8

SURFACE ELEVATION 733.8

ELEVATION  
(FEET)

### SYMBOLS

### DESCRIPTIONS

AG	CL	TOP OF LOESS	
	ML	Brown, silty clay, manganese nodules noted.	
BG		TOP OF WISCONSINAN TILL	731.3
	CL	Brown, clayey silt, little fine to coarse sand, trace fine gravel.	
BG		6.0 feet, some fine to coarse sand.	
		11.0 feet, color grades to gray.	

Boring completed at 20.0 feet  
on 4-2-75.  
Water level at 18.5 feet.

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-133

LOG OF BORING S-8



LABORATORY TEST DATA										
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH						MOISTURE CONTENT %	DRY DENSITY PCF
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAxIAL COMPRESSION		UNCONSOLIDATED COMPRESSION		POCKET SHEAR TEST			
			$\sigma_1$ PSI	$\sigma_3$ PSI	$\sigma_1$ PSI	$\sigma_3$ PSI	$\sigma_1$ PSI	$\sigma_3$ PSI		
720										
710	COMP UC/R	13.1	9.3					4500+	10.8	22.2
700								3000	13.6	
								3500	13.4	
690	COMP	13.5	10.7						11.1	
								4500+	11.4	
680									11.1	
670									12.1	

BLOW COUNTS  
SAMPLES

# **BORING S-9** SURFACE ELEVATION 717.2

SYMBOLS	DESCRIPTIONS
ML	BROWN CLAYEY SILT WITH ROOTS Top of Wisconsin Glacial Till BROWN SILTY CLAY (HARD)
CL	GRADES WITH GRAVEL GRADES TO VERY STIFF GRAVEL GRADES OUT GRADES WITH SAND GRADES TO HARD GRADES TO GRAY AND WITH GRAVEL

BORING COMPLETED AT 40.0 FEET  
ON 3-19-73  
NO CASING USED  
WATER LEVEL NOT RECORDED

## **NOTES**

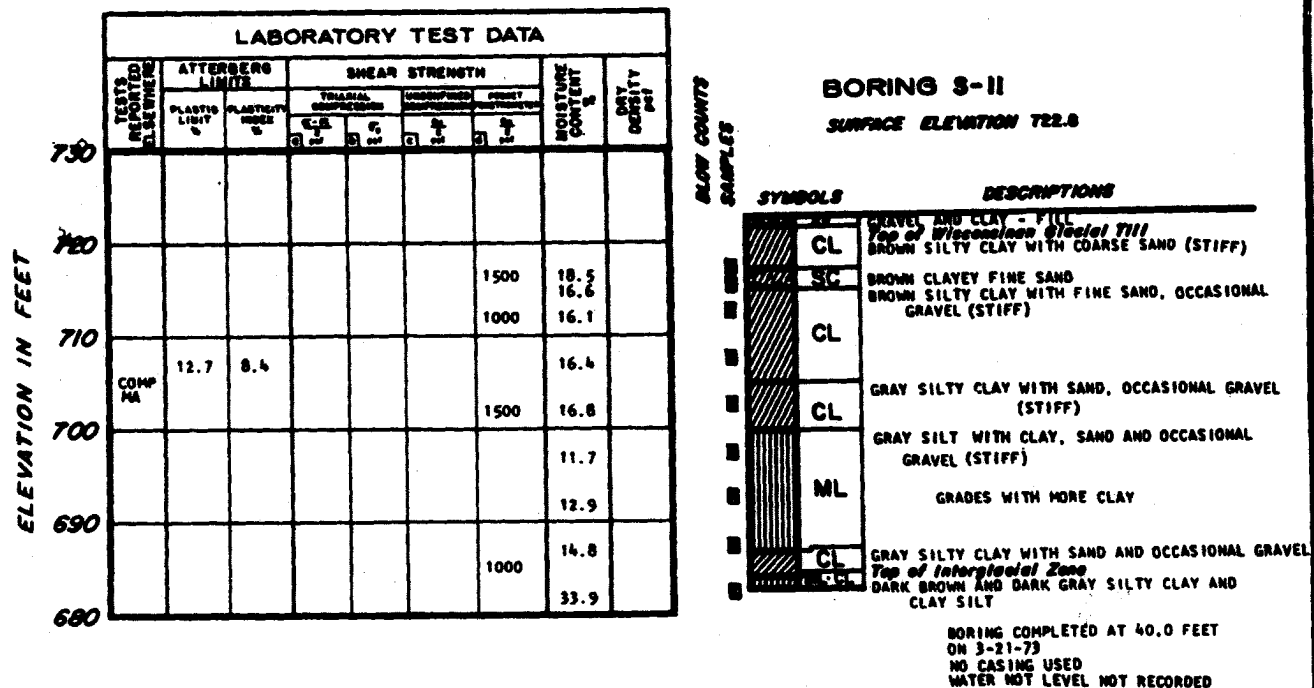
1. LOGGED BY: DAMES & MOORE
2. DRILLED BY: RAYMOND INTERNATIONAL
3. TESTED BY: DAMES & MOORE

## **CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-134

LOG OF BORING S-9





**NOTES**

1. LOGGED BY: DAMES & MOORE
2. DRILLED BY: RAYMOND INTERNATIONAL
3. TESTED BY: DAMES & MOORE

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-136

LOG OF BORING S-11

LABORATORY TEST DATA									
ELEVATION IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH					
		PLASTICITY INDEX %	PLASTICITY INDEX %	UNSATURATED COMPRESSION		SATURATED COMPRESSION		MOISTURE CONTENT %	DRY DENSITY PCF
				q <sub>u</sub> (PSI)	q <sub>u</sub> (KSI)	q <sub>v</sub> (PSI)	q <sub>v</sub> (KSI)		
730									
720	UC/R	14.0	9.0					23.1	
710	COMP							1000	14.9
								2000	13.2
700	COMP	11.2	7.4						14.5
								2000	14.7
690	COMP MA	13.0	8.6					1000	15.9
680								1000	15.9

BLOW COUNTS  
SAMPLES

## BORING S-12

SURFACE ELEVATION 722.2

SYMBOLS	DESCRIPTIONS
CL	GRAVEL - FILL Top of Wisconsin Glacial Till BROWN SILTY CLAY (STIFF)
CL	GRADES SANDY GRADES WITH SAND AND GRAVEL GRAY SILTY CLAY WITH SAND AND GRAVEL (STIFF)
CL	GRADES WITH LESS SILT
CL	GRADES WITH MORE SILT Top of Interstitial Zone BROWN SILTY CLAY AND CLAYEY SILT

BORING COMPLETED AT 40.0 FEET  
ON 3-19-73  
NO CASING USED  
WATER LEVEL NOT RECORDED

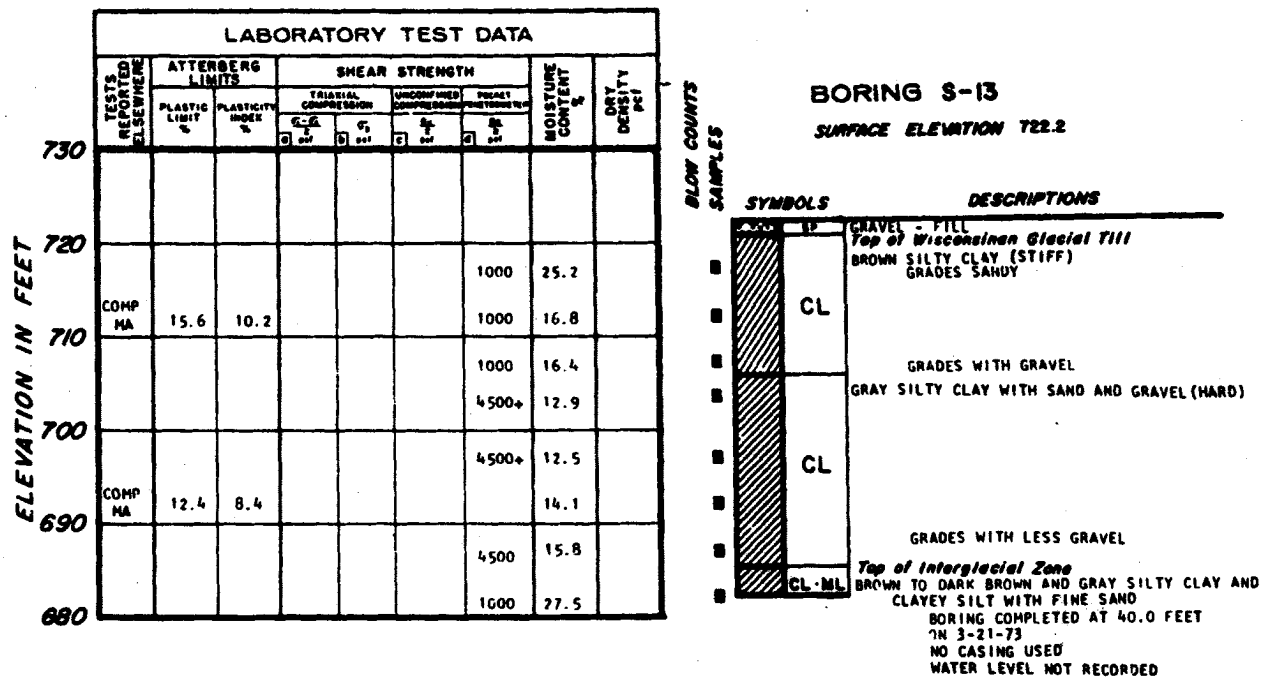
### NOTES

1. LOGGED BY: DAMES & MOORE
2. DRILLED BY: RAYMOND INTERNATIONAL
3. TESTED BY: DAMES & MOORE

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-137

LOG OF BORING S-12



**NOTES**

1. LOGGED BY: DAMES & MOORE
2. DRILLED BY: RAYMOND INTERNATIONAL
3. TESTED BY: DAMES & MOORE

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-138

LOG OF BORING S-13

LABORATORY TEST DATA											
ELEVATION IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH						MOISTURE CONTENT %	DRY DENSITY PCF
		PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION			UNCONFINED COMPRESSION		MOISTURE CONTENT %		
				S <sub>1</sub> psi	S <sub>2</sub> psi	S <sub>3</sub> psi	q <sub>u</sub> psi	q <sub>u</sub> psi			
740											
730											
720	PERM C COMP UC/R	16.6	11.4					1500	24.9		
									16.6		
									14.3		
710								3500	15.3		
	UC/R	12.2	6.8					4500+	12.2		
700	COMP TR/UL R								14.9		
									11.7		
690								3500	17.7		
680	COMP								16.6		

BLOW COUNTS  
SAMPLES

# **BORING S-14** SURFACE ELEVATION 730.2

SYMBOLS	DESCRIPTIONS
SP	GRAVEL - FILL Top of Wisconsin Glacial Till BROWN SILTY CLAY (STIFF)
CL	GRADES WITH FINE SAND GRAY SILTY CLAY WITH SAND AND GRAVEL (VERY STIFF TO HARD) GRADES WITH MORE SAND GRADES WITH LESS SAND
CL	Top of Interglacial Zone GRAY SILTY CLAY WITH SAND AND OCCASIONAL GRAVEL (VERY STIFF) VERY SILTY SAND AND GRAVEL GRADE OUT 43 TO 46 FEET GREEN SILTY CLAY WITH SAND AND OCCASIONAL GRAVEL
CL	

BORING COMPLETED AT 50.0 FEET  
ON 3-19-73  
NO CASING USED  
WATER LEVEL NOT RECORDED

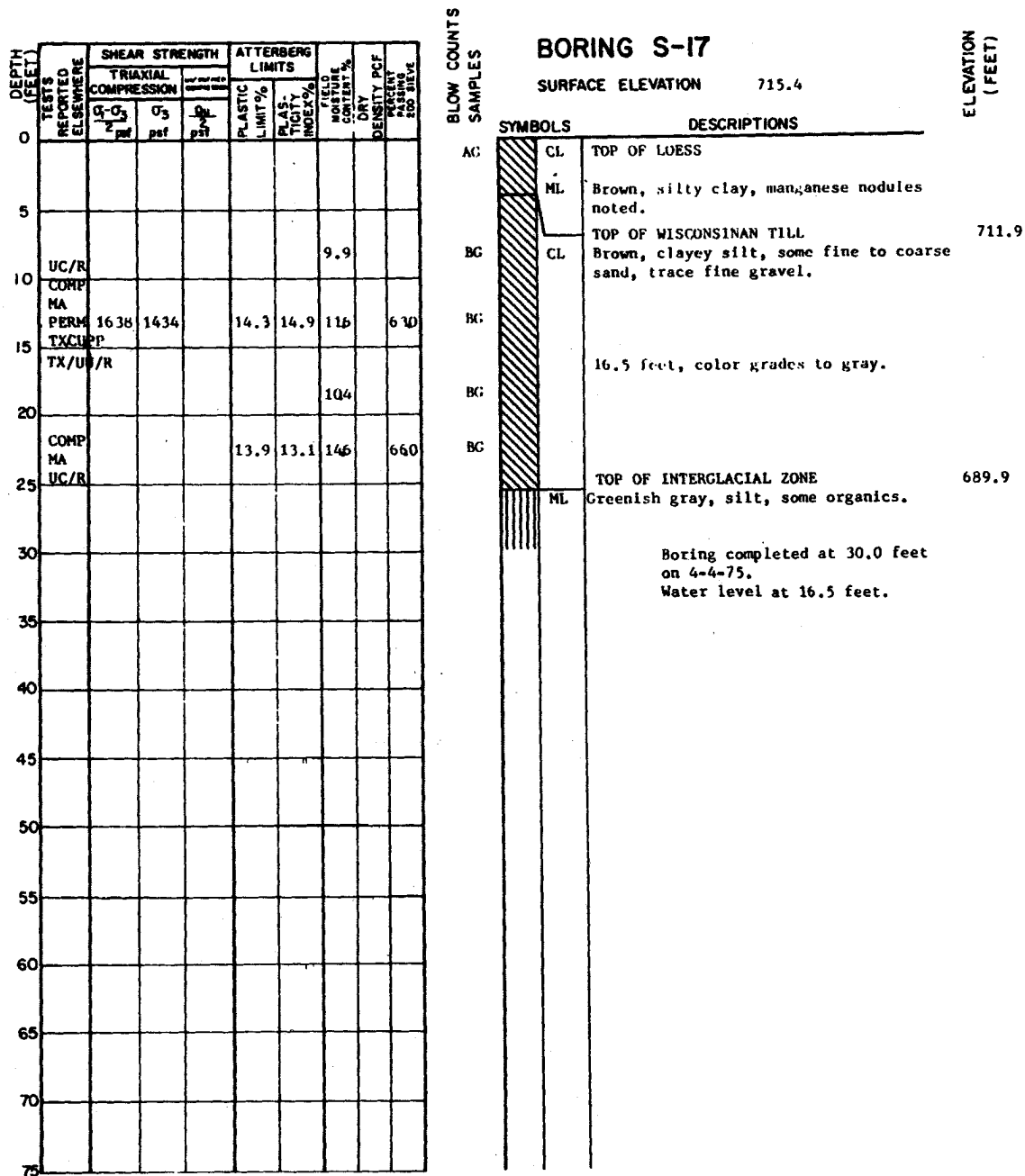
## **NOTES**

1. LOGGED BY: DAMES & MOORE
2. DRILLED BY: RAYMOND INTERNATIONAL
3. TESTED BY: DAMES & MOORE

## **CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-139

LOG OF BORING S-14



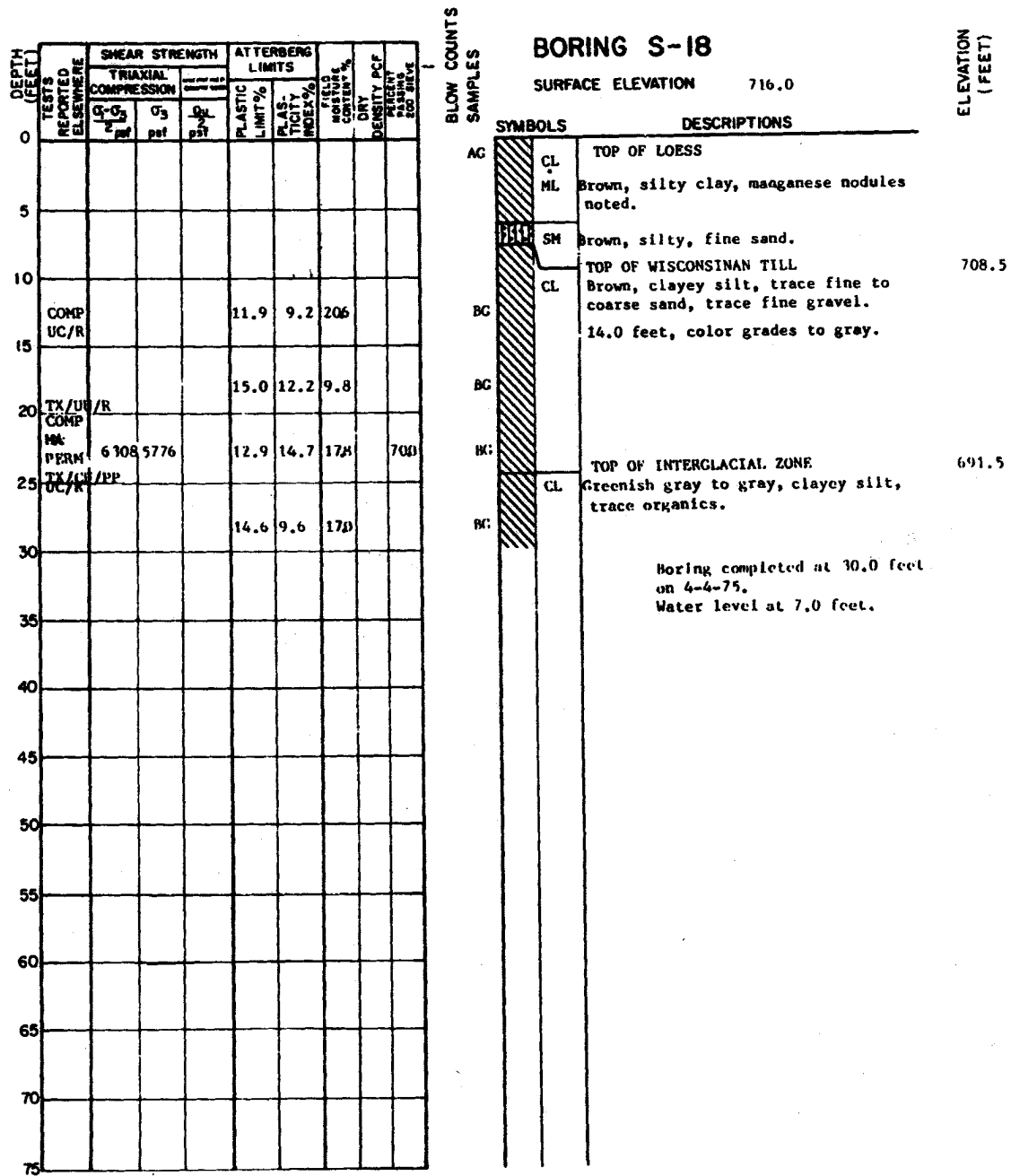
**NOTES**

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-140

LOG OF BORING S-17



#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-141

LOG OF BORING S-18



### BLOW COUNTS SAMPLES

**SURFACE ELEVATION**      725.5

ELEVATION  
( FEET )

## NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

# CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-142

LOG OF BORING S-19

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTENBERG LIMITS		FILLS MATERIAL CONTENT %	DRY DENSITY PCF	WATER CONTENT %	FLUIDITY INDEX	SAND PERCENT	SILT PERCENT	CLAY PERCENT	
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS. TICITY INDEX %								
		$\sigma_1 - \sigma_3$ psi	$\sigma_3$ psi	$\frac{\sigma_1 - \sigma_3}{2}$ psi										
0														
5	COMP TXCURP UC/R	786	1434		15.0	15.0	146							
10							119							
15							120							
20	COMP TXCURP	5960	5776		13.8	15.0	107							
25														
30														
35														
40														
45														
50														
55														
60														
65														
70														
75														

BLOW COUNTS  
SAMPLES

## BORING S-20

SURFACE ELEVATION 724.9

ELEVATION  
(FEET)

SYMBOLS	DESCRIPTIONS
AC	TOP OF LOESS Brown, silty clay, manganese nodules noted. TOP OF WISCONSINAN TILL. 722.4
CL	Brown, clayey silt, some fine to coarse sand, trace fine gravel.
BC	
BC	-13.0 feet, color grades to gray.
BC	
BC	
BC	
ML	TOP OF INTERGLACIAL ZONE 687.9 Greenish gray, silt, trace organics.
	Boring completed at 40.0 feet on 4-7-75. Water level at 18.0 feet.

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-143

LOG OF BORING S-20

**BLOW COUNTS  
SAMPLES**

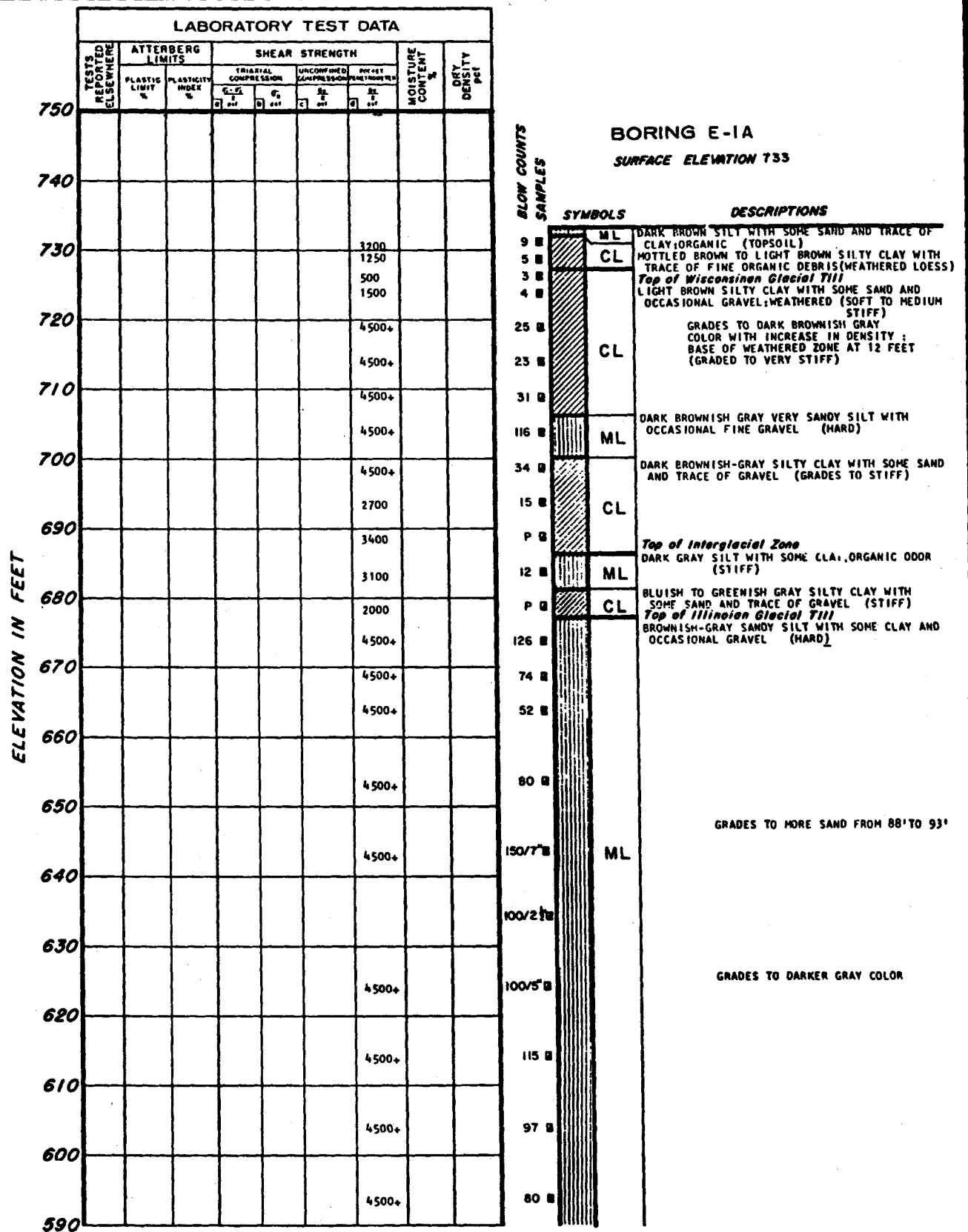
**SURFACE ELEVATION 736.4**

ELEVATION  
(FEET)

Boring completed at 50.0 feet  
on 4-3-75.  
Water level at 4.0 feet.

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Soil Testing Services, Inc.

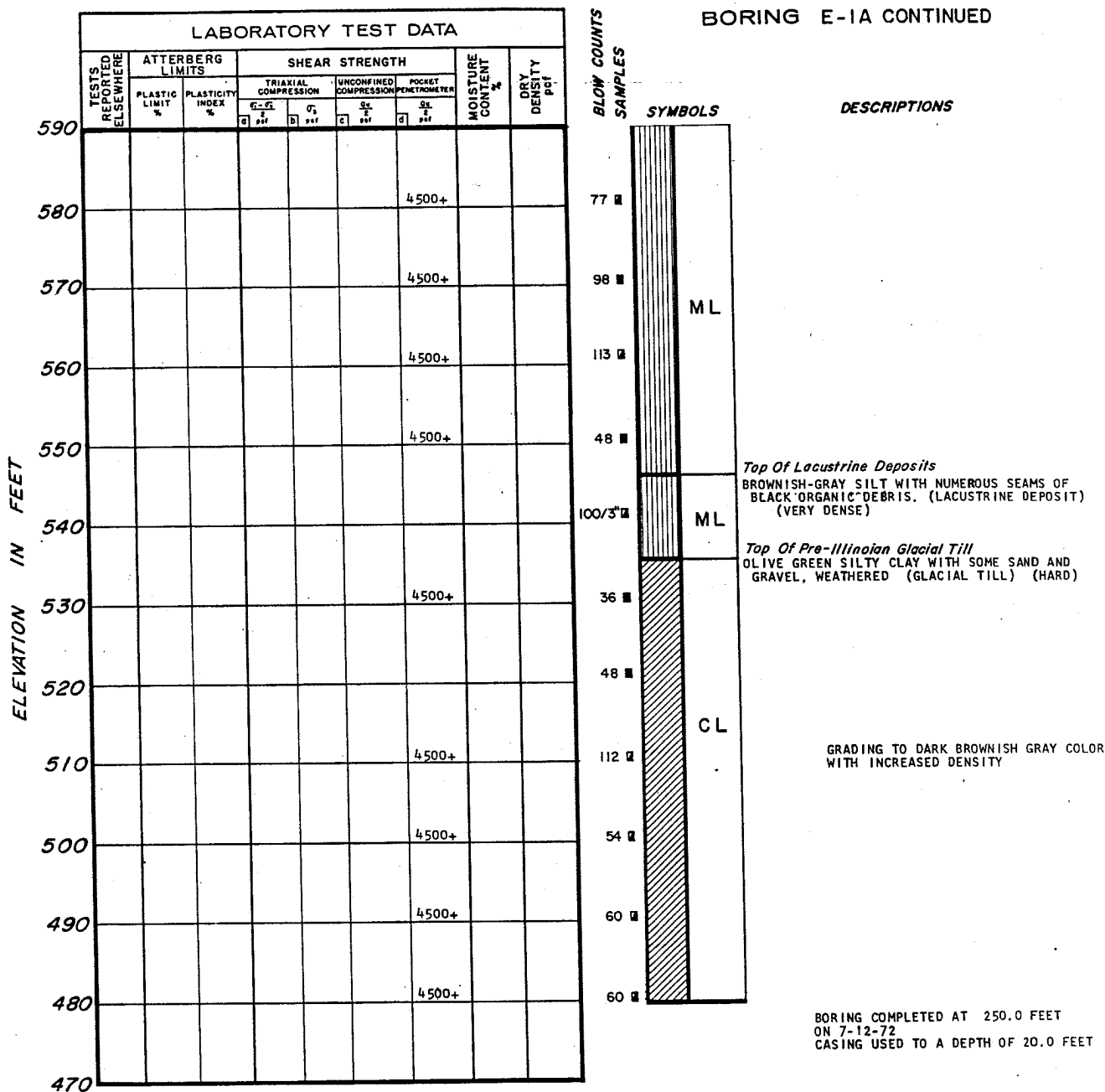
## LOG OF BORING S-21



BORING CONTINUED

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-145  
LOG OF BORING E-1A  
(SHEET 1 of 2)



PIEZOMETER INSTALLED ON 7-13-72  
BORING E-1B, LOCATED 10 FEET FROM E-1A,  
WAS DRILLED TO A DEPTH OF 40 FEET.  
A 3/4 INCH PVC PIPE WITH THE LOWER END  
PLUGGED AND THE LOWER 5 FEET PERFORATED  
WAS PLACED TO ELEVATION 693. GRANULAR  
BACKFILL WAS PLACED FROM ELEVATION 693 TO 703;  
BENTONITE SEAL FROM ELEVATION 703 TO 705;  
AND CEMENT GROUT FROM ELEVATION 705 TO 733.

WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
10.0	8-3-72
10.6	8-22-72
11.7	9-6-72

REFER TO FIGURE 2.4-38 FOR  
WATER LEVEL OBSERVATIONS.

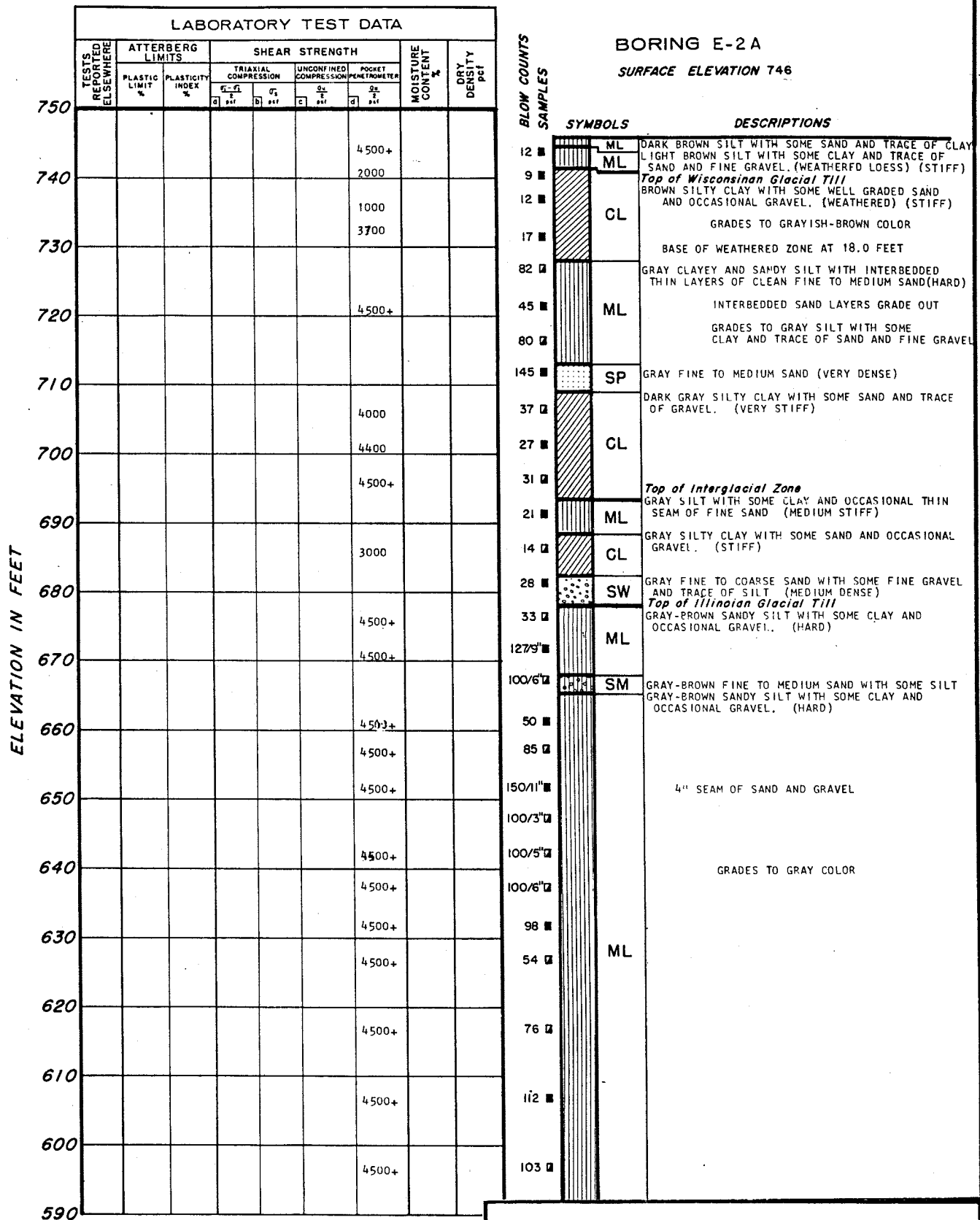
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-145

LOG OF BORING E-1A  
(SHEET 2 of 2)

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

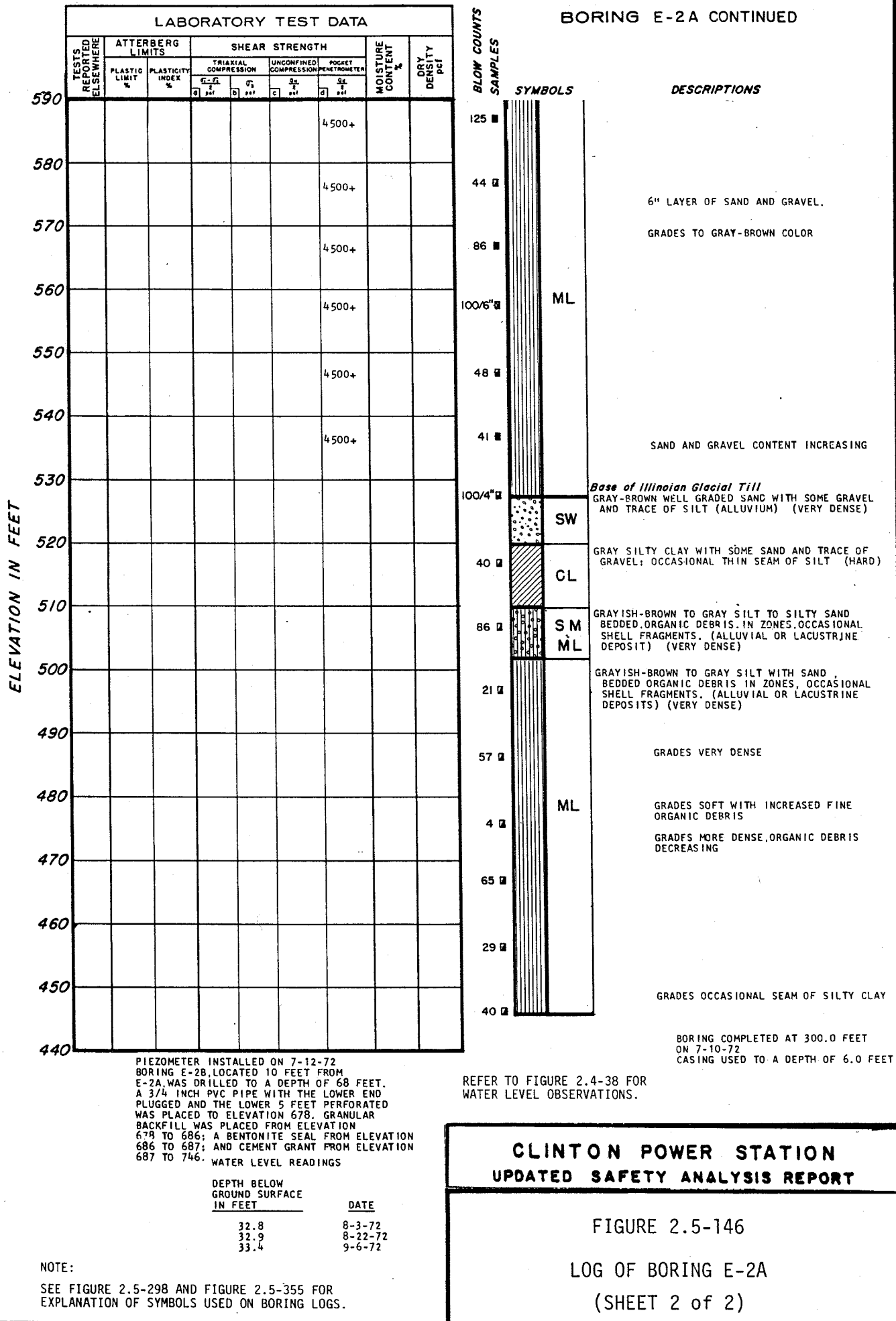


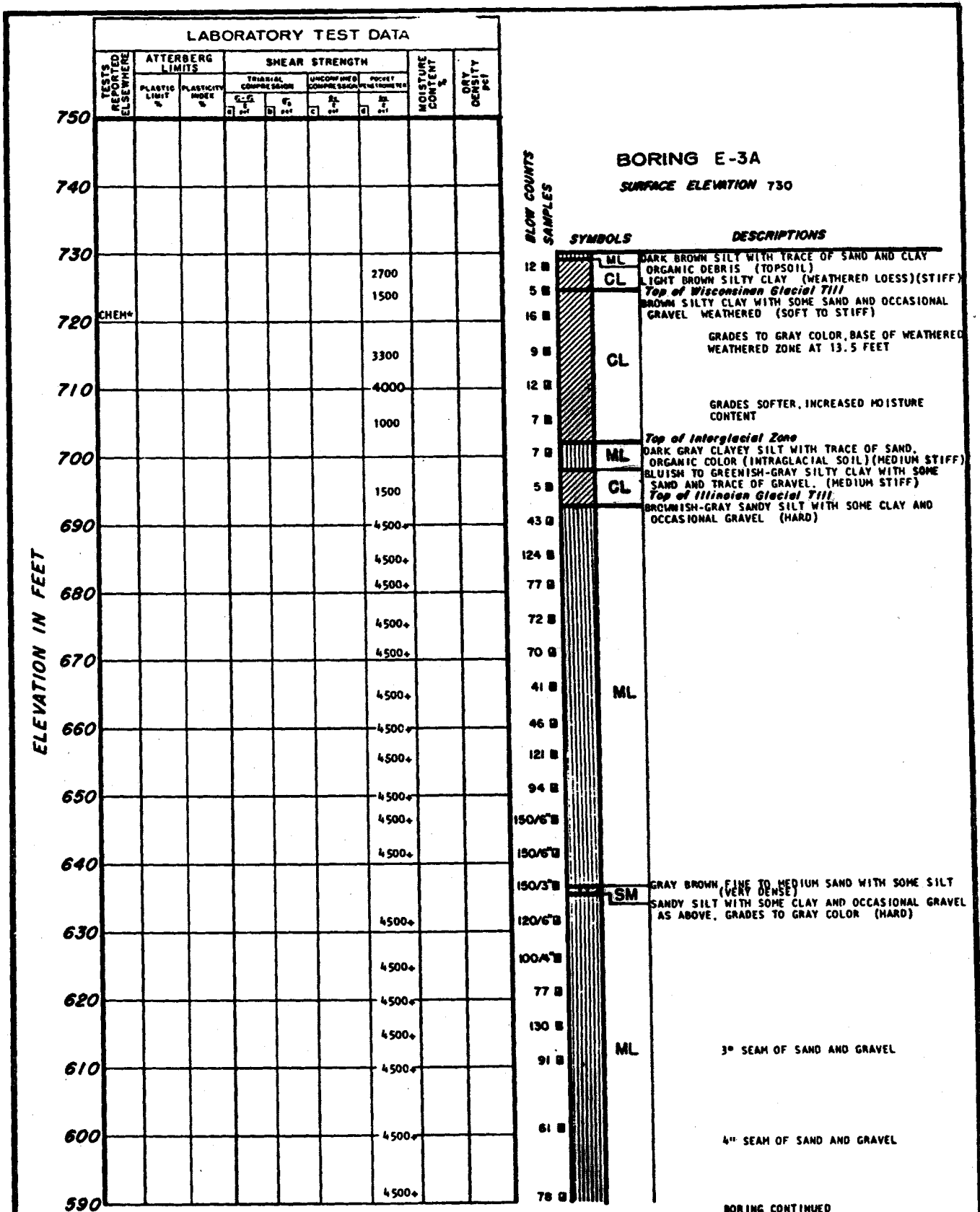
BORING CONTINUED

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-146

LOG OF BORING E-2A  
(SHEET 1 of 2)

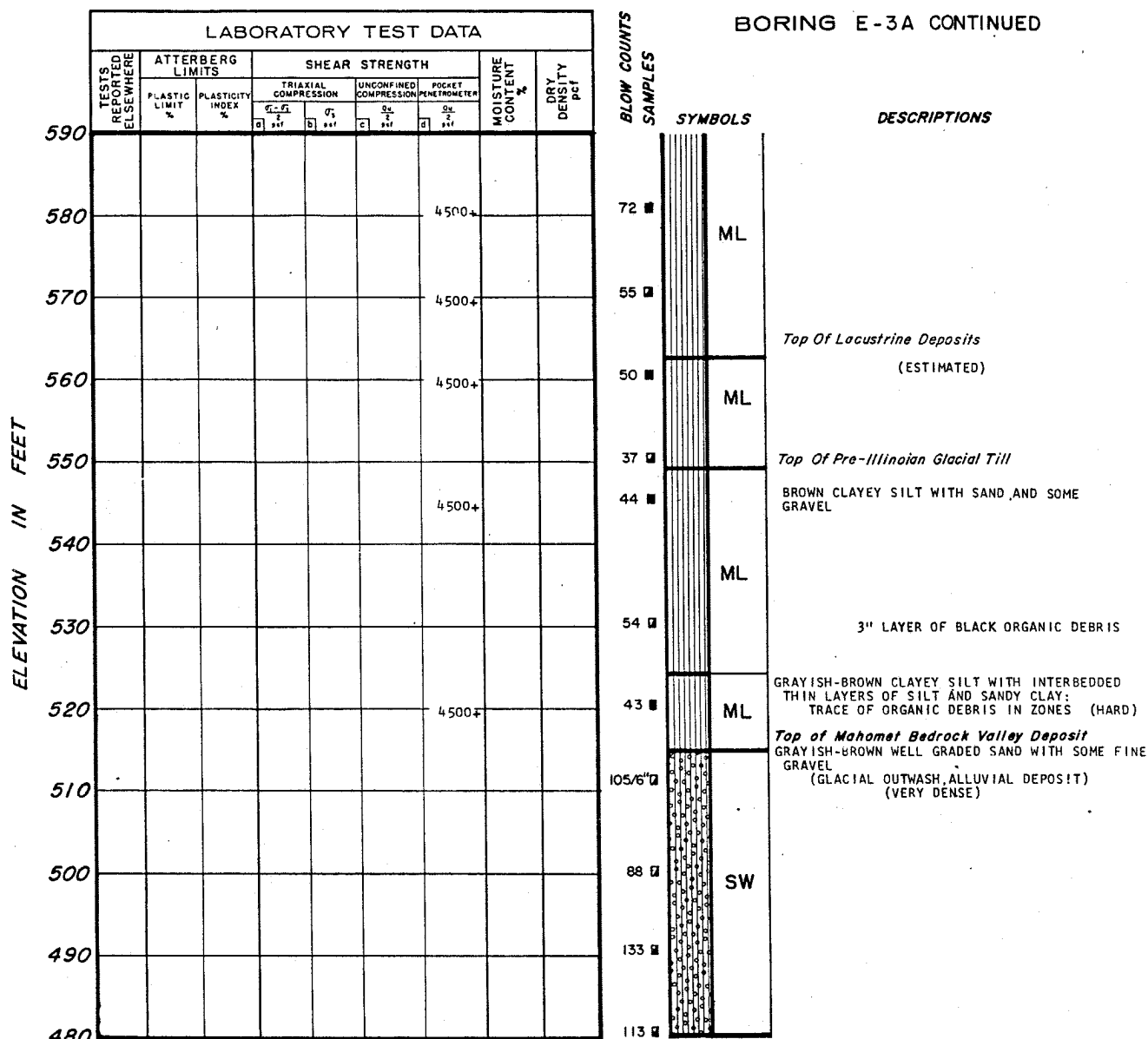




**CLINTON POWER STATION**  
**UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-147  
 LOG OF BORING E-3A  
 (SHEET 1 of 2)





PIEZOMETER INSTALLED IN E-3A ON 7-5-72 BORING WAS REOPENED TO 238 FEET. A 3/4 INCH PVC PIPE WITH AN 18 INCH POROUS STONE TIP WAS PLACED AT ELEVATION 495. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 492 TO 516; A BENTONITE PLUG FROM ELEVATION 516 TO 518; AND CEMENT GROUT FROM ELEVATIONS 518 TO 730.

PIEZOMETER INSTALLED ON 7-12-72 BORING E-3B LOCATED 10 FEET FROM E-3A WAS DRILLED TO A DEPTH OF 75 FEET. A 3/4 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 5 FEET PERFORATED WAS PLACED AT ELEVATION 655. GRANULAR BACKFILL WAS PLACED FROM ELEVATIONS 655 TO 662; A BENTONITE SEAL FROM ELEVATIONS 662 TO 663; AND PEA GRAVEL AND CEMENT GROUT FROM ELEVATIONS 663 TO 730.

**WATER LEVEL READINGS**

DEPTH BELOW GROUND  
SURFACE IN FEET

TIP ELEVATION 492.0   TIP ELEVATION 657.5   DATE

81.6  
81.8

8-15-72  
9-6-72

REFER TO FIGURE 2.4-38 FOR  
WATER LEVEL OBSERVATIONS.

BORING COMPLETED AT 249.5 FEET  
ON 6-29-72

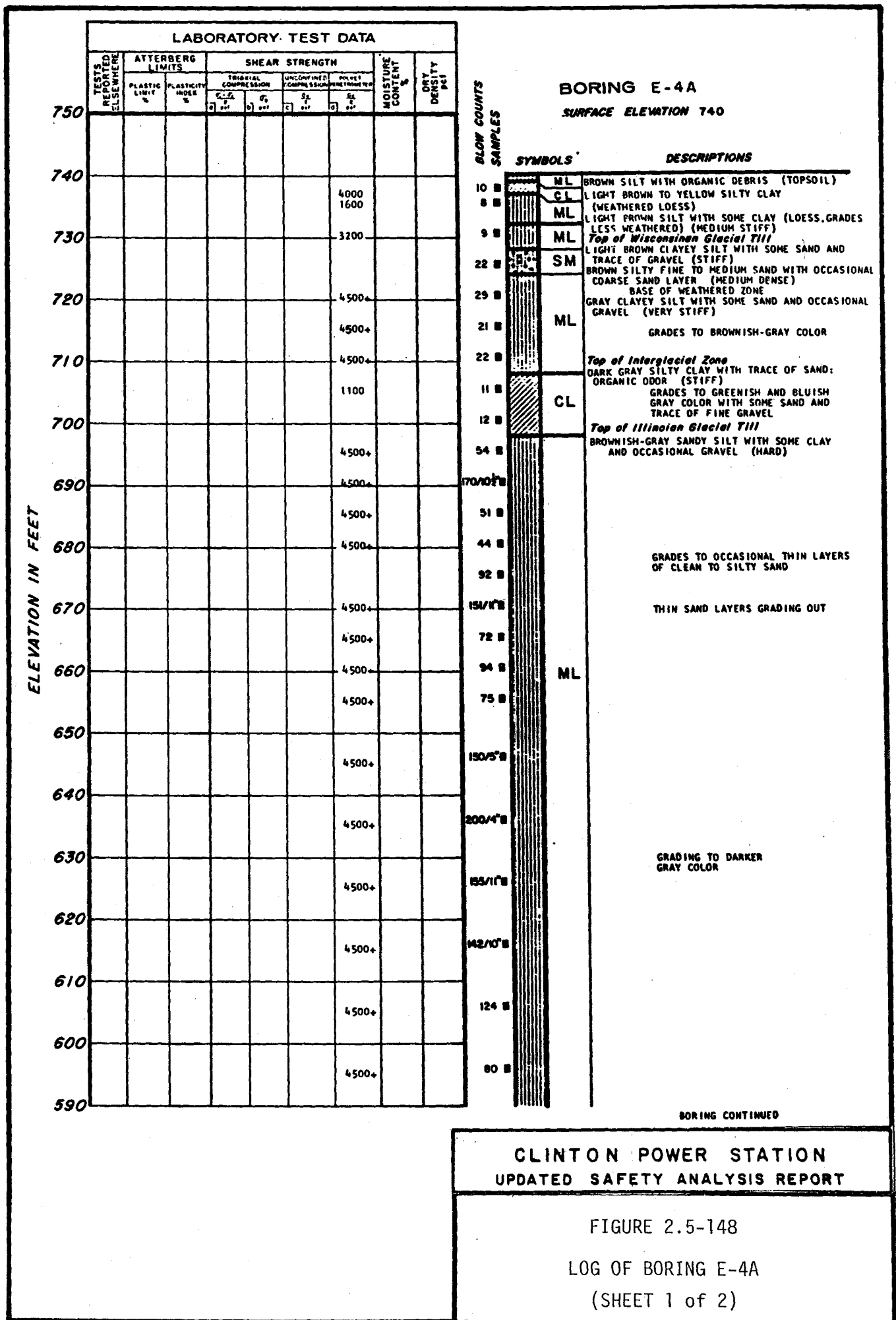
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

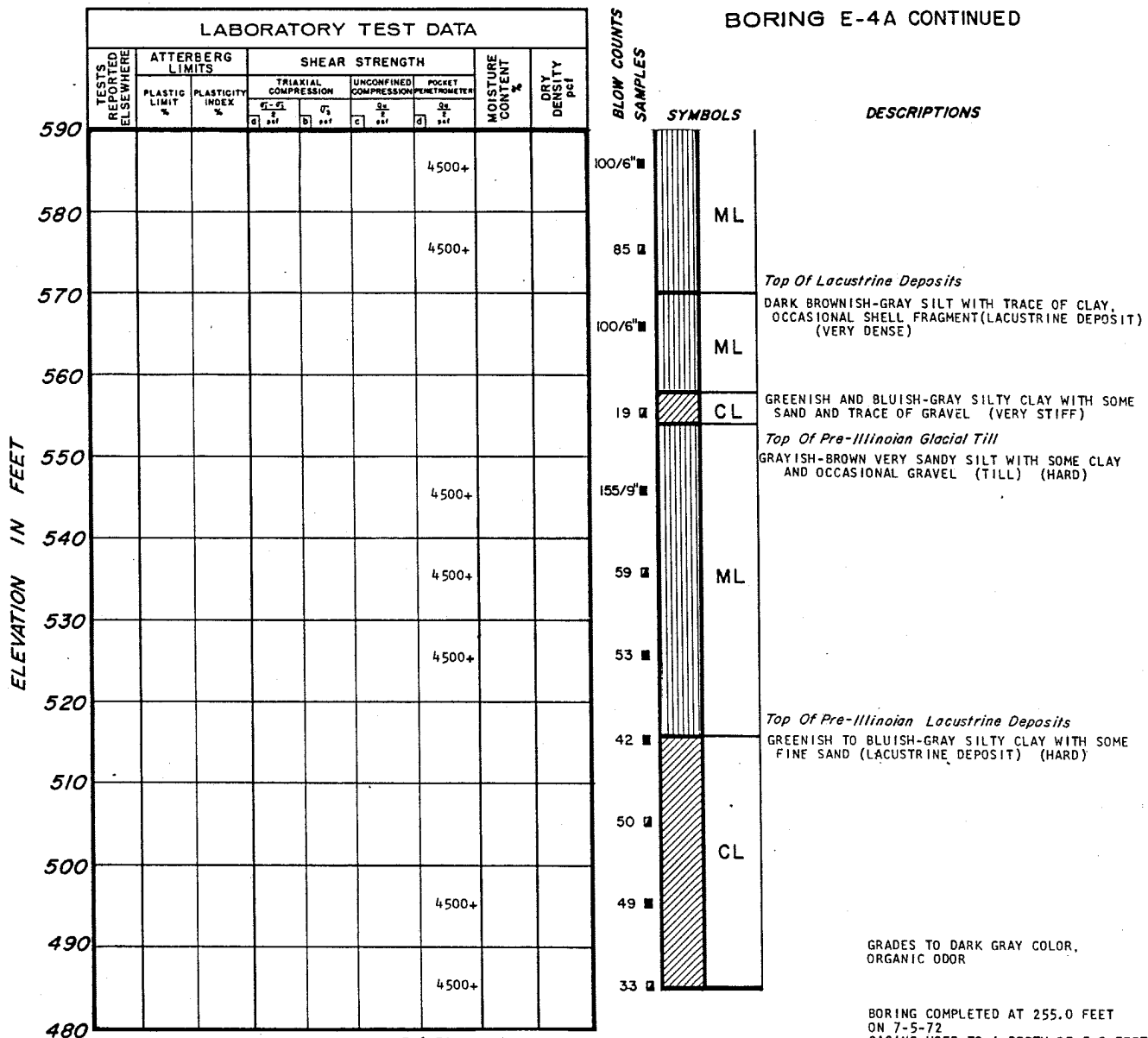
FIGURE 2.5-147

LOG OF BORING E-3A  
(SHEET 2 of 2)

**NOTE:**

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





PIEZOMETER INSTALLED ON 7-6-72  
BORING E-4B LOCATED 10 FEET  
FROM E-4A WAS DRILLED TO A  
DEPTH OF 76 FEET. A 3/4 INCH PVC  
PIPE WITH THE LOWER END PLUGGED AND  
THE LOWER 5 FEET PERFORATED WAS PLACED  
AT ELEVATION 644. GRANULAR BACKFILL WAS  
PLACED FROM ELEVATIONS 644 TO 654. A BENTONITE  
SEAL FROM ELEVATIONS 654 TO 656 AND PEA GRAVEL  
AND CEMENT GROUT FROM ELEVATIONS 656 TO 740.

WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
26.6	8-3-72
26.8	8-15-72
27.9	9-6-72

REFER TO FIGURE 2.4-38 FOR  
WATER LEVEL OBSERVATIONS.

BORING COMPLETED AT 255.0 FEET  
ON 7-5-72  
CASING USED TO A DEPTH OF 5.0 FEET

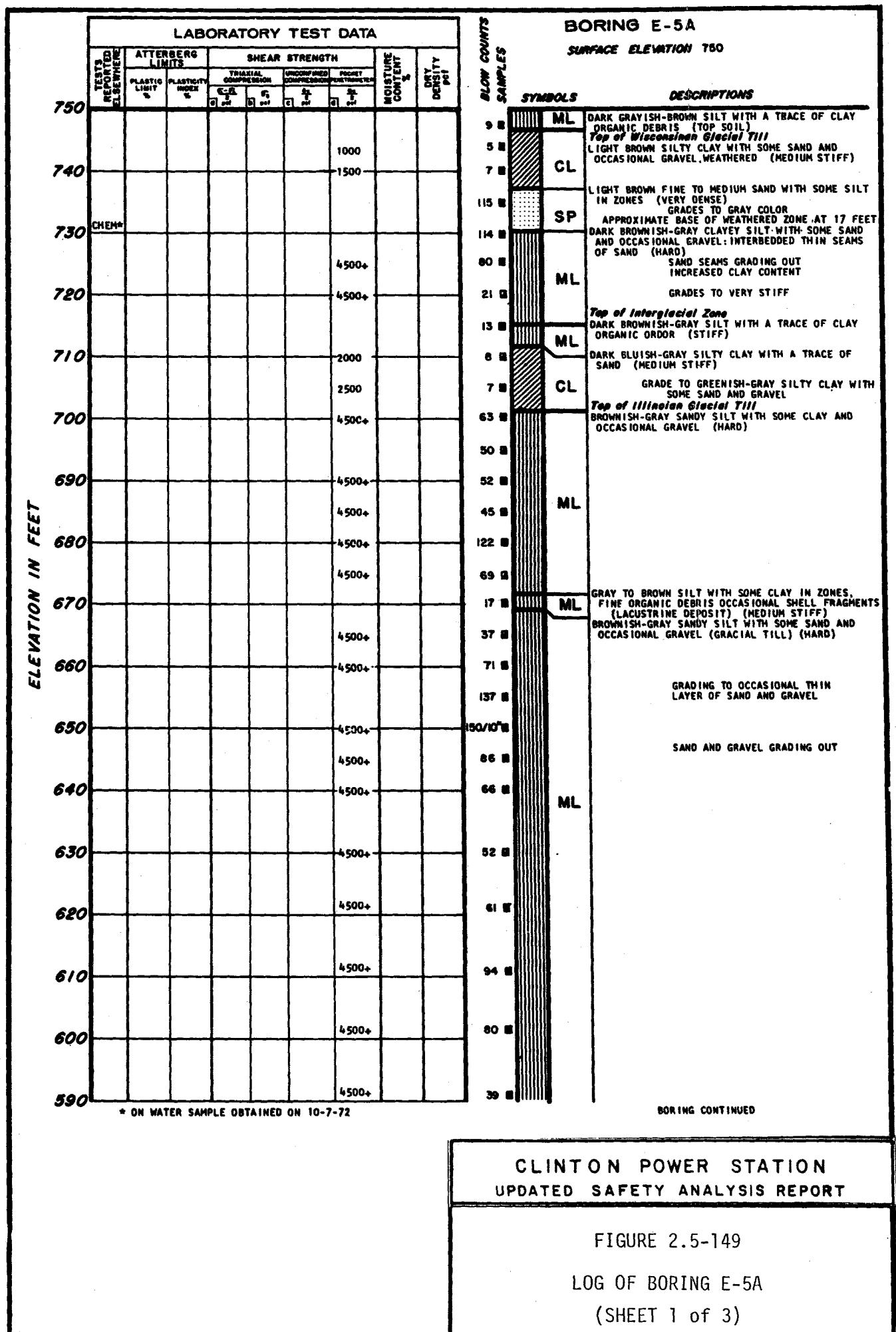
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

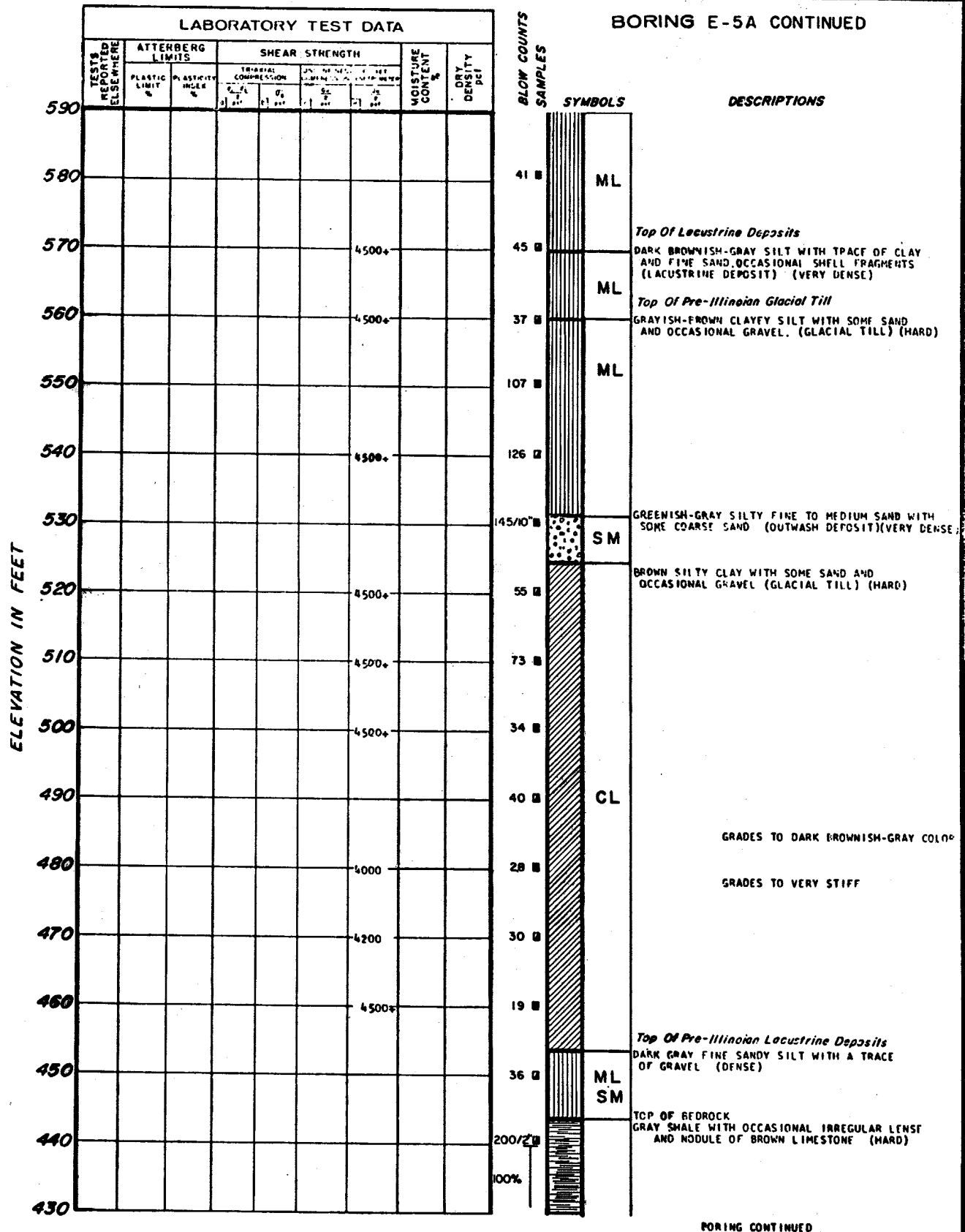
FIGURE 2.5-148

LOG OF BORING E-4A  
(SHEET 2 of 2)

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

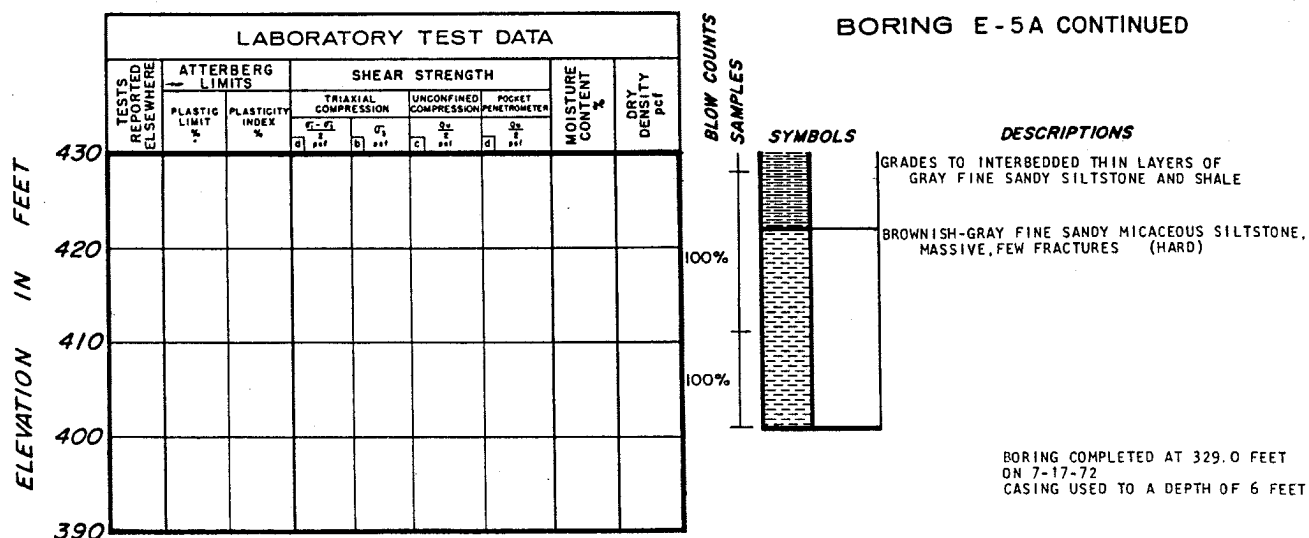




**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-149

LOG OF BORING E-5A  
(SHEET 2 of 3)



PIEZOMETER INSTALLED ON 7-19-72 BORING E-5B, LOCATED 10 FEET FROM E-5A, WAS DRILLED TO A DEPTH OF 76 FEET. A 3/4 INCH PVC PIPE WITH AN 18 INCH POROUS STONE TIP WAS PLACED TO ELEVATION 675. GRANULAR BACKFILL WAS PLACED BETWEEN ELEVATIONS 674 TO 680; A BENTONITE SEAL BETWEEN ELEVATIONS 680 AND 683; AND CEMENT GROUT FROM ELEVATION 683 TO 750.

**WATER LEVEL READINGS**

DEPTH BELOW GROUND SURFACE IN FEET	DATE
16.8	8-3-72
16.9	8-15-72
17.3	9-6-72

REFER TO FIGURE 2.4-38 FOR WATER LEVEL OBSERVATIONS.

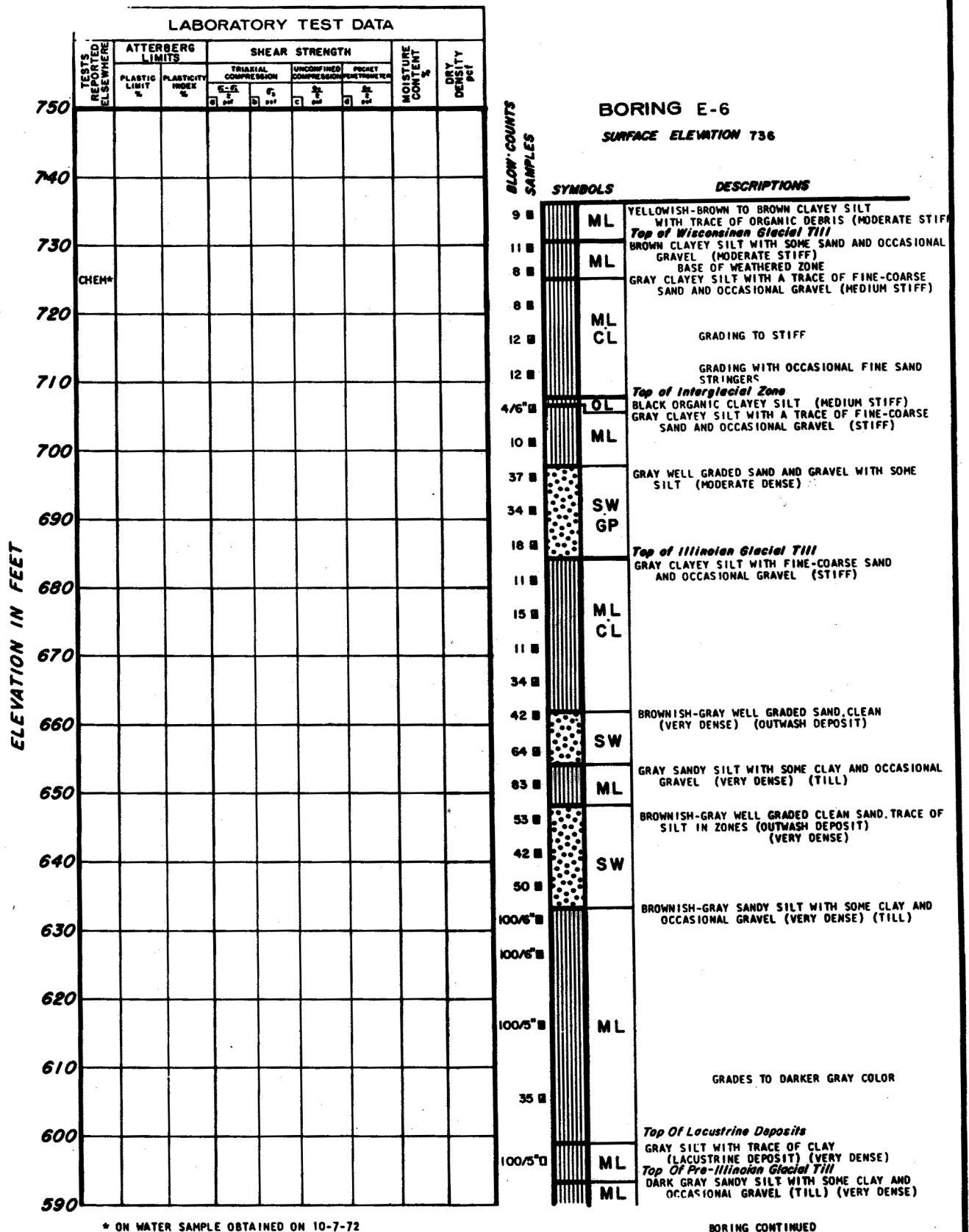
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-149

LOG OF BORING E-5A  
(SHEET 3 of 3)

**NOTE:**

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

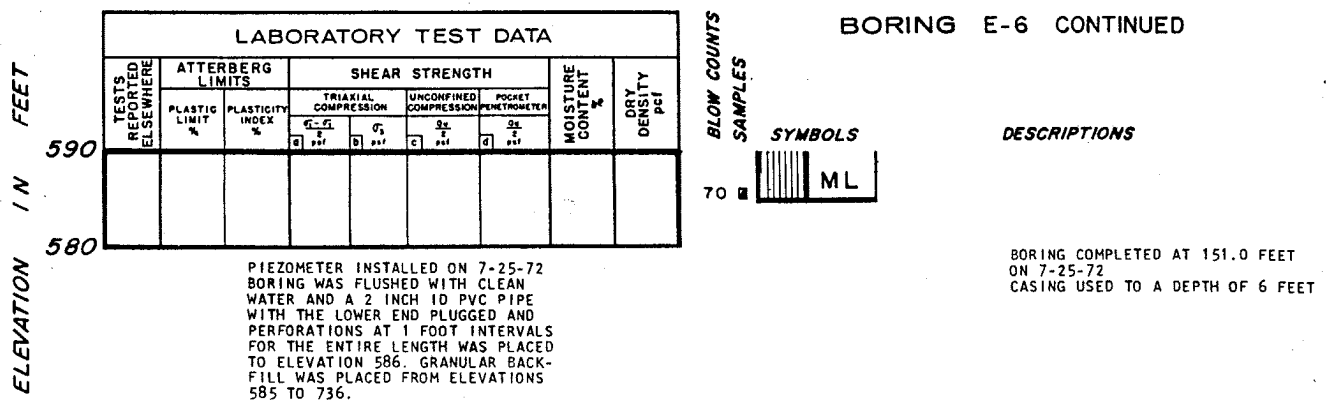


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-150

LOG OF BORING E-6

(SHEET 1 of 2)



PIEZOMETER INSTALLED ON 7-25-72  
BORING WAS FLUSHED WITH CLEAN  
WATER AND A 2 INCH ID PVC PIPE  
WITH THE LOWER END PLUGGED AND  
PERFORATIONS AT 1 FOOT INTERVALS  
FOR THE ENTIRE LENGTH WAS PLACED  
TO ELEVATION 586. GRANULAR BACK-  
FILL WAS PLACED FROM ELEVATIONS  
585 TO 736.

WATER LEVEL READINGS

DEPTH BELOW GROUND SURFACE IN FEET	DATE
11.8	9-19-72
11.4	9-26-72
11.3	10-10-72

REFER TO FIGURE 2.4-38 FOR  
WATER LEVEL OBSERVATIONS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-150

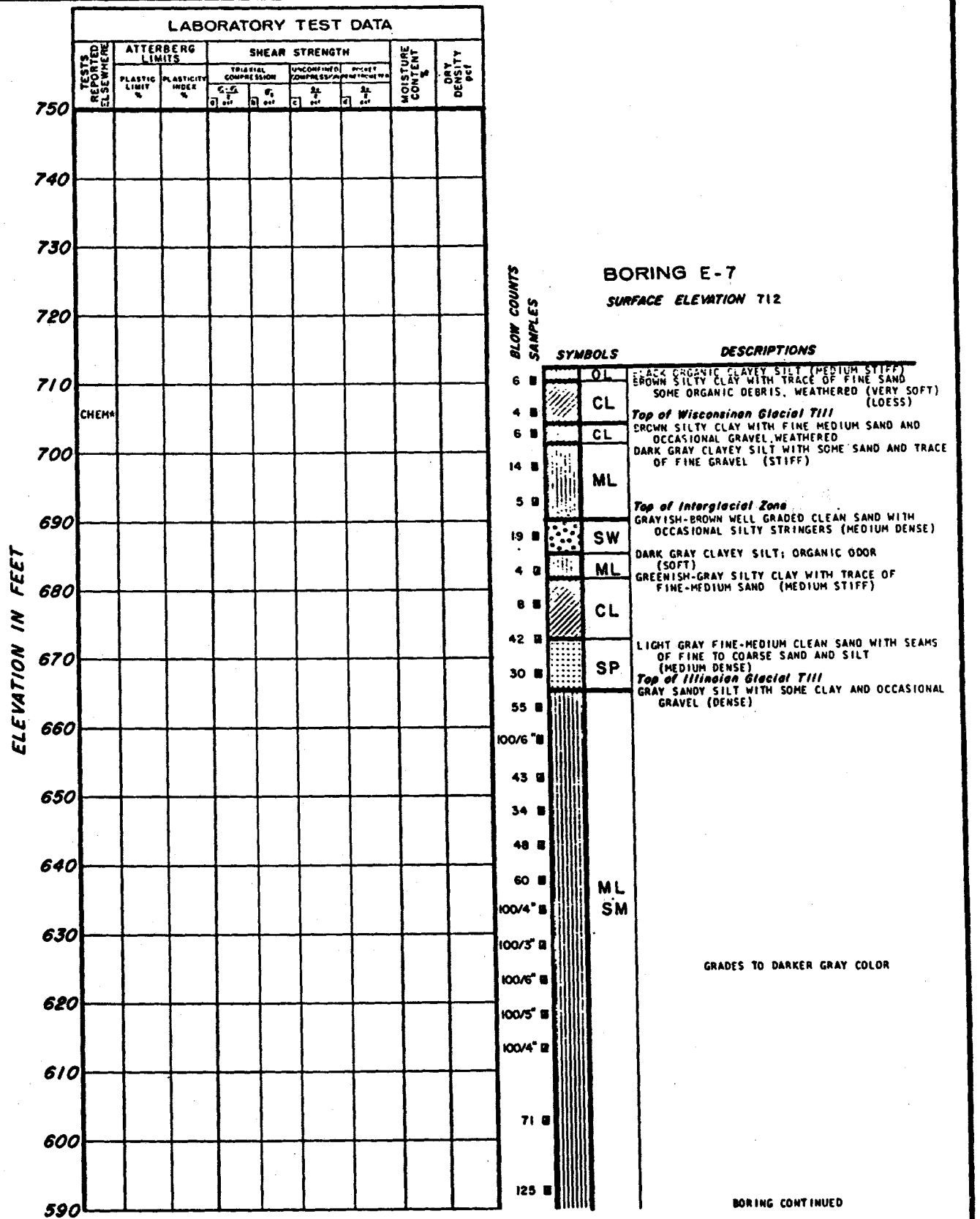
LOG OF BORING E-6

(SHEET 2 of 2)

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





\* ON WATER SAMPLE OBTAINED ON 10-7-72

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-151  
LOG OF BORING E-7  
(SHEET 1 of 2)

LABORATORY TEST DATA										
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH						MOISTURE CONTENT %	DRY DENSITY pcf
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION		POCKET PENETROMETER			
			$\frac{\sigma_1 - \sigma_3}{2}$	$\sigma_3$	$\frac{q_u}{2}$	$q_u$				
			a psi	b psi	c psi	d psi				
590										
580										
570										
560										
550										

PIEZOMETER INSTALLED IN 7-20-72  
BORING WAS FLUSHED WITH CLEAN WATER  
AND A 3 INCH ID PIPE WITH THE LOWER  
END PLUGGED AND PERFORATION AT 1 FOOT  
INTERVALS FOR THE ENTIRE LENGTH WAS  
PLACED TO ELEVATION 562. GRANULAR  
BACKFILL WAS PLACED FROM ELEVATION  
560.5 TO 712.

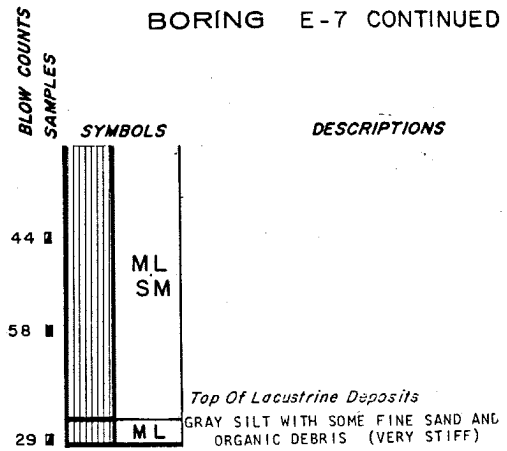
DEPTH BELOW GROUND  
SURFACE IN FEET

DATE

5.5	9-19-72
2.4	9-26-72
3.7	10-10-72

REFER TO FIGURE 2.4-38 FOR  
WATER LEVEL OBSERVATIONS.

## BORING E-7 CONTINUED



BORING COMPLETED AT 151.5 FEET  
ON 7-20-72  
CASING USED TO A DEPTH OF 6.0 FEET

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-151

LOG OF BORING E-7

(SHEET 2 of 2)

### NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

LABORATORY TEST DATA										
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH						MOISTURE CONTENT %	DRY DENSITY pcf
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAxIAL COMPRESSION		UNCONFINED COMPRESSION		POCKET PENETROMETER			
			$\frac{\sigma_1 - \sigma_3}{2}$	$\sigma_3$	$\frac{q_u}{2}$	$q_u$	$\frac{q_n}{2}$	$q_n$		
			a	b	c	d	e	f		
680										
670	24	27								
660										
650										
640										

ELEVATION IN FEET

700									
690									
680									
670									
660									
650									

## BORING G-1

SURFACE ELEVATION 675.1

SAMPLES

SYMBOLS

DESCRIPTIONS

☒	CH	BROWN SILTY CLAY WITH SOME FINE ROOTS (MEDIUM STIFF TO STIFF)
☒		GRADING MOIST
☒	SM	BROWN SILTY FINE TO MEDIUM SAND (DENSE)
☒		GRADING WITH LESS SILT
☒	SW	GRADING WITH SOME COARSER SAND
☒		BROWN FINE TO COARSE SAND WITH SOME SILT AND FINE TO COARSE GRAVEL (DENSE)
☒	CL	GRAY FINE TO MEDIUM SANDY CLAY WITH OCCASIONAL FINE GRAVEL (VERY STIFF)

BORING COMPLETED ON 8-22-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 11.0 FEET ON 8-22-73.

## BORING G-2

SURFACE ELEVATION 692.3

SAMPLES

SYMBOLS

DESCRIPTIONS

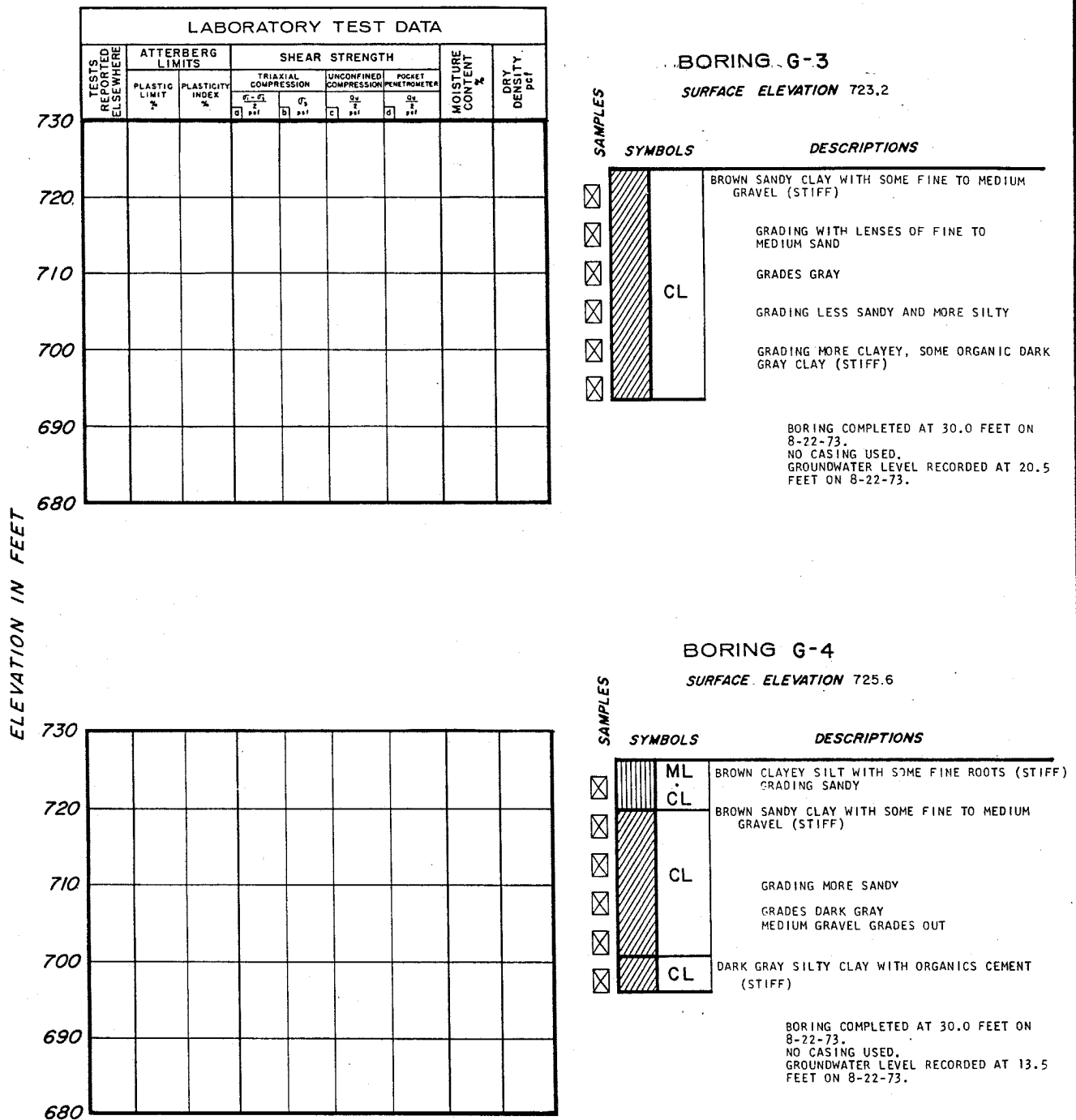
☒	ML	BROWN CLAYEY SILT WITH SOME FINE ROOTS (STIFF)
☒	CL	GRADING MOIST
☒		GRADING MORE CLAYEY
☒	SC	BROWN CLAYEY FINE SAND WITH SOME SILT (MEDIUM STIFF)
☒		GRADING STIFFER
☒	SC	GRADING WITH MORE MEDIUM TO COARSE SAND
☒	SM	GRAY CLAYEY FINE TO COARSE SAND WITH SOME FINE GRAVEL (VERY DENSE)
☒		GRADING LESS CLAYEY
☒	SM	GRADING WITH MORE MEDIUM SIZE GRAVEL
☒		GRAY SILTY FINE TO COARSE SAND (DENSE)
☒		GRADING MORE CLAYEY WITH OCCASIONAL GRAVEL

BORING COMPLETED AT 30.0 FEET  
ON 8-22-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 11.0 FEET ON 8-22-73.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-152

LOG OF BORINGS G-1 AND G-2



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-153

LOG OF BORINGS G-3 AND G-4

ELEVATION IN FEET

LABORATORY TEST DATA								
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAxIAL COMPRESSION		UNCONFINED COMPRESSION	POCKET PENETROMETER		
			$\frac{\sigma_1 - \sigma_3}{2}$	$\sigma_3$	$\frac{q_u}{2}$	$\frac{q_u}{E}$		
			a psi	b psi	c psi	d psi		
730								
	26	23						
720								
710								
700								
690								

## BORING G-5

SURFACE ELEVATION 729.3

SAMPLES	SYMBOLS		DESCRIPTIONS
	CL		
	CL		
	GC		
	CL		
			DARK BROWN SILTY CLAY WITH SOME FINE ROOTS (MEDIUM STIFF) GRADING MORE CLAYEY GRADING WITH OCCASIONAL MEDIUM GRAVEL
			LIGHT BROWN AND GRAY CLAYEY FINE TO MEDIUM SAND AND GRAVEL (MEDIUM DENSE) GRADING WITH LESS FINE SAND GRADING MORE CLAYEY
			BROWN AND GRAY FINE SANDY CLAY (MEDIUM STIFF TO STIFF) GRADING GRAY AND STIFFER GRADING DARKER GRAY WITH OCCASIONAL FINE GRAVEL (STIFF TO VERY STIFF) GRADING MORE SANDY

BORING COMPLETED AT 30.0 FEET ON 8-17-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 9.5 FEET ON 8-17-73.

680								
670								
660	SA						18.2 11.6	
650	SA						16.0	
640								
630								

## BORING G-6

SURFACE ELEVATION 677.8

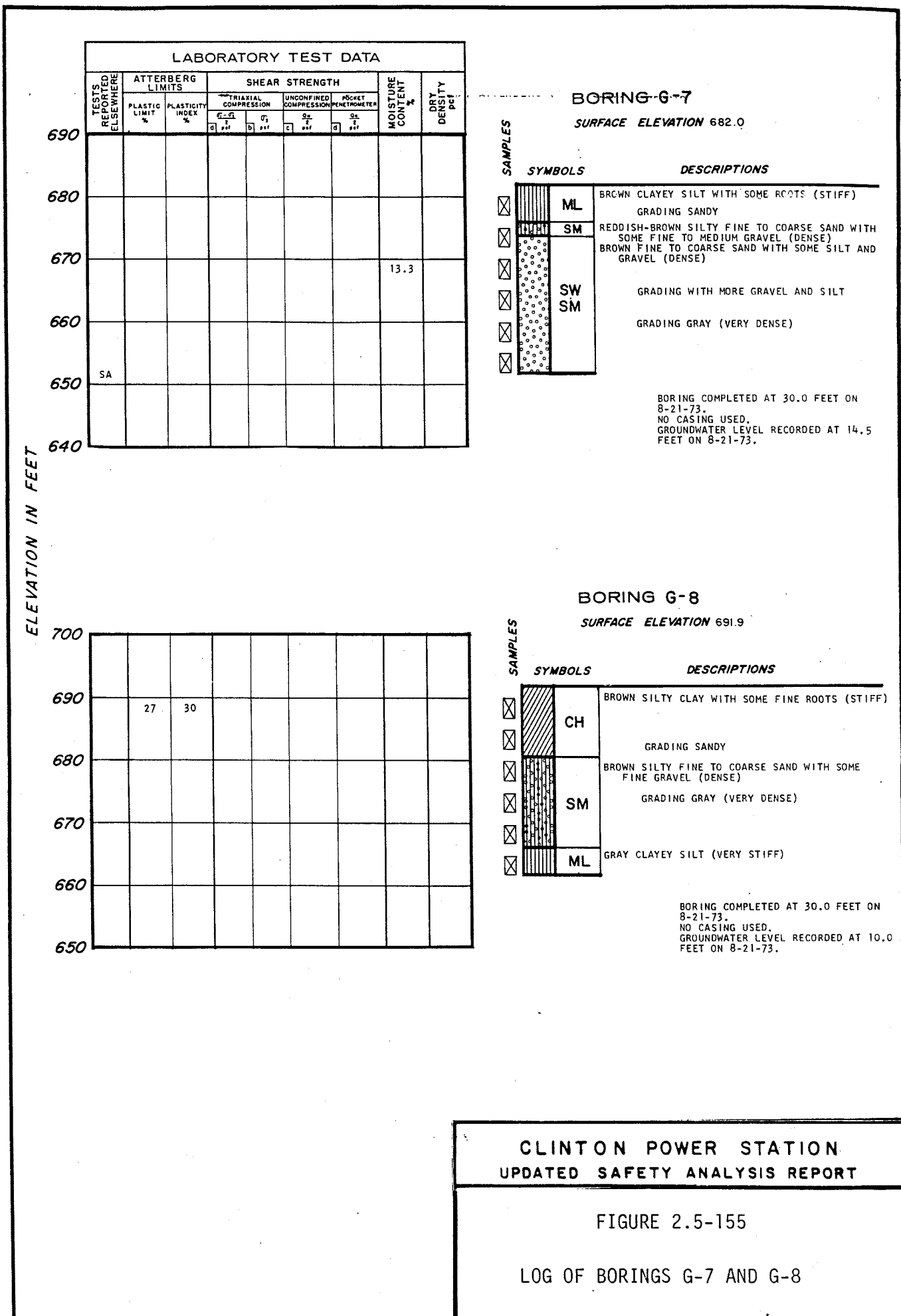
SAMPLES	SYMBOLS		DESCRIPTIONS
	ML		
	SC		
	SC		
	ML		
			BROWN CLAYEY SILT WITH SOME FINE ROOTS (STIFF) GRADING SANDY BROWN FINE MEDIUM SAND WITH SOME CLAY (MEDIUM DENSE TO DENSE) GRADING WITH SOME FINE TO MEDIUM GRAVEL
			GRADING WITH LESS GRAVEL AND MORE SILT
			GRADING WITH MORE COARSE GRAVEL (DENSE)
			GRAY CLAYEY SILT WITH SOME FINE TO MEDIUM SAND AND GRAVEL (VERY STIFF)

BORING COMPLETED AT 30.0 FEET ON 8-21-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 13.5 FEET ON 8-21-73.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-154

LOG OF BORINGS G-5 AND G-6



ELEVATION IN FEET

LABORATORY TEST DATA										
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH						MOISTURE CONTENT %	DRY DENSITY pcf
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION		POCKET PENETROMETER			
			$\sigma_1 - \sigma_3$	$\sigma_3$	$\sigma_u$	$\sigma_u$				
			a pcf	b pcf	c pcf	d pcf				
730										
720										
710										
700										
690										
680										

## BORING G-9

SURFACE ELEVATION 724.9

SAMPLES

SYMBOLS

DESCRIPTIONS

CL	BROWN SILTY CLAY WITH SOME ROOTS (STIFF)
ML	GRADING MORE SILTY
SM	REDDISH-BROWN SILTY FINE TO COARSE SAND WITH FINE TO MEDIUM GRAVEL (VERY DENSE) GRADING LESS SANDY GRADING MORE SANDY GRADING DARK GRAYISH-BROWN GRADING GRAY AND MORE SILTY
ML	DARK GRAY CLAYEY SILT WITH FINE TO COARSE SAND AND SOME FINE GRAVEL (STIFF TO VERY STIFF) GRADING WITH SOME PEAT

BORING COMPLETED AT 30.0 FEET ON 8-20-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 14.5 FEET ON 8-20-73.

## BORING G-10

SURFACE ELEVATION 727.2

SAMPLES

SYMBOLS

DESCRIPTIONS

CL	MOTTLED BROWN AND GRAY SILTY CLAY WITH SOME FINE SAND (STIFF)
SM	ORANGE-BROWN SILTY SAND WITH OCCASIONAL FINE TO MEDIUM GRAVEL AND SOME CLAY (MEDIUM DENSE)
SP	REDDISH-BROWN SAND WITH SOME GRAVEL AND SILT (MEDIUM DENSE TO DENSE)
ML	GRAY CLAYEY SILT WITH OCCASIONAL FINE GRAVEL (STIFF TO VERY STIFF)
GC	GRAY CLAYEY GRAVEL WITH SOME SAND (DENSE)
SC	GRADING DENSER WITH MORE FINE TO MEDIUM GRAVEL
ML	GRADING WITH LESS GRAVEL
PT	GRAY CLAYEY SILT WITH SOME SAND AND OCCASIONAL FINE GRAVEL (STIFF)
ML	DARK GRAY PEAT GRAY CLAYEY SILT WITH SOME SAND AND GRAVEL

BORING COMPLETED AT 30.0 FEET ON 8-17-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 7.0 FEET ON 8-17-73.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-156

LOG OF BORINGS G-9 AND G-10

LABORATORY TEST DATA									
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf	
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAxIAL COMPRESSION		UNCONFINED COMPRESSION				POCKET PENETROMETER
			$\frac{\sigma_1 - \sigma_3}{2}$	$\sigma_3$	$\frac{q_u}{2}$	$q_u$			
			a psi	b psi	c psi	d psi			e psi
680									
670									
660	SA	NONPLASTIC							
650									
640									

## BORING G-11

SURFACE ELEVATION 675.3

SAMPLES	SYMBOLS		DESCRIPTIONS
×	ML	CL	BROWN CLAYEY SILT WITH SOME ROOTS (MEDIUM STIFF)
×	SM	SW	BROWN SILTY FINE TO COARSE SAND WITH SOME FINE TO MEDIUM GRAVEL AND SOME CLAY (DENSE)
×	SM	SW	GRADING MORE GRAVELLY AND LESS SILTY
×	SM	SW	BROWN FINE TO COARSE SAND WITH SOME SILT AND GRAVEL (DENSE)
×	SM	SW	GRAY SILTY FINE TO MEDIUM SAND WITH SOME CLAY AND OCCASIONAL FINE GRAVEL (VERY DENSE)
×	SM	SW	GRADING MORE SANDY
×	SM	SW	GRADING WITH MORE FINE TO MEDIUM GRAVEL

BORING COMPLETED AT 30.0 FEET ON 8-21-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 7.0 FEET ON 8-21-73.

ELEVATION IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf
		PLASTIC LIMIT %	PLASTICITY INDEX %	$\frac{q_1 - q_2}{2}$ psi	$q_3$ psi	$\frac{q_1}{2}$ psi	$q_2$ psi		
690									
680									
670	SA								
660	SA	NONPLASTIC						17.8	
650									
640									

## BORING G-12

SURFACE ELEVATION 685.1

SAMPLES	SYMBOLS		DESCRIPTIONS
×	ML	CL	BROWN CLAYEY SILT (STIFF)
×	SM	SW	BROWN SILTY FINE TO COARSE SAND WITH SOME FINE TO MEDIUM GRAVEL (DENSE)
×	SM	SW	GRADING WITH SOME CLAY
×	SM	SW	LIGHT BROWN FINE TO COARSE SAND WITH SOME SILT AND TRACE OF GRAVEL (DENSE)
×	SM	SW	GRADING WITH LESS GRAVEL AND COARSE SAND
×	SM	SW	GRAY SILTY SAND WITH SOME FINE TO MEDIUM GRAVEL (VERY DENSE)
×	SM	SW	GRADING MORE SILTY

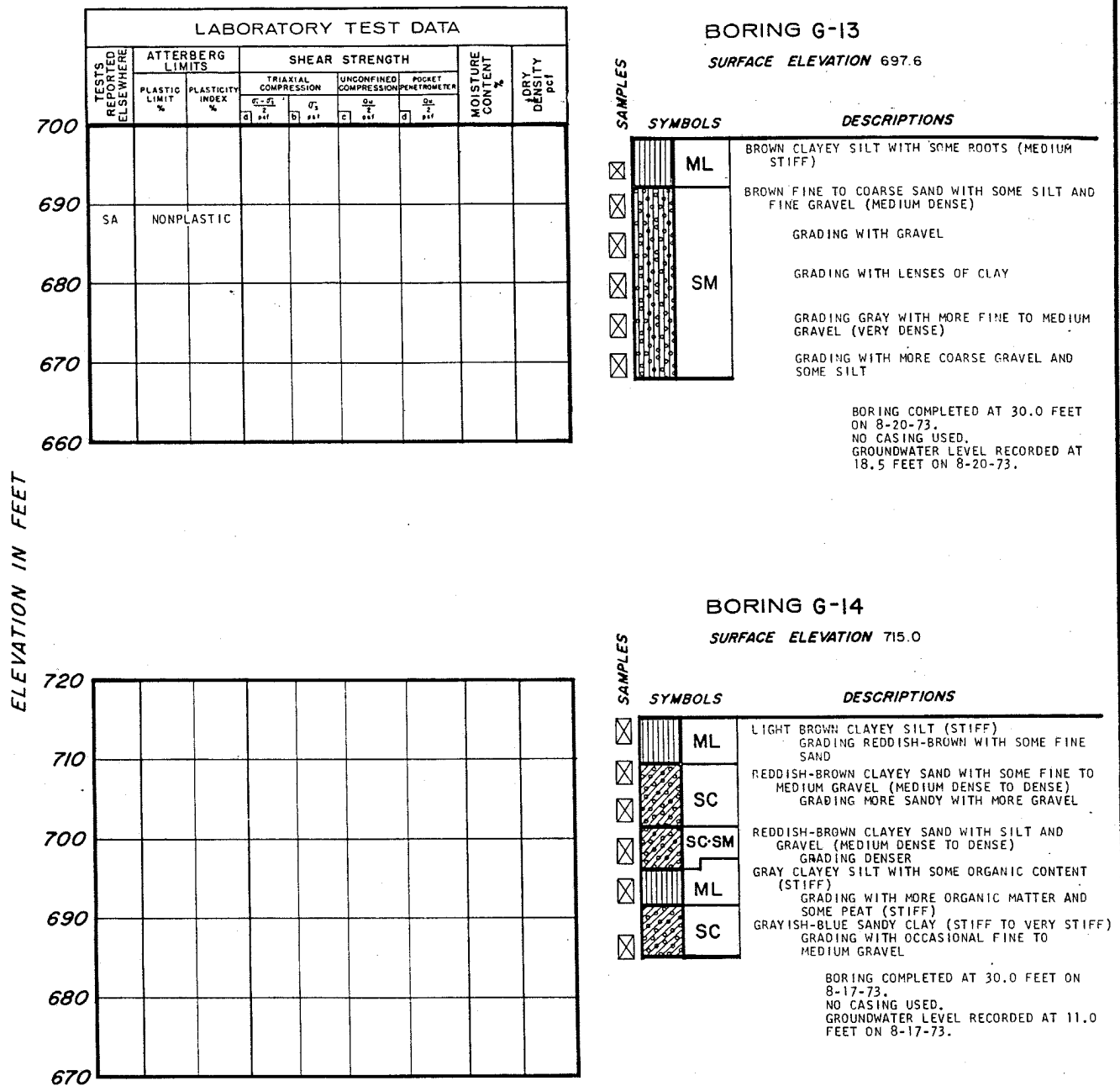
BORING COMPLETED AT 30.0 FEET ON 8-20-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 17.5 FEET ON 8-20-73.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-157

LOG OF BORINGS G-11 AND G-12





**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-158

LOG OF BORINGS G-13 AND G-14

ELEVATION IN FEET

LABORATORY TEST DATA									
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH					MOISTURE CONTENT %	DRY DENSITY pcf
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION	POCKET PENETROMETER			
			$\frac{\sigma_1 - \sigma_3}{2}$	$\sigma_3$					
			pcf	pcf	pcf	pcf			
SA	17	13							

## BORING G-15

SURFACE ELEVATION 669.6

SAMPLES

SYMBOLS

DESCRIPTIONS

CL	DARK GRAY SILTY CLAY (MEDIUM STIFF)
SC	BROWN SILTY FINE TO COARSE SAND WITH SOME GRAVEL (MEDIUM DENSE) GRADING WITH LENSES OF GRAY SILTY CLAY GRADING WITH CLAY GRADING WITH LESS GRAVEL GRADING WITH COARSER SAND
SM	GRAY SILTY FINE TO COARSE SAND WITH SOME FINE TO MEDIUM SIZE GRAVEL (VERY DENSE)

BORING COMPLETED AT 30.0 FEET  
ON 8-21-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT  
9.5 FEET ON 8-21-73.

## BORING G-16

SURFACE ELEVATION 678.1

SAMPLES

SYMBOLS

DESCRIPTIONS

ML	BROWN SILT WITH SOME ORGANICS, TRACE OF FINE SAND AND CLAY (TOPSOIL)
ML	BROWN SILT WITH CLAY AND TRACE OF FINE SAND (STIFF)
SM	BROWN FINE TO MEDIUM SAND WITH SOME SILT AND GRAVEL
SP	BROWN FINE TO MEDIUM SAND WITH SOME GRAVEL AND TRACE OF SILT
SM	BROWN FINE TO COARSE SAND WITH SOME SILT AND GRAVEL GRADES WITH LESS GRAVEL GRADES WITH MORE FINE SAND AND SILT GRADES WITH LESS SILT GRADES WITH LENSES OF FINE AND MEDIUM SAND
ML	GRAYISH-BROWN SILT WITH SOME CLAY, FINE SAND AND GRAVEL

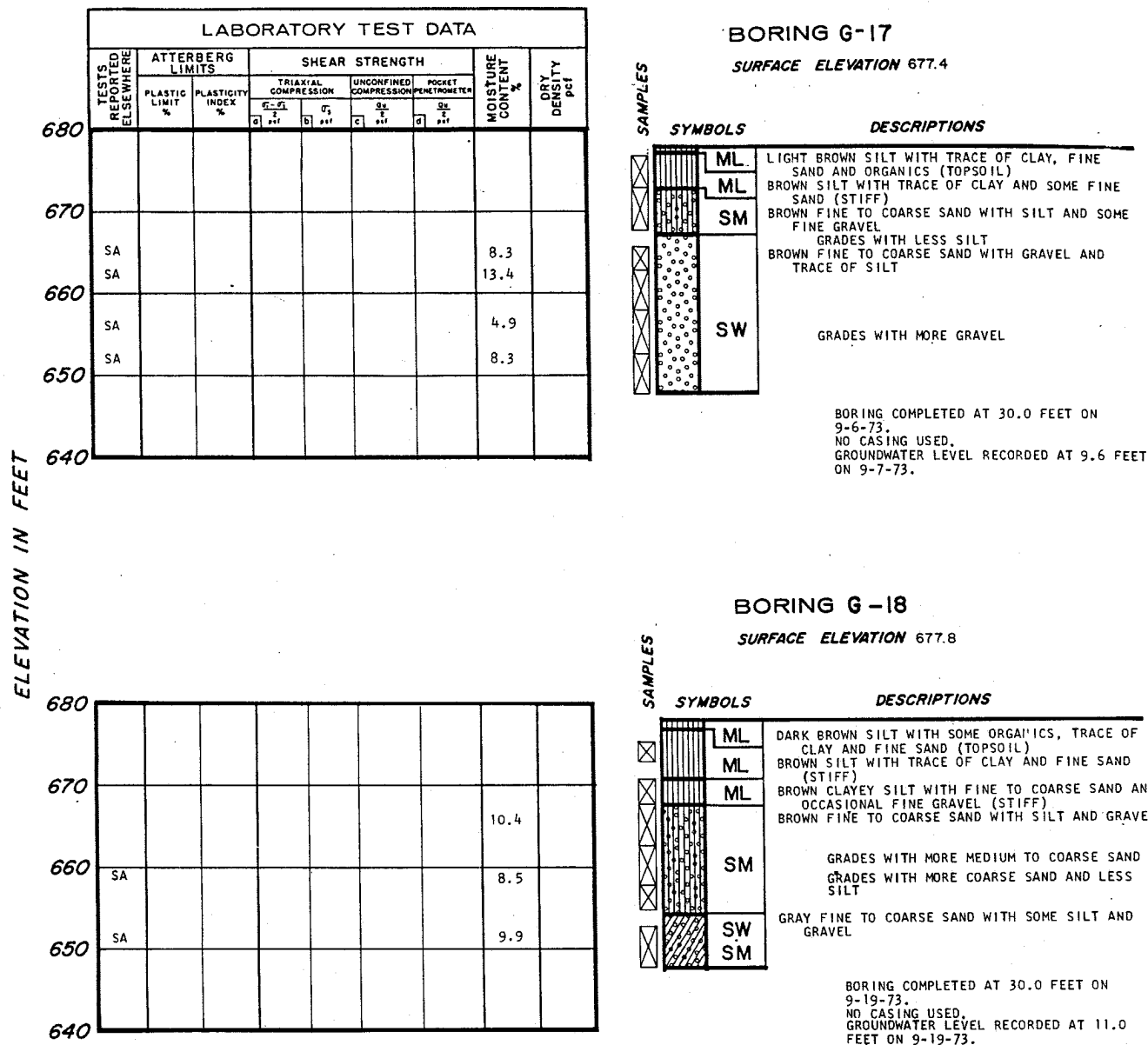
BORING COMPLETED AT 30.0 FEET ON  
9-19-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT  
11.5 FEET ON 9-19-73.

680									
670	SA							9.4	
								7.5	
								9.7	
660	SA							9.8	
								9.7	
650	SA							9.4	
640									

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-159

LOG OF BORINGS G-15 AND G-16



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-160

LOG OF BORINGS G-17 AND G-18

ELEVATION IN FEET

LABORATORY TEST DATA										
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH						MOISTURE CONTENT %	DRY DENSITY pcf
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAxIAL COMPRESSION			UNCONFINED COMPRESSION		POCKET PENETROMETER		
			$\frac{Q_1 - Q_2}{2}$	$Q_1$	$Q_2$	$\frac{S_u}{2}$	$S_u$			
			q pcf	d pcf	c pcf	d pcf				
690										
680										
670	SA								7.1	
	SA								7.3	
	SA								9.9	
660										
650										
640										

## BORING G-19

SURFACE ELEVATION 682.6

SAMPLES	SYMBOLS	DESCRIPTIONS
×	ML	BROWN SILT WITH SOME ORGANICS AND TRACE OF CLAY AND FINE SAND (TOPSOIL)
×	ML	BROWN SILT WITH SOME CLAY AND TRACE OF FINE SAND (STIFF)
×	SM	GRADES WITH MORE FINE SAND
×	SM	DARK BROWN SILTY SAND WITH SOME CLAY
×	SM	BROWN FINE TO COARSE SAND WITH SOME GRAVEL AND SILT
×	SM	GRADES WITH MORE FINE SAND
×	SM	GRADES WITH LESS FINE SAND
×	SM	COARSE GRAVEL GRADES OUT
×	ML	GRAY FINE TO COARSE SAND WITH SILT AND SOME FINE GRAVEL
×	ML	GRAY AND BROWN LAYERED SILT WITH SEAMS OF SAND AND FINE GRAVEL AND TRACE OF ORGANICS (MEDIUM STIFF)
×	ML	LIGHT GRAY SANDY SILT WITH SOME GRAVEL (MEDIUM STIFF)

BORING COMPLETED AT 30.0 FEET ON 9-19-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 16.0 FEET ON 9-19-73.

## BORING G-20

SURFACE ELEVATION 668.9

SAMPLES	SYMBOLS	DESCRIPTIONS
×	CL	BLACK CLAY WITH SILT AND TRACE OF FINE SAND AND ORGANICS (TOPSOIL)
×	CL	DARK GRAY TO BLACK CLAY WITH SILT, TRACE OF FINE SAND AND SOME ORGANICS (VERY STIFF)
×	SM	GRADES LESS STIFF
×	SM	BROWN FINE TO COARSE SAND WITH SOME SILT, GRAVEL AND TRACE OF CLAY
×	SM	GRADES WITH SOME SEAMS OF CLAYEY SILT AND CLAYEY SAND
×	SM	GRADES WITH LESS SILT
×	SM	GRAY SILTY FINE TO COARSE SAND WITH SOME GRAVEL, TRACE OF CLAY AND SOME SEAMS AND LAYERS OF SILT
×	ML	GRAY SANDY SILT WITH SOME FINE GRAVEL AND TRACE OF CLAY
×	ML	GRADES WITH SEAMS OF FINE SAND

BORING COMPLETED AT 30.0 FEET ON 9-20-73.  
NO CASING USED.  
GROUNDWATER LEVEL RECORDED AT 3.2 FEET ON 9-20-73.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-161

LOG OF BORINGS G-19 AND G-20

LABORATORY TEST DATA									
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf	
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION				POCKET PENETROMETER
			$\frac{\sigma_1 - \sigma_3}{2}$ psi	$\sigma_3$ psi	$\frac{q_u}{2}$ psi	$q_u$ psi			
680									
670	C						2000	23.8	96
660							4500+	9.1	135
							4500+	8.3	137
650							4500+		
640							4500+	5.9	144
630							4500+	7.6	139
620							4500+	9.3	136
610							4500+	7.8	138
600							4500+	8.1	136
590									

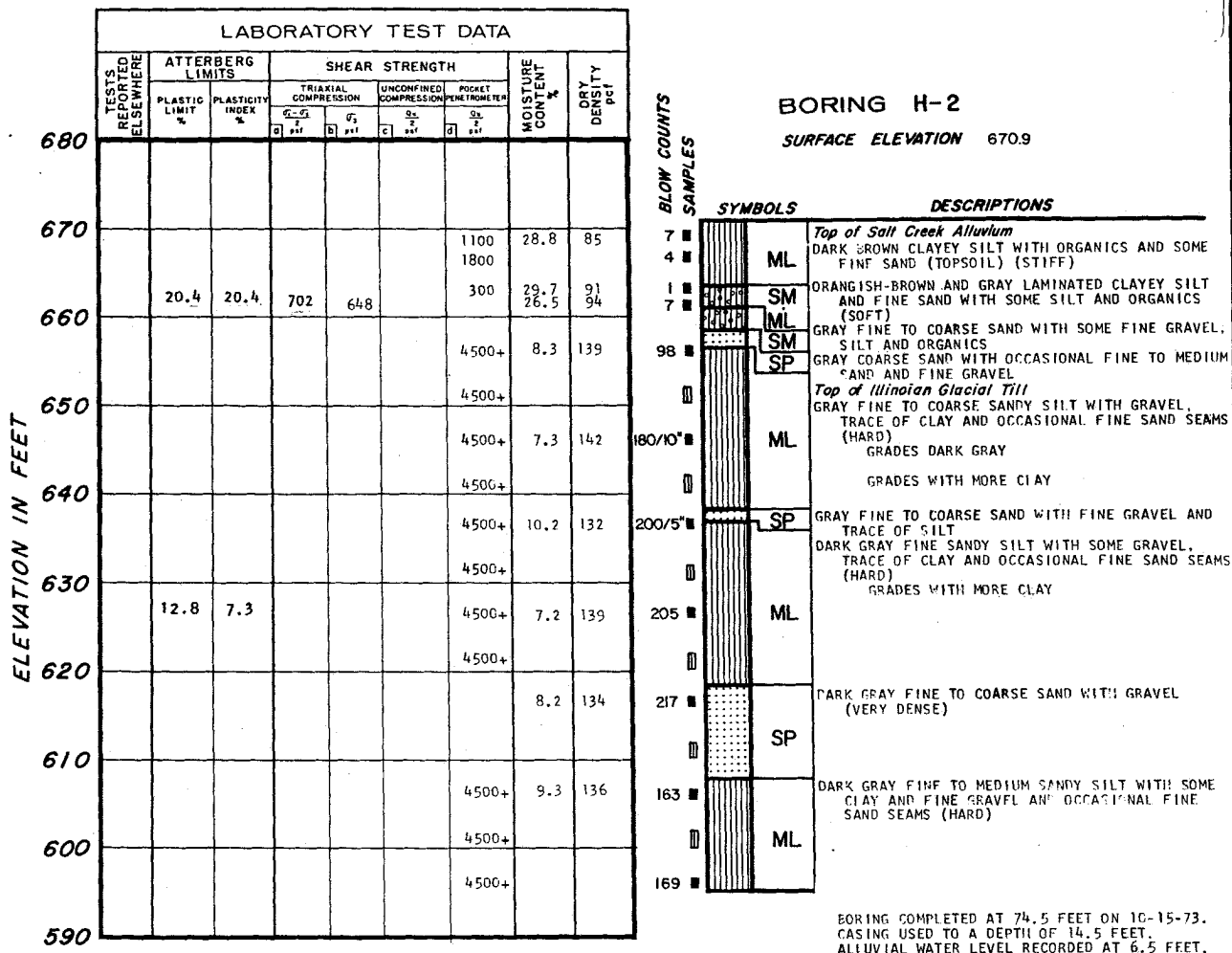
  

BORING H-1		SURFACE ELEVATION 671.7	
BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS	
8	ML	Top of Salt Creek Alluvium	
7	ML	DARK BROWN SILT WITH SOME FINE SAND, CLAY AND	
2	ML	TRACE OF ROOTS (TOPSOIL)	
15	SM	DARK BROWN AND GRAY LAMINATED CLAYEY SILT AND	
16	SW	SILTY FINE SAND WITH TRACE OF GRAVEL AND	
28		ROOTS	
35		BROWN FINE TO COARSE SAND WITH TRACE OF SILT	
36		Top of Illinoian Glacial Till	
38		GRAY FINE TO COARSE SANDY SILT WITH TRACE OF	
39		CLAY AND GRAVEL	
40		GRADES WITH MORE CLAY	
113		GRADES WITH MORE FINE GRAVEL	
		BOULDER AT 30.0'	
105/6"	ML		
139/10"	ML		
60			
102			
149		14" LAYER GRAY FINE SAND AT 73.8'	

BORING COMPLETED AT 76.5 FEET ON 10-30-73.  
CASING USED TO A DEPTH OF 5.0 FEET.  
ALLUVIAL WATER LEVEL NOT RECORDED.

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## LOG OF BORING H-1



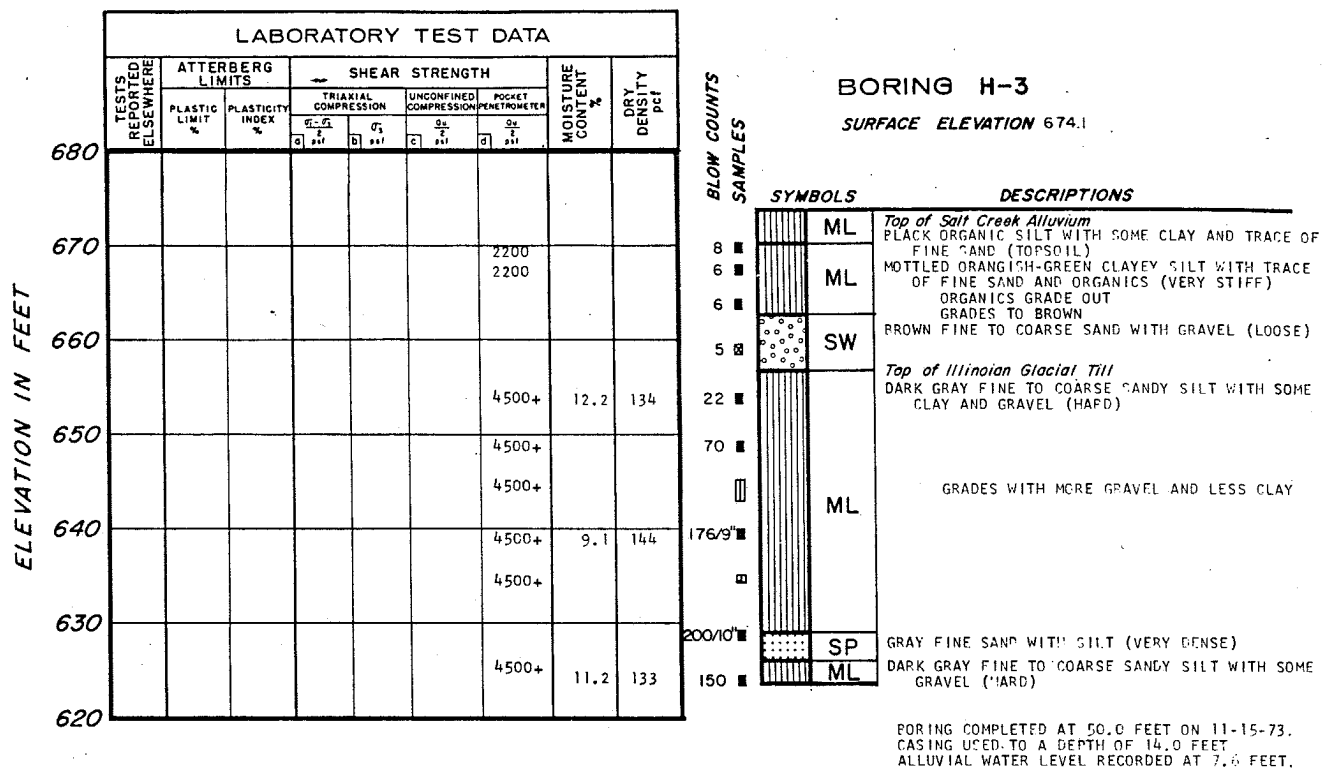
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-163

LOG OF BORING H-2

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

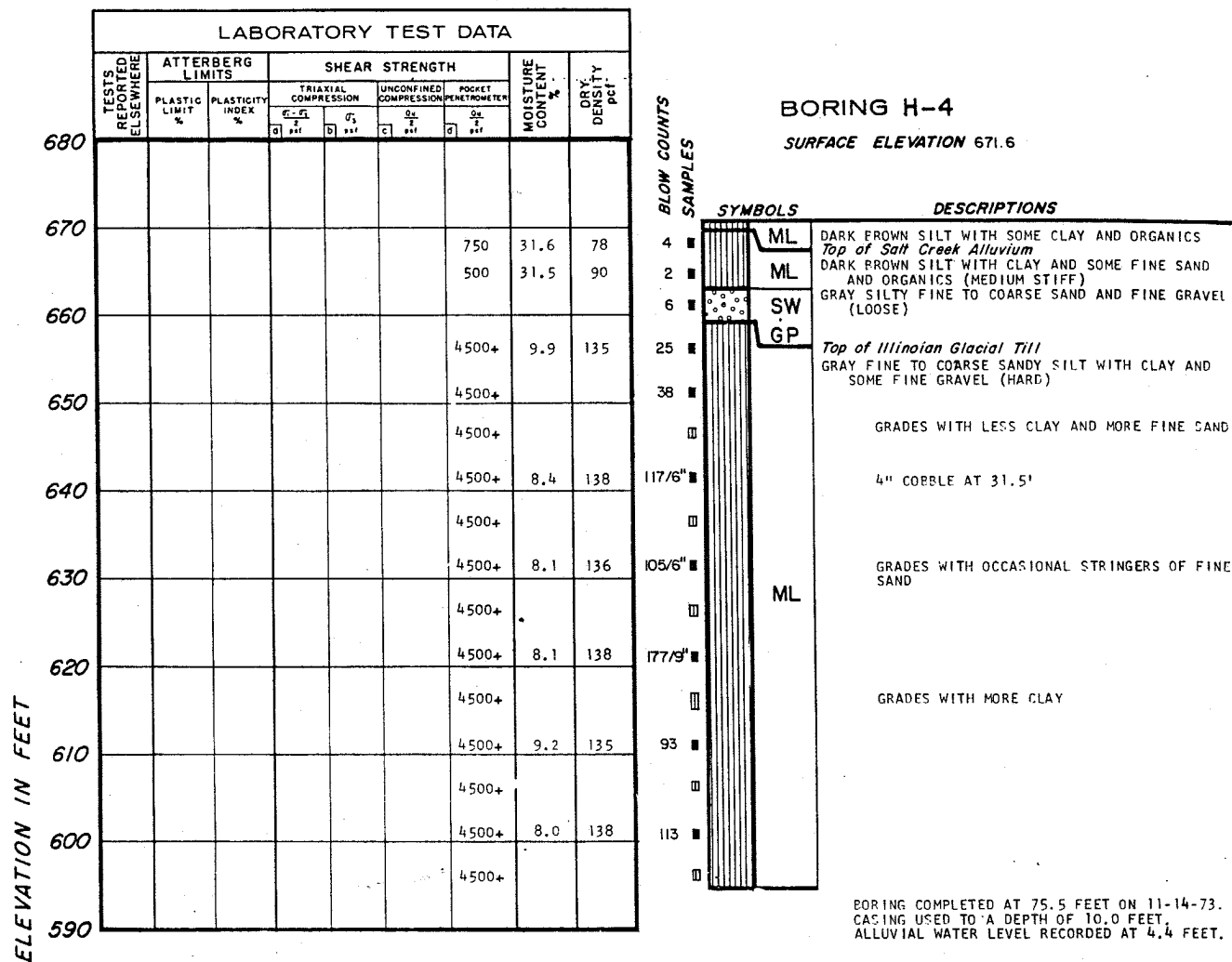


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-164

LOG OF BORING H-3

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



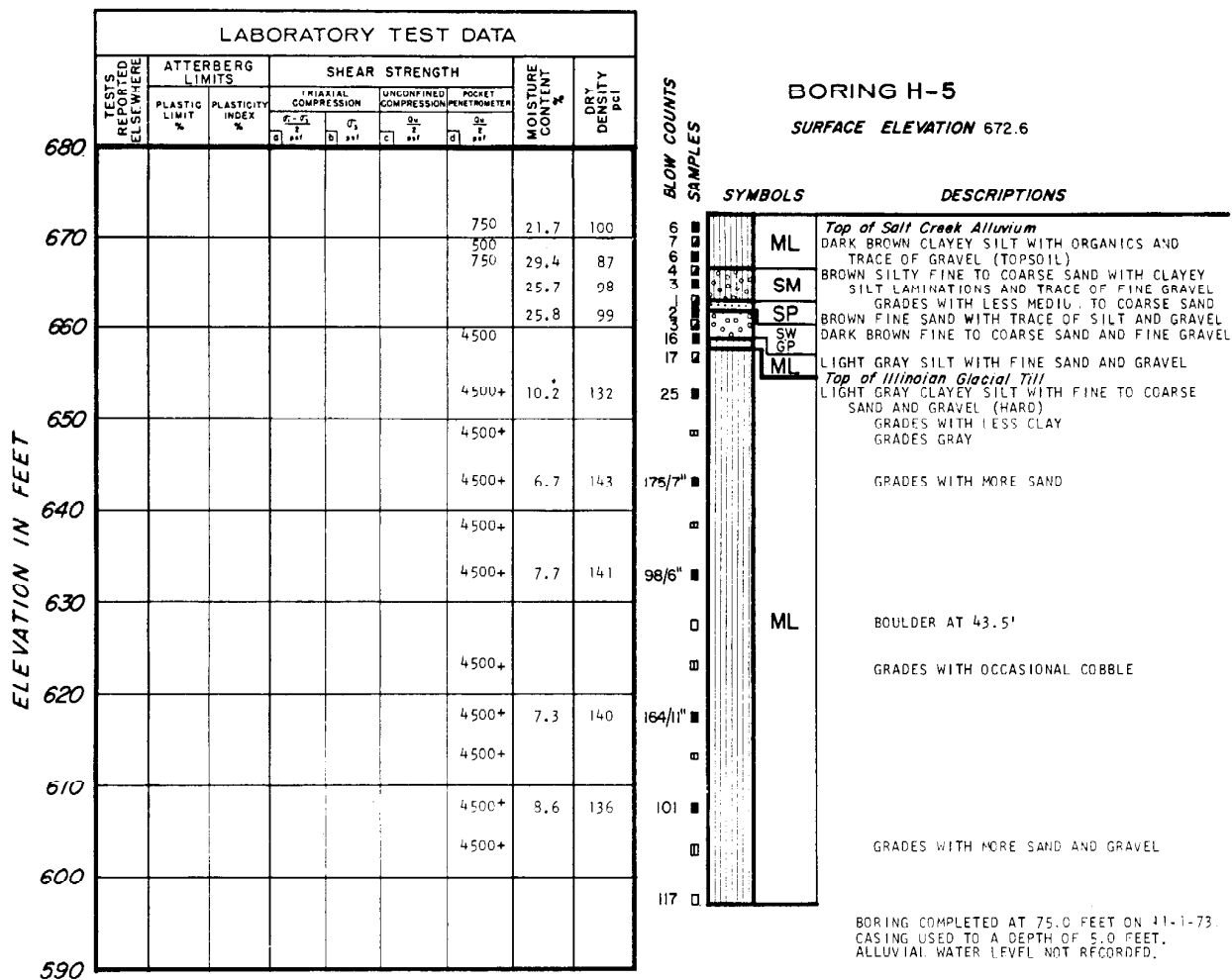
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-165

LOG OF BORING H-4

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





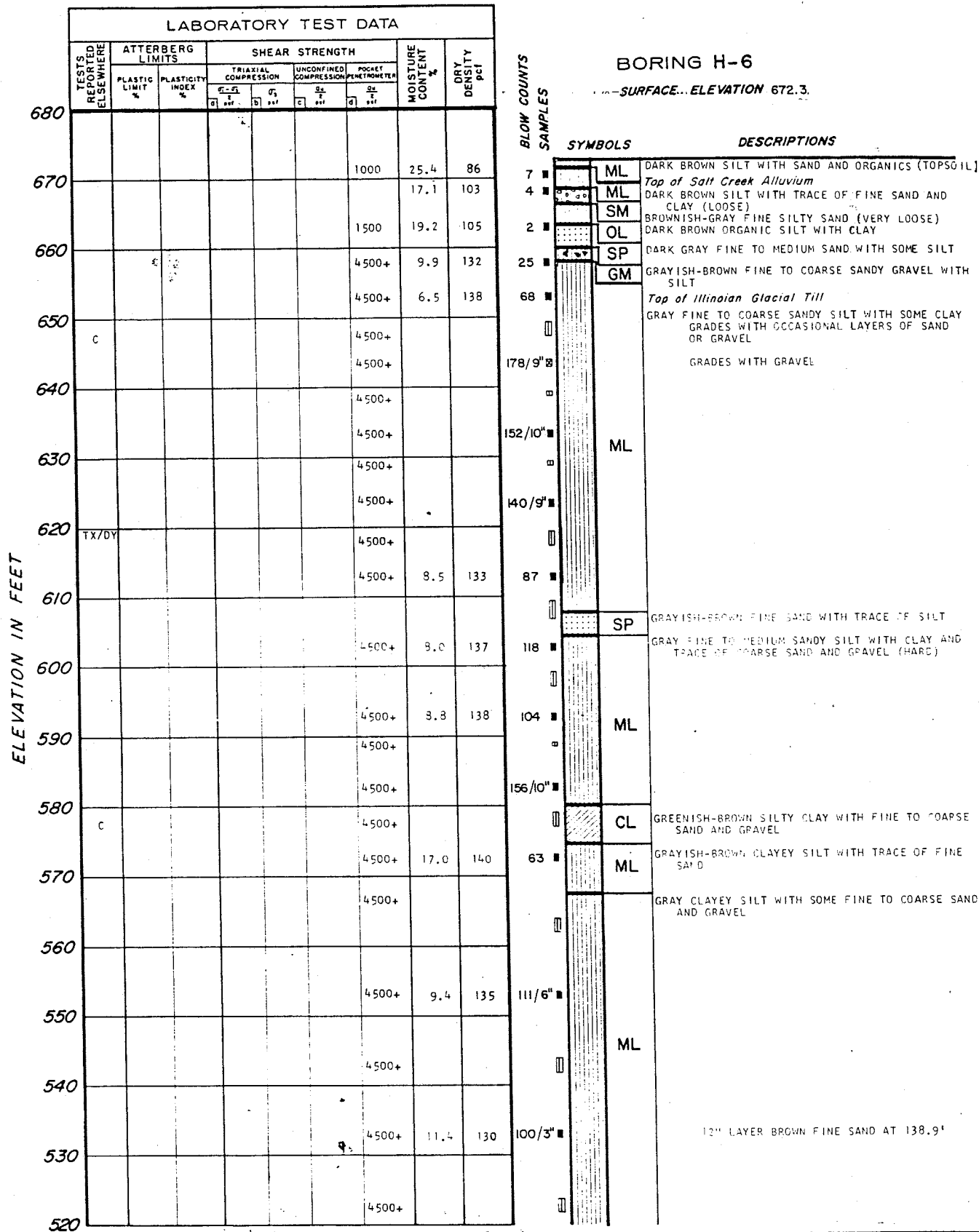
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-166

LOG OF BORING H-5



NOTE:

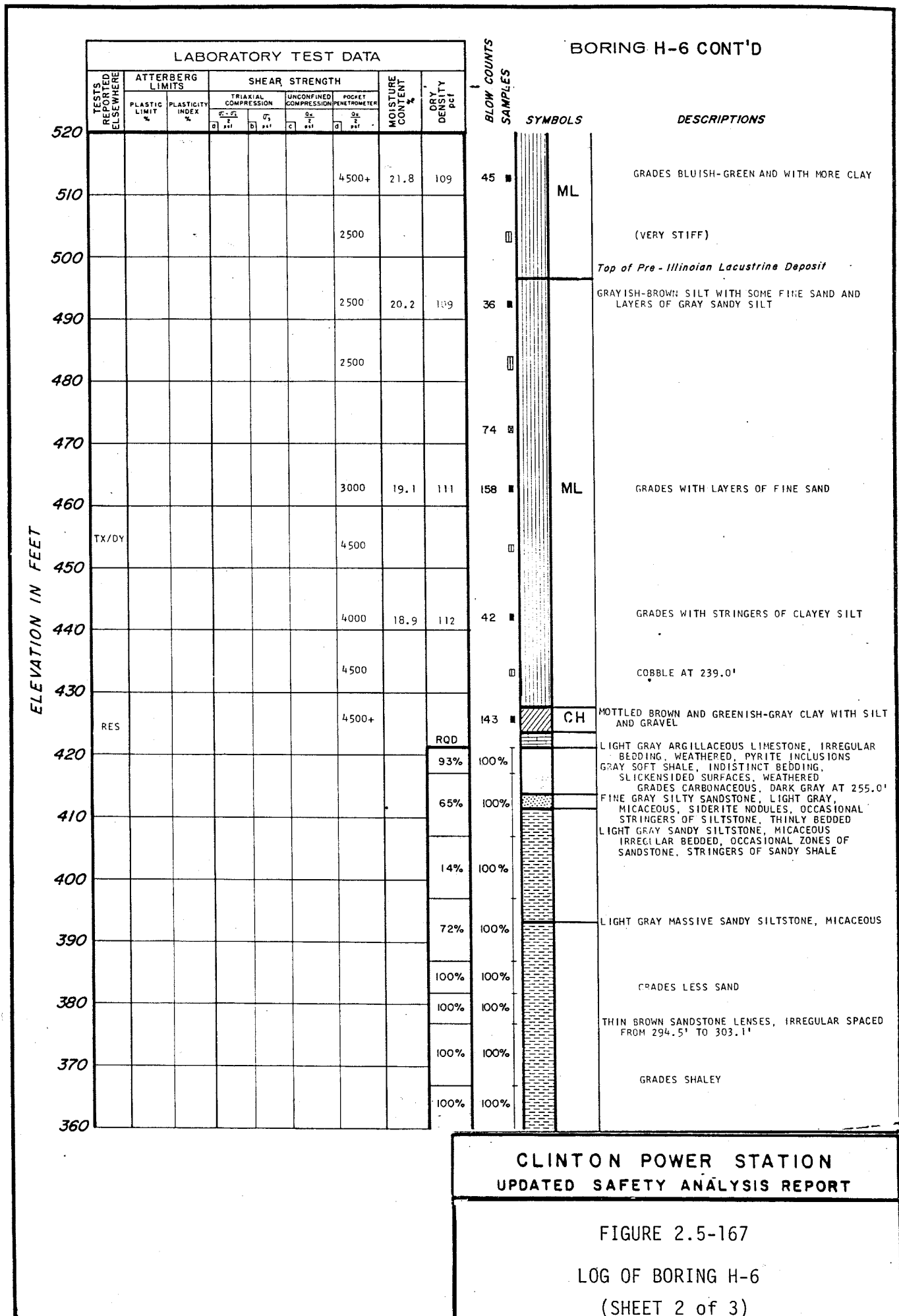
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

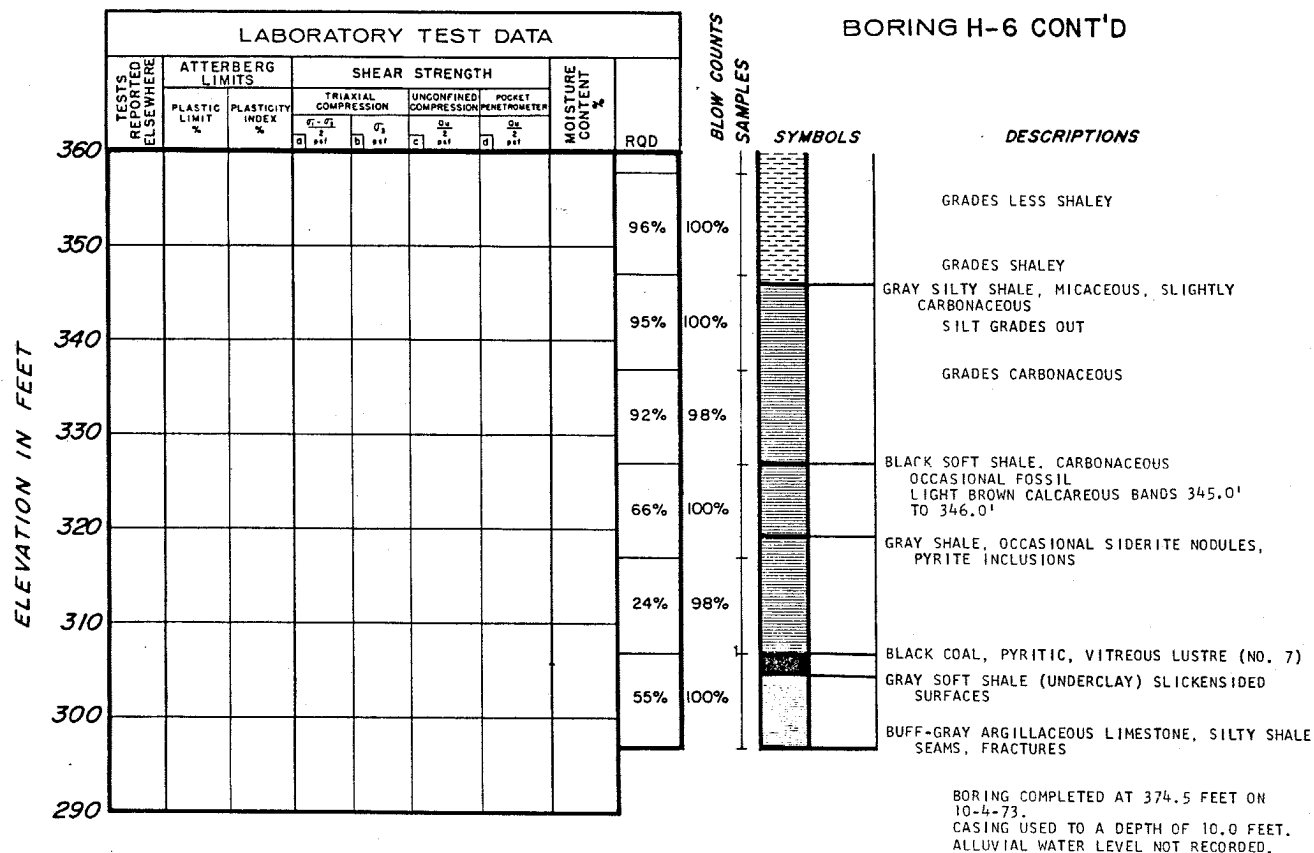
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-167

LOG OF BORING H-6

(SHEET 1 of 3)

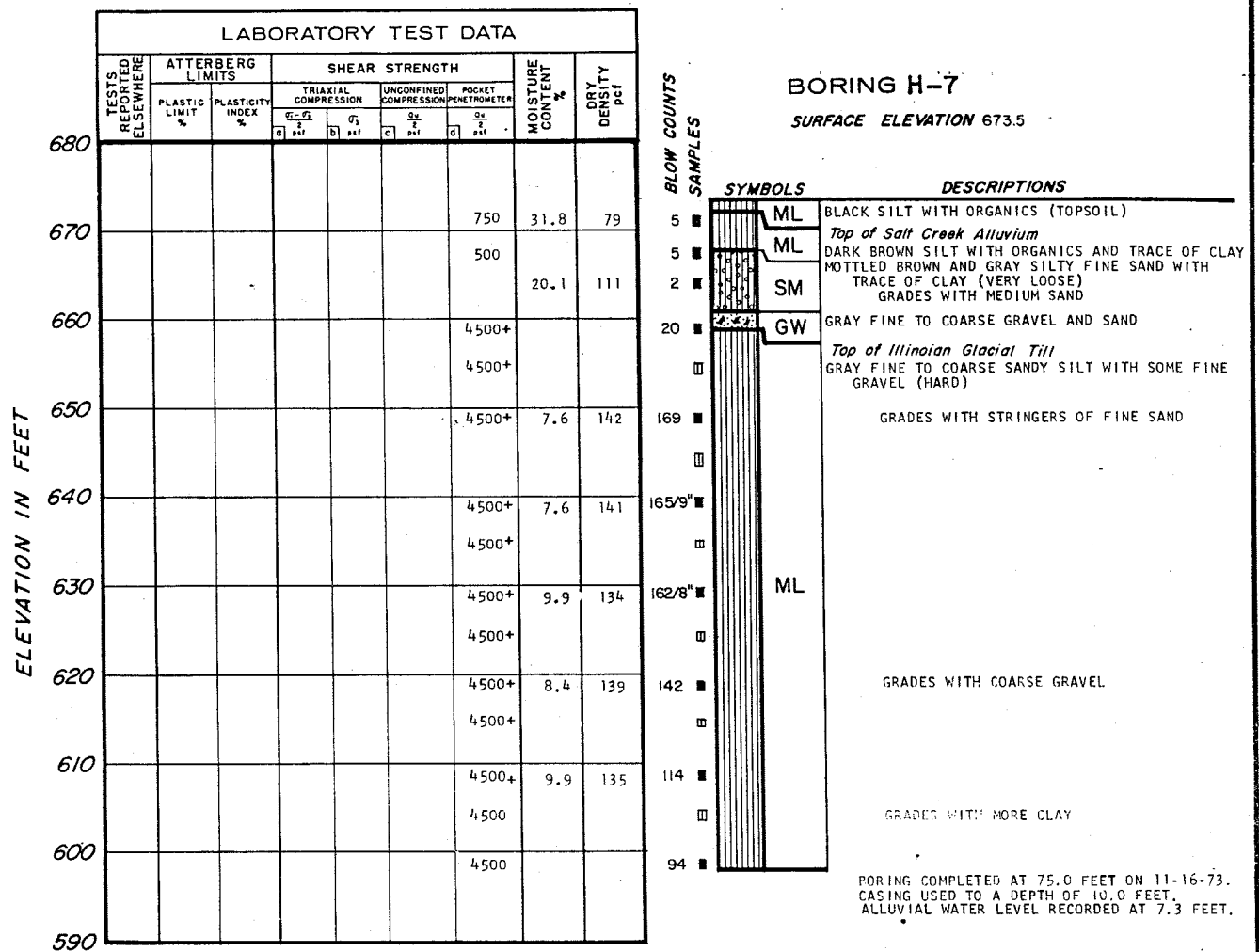




**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-167

LOG OF BORING H-6  
(SHEET 3 of 3)



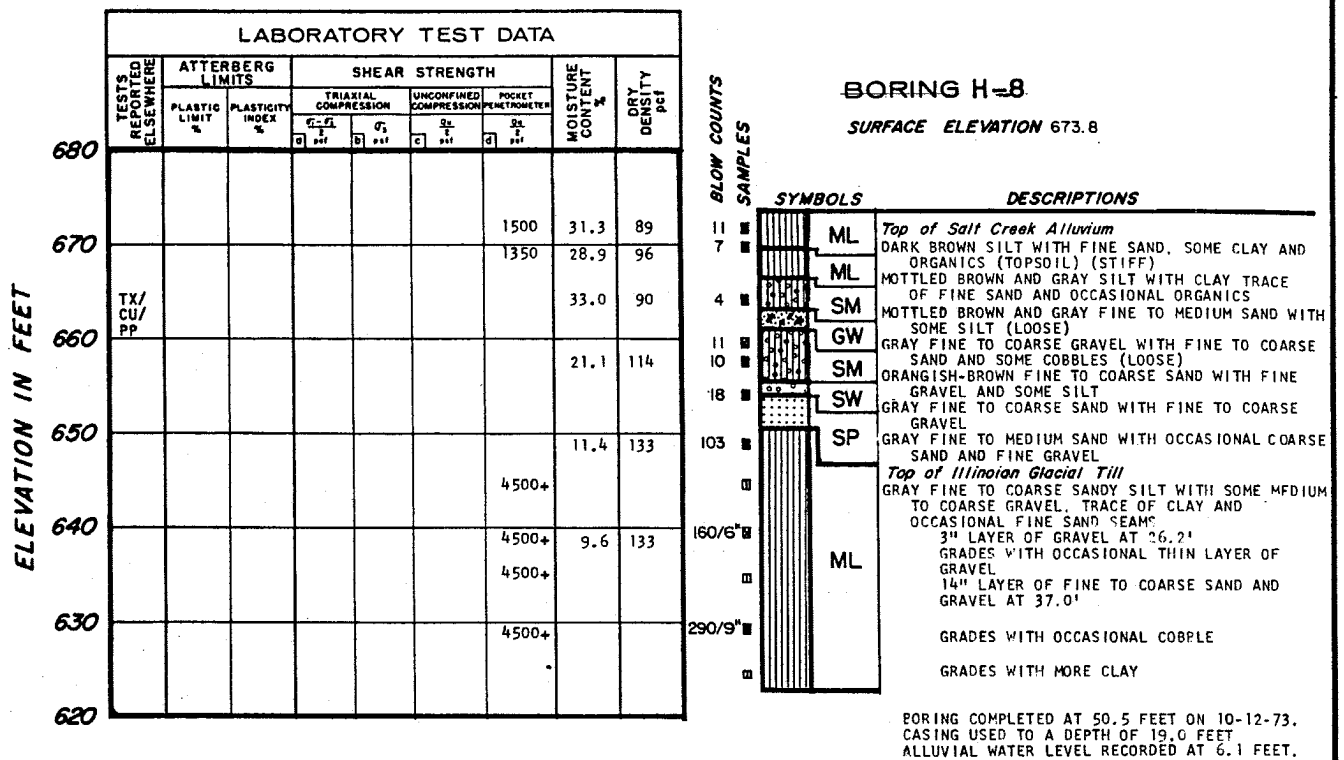
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-168

LOG OF BORING H-7



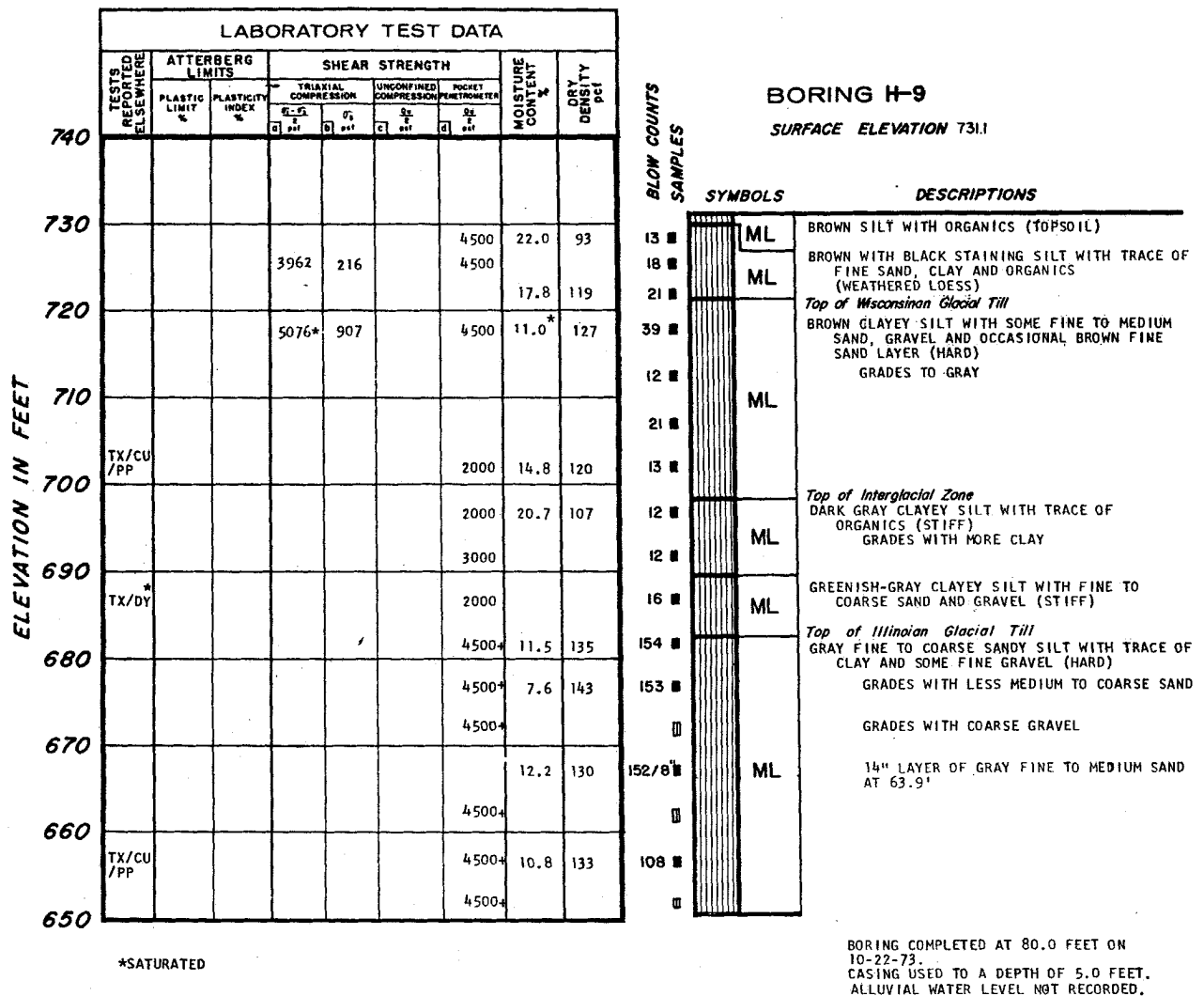
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-169

LOG OF BORING H-8

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

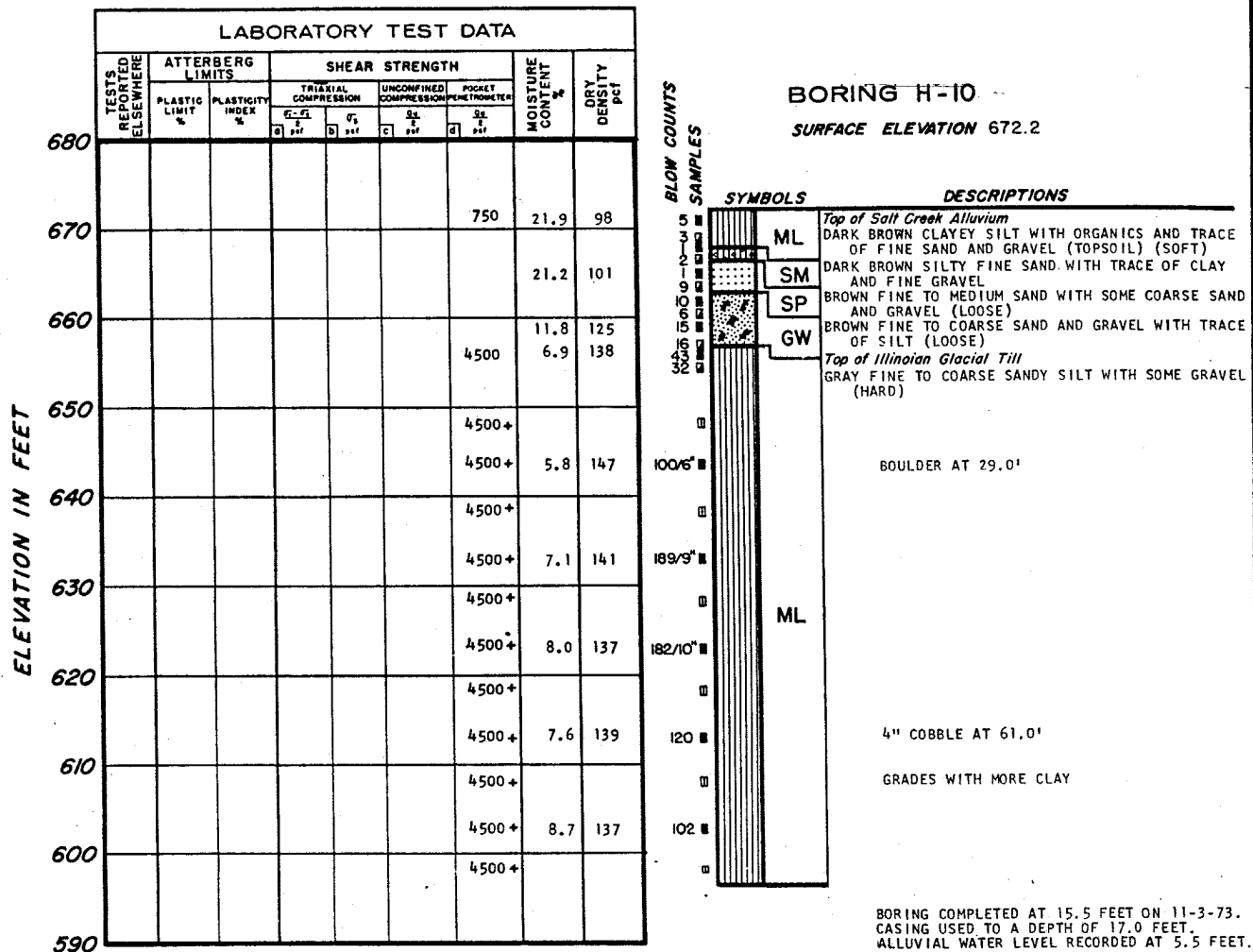


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-170

LOG OF BORING H-9

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

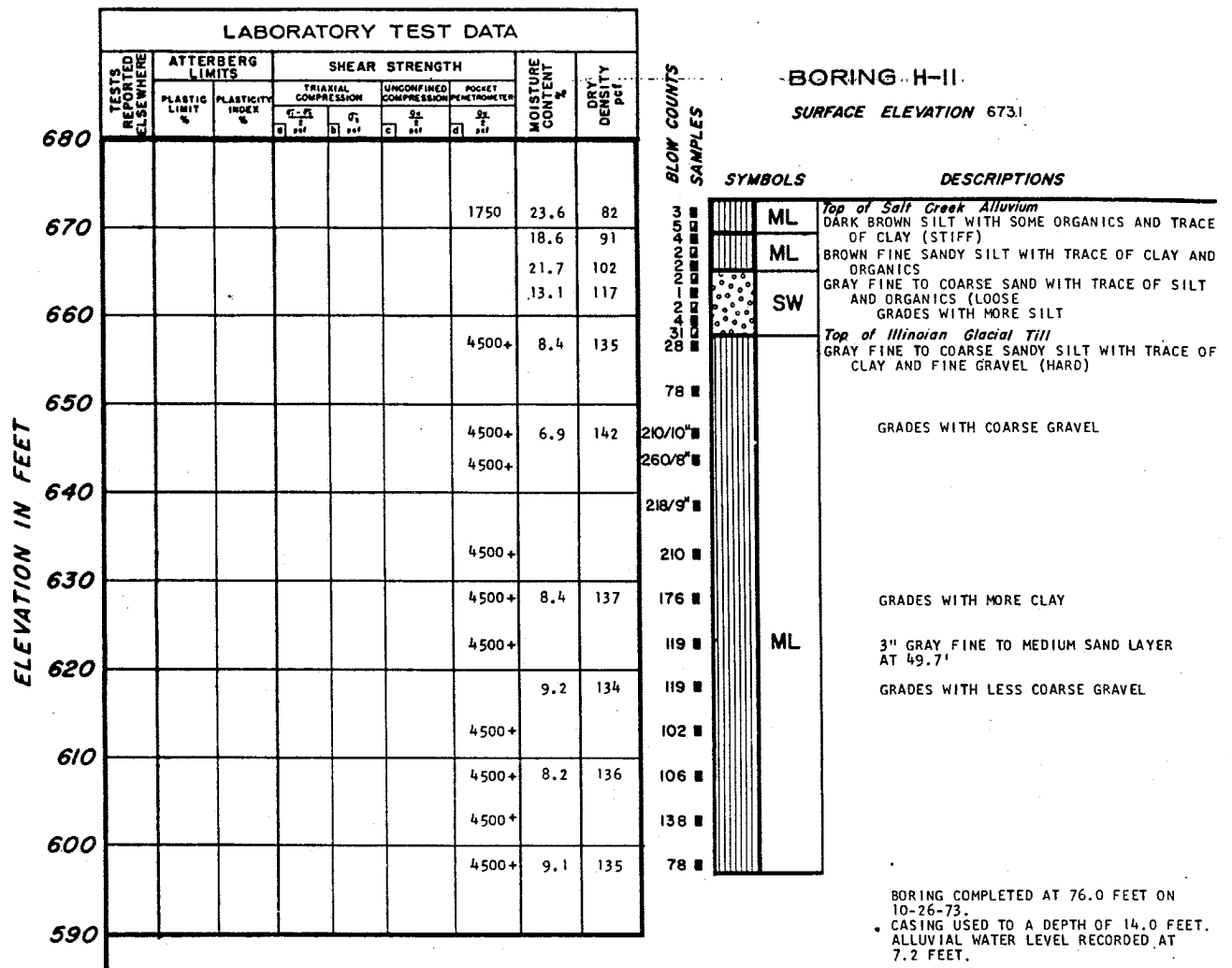
FIGURE 2.5-171

LOG OF BORING H-10

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-172

LOG OF BORING H-11

ELEVATION IN FEET

LABORATORY TEST DATA									
TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf	
	PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAxIAL COMPRESSION		UNCONFINED COMPRESSION	POCKET PENETROMETER			
			$\frac{\sigma_1 - \sigma_3}{2}$ psi	$\sigma_3$ psi					$\frac{q_u}{2}$ psi
680									
670							23.3	86	
							29.6	92	
							17.1	123	
660							13.8	132	
							13.3		
650							4500+		
							4500+	10.6	137
640							4500+		
							4500+	11.9	135
630							4500+		
							4500+	11.6	136
620									

BLOW COUNTS  
SAMPLES

## BORING H-12

SURFACE ELEVATION 674.6

SYMBOLS		DESCRIPTIONS
15	ML	Top of Salt Creek Alluvium
7	ML	BLACK ORGANIC CLAY WITH SOME SILT AND FINE SAND (TOPSOIL)
2	ML	MOTTLED DARK BROWN AND ORANGISH-BROWN SILT WITH SOME FINE SAND, CLAY AND ORGANIC (STIFF)
14		Top of Illinoian Glacial Till
26		LIGHT GRAY FINE TO COARSE SANDY SILT WITH SOME CLAY AND FINE GRAVEL
43		GRADES WITH COARSE GRAVEL AND MORE CLAY
		GRADES WITH MORE GRAVEL AND LESS CLAY
207/10"	ML	
238/11"		
201		

BORING COMPLETED AT 49.5 FEET ON 11-6-73.  
CASING USED TO A DEPTH OF 21.0 FEET.  
ALLUVIAL WATER LEVEL RECORDED AT 8.0 FEET.

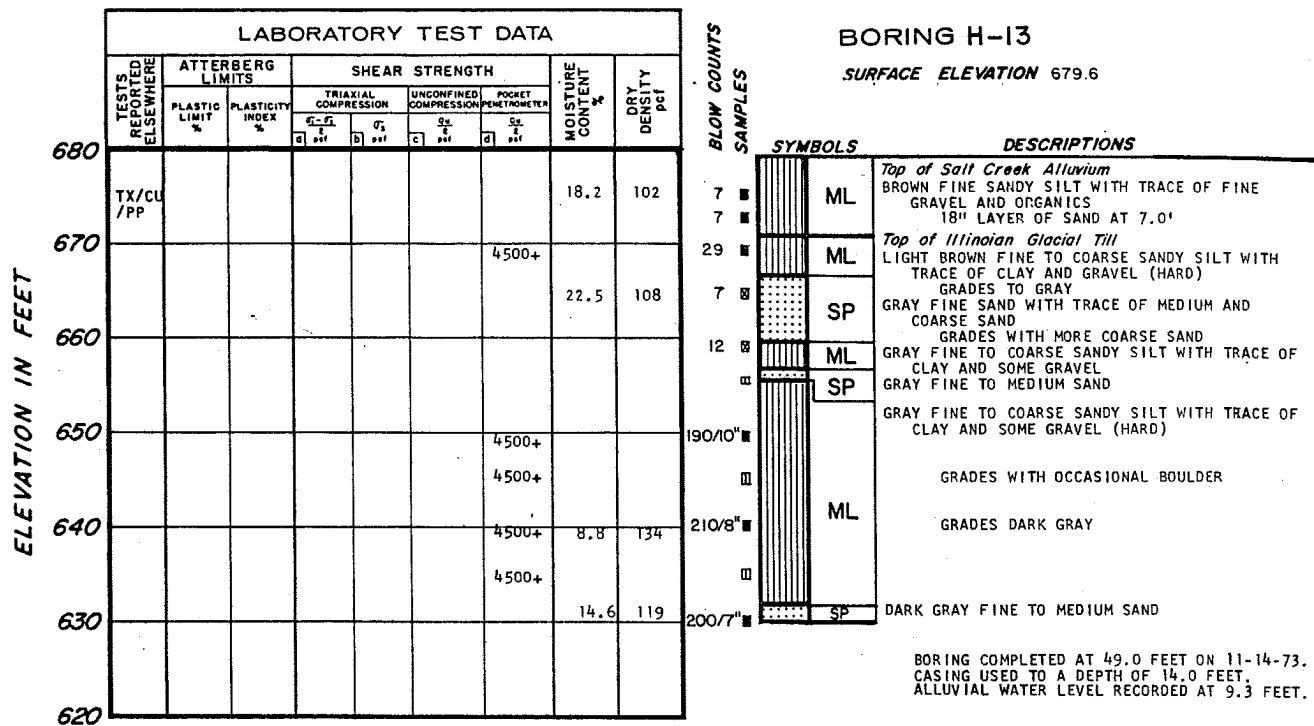
## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-173

LOG OF BORING H-12

### NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



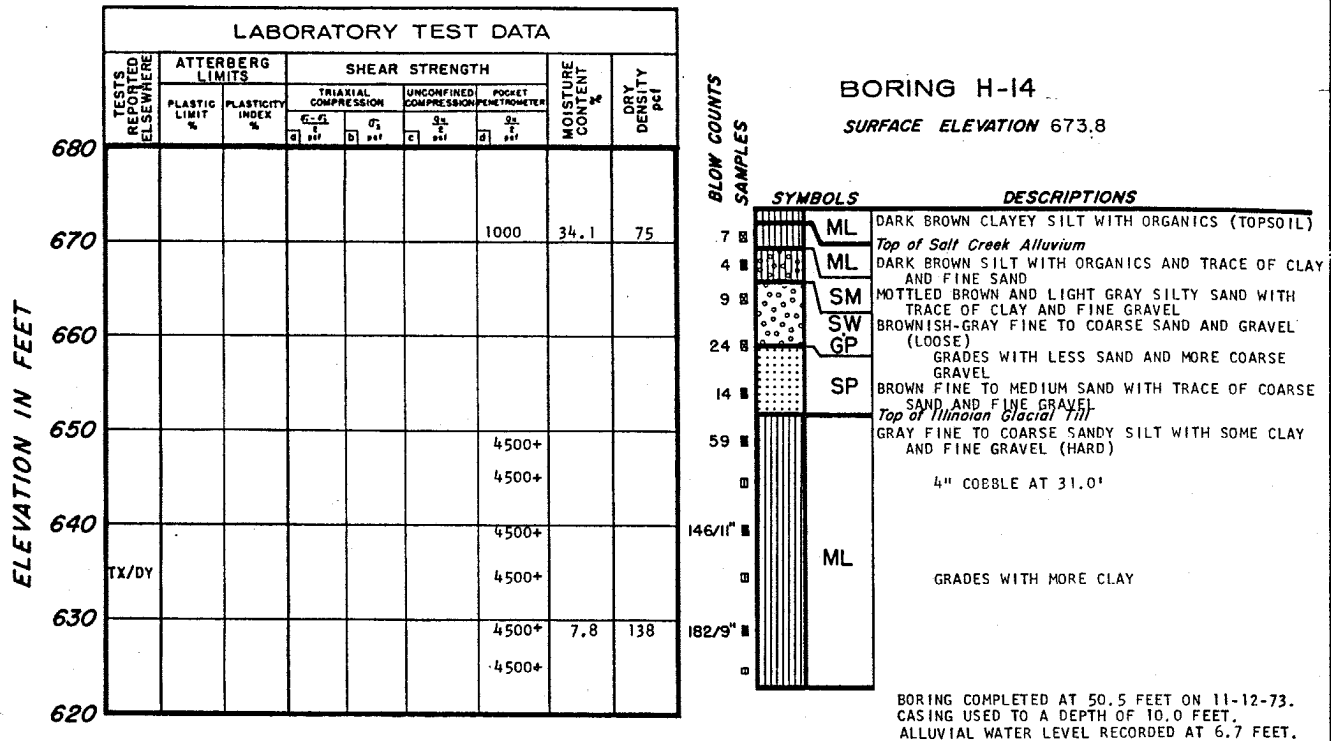
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-174

LOG OF BORING H-13



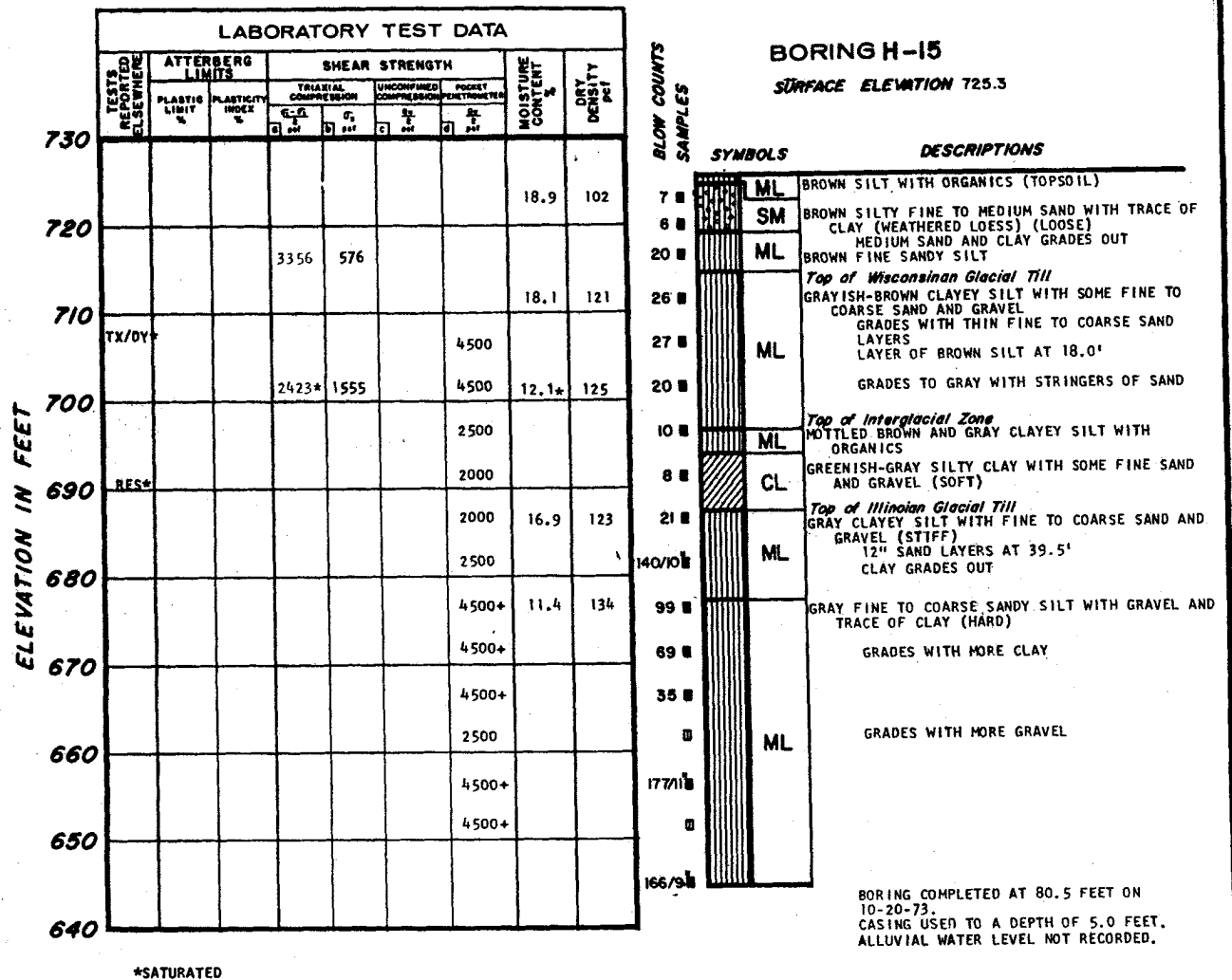
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-175

LOG OF BORING H-14

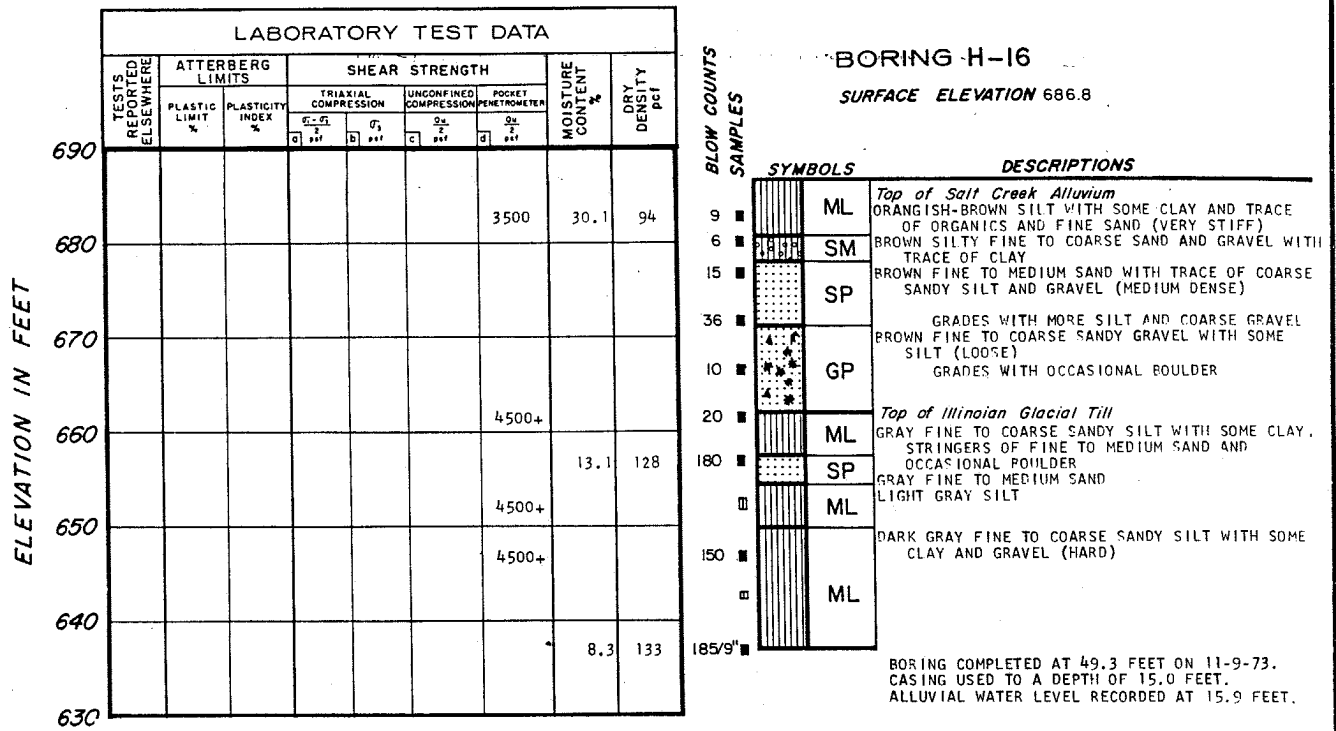


CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-176

LOG OF BORING H-15

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

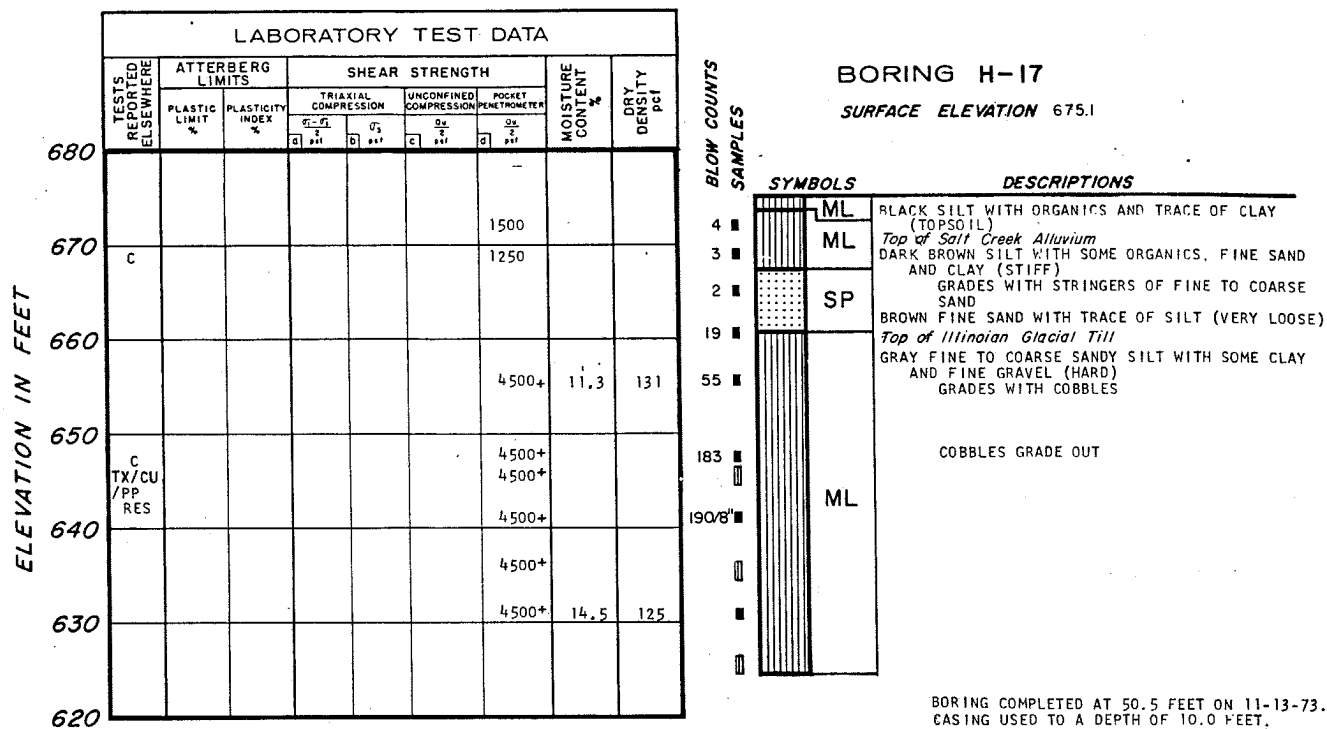


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-177

LOG OF BORING H-16

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



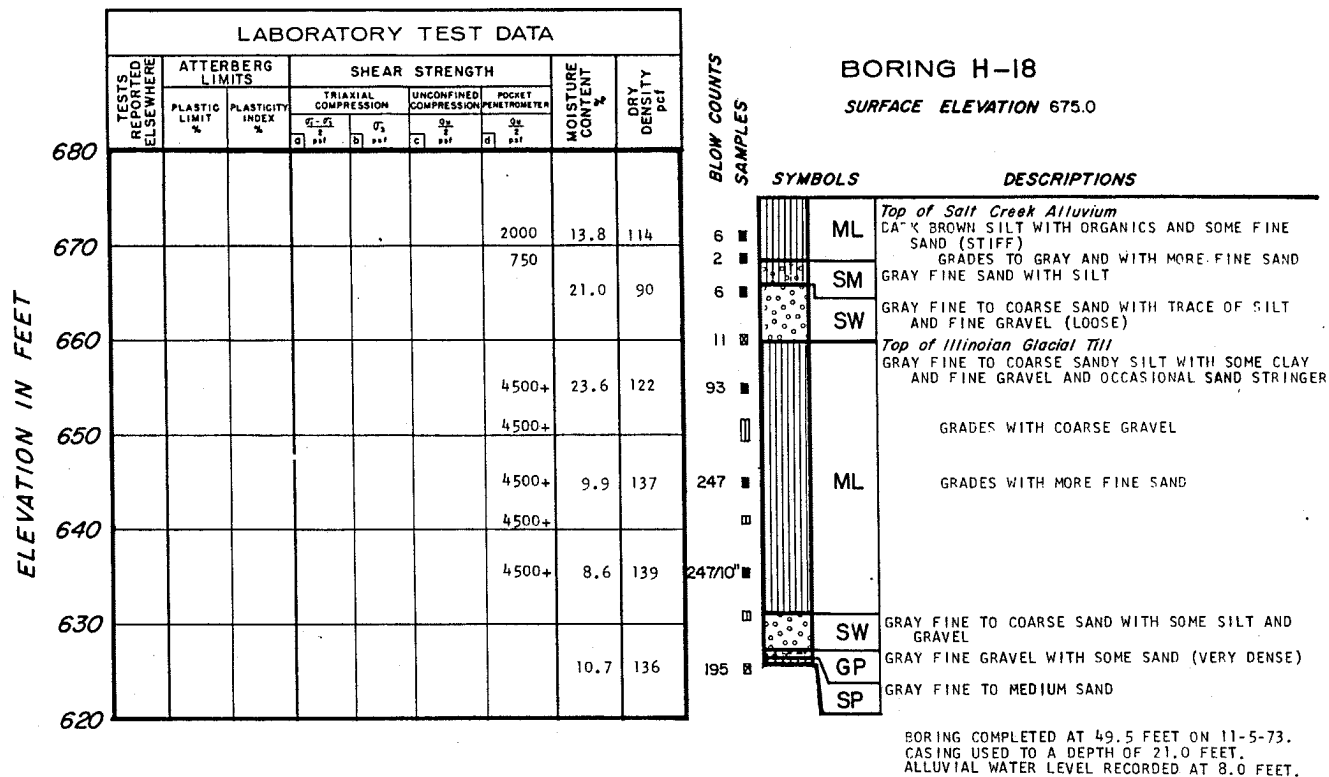
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-178

LOG OF BORING H-17



NOTE:

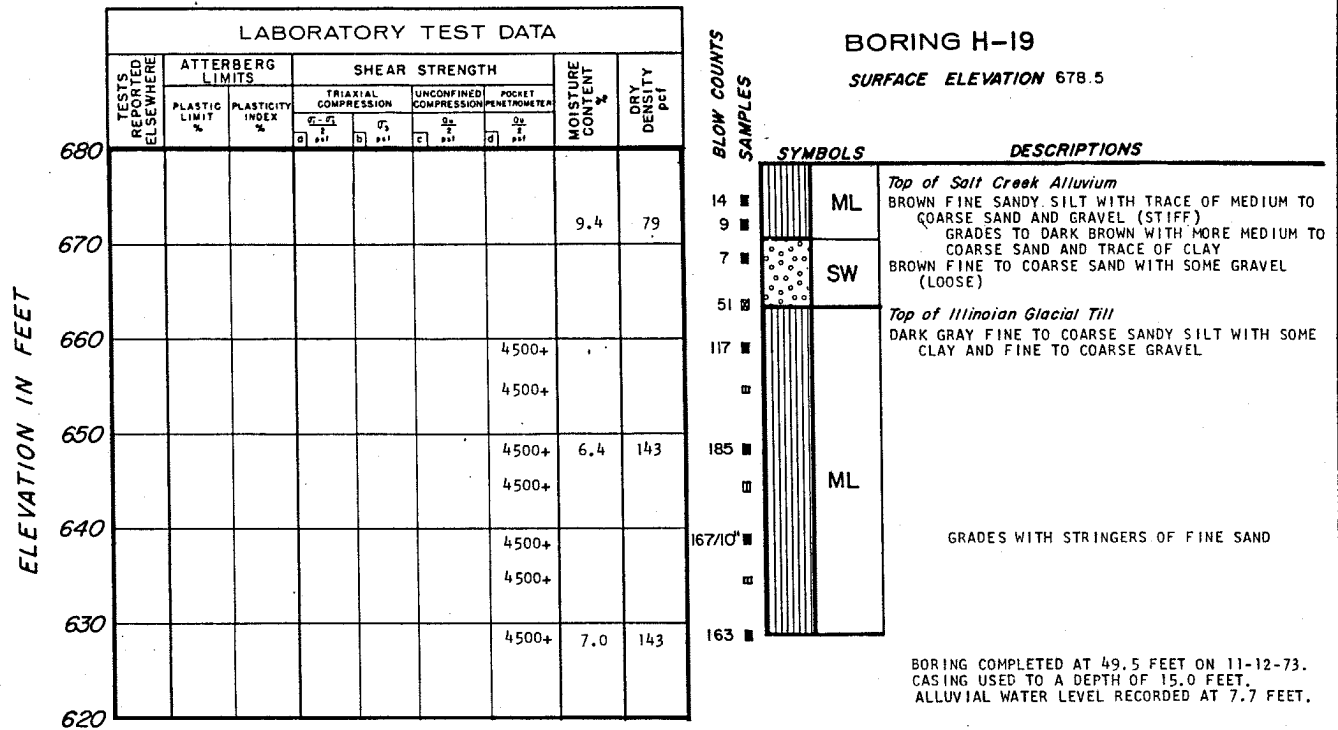
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-179

LOG OF BORING H-18





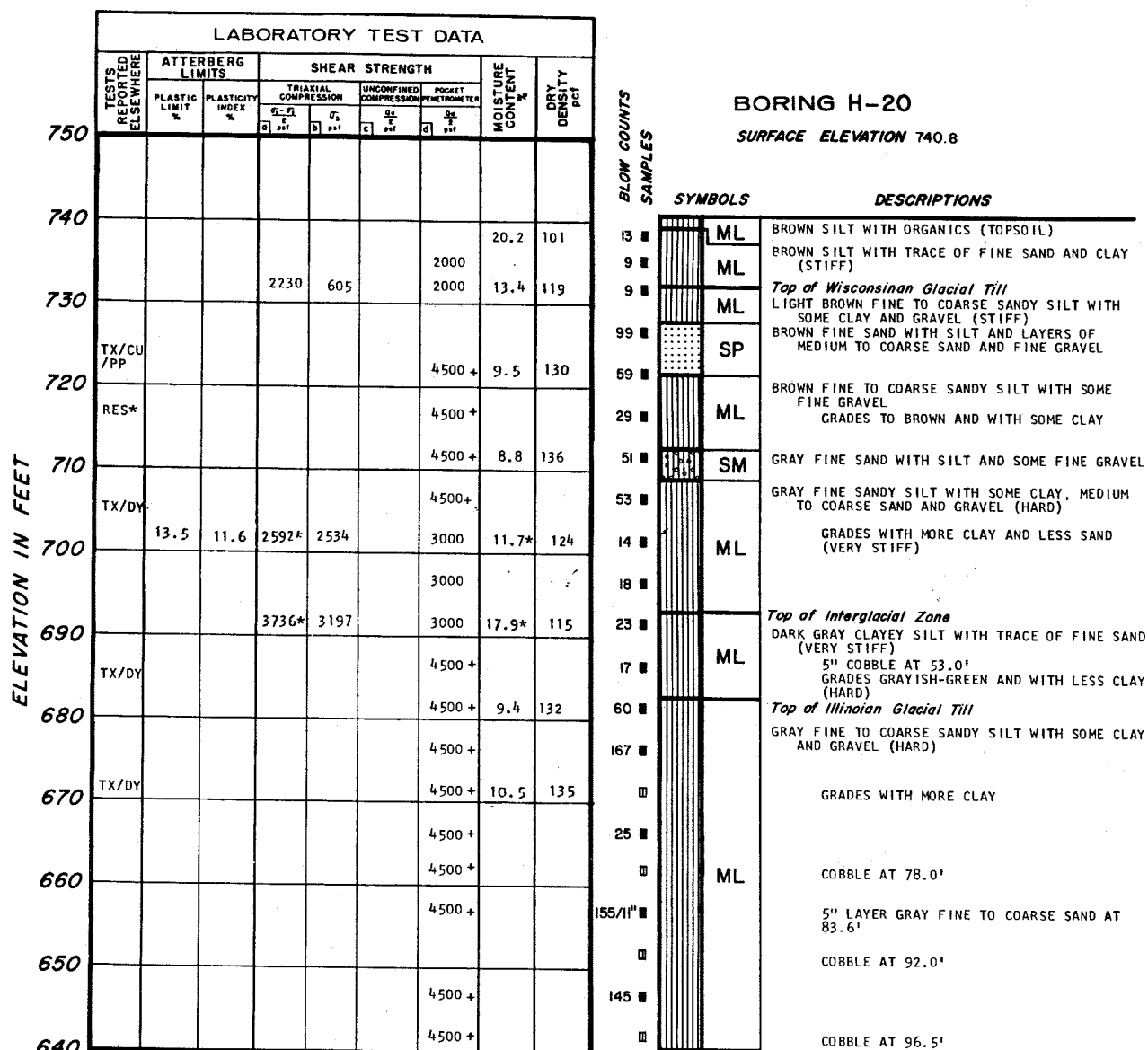
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-180

LOG OF BORING H-19



\* SATURATED

BORING COMPLETED AT 100.0 FEET ON 10-25-73.  
CASING USED TO A DEPTH OF 5.0 FEET.  
GROUNDWATER LEVEL NOT RECORDED.

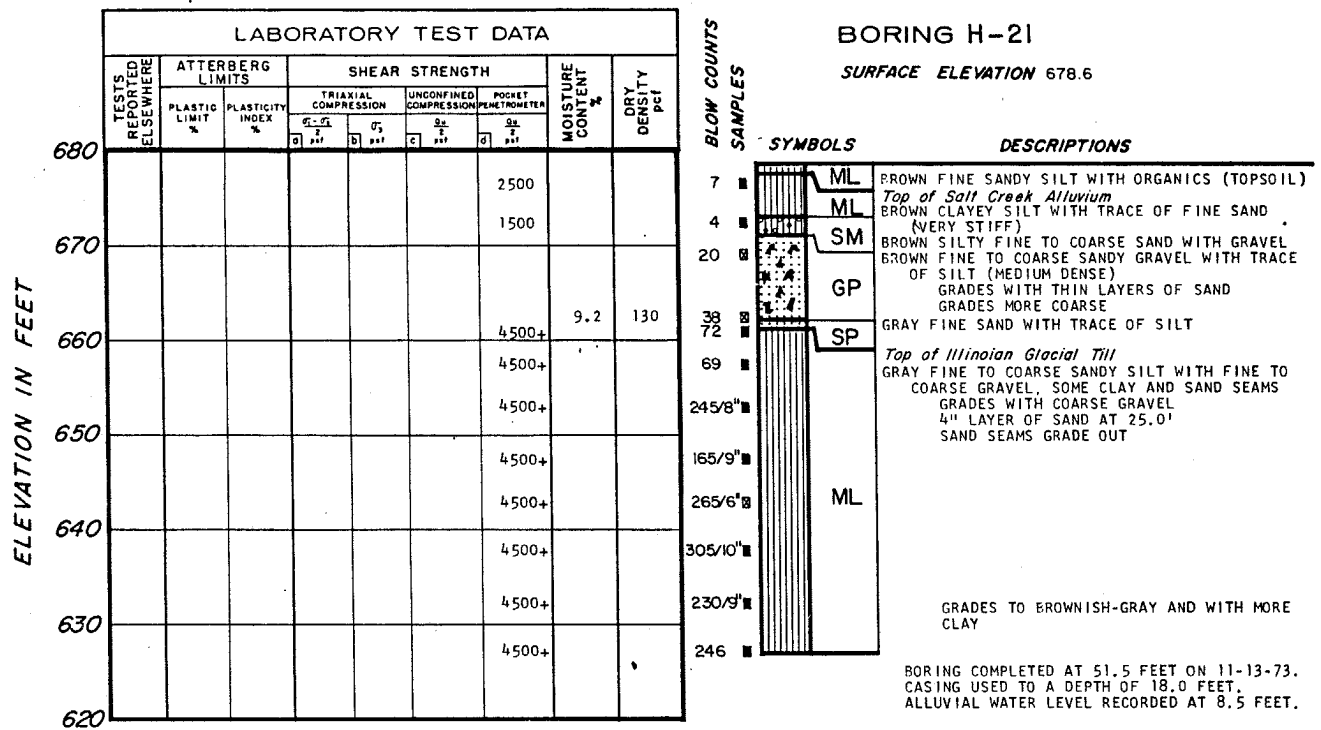
## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-181

LOG OF BORING H-20

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.



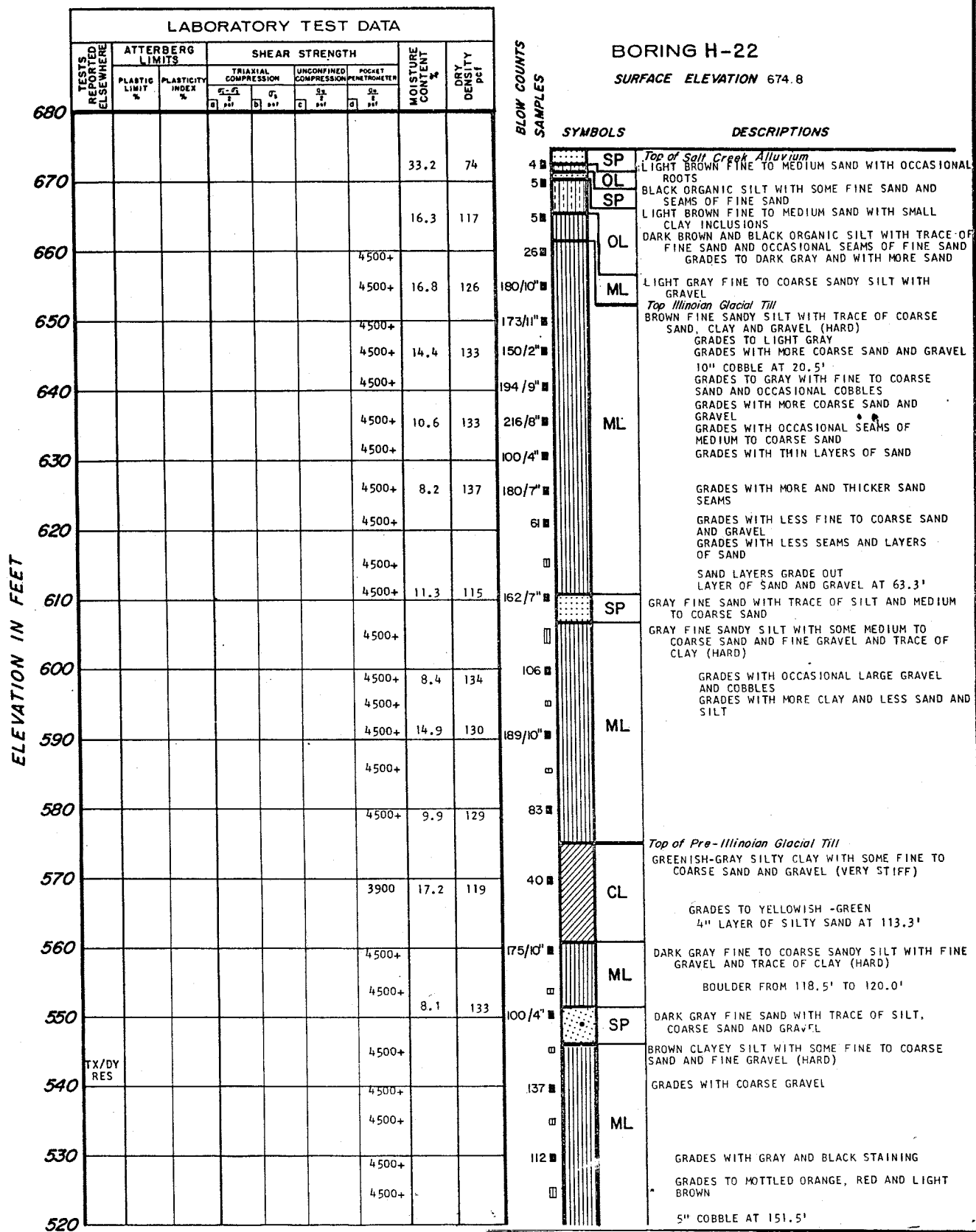
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-182

LOG OF BORING H-21

NOTE:

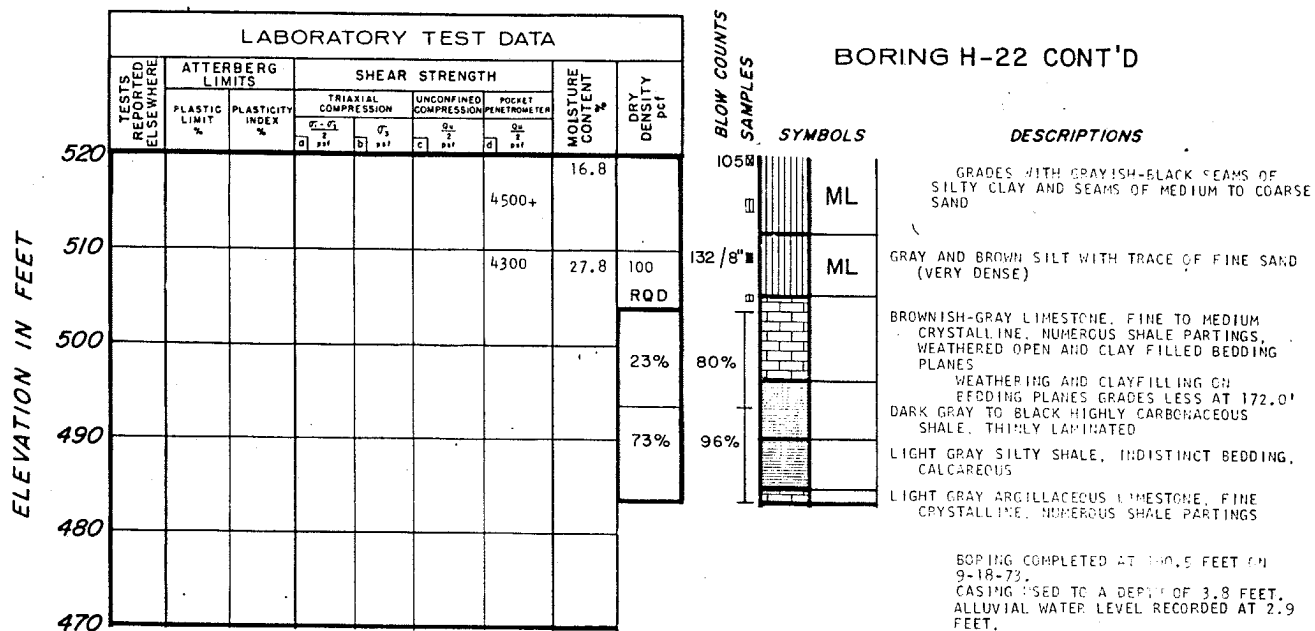
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

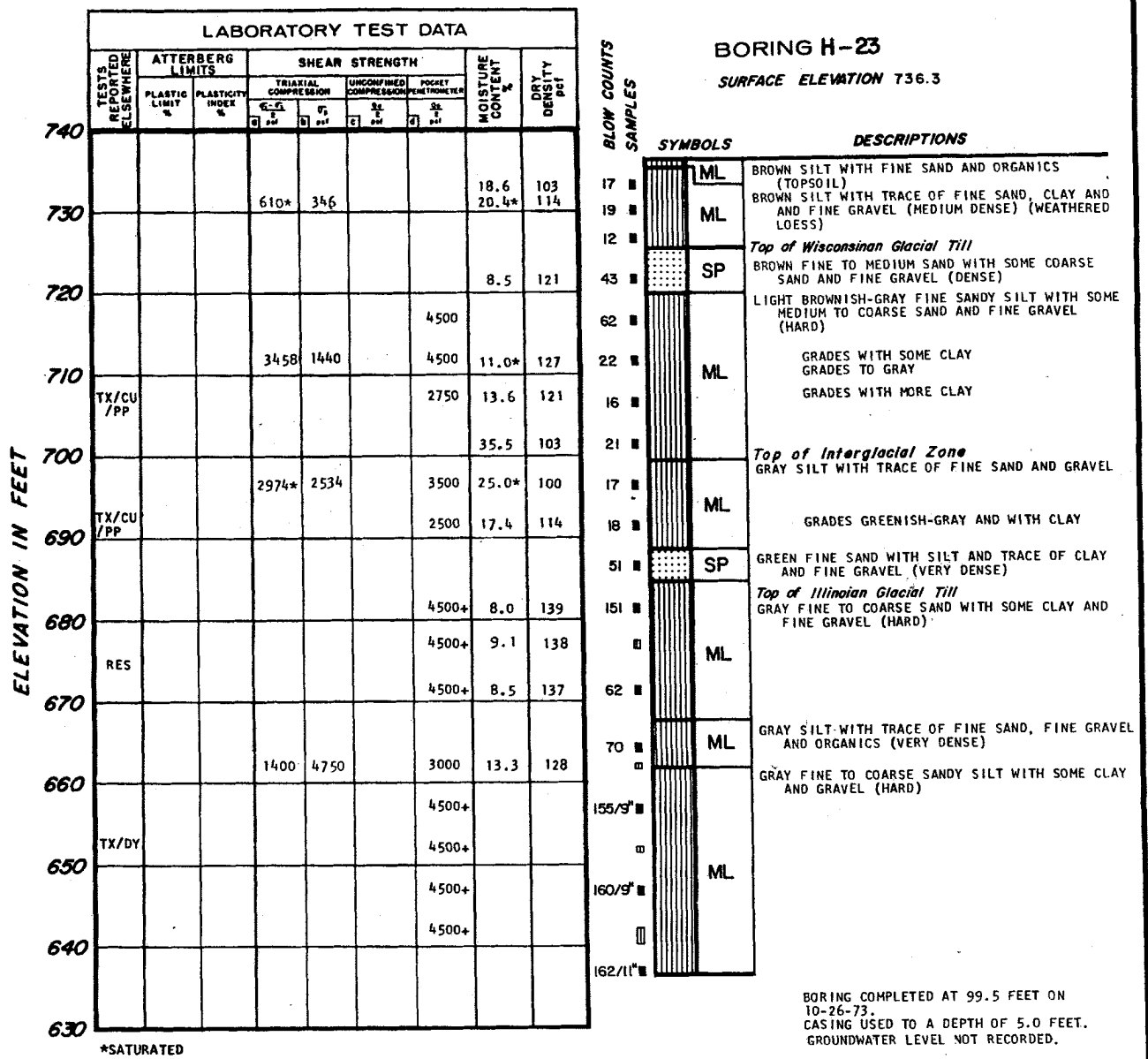
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-183  
LOG OF BORING H-22  
(SHEET 1 of 2)



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-183  
LOG OF BORING H-22  
(SHEET 2 of 2)

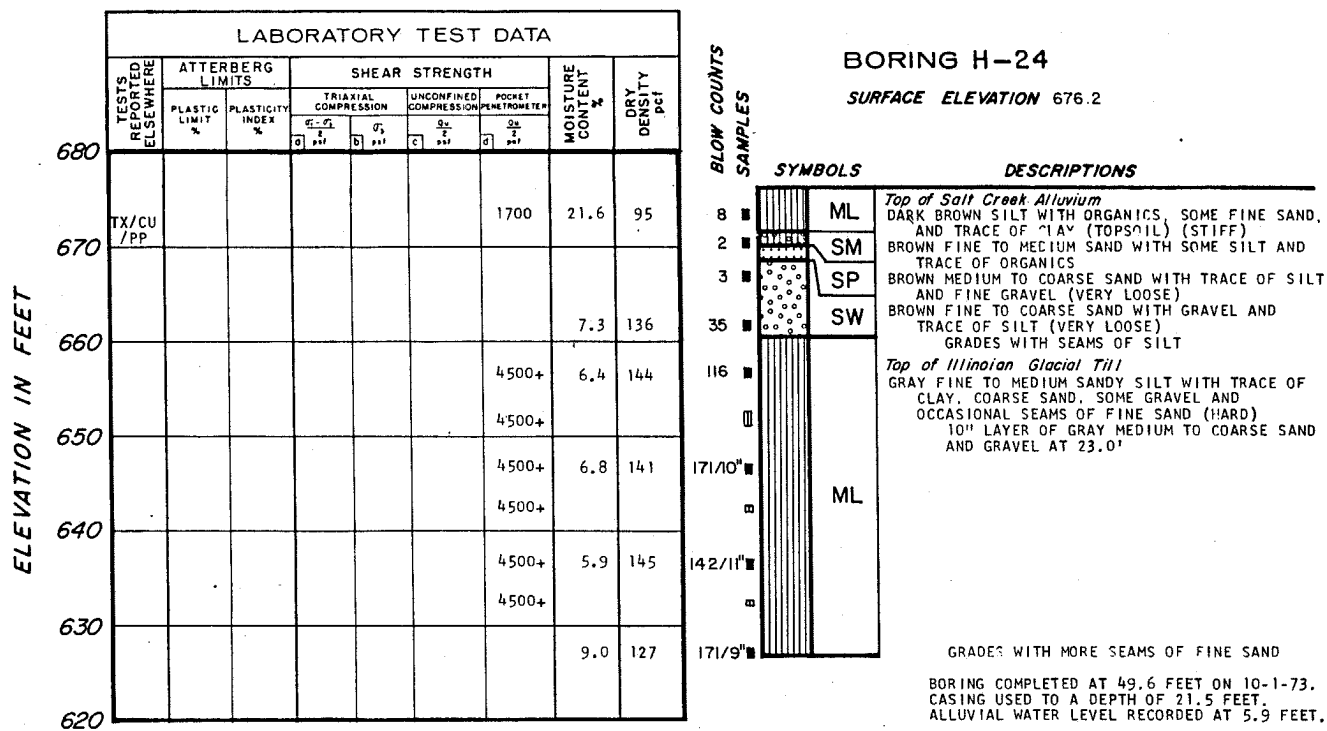


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-184

LOG OF BORING H-23

NOTE:  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

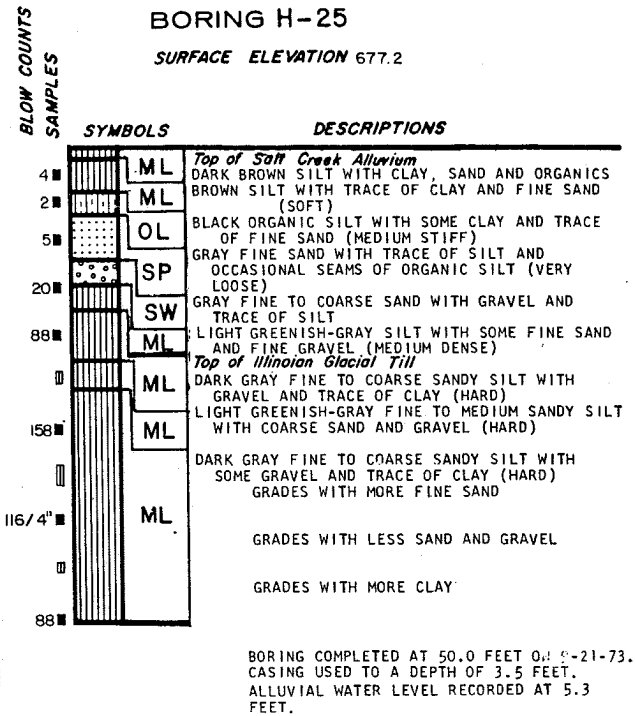
## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-185

LOG OF BORING H-24

LABORATORY TEST DATA									
ELEVATION IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS		SHEAR STRENGTH				MOISTURE CONTENT %	DRY DENSITY pcf
		PLASTIC LIMIT %	PLASTICITY INDEX %	TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION			
				PENETROMETER					
				$\frac{\sigma_1 - \sigma_3}{2}$ psi	$\sigma_3$ psi	$\frac{q_u}{2}$ psi	$\frac{q_u}{2}$ psi		
680									
670	TX/CU /PP						500		
660								21.1	105
650							4500+	6.5	142
640							4500+	6.2	143
630	TX/CU /PP						4500+	6.6	146
620							4500+	8.5	138

BORING H-25  
 SURFACE ELEVATION 677.2



CLINTON POWER STATION  
 UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-186

LOG OF BORING H-25

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
 EXPLANATION OF SYMBOLS USED ON BORING LOGS.

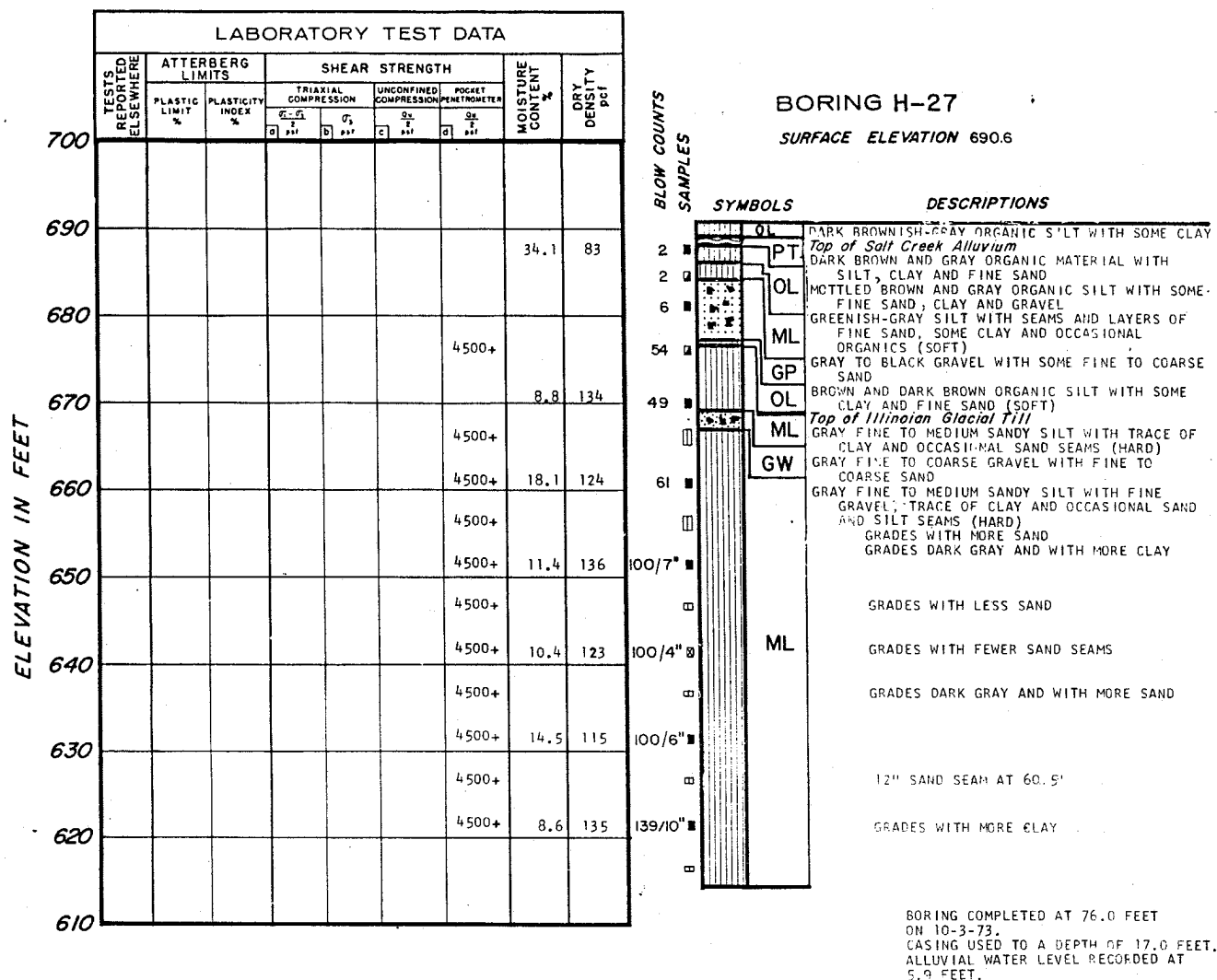


**SURFACE ELEVATION 687.7**

BORING COMPLETED AT 100.0 FEET  
ON 11-3-73.  
CASING USED TO A DEPTH OF 47.5 FEET.  
GROUNDWATER LEVEL NOT RECORDED.

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## LOG OF BORING H-26



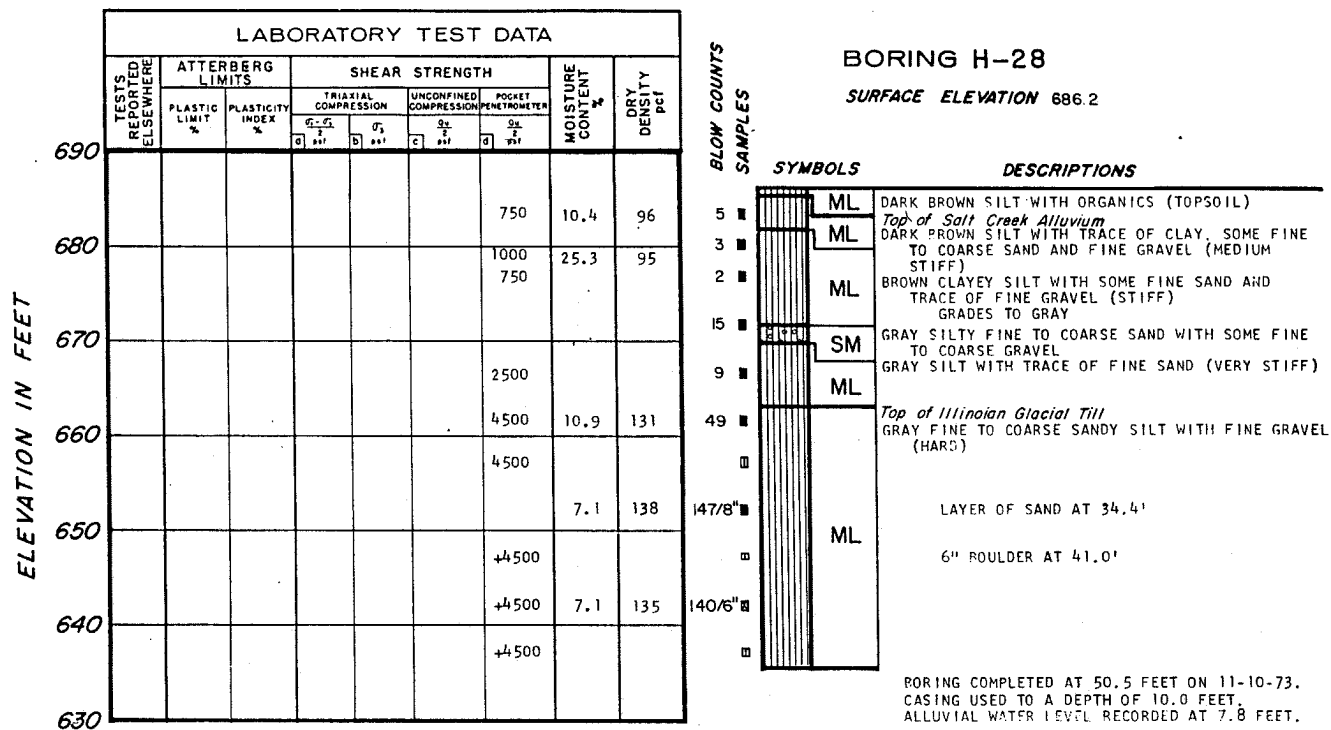
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-188

LOG OF BORING H-27

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.



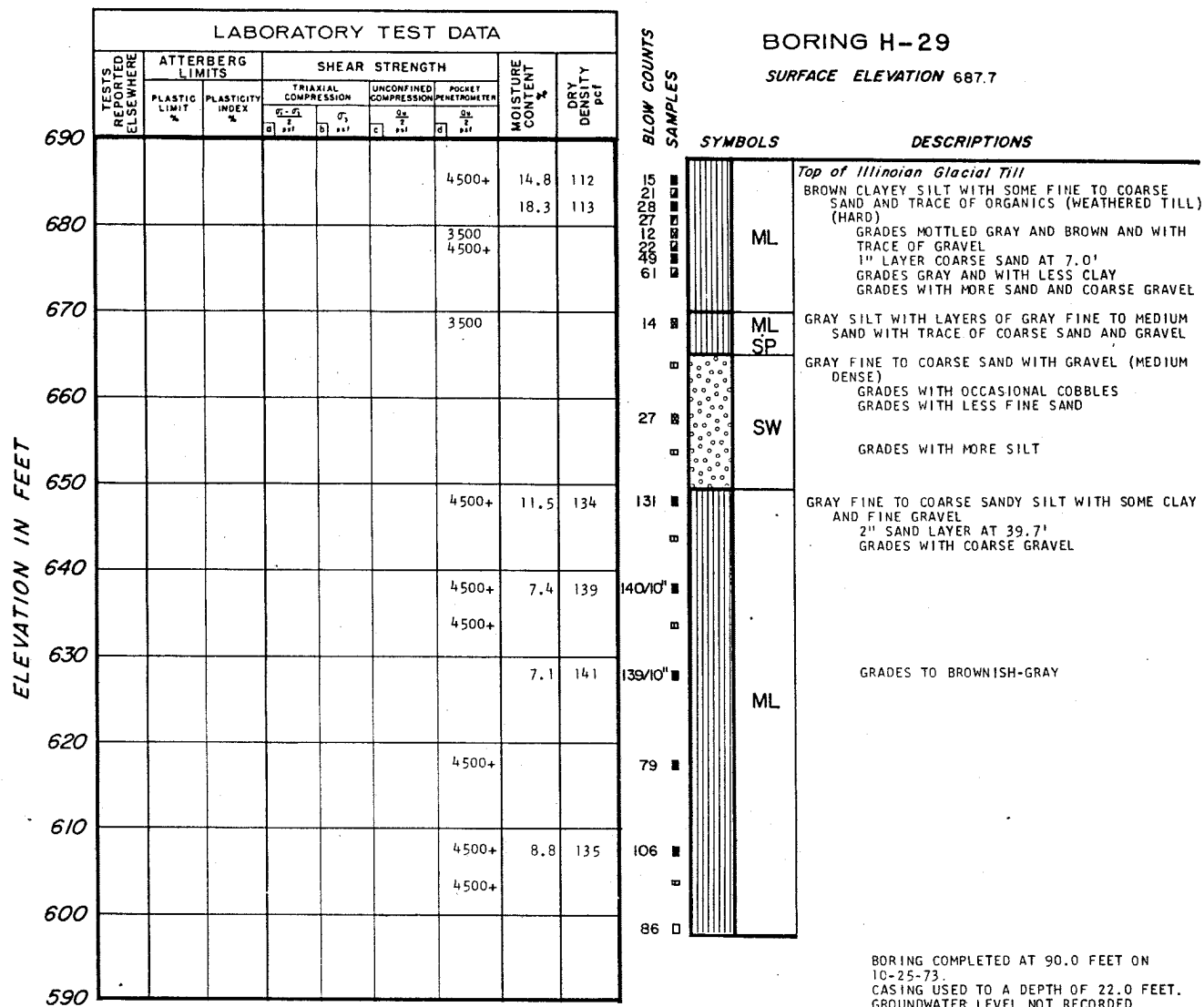
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-189

LOG OF BORING H-28



**NOTES:**

SLOPE BENCHED FOR ACCESS; NATURAL GROUND SURFACE AT ELEVATION 689.7.  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

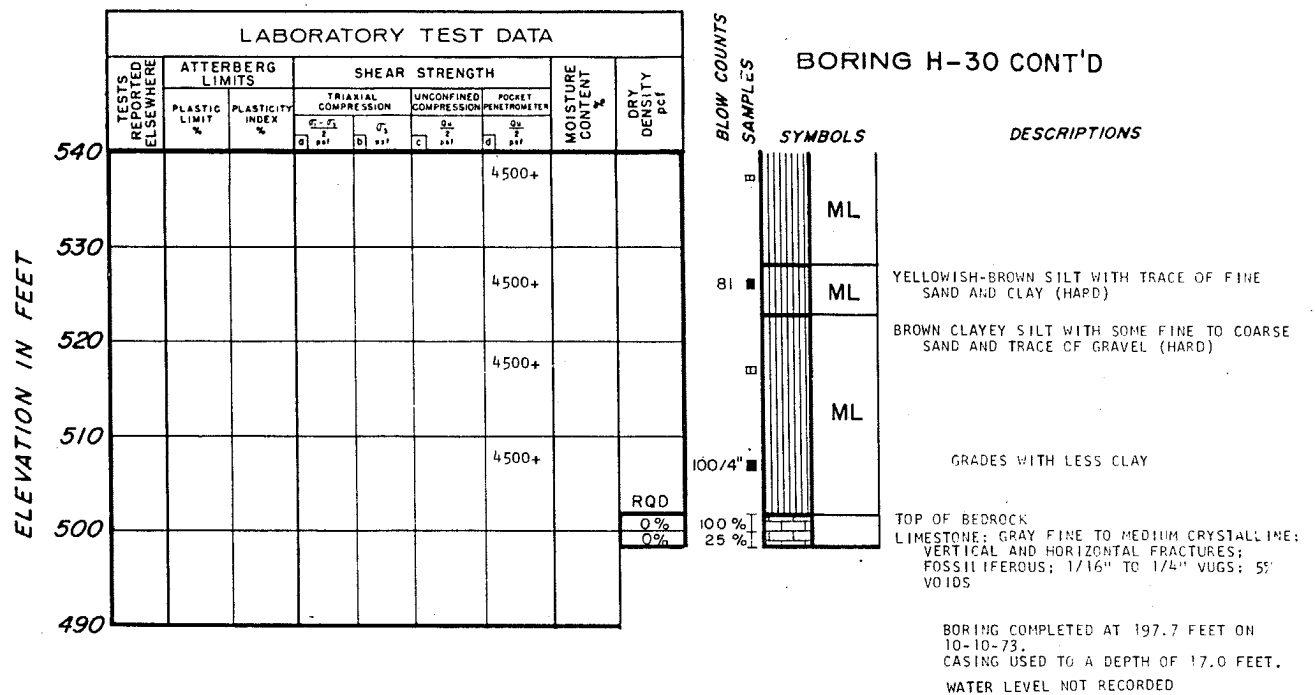
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-190

LOG OF BORING H-29

**SURFACE ELEVATION 697.0**

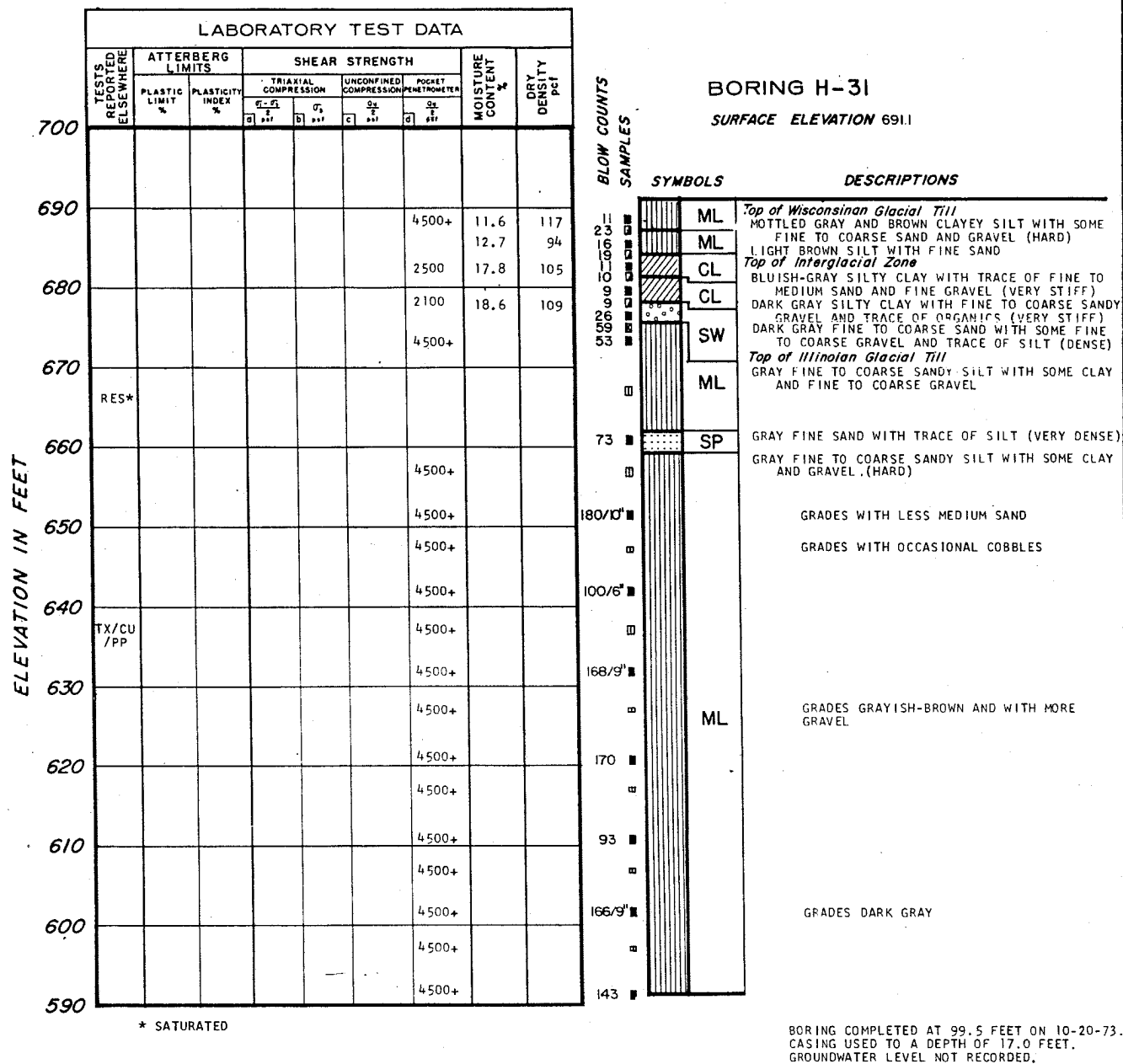
(SHEET 1 of 2)



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-191

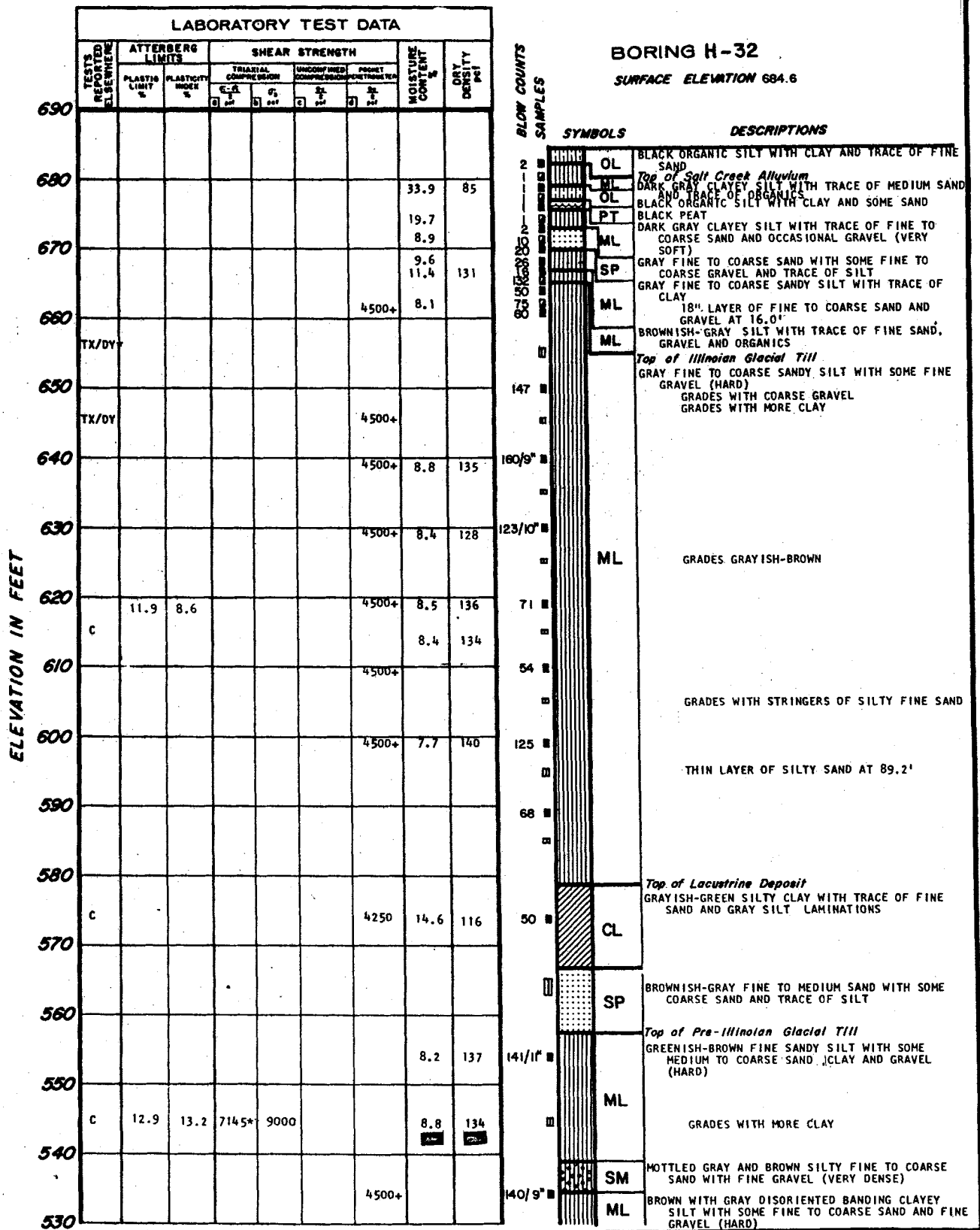
LOG OF BORING H-30  
(SHEET 2 of 2)



**NOTES:**

SLOPE BENCHMARK FOR ACCESS; NATURAL GROUND SURFACE AT ELEVATION 692.6.  
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

BORING COMPLETED AT 99.5 FEET ON 10-20-73. CASING USED TO A DEPTH OF 17.0 FEET. GROUNDWATER LEVEL NOT RECORDED.



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-193

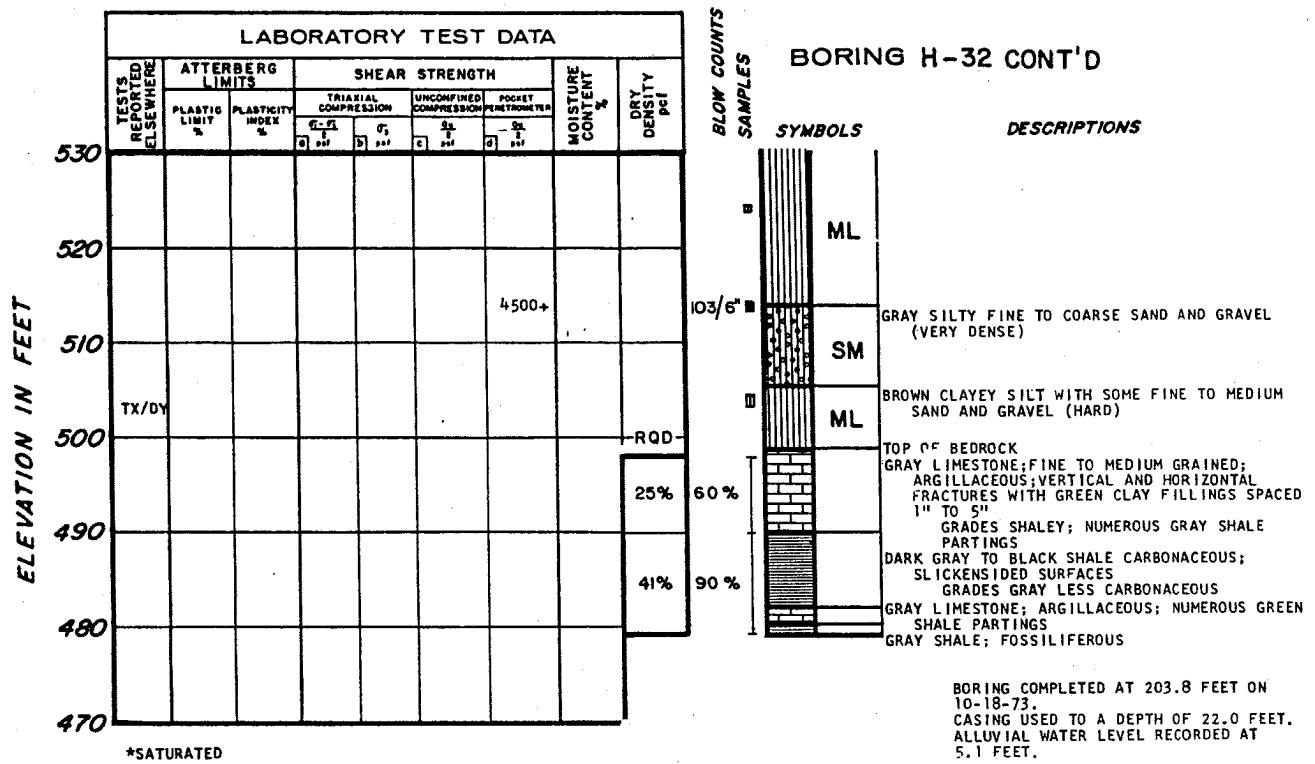
LOG OF BORING H-32

(SHEET 1 of 2)

NOTE:

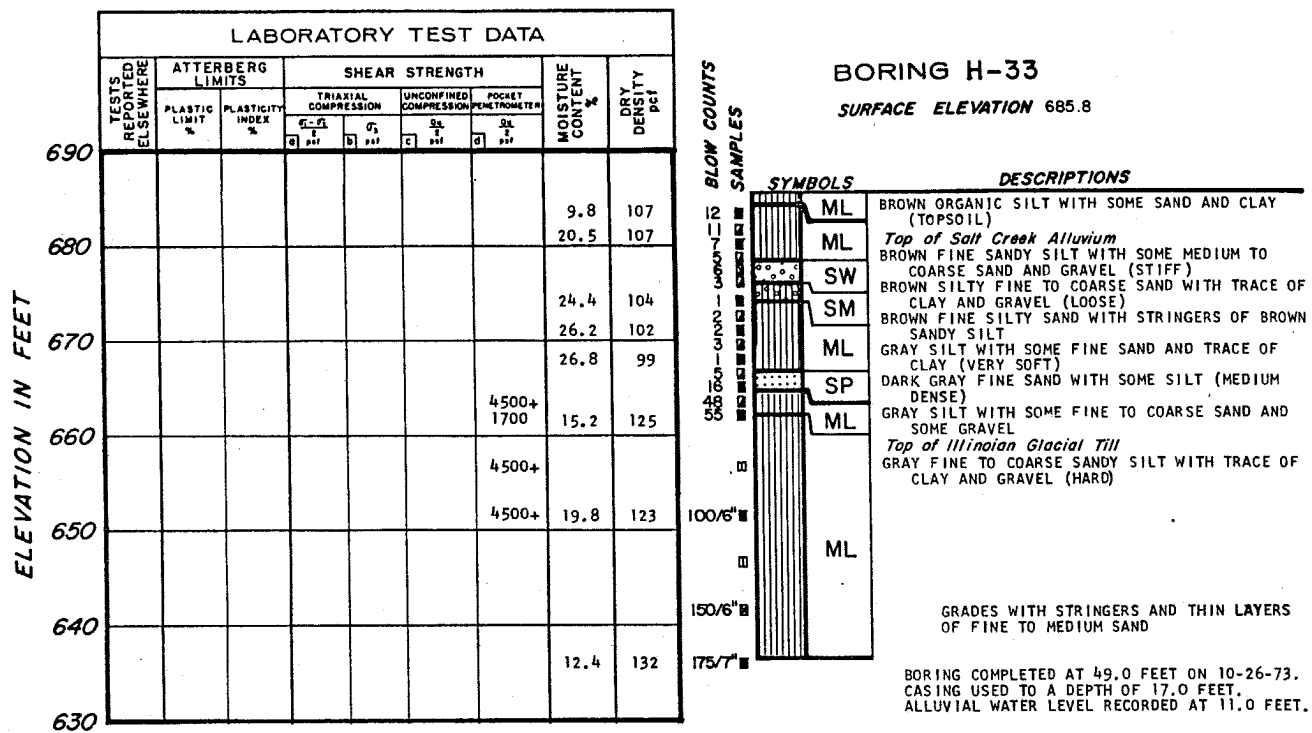
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.





**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-193  
LOG OF BORING H-32  
(SHEET 2 of 2)



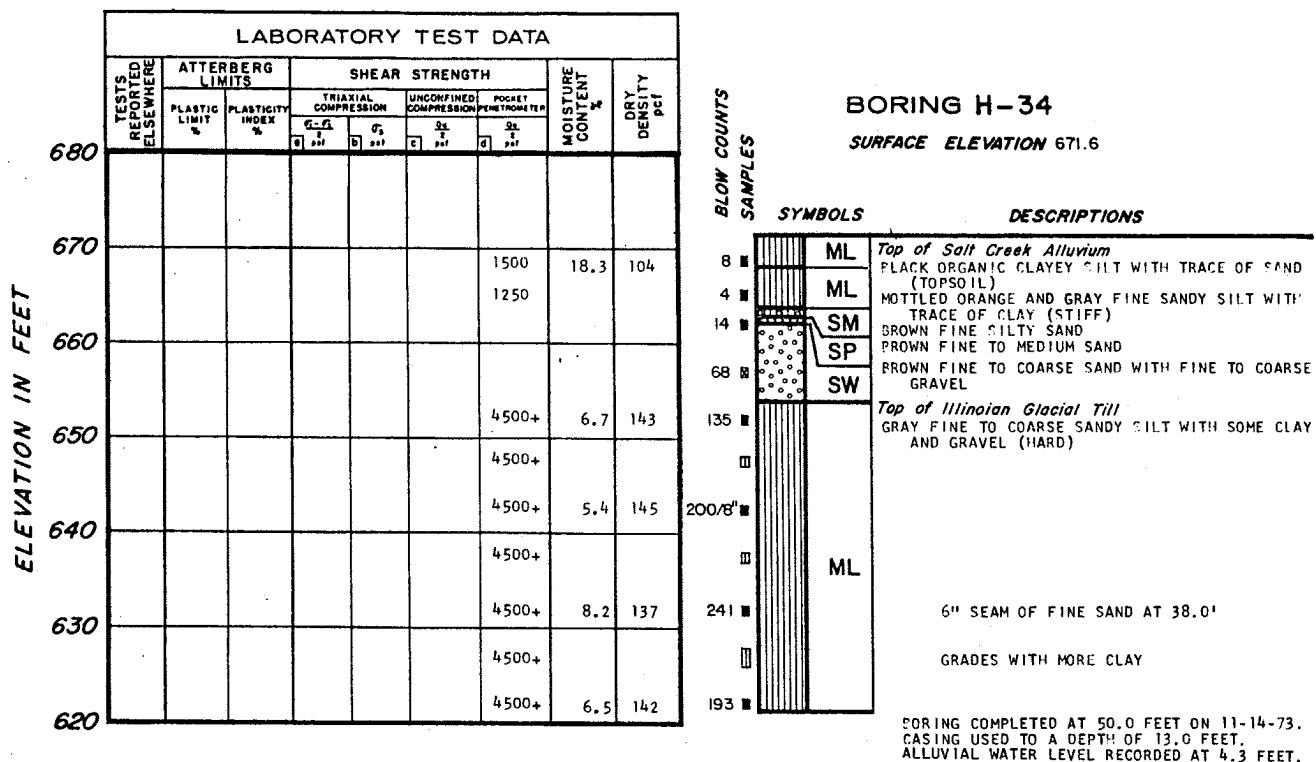
**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-194

LOG OF BORING H-33

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



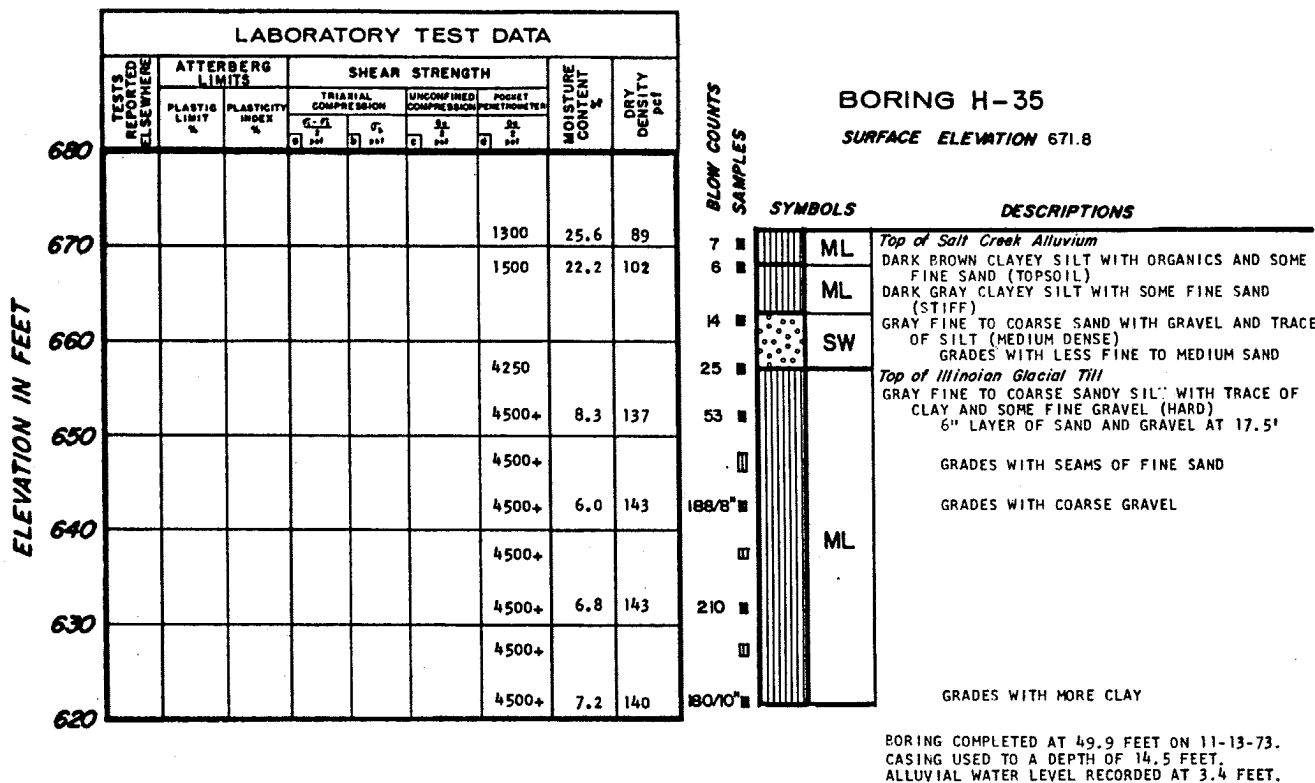
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-195

LOG OF BORING H-34



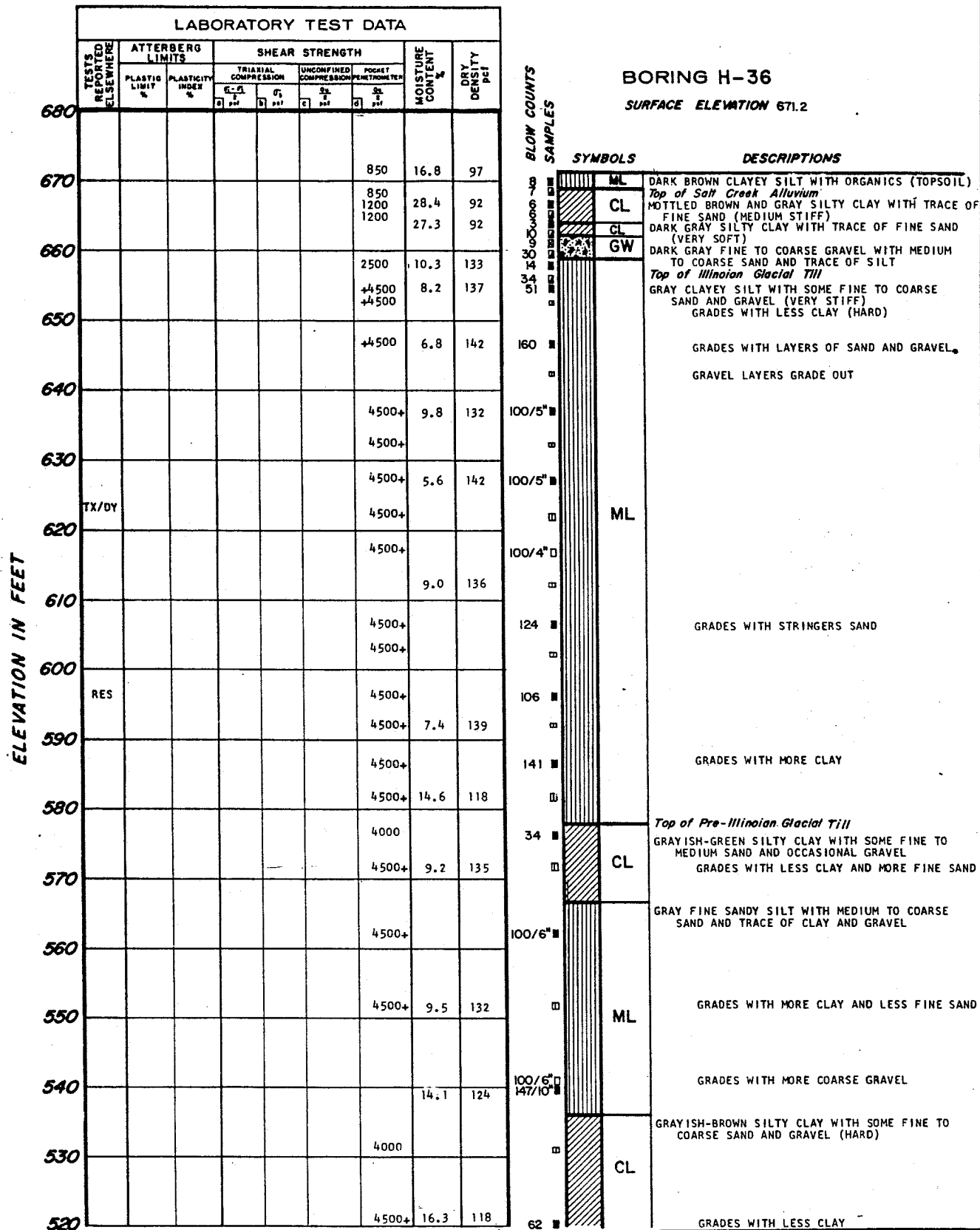
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-196

LOG OF BORING H-35



NOTE:

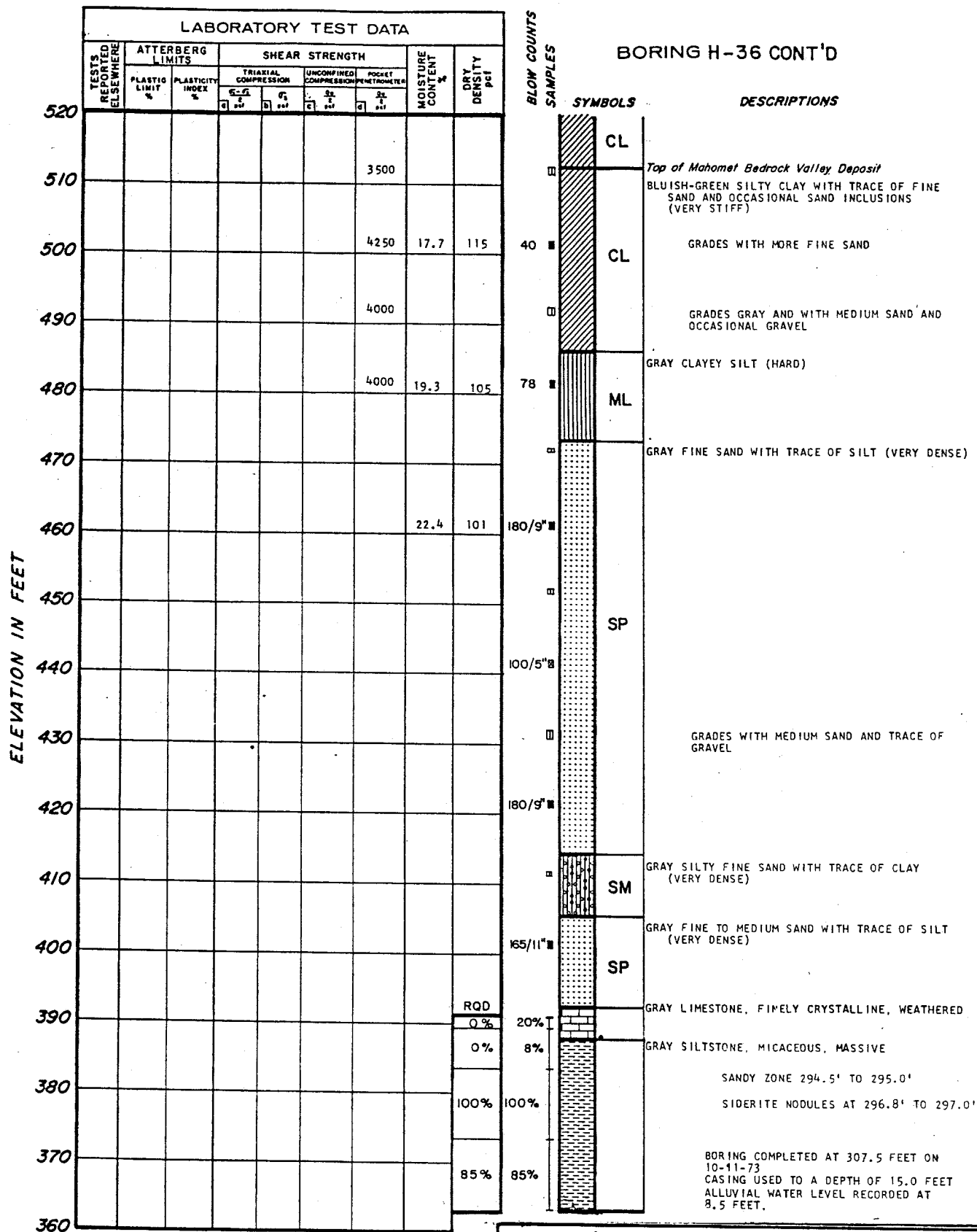
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-197

LOG OF BORING H-36

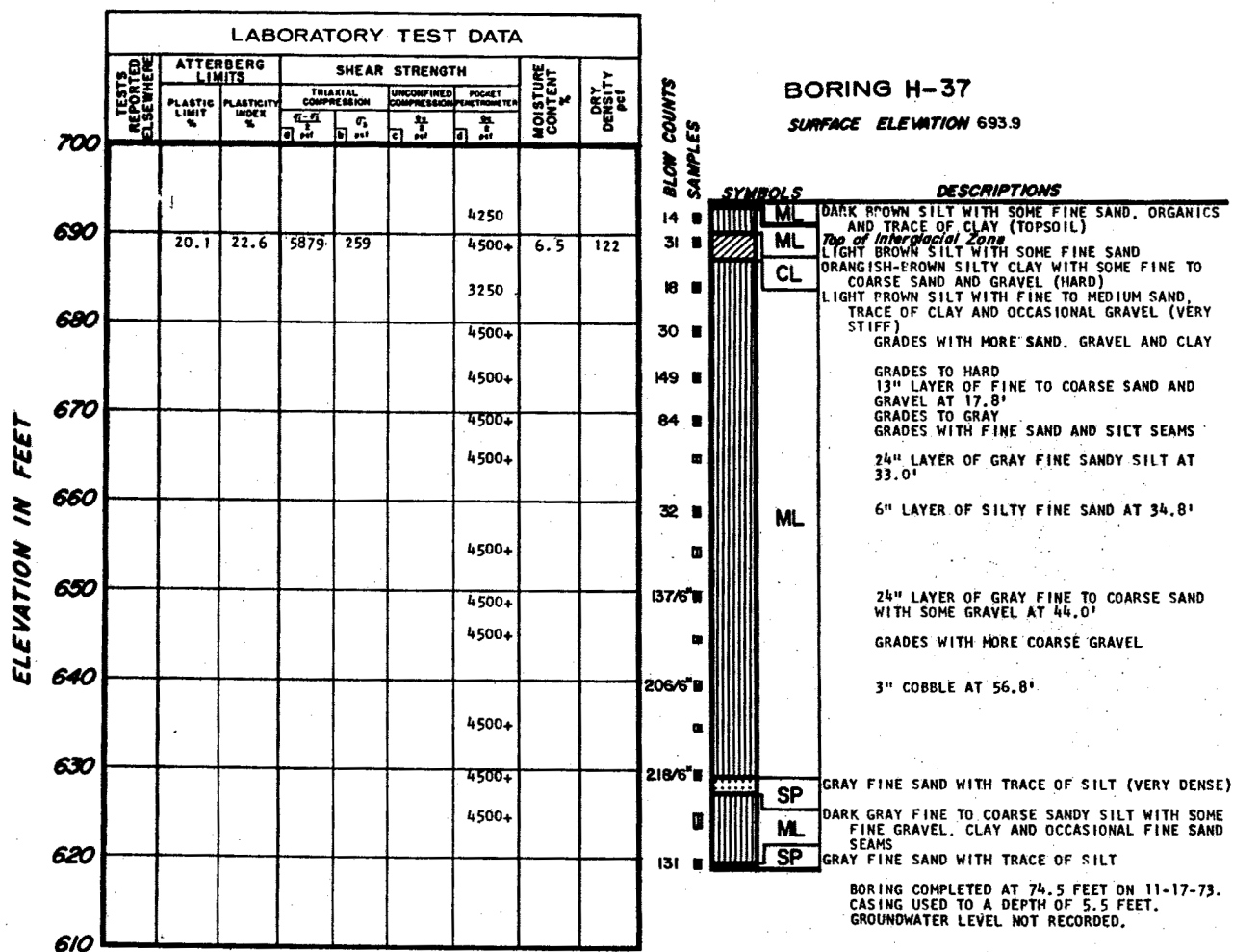
(SHEET 1 of 2)



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-197

LOG OF BORING H-36  
(SHEET 2 of 2)



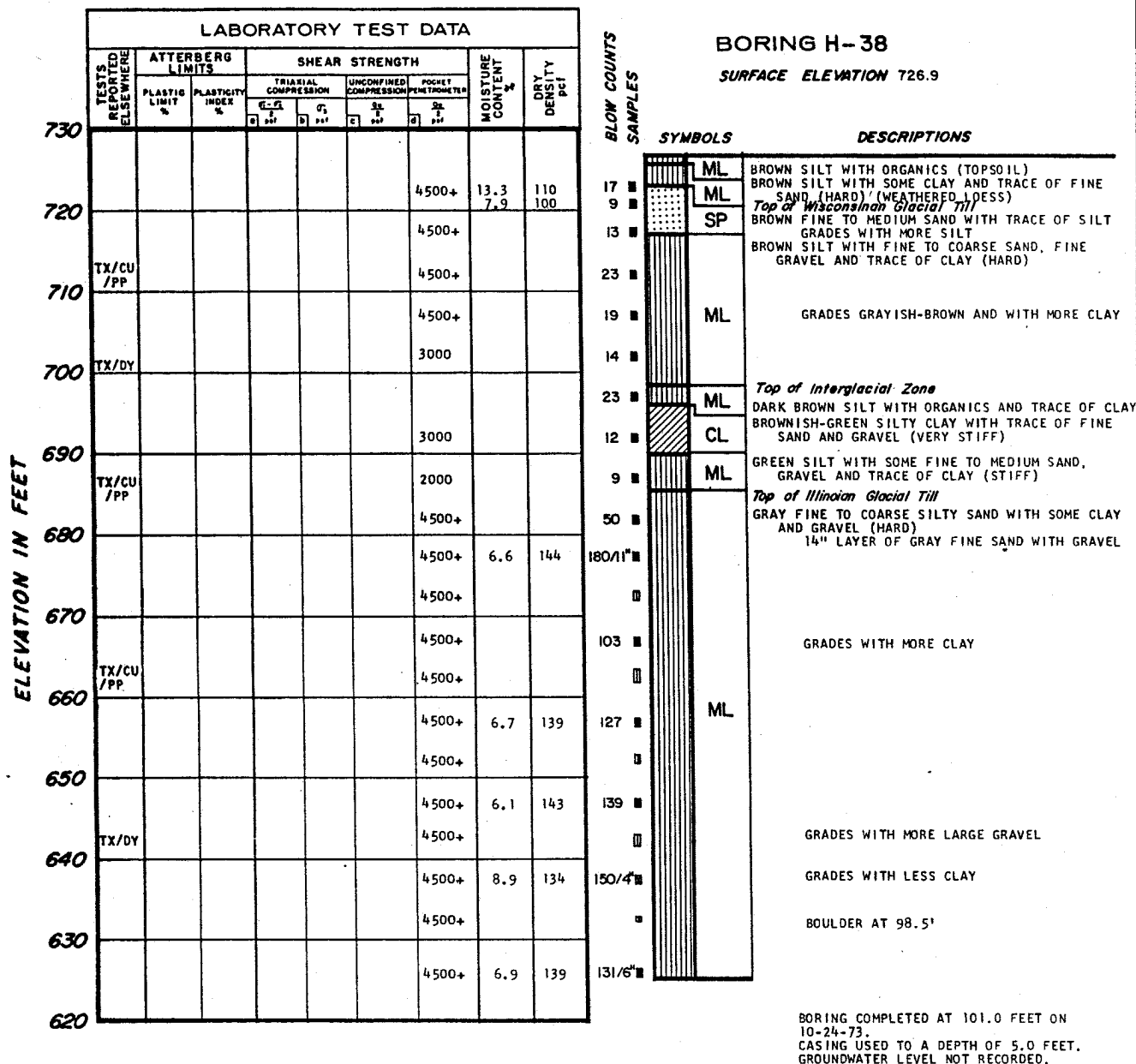
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-198

LOG OF BORING H-37



NOTE:

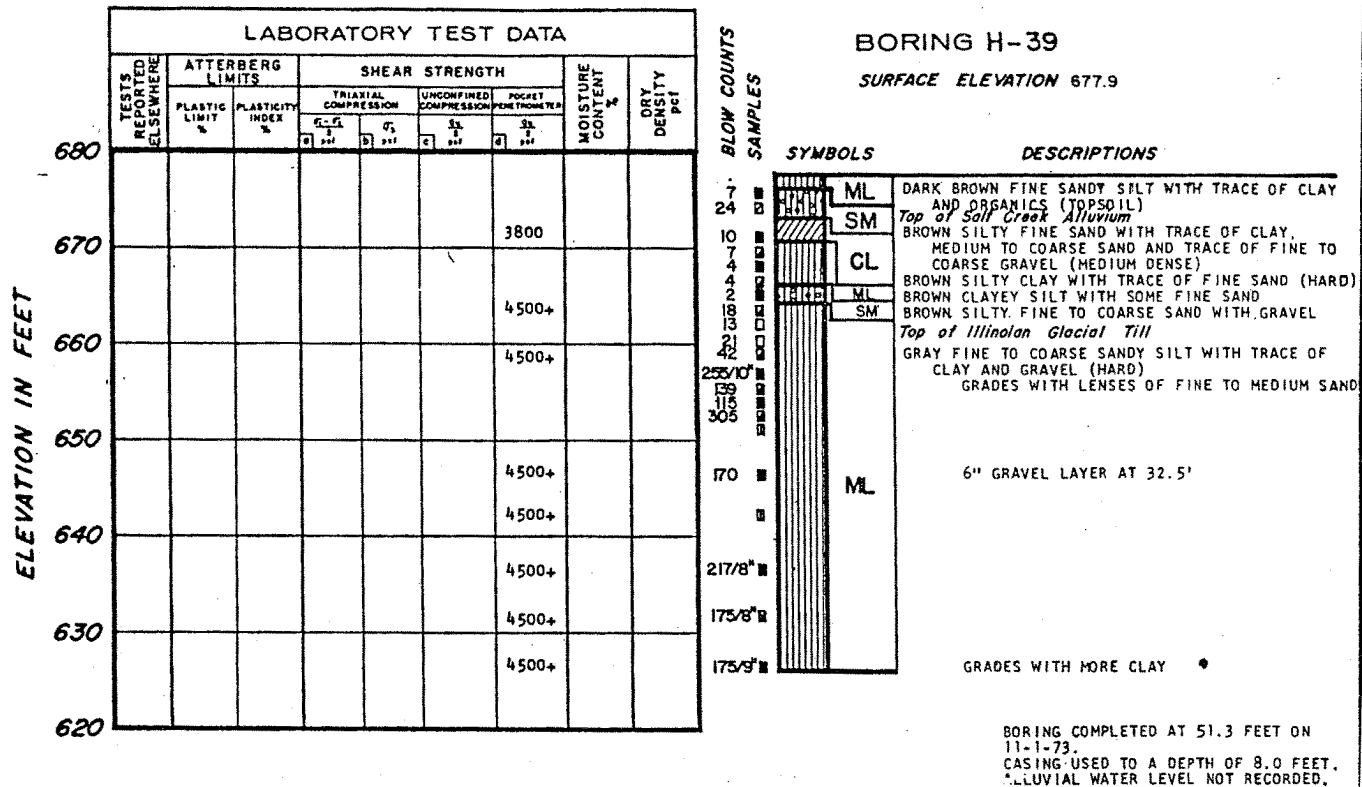
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-199

LOG OF BORING H-38





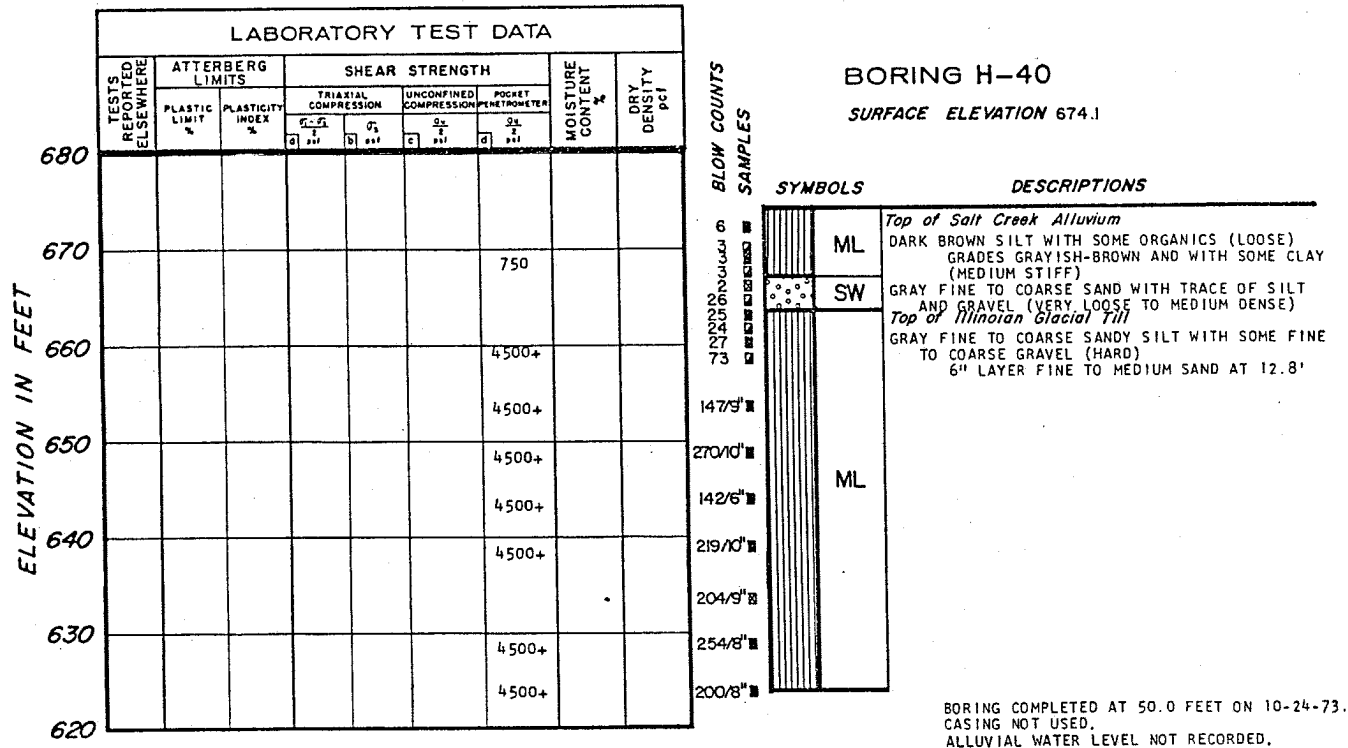
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-200

LOG OF BORING H-39



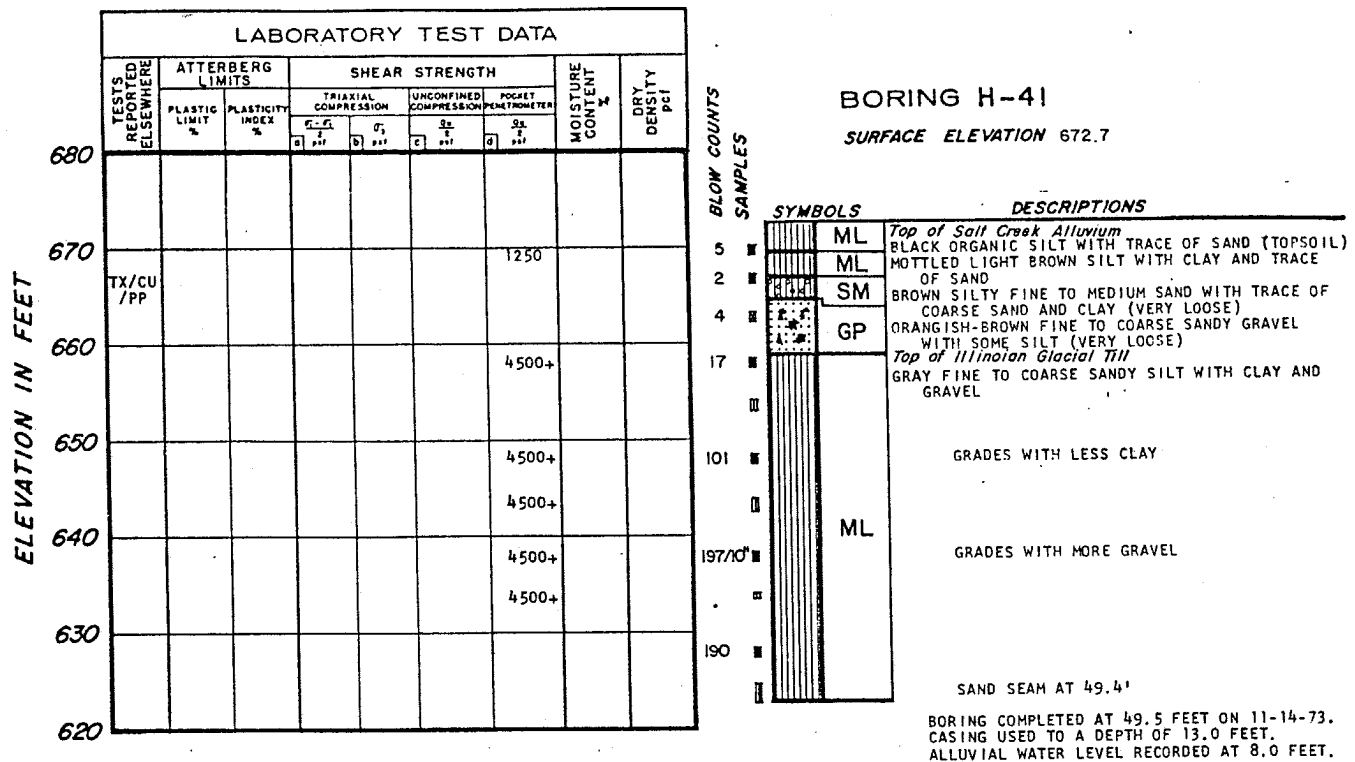
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-201

LOG OF BORING H-40



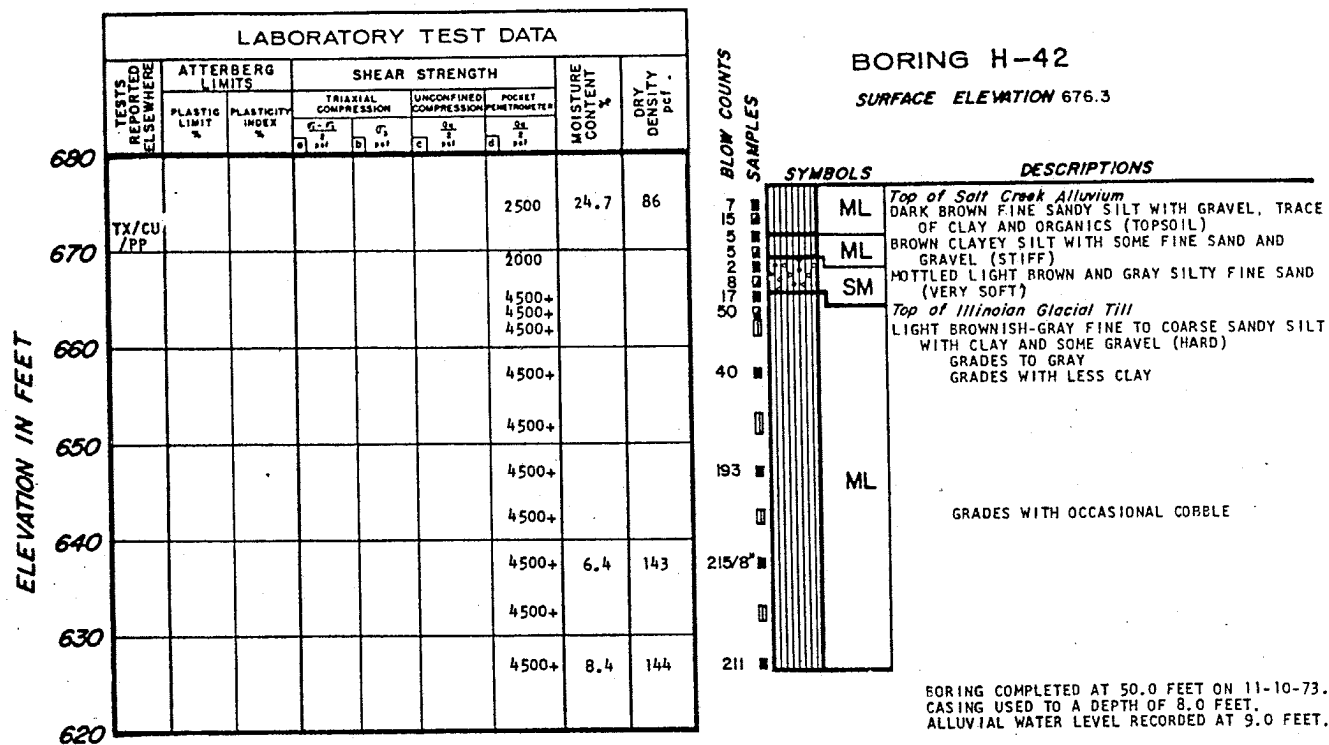
NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-202

LOG OF BORING H-41



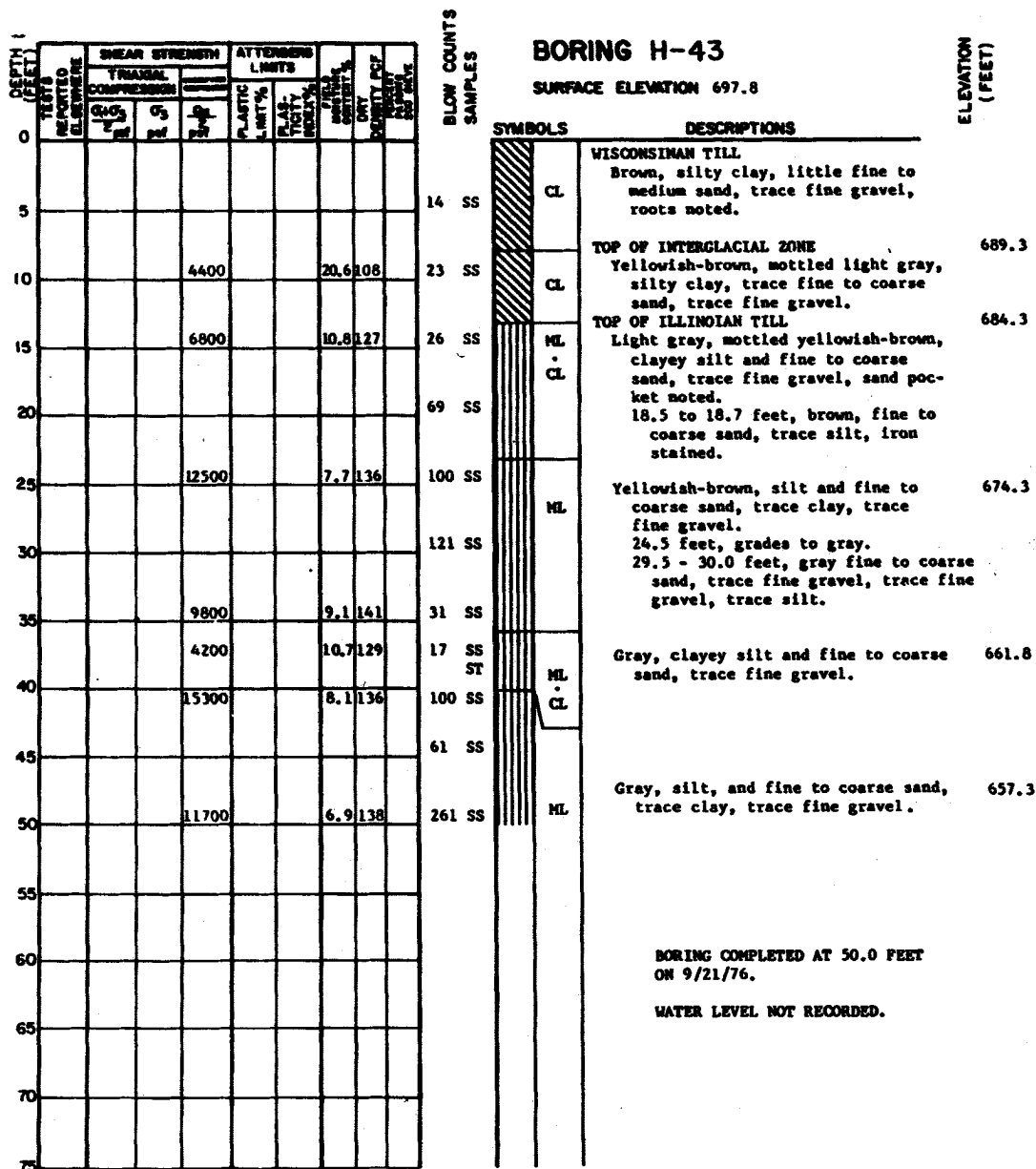
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-203

LOG OF BORING H-42

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR  
EXPLANATION OF SYMBOLS USED ON BORING LOGS.



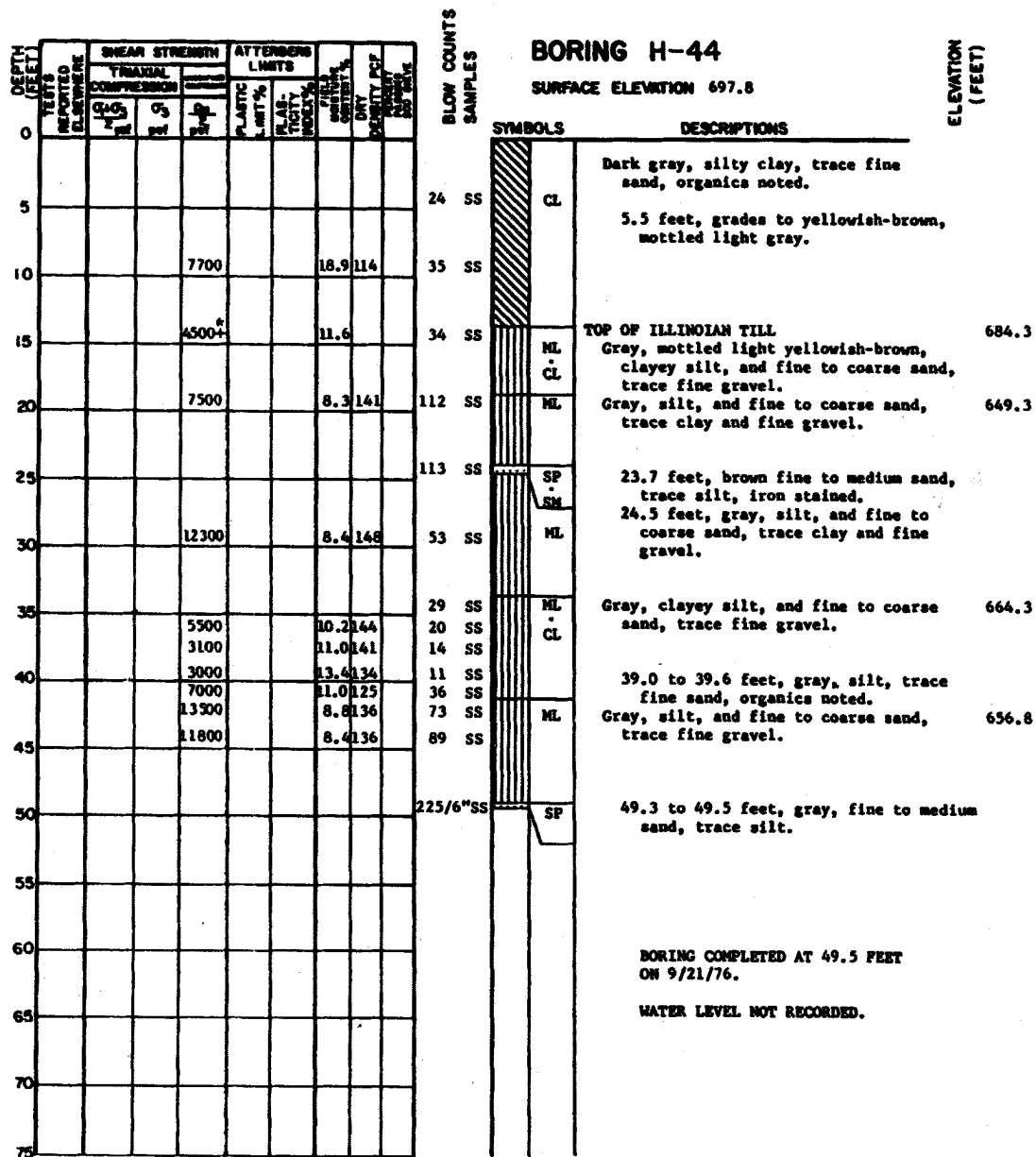
**NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-204

LOG OF BORING H-43



NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-205

LOG OF BORING H-44

DEPTH (FEET)	TESTS REPORTED ELEMENTS	SHEAR STRENGTH			ATTENDING LIMITS			UNIT WEIGHT pcf	UNIT WEIGHT pcf
		TRIAXIAL COMPRESSION			LIMITS				
		C <sub>1</sub> psi	C <sub>2</sub> pcf	C <sub>3</sub> psi	PLASTIC LIMIT %	PLASTICITY INDEX %	WATER CONTENT %		
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

# **BORING H-44A** SURFACE ELEVATION 697.8

BLOW COUNTS  
SAMPLES

ELEVATION  
(FEET)

SYMBOLS	DESCRIPTIONS
	Rotary drilled without sampling to 35.0 feet.
ST	Gray, clayey silt and fine to coarse sand, trace fine gravel.
ST	39.0 to 39.6 feet, gray, silt, trace fine sand, organics noted.
	BORING COMPLETED AT 39.9 FEET ON 9/21/76.
	WATER LEVEL NOT RECORDED.

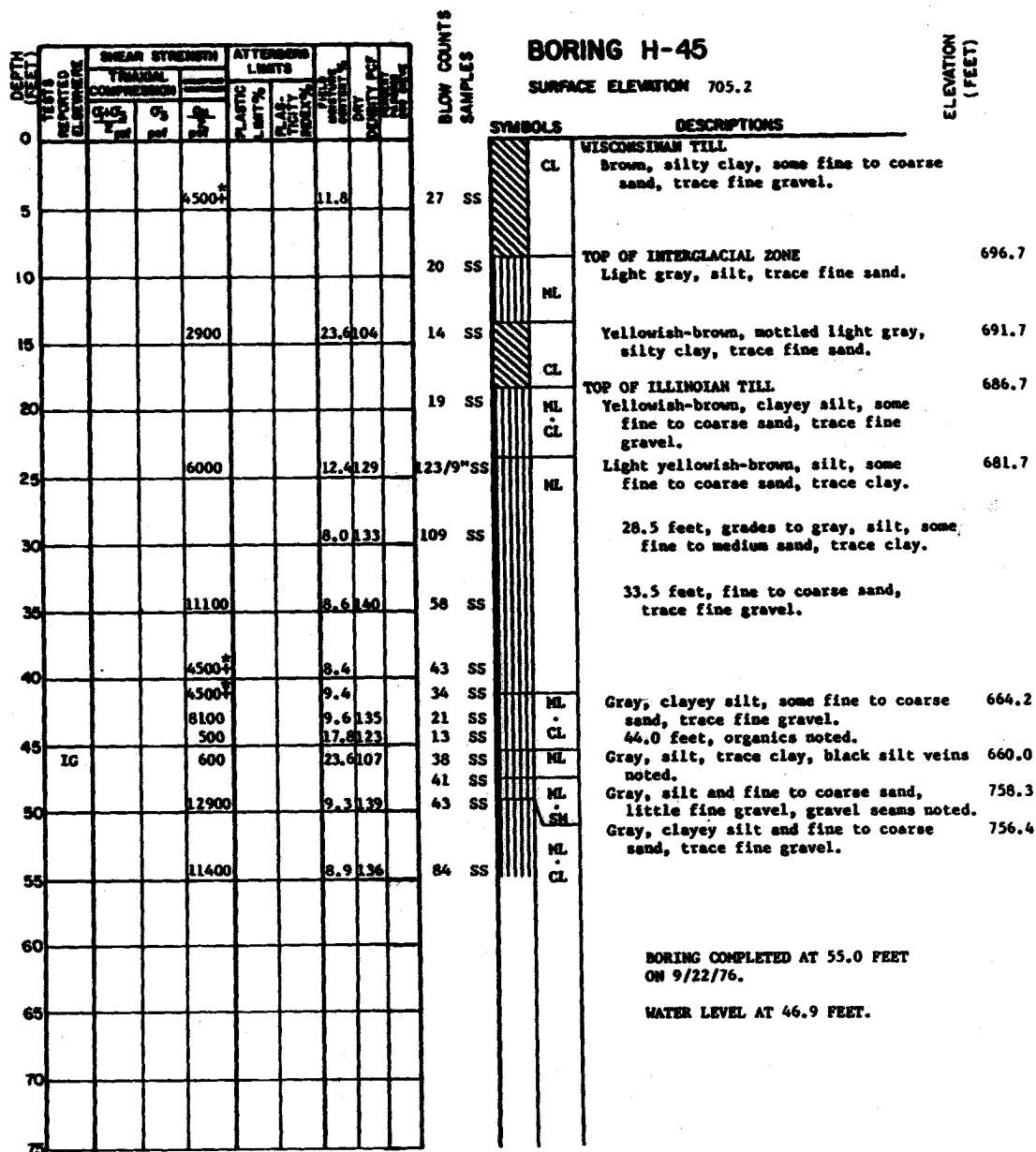
## **NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

## **CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-206

LOG OF BORING H-44A



**NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-207

LOG OF BORING H-45



DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTENDING LIMITS			FILL SANDING PERCENT %	UNIT WEIGHT PCF	SANDY FACIES	CLAYEY FACIES		
		TRIAxIAL COMPRESSION											
		Q <sub>u</sub> psi	C <sub>u</sub> pcf	S <sub>u</sub> pcf	PLASTIC LIMIT %	FLAS- TICITY INDEX %							
0													
5													
10													
15													
20													
25													
30													
35													
40													
45													
50													
55													
60													
65													
70													
75													

BLOW COUNTS  
SAMPLES

## BORING H-45A

SURFACE ELEVATION 705.2

ELEVATION  
(FEET)

SYMBOLS

DESCRIPTIONS

Rotary drilled without sampling to  
42.5 feet.

ST  
ST  
ST

ML  
CL  
ML  
ML  
SH

Gray, clayey silt, some fine to coarse  
sand, trace fine gravel.  
44.0 feet, organics noted.  
Gray, silt, trace clay, black silt  
veins noted.  
Gray, silt and fine to coarse sand,  
little fine gravel, gravel seams  
noted.

660.0  
758.3

BORING COMPLETED AT 47.7 FEET  
ON 9/22/76.

WATER LEVEL NOT RECORDED.

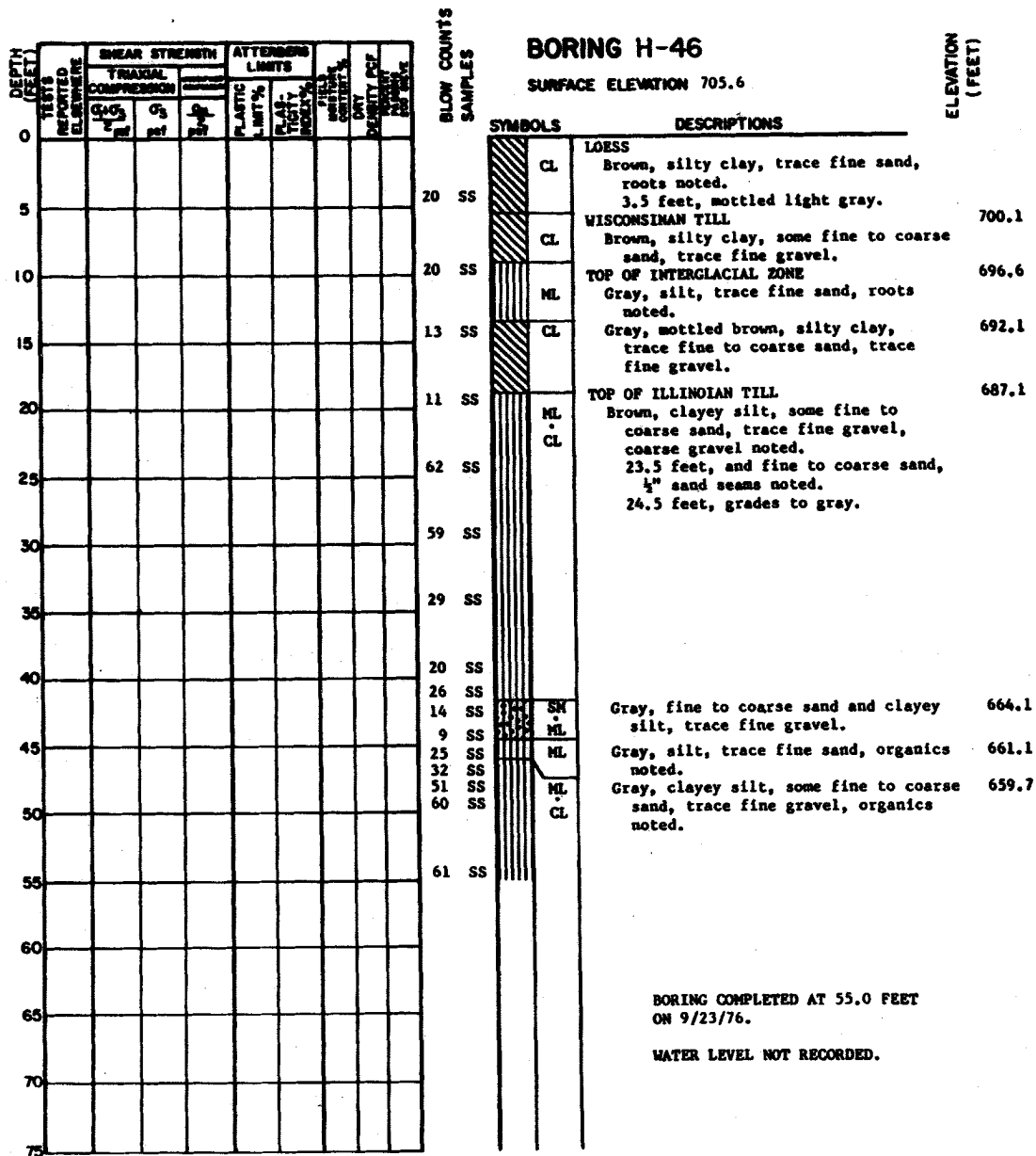
### NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-208

LOG OF BORING H-45A



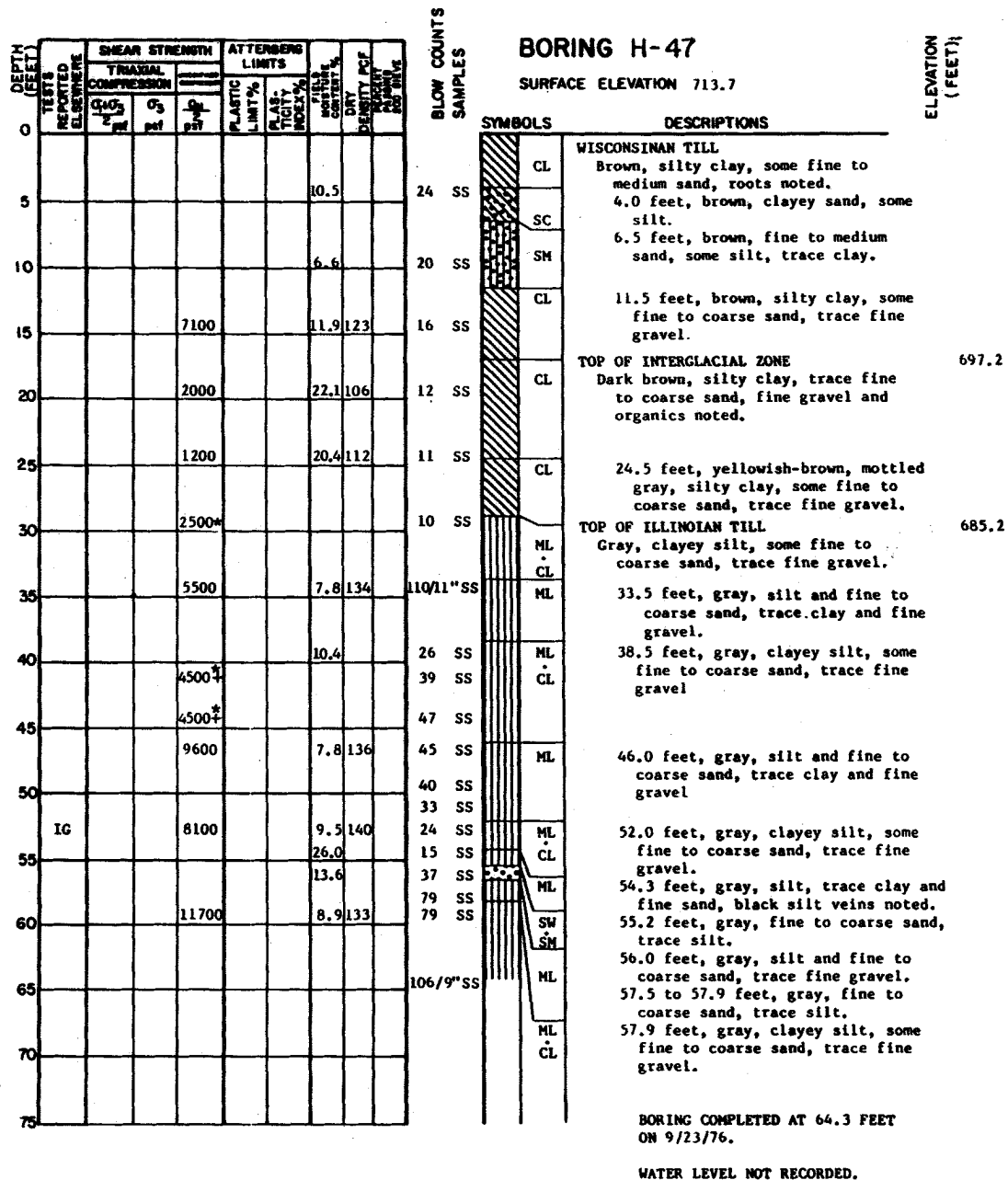
**NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-209

LOG OF BORING H-46



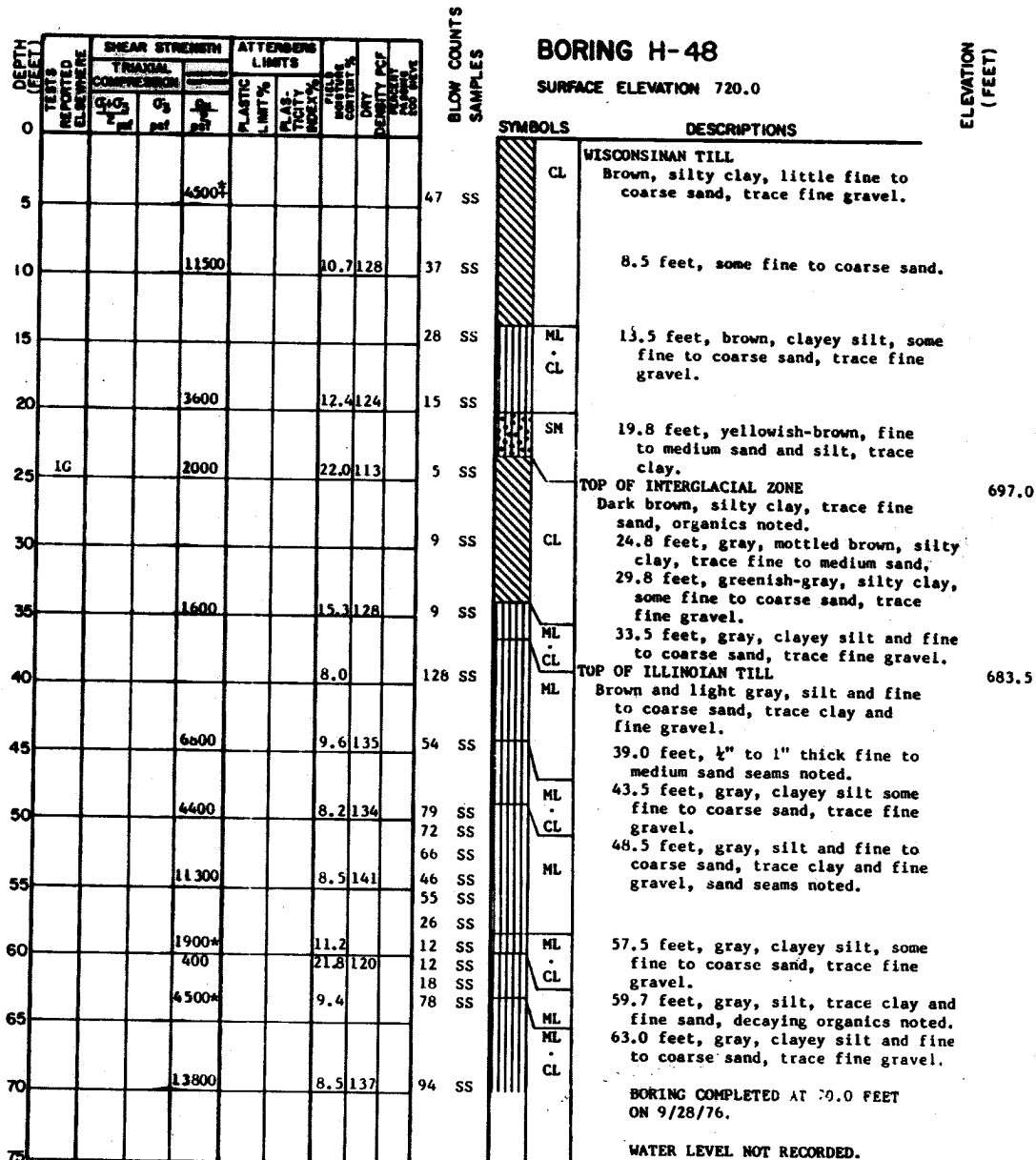
**NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-210

LOG OF BORING H-47



**BLOW COUNTS  
SAMPLES**

**SURFACE ELEVATION 716.1**

ELEVATION  
( FEET )

BORING COMPLETED AT 65.0 FEET  
ON 9/27/76.

WATER LEVEL NOT RECORDED.

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

## LOG OF BORING H-49

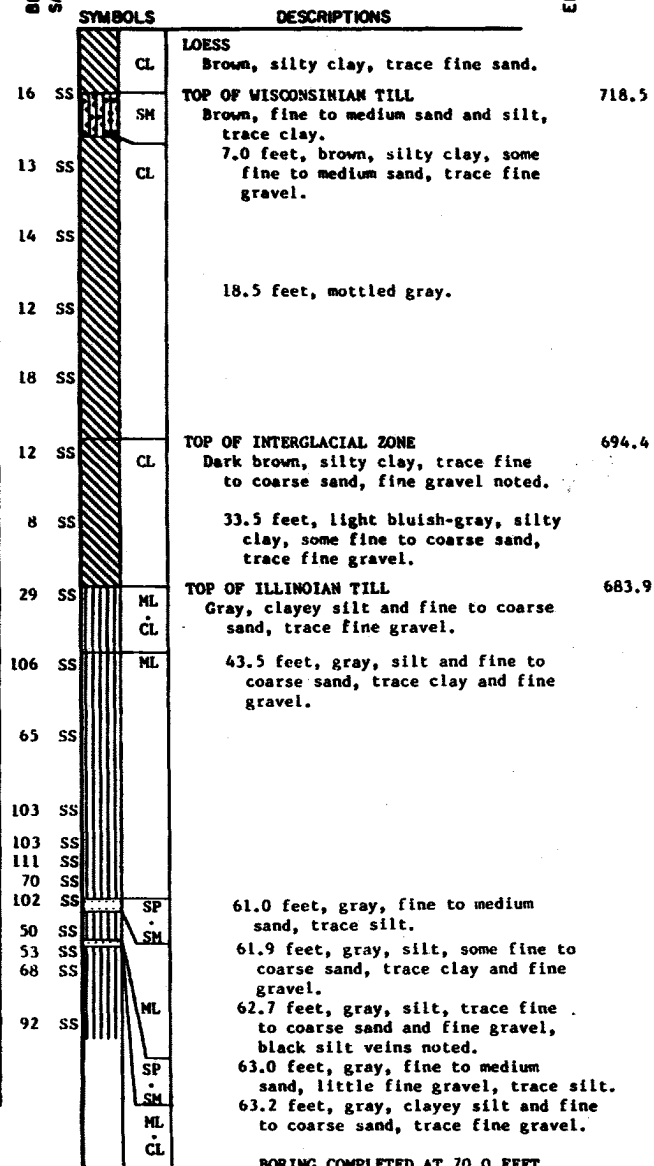
DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTENDING LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF	WATER CONTENT PCF VALUE
		TRIAXIAL COMPRESSION			LIMITS					
		Q+Q <sub>u</sub> psi	Q <sub>s</sub> psi	Q <sub>u</sub> psi	PLASTIC LIMIT %	PLAS- TICITY INDEX %				
0										
5										
10										
15				2600			14.2	120		
20				3900			15.0	123		
25										
30				3100			20.4	107		
35				2200*						
40				6000			11.0	132		
45				* 4500+						
50				12200			8.4	138		
55				* 4500+						
				4500* 4500*						
60				11300			8.0	142		
							16.9			
							9.9			
65				* 4500+						
70				14900			7.7	140		
75										

BLOW COUNTS  
SAMPLES

## BORING H-50

SURFACE ELEVATION 722.9

ELEVATION  
(FEET)



BORING COMPLETED AT 70.0 FEET  
ON 9/24/76.

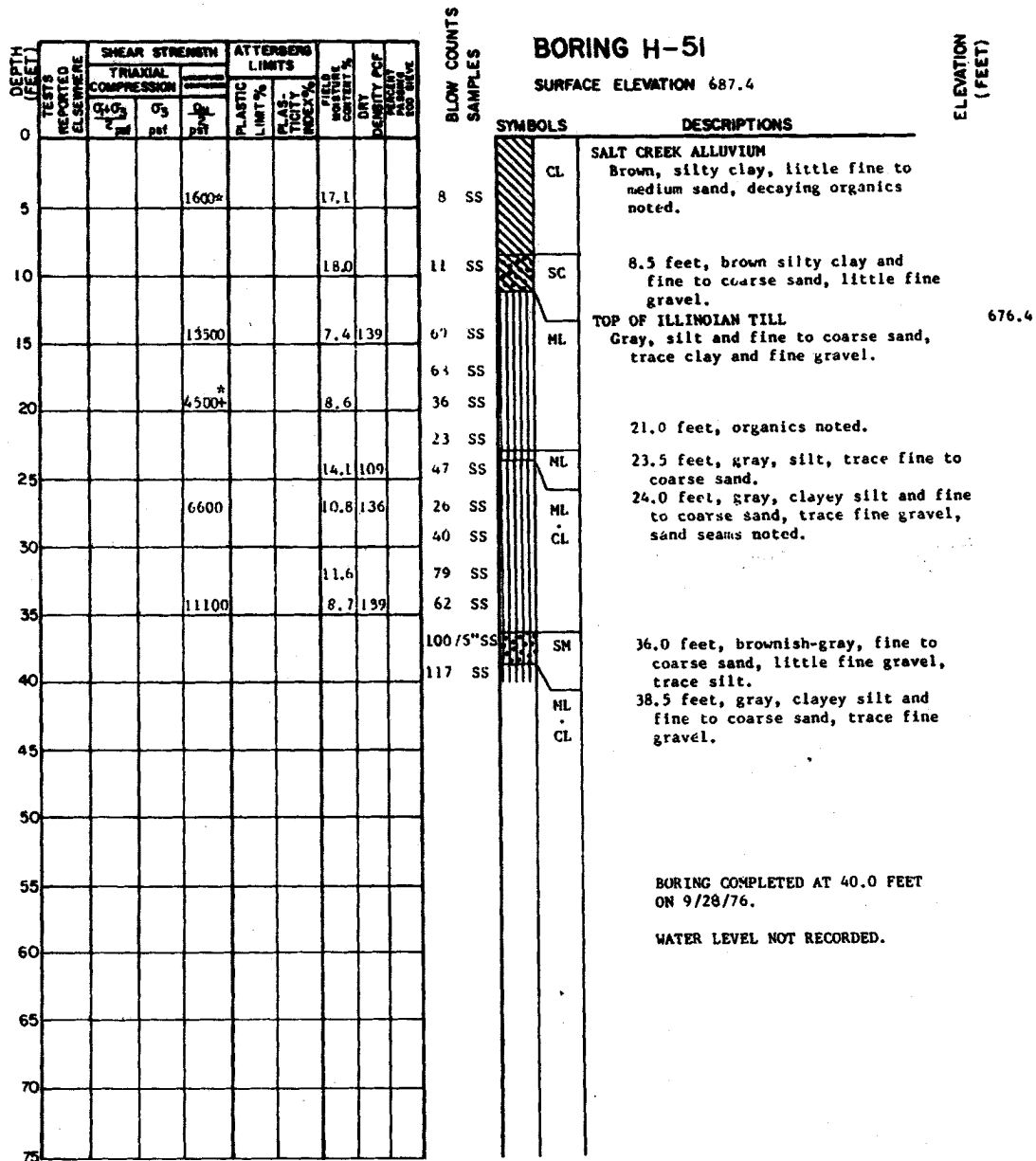
### NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-213

LOG OF BORING H-50



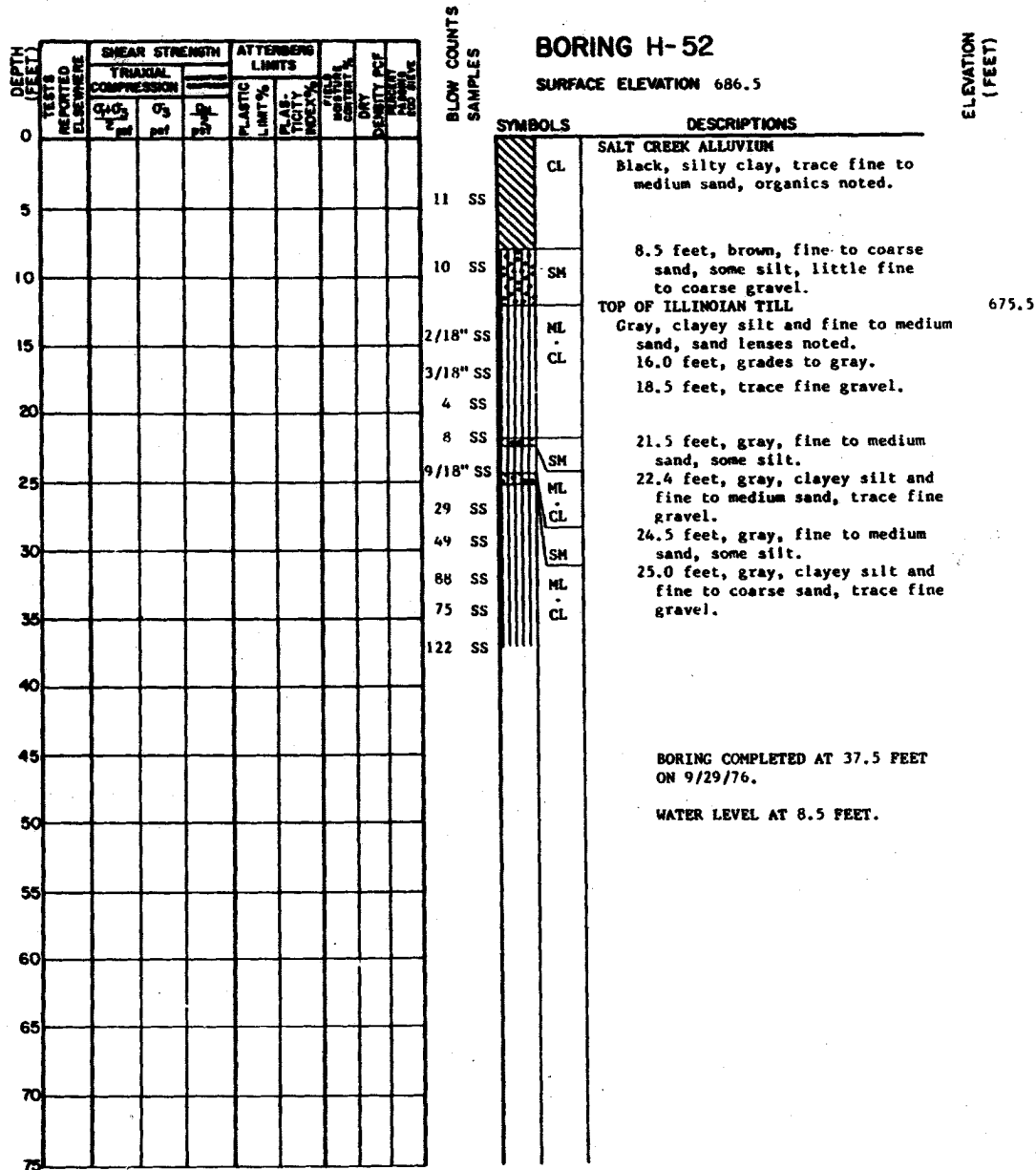
#### NOTES

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-214

LOG OF BORING H-51



**NOTES:**

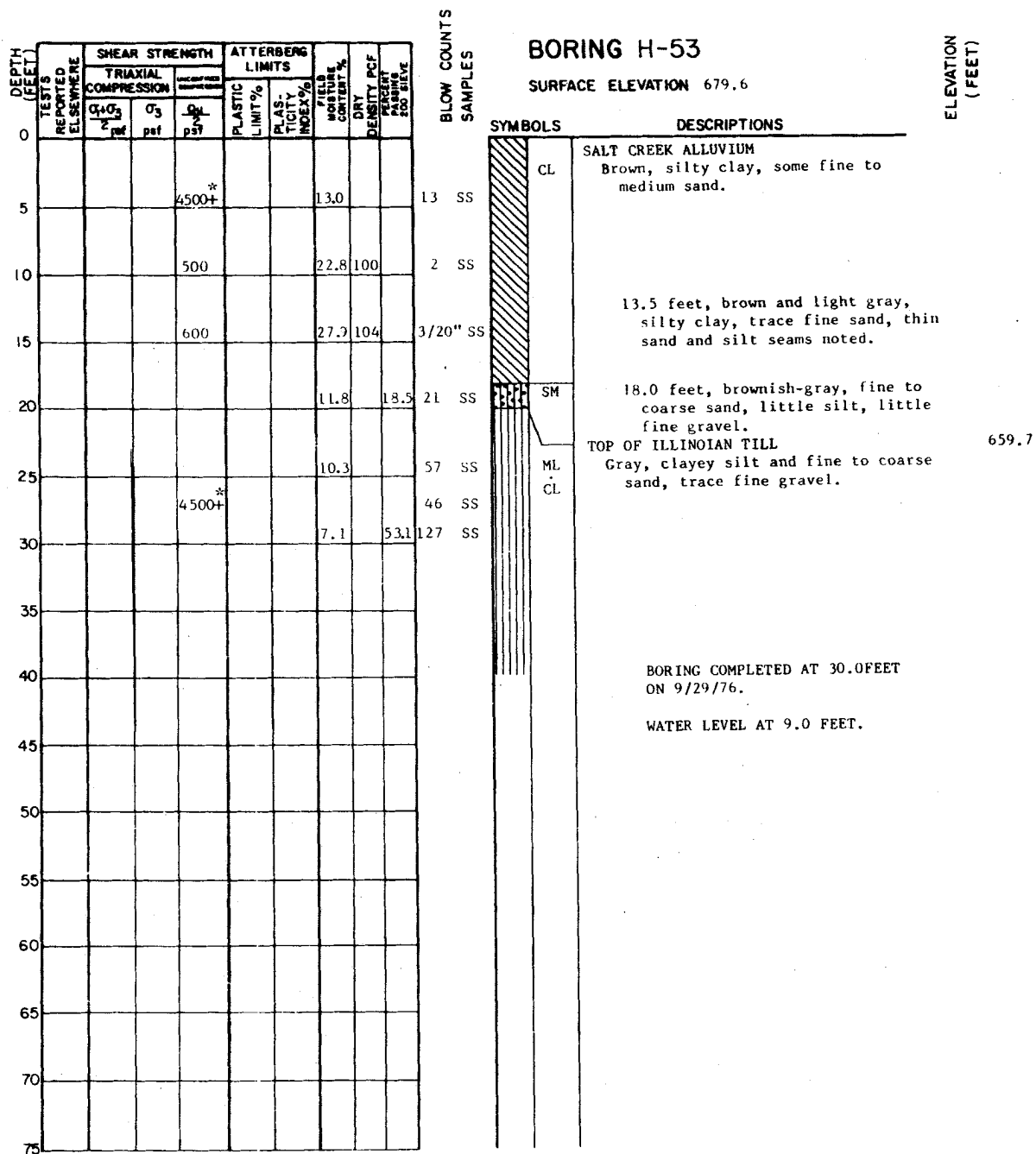
1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-215

LOG OF BORING H-52





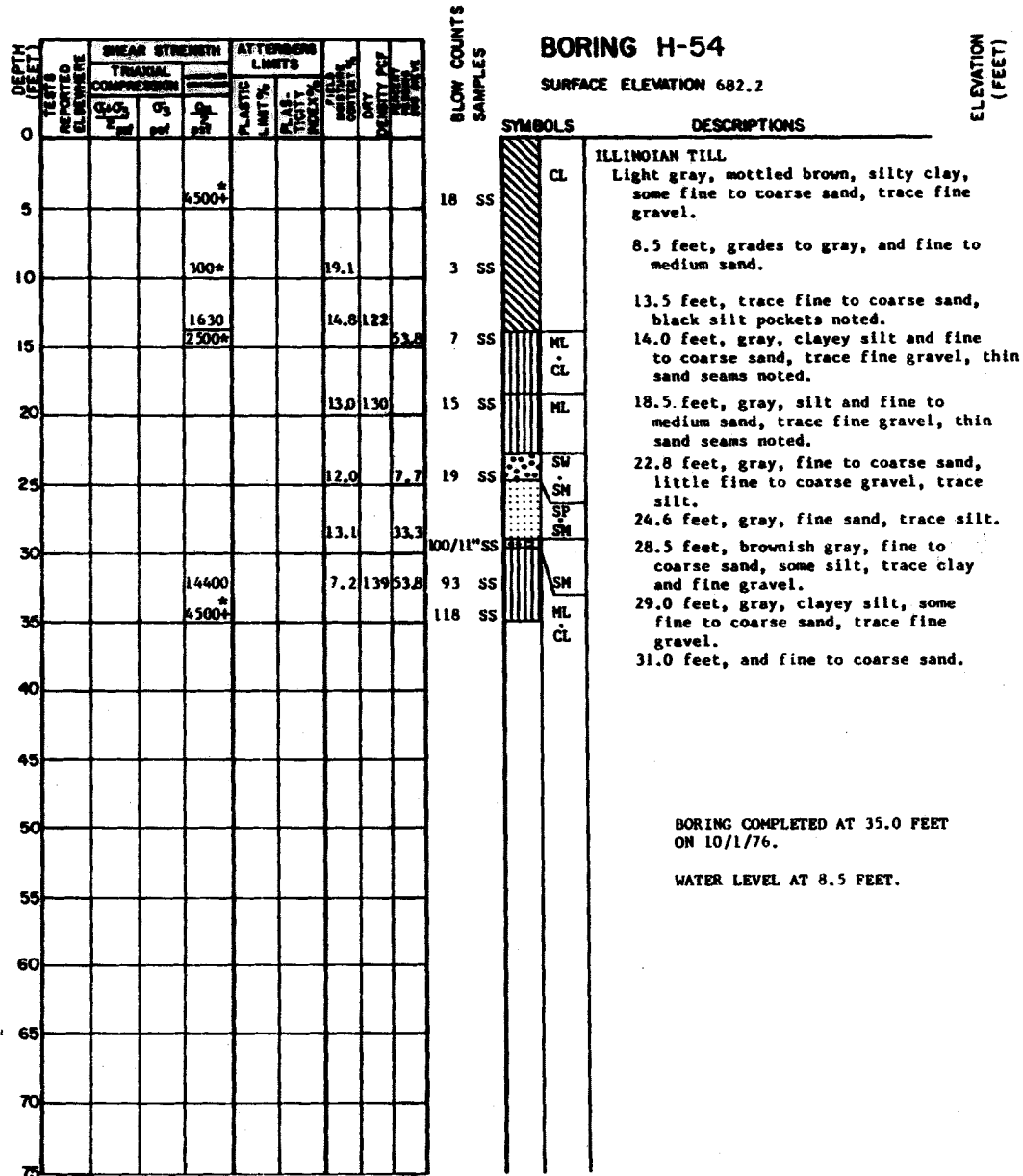
NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-216

LOG OF BORING H-53



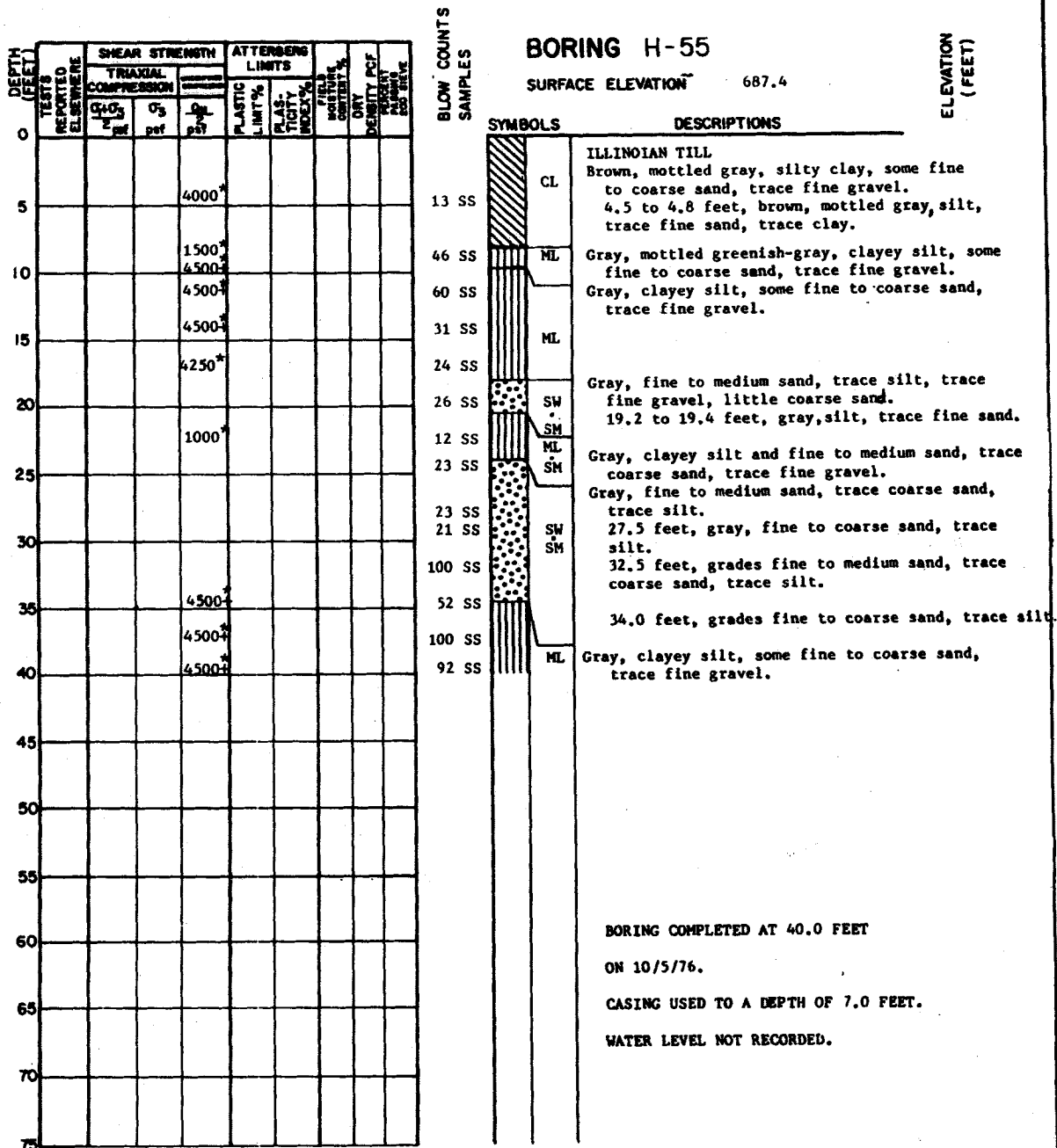
**NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-217

LOG OF BORING H-54



**NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-218

LOG OF BORING H-55

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTENBERG LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PLASTIC LIMIT PI	FLUIDITY INDEX %	UNIT WEIGHT PCF	UNIT WEIGHT PCF	UNIT WEIGHT PCF	
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %	FIELD MOISTURE CONTENT %								
		$\sigma_1 + \sigma_3$ psi	$\sigma_3$ psi	$\sigma_1$ psi											
		$\sigma_1 + \sigma_3$ psi	$\sigma_3$ psi	$\sigma_1$ psi											
0				1000*											
5															
10				500*											
15				500*											
20				500*											
25				3750*											
30				1500*											
35				4500*											
40				4500*											
45				4500*											
50				4500*											
55				4500*											
60				4500*											
65				4500*											
70				4500*											
75				4500*											

BLOW COUNTS  
SAMPLES

## BORING H-56

SURFACE ELEVATION 680.7

ELEVATION  
(FEET)

### SYMBOLS

### DESCRIPTIONS

0	SS	SM	SALT CREEK ALLUVIUM	
7	SS	ML	Brown, silty, fine to coarse sand, some clay, trace fine gravel.	
3	SS	ML	TOP OF ILLINOIAN TILL	676.2
6	SS	SM	Brown, clayey silt and fine to coarse sand, trace fine gravel.	
6	SS	SM	Gray, clayey silt and fine to medium sand, silt and sand lenses noted.	
25	SS	ML	9.5 to 9.7 feet, gray, fine to medium sand, some silt.	
27	SS	ML	9.7 to 12.0 feet, gray, silt, some clay, trace fine sand, trace fine gravel.	
36	SS	ML	12.0 feet, gray, clayey silt and fine to coarse sand, trace fine gravel.	
120	SS	ML	17.2 feet, gray, silt, trace fine sand, fine gravel and organics noted.	
99	SS	ML	Gray, clayey silt and fine to coarse sand, trace fine gravel, coarse gravel noted.	
96	SS	ML	26.0 to 26.6 feet, gray, fine to medium sand, trace silt.	
		SP	Gray, clayey silt and fine to coarse sand, trace fine gravel.	

BORING COMPLETED AT 30.0 FEET

ON 10/5/76.

CASING USED TO A DEPTH OF 10.0 FEET.

WATER LEVEL AT 7.0 FEET.

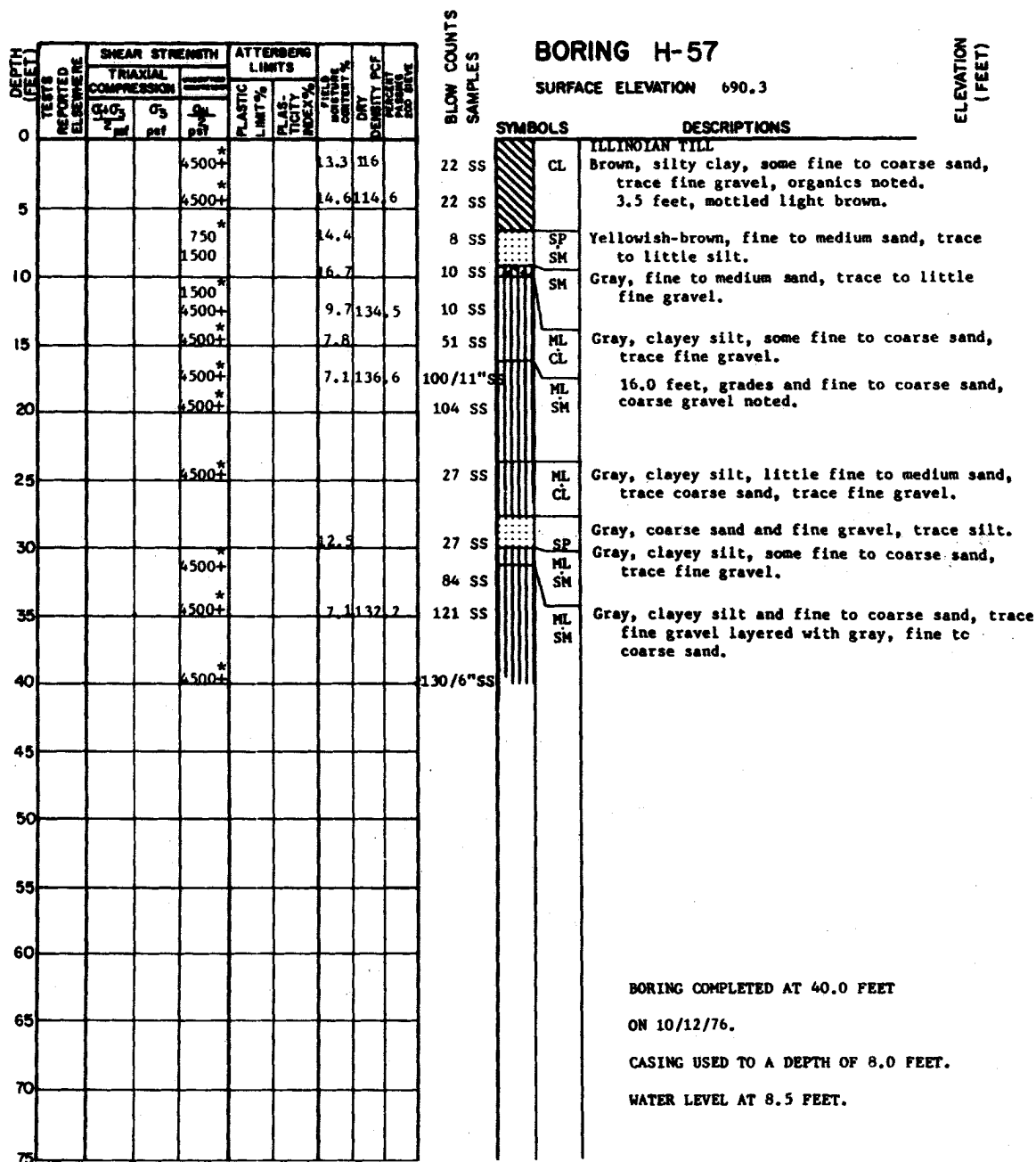
#### NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-219

LOG OF BORING H-56



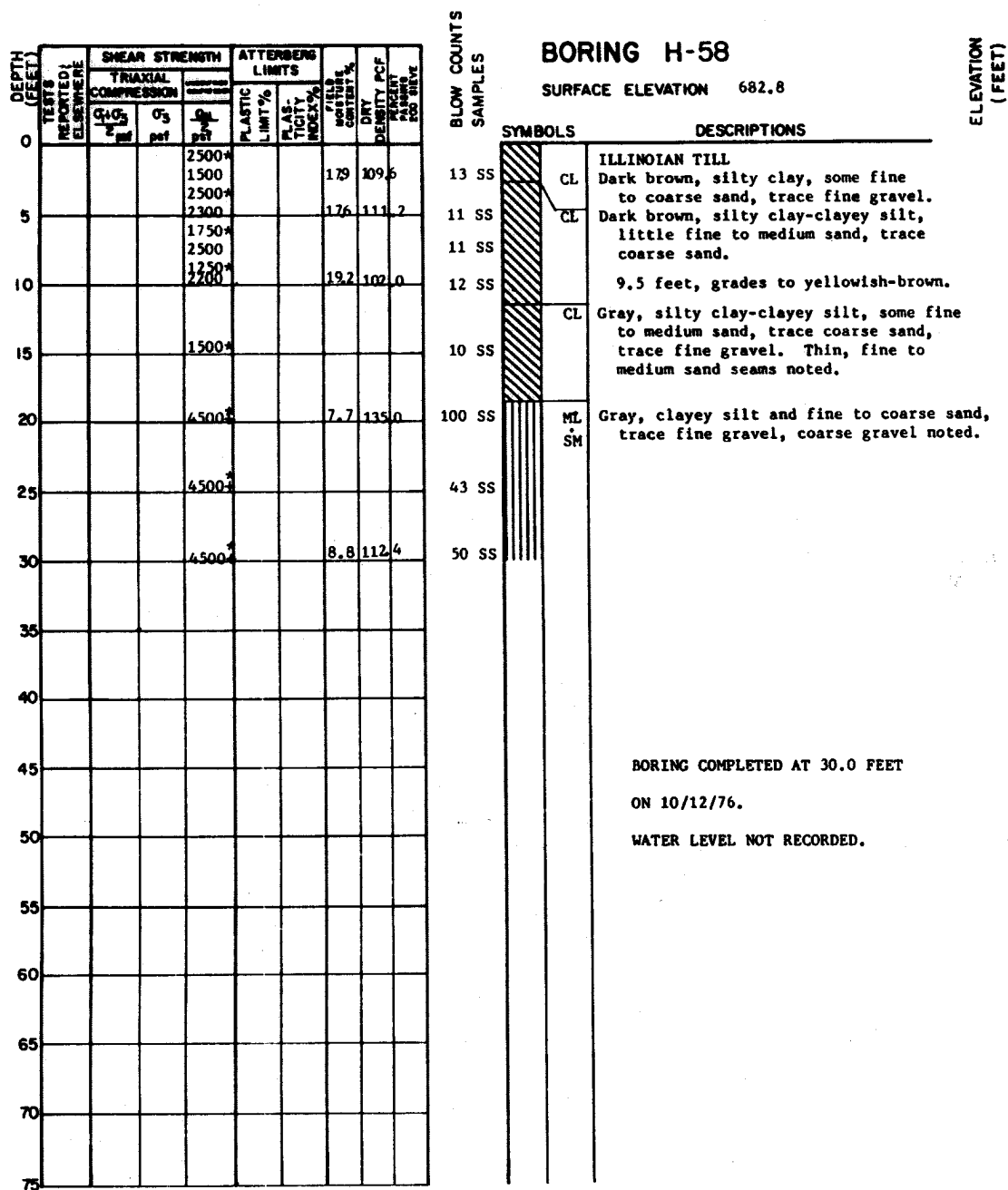
NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-220

LOG OF BORING H-57



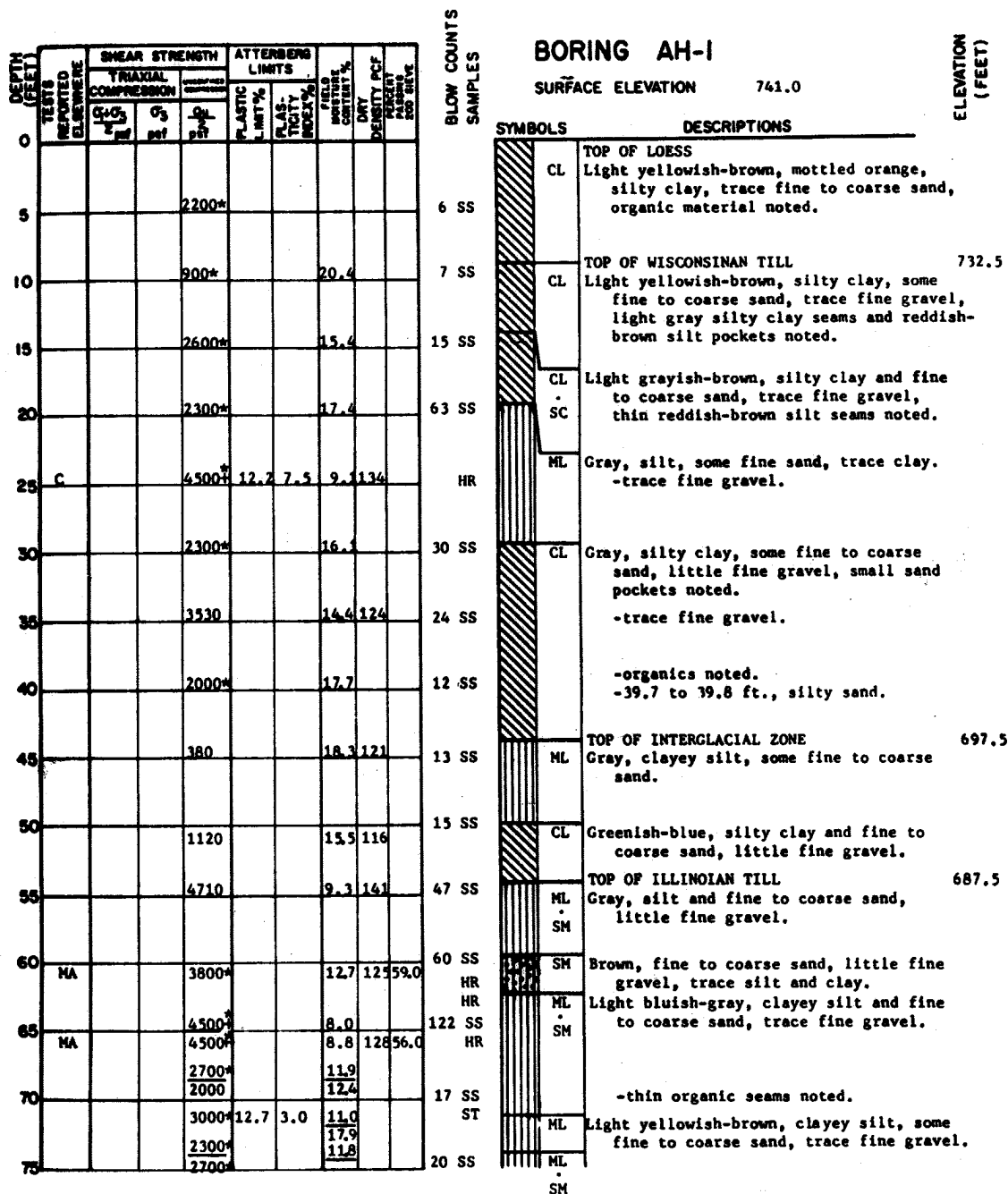
NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-221

LOG OF BORING H-58



Boring continued.....

#### NOTES

Logged by: Sargent & Lundy  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-222

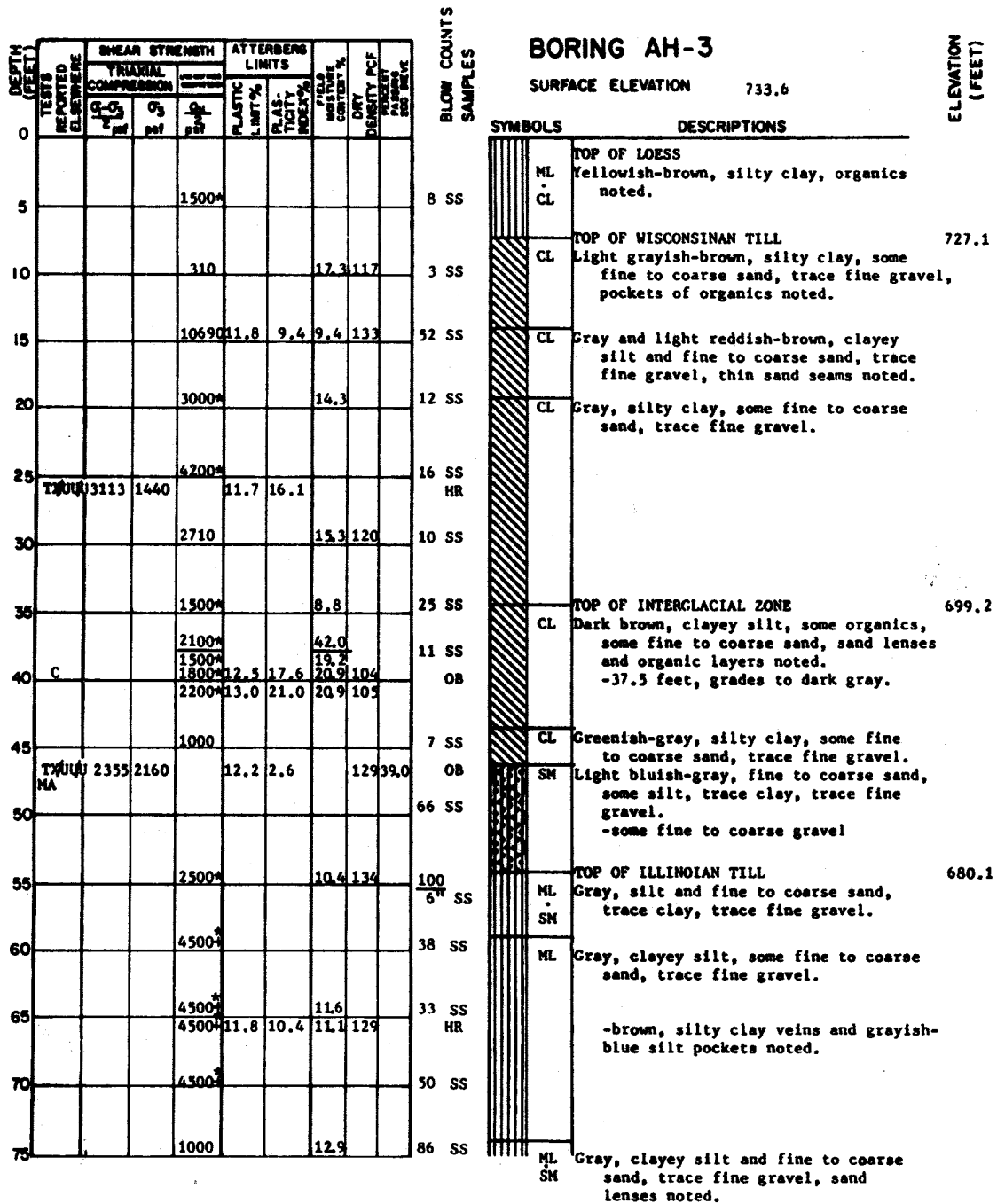
LOG OF BORING AH-1  
(SHEET 1 of 2)

FIGURE 2.5-222  
LOG OF BORING AH-1  
(SHEET 2 of 2)



Boring completed at 69.5 feet on 4-2-75.  
Water level not recorded.

LOG OF BORING AH-2



Boring completed at 75.0 feet on 4-4-75.  
Water level at 3.0 feet.

#### NOTES

Logged by: Sargent & Lundy  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-224

LOG OF BORING AH-3

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTENBURG LIMITS			WATER CONTENT %	DRY DENSITY PCF	PERCENT WATER FOR LIQUIDITY
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	FLUIDITY LIMIT %	PLASTICITY INDEX %			
		Q <sub>1</sub> psi	Q <sub>2</sub> psi	Q <sub>3</sub> psi						
0										
5	TC	1434	1413	2000*	16.3	32.0			99	
				1000*				26.8		
10	IG			2000*				17.6	116	
	MA			2200*				15.0		
				3200*				17.8	117	1.0
15				1000*				17.7	121	1.0
								14.6		
20										
				13000	11.2	10.1	9.3		140	
25				2700*						
30				2800*				16.4		
35				1000*				16.8		
40				1370				17.0	117	
				2100*				16.6		
45				1530				17.8	116	
				3200*						
50				2700*						
				1360	10.8	11.4	15.6		120	
				4100*						
55				1000				14.2		
60				6980				8.3	135	
65										
70										
75										

BLOW COUNTS  
SAMPLES

## BORING AH-4

SURFACE ELEVATION

737.4

ELEVATION  
(FEET)

### SYMBOLS

### DESCRIPTIONS

ST	CL	TOP OF LOESS Light yellowish-brown, mottled gray, silty clay, manganese nodules noted.	
2 SS			
ST	CL	TOP OF WISCONSINAN TILL Light yellowish-brown, silty clay, some fine to coarse sand, trace fine gravel, pockets of organic material and fine sand pockets noted.	731.4
12 SS			
ST			
36 SS	SM	Brown, silty, fine to coarse sand, trace fine gravel, trace clay.	
52 SS	CL	Gray, clayey silt, some fine to coarse sand, trace fine gravel.	
54 SS	ML		
14 SS			
7 SS			
8 SS		-and fine to coarse sand, little fine gravel.	
7 SS			
ST		-little fine to coarse sand, trace fine gravel, silt pockets noted.	
11 SS	ML	TOP OF INTERGLACIAL ZONE Gray, silt, silty clay veins noted.	696.5
	ML	Gray, clayey silt, trace fine sand, trace organic materials.	
	CL		
12 SS	CL	Greenish-blue, silty clay and fine to coarse sand, trace fine gravel.	
ST	SC		
69 SS	ML	TOP OF ILLINOIAN TILL Light bluish-gray, silty clay and fine to coarse sand, trace fine gravel.	683.9
	SM	-4.4 to 4.8 feet, lenses of fine to medium sand, little silt, little fine gravel, trace clay.	
100 SS		Gray, silty clay, some fine to coarse sand, trace fine gravel.	
6"	ML		

Boring completed at 59.0 feet  
on 3-19-75.  
Water level at 5.0 feet.

#### NOTES

Logged by: Sargent & Lundy  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-225

LOG OF BORING AH-4

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTENBERG LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF	WATER CONTENT PCF	
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %	FIELD MOISTURE CONTENT %				
		$\sigma_1 - \sigma_3$ psi	$\sigma_3$ psi	$\sigma_d$ psi							
		$\sigma_1$ psi	$\sigma_3$ psi	$\sigma_d$ psi							
0				2300*			25.5	90			
5	TCUPP1229	1413	700		15.5	30.8	32.2	92			
10	IG			1500			16.3				
				3500			12.6	128			
15				4500*			12.3				
20				4500*							
25				4200*			14.8				
30				7300	11.1	16.7	12.1	126			
35				3000*			14.2				
40				1320			53.4	58			
45				2200			17.3				
50											
55				2000*			11.1				
60				4000*			10.7				
				3750			11.9	111			
65											
70											
75											

BLOW COUNTS  
SAMPLES

## BORING AH-5

SURFACE ELEVATION 730.8

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
CL	TOP OF LOESS		
ST	Black, mottled yellowish-brown, silty clay, trace fine sand, decaying organic material noted.		
CL	TOP OF WISCONSINAN TILL		724.3
5 SS	Brown, silty clay, some fine to coarse sand, trace fine gravel, pockets of organic material noted.		
22 SS	Gray, clayey silt and fine to medium sand, trace fine gravel, .025 foot thick sand lenses noted.		
27 SS	Gray, clayey silt, some fine to coarse sand, trace fine gravel.		
20 SS	-little fine to coarse sand.		
32 SS			
16 SS			
23 SS	TOP OF INTERGLACIAL ZONE		692.8
12 SS	Brownish-black, organic clayey silt.		
14 SS	Gray, silty clay, some fine to coarse sand, trace fine gravel.		
13 SS	Light bluish-gray, fine to coarse sand, some fine gravel, some silt and clay.		
46 SS	TOP OF ILLINOIAN TILL		676.3
	Gray, clayey silt, some fine to coarse sand, trace fine gravel.		
	Boring completed at 60.0 feet on 3-19-75.		
	Water level at 4.0 feet.		

### NOTES

Logged by: Sargent & Lundy

Drilled by: Raymond International

Tested by: Westenhoff & Novick

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-226

LOG OF BORING AH-5

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS--			MOISTURE CONTENT %	DENSITY PCF	PCF WATER FOR WATTS
		TRIAXIAL COMPRESSION		UNCONFINED COMPRESSION STRESS	PLASTIC LIMIT %	FLUIDITY INDEX %				
		Q <sub>1</sub> psi	Q <sub>3</sub> psi							
							Q <sub>u</sub> psi			
0										
5				500*				20.5		
10										
15				1000*				22.0		
20				7580				9.9	136	
25	MA			4000*	12.2	13.8	11.9	121	720	
30				4400*				13.9		
35				3050				14.5	120	
40				3200*	12.1	13.6	14.5			
45										
50				4300*				13.3		
55				3460				15.3	116	
60				4500*				14.5		
65				970				13.5	135	
70										
75										

#### NOTES

Logged by: Sargent & Lundy

Drilled by: Raymond International

Tested by: Westenhoff & Novick

## BORING AH-6

SURFACE ELEVATION

737.9

ELEVATION  
(FEET)

BLOW COUNTS  
SAMPLES

#### SYMBOLS

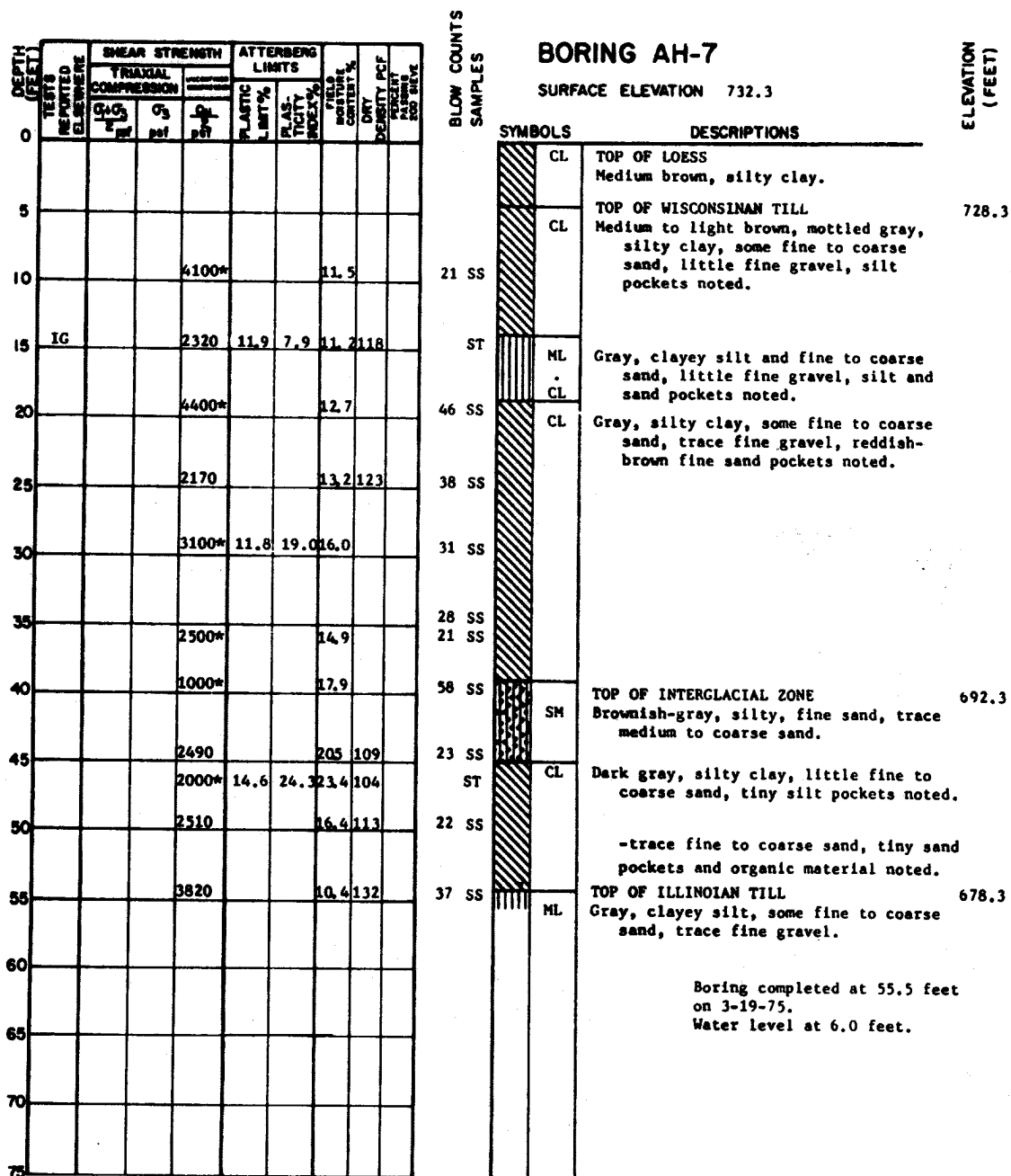
#### DESCRIPTIONS

3 SS	CL	TOP OF LOESS Brown, silty clay, trace fine to coarse sand, pockets of fine sand and organic material noted.
24 SS	SP SM	TOP OF WISCONSINAN TILL 731.4 Light reddish-brown, fine to medium sand, trace silt, trace fine gravel.
46 SS		
44 SS	CL ML	Gray, clayey silt and fine to coarse sand, trace fine gravel.
30 SS		
ST		-some fine to coarse sand, black silty clay seams noted.
24 SS		
19 SS		
16 SS		-pockets of black organic material noted.
11 SS		
40 SS		
24 SS	CL	TOP OF INTERGLACIAL ZONE 685.4 Greenish-gray, clayey silt, some fine to coarse sand, trace fine gravel, thin seams of black organic material noted.
43 SS	ML SM	Gray, silt and fine sand, trace clay, trace fine gravel.
51 SS	ML	TOP OF ILLINOIAN TILL 675.4 Gray, silt, some clay, some fine to coarse sand, trace fine gravel.
Boring completed at 64.0 feet on 3-18-75. Water level 8.5 feet.		

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-227

LOG OF BORING AH-6



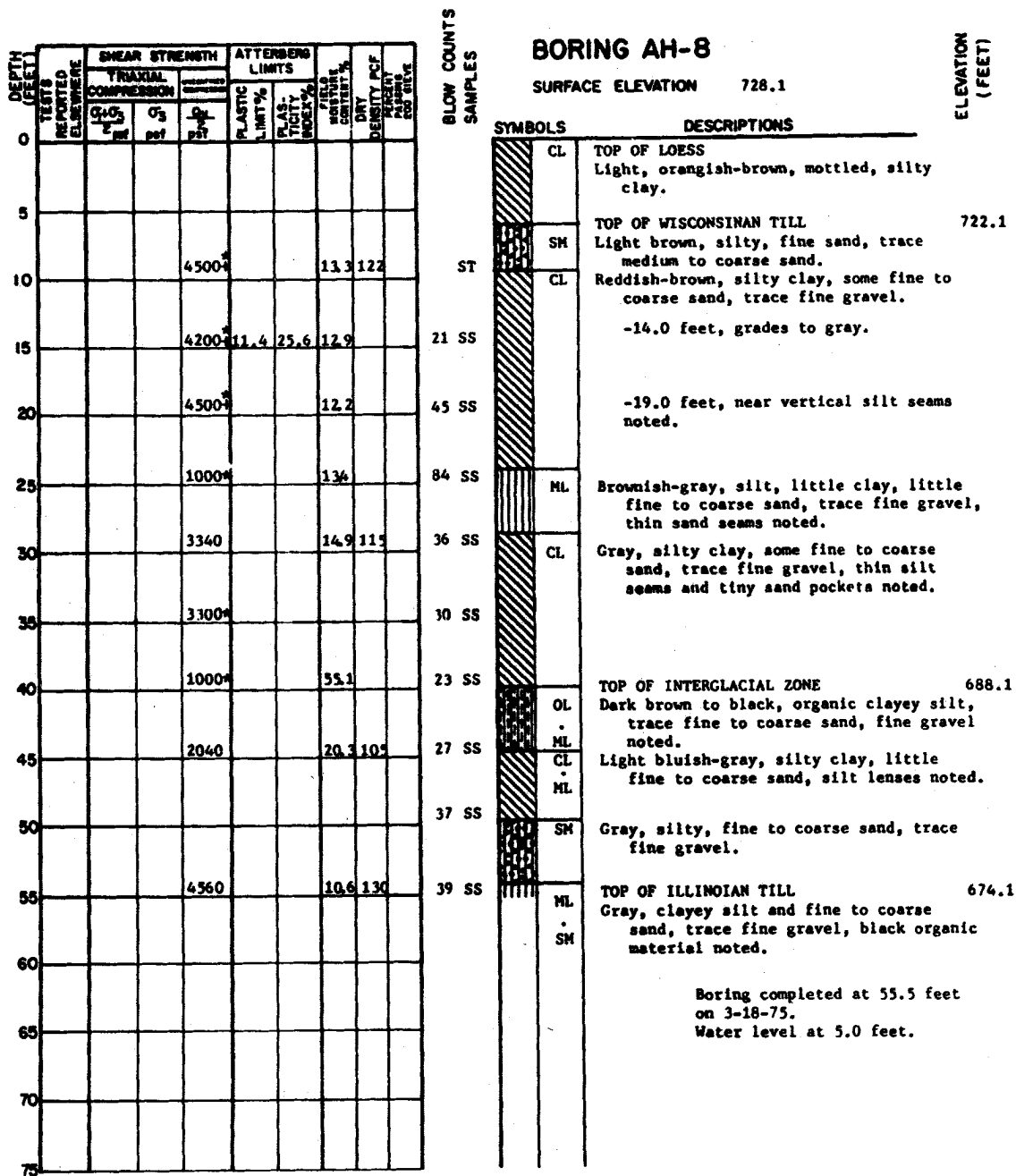
#### NOTES

Logged by: Sargent & Lundy  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-228

LOG OF BORING AH-7



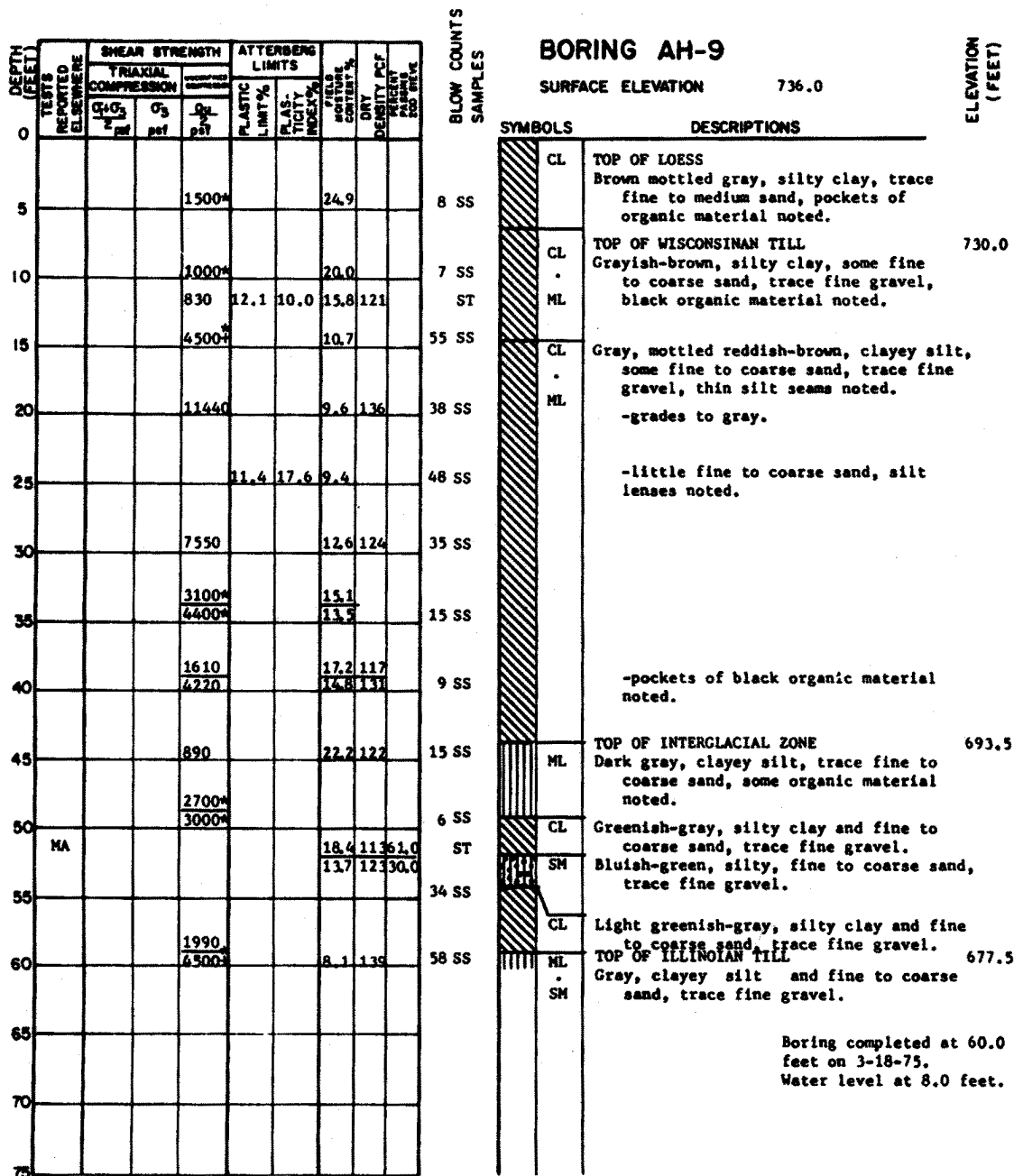
#### NOTES

Logged by: Sargent & Lundy  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-229

LOG OF BORING AH-8



#### NOTES

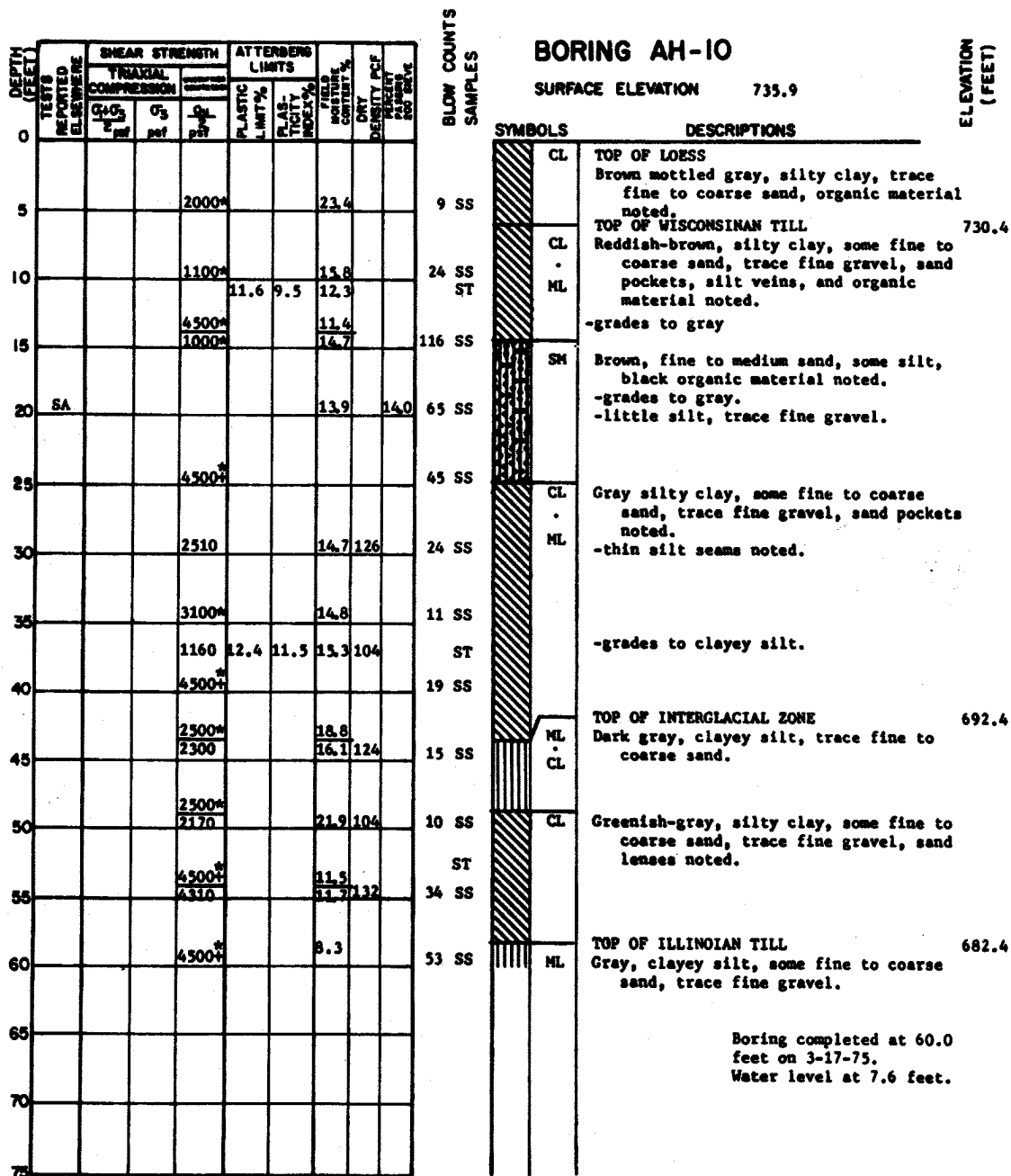
Logged by: Sargent & Lundy  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-230

LOG OF BORING AH-9





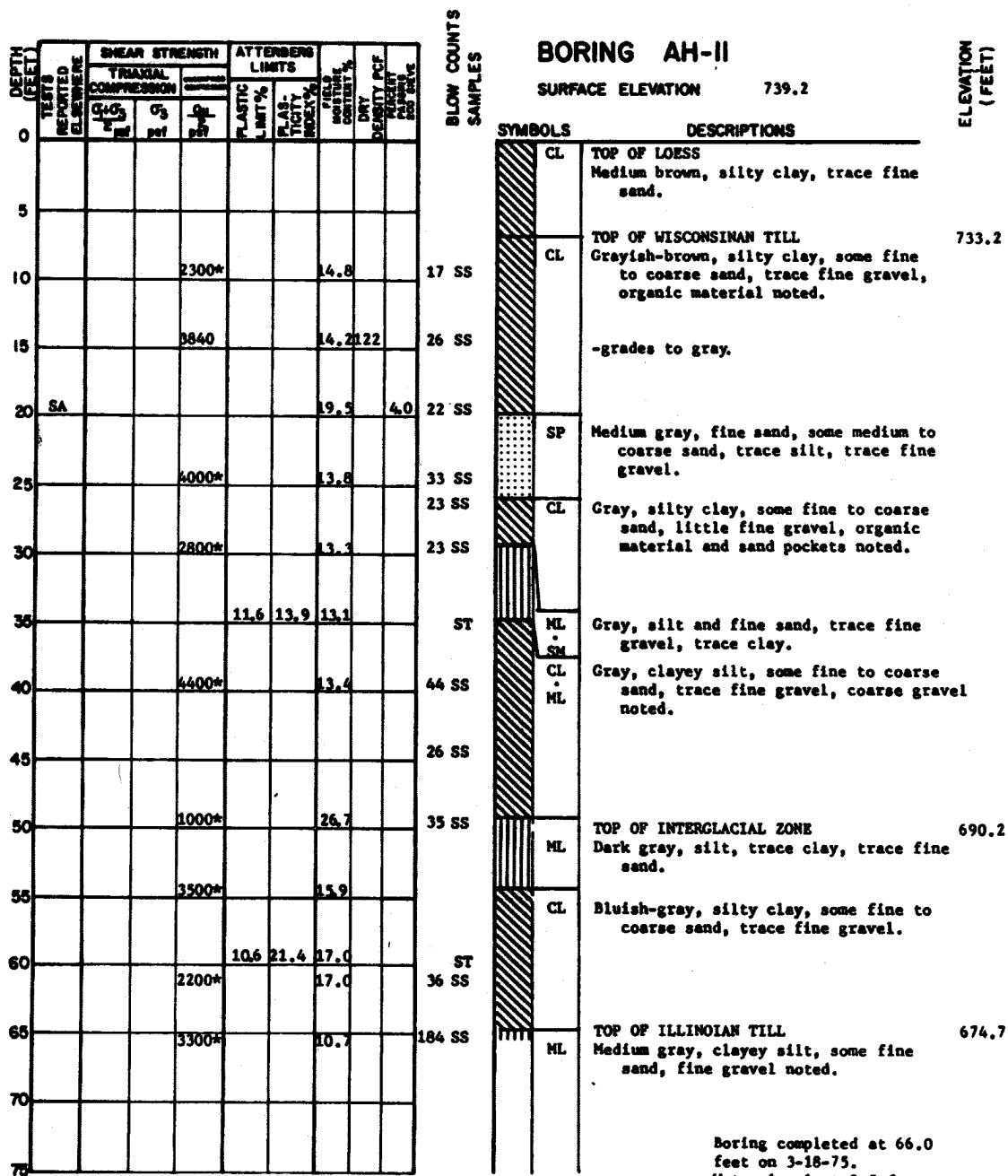
#### NOTES

Logged by: Sargent & Lundy  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-231

LOG OF BORING AH-10



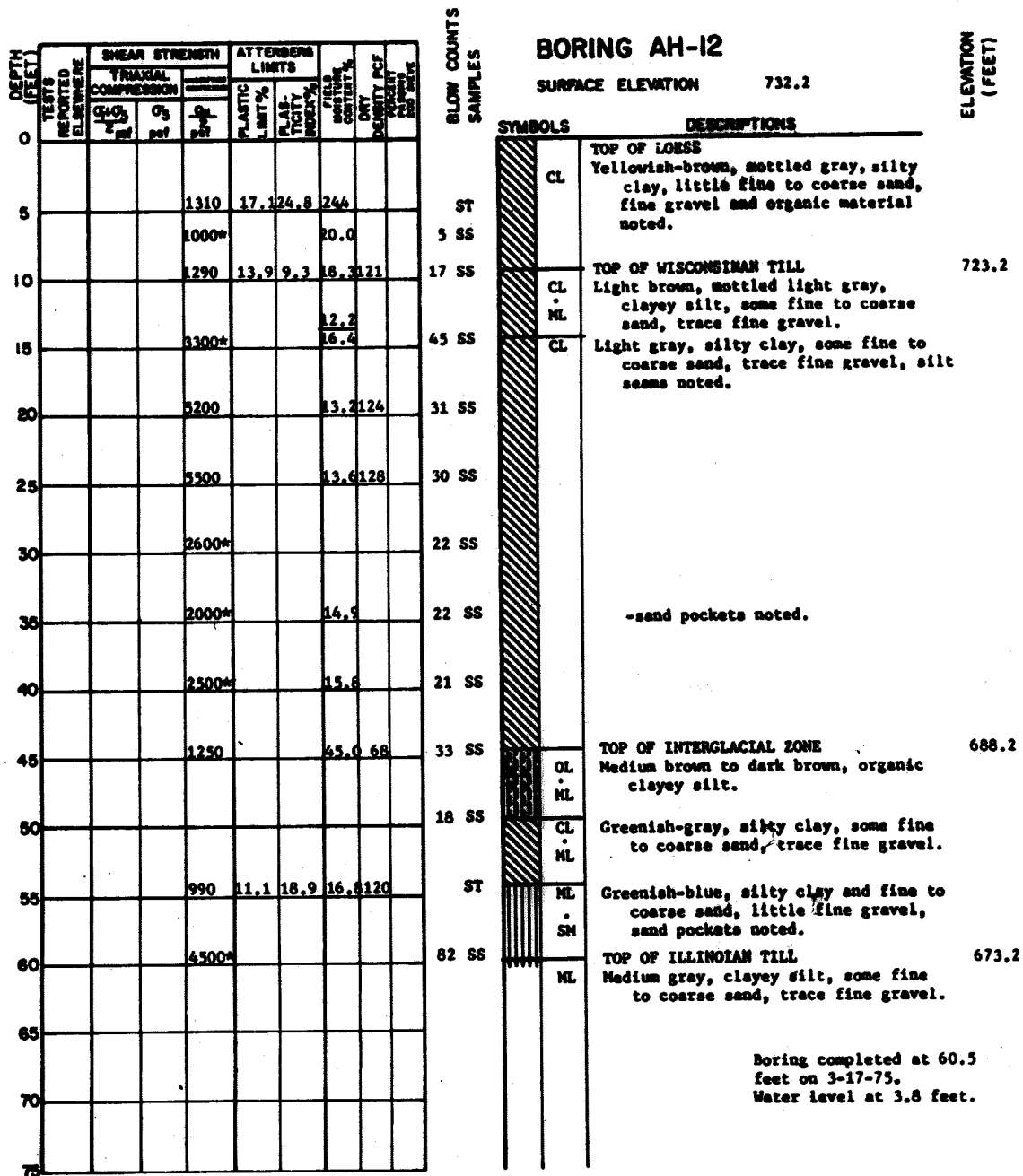
#### NOTES

Logged by: Sargent & Lundy  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-232

LOG OF BORING AH-11



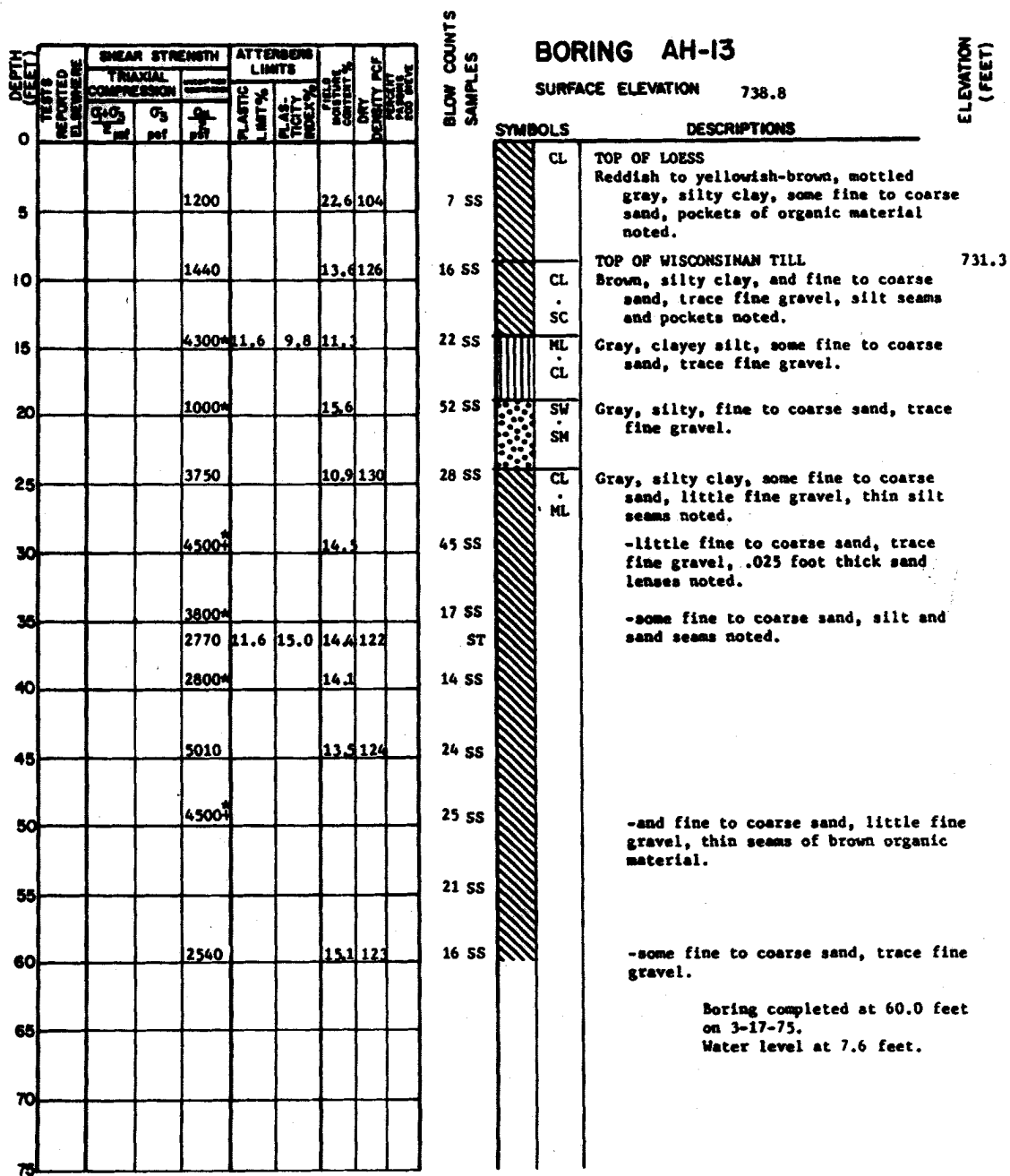
#### NOTES

Logged by: Sargent & Lundy  
Drilled by: Raymond International  
Tested by: Westenhoff & Novick

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-233

LOG OF BORING AH-12



#### NOTES

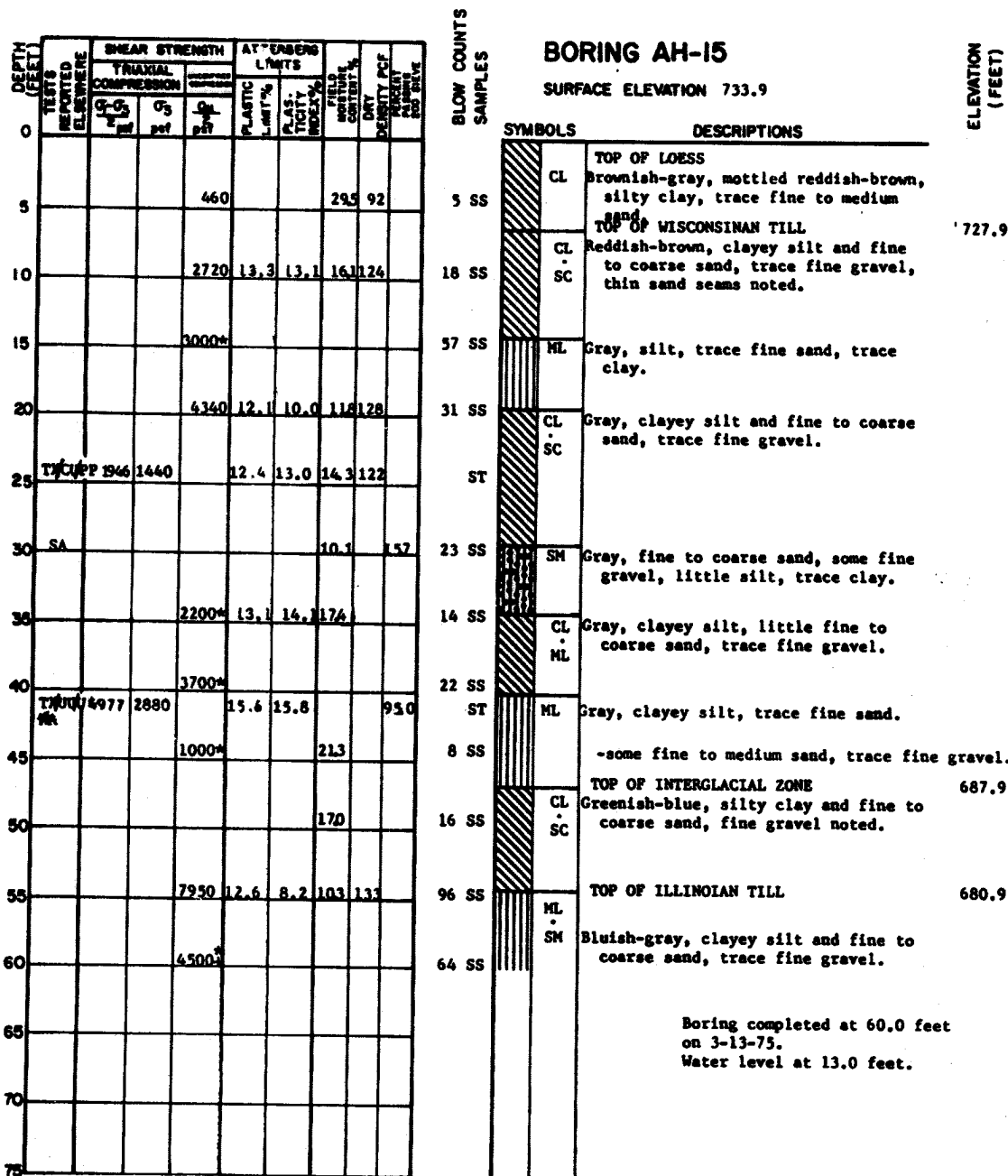
Logged by: Sargent & Lundy  
 Drilled by: Raymond International  
 Tested by: Westenhoff & Novick

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-234

LOG OF BORING AH-13

LOG OF BORING AH-14



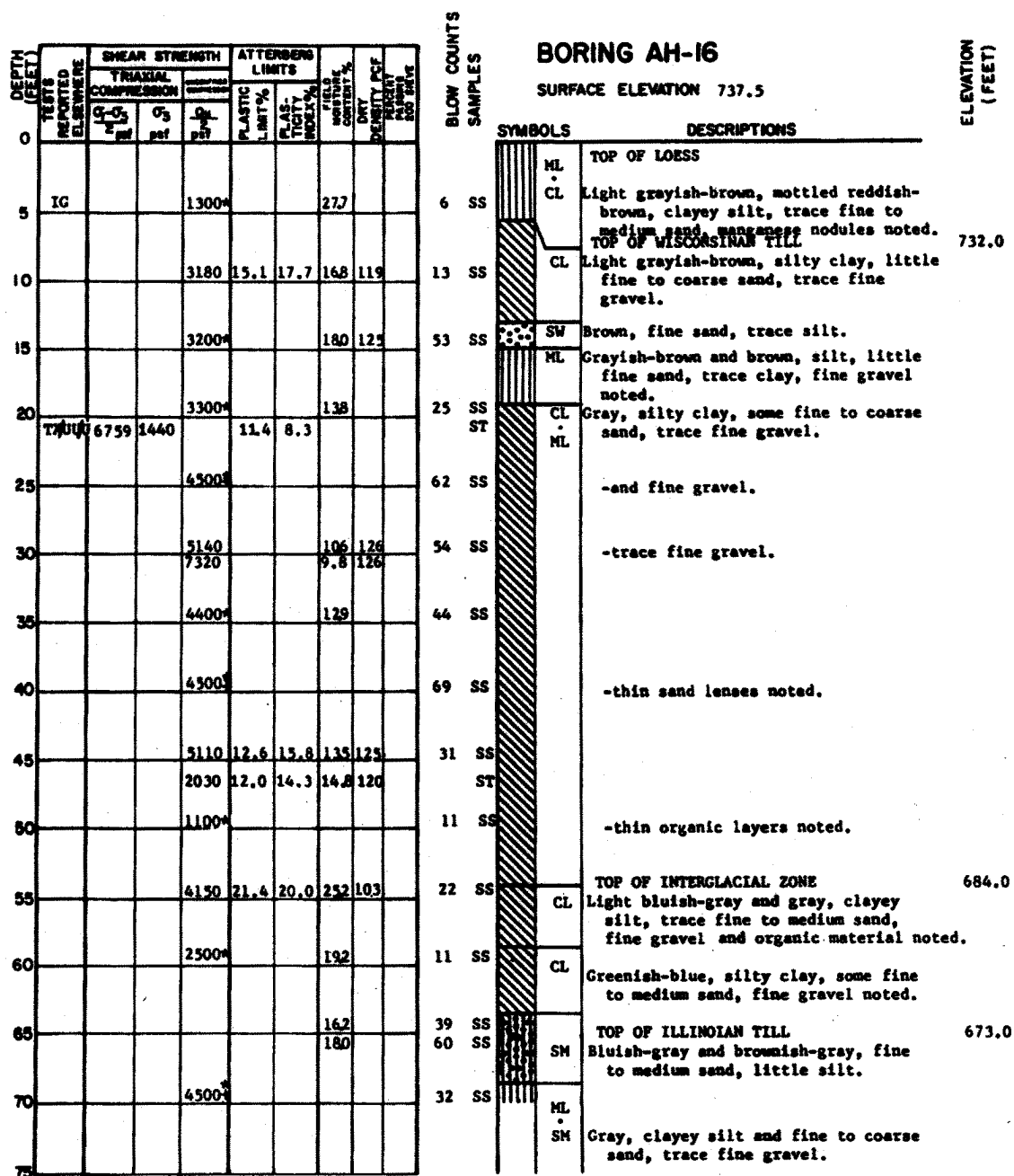
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-236

LOG OF BORING AH-15



Boring completed at 70.0 feet  
on 3-17-75.  
Water level at 12.5 feet.

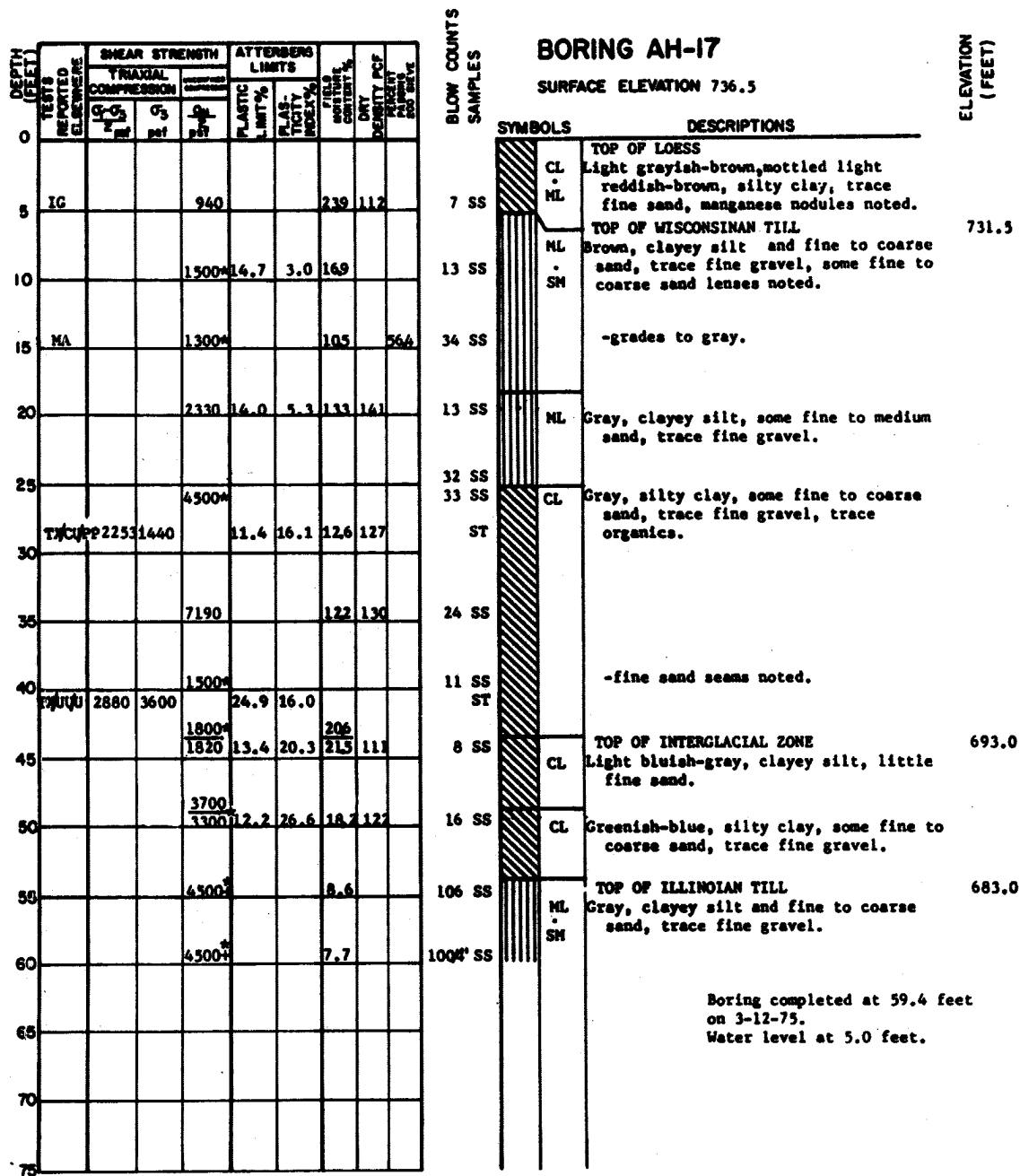
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-237

LOG OF BORING AH-16



#### NOTES

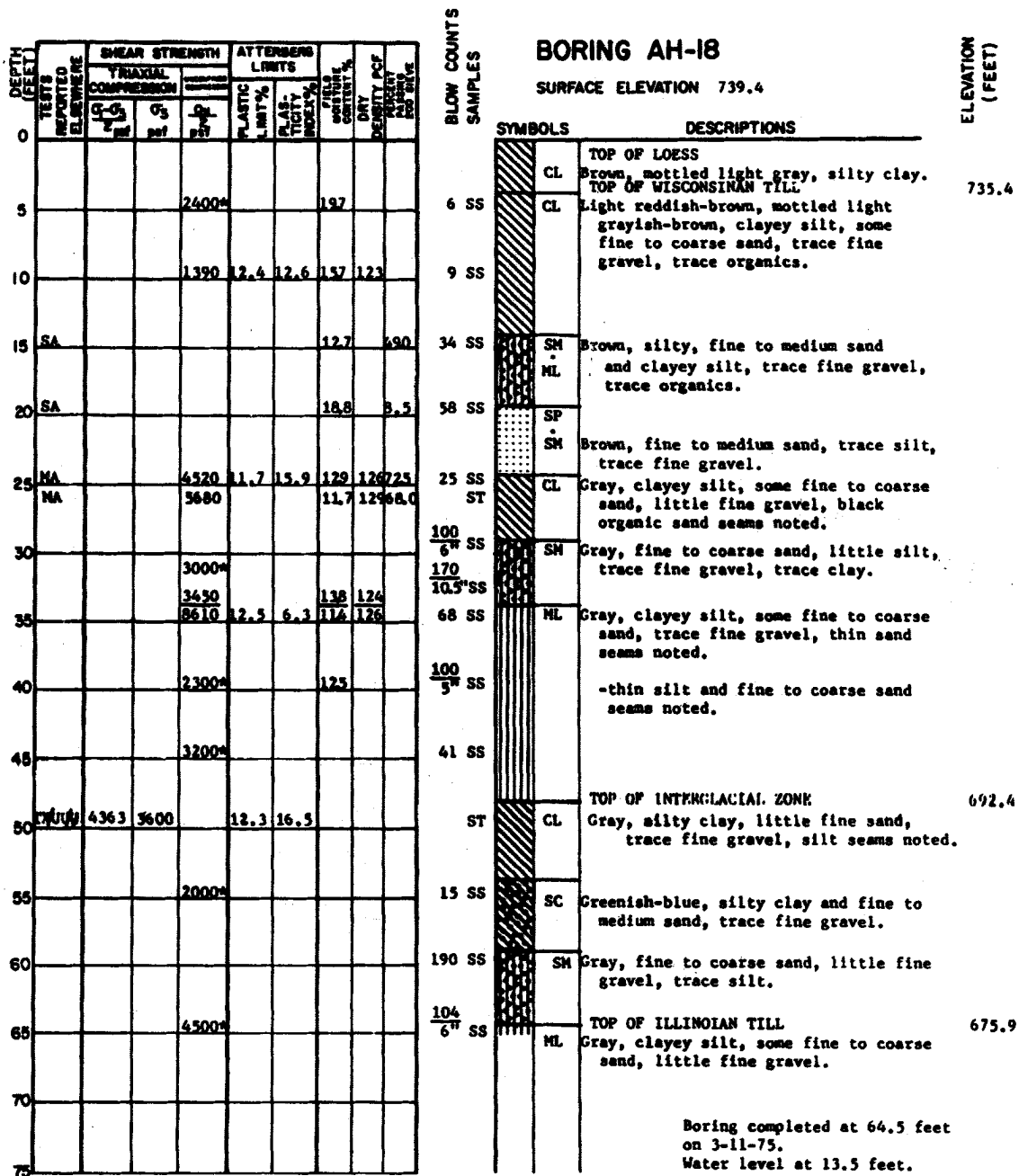
1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-238

LOG OF BORING AH-17





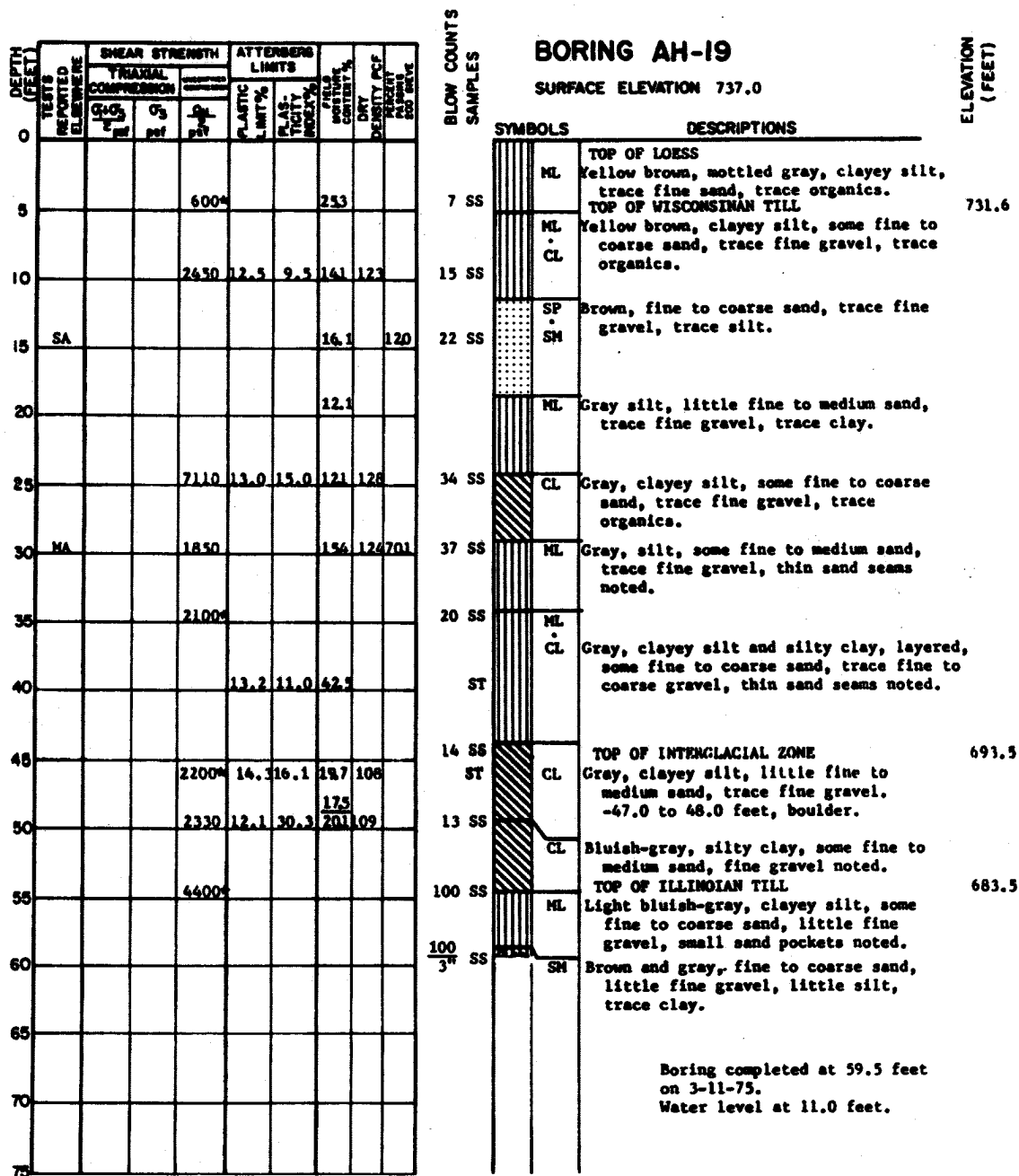
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-239

LOG OF BORING AH-18



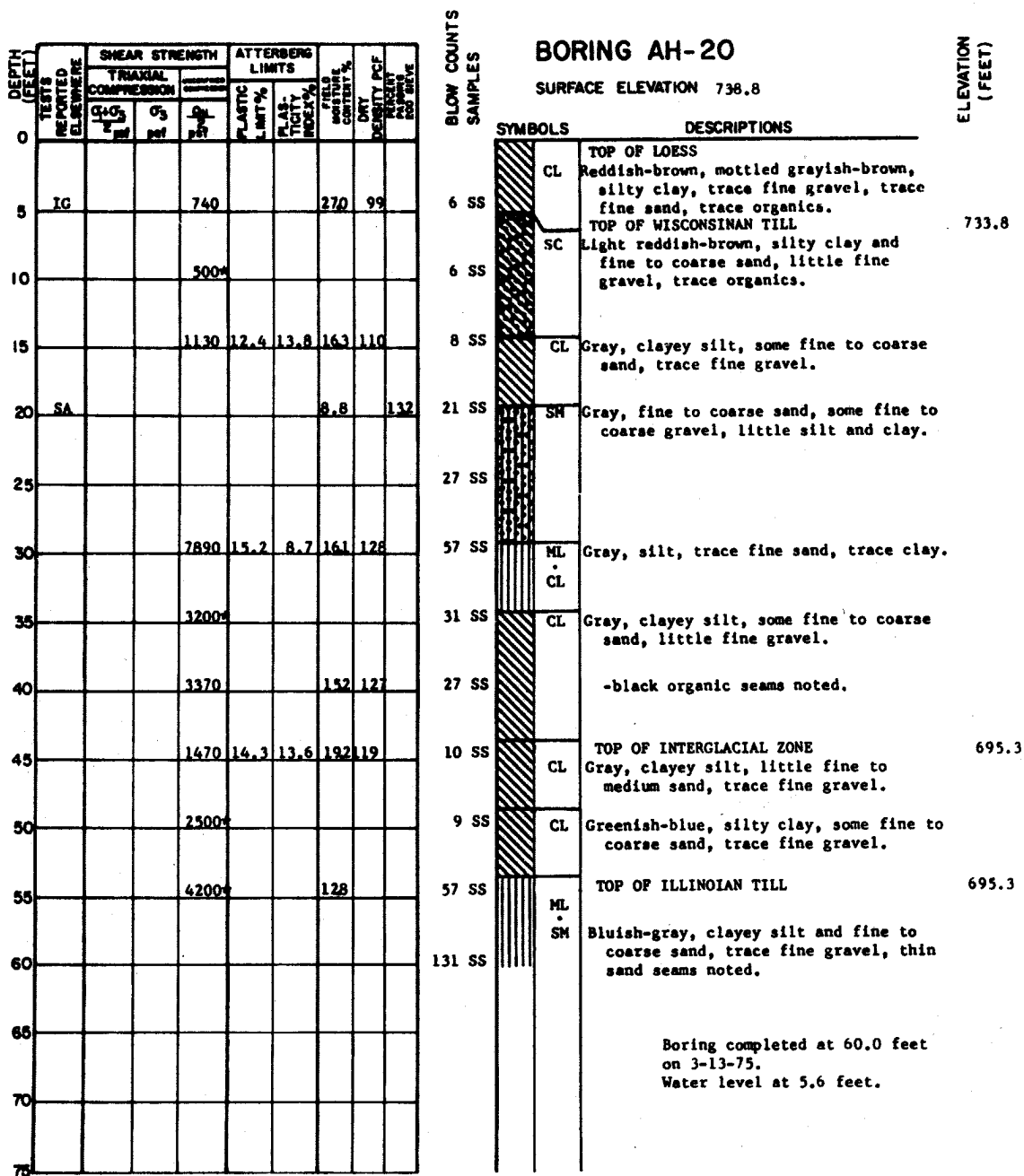
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-240

LOG OF BORING AH-19



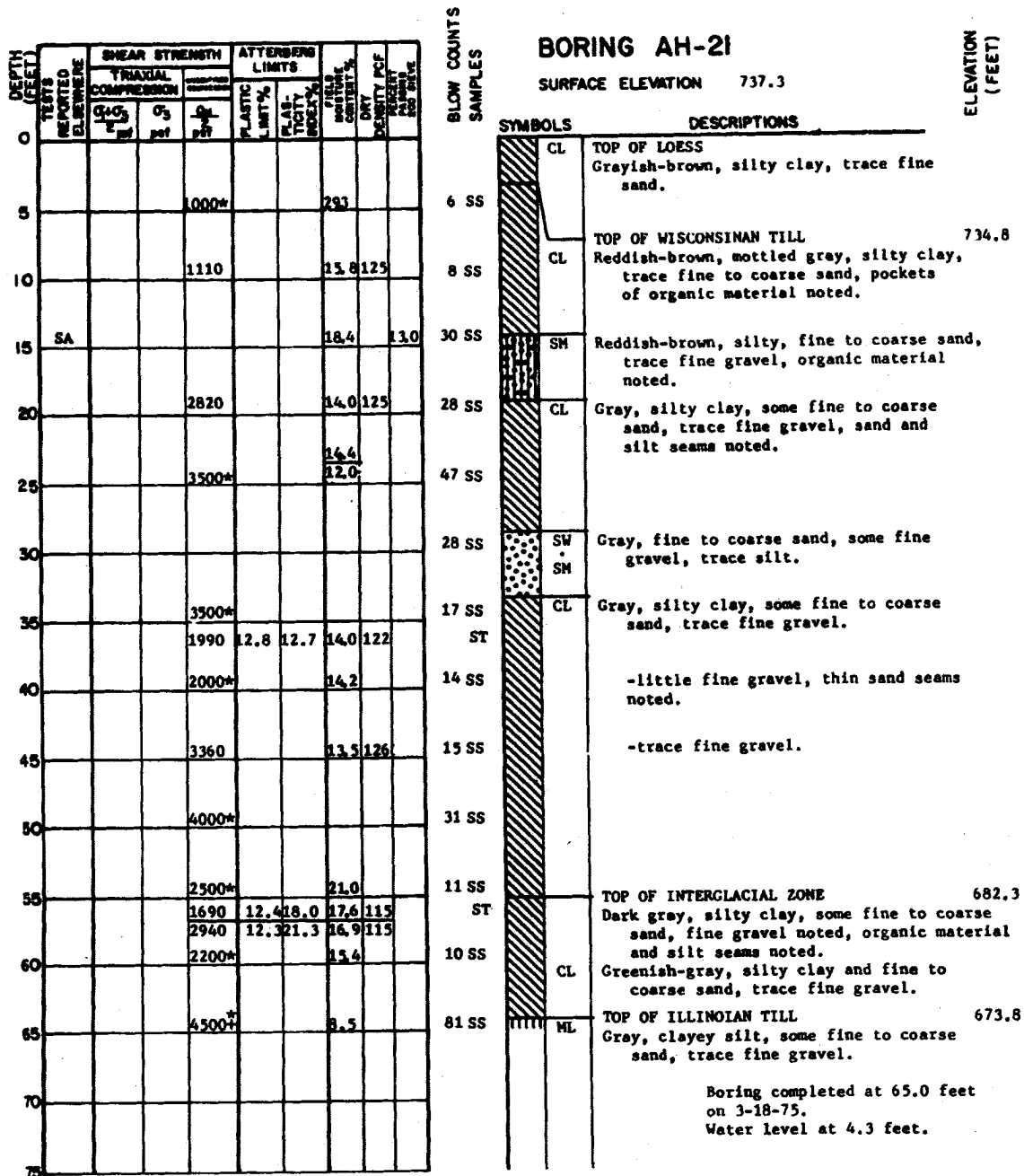
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-241

LOG OF BORING AH-20



#### NOTES

Logged by: Sargent & Lundy

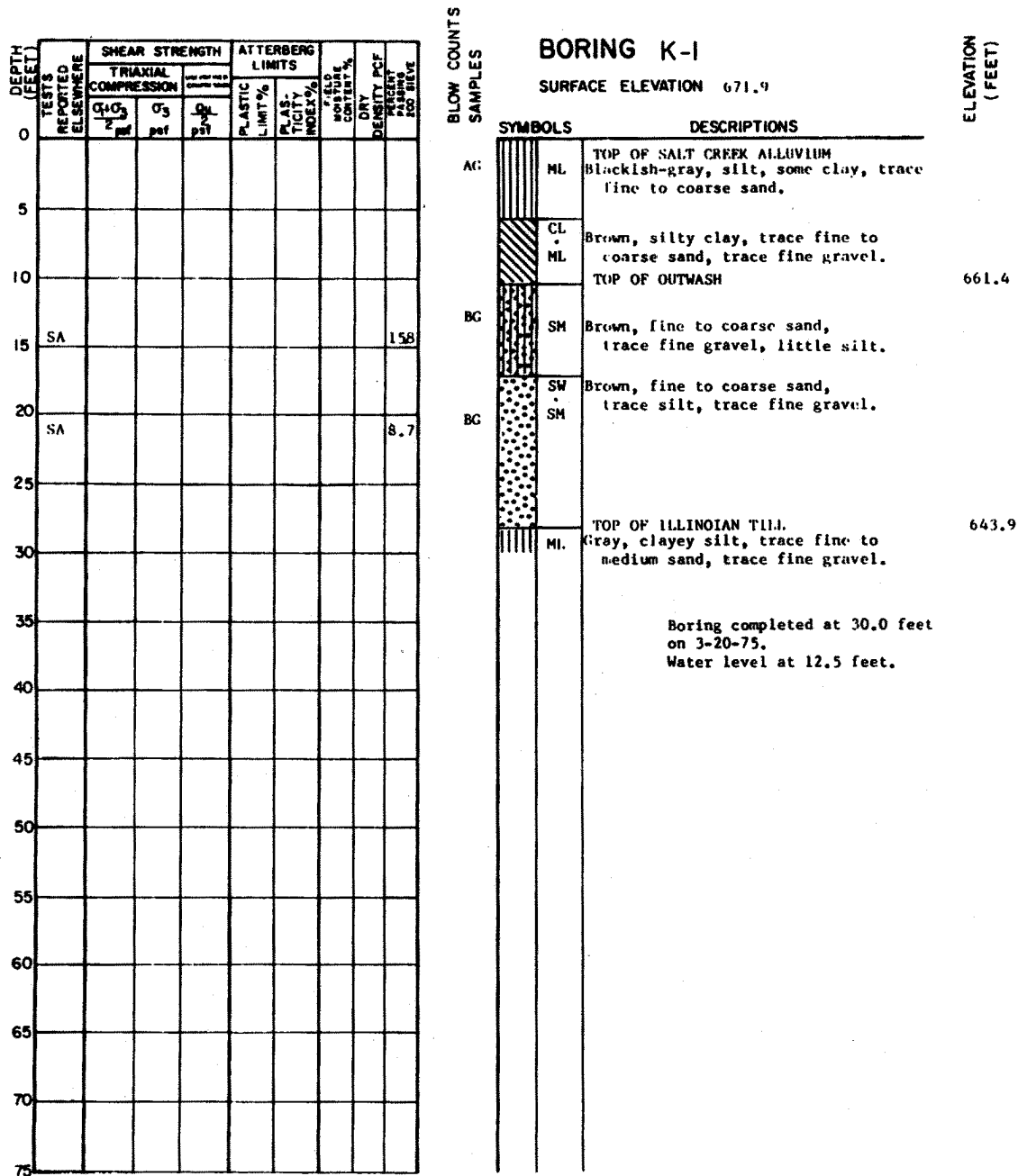
Drilled by: Raymond International

Tested by: Westenhoff & Novick

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-242

LOG OF BORING AH-21



#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.
4. Compaction and relative density tests performed on bulk samples from 10.5 to 25.5 feet depth.

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-243

LOG OF BORING K-1

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS		FIELD MOISTURE CONTENT %	DRY DENSITY PCF	TEST PASSED FOOT BEVE
		COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %			
		TEST METHOD USED							
		$\sigma_1$ psf	$\sigma_3$ psf	$\frac{\sigma_1}{\sigma_3}$ pcf					
0									
5	SA								20.5
10									
15	SA								13.3
20	SA								9.9
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BLOW COUNTS  
SAMPLES

## BORING K-2

SURFACE ELEVATION 670.5

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
AC	CL ML	TOP OF SALT CREEK ALLUVIUM	
		Brown, silty clay, trace fine sand.	
BC	SM	TOP OF OUTWASH	665.0
		Brown, fine to coarse sand, some silt, some fine to coarse gravel.	
BC	GM	Brown, fine to coarse gravel, some fine to coarse sand, some silt.	
BC	SW SM	Brown, fine to coarse sand, some fine to coarse gravel, trace silt.	
		TOP OF ILLINOIAN TILL	642.5
	ML	Gray, clayey silt, some fine to coarse sand, trace fine gravel.	
		Boring completed at 30.0 feet on 3-19-75.	
		Water level at 11.0 feet.	

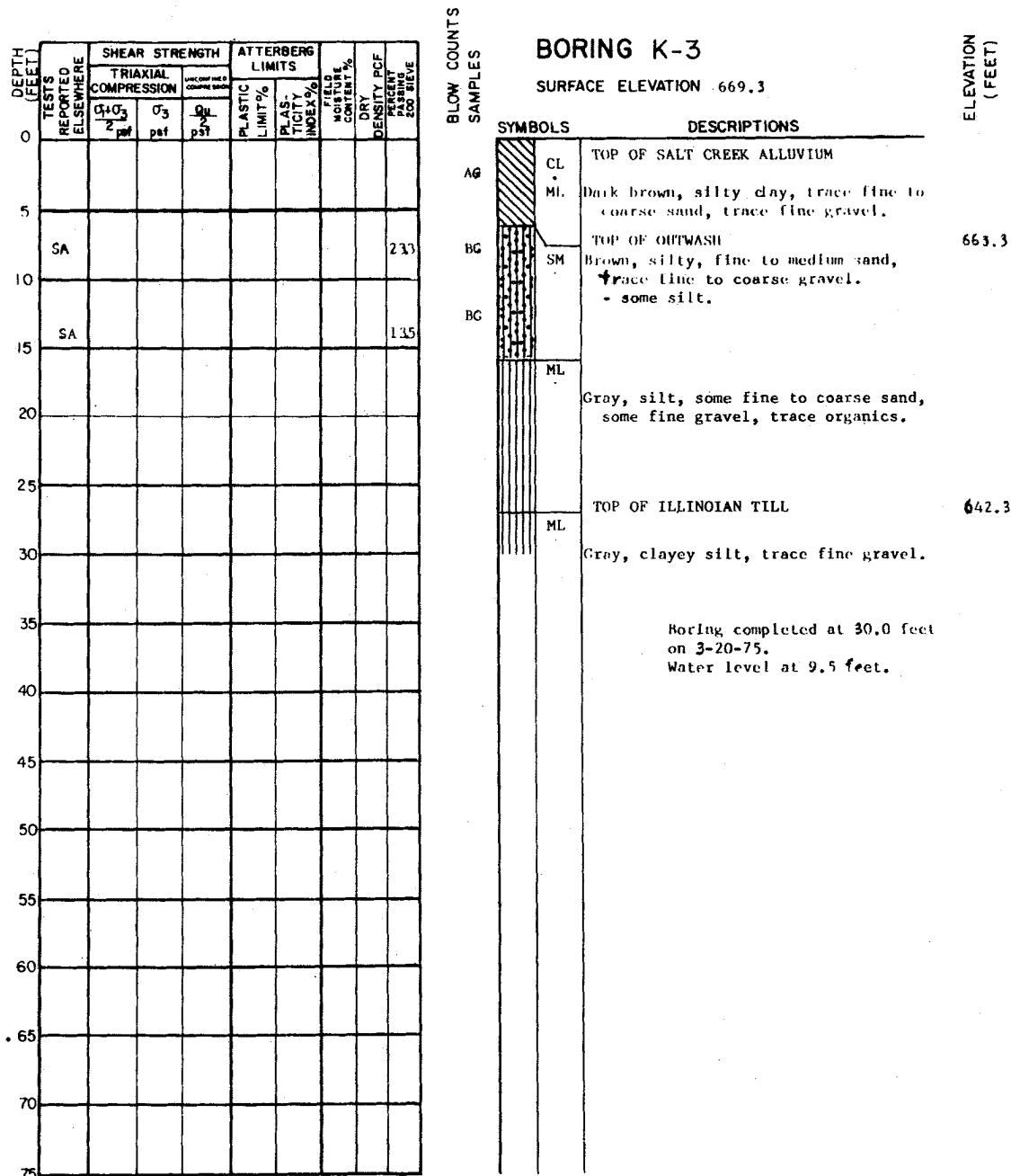
### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westernhoff and Novick, Inc.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-244

LOG OF BORING K-2



#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.
4. Compaction and relative density tests performed on mixed bulk samples from 10.0 to 15.0 feet depth in K-3 and 15.0 to 25.0 feet in K-7.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-245

LOG OF BORING K-3

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS			FIELD MOISTURE CONTENT, %	DRY DENSITY PCF	PCF PERCENT PASSING 200 SIEVE
		COMPRESSION			PLASTIC LIMIT, %	PLAS- TICITY INDEX, %	LIQUID LIMIT, %			
		$\frac{\sigma_1 + \sigma_3}{2}$ pcf	$\sigma_3$ pcf	$\frac{\sigma_1 - \sigma_3}{2}$ pcf						
0										
5										
10										
15	SA								121	
20										
25										
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										

BLOW COUNTS  
SAMPLES

## BORING K-4

SURFACE ELEVATION 684.1

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
AG	CL • ML	TOP OF SALT CREEK ALLUVIUM	
		Brown, silty clay, trace fine sand.	
		TOP OF OUTWASH	672.6
BC	SM	Brown, fine to coarse sand, trace fine gravel, trace silt.	
		TOP OF ILLINOIAN TILL	663.1
	ML	Gray, clayey silt, trace fine to coarse sand, trace fine gravel.	
Boring completed at 30.0 feet on 3-20-75. Water level at 6.5 feet.			

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.
4. Compaction and relative density tests performed on mixed bulk samples from 12.0 to 21.0 feet depth in K-4 and 6.5 to 15.0 feet depth in K-5.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-246

LOG OF BORING K-4



DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH.			ATTERBERG LIMITS			FIELD MOISTURE CONTENT %	DRY DENSITY PCF	RELATIVE DENSITY PERCENT ASTM D 1556
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %				
		UNIT AND TEST CRITERION USED								
		$\frac{\sigma_1 + \sigma_3}{2}$ psf	$\sigma_3$ psf	$\frac{\sigma_1 - \sigma_3}{2}$ psf						
0										
5										
10	SA									194
15	SA									109
20	SA									226
25	SA									162
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										

BLOW COUNTS  
SAMPLES

## BORING K-5

SURFACE ELEVATION 683.3

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
AC	CL ML	TOP OF SALT CREEK ALLUVIUM	
		Brown, silty clay, trace fine sand.	
		TOP OF OUTWASH	676.8
BC	SM	Brown, fine to coarse sand, some fine to coarse gravel some silt.	
	SP	Brown, fine to coarse sand, some fine gravel, trace silt.	
BC	SM		
	SM	Brown, silty, fine to coarse sand and fine to coarse gravel.	
BC	GM		
	SM	Brown, fine to coarse sand, some fine to coarse gravel, some silt.	
BC	ML	TOP OF ILLINOIAN TILL.	660.3
		Gray, clayey silt, trace fine gravel.	
Boring completed at 30.0 feet on 3-20-75.			
Water level at 17.5 feet.			

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westernhoff and Novick, Inc.
4. Compaction and relative density tests performed on bulk samples from 6.5 to 20.0 feet depth and on mixed bulk samples from 6.5 to 15.0 feet depth in K-5 and 12.0 to 21.0 feet depth in K-4.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-247

LOG OF BORING K-5

DEPTH DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTENBERG LIMITS			MOISTURE CONTENT %	DRY DENSITY PCF	RELATIVE DENSITY PERCENT
		COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %	FIELD MOISTURE CONTENT %			
		$\frac{C_u}{2}$ psi	$C_s$ psi	$\frac{C_u}{2}$ psi						
0										
5										
10	SA									24.1
15	SA									9.2
20										
25										
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										

BLOW COUNTS  
SAMPLES

## BORING K-6

SURFACE ELEVATION 671.8

ELEVATION  
(FEET)

SYMBOLS	DESCRIPTIONS	
AG	CL ML	TOP OF SALT CREEK ALLUVIUM
		Brown, silty clay, trace fine sand.
		TOP OF OUTWASH
665.3		
BG	SM	Brown, fine to coarse sand, some fine to coarse gravel, some silt.
	SW SM	Brown, fine to coarse sand, some fine to coarse gravel, trace silt.
	ML	Gray, silt, trace fine gravel, trace fine to medium sand, trace organics.
650.8		TOP OF ILLINOIAN TILL
	ML	Gray, clayey silt, trace fine sand, trace fine gravel.
		Boring completed at 30.0 feet on 3-19-75. Water level at 13.5 feet.

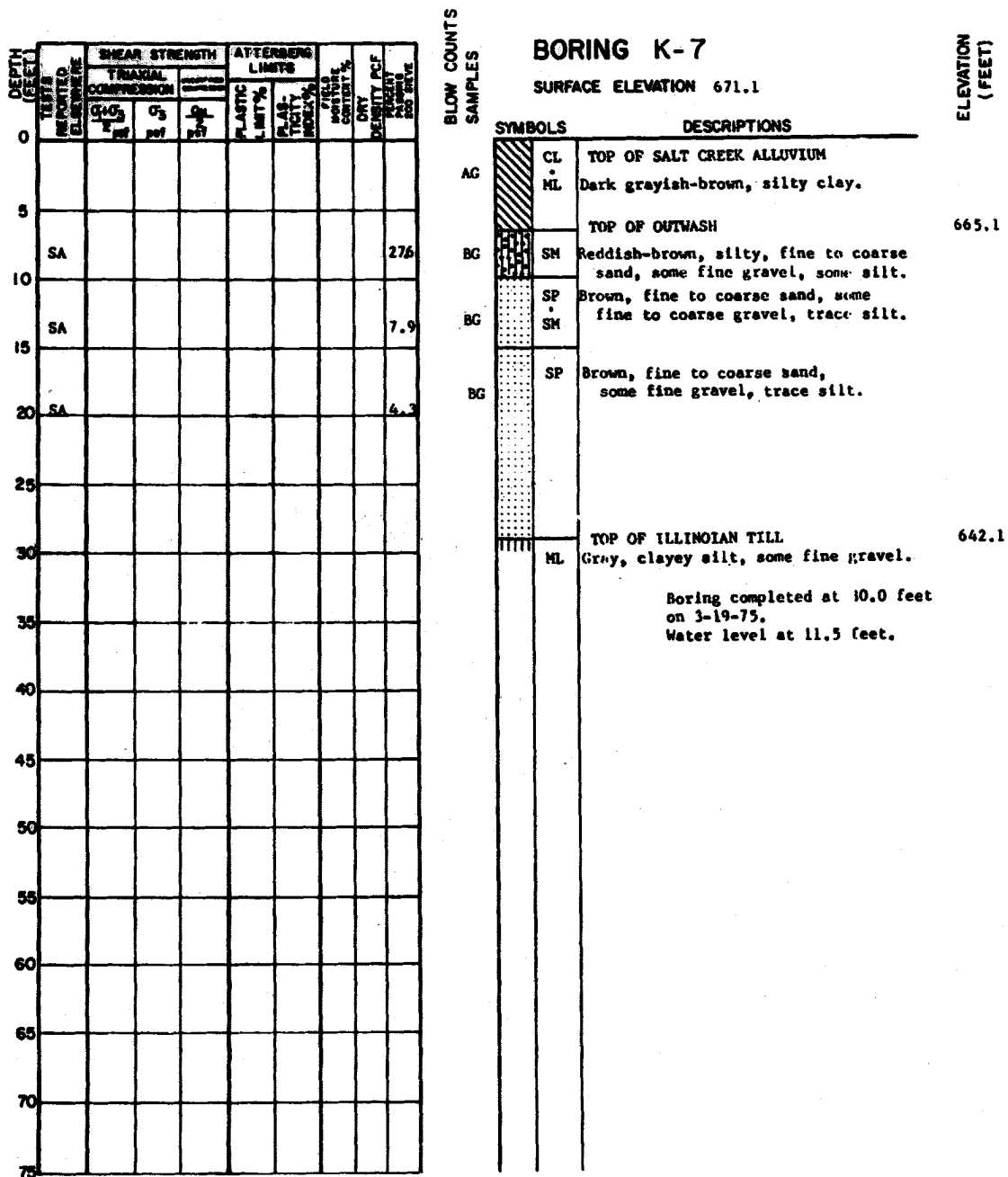
### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.
4. Compaction and relative density tests performed on bulk samples from 6.5 to 13.0 feet depth.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-248

LOG OF BORING K-6



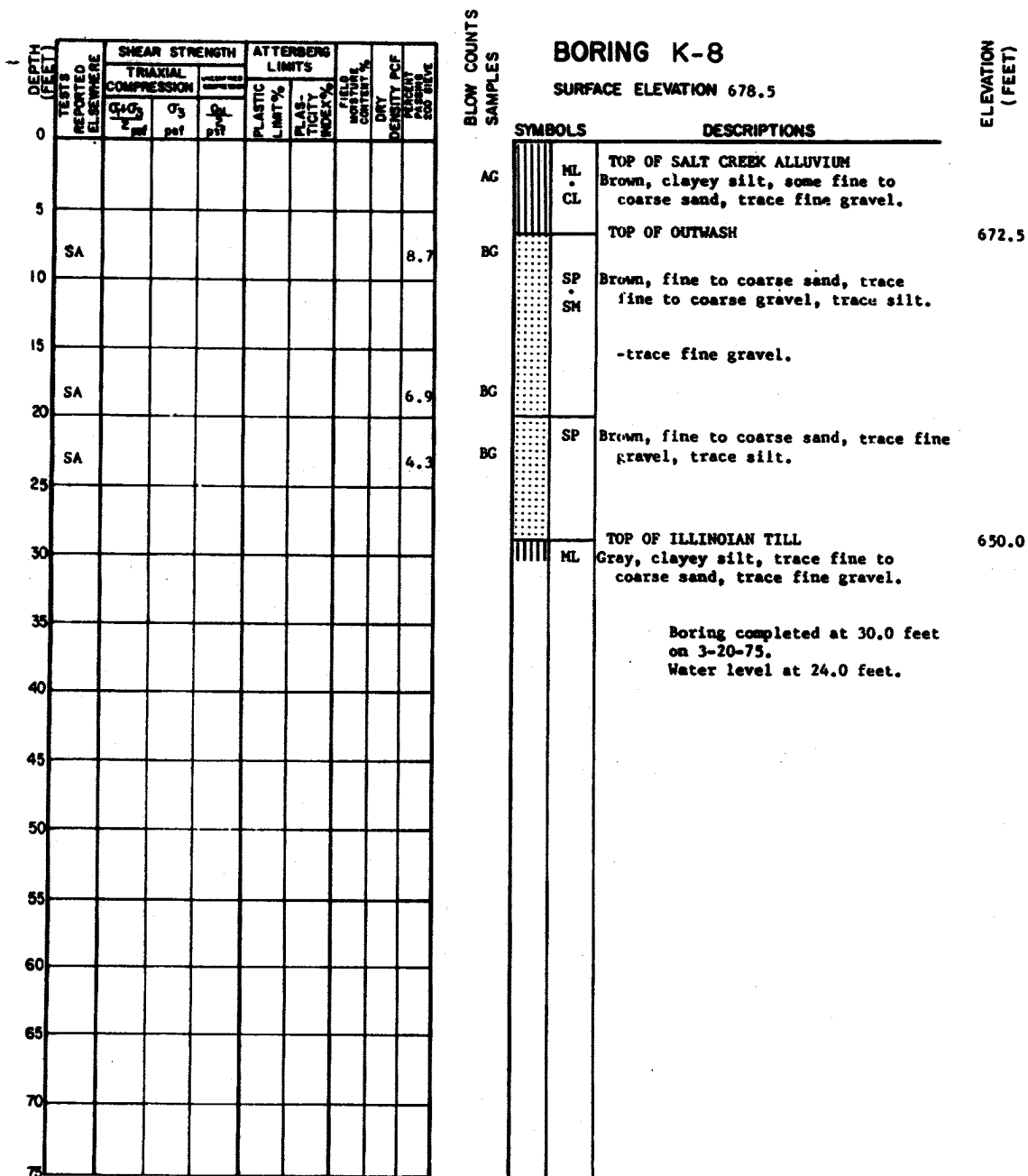
#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.
4. Compaction and relative density tests performed on mixed bulk samples from 15.0 to 25.0 feet depth in K-7 and 10.0 to 15.0 feet depth in K-3.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-249

LOG OF BORING K-7



#### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.
4. Compaction and relative density tests performed on bulk samples from 6.0 to 20.0 feet depth.

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-250

LOG OF BORING K-8

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTENBERG LIMITS			FIELD MOISTURE CONTENT, %	DRY DENSITY PCF	RELATIVE DENSITY PERCENT	SPT BLOWS FOOT BLIVE
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	FLAS- TICITY INDEX %					
		$\sigma_1$ psi	$\sigma_3$ psi	$\sigma_d$ psi							
0											
5											
10	SA										18.5
15	SA										23
20	SA										8.4
25	SA										7.7
30	SA										4.1
35											
40											
45											
50											
55											
60											
65											
70											
75											

BLOW COUNTS  
SAMPLES

## BORING K-11

SURFACE ELEVATION 682.5

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
AG	CL • ML	TOP OF SALT CREEK ALLUVIUM	
		Brown, silty clay, trace fine sand.	
		TIP OF OUTWASH	677.5
BC	SM	Brown, fine to coarse sand, some silt, trace fine gravel.	
BC			
BC	SP • SM	Brown, fine to coarse sand, some fine gravel, trace silt.	
BC			
BC	SP	Brown, fine to coarse sand, some fine gravel, trace silt.	
BC			
Boring completed at 30.0 feet on 3-20-75. Water level at 28.0 feet.			

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.
4. Compaction and relative density tests performed on bulk samples from 5.0 to 25.0 feet depth.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-251

LOG OF BORING K-11

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTERBERG LIMITS			FIELD NOTES	DRY DENSITY pcf	DESIGNATION PASSING NO. 200 SIEVE
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	PLAS- TICITY INDEX %				
		$\sigma_1 - \sigma_3$ psi	$\sigma_3$ psi	$\sigma_1$ psi						
0										
5	HA									47.6
	SA									15.1
10										
	SA									7.3
15										
	SA									3.8
20										
25										
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										

BLOW COUNTS  
SAMPLES

## BORING K-12

SURFACE ELEVATION 673.8

ELEVATION  
(FEET)

SYMBOLS		DESCRIPTIONS	
AC	CL	TOP OF SALT CREEK ALLUVIUM	
BG	ML	Brown, silty clay, trace fine to coarse sand.	
BG	SM	TOP OF OUTWASH	671.8
	ML	Brown, fine to coarse sand and clayey silt.	
BG	SM	Brown, fine to coarse sand, some fine gravel, some silt.	
	SP		
BG	SM	Brown, fine to coarse sand, some fine gravel, trace silt.	
	SP	Brown, fine to coarse sand, trace fine gravel, trace silt.	
	ML	TOP OF ILLINOIAN TILL	652.8
	CL	Greenish-gray, clayey silt, trace fine gravel, trace organics.	
	ML	Gray, clayey silt, trace fine to coarse sand, trace fine gravel.	

Boring completed at 30.0 feet  
on 3-20-75.  
Water level at 21.5 feet.

### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.
4. Compaction and relative density tests performed on bulk samples from 5.0 to 20.0 feet depth.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-252

LOG OF BORING K-12

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH			ATTENBERG LIMITS			MOISTURE CONTENT %	DRY DENSITY PCF	WET DENSITY PCF	SPT BLOW END BLADE											
		TRIAXIAL COMPRESSION			PLASTIC LIMIT %	FLAS- TICITY INDEX %	FIELD TESTS															
		$\sigma_1$ psi	$\sigma_3$ psi	$\sigma_1$																		
0																						
5	SA									23.7												
10	SA									8.8												
15	SA									7.5												
20																						
25																						
30																						
35																						
40																						
45																						
50																						
55																						
60																						
65																						
70																						
75																						

BLOW COUNTS  
SAMPLES

## BORING K-15

SURFACE ELEVATION 668.4

ELEVATION  
(FEET)

### SYMBOLS

### DESCRIPTIONS

CL	TOP OF SALT CREEK ALLUVIUM	
ML	Brown, silty clay.	
SM	TOP OF OUTWASH	663.9
SM	Brown, silty, fine to coarse sand, some fine to coarse gravel.	
SP	Brown, fine to coarse sand, some fine to coarse gravel, trace silt.	
SW	Brown, fine to coarse sand, some fine to coarse gravel, trace silt.	
ML	TOP OF ILLINOIAN TILL	645.4
ML	Gray, silty clay, some fine to coarse sand, some fine gravel.	

Boring completed at 30.0 feet  
on 3-19-75.  
Water level at 9.0 feet.

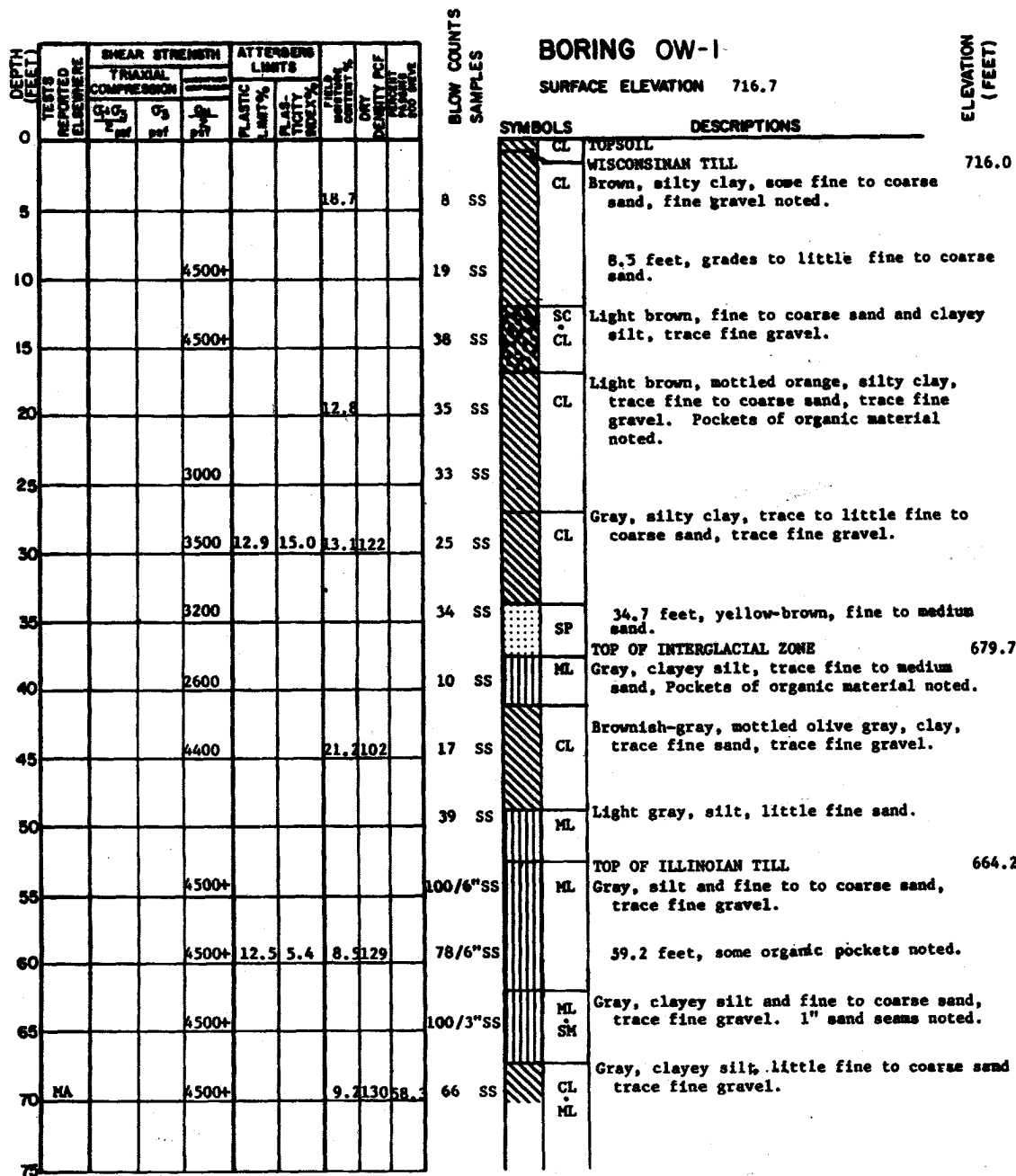
### NOTES

1. Logged by: Sargent & Lundy Engineers
2. Drilled by: Raymond International
3. Tested by: Westenhoff and Novick, Inc.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-253

LOG OF BORING K-15



PIEZOMETER INSTALLED ON 5/12/76. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED TO ELEVATION 646.7. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 646.7 TO 656.7; BEN-TONITE SEAL FROM ELEVATION 656.7 TO 658.7; AND CEMENT GROUT FROM ELEVATION 658.7 TO 716.7.

BORING COMPLETED AT 70.0 FEET.

ON 5/12/76.

CASING USED TO A DEPTH OF 10.0 FEET.

#### NOTES:

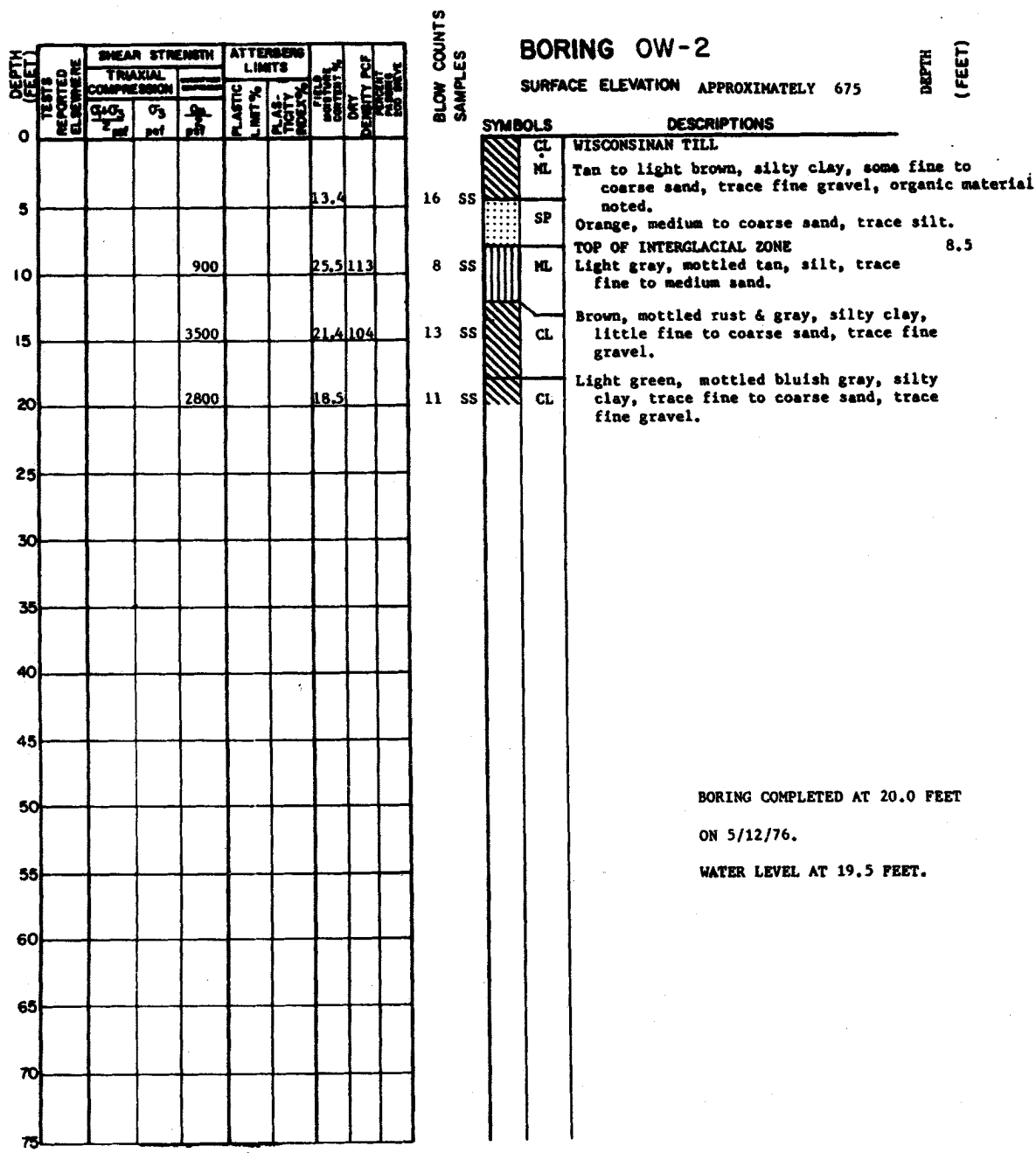
1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-254

LOG OF BORING OW-1





PIEZOMETER INSTALLED ON 5/12/76. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED TO ELEVATION 675. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 675 TO 690; BENTONITE SEAL FROM ELEVATION 690 TO 692; AND CEMENT GROUT FROM ELEVATION 692 TO 695.

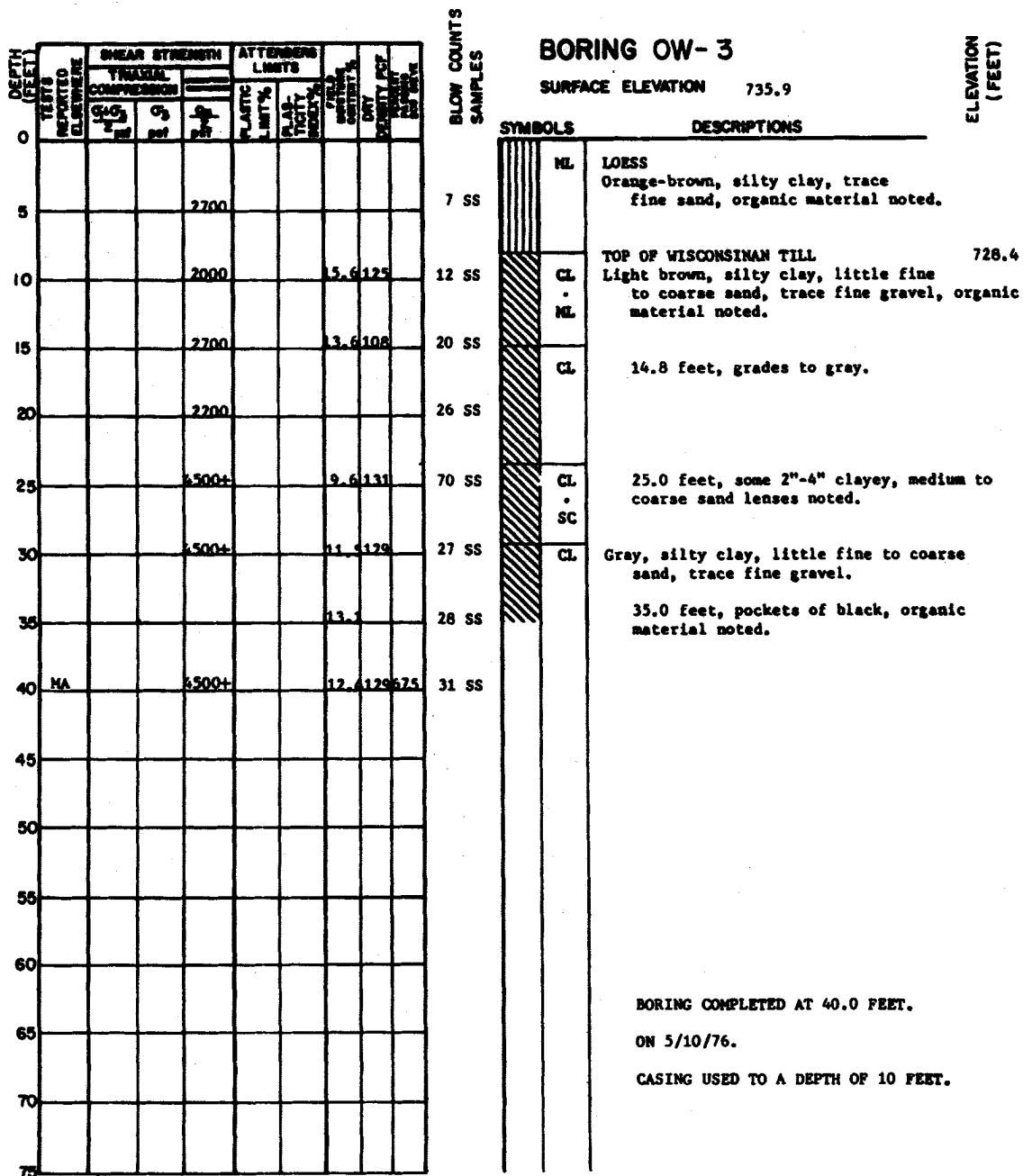
- NOTES:**
1. LOGGED BY: SARGENT & LUNDY.
  2. DRILLED BY: RAYMOND INTERNATIONAL.
  3. TESTED BY: WESTENHOFF & NOVICK.

**CLINTON POWER STATION**  
**UPDATED SAFETY ANALYSIS REPORT**

---

FIGURE 2.5-255

LOG OF BORING OW-2



PIEZMETER INSTALLED IN OW-3 DEEP ON 5/10/76. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED TO ELEVATION 695.9. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 695.9 TO 705.9, BENTONITE SEAL FROM ELEVATION 705.9 TO 707.9, AND CEMENT GROUT FROM ELEVATION 707.9 TO 735.9.

PIEZMETER INSTALLED ON 5/10/76. BORING OW-3 SHALLOW LOCATED 2 FEET NORTH OF OW-3 DEEP WAS DRILLED TO A DEPTH OF 10 FEET. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED TO ELEVATION 725.9. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 725.9 TO 730.9, BENTONITE SEAL FROM ELEVATION 730.9 TO 732.9, AND CEMENT GROUT FROM ELEVATION 732.9 TO 735.9.

#### NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

## BORING OW-3

SURFACE ELEVATION 735.9

BORING COMPLETED AT 40.0 FEET.

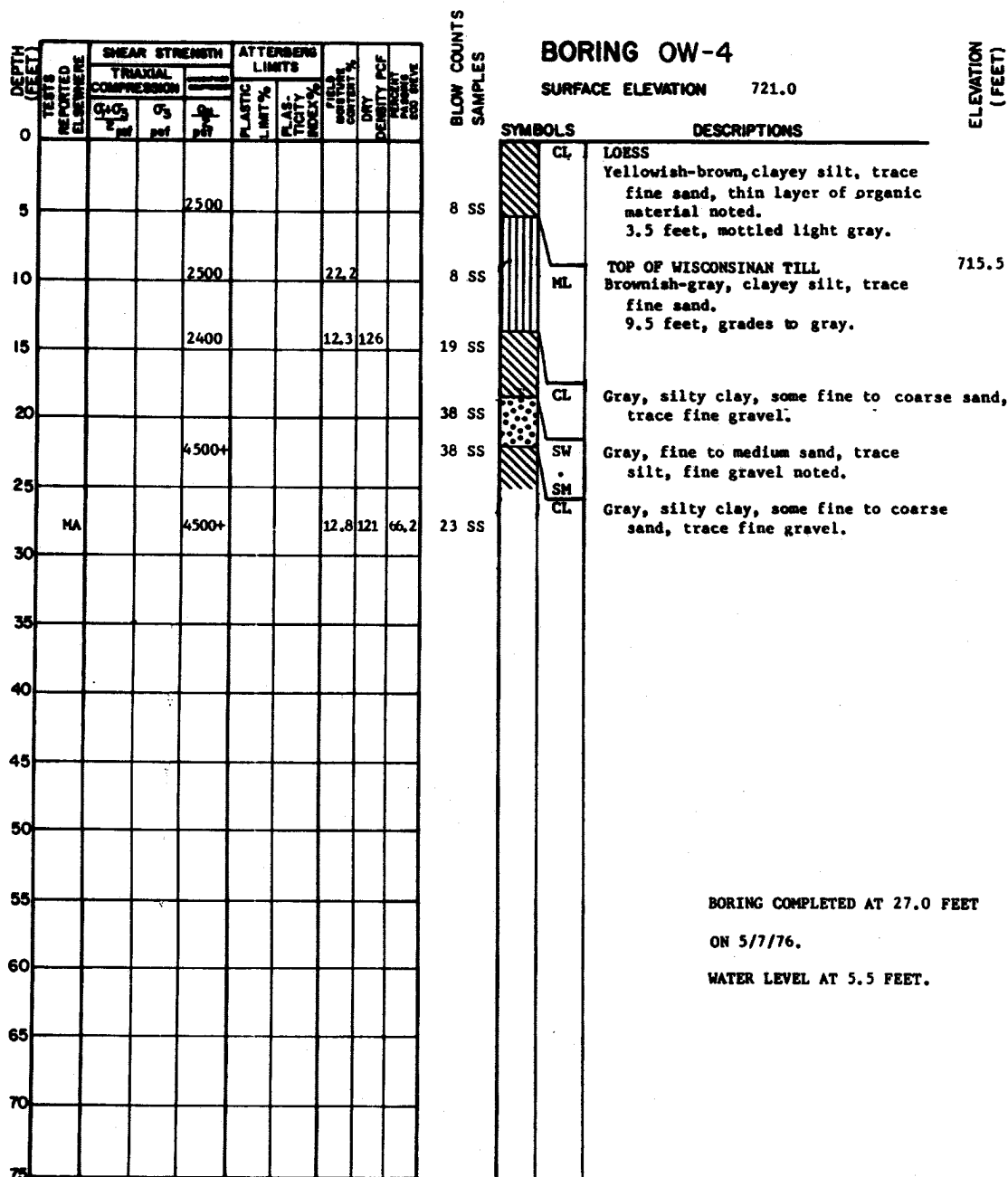
ON 5/10/76.

CASING USED TO A DEPTH OF 10 FEET.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-256

LOG OF BORING OW-3



PIEZOMETER INSTALLED IN OW-4 DEEP ON 5-7-76. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED TO ELEVATION 697.5 GRANULAR BACKFILL WAS PLACED FROM ELEVATION 697.5 TO 711; BENTONITE SEAL FROM ELEVATION 711 TO 713; AND CEMENT GROUT FROM ELEVATION 713 TO 721.

PIEZOMETER INSTALLED ON 5-7-76. BORING OW-4 SHALLOW LOCATED 3.5 FEET NORTH OF OW-4 DEEP WAS DRILLED TO A DEPTH OF 6.9 FEET. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED TO ELEVATION 714.1 GRANULAR BACKFILL WAS PLACED FROM ELEVATION 714.1 TO 718.1; BENTONITE SEAL FROM ELEVATION 718.1 TO 720.1; CEMENT GROUT FROM ELEVATION 720.1 TO 721.0.

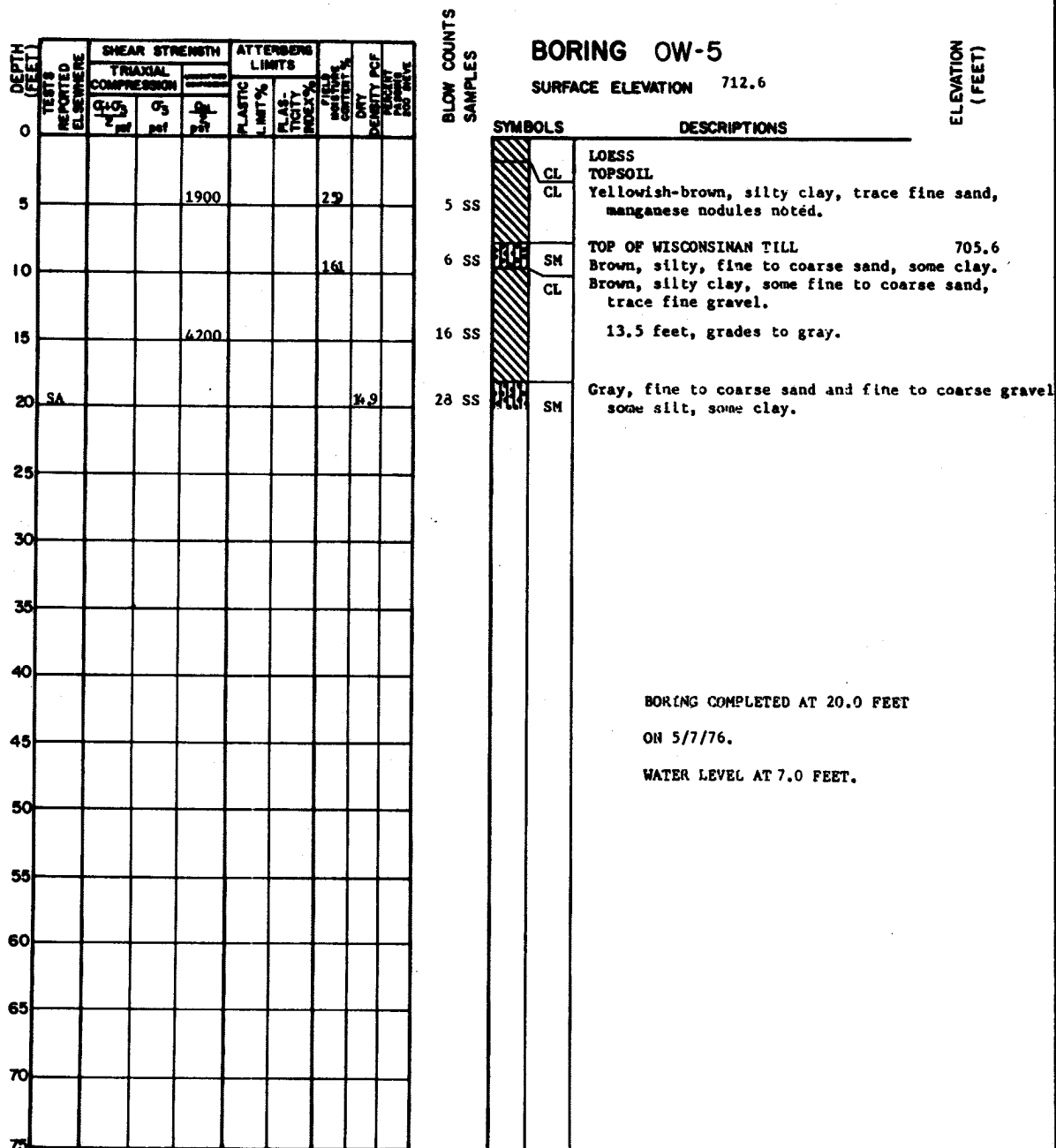
**NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTERNHOFF & NOVICK.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-257

LOG OF BORING OW-4



PIEZOMETER INSTALLED IN OW-5 DEEP ON 5/7/76. A 2 INCH INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED TO ELEVATION 694.4. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 694.4 TO 702.6; BENTONITE SEAL FROM ELEVATION 702.6 TO 704.6; AND CEMENT GROUT FROM ELEVATION 704.6 TO 712.6.

PIEZOMETER INSTALLED ON 5/7/76. BORING OW-5 SHALLOW LOCATED 2 FEET SOUTH OF OW-5 DEEP WAS DRILLED TO A DEPTH OF 8 FEET. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED TO ELEVATION 704.6 GRANULAR BACKFILL WAS PLACED FROM ELEVATION 704.6 TO 708.6; BENTONITE SEAL FROM ELEVATION 708.6 TO 710. AND CEMENT GROUT FROM ELEVATION 710.6 TO 712.6.

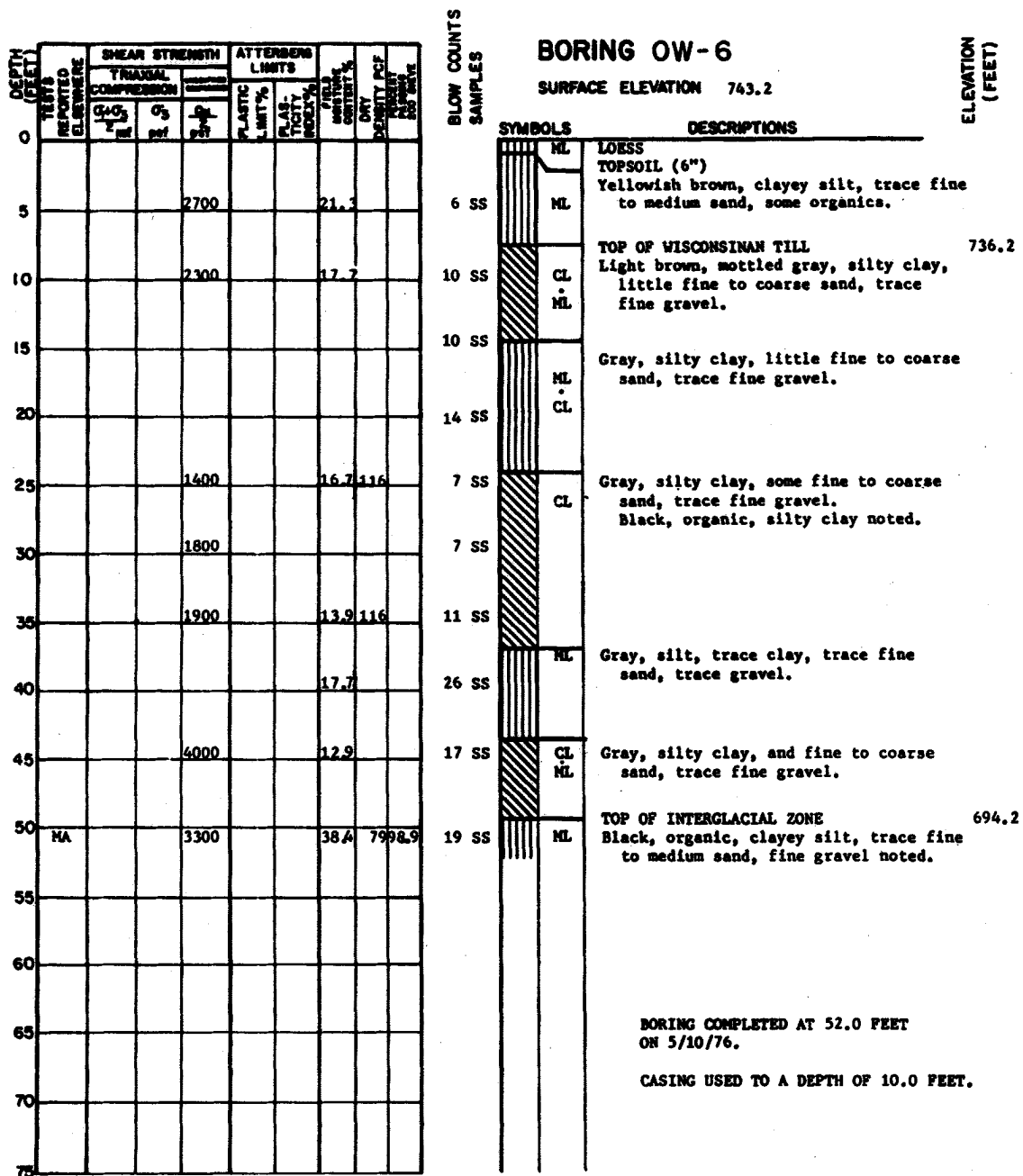
# CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-258

LOG OF BORING OW-5

## NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.



PIEZOMETER INSTALLED IN OW-6 DEEP ON 5/10/76. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED AT ELEVATION 691.2. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 691.2 TO 733.2; BENTONITE SEAL FROM ELEVATION 733.2 TO 735.2; AND CEMENT GROUT FROM ELEVATION 735.2 TO 743.2.

PIEZOMETER INSTALLED ON 5/10/76. BORING OW-6 SHALLOW LOCATED 2 FEET NORTH OF OW-6 DEEP WAS DRILLED TO A DEPTH OF 7.5 FEET. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED AT ELEVATION 735.8. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 735.8 TO 740.8; BENTONITE SEAL FROM ELEVATION 740.8 TO 741.8; AND CEMENT GROUT FROM 741.8 TO 743.2.

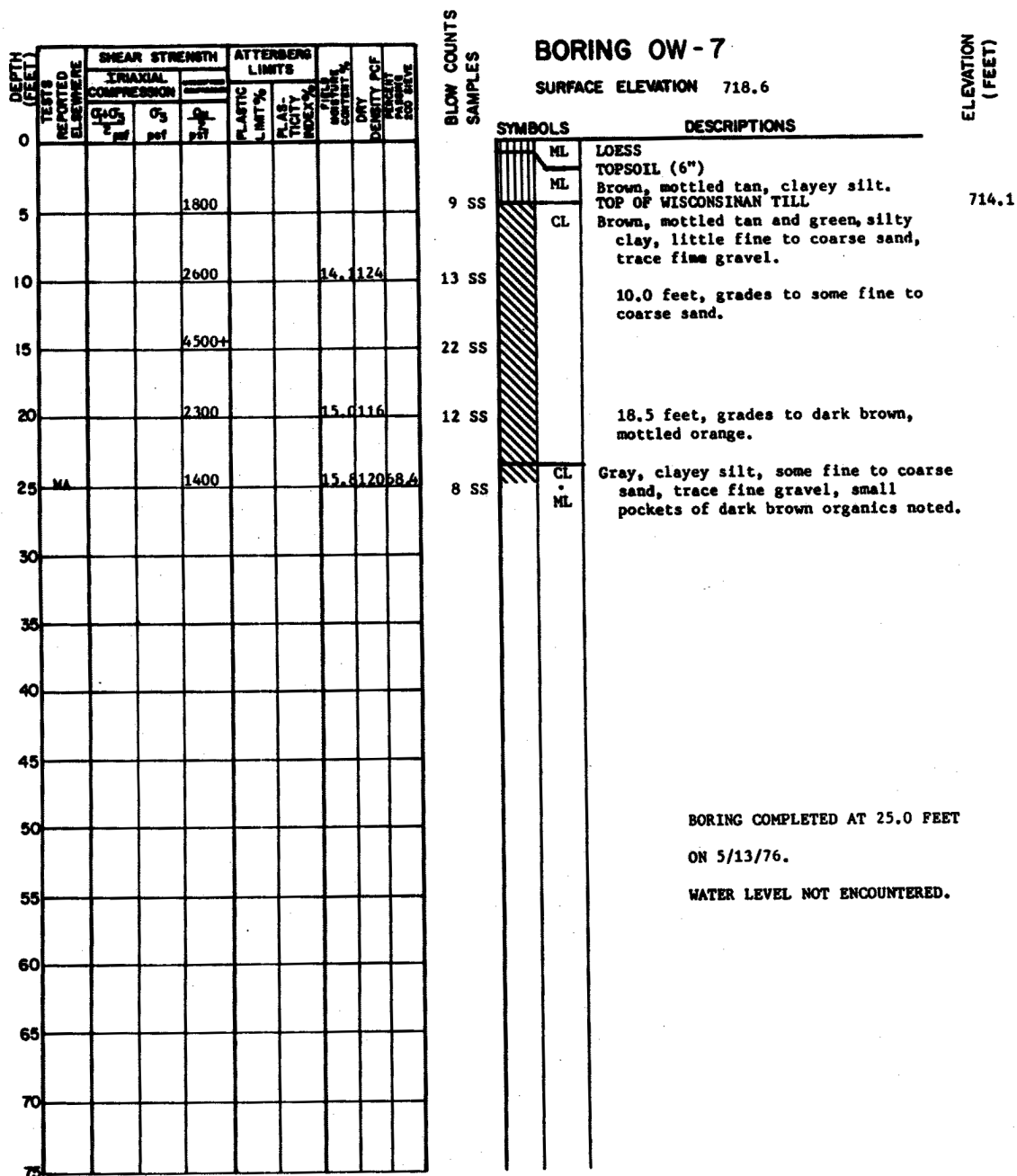
#### NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-259

LOG OF BORING OW-6



PIEZOMETER INSTALLED IN OW-7 DEEP ON 5/13/76. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED AT ELEVATION 693.6. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 693.6 TO 708.6; BENTONITE SEAL FROM ELEVATION 708.6 TO 710.6; AND CEMENT GROUT FROM 710.6 TO 718.6.

PIEZOMETER INSTALLED ON 5/13/76, BORING OW-7 SHALLOW LOCATED 2.5 FEET WEST OF OW-7 DEEP WAS DRILLED TO A DEPTH OF 6.0 FEET. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED AT ELEVATION 712.6. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 712.6 TO 716.6; BENTONITE SEAL FROM ELEVATION 716.6 TO 717.6; AND CEMENT GROUT FROM ELEVATION 717.6 TO 718.6.

#### NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: RAYMOND INTERNATIONAL.
3. TESTED BY: WESTENHOFF & NOVICK.

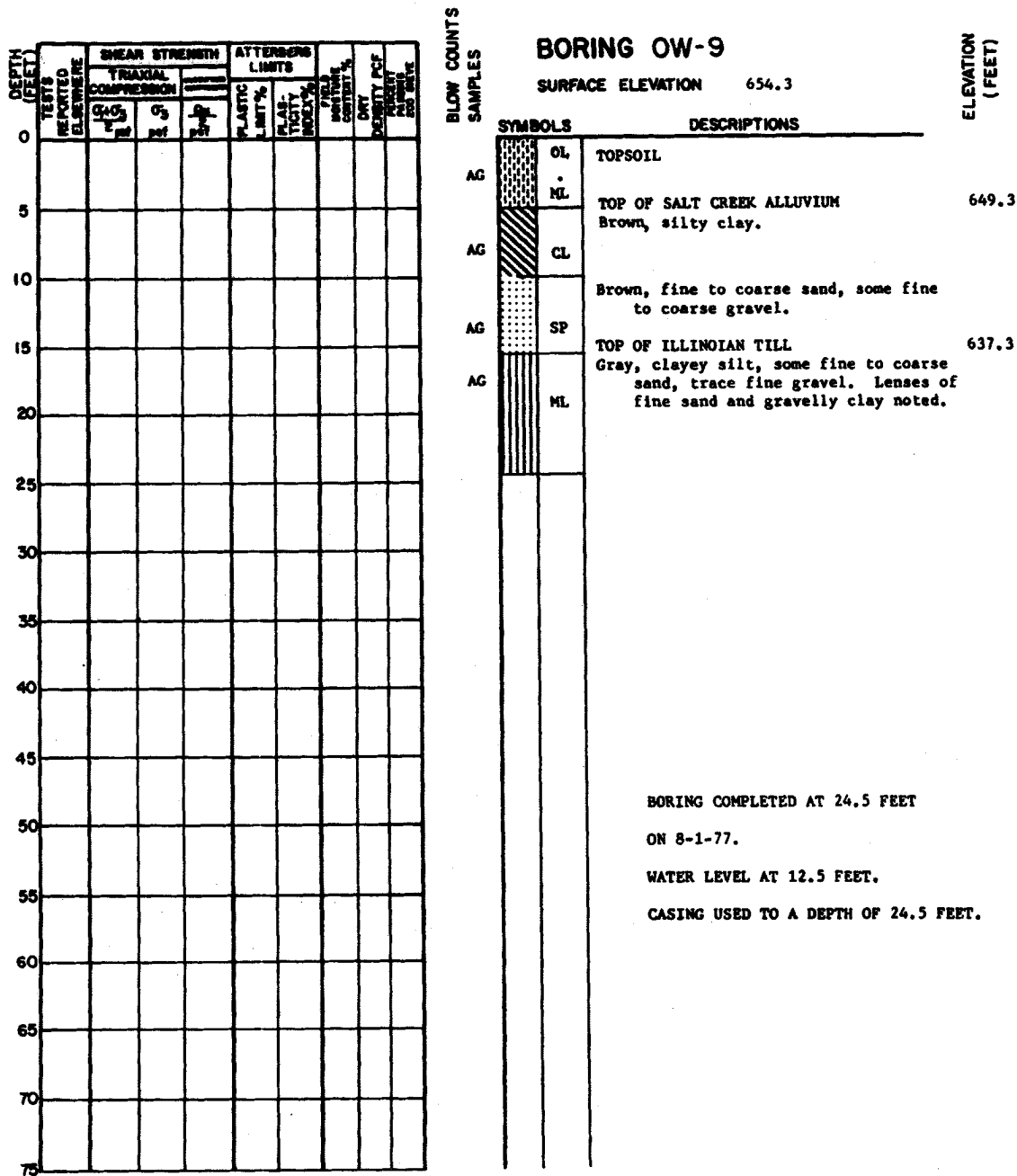
#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-260

LOG OF BORING OW-7

PIEZOMETER INSTALLED ON 5/12/76. A 2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 3 FEET PERFORATED WAS PLACED TO ELEVATION 677.2. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 677.2 TO 701.2; BENTONITE SEAL FROM ELEVATION 701.2 TO 703.2; AND CEMENT GROUT FROM ELEVATION 703.2 TO 719.2.

LOG OF BORING OW-8



PIEZOMETER INSTALLED ON 8-1-77. A 1½ INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 5 FEET SLOTTED WAS PLACED TO ELEVATION 629.8. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 629.8 TO 637.8; BENTONITE SEAL FROM ELEVATION 637.8 TO 639.8; AND GRANULAR BACKFILL FROM ELEVATION 639.8 TO 654.3.

**NOTES:**

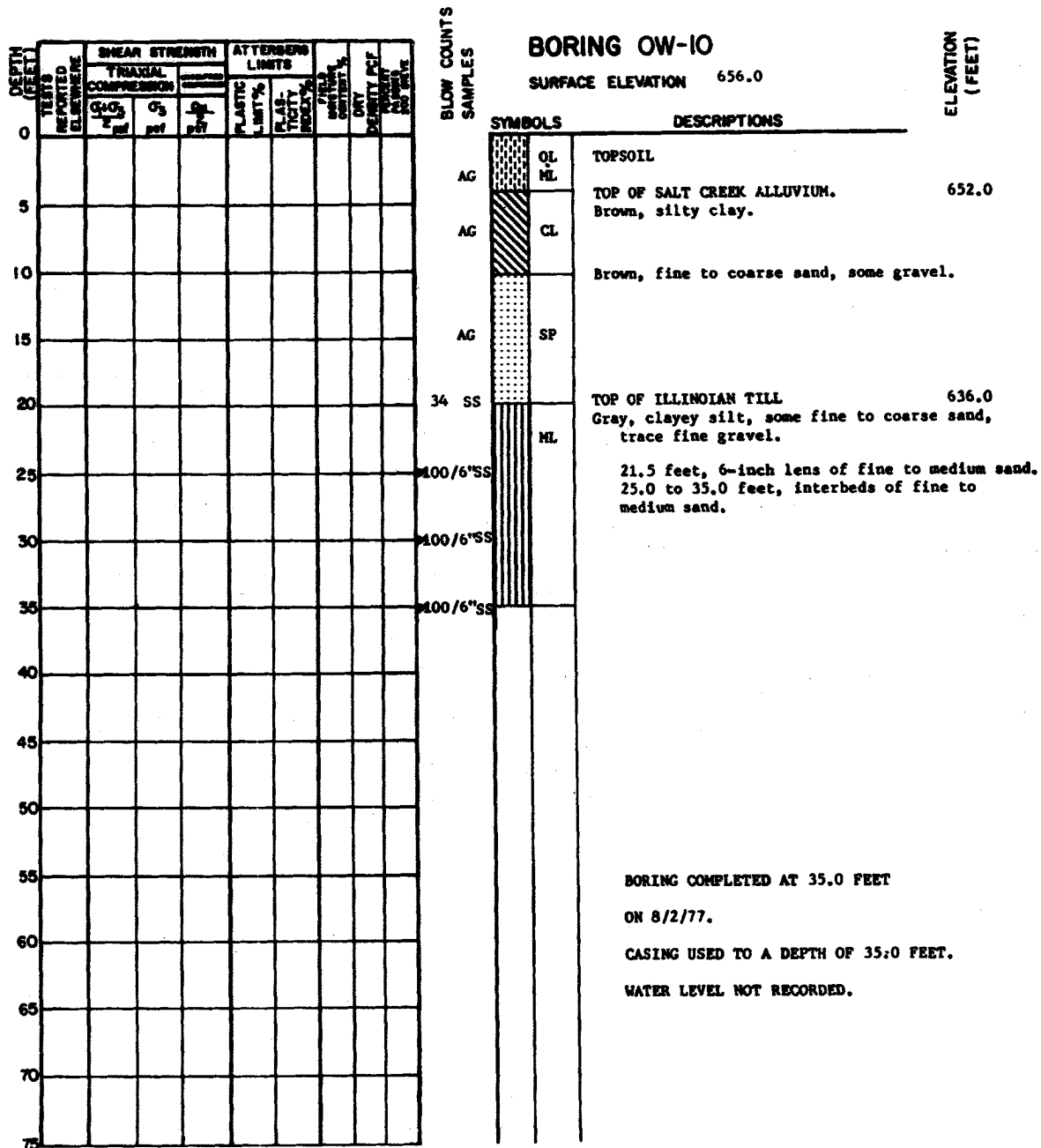
1. LOGGED BY: SOIL TESTING SERVICES.
2. DRILLED BY: SOIL TESTING SERVICES

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-262

LOG OF BORING OW-9





PIEZOMETER INSTALLED ON 8/2/77. A 1½ INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 5 FEET SLOTTED WAS PLACED TO ELEVATION 621.0. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 621.0 TO 629.0; BENTONITE SEAL FROM ELEVATION 629.0 TO 631.0; AND GRANULAR BACKFILL FROM ELEVATION 631.0 TO 656.0.

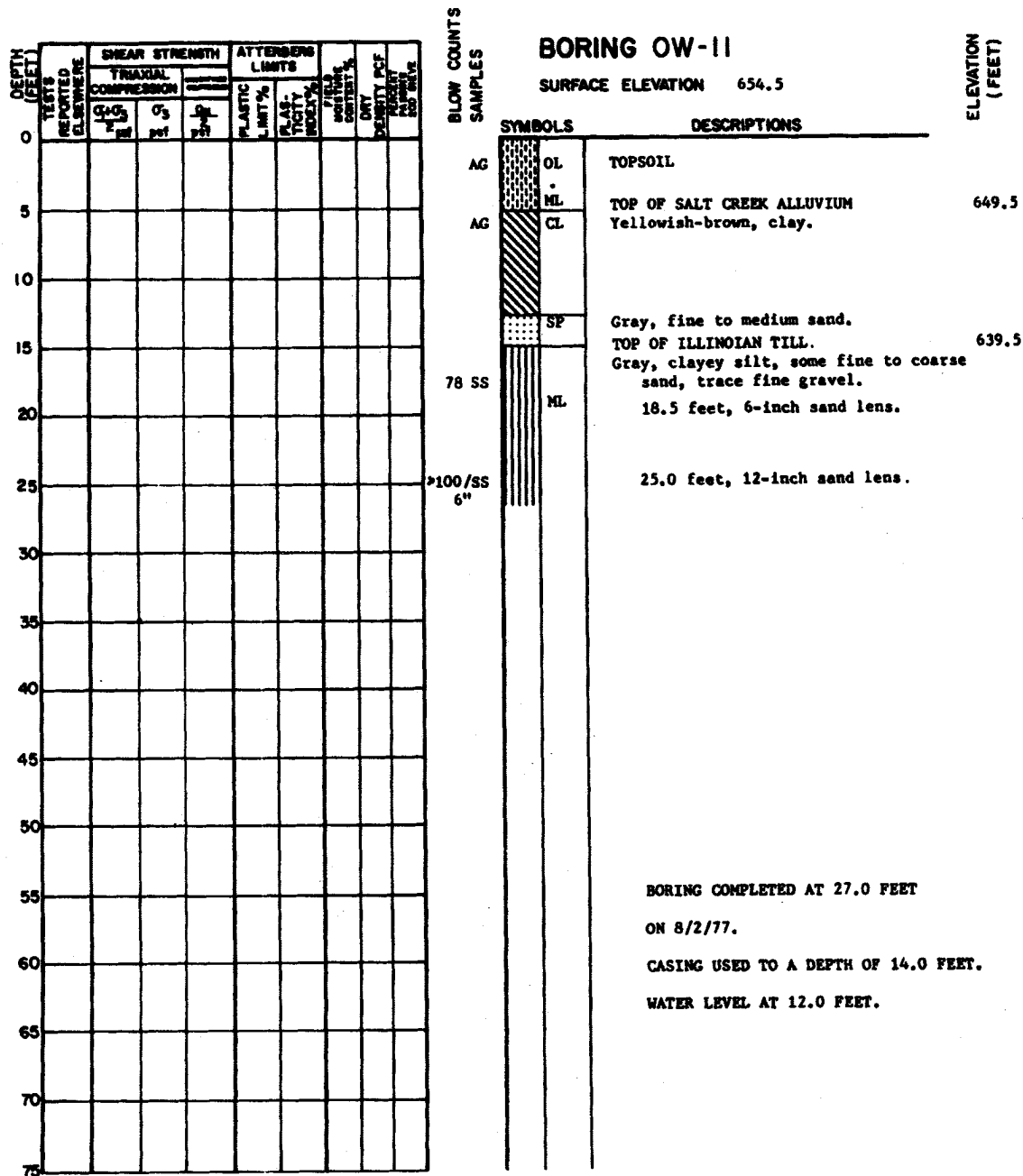
**NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: SOIL TESTING SERVICES.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-263

LOG OF BORING OW-10



PIEZOMETER INSTALLED ON 8/2/77. A 1½ INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 5 FEET SLOTTED WAS PLACED TO ELEVATION 627.5. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 627.5 TO 635.5; BENTONITE SEAL FROM ELEVATION 635.5 TO 637.5; AND GRANULAR BACKFILL FROM ELEVATION 637.5 TO 654.5.

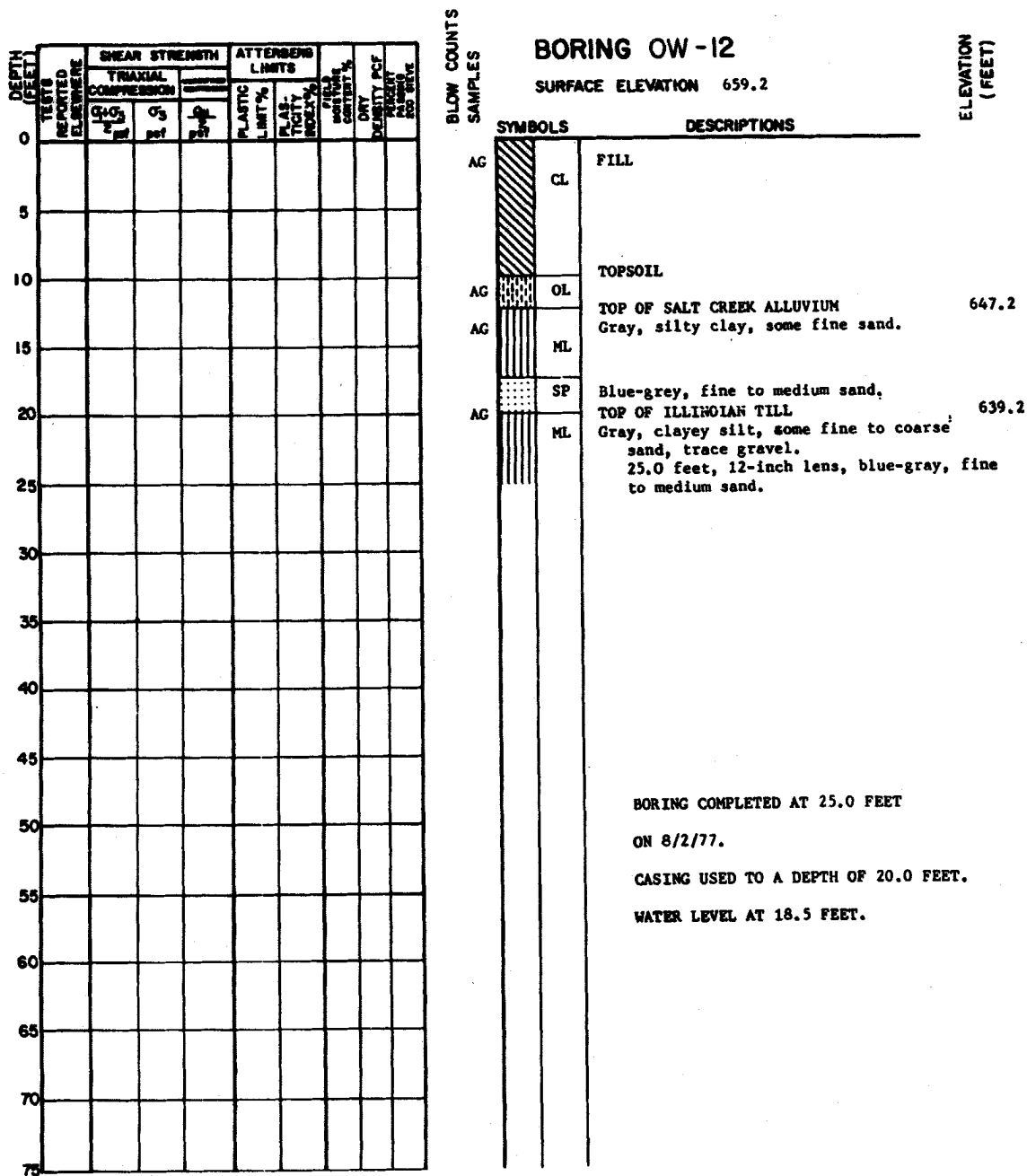
NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: SOIL TESTING SERVICES.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-264

LOG OF BORING OW-11



PIEZOMETER INSTALLED ON 8/2/77. A 1 1/2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 5 FEET SLOTTED WAS PLACED TO ELEVATION 634.2. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 634.2 TO 642.2; BENTONITE SEAL FROM ELEVATION 642.2 TO 644.2; AND GRANULAR BACKFILL FROM ELEVATION 644.2 TO 659.2.

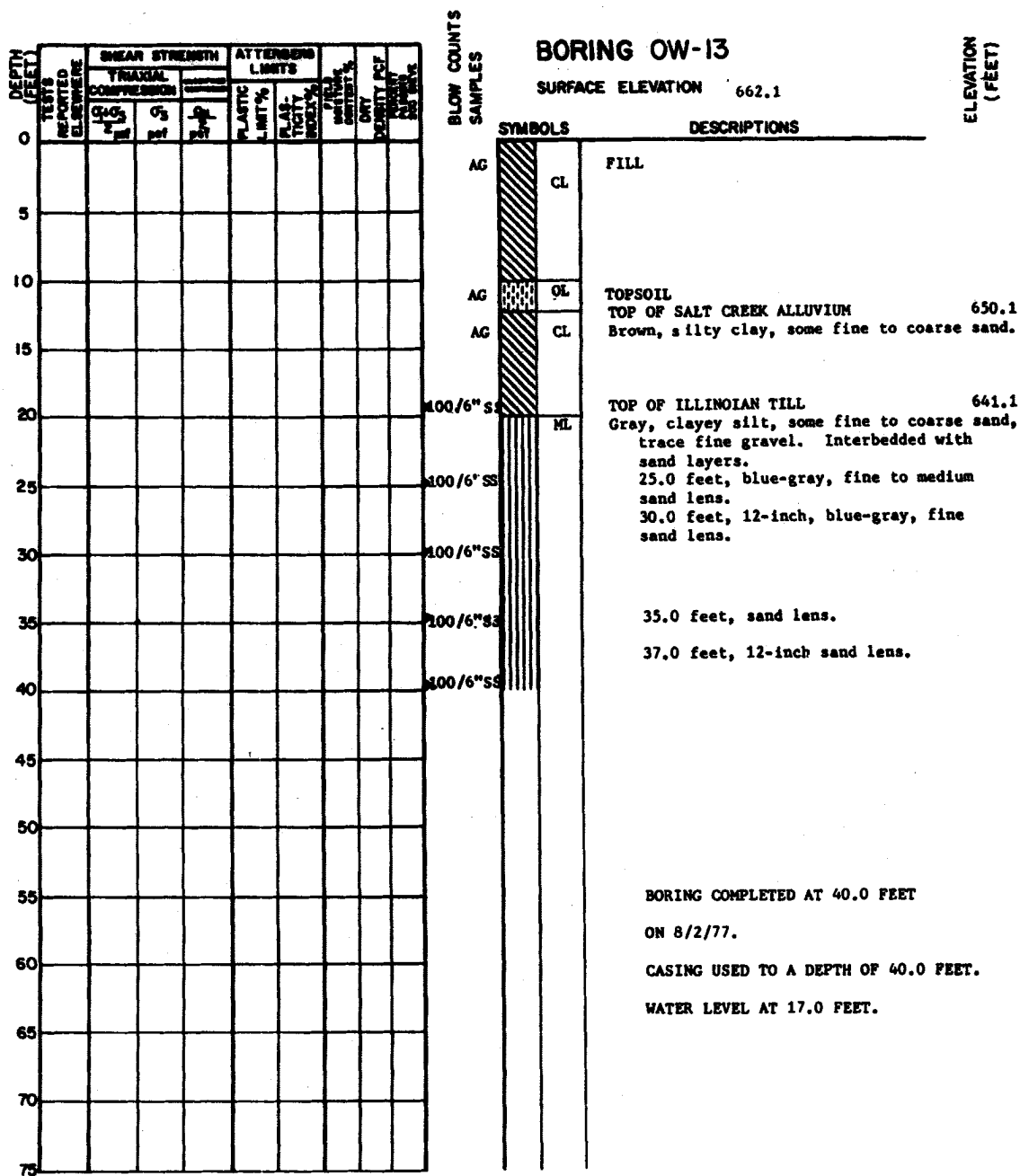
#### NOTES:

1. LOGGED BY: SARGENT & LUND.
2. DRILLED BY: SOIL TESTING SERVICES.

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-265

LOG OF BORING OW-12



PIEZOMETER INSTALLED ON 8/2/77. A 1½ INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 5 FEET SLOTTED WAS PLACED AT ELEVATION 622.1. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 622.1 TO 630.1; BENTONITE SEAL FROM ELEVATION 630.1 TO 632.1; AND GRANULAR BACKFILL FROM ELEVATION 632.1 TO 662.1.

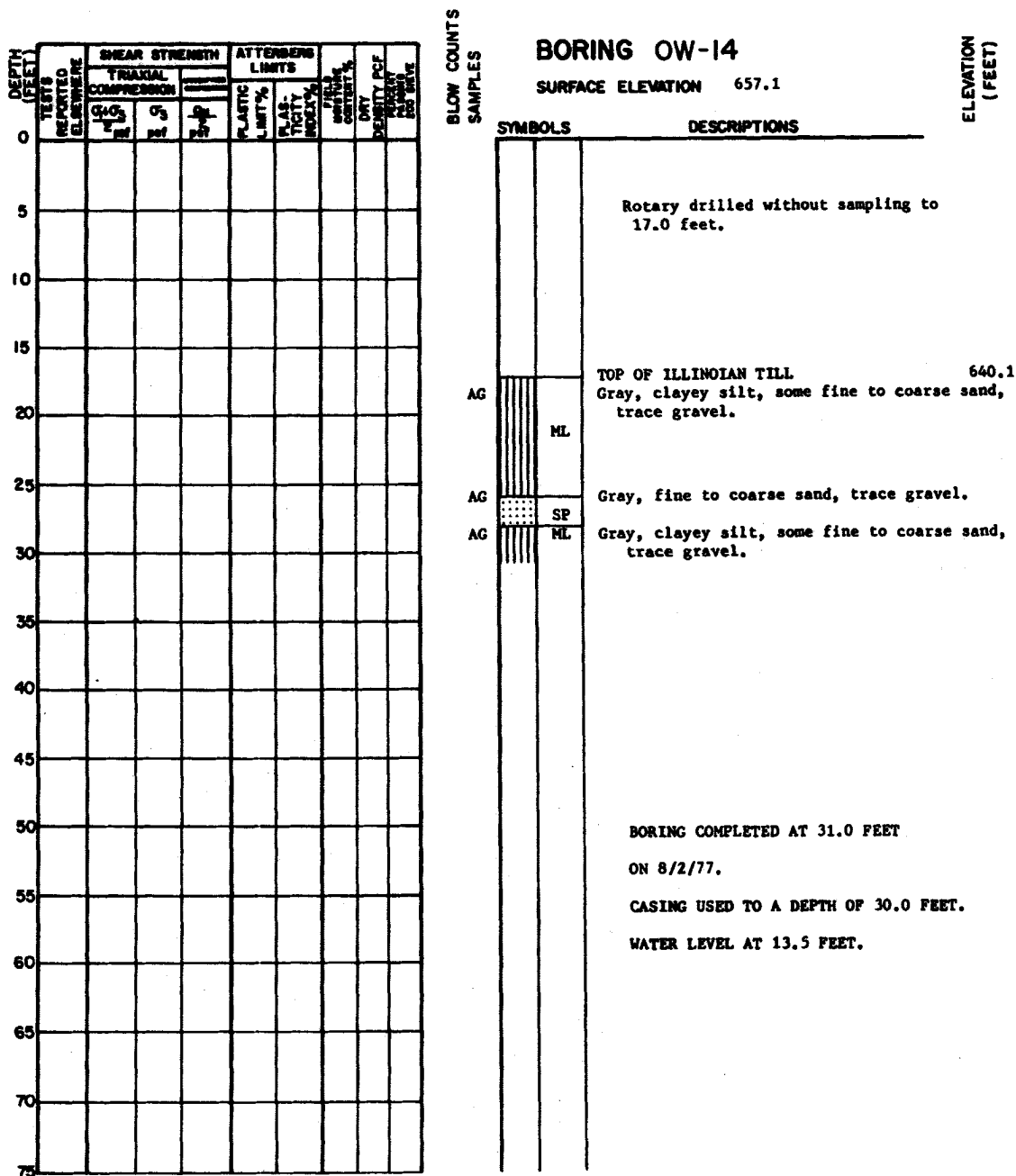
NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: SOIL TESTING SERVICES.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-266

LOG OF BORING OW-13



PIEZOMETER INSTALLED ON 8/2/77. A 1 1/2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 5 FEET SLOTTED WAS PLACED FROM ELEVATION 626.1. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 626.1 TO 634.1; BENTONITE SEAL FROM ELEVATION 634.1 TO 636.1; AND GRANULAR BACKFILL FROM ELEVATION 636.1 TO 657.1.

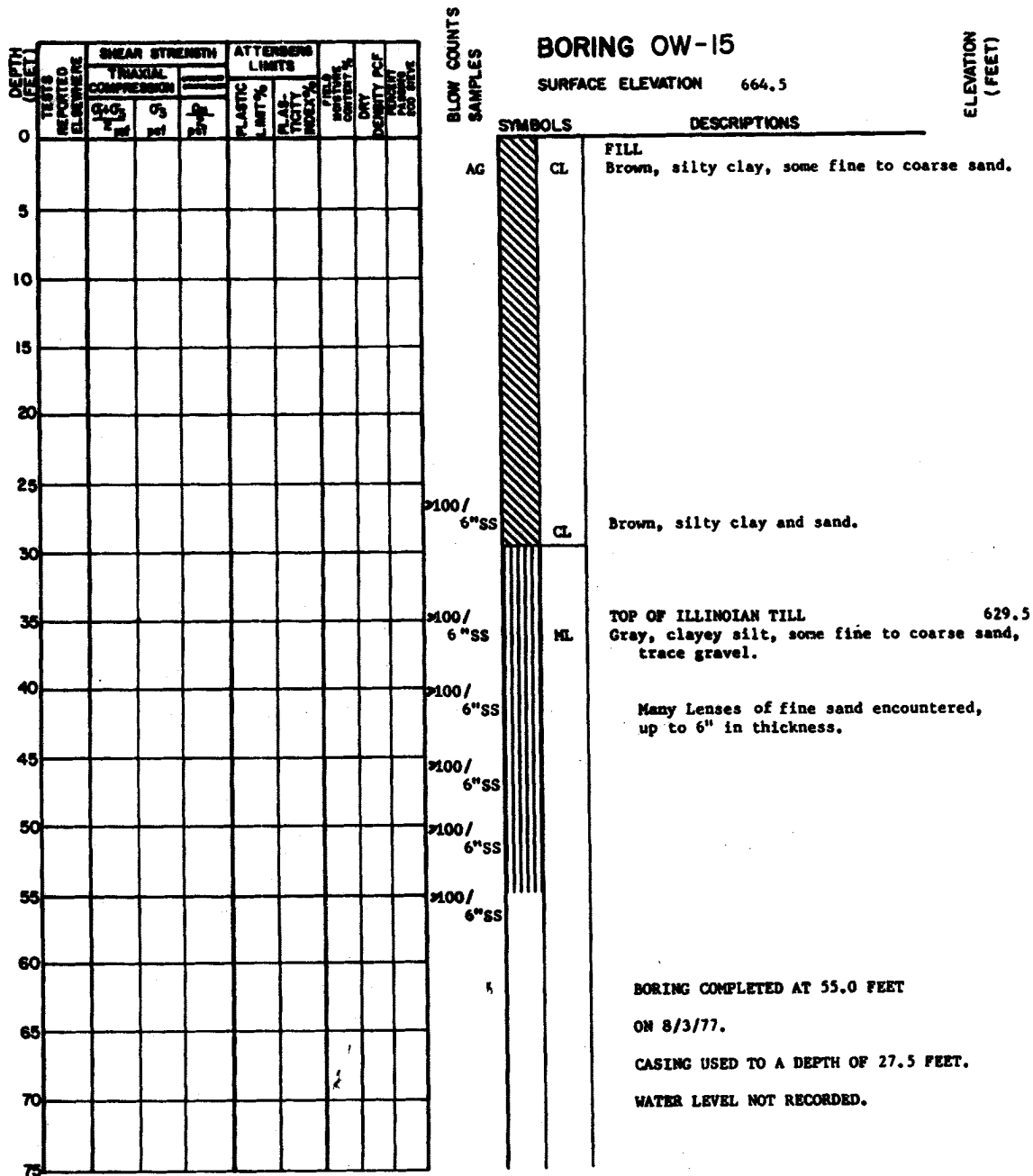
**NOTES:**

1. LOGGED BY SARGENT & LUNDY.
2. DRILLED BY: SOIL TESTING SERVICES.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-267

LOG OF BORING OW-14



PIEZOMETER INSTALLED ON 8/3/77. A 1 1/2 INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 5 FEET SLOTTED WAS PLACED TO ELEVATION 609.5. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 609.5 TO 617.5; BENTONITE SEAL FROM ELEVATION 617.5 TO 619.5; AND GRANULAR BACKFILL FROM ELEVATION 619.5 TO 664.5.

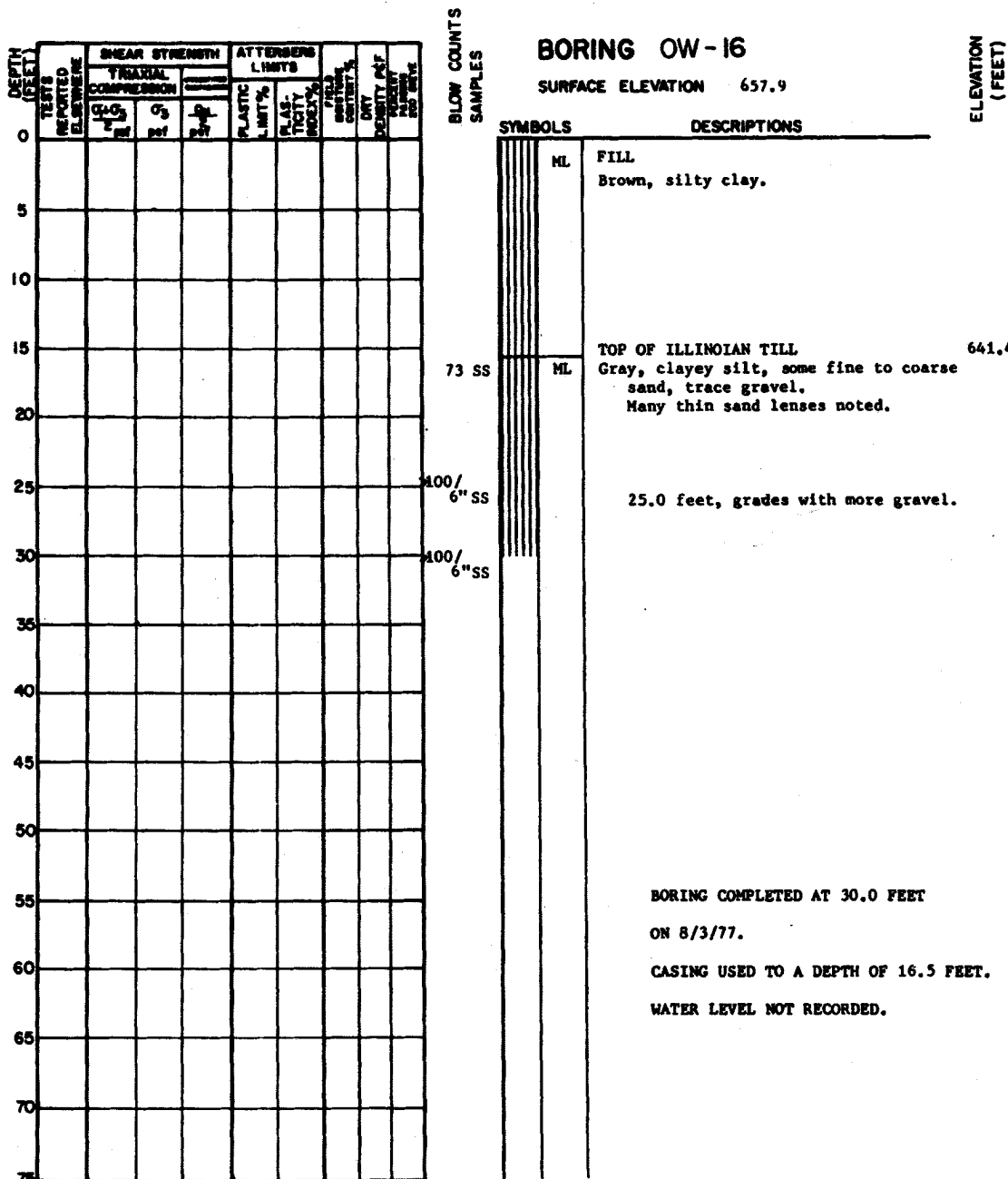
**NOTES:**

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: SOIL TESTING SERVICES

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-268

LOG OF BORING OW-15



PIEZOMETER INSTALLED ON 8/3/77. A 1½ INCH PVC  
 PIPE WITH THE LOWER END PLUGGED AND THE LOWER  
 5 FEET SLOTTED WAS PLACED AT ELEVATION 627.9  
 GRANULAR BACKFILL WAS PLACED FROM ELEVATION  
 627.9 TO 635.9; BENTONITE SEAL FROM ELEVATION  
 635.9 TO 637.9; AND GRANULAR BACKFILL FROM  
 ELEVATION 637.9 TO 657.9.

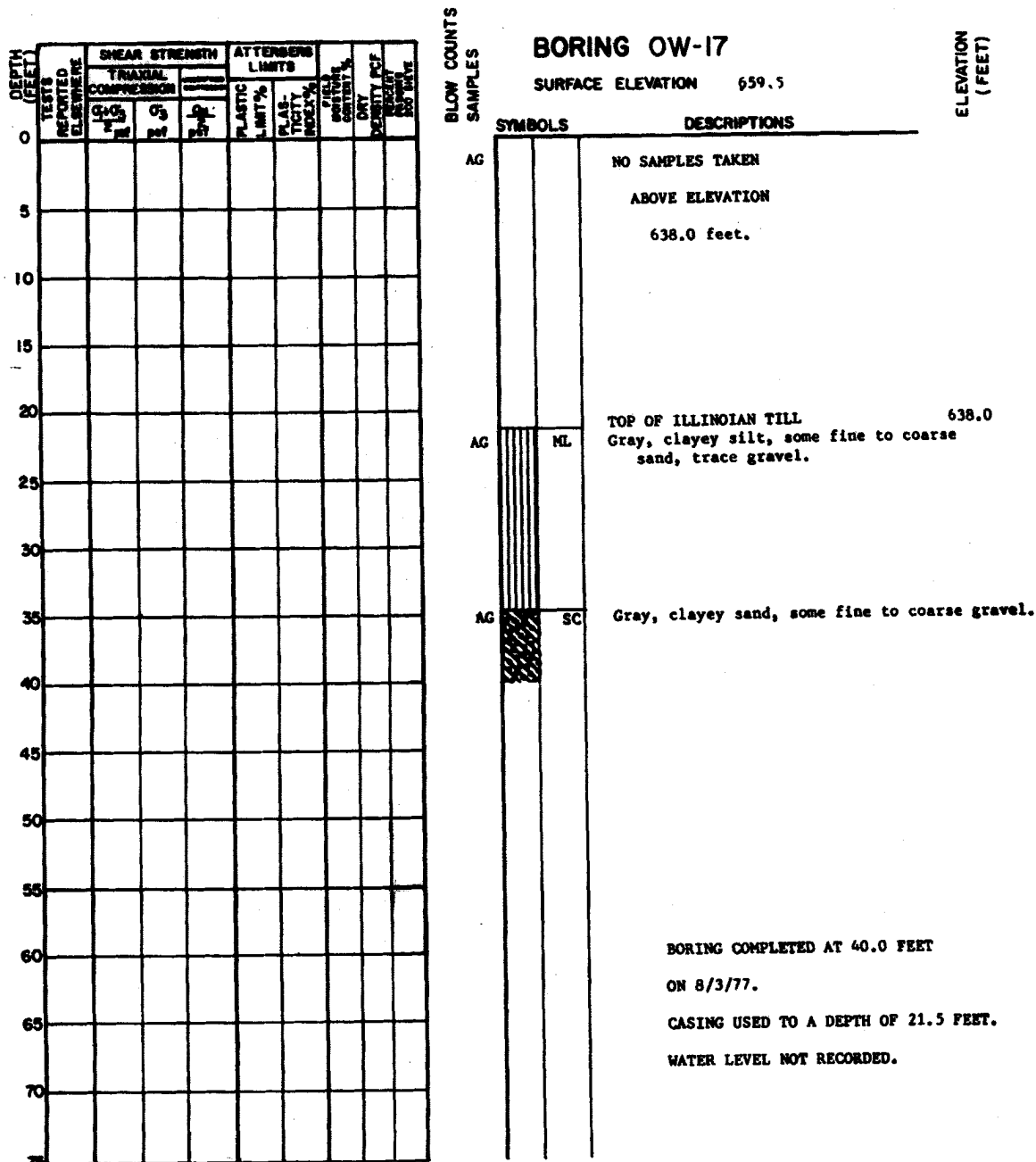
NOTES:

1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: SOIL TESTING SERVICES

CLINTON POWER STATION  
 UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-269

LOG OF BORING OW-16



PIEZOMETER INSTALLED ON 8/3/77. A 1½ INCH PVC PIPE WITH THE LOWER END PLUGGED AND THE LOWER 5 FEET SLOTTED WAS PLACED TO ELEVATION 619.5. GRANULAR BACKFILL WAS PLACED FROM ELEVATION 619.5 TO 627.5; BENTONITE SEAL FROM ELEVATION 627.5 TO 629.5; AND GRANULAR BACKFILL FROM ELEVATION 629.5 TO 659.5.

# NOTES:

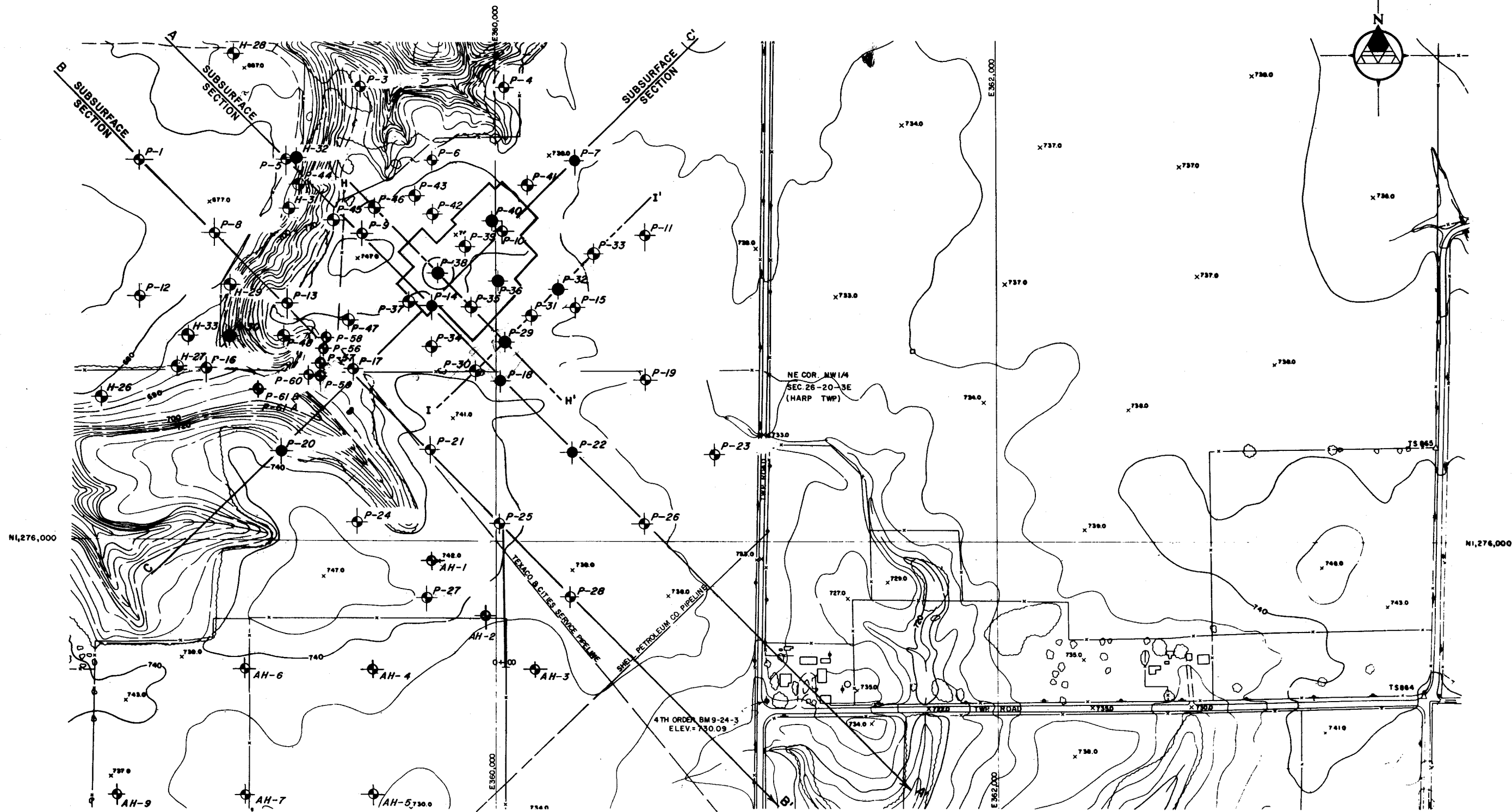
1. LOGGED BY: SARGENT & LUNDY.
2. DRILLED BY: SOIL TESTING SERVICES.

## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-270

LOG OF BORING OW-17



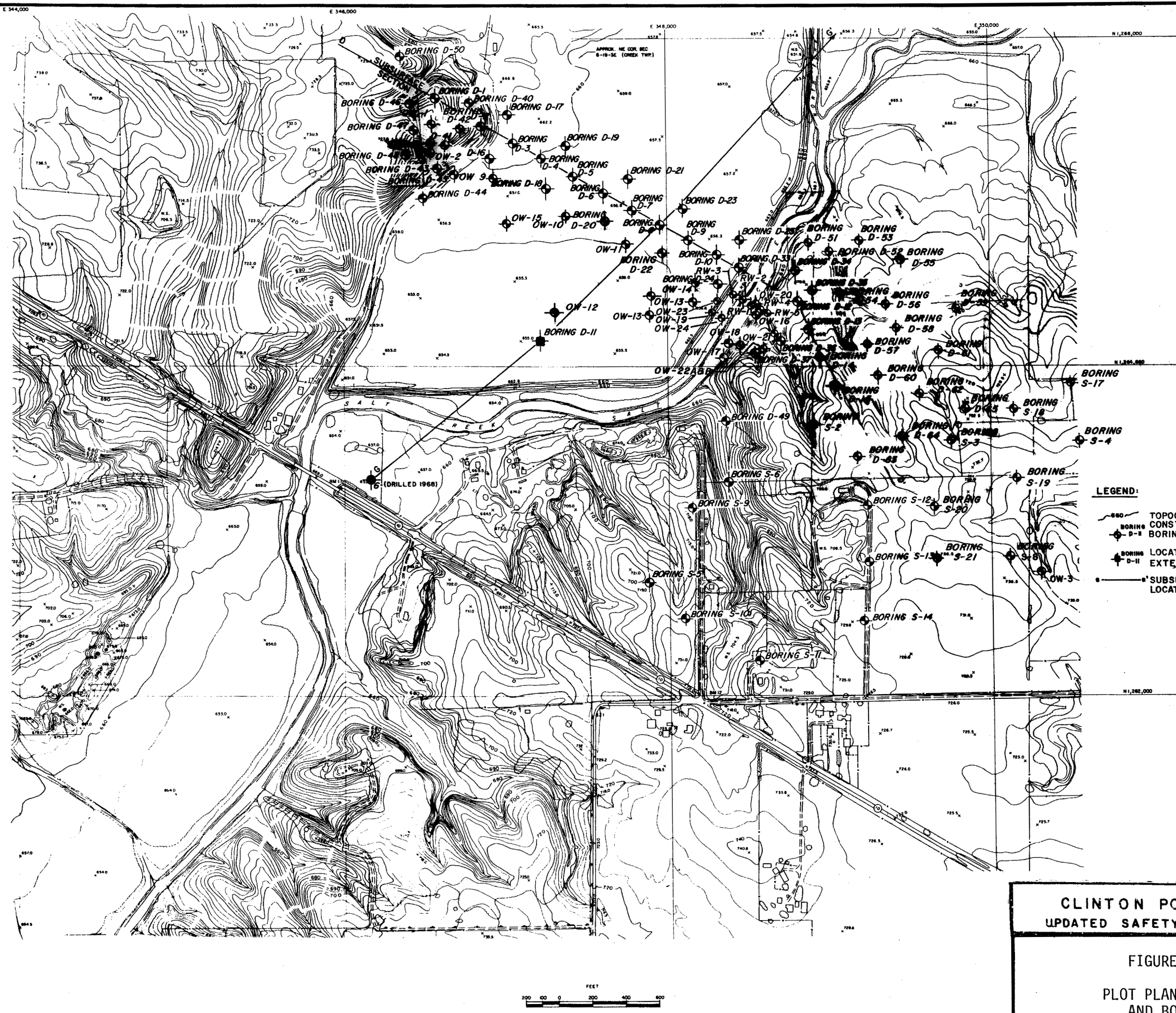


LEGEND:

- 740 — TOPOGRAPHIC CONTOURS
- P-1 BORING LOCATION
- LOCATION OF BORING THAT EXTENDED TO BEDROCK.
- H — H' SUBSURFACE SECTION LOCATION

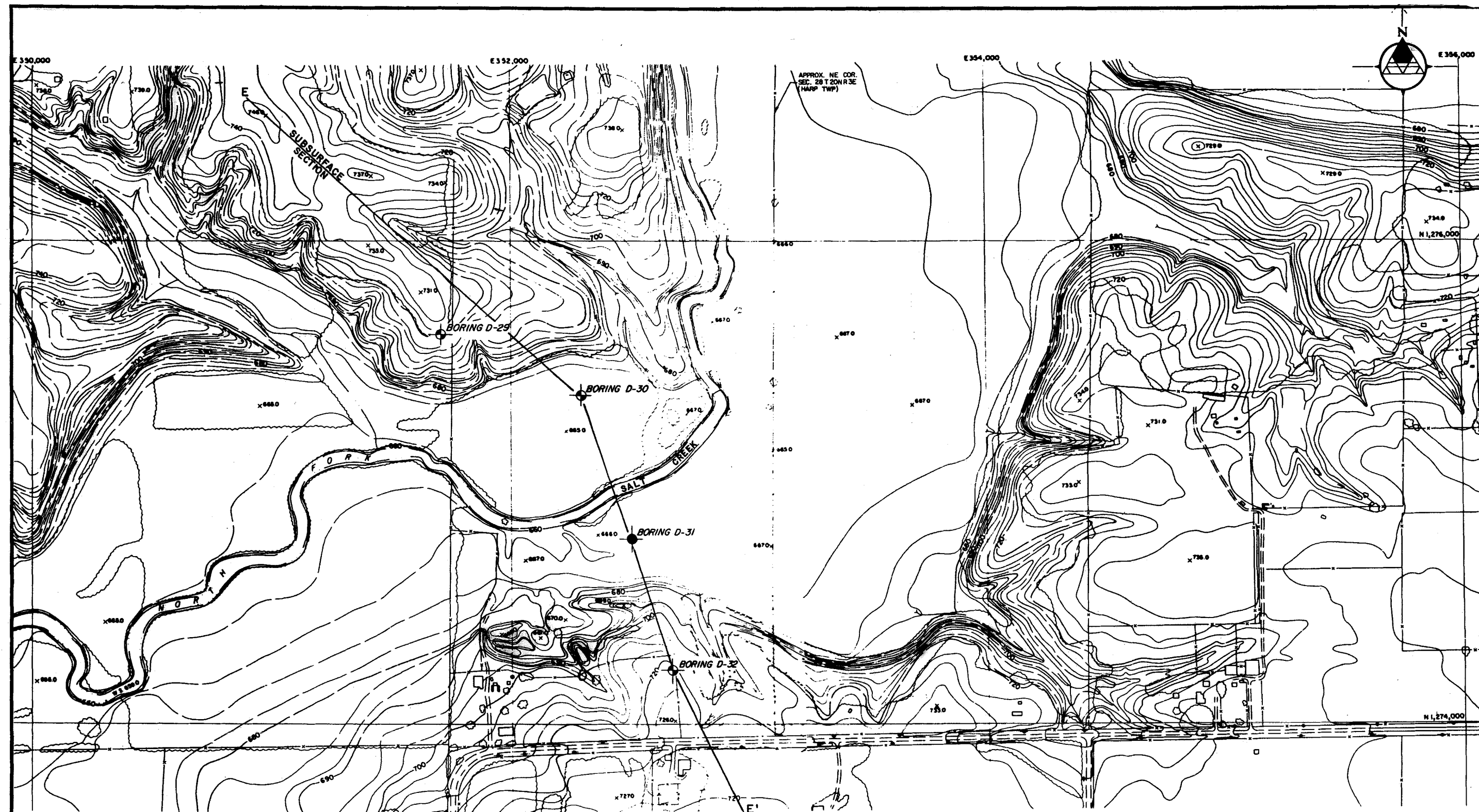
NOTES:

1. BORING LOCATIONS 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.
2. BORING LOCATIONS 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 31



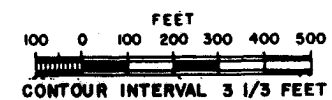
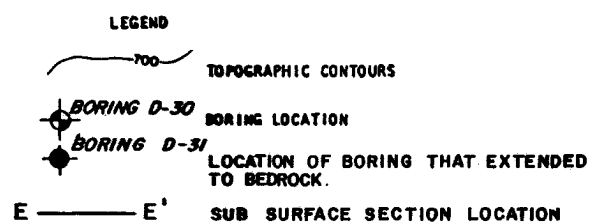
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-272  
PLOT PLAN - DAM SITE  
AND BORROW AREA



**NOTES:**

1. REFER TO FIGURE 2.5-278 FOR SUBSURFACE SECTION.
2. REFER TO FIGURES 2.5-94 THROUGH 2.5-97 FOR LOG OF BORINGS.



**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-273  
SECTION E-E' ALONG NORTH FORK  
OF SALT CREEK

TIME STRATIGRAPHY			STRATIGRAPHIC UNITS				
			FSAR		PSAR	BORING LOGS	
Quaternary System	Pleistocene Series	Holocene Stage		Cahokia Alluvium	Peyton Colluvium	Salt Creek Alluvium or Flood Plain Alluvium and Recent Channel Deposits	Salt Creek Alluvium
		Wisconsinan Stage	Valderan Substage	Richland Loess	Henry Formation	Loess	Loess
			Twocreekan Substage				
			Woodfordian Substage	Wedron Formation	Wisconsinan Till or Wisconsinan Glacial Till	Wisconsinan Glacial Till	
			Farmdalian Substage	Robein Silt	Interglacial Zone or Sangamon Interglacial Zone or Sangamon Soil Interval	Interglacial Zone	
			Altonian Substage				
		Sangamonian Stage	weathered Glasford Formation				
		Illinoian Stage	unaltered Glasford Formation	Illinoian Till or Illinoian Glacial Till	Illinoian Glacial Till		
		Yarmouthian Stage	Banner Formation	Lacustrine Deposit	Lacustrine Deposit		
		Kansan Stage		Pre-Illinoian Glacial Till or Kansan Till	Pre-Illinoian Glacial Till		
				Pre-Illinoian Alluvial and Lacustrine Deposit or Kansan Alluvial or Lacustrine Soils	Pre-Illinoian Lacustrine Deposit		
				Bedrock Valley Outwash Deposit or Mahomet Valley Deposit	Mahomet Bedrock Valley Deposit		
		Unconformity					
		Pennsylvanian System		Bedrock	Bedrock	Bedrock	

**NOTES:**

1. EXCAVATIONS FOR THE CLINTON POWER STATION DID NOT EXTEND BELOW THE UNALTERED GLASFORD FORMATION.
2. BORINGS FOR THE CLINTON POWER STATION DID NOT EXTEND INTO ROCKS OLDER THAN THOSE OF THE PENNSYLVANIAN SYSTEM.
3. ILLINOIAN-AGE TILL OF THE GLASFORD FORMATION WAS SUBJECTED TO A SIGNIFICANT PERIOD OF WEATHERING DURING THE SANGAMONIAN STAGE AND ALTONIAN SUBSTAGE.
4. DEPOSITS OF CAHOKIA ALLUVIUM AND HENRY FORMATION WERE NOT DIFFERENTIATED.
5. THE HOLOCENE STAGE IS REPRESENTED BY A SIGNIFICANT PERIOD OF WEATHERING AND DEVELOPMENT OF AGRICULTURAL SOIL PROFILES (MODERN SOIL).
6. VERTICAL SCALE DOES NOT REPRESENT EITHER RELATIVE THICKNESS OF STRATIGRAPHIC UNITS OR RELATIVE DURATION OF TIME INTERVAL.

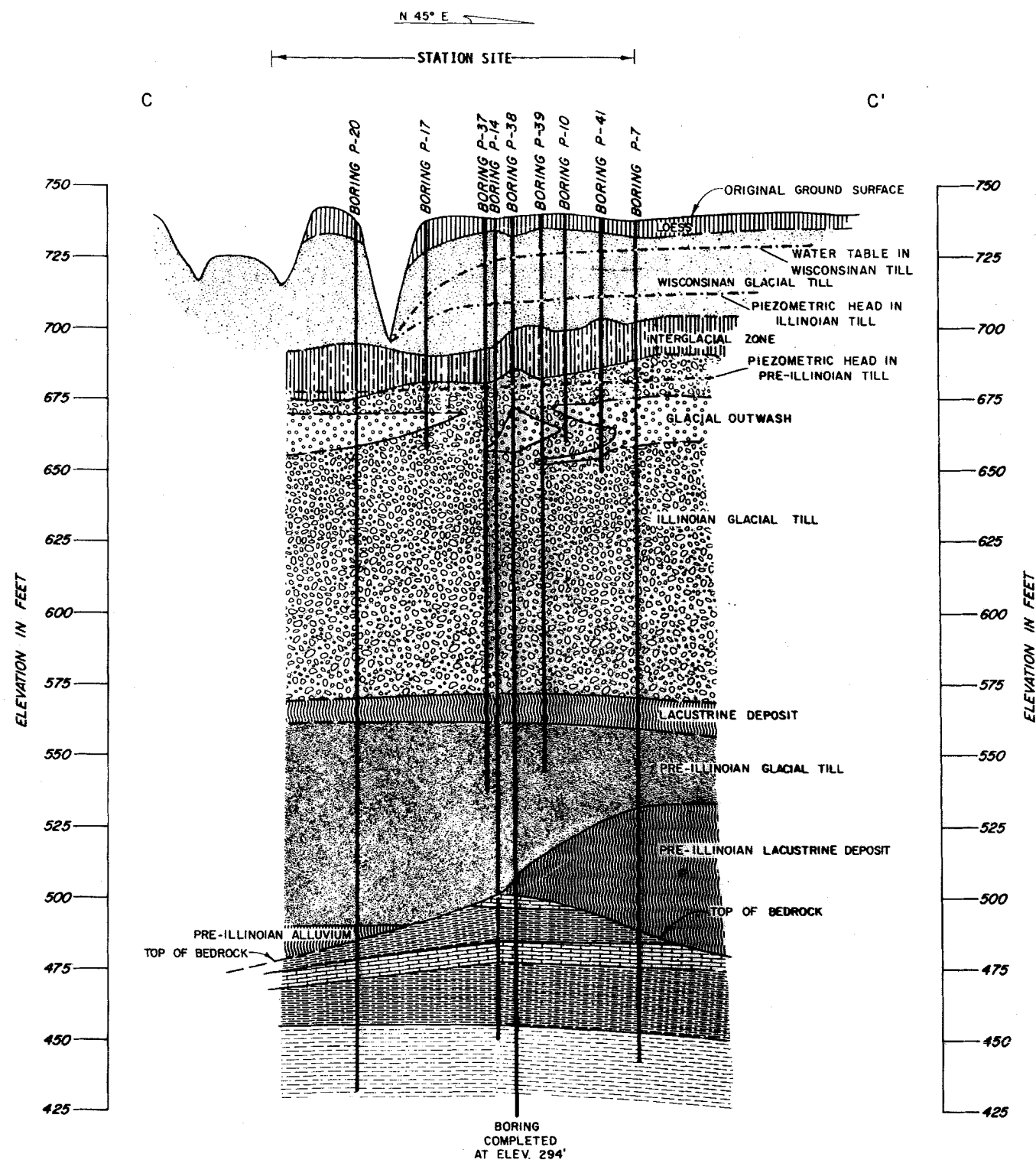
**CLINTON POWER STATION  
FINAL SAFETY ANALYSIS REPORT**

FIGURE 2.5-274

COMPARISON OF TERMINOLOGY USED FOR THE  
FSAR, PSAR AND BORING LOGS







# LEGEND

QUATERNARY	LOESS - BROWN TO MOTTLED BROWN AND GRAY CLAYEY SILT OR SILTY CLAY WITH TRACE OF FINE SAND; WEATHERED
WISCONSINAN	WISCONSINAN GLACIAL TILL - BROWNISH-GRAY TO GRAY CLAYEY SILT OR SILTY CLAY WITH SAND AND GRAVEL; CONTAINS (IRREGULAR AND DISCONTINUOUS LENSES OF SAND AND SILT THROUGHOUT (GLACIAL OUTWASH AND POSSIBLY LOCAL LACUSTRINE DEPOSITS)
ILLINOIAN	INTERGLACIAL ZONE - INCLUDES DARK GRAY TO GRAY ORGANIC CLAYEY SILT OR SILTY CLAY (COLLUVIAL SOILS); GREENISH TO BLuish-GRAY CLAYEY SILT WITH SAND AND GRAVEL (REWORKED AND WEATHERED ILLINOIAN GLACIAL TILL)
ILLINOIAN	ILLINOIAN GLACIAL TILL - BROWNISH-GRAY TO GRAY CLAYEY SILT WITH SAND AND GRAVEL TO VERY SANDY SILT OR SILTY SAND WITH SOME CLAY AND GRAVEL; INTERBEDDED OUTWASH DEPOSITS IN UPPER HORIZONS.
YAR-MOUTHIAN	LACUSTRINE DEPOSIT - BROWNISH-GRAY TO BLACK AND GRAY CLAYEY SILT TO SILT, ORGANIC IN ZONES; INCLUDES GREENISH TO BLuish-GRAY CLAYEY SILT WITH SAND AND GRAVEL (REWORKED AND WEATHERED PRE-ILLINOIAN GLACIAL TILL); ASSIGNMENT TO YAR-MOUTHIAN GLACIAL STAGE IS TENTATIVE
PRE-ILLINOIAN	PRE-ILLINOIAN GLACIAL TILL - GRAYISH-BROWN TO BROWN SILTY CLAY AND CLAYEY SILT WITH SOME SAND AND GRAVEL; BROWN COLOR AND RELATIVELY HIGH CLAY CONTENT IS CHARACTERISTIC; TENTATIVELY ASSIGNED TO KANSAN GLACIAL STAGE ON THE BASIS OF CLAY ANALYSIS BY ILLINOIS STATE GEOLOGICAL SURVEY
KANSAN	PRE-ILLINOIAN ALLUVIAL AND LACUSTRINE DEPOSIT - CONSISTS OF GRAYISH-BROWN, BROWN AND GREEN CLAYEY SILT AND SILTY CLAY WITH SAND AND SOME GRAVEL (REWORKED GLACIAL TILL) AND GRAY TO BROWN CLAYEY SILT WITH ORGANIC DEBRIS (LACUSTRINE OR LOW ENERGY ALLUVIAL DEPOSIT); INCLUDED AS PART OF THE MANOMET BEDROCK DEPOSIT IN AREAS WHERE IT IS UNDERLAIN BY SANDY OUTWASH DEPOSITS
PENNSYLVANIAN	BEDROCK - INTERBEDDED LAYERS OF LIMESTONE, SHALE AND SILTSTONE ASSIGNED TO THE MCLAUSSON GROUP, FOLDED TO FORMATION ON THE BASIS OF SPORE ANALYSIS OF THE COAL ENCOUNTERED IN BORING D-31
PENNSYLVANIAN	LIMESTONE - GREENISH-GRAY, GRAY AND BROWN, FINE TO COARSELY CRYSTALLINE, SILTY, THIN BEDDED TO MASSIVE, NUMEROUS SHALE PARTINGS IN ZONES, FOSSILIFEROUS
PENNSYLVANIAN	SHALE - GRAY TO DARK GRAY SHALE, CARBORACEOUS TO CALCAREOUS; CLAYEY IN ZONES, EXPANSIVE, SLICKENSIDES; OCCASIONAL CONCRETION
PENNSYLVANIAN	SILTSTONE - LIGHT GRAY SILTSTONE, MICACEOUS, FINE SANDY; CROSS-BEDDED IN ZONES; OCCASIONAL INTERBEDDED LAYER OF SILTY SANDSTONE

HORIZONTAL SCALE IN FEET

400 0 400 800

VERTICAL EXAGGERATION 16X

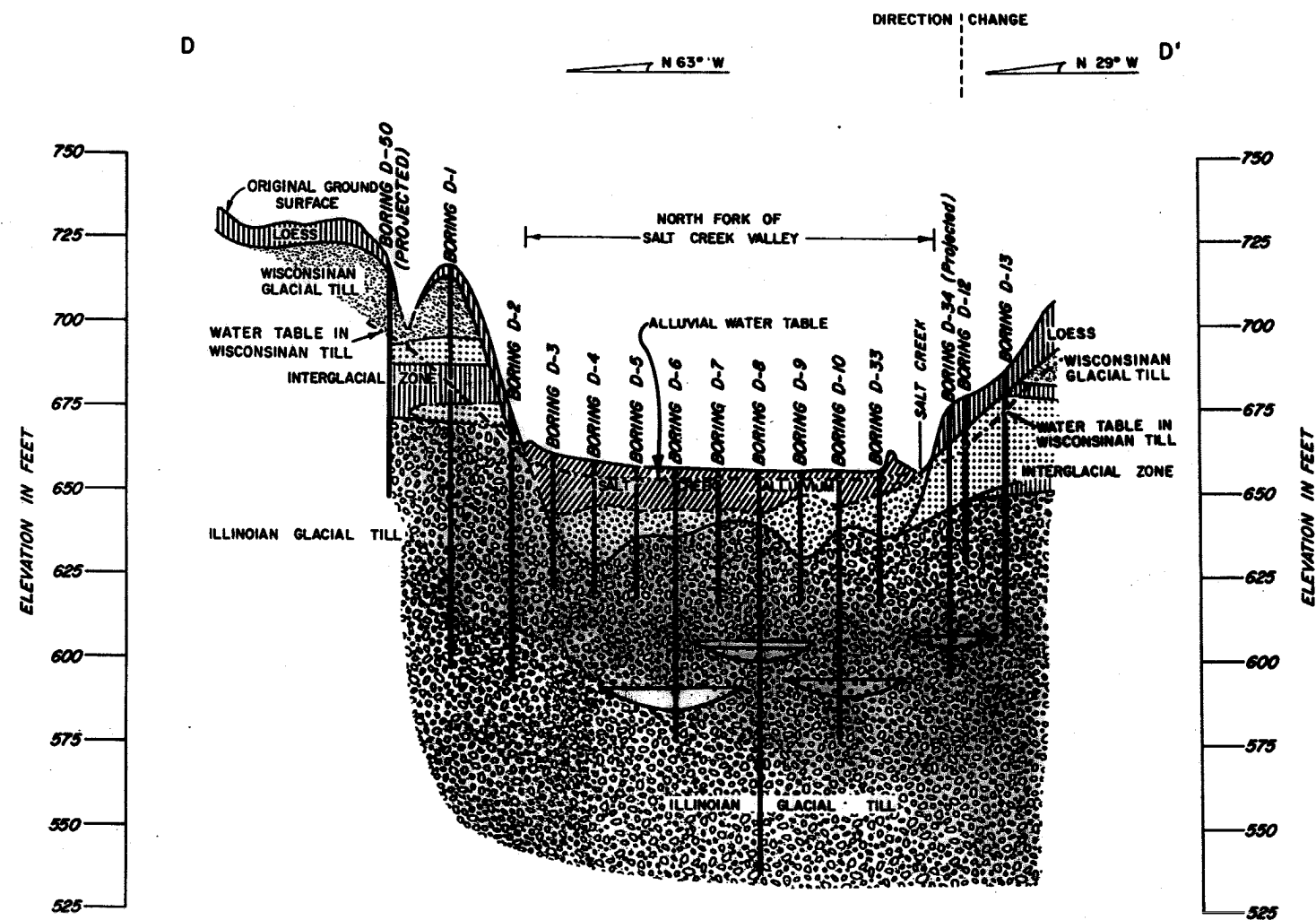
## NOTES:

- GROUNDWATER LEVELS INDICATED ON THE SUBSURFACE SECTION WERE OBTAINED BY INTERPOLATING BETWEEN BORINGS WITH PIEZOMETERS. INFORMATION ON ACTUAL GROUNDWATER LEVELS EXIST ONLY AT BORING LOCATIONS WITH PIEZOMETERS. IT IS POSSIBLE THAT GROUNDWATER LEVELS BETWEEN BORINGS WITH PIEZOMETERS MAY VARY FROM THOSE INDICATED.
- THE DEPTH AND THICKNESS OF SOIL AND ROCK STRATA INDICATED ON THE SUBSURFACE SECTION WERE OBTAINED BY INTERPOLATING BETWEEN BORINGS. INFORMATION ON ACTUAL SOIL AND ROCK CONDITIONS EXIST ONLY AT BORING LOCATIONS. IT IS POSSIBLE THAT SOIL AND ROCK CONDITIONS MAY VARY FROM THOSE INDICATED.
- THE DISCUSSION IN THE TEXT IS NECESSARY FOR PROPER UNDERSTANDING OF THE NATURE OF THE SUBSURFACE MATERIALS.
- ELEVATIONS REFER TO U.S.G.S. DATUM.
- REFER TO FIGURE 2.5-271 FOR LOCATION OF SUBSURFACE PROFILES.
- FOR DETAILED WATER LEVEL DATA REFER TO FIGURE 2.4-36.
- STRATIGRAPHIC NOMENCLATURE OF THE QUATERNARY DEPOSITS USED IN THE FSAR TEXT DIFFERS FROM THAT USED ON THIS FIGURE AND ON THE BORING LOGS, AND IS CROSS REFERENCED ON FIGURE 2.5-274.

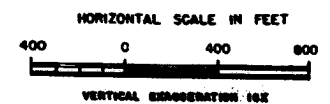
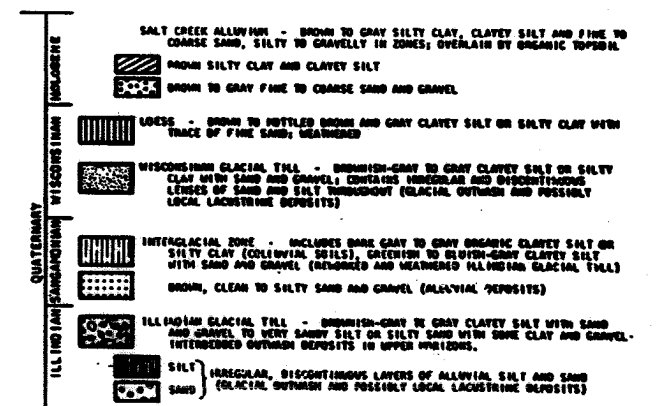
## CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-276

GEOLOGIC SECTION C-C' - STATION SITE



#### LEGEND



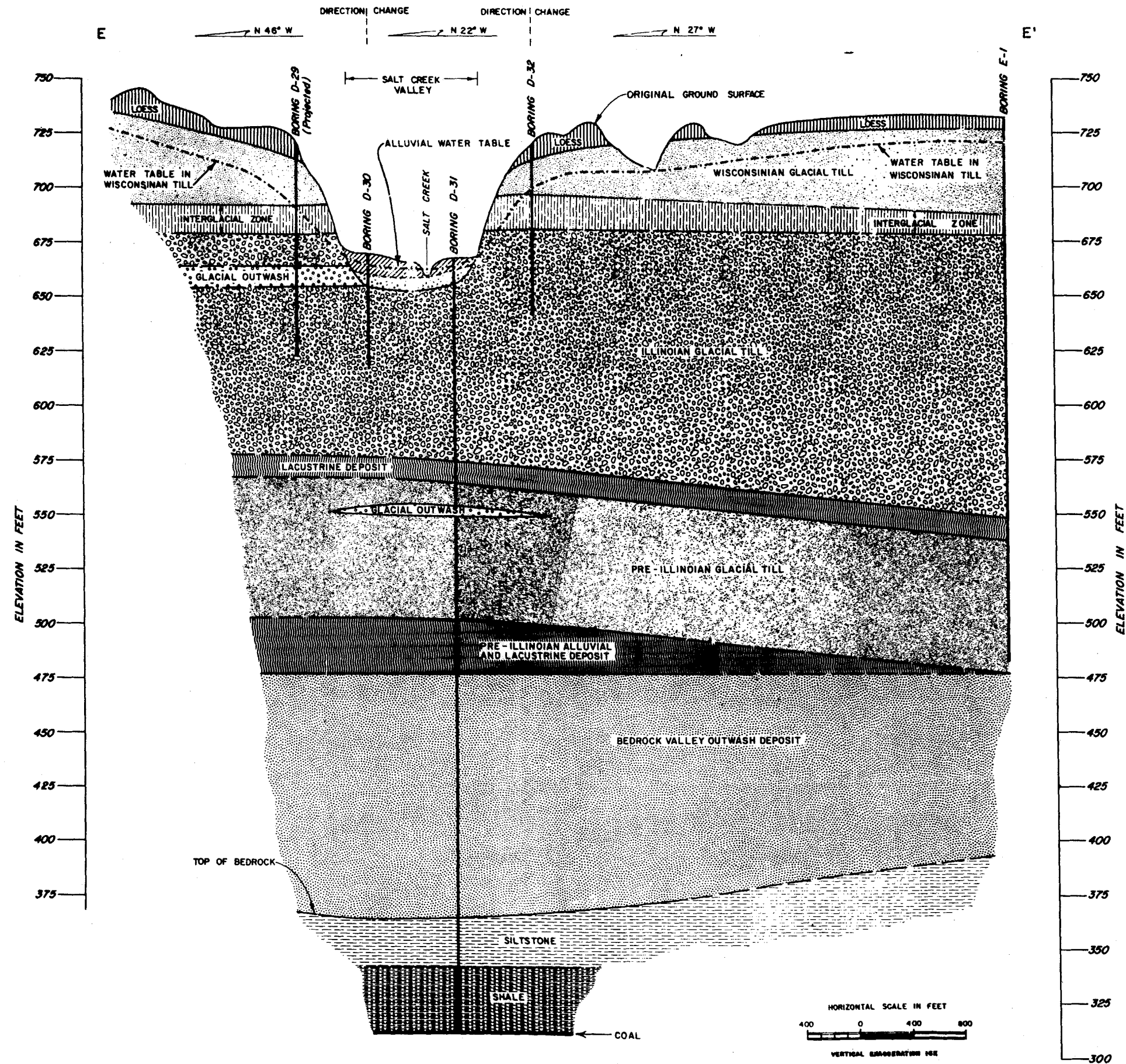
#### NOTES:

- GROUNDWATER LEVELS INDICATED ON THE SUBSURFACE SECTION WERE OBTAINED BY INTERPOLATING BETWEEN BORINGS WITH PIEZOMETERS. INFORMATION ON ACTUAL GROUNDWATER LEVELS EXIST ONLY AT BORING LOCATIONS WITH PIEZOMETERS. IT IS POSSIBLE THAT GROUNDWATER LEVELS BETWEEN BORINGS WITH PIEZOMETERS MAY VARY FROM THOSE INDICATED.
- THE DEPTH AND THICKNESS OF SOIL AND ROCK STRATA INDICATED ON THE SUBSURFACE SECTION WERE OBTAINED BY INTERPOLATING BETWEEN BORINGS. INFORMATION ON ACTUAL SOIL AND ROCK CONDITIONS EXIST ONLY AT BORING LOCATIONS. IT IS POSSIBLE THAT SOIL AND ROCK CONDITIONS MAY VARY FROM THOSE INDICATED.
- THE DISCUSSION IN THE TEXT IS NECESSARY FOR PROPER UNDERSTANDING OF THE NATURE OF THE SUBSURFACE MATERIALS.
- ELEVATIONS REFER TO U.S.G.S. DATUM.
- REFER TO FIGURE 2.5-272 FOR LOCATION OF SUBSURFACE PROFILES.
- FOR DETAILED WATER LEVEL DATA REFER TO FIGURES 2.4-37 AND 2.4-41.
- STRATIGRAPHIC NOMENCLATURE OF THE QUATERNARY DEPOSITS USED IN THE PSAR TEXT DIFFERS FROM THAT USED ON THIS FIGURE AND ON THE BORING LOGS, AND IS CROSS REFERENCED ON FIGURE 2.5-274.

### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-277

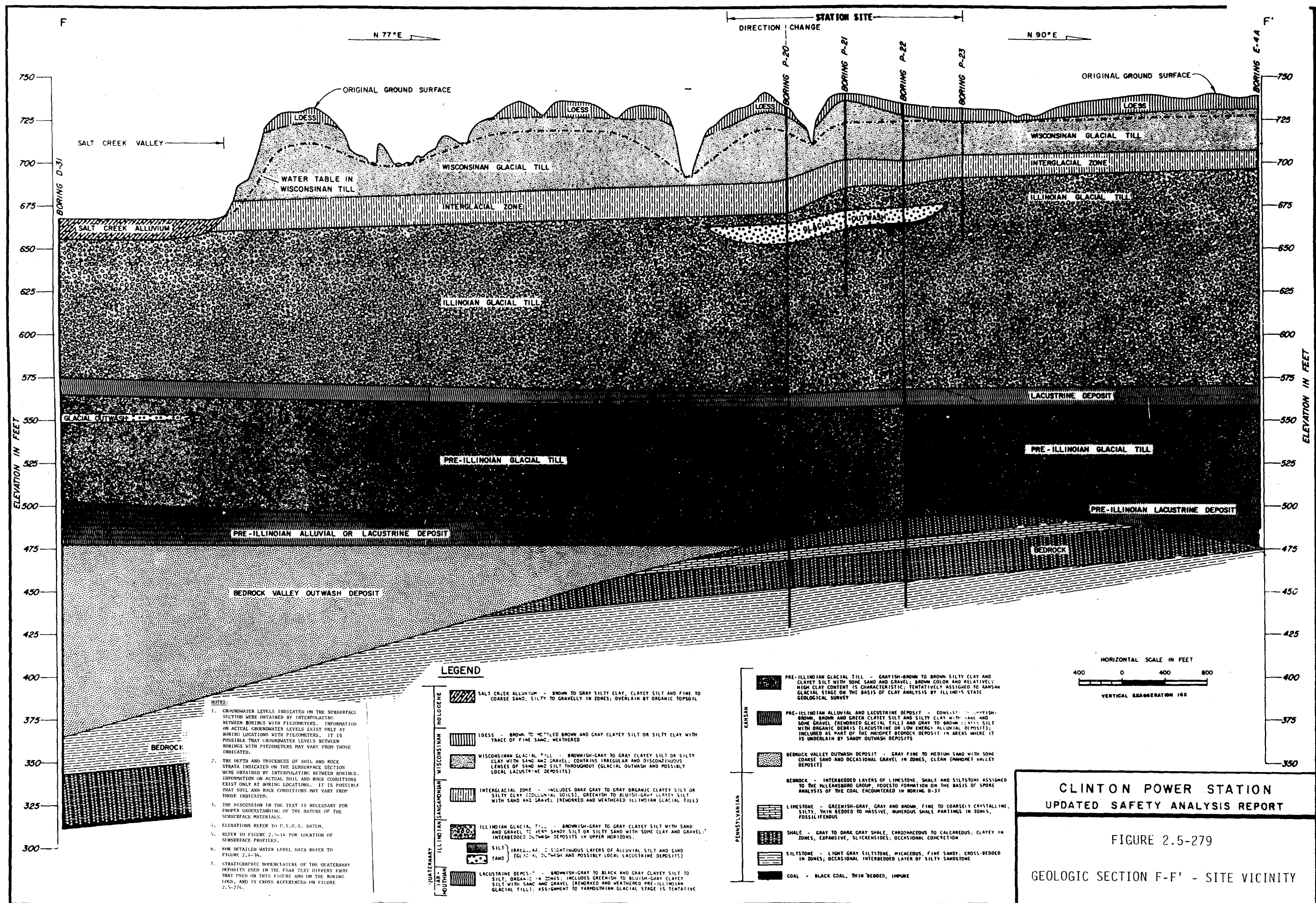
GEOLOGIC SECTION D-D' - DAM SITE

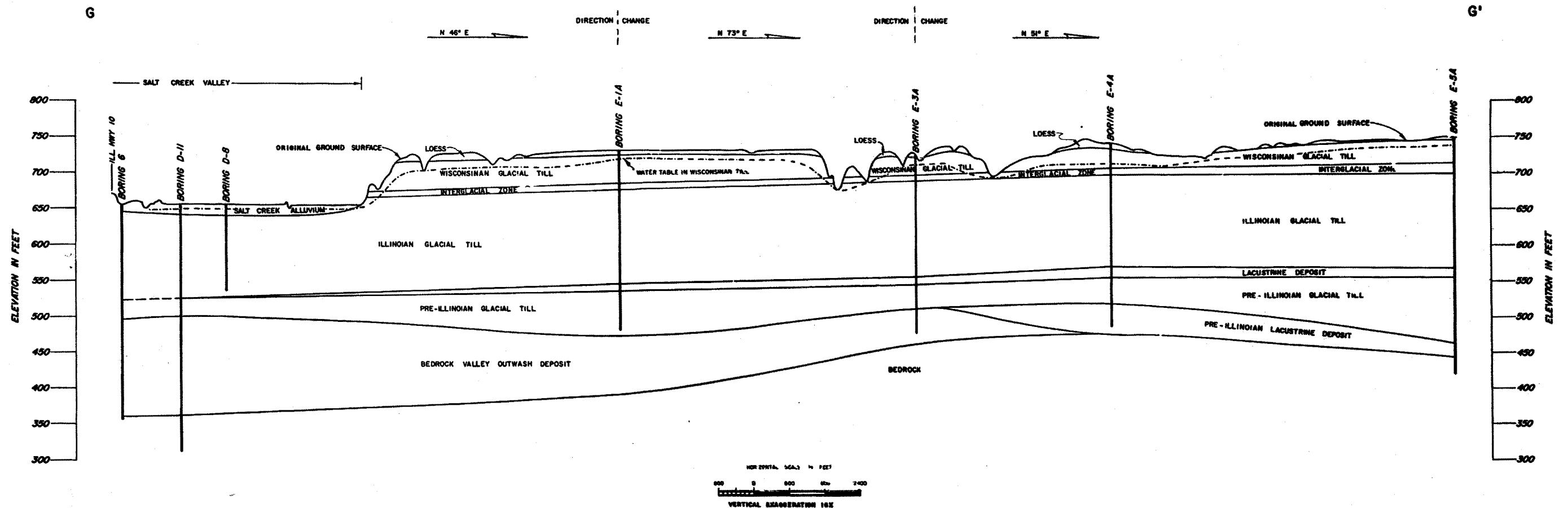


**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

**FIGURE 2.5-278  
GEOLOGIC SECTION E-E' - ALONG NORTH  
FORK OF SALT CREEK**







#### NOTES:

- GROUNDWATER LEVELS INDICATED ON THE SUBSURFACE SECTION WERE OBTAINED BY INTERPOLATING BETWEEN BORINGS WITH PIEZOMETERS. INFORMATION ON ACTUAL GROUNDWATER LEVELS EXIST ONLY AT BORING LOCATIONS WITH PIEZOMETERS. IT IS POSSIBLE THAT GROUNDWATER LEVELS BETWEEN BORINGS WITH PIEZOMETERS MAY VARY FROM THOSE INDICATED.
- THE DEPTH AND THICKNESS OF SOIL AND ROCK STRATA INDICATED ON THE SUBSURFACE SECTION WERE OBTAINED BY INTERPOLATING BETWEEN BORINGS. INFORMATION ON ACTUAL SOIL AND ROCK CONDITIONS EXIST ONLY AT BORING LOCATIONS. IT IS POSSIBLE THAT SOIL AND ROCK CONDITIONS MAY VARY FROM THOSE INDICATED.
- THE DISCUSSION IN THE TEXT IS NECESSARY FOR PROPER UNDERSTANDING OF THE NATURE OF THE SUBSURFACE MATERIALS.
- ELEVATIONS REFER TO U.S.G.S. DATUM.
- REFER TO FIGURE 2.5-14 FOR LOCATION OF SUBSURFACE PROFILES.
- FOR DETAILED WATER LEVEL DATA REFER TO FIGURES 2.4-37, 2.4-38, 2.4-41, 2.4-42 AND 2.4-43.
- STRATIGRAPHIC NOMENCLATURE OF THE QUATERNARY DEPOSITS USED IN THE FSAR TEXT DIFFERS FROM THAT USED ON THIS FIGURE AND ON THE BORING LOGS, AND IS CROSS REFERENCED ON FIGURE 2.5-274.

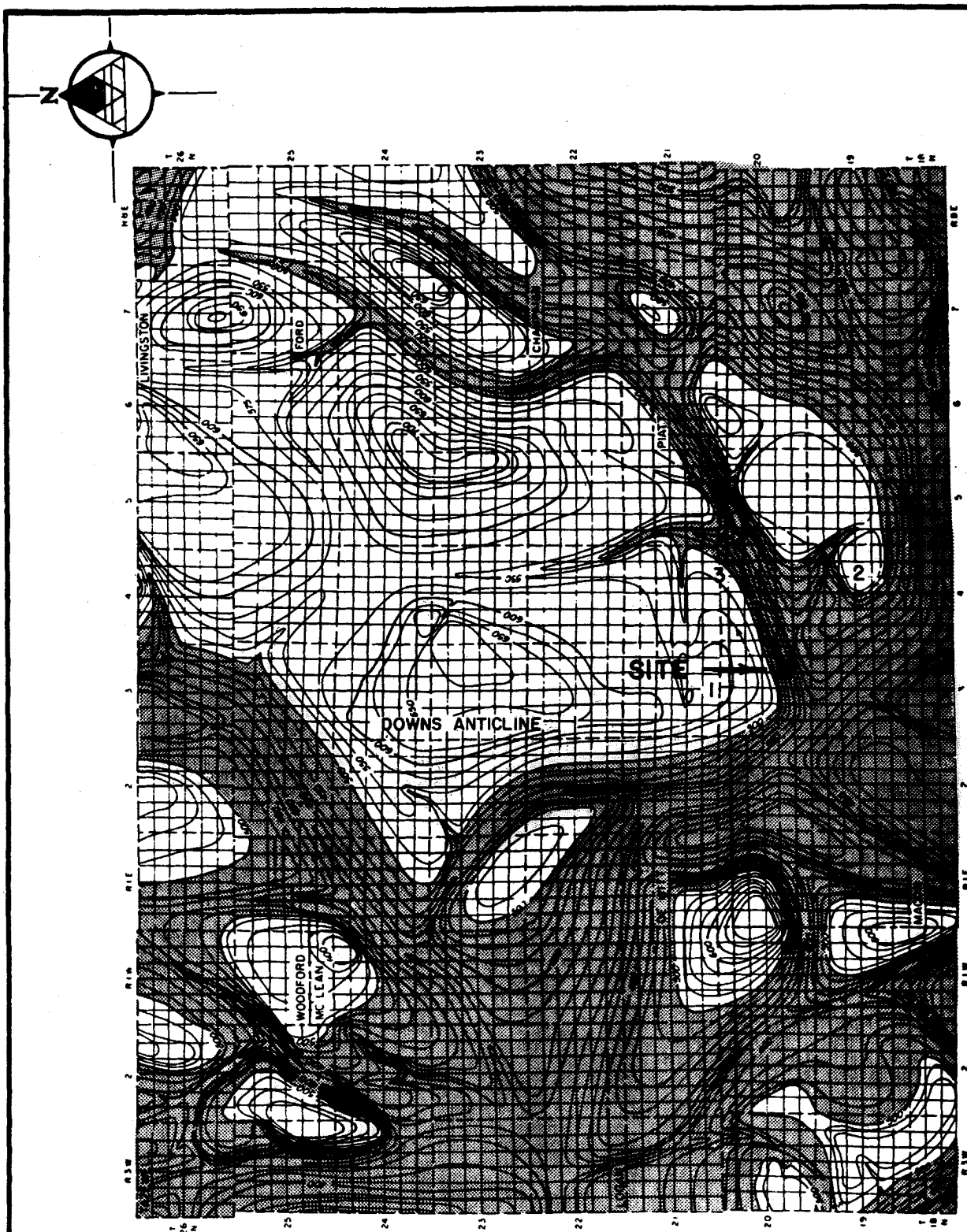
#### LEGEND

QUATERNARY	ILLINOIAN	WISCONSINAN	HOLOCENE
SALT CREEK ALLUVIUM - BROWN TO GRAY SALTY CLAY, CLAYED SALT AND FINE TO COARSE SAND, SILTY TO GRAVELLY IN SOME; UNDERLAIN BY ORGANIC DEPOSITS.			
LOESS - BROWN TO MOTTLED BROWN AND GRAY CLAYEY SILT OR SILTY CLAY WITH TRACE OF FINE SAND; WEATHERED.			
WISCONSINAN GLACIAL TILL - BROWNISH-GRAY TO BROWN CLAYEY SILT OR SILTY CLAY WITH SAND AND GRAVEL; CONTAINS HERRINGBONE AND DISSEMINATED LENSES OF SAND AND SILT THROUGHOUT (GLACIAL, SUBGLACIAL AND POSSIBLY LOCAL LACUSTRINE DEPOSITS).			
INTERGLACIAL ZONE - INCLUDES BROWN GRAY TO BROWN GRAYEY CLAYEY SILT OR SILTY CLAY (COLLUVIAL SOILS), GREENISH TO BROWN-GRAY CLAYEY SILT WITH SAND AND GRAVEL (WEATHERED AND WEATHERED ILLINOIAN GLACIAL TILL).			
ILLINOIAN GLACIAL TILL - BROWNISH-GRAY TO BROWN CLAYEY SILT WITH SAND AND GRAVEL TO VERY SANDY SILT OR SILTY SAND WITH SOME CLAY AND GRAVEL; INTERGLACIAL OUTWASH DEPOSITS IN UPPER MEMBER.			
LACUSTRINE DEPOSIT - BROWNISH-GRAY TO BLACK OR BROWN CLAYEY SILT TO SILT, ORGANIC IN SOME; INCLUDES SHEETED TO BROWN-GRAY CLAYEY SILT WITH SAND AND GRAVEL (DISSEMINATED AND WEATHERED ILLINOIAN GLACIAL TILL); ASSIGNMENT TO VANCOUVERIAN GLACIAL STAGE IS TENTATIVE.			
PRE-ILLINOIAN GLACIAL TILL - GRAYISH-BROWN TO BROWN SILTY CLAY AND CLAYEY SILT WITH SOME SAND AND GRAVEL; BROWN GRAY TO RELATIVELY HIGH CLAY CONTENT IS CHARACTERISTIC; SUBSEQUENTLY RECALLED TO ILLINOIAN GLACIAL STAGE ON THE BASIS OF CLAY ANALYSIS OF HALLAM'S STAGE GEOLOGICAL SURVEY.			
PRE-ILLINOIAN ALLUVIAL AND LACUSTRINE DEPOSIT - CONSISTS OF GRAYISH-BROWN, BROWN AND GRAY CLAYEY SILT AND SILTY CLAY WITH SAND AND GRAVEL; INCLUDES GLACIAL SILT AND SAND TO VERY SANDY SILT WITH SOME CLAY AND GRAVEL; INCLUDES AS PART OF THE JEFFERSON BEDROCK DEPOSIT IN AREAS WHERE IT IS UNDERLAIN BY SANDY OUTWASH DEPOSITS.			
SALT CREEK VALLEY OUTWASH DEPOSIT - GRAY FINE TO MEDIUM SAND WITH SOME COARSE SAND AND OCCASIONAL GRAVEL IN SOME; CLAYEY SUBGLACIAL DEPOSIT.			
BEDROCK - INTERBEDDED LAYERS OF LIMESTONE, SHALE AND SLATSTONE ASSIGNED TO THE HERRINGBONE GROUP, SUBJECT TO FURTHER STUDY ON THE BASIS OF SPORE ANALYSIS OF THE COAL ENCOUNTERED IN BORING D-8.			

#### CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-280

GEOLOGIC SECTION G-G' - SITE VICINITY



**KEY:**

- 1) WAPPELLA DOME
- 2) DELAND DOME
- 3) PARNELL DOME

~800~ CONTOURS ON BEDROCK SURFACE

■ APPROXIMATE POSITION OF MAHOMET VALLEY FILL DEPOSITS

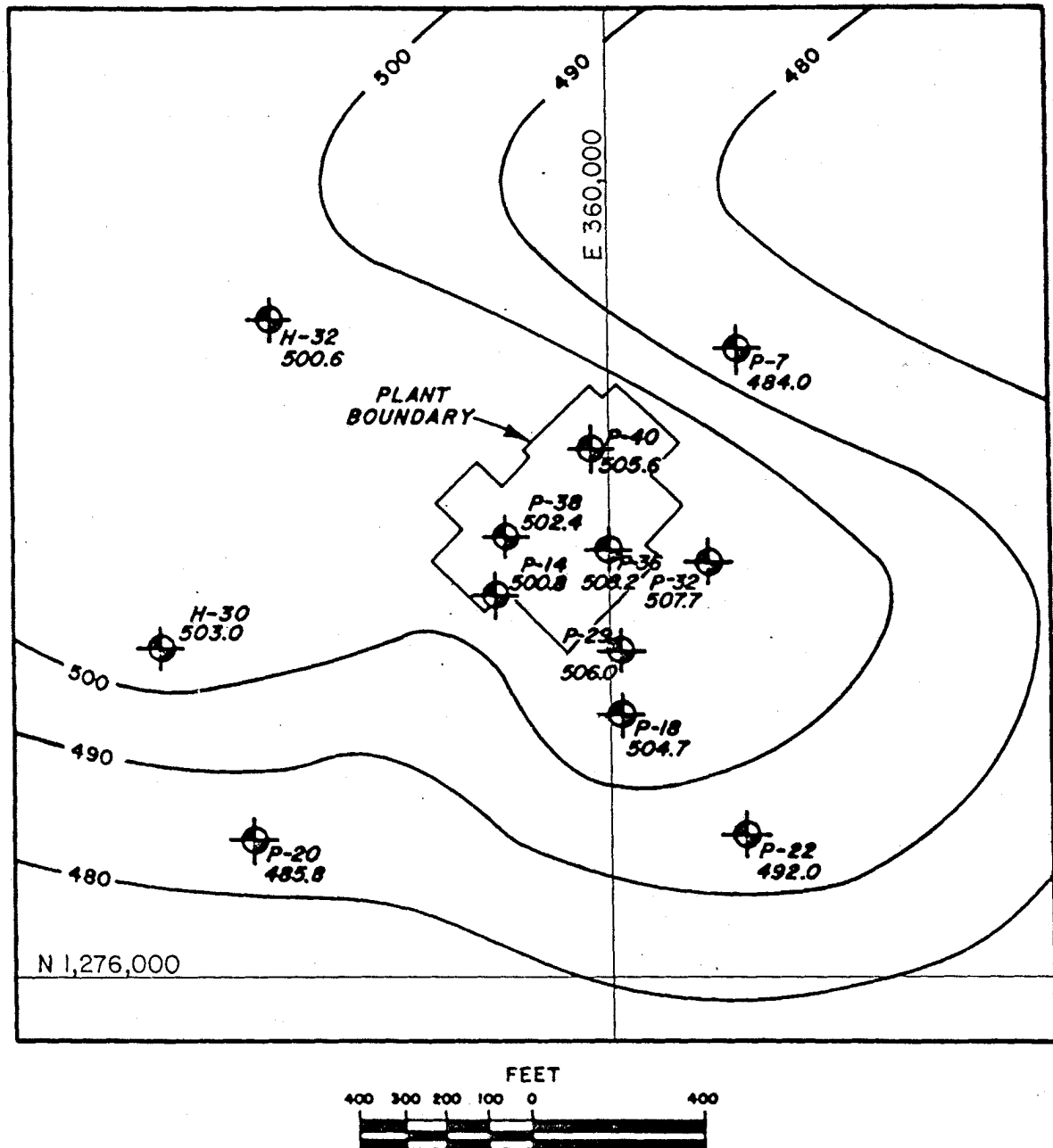
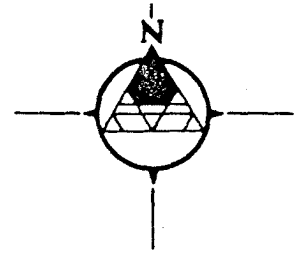
**NOTE:**

MODIFIED FROM: GEOLOGICAL SIGNIFICANCE OF THE GRAVITY FIELDS IN THE DEWITT - MCLEAN COUNTY AREA, ILLINOIS BY P.C. HETGOLD, L.D. MCGINNIS AND R.H. HOWARD: ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 369, 1964.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-281

RELIEF OF BEDROCK SURFACE



## LEGEND:



BORING LOCATION



ELEVATION OF TOP OF BEDROCK



CONTOUR ON TOP OF BEDROCK SURFACE

CONTOUR INTERVAL 10 FEET

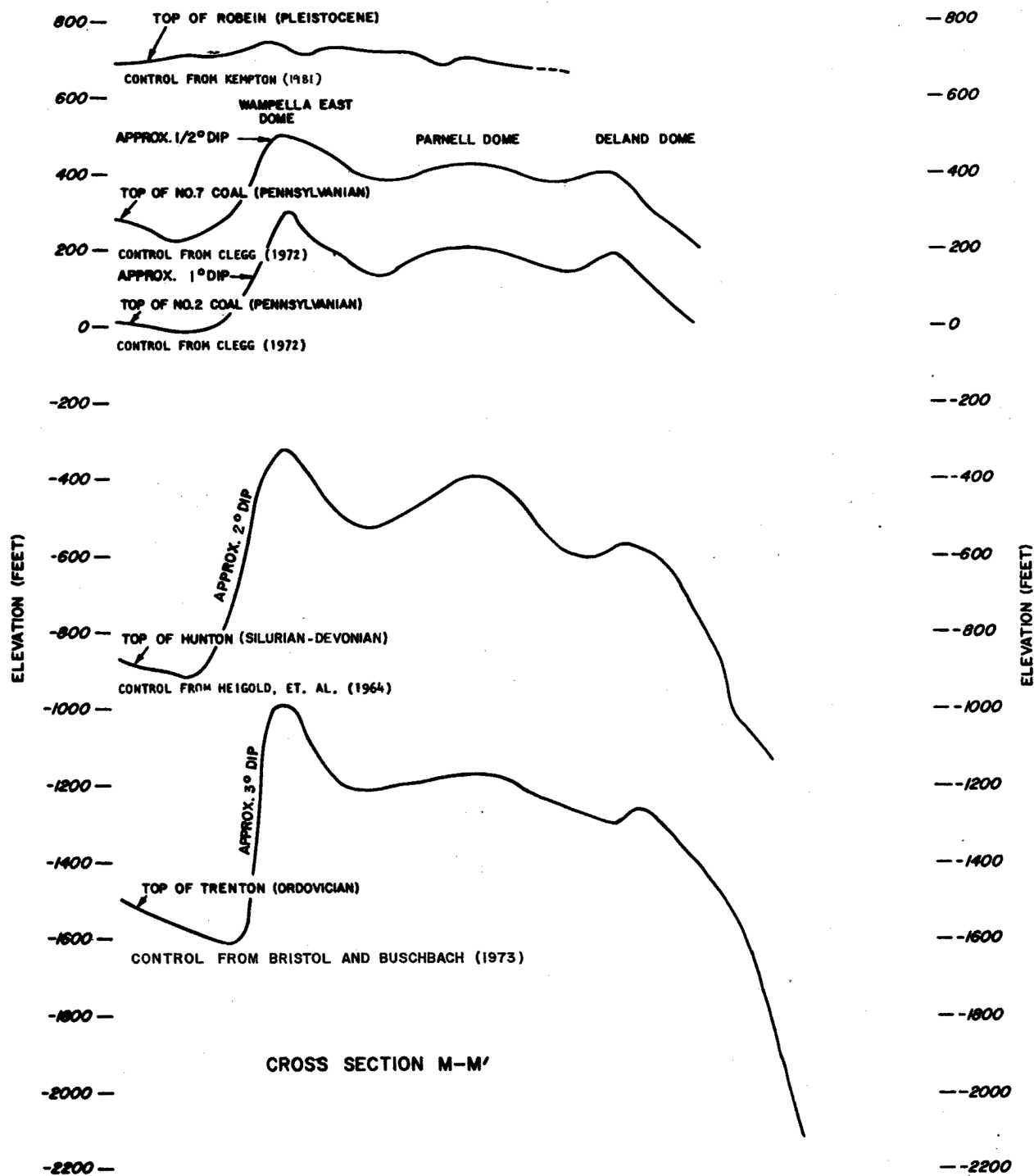
## NOTES:

1. ENLARGED VIEW OF BORINGS IN PLANT AREA FROM FIGURE 2.5-17.
2. BEDROCK CONTOURS ARE BASED ON GEOLOGICAL SIGNIFICANCE OF THE GRAVITY FIELDS IN THE DEWITT-MCLEAN COUNTY AREA, ILLINOIS BY P.C. HEIGOLD, L.D. MCGINNIS AND R.H. HOWARD; ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 369, 1964, WITH MODIFICATION FROM BOREHOLE DATA.

# CLINTON POWER STATION FINAL SAFETY ANALYSIS REPORT

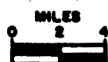
FIGURE 2.5-282

## CONTOURS OF BEDROCK SURFACE STATION SITE



REFERENCES:

- KEMPTON, J.P., 1981, ILL. STATE GEOL. SURVEY ENVIRONMENTAL GEOLOGY NOTE 100.  
 CLEGG, K.E., 1972, ILL. STATE GEOL. SURVEY CIRCULAR 473  
 HEIGOLD, P.C. ET AL. 1964, ILL. STATE GEOL. SURVEY CIRCULAR 369  
 BRISTOL, H.M. & BUSCHBACH, T.C., 1973, ILL. STATE GEOL. SURVEY, ILL. PETROLEUM 99.



VERTICAL EXAGGERATION 100:1

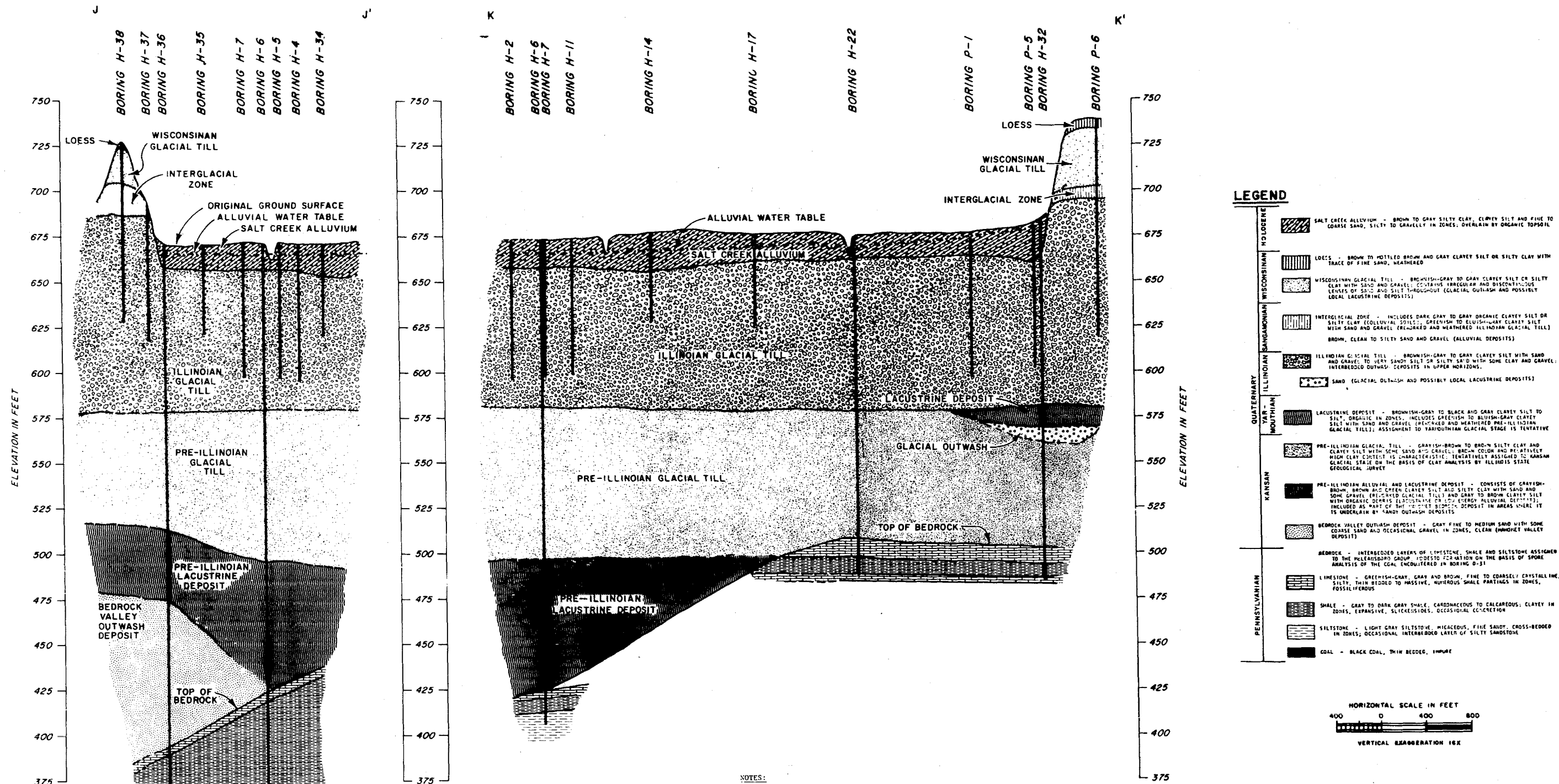
NOTE: SEE FIGURE 2.5-285 FOR LOCATION OF THE CROSS SECTION

CLINTON POWER STATION  
 UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-283

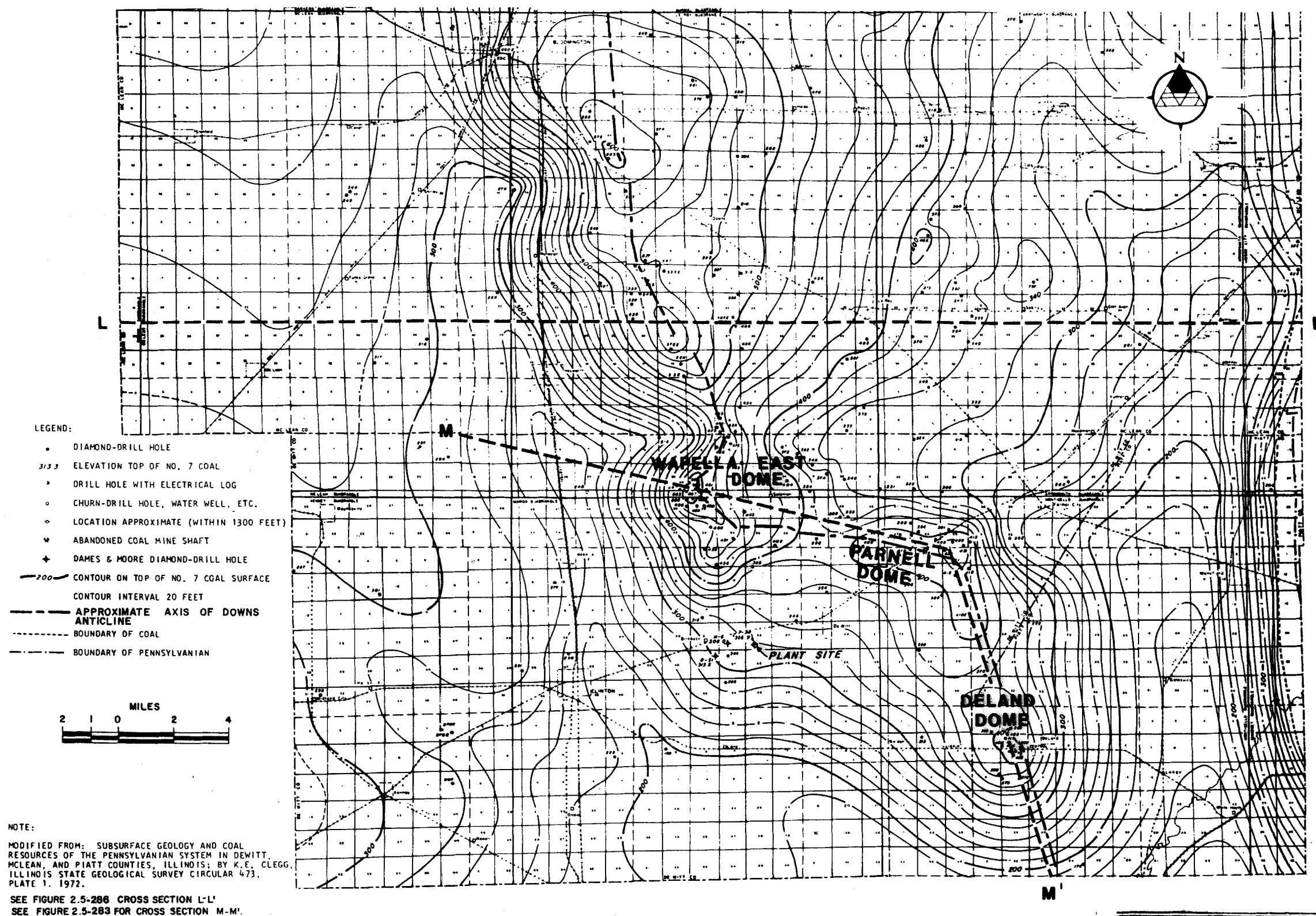
WAPPELLA EAST, PARNELL AND DELAND  
 DOMES, CROSS SECTION M-M'





# CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

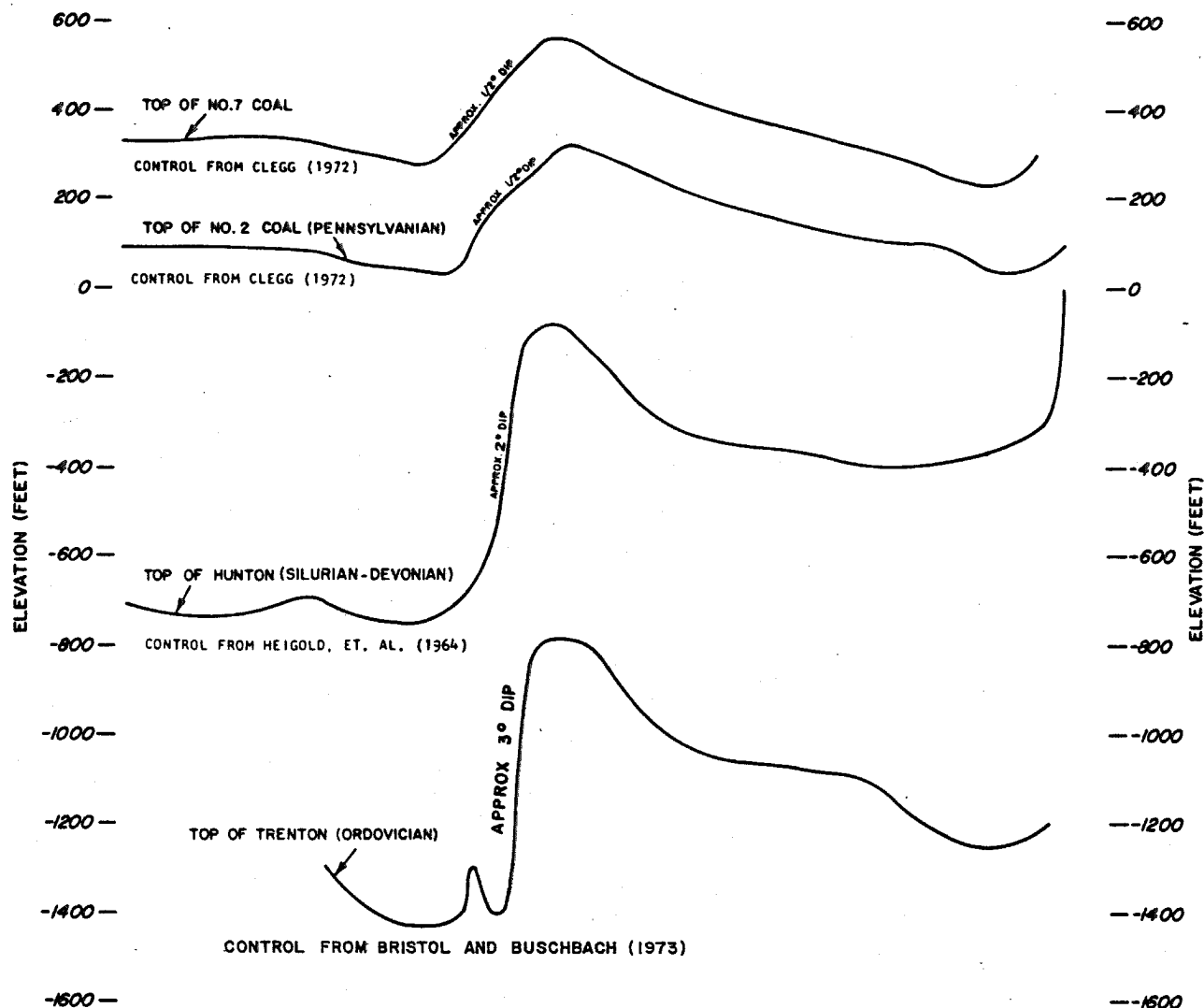
FIGURE 2.5-284  
ULTIMATE HEAT SINK GEOLOGIC  
SECTIONS J-J' AND K-K'



CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-285

STRUCTURAL CONTOUR MAP OF THE TOP OF  
THE NUMBER 7 COAL MEMBER



REFERENCES: CROSS SECTION L-L'

KEMPTON, J.P., 1981, ILL. STATE GEOL. SURVEY ENVIRONMENTAL GEOLOGY NOTE 100.

CLEGG, K.E., 1972, ILL. STATE GEOL. SURVEY CIRCULAR 473.

HEIGOLD, P.C. ET. AL. 1964, ILL. STATE GEOL. SURVEY CIRCULAR 369

BRISTOL, H.M. & BUSCHBACH, T.C., 1973, ILL. STATE GEOL. SURVEY, ILL. PETROLEUM 99.



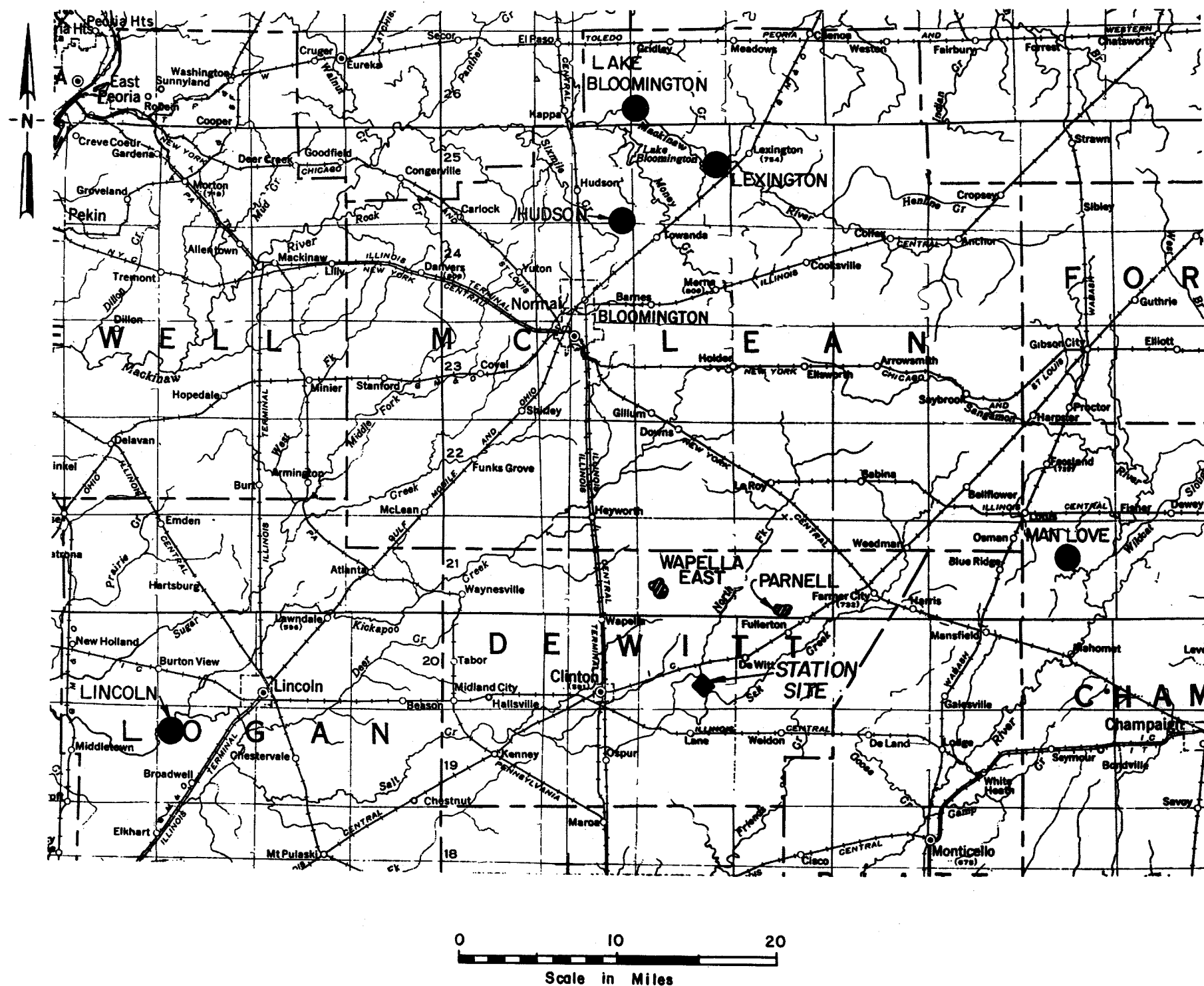
NOTE: SEE FIGURE 2.5-285 FOR LOCATION OF THE CROSS SECTION

# CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-286

DOWNS ANTICLINE - CROSS SECTION L-L'





**LEGEND**

- Gas Storage Project
- ▨ Oil field

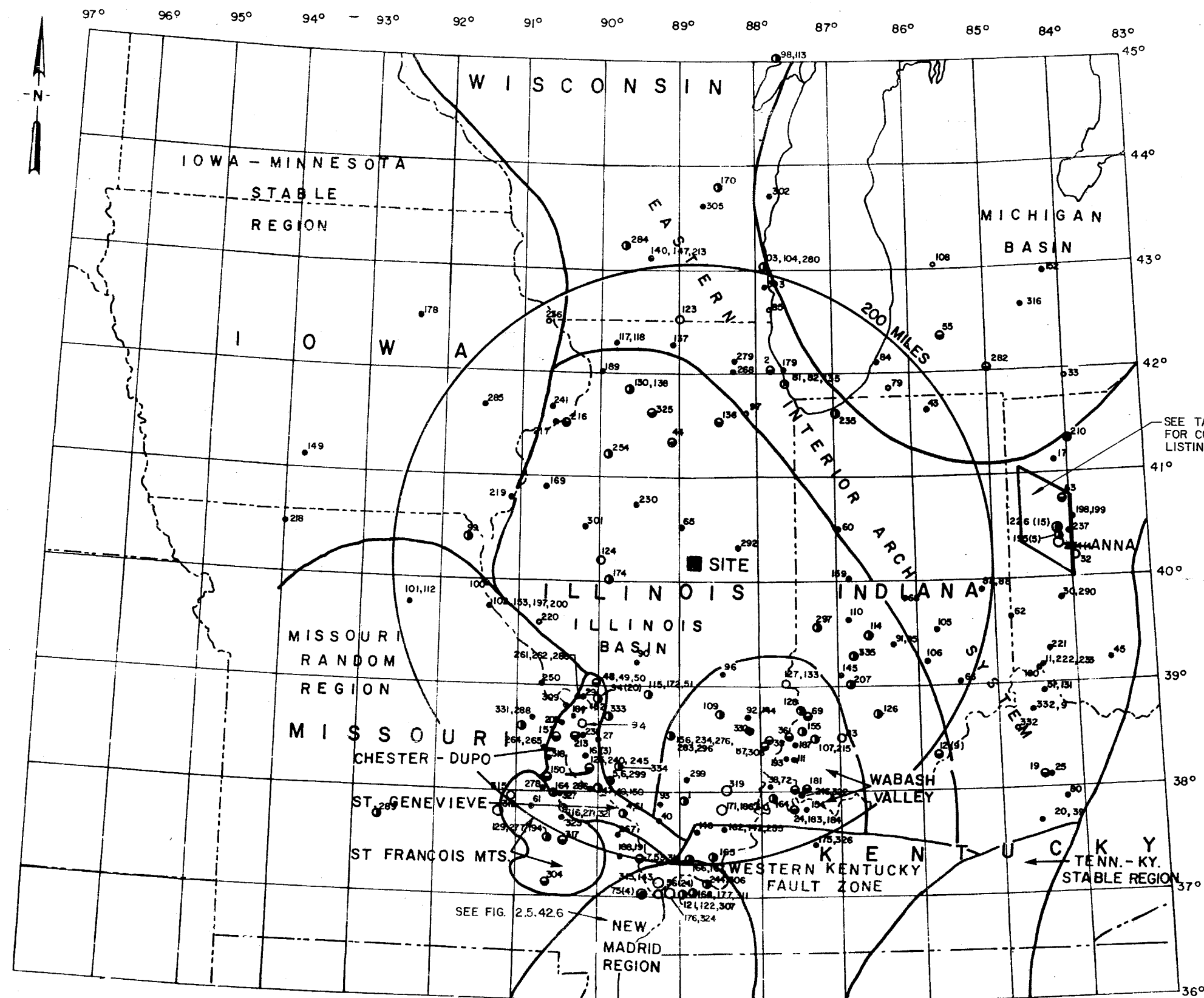
**NOTES**

1. Adapted from W. F. Meents, Oil and Gas Industry in Illinois, 1977, Illinois State Geological Survey, Urbana, 1977.

**CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT**

FIGURE 2.5-287

LOCATION OF GAS STORAGE PROJECTS AND  
OIL FIELDS IN THE SITE VICINITY



# **LEGEND**

## LOCATION OF MAXIMUM INTENSITY

- INTENSITY NOT RECORDED
- IV OR LESS
- IV-V TO V
- V-VI TO VI
- VI-VII TO VII
- VII-VIII TO VIII

SEE TABLE 2.5.4  
FOR COMPLETE  
LISTING

## **NOTES**

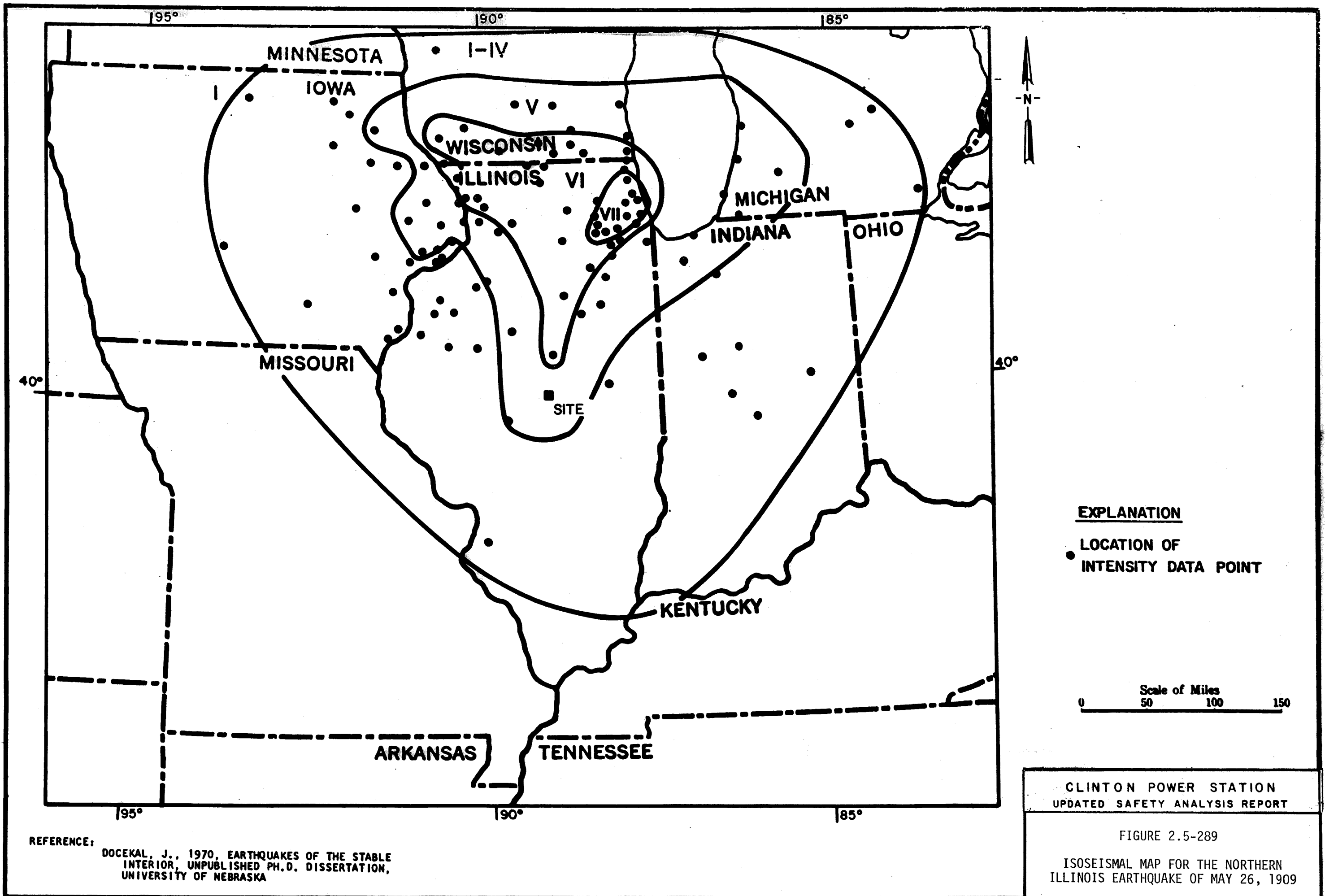
1. BASIS FOR SEISMOTECTONIC BOUNDARIES DISCUSSED IN TEXT.
2. ONLY THE LARGEST EVENT IS PRESENTED ON MAP.
3. EARTHQUAKES LISTED IN TABLE 2.5.4 NOS. IN PARENTHESES INDICATE NO. OF EVENTS AT ONE LOCATION.

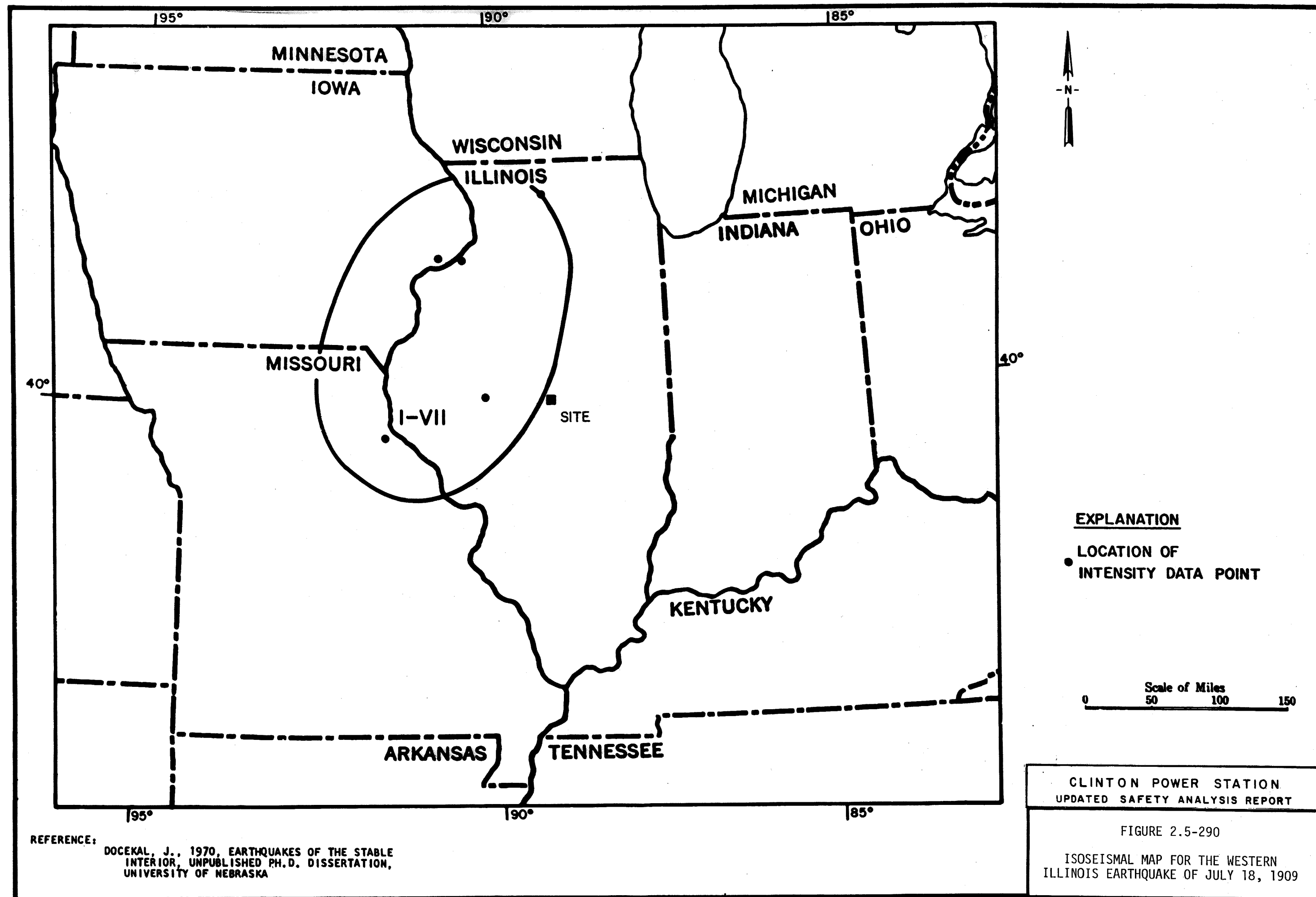
0 25 50 75 100  
SCALE IN MILES

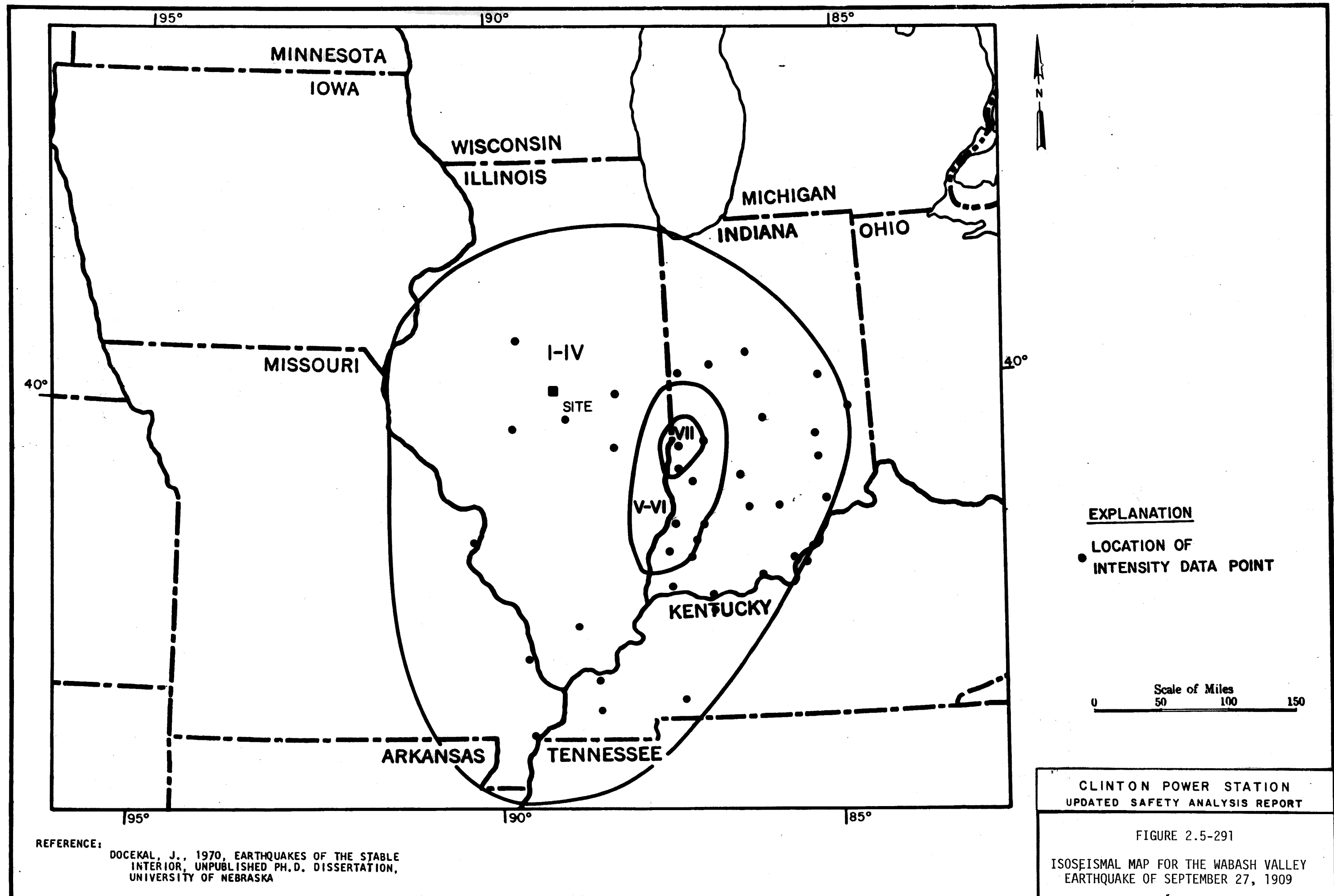
CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

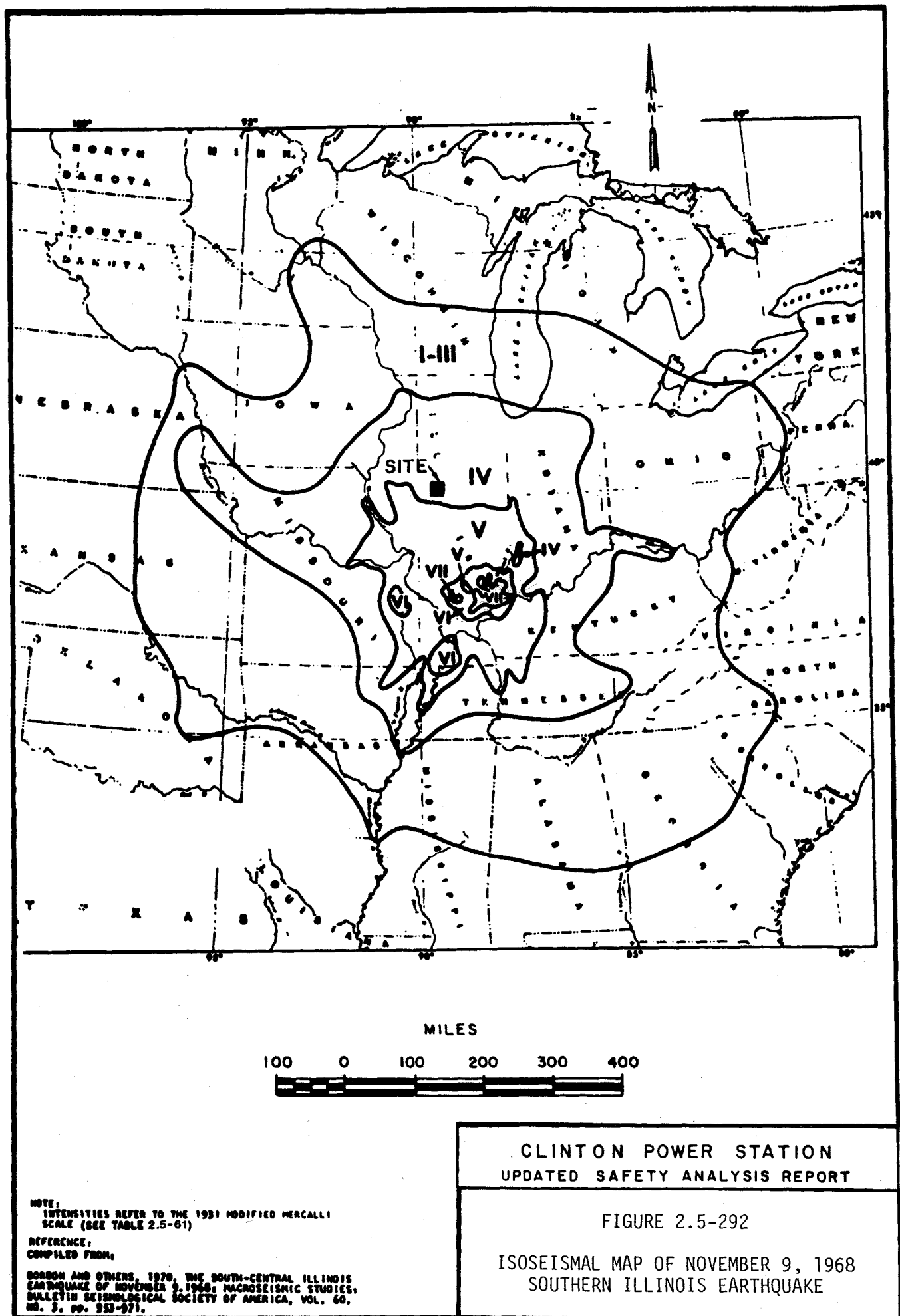
FIGURE 2.5-288

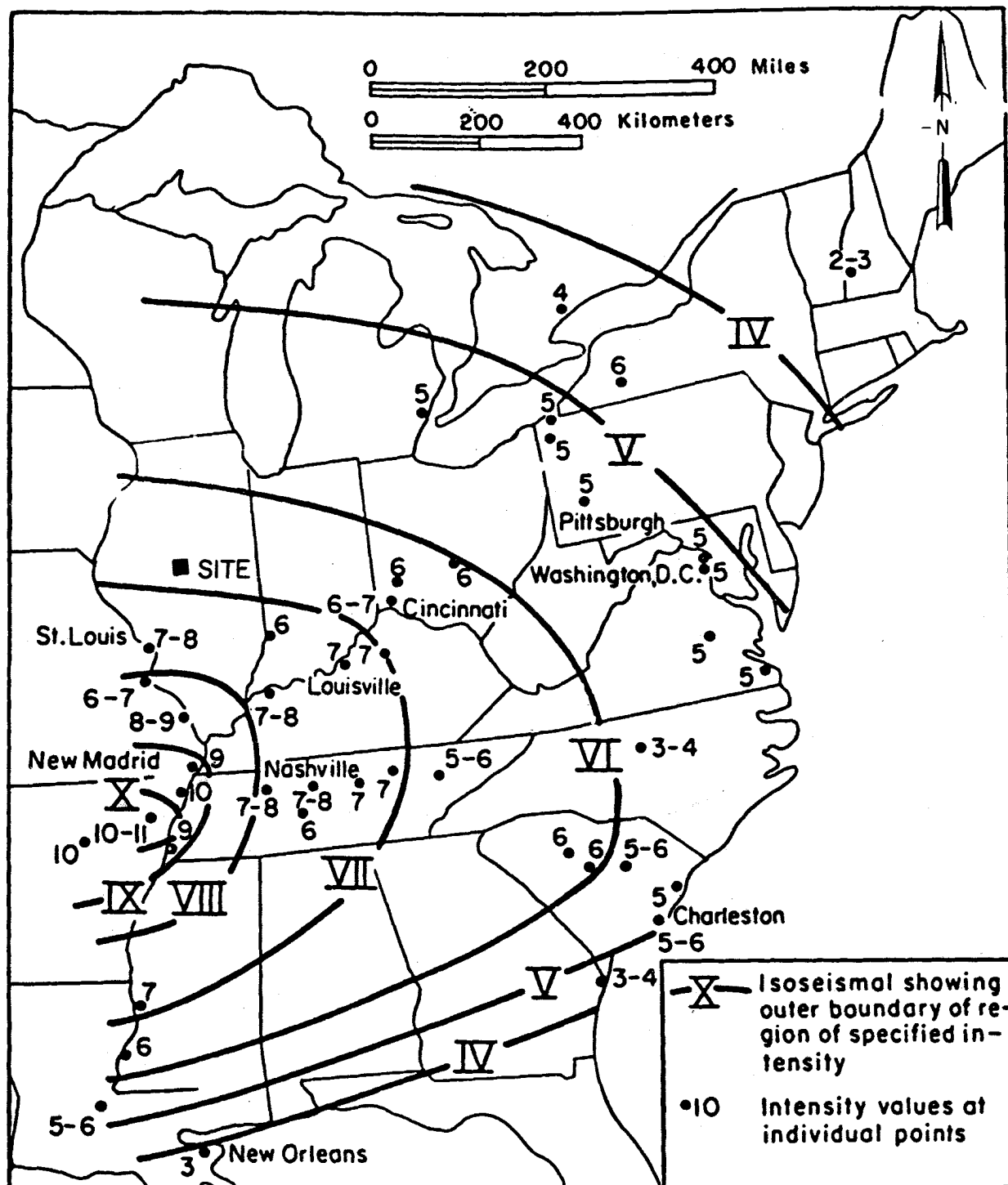
EARTHQUAKE EPICENTERS AND RELATIONSHIP  
TO SEISMOTECTONIC REGIONS











NOTES:

1. INTENSITIES REFER TO THE 1931 MODIFIED MERCALLI SCALE.
2. ISOSEISMAL LINES INDICATE THE APPROXIMATE OUTER BOUNDARY OF THE REGION OF SPECIFIED INTENSITY.

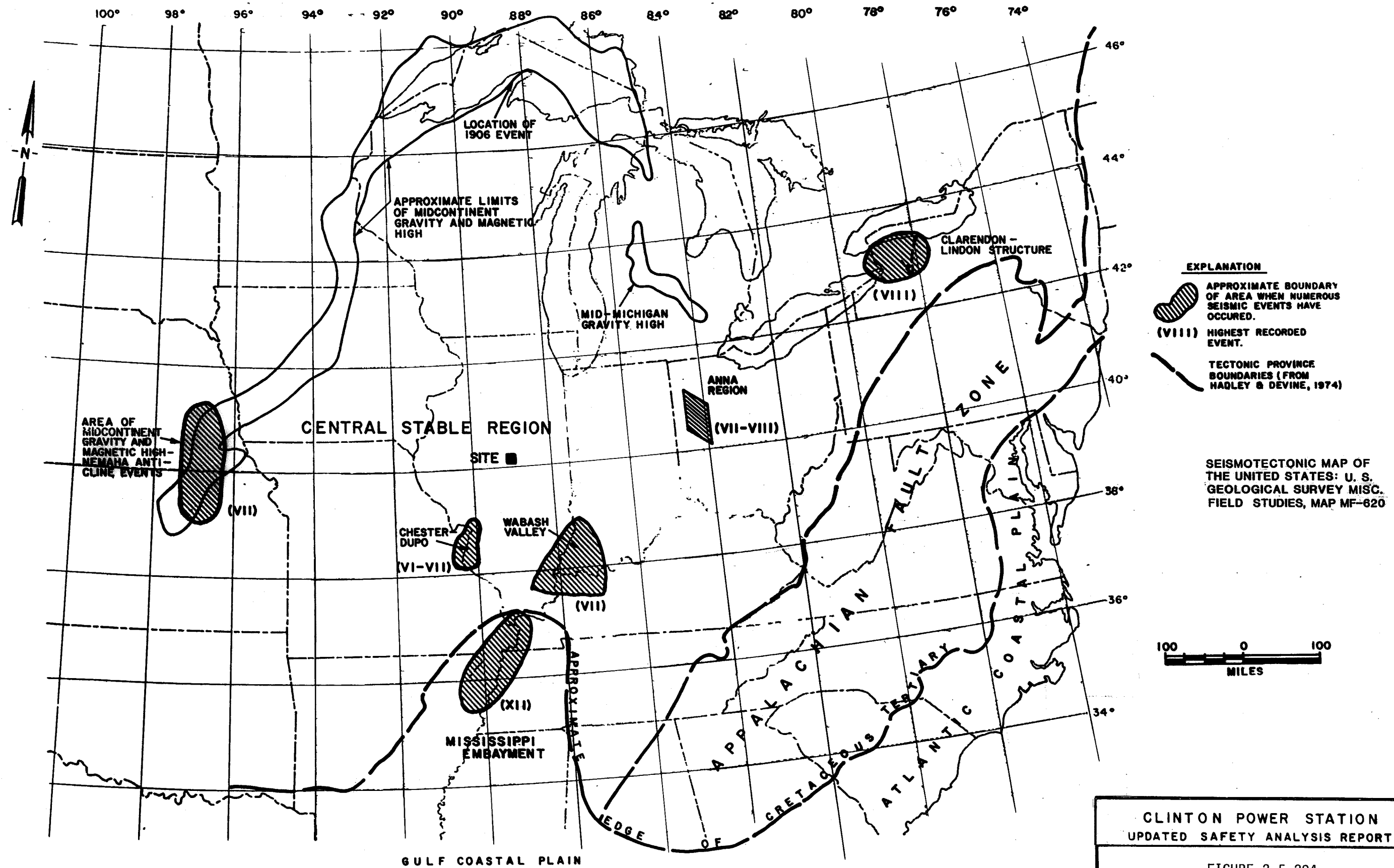
REFERENCE:

NUTTLI, O.W. 1973, THE MISSISSIPPI VALLEY EARTHQUAKE OF 1811 AND 1812, INTENSITIES, GROUND MOTION, AND MAGNITUDES, SEISMOLOGICAL SOCIETY OF AMERICA, BULL. 63, NO. 1 P. 227-248.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-293

ISOSEISMAL MAP FOR NEW MADRID EARTHQUAKE OF DECEMBER 16, 1811



**EXPLANATION**

APPROXIMATE BOUNDARY OF AREA WHEN NUMEROUS SEISMIC EVENTS HAVE OCCURED.

**(VIII)** HIGHEST RECORDED EVENT.

TECTONIC PROVINCE BOUNDARIES (FROM HADLEY & DEVINE, 1974)

SEISMOTECTONIC MAP OF THE UNITED STATES: U. S. GEOLOGICAL SURVEY MISC. FIELD STUDIES, MAP MF-620

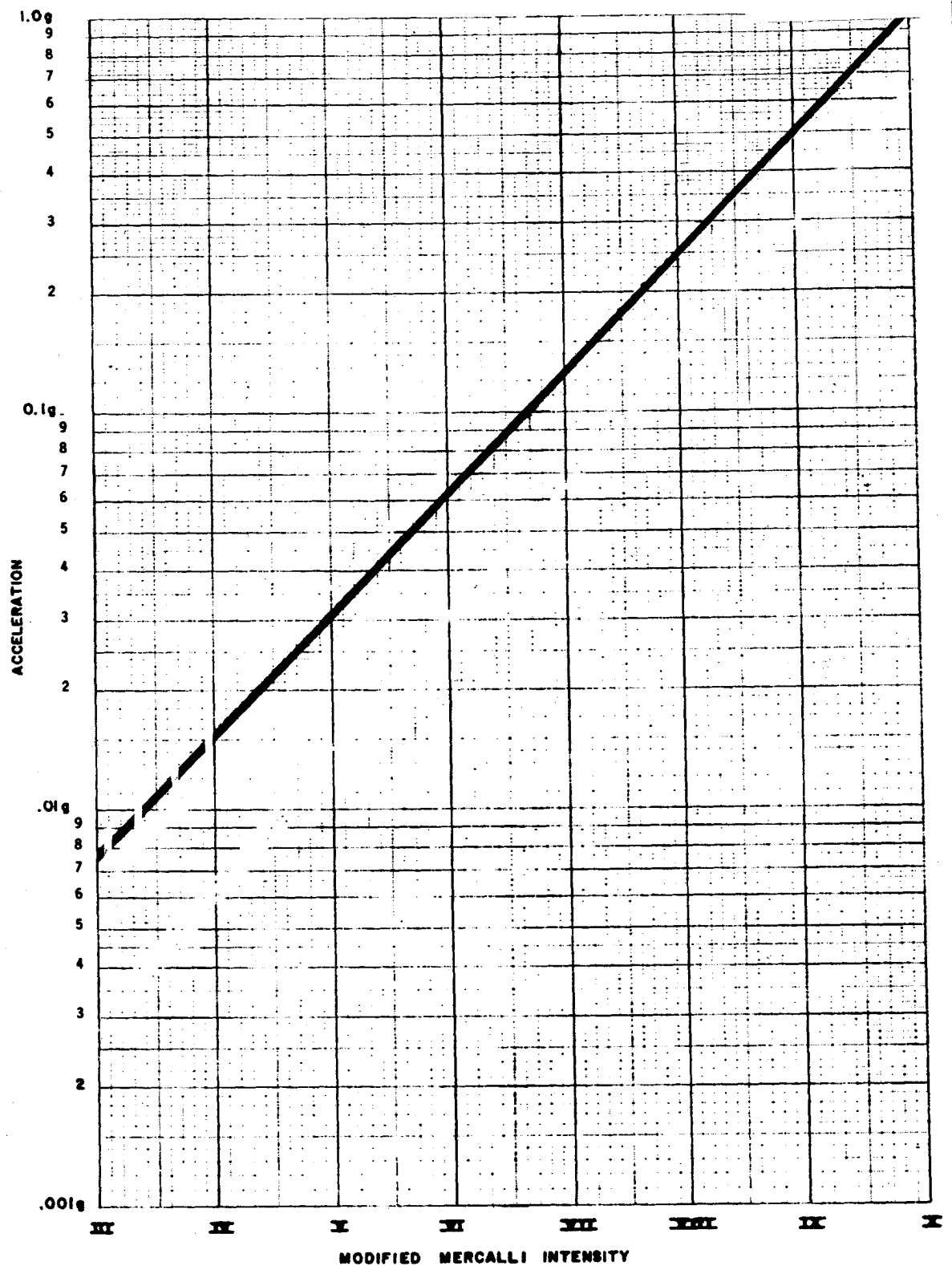
100 0 100  
MILES

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-294

AREAS OF RELATIVELY HIGH SEISMICITY  
IN CENTRAL UNITED STATES



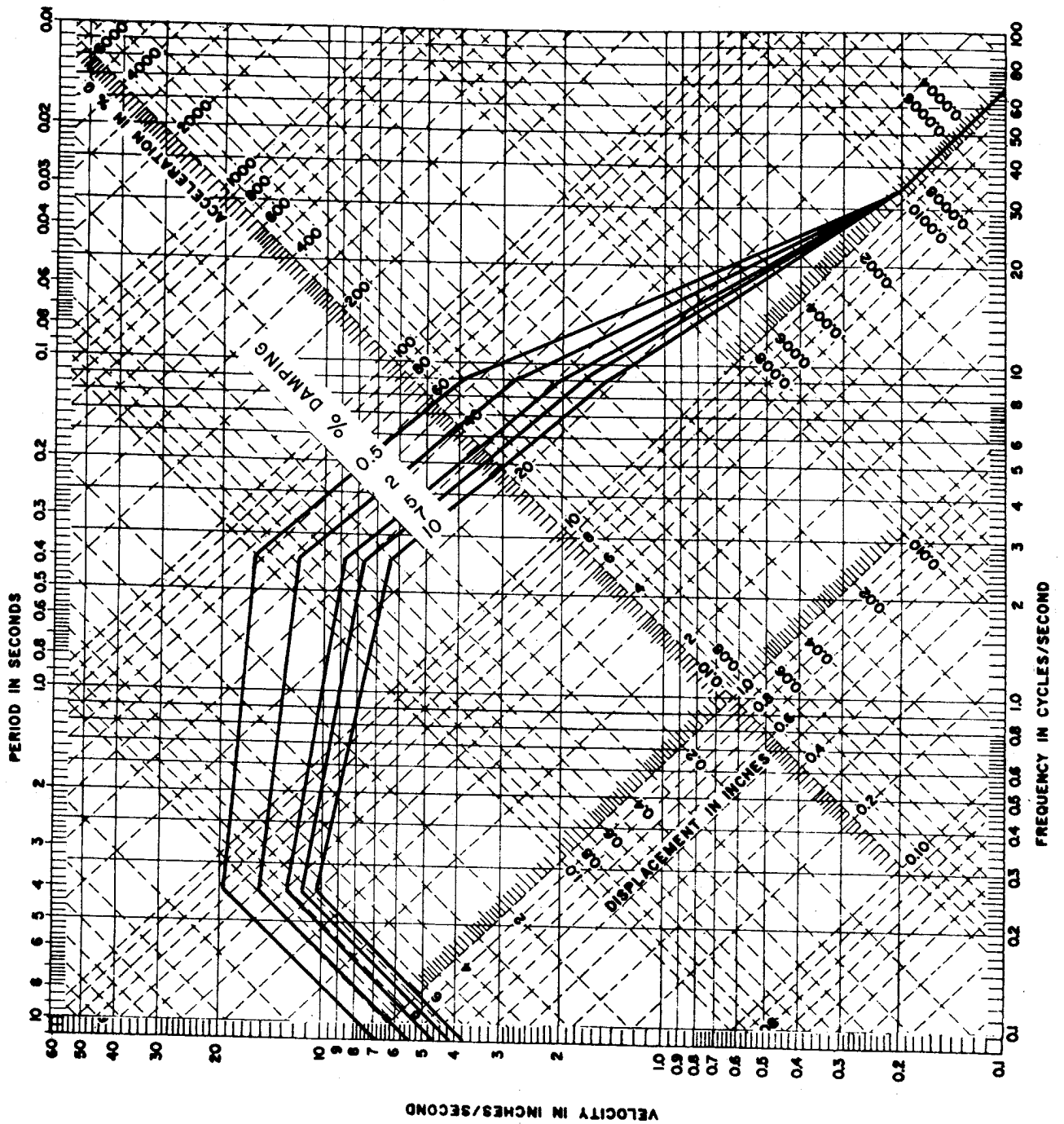


CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

REFERENCE: TRIFUNAC, M.D., AND BRADY, A.G., 1975, ON THE CORRELATION OF SEISMIC INTENSITY SCALES WITH THE PEAKS OF RECORDED STRONG GROUND MOTION; SEISMOL. SOC. AMERICA BULL., VOL. 65, NO. 1, pp.139-162.

FIGURE 2.5-295  
COMPARISON OF EARTHQUAKE INTENSITY  
AND AVERAGE HORIZONTAL ACCELERATION





CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-297  
HORIZONTAL SPECTRA FOR A MAXIMUM  
HORIZONTAL GROUND ACCELERATION OF 11%  
OF GRAVITY (OPERATING-BASIS EARTHQUAKE)

KEY TO LOG OF BORINGS

KEY TO SAMPLES			KEY TO TEST DATA		
BORINGS LOGGED BY:			SHEAR STRENGTH DATA:		
WOODWARD-CLYDE CONSULTANTS	DAMES & MOORE	SARGENT & LUNDY ENGINEERS	DAMES & MOORE	SARGENT & LUNDY ENGINEERS	TEST DESCRIPTION
	15 ■		a.	$\frac{\sigma_1 - \sigma_3}{2}$	<u>Triaxial Compression</u>  SHEAR STRENGTH DEFINED AS ONE-HALF THE PEAK AXIAL COMPRESSIVE STRESS IN PSF OR ONE-HALF THE AXIAL COMPRESSIVE STRESS AT 10 PERCENT AXIAL STRAIN, WHICHEVER OCCURS FIRST.
	P ■		b.	$\sigma_3$	CELL PRESSURE IN PSF FOR UNCONSOLIDATED (UNDRAINED TRIAXIAL) COMPRESSION TESTS.
	■				<u>Unconfined Compression</u>
	□		c.	Qu/2	SHEAR STRENGTH DEFINED AS ONE-HALF THE PEAK AXIAL COMPRESSIVE STRESS IN PSF.
			d.	Qu/2*	SHEAR STRENGTH DEFINED AS COHESION IN PSF AS DETERMINED BY A POCKET PENETROMETER. VALUES IN EXCESS OF 4500 PSF ARE INDICATED BY 4500+.
<u>TESTS REPORTED ELSEWHERE:</u> DAMES & MOORE/SARGENT & LUNDY ENGINEERS					
			C		CONSOLIDATION TEST
			CHEM		CHEMICAL TEST ON GROUNDWATER SAMPLES
			COMP		BULK COMPACTION TEST
			D/CD		CONSOLIDATED - DRAINED DIRECT SHEAR TEST
			IG		LOSS ON IGNITION
			MA		MECHANICAL PARTICLE SIZE ANALYSIS (SIEVE AND HYDROMETER)
			PERM		LABORATORY PERMEABILITY TEST
			DR		RELATIVE DENSITY TEST
			RES		RESONANT COLUMN TEST
			SA		SIEVE ANALYSIS
			SHOCK		SHOCKSCOPE TEST
			TX/CD		CONSOLIDATED-DRAINED TRIAXIAL COMPRESSION TEST
			TX/CU/PP		CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST WITH PORE PRESSURE MEASUREMENTS
			TX/DY		DYNAMIC TRIAXIAL COMPRESSION TEST
			TX/UU/U		UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON UNDISTURBED SAMPLE.
			TX/UU/R		UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON REMOLDED SAMPLES
			UC/R		UNCONFINED COMPRESSION TEST ON REMOLDED SAMPLES

INDICATES THE NUMBER OF BLOWS REQUIRED TO DRIVE A DAMES & MOORE TYPE U SAMPLER, ONE FOOT WITH A 340 POUND WEIGHT FALLING 24 INCHES.	INDICATES THE NUMBER OF BLOWS REQUIRED TO DRIVE A SPLIT SPOON SAMPLER, WITH AN OUTSIDE DIAMETER OF 2.0 INCHES, ONE FOOT WITH A 140 POUND WEIGHT FALLING 30 INCHES (ASTM Test Designation D1586-67).
INDICATES DEPTH OF RELATIVELY UNDISTURBED SAMPLE OBTAINED WITH A DAMES & MOORE TYPE U SAMPLER.	INDICATES DEPTH OF SAMPLE OBTAINED USING A SPLIT SPOON SAMPLER WITH AN OUTSIDE DIAMETER OF 2.0 INCHES.
INDICATES DAMES & MOORE TYPE U SAMPLER WAS HYDRAULICALLY PUSHED TO OBTAIN SAMPLE.	INDICATES DEPTH OF SPLIT SPOON SAMPLE WITH NO RECOVERY.
INDICATES DEPTH OF DISTURBED SAMPLE OBTAINED WITH A DAMES & MOORE TYPE U SAMPLER.	INDICATES AUGER BORING.
INDICATES DEPTH OF SAMPLING ATTEMPT WITH NO RECOVERY USING A DAMES & MOORE TYPE U SAMPLER.	INDICATES DEPTH OF DISTURBED SAMPLE OBTAINED WITH CONTINUOUS FLIGHT AUGERS.
	INDICATES DEPTH OF UNDISTURBED SAMPLE OBTAINED USING A SHELBY TUBE WITH AN OUTSIDE DIAMETER OF 3.0 INCHES AND AN INSIDE DIAMETER OF 2.9 INCHES.
	INDICATES DEPTH OF RELATIVELY UNDISTURBED SAMPLE OBTAINED WITH A PITCHER SAMPLER WITH AN OUTSIDE DIAMETER OF 3.0 INCHES AND AN INSIDE DIAMETER OF 2.9 INCHES.
	INDICATES DEPTH OF RELATIVELY UNDISTURBED SAMPLE OBTAINED USING AN OSTERBERG SAMPLER WITH AN OUTSIDE DIAMETER OF 3.0 INCHES AND AN INSIDE DIAMETER OF 2.9 INCHES.
	INDICATES DEPTH OF RELATIVELY UNDISTURBED SAMPLE OBTAINED WITH A DOUBLE TUBE CORE BARREL WITH AN INSIDE DIAMETER OF 4.0 INCHES. (HIGH RECOVERY CORE BARREL)
	INDICATES DEPTH, LENGTH AND PERCENT OF CORE RUN RECOVERED FOR NX DIAMOND DRILL ROCK CORING.
	INDICATES PERCENT OF ROCK QUALITY DESIGNATION FOR NX DIAMOND DRILL ROCK CORING.

ELEVATION REFERENCE  
ELEVATIONS REFER TO MEAN SEA LEVEL DATUM.

DRILLING REFERENCE  
BORINGS WERE DRILLED USING TRUCK-MOUNTED AUGER/ROTARY WASH TYPE DRILLING EQUIPMENT.

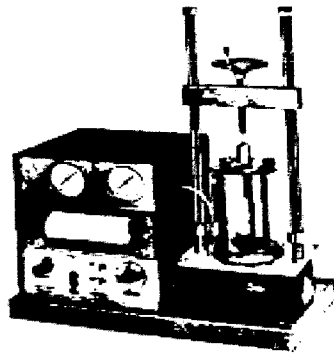
PIEZOMETER REFERENCE  
PIEZOMETERS WERE INSTALLED IN BORINGS TO RECORD GROUND WATER CONDITIONS. DETAILS OF EACH INSTALLATION ARE DESCRIBED ON THE BORING LOGS.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-298

KEY TO LOG OF BORINGS

## Triaxial Compression Test Unit



TRIAxIAL COMPRESSION TEST UNIT

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

Figure 2.5-299  
Sheet 1 of 2  
UNCONFINED COMPRESSION  
AND TRIAXIAL COMPRESSION  
TESTS (METHOD)

## NOTES FOR FIGURE 2.5-299

### Methods of Performing Unconfined Compression and Triaxial Compression Tests

The shearing strengths of soils are determined from the results of unconfined compression and triaxial compression tests. In triaxial compression tests the test method and the magnitude of the confining pressure are chosen to simulate anticipated field conditions.

Unconfined compression and triaxial compression tests are performed on undisturbed, or remolded samples of soil, approximately six inches in length and two and one-half inches in diameter. The tests are run either strain-controlled or stress-controlled. In a strain-controlled test the sample is subjected to a constant rate of deflection and the resulting stresses are recorded. In a stress-controlled test the sample is subjected to equal increments of load with each increment being maintained until an equilibrium condition with respect to strain is achieved.

Yield, peak, or ultimate stresses are determined from the stress-strain plot for each sample and the principal stresses are evaluated. The principal stresses are plotted on a Mohr's circle diagram to determine the shearing strength of the soil type being tested.

Unconfined compression tests can be performed only on samples with sufficient cohesion so that the soil will stand as an unsupported cylinder. These tests may be run at natural moisture content or on artificially saturated soils.

In a triaxial compression test the sample is encased in a rubber membrane, placed in a test chamber, and subjected to a confining pressure throughout the duration of the test. Normally, this confining pressure is maintained at a constant level, although for special tests it may be varied in relation to the measured stresses. Triaxial compression tests may be run on soils at field moisture content or on artificially saturated samples.

The tests are performed in one of the following ways:

Unconsolidated-undrained: The confining pressure is imposed on the sample at the start of the test. No drainage is permitted and the stresses which are measured represent the sum of the intergranular stresses and pore water pressures.

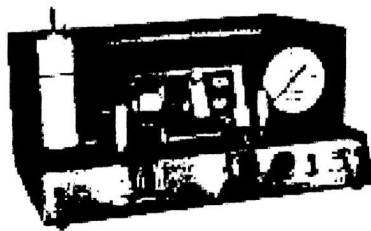
Consolidated-undrained: The sample is allowed to consolidate fully under the applied confining pressure prior to the start of the test. The volume change is determined by measuring the water and/or air expelled during consolidation. No drainage is permitted during the test and the stresses which are measured are the same as for the unconsolidated-undrained test.

Drained: The intergranular stresses in a sample may be measured by performing a drained, or slow, test. In this test, the sample is fully saturated and consolidated prior to the start of the test. During the test, drainage is permitted and the test is performed at a slow enough rate to prevent the buildup of pore water pressures. The resulting stresses which are measured represent only the intergranular stresses. These tests are usually performed on samples of generally non-cohesive soils, although the test procedure is applicable to cohesive soils if a sufficiently slow test rate is used.

An alternate means of obtaining the data resulting from the drained test is to perform an undrained test in which special equipment is used to measure the pore water pressures. The differences between the total stresses and the pore water pressures measured are the intergranular stresses.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

Figure 2.5-299  
Sheet 2 of 2  
UNCONFINED COMPRESSION  
AND TRIAXIAL COMPRESSION  
TESTS (METHOD)



**DIRECT SHEAR TESTING  
& RECORDING APPARATUS**

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

Figure 2.5-300  
Sheet 1 of 2

DIRECT SHEAR AND FRICTION  
TESTS (METHOD)

---

## NOTES FOR FIGURE 2.5-300

### Method of Performing Direct Shear and Friction Tests

Direct shear tests are performed to determine the shearing strengths of soils. Friction tests are performed to determine the frictional resistances between soils and various other materials such as wood, steel, or concrete. The tests are performed in the laboratory to simulate anticipated field conditions.

Each sample is tested within three brass rings, two and one-half inches in diameter and one inch in length. Undisturbed samples of in-place soils are tested in rings taken from the sampling device in which the samples were obtained. Loose samples of soils to be used in constructing earth fills are compacted in rings to predetermined conditions and tested.

#### Direct Shear Tests

A three-inch length of the sample is tested in direct double shear. A constant pressure, appropriate to the conditions of the problem for which the test is being performed, is applied normal to the ends of the sample through porous stones. A shearing failure of the sample is caused by moving the center ring in a direction perpendicular to the axis of the sample. Transverse movement of the outer rings is prevented.

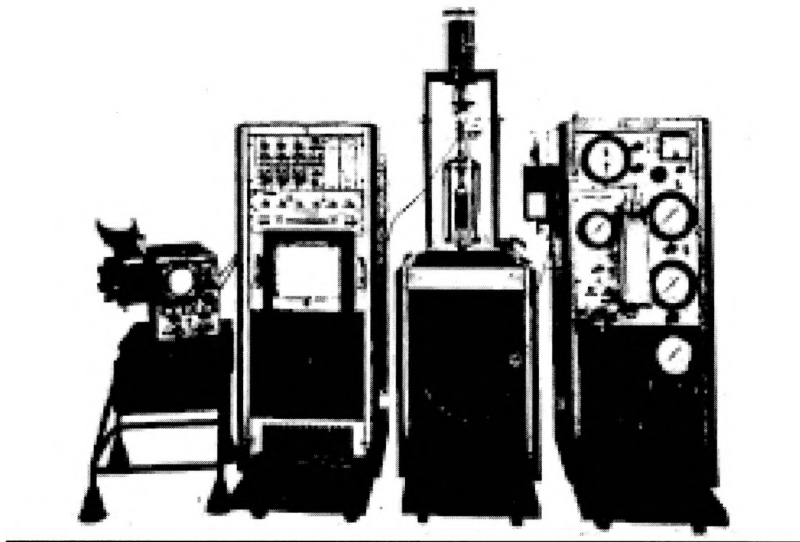
The shearing failure may be accomplished by applying to the center ring either a constant rate of load, a constant rate of deflection, or increments of load or deflection. In each case, the shearing load and the deflections in both the axial and transverse directions are recorded and plotted. The shearing strength of the soil is determined from the resulting load-deflection curves.

#### Friction Tests

In order to determine the frictional resistance between soil and the surfaces of various materials, the center ring of soil in the direct shear test is replaced by a disk of the material to be tested. The test is then performed in the same manner as the direct shear test by forcing the disk of material from the soil surfaces.

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
Figure 2.5-300 Sheet 2 of 2 DIRECT SHEAR AND FRICTION TESTS (METHOD)





CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

Figure 2.5-301  
Sheet 1 of 2

PULSATING LOAD TRIAXIAL  
TEST (METHOD)

## NOTES FOR FIGURE 2.5-301

### Methods of Performing Pulsating Load Triaxial Tests

Pulsating axial load tests are performed to evaluate the dynamic properties and the liquefaction potential of the soils under simulated anticipated field loading conditions.

Pulsating load tests are stress controlled and are performed on undisturbed or reconstituted samples of soil approximately six inches in length and two and one-half inches in diameter. The samples are encased in a rubber membrane, placed in a test chamber, and subjected to confining pressure throughout the duration of the test. The tests may be run on soils at field moisture content or on artificially saturated samples. The triaxial equipment acting through a Bellofram system applies a pulsating axial load. The cycling speed of the load can be varied between one-half to five cycles per second to simulate the field loading frequency.

#### Dynamic Properties Determination

To evaluate the dynamic parameters, the soil sample is loaded in cyclic compression. The load and deflection are recorded on two channels of a recording oscillograph. By tapping the output of the load and deflection transducers and applying these to vertical and horizontal plates, respectively, of a cathode ray oscilloscope, a hysteresis loop is produced. This loop is photographed, and the photograph is used to evaluate the damping value present. The procedure is repeated at various strain amplitudes to evaluate the dynamic properties in the range of interest on a particular sample. The load and deflection values obtained from the oscillograph are used to evaluate the dynamic moduli of elasticity.

#### Liquefaction Potential

To evaluate the liquefaction potential, the soil sample is subjected to axial cyclic loading, the magnitude, frequency, duration and sequence of loading is determined on the basis of past earthquake records. The load deflection, and pore pressure are recorded on three channels of a recording oscillograph. These records are used to evaluate the liquefaction potential for that particular soil type under the test conditions.

CLINTON POWER STATION  
UPDATED SAFETY ANALYSIS REPORT

Figure 2.5-301  
Sheet 2 of 2

PULSATING LOAD TRIAXIAL  
TEST (METHOD)