



US Army Corps
of Engineers
Baltimore District



Maryland Port
Administration

Baltimore Harbor Anchorages and Channels, Maryland

*Integrated Feasibility Report and
Environmental Impact Statement*

Technical Appendices

APPENDIX E - GEOTECHNICAL ENGINEERING

March 1997

APPENDIX E

BORING LOGS

ENVIRONMENTAL BORING LEGEND

WATER SURFACE
LOCATION _____
NAD 1983 GRID
N-NORTH E-EAST
N580,528 E1,428,352

EB-1-941

ELEV. MLLW

BORING NUMBER
REFERENCE DATUM
MEAN LOWER LOW WATER

BALTIMORE HARBOR FEASIBILITY STUDY BALTIMORE, MARYLAND

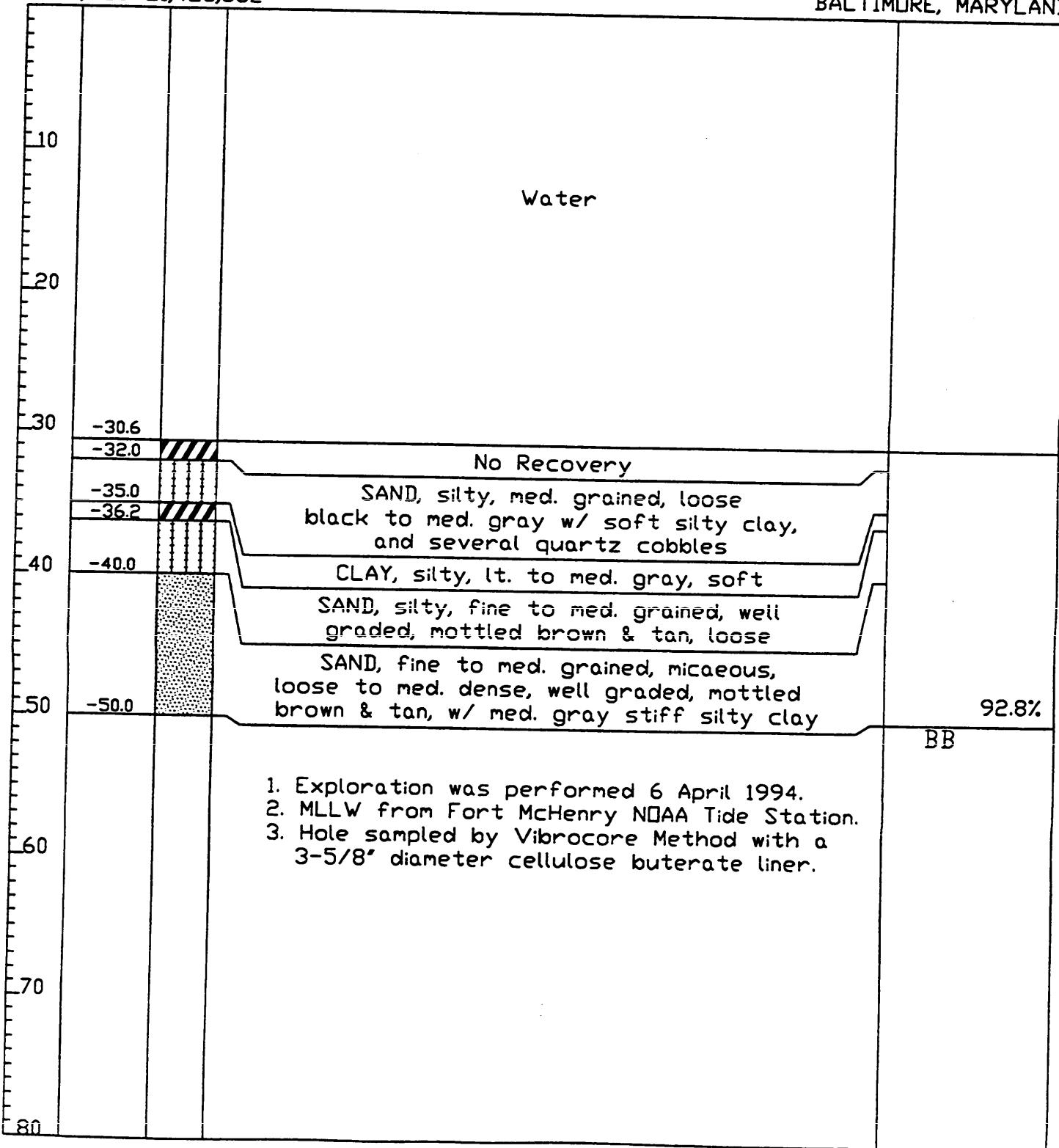
DEPTH (REF. MLLW)	USCS SYMBOL	WATER		% RECOVERY
		BOTTOM OF CHANNEL		
-3.1		SOIL DESCRIPTION:		
4				
-4.1		CLAY, HIGH PLASTICITY	(CH)	
-5.1		CLAY, LOW PLASTICITY	(CL)	
6				
-6.1		SILT, HIGH PLASTICITY	(MH)	
7				
-7.1		SILT, LOW PLASTICITY	(ML)	
8				
-8.1		CLAYEY SAND	(SC)	
9				
-9.1		SILTY SAND	(SM)	
10				
-10.1		POORLY GRADED SAND	(SP)	
11				
-11.1		WELL GRADED SAND	(SW)	92.8%
12		<u>SUBSURFACE EXPLORATION NOTES:</u>		BB
13		1. Exploration was performed 6-21 April 1994. 2. MLLW from Fort McHenry NOAA Tide Station. 3. Hole sampled by Vibrocoring Method with a 3-5/8" diameter cellulose buterate liner. 4. Abbreviations: W% - Water content (percent) med. - medium Dens. - In-situ Density (g/cc) dk. - dark lt. - light		BOTTOM OF BORING
14				
15				
16				

EB-1-94

N580,528 E1,428,352

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

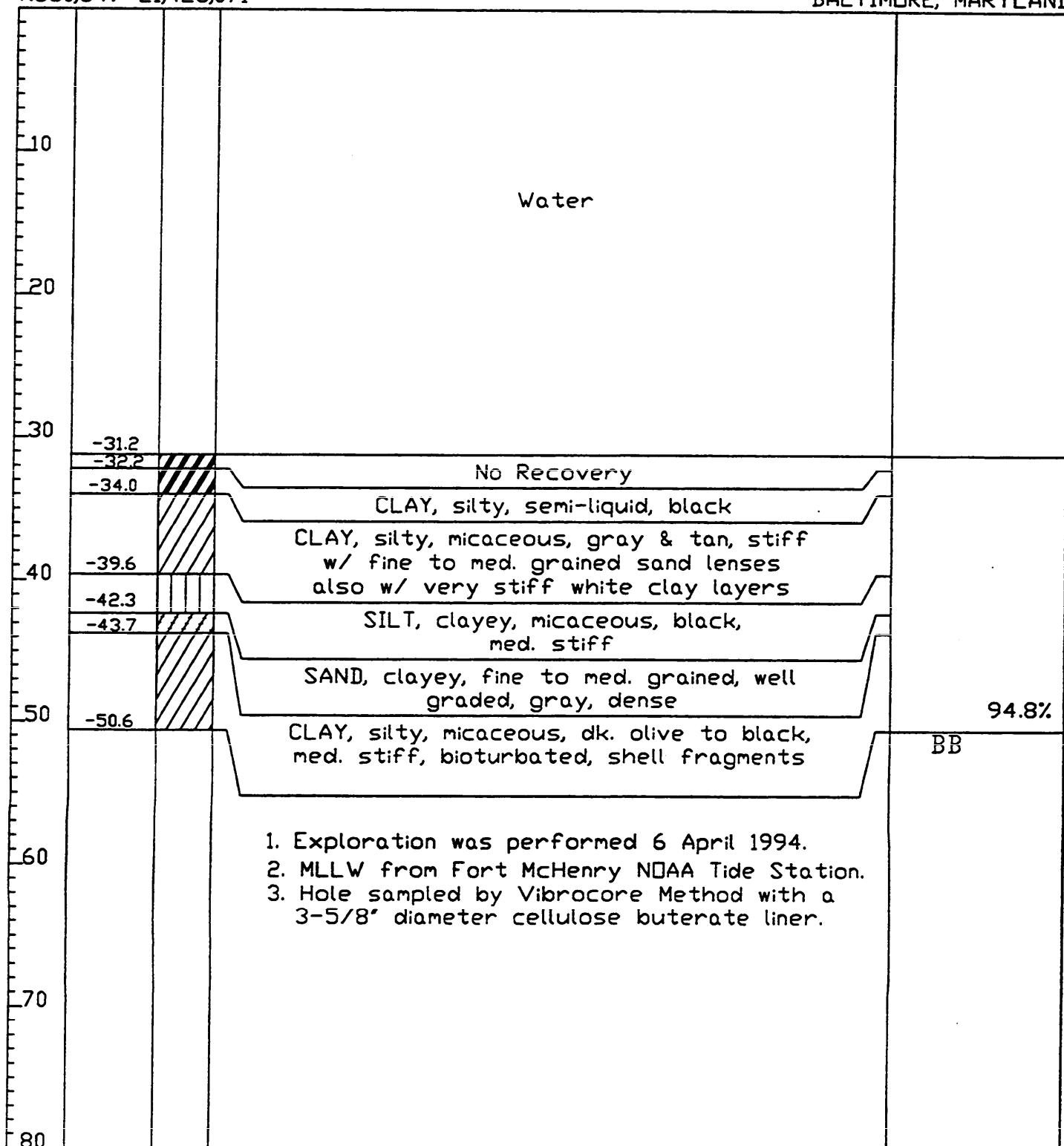


EB-2-94

N580,547 E1,428,071

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

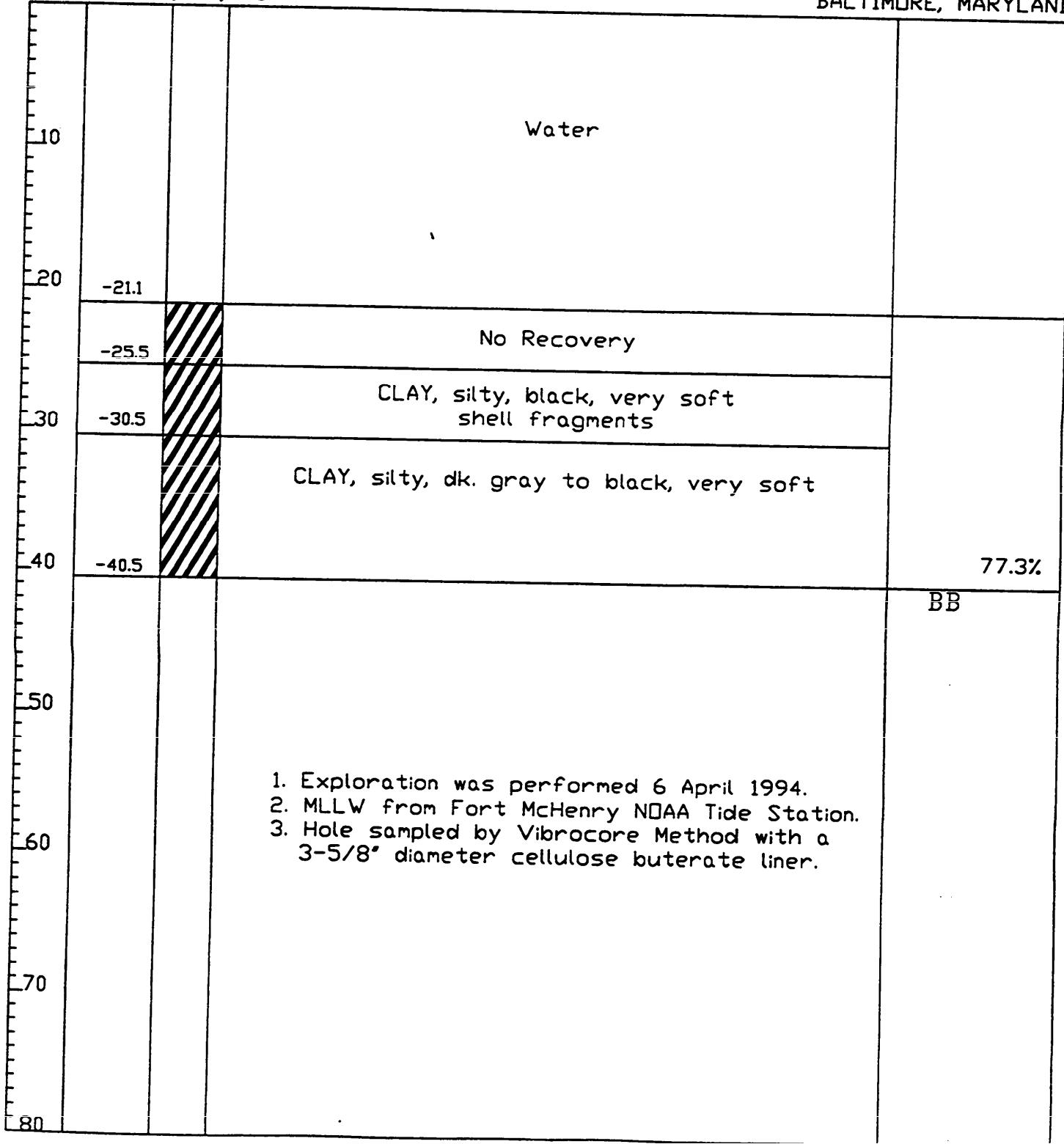


EB-3-94

N579,537 E1,428,448

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

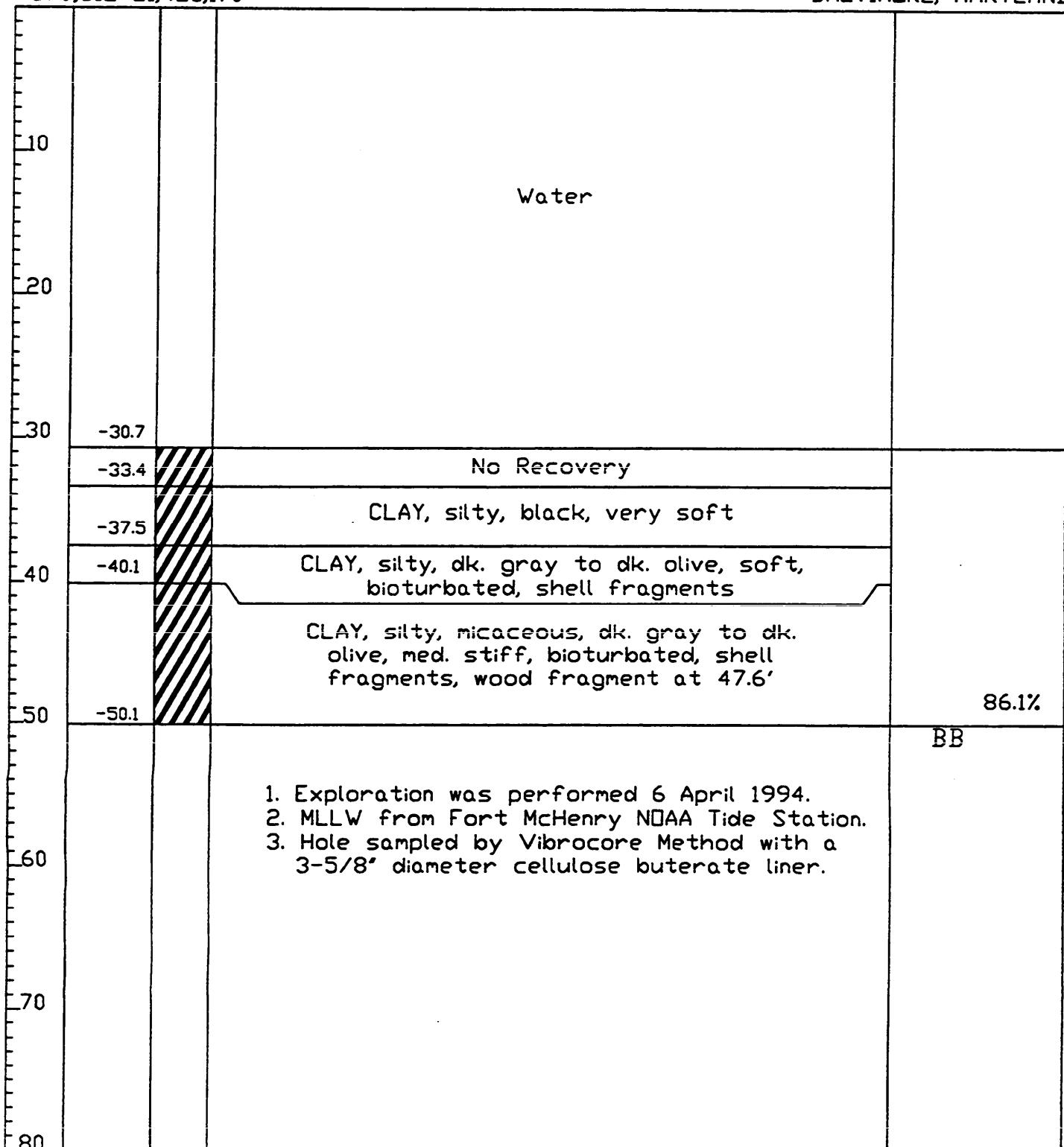


EB-4-94

N579,612 E1,428,170

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

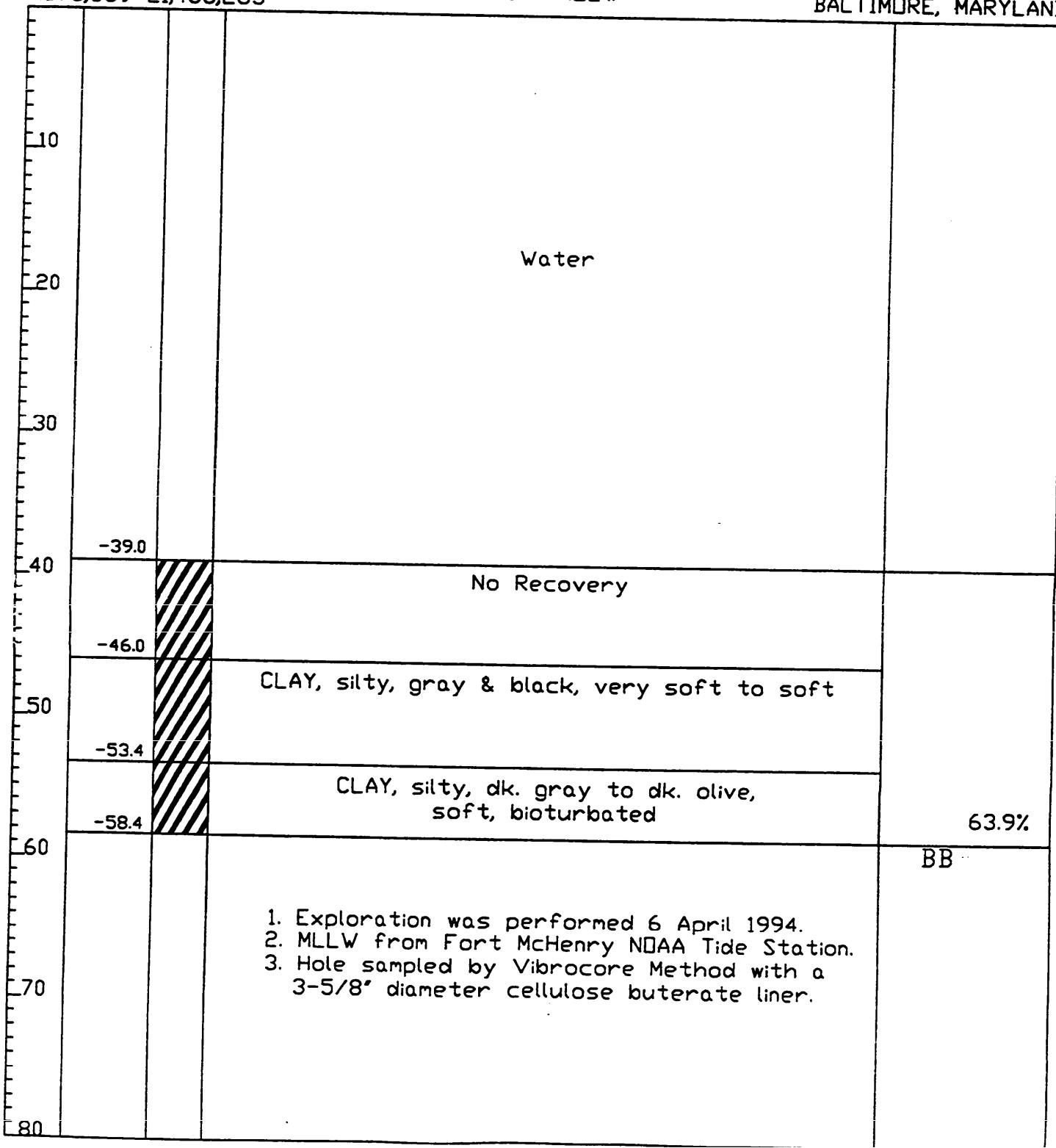


EB-5-94

N575,639 E1,438,285

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

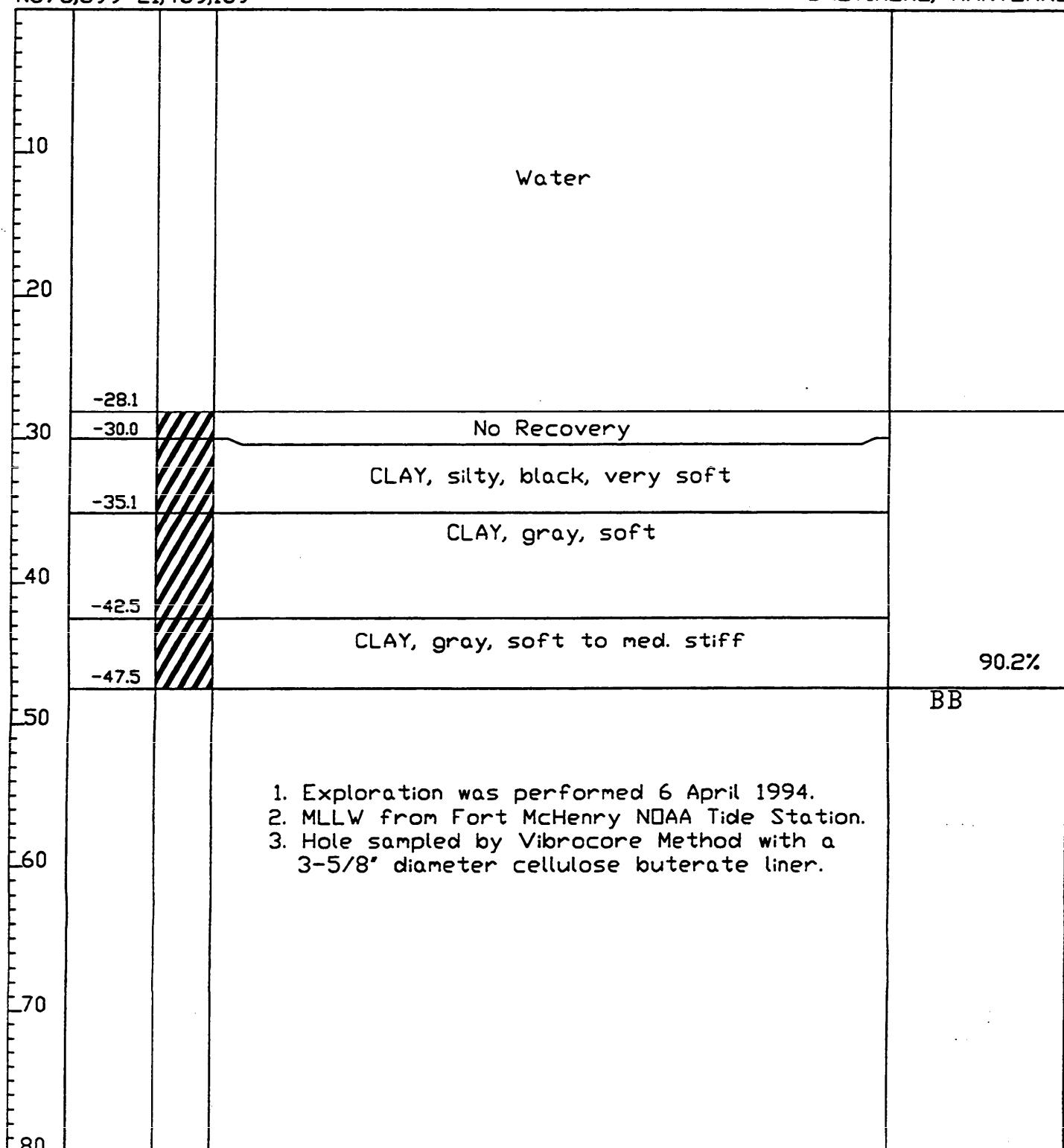


EB-6-94

N576,399 E1,439,159

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

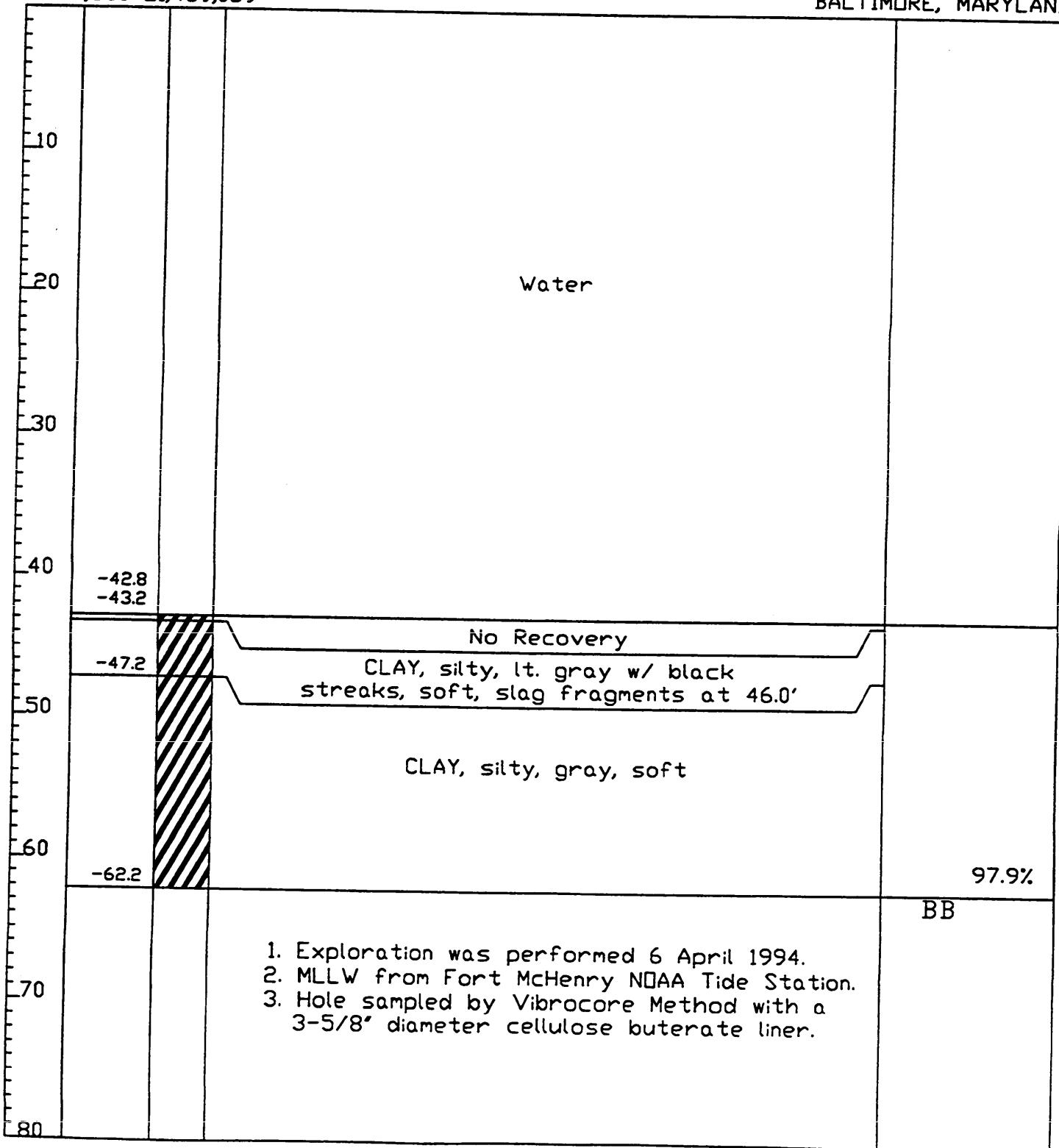


EB-7-94

N574,881 E1,439,039

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

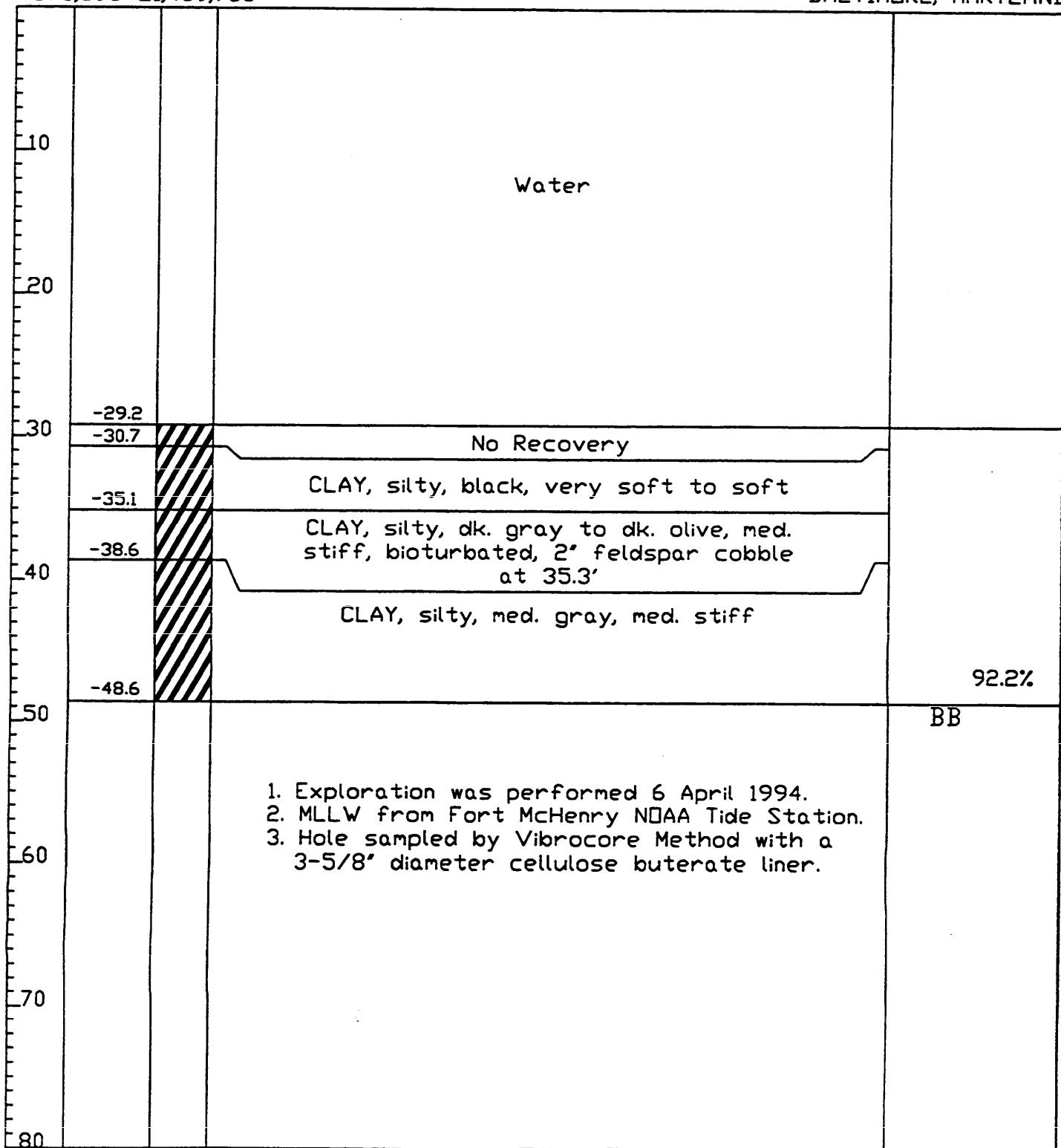


EB-8-94

N575,593 E1,439,738

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

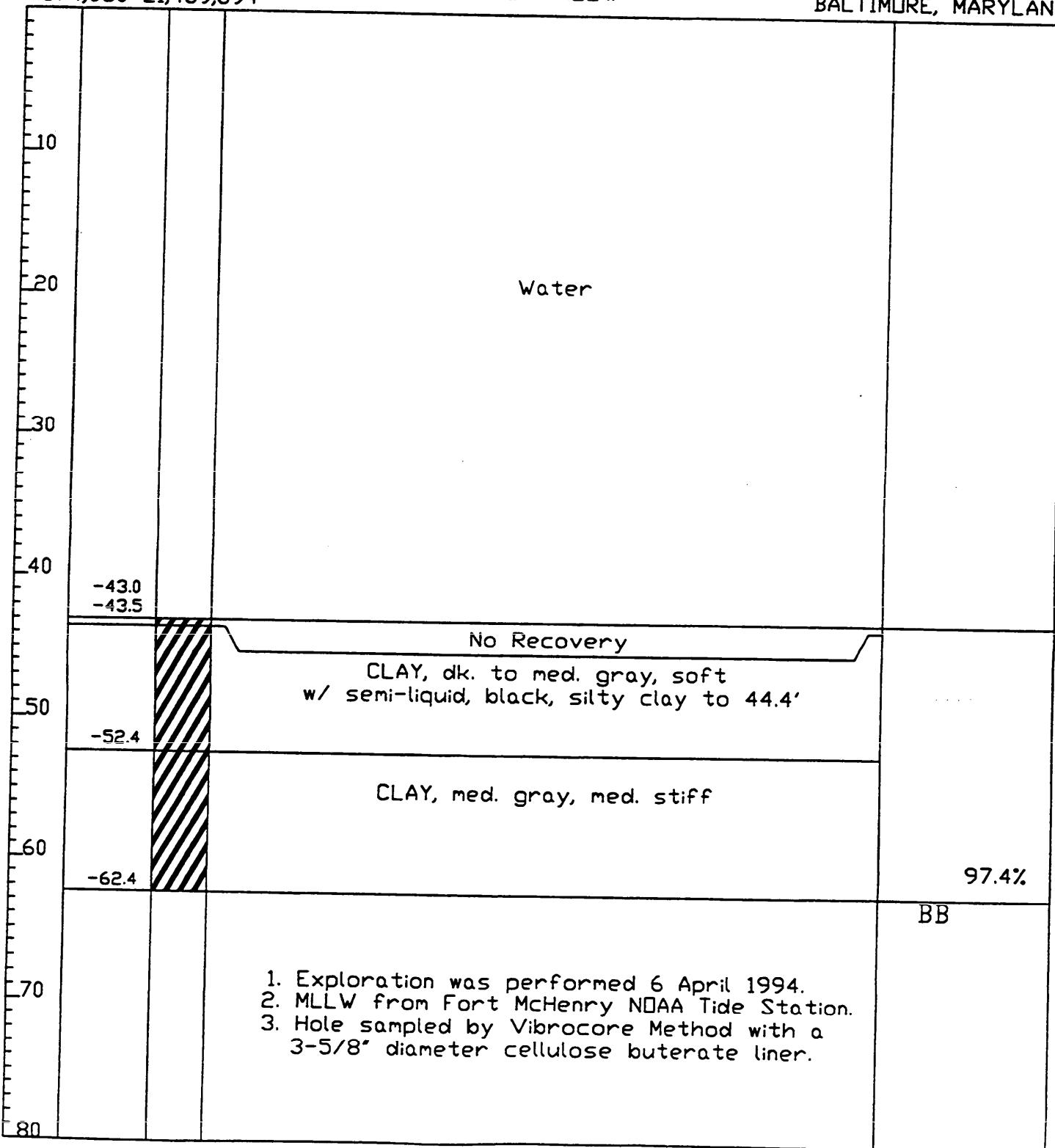


EB-9-94

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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

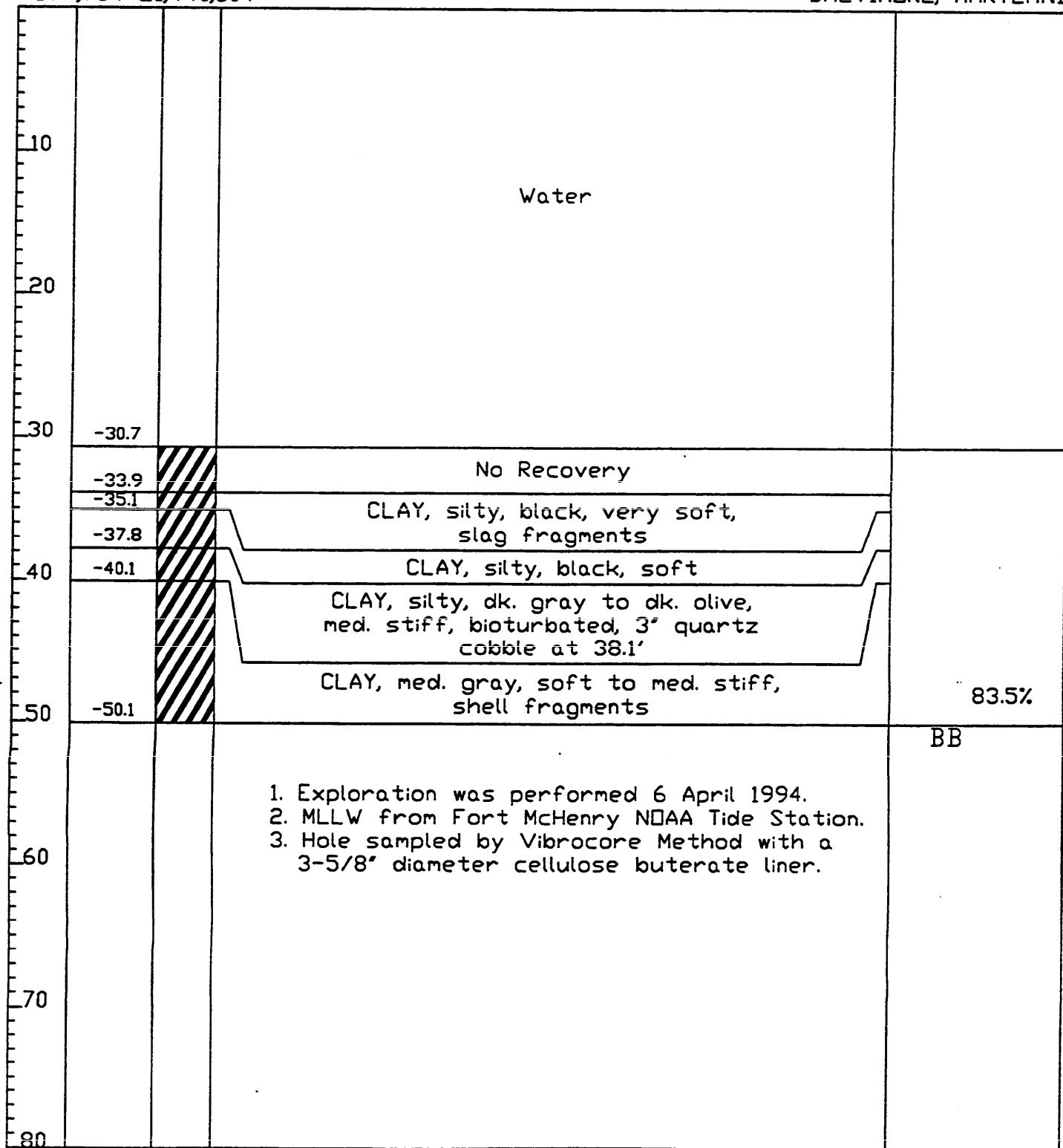


EB-10-94

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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

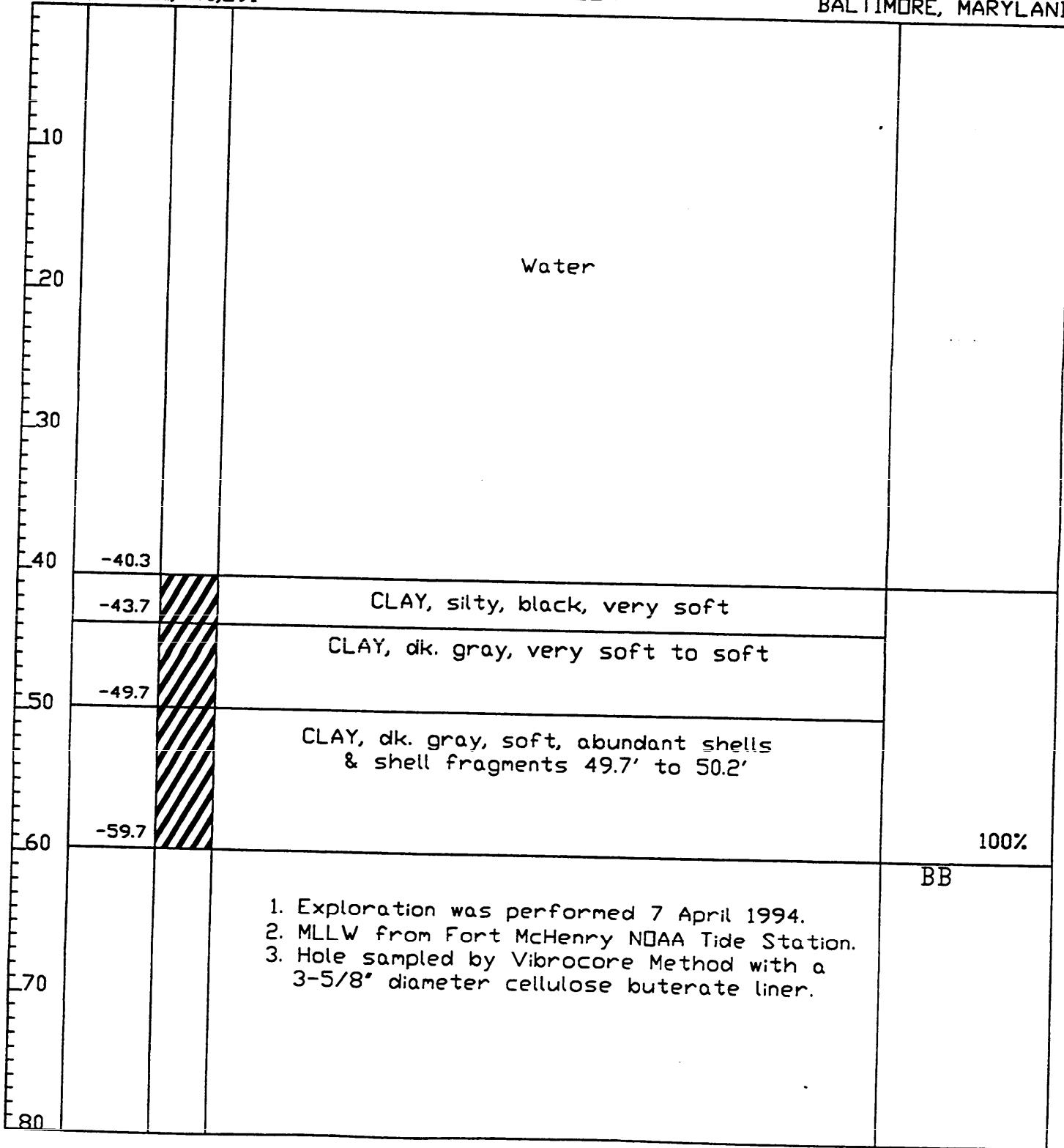


EB-11-94

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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

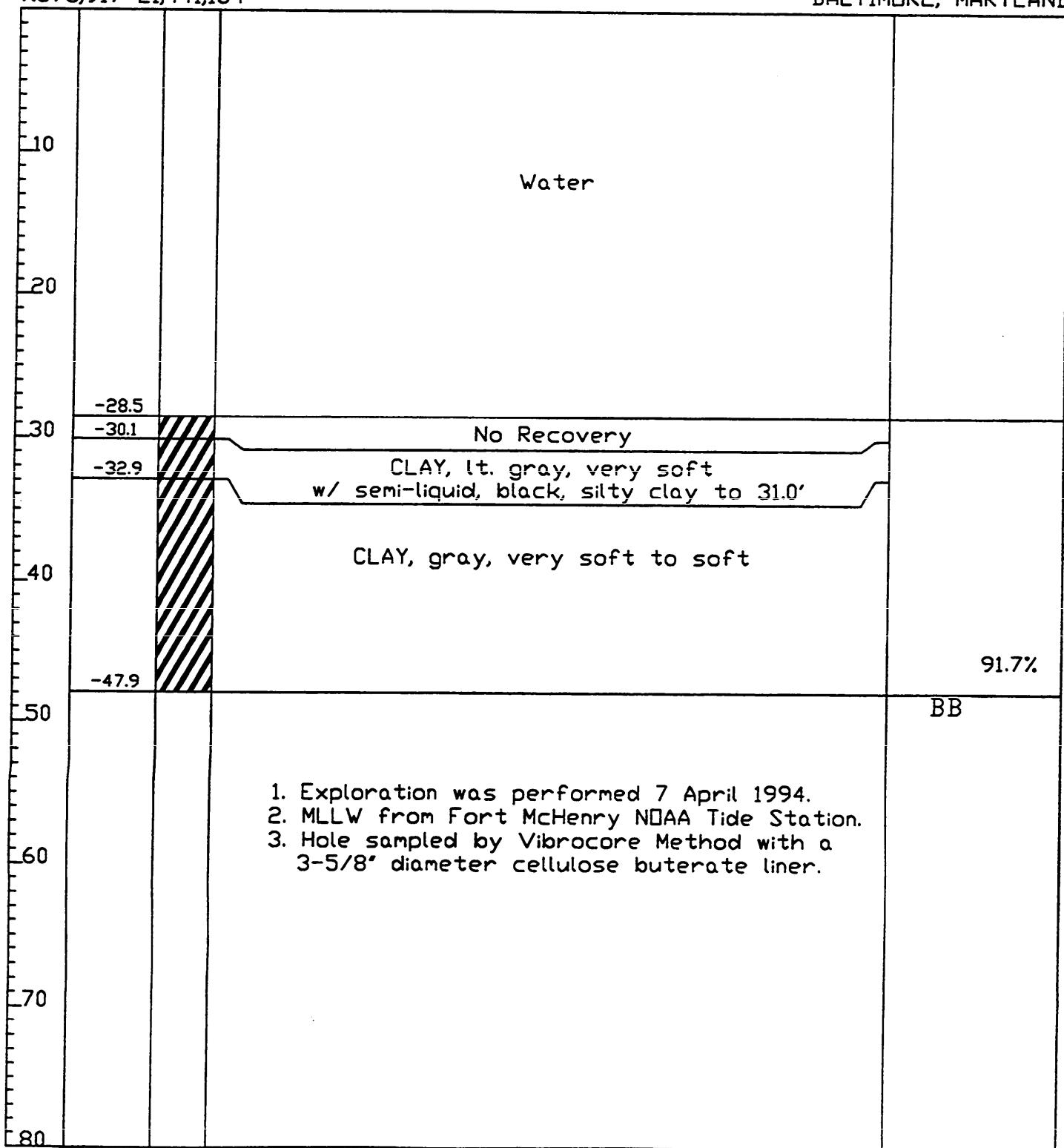


EB-12-94

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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

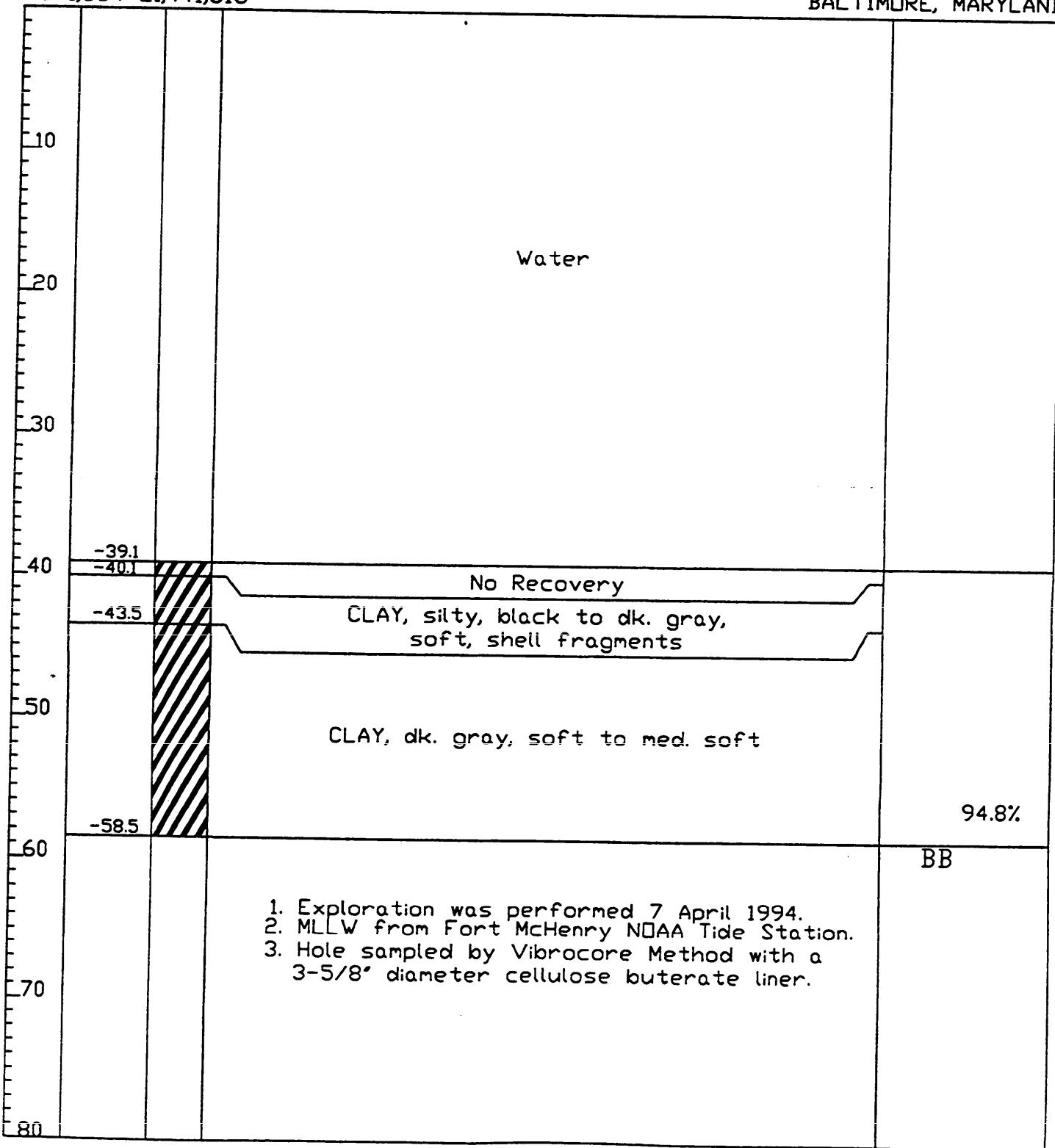


EB-13-94

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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

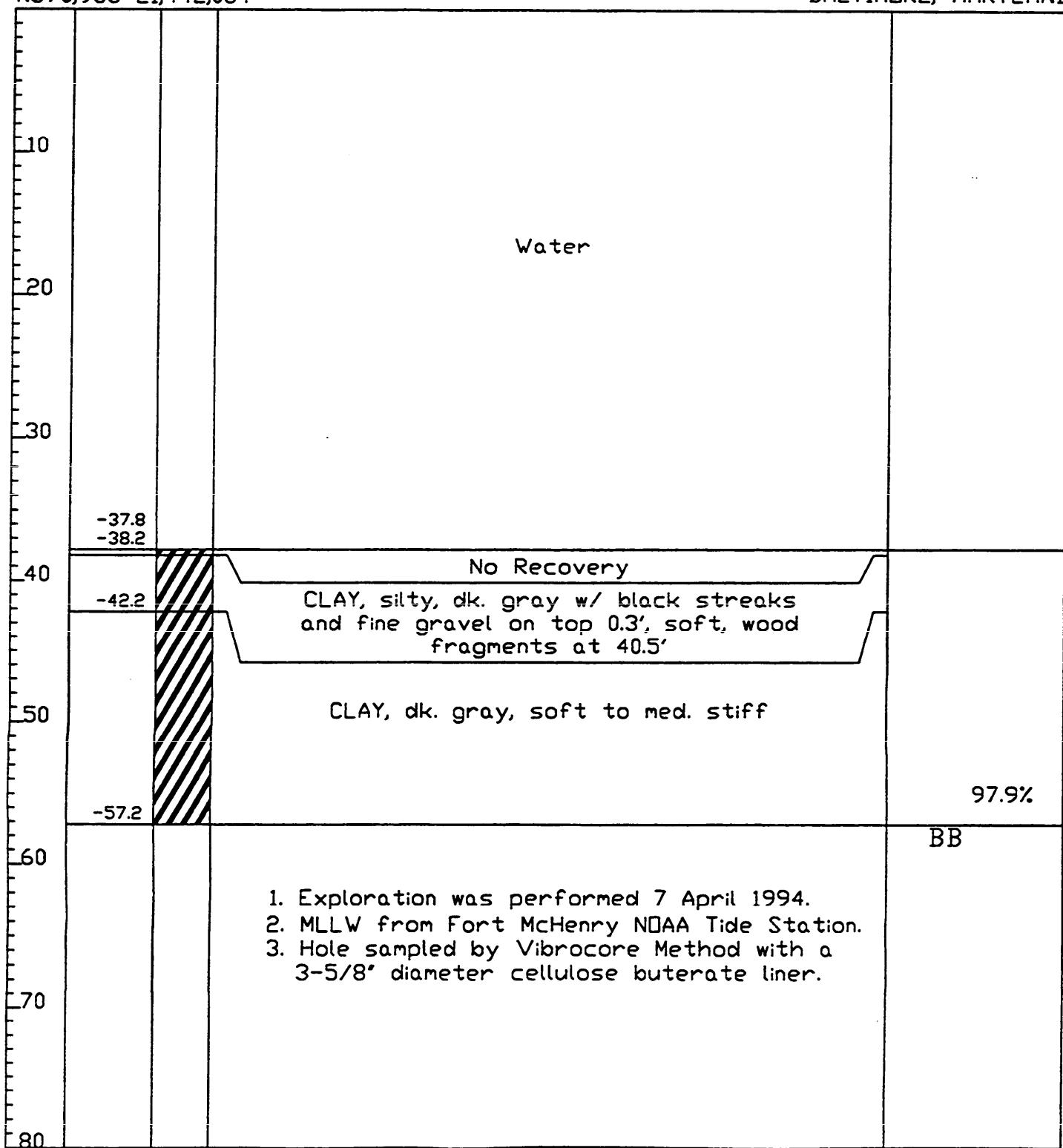


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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

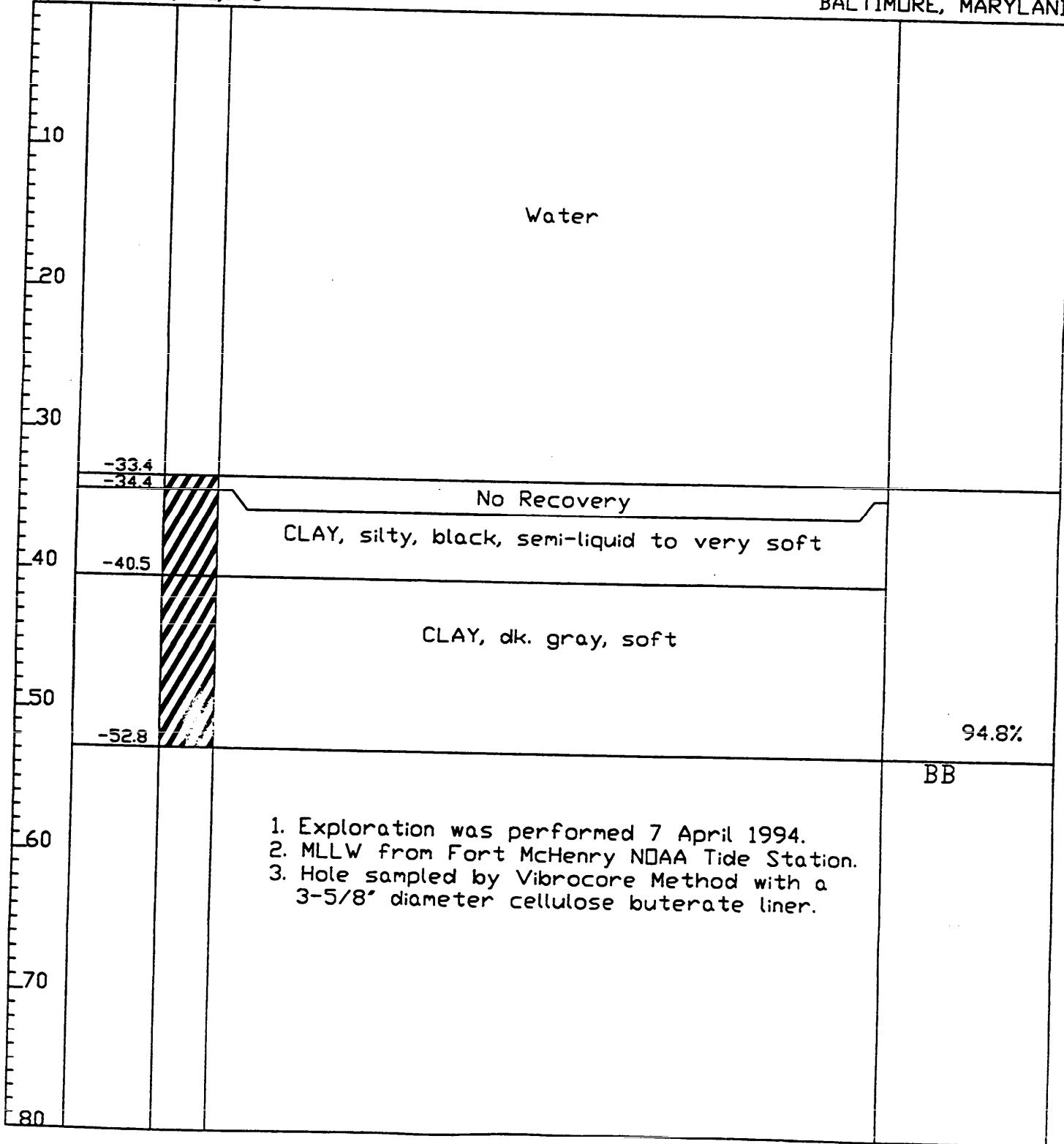


EB-15-94

N572,040 E1,442,048

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

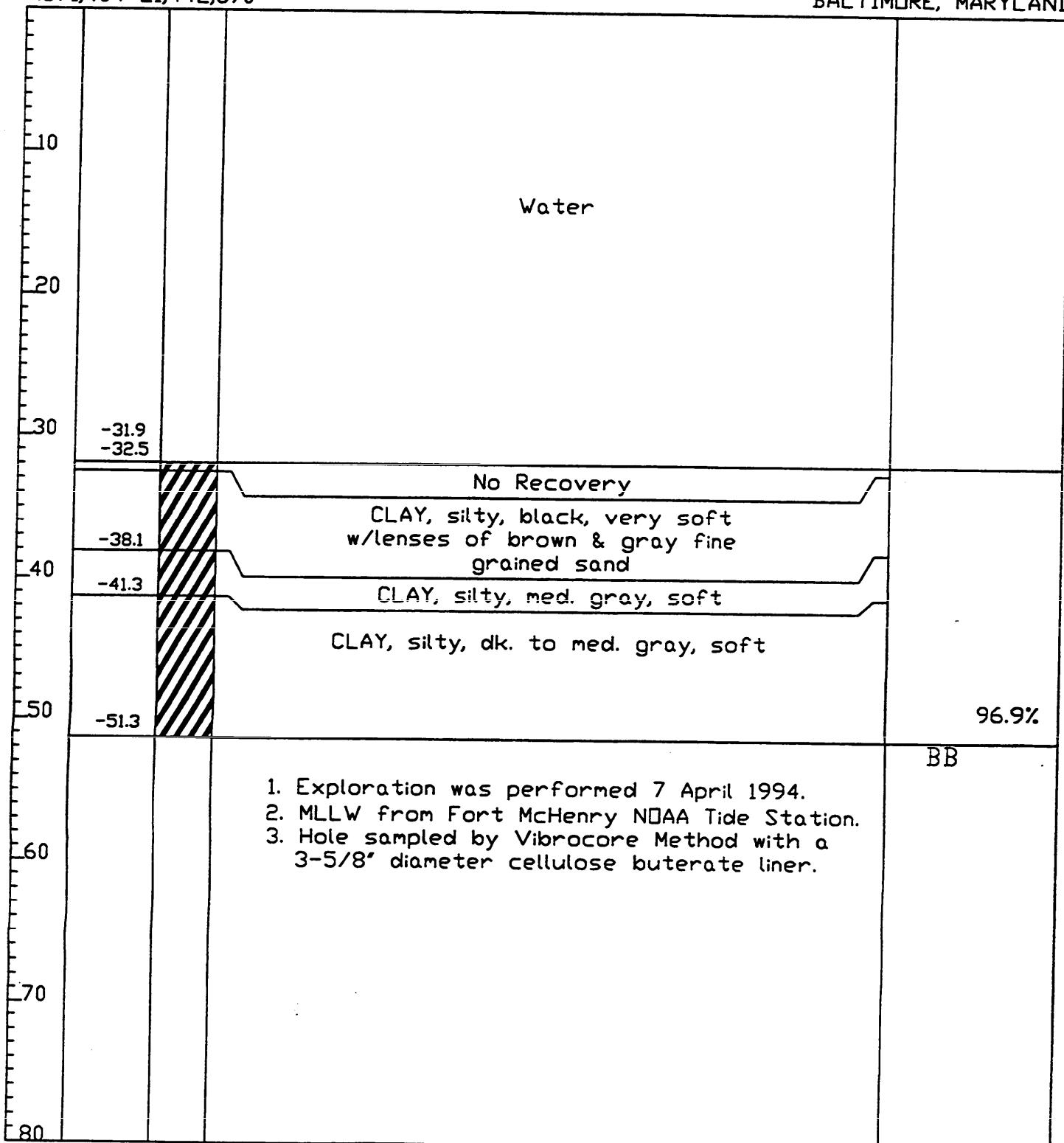


EB-16-94

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

N571,404 E1,442,670

ELEV. MLLW

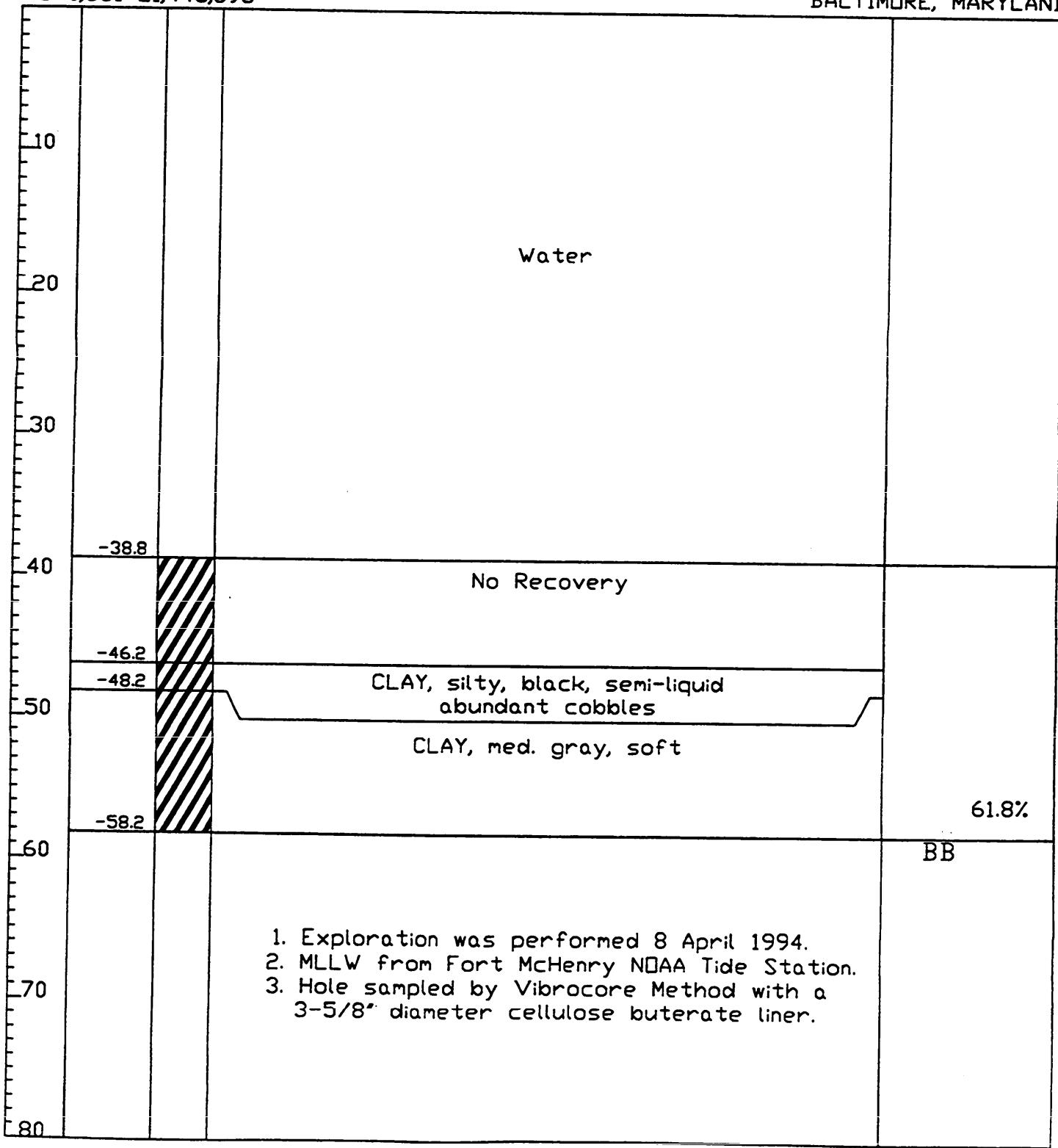


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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

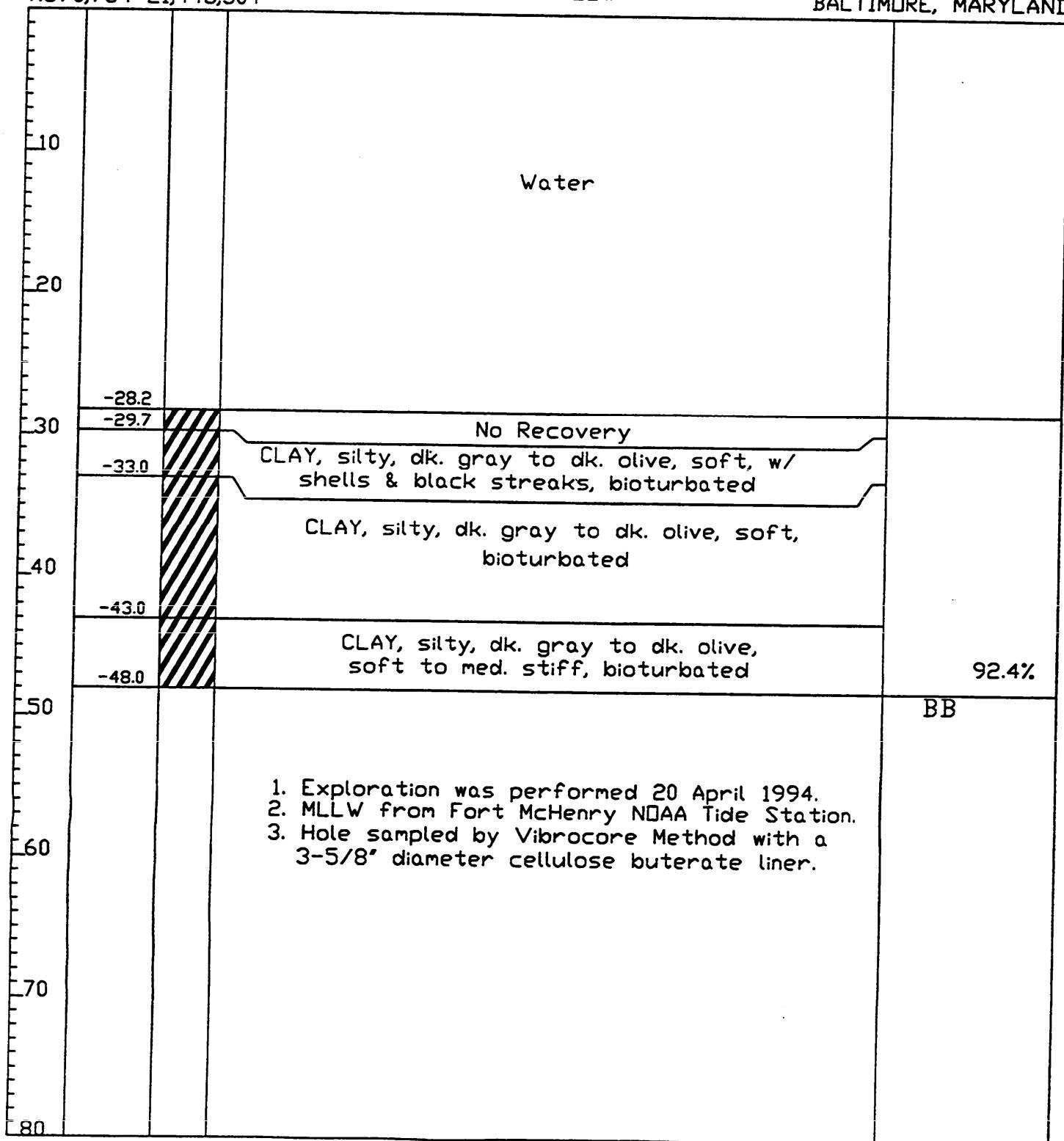


EB-17A-94

N570,784 E1,443,504

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

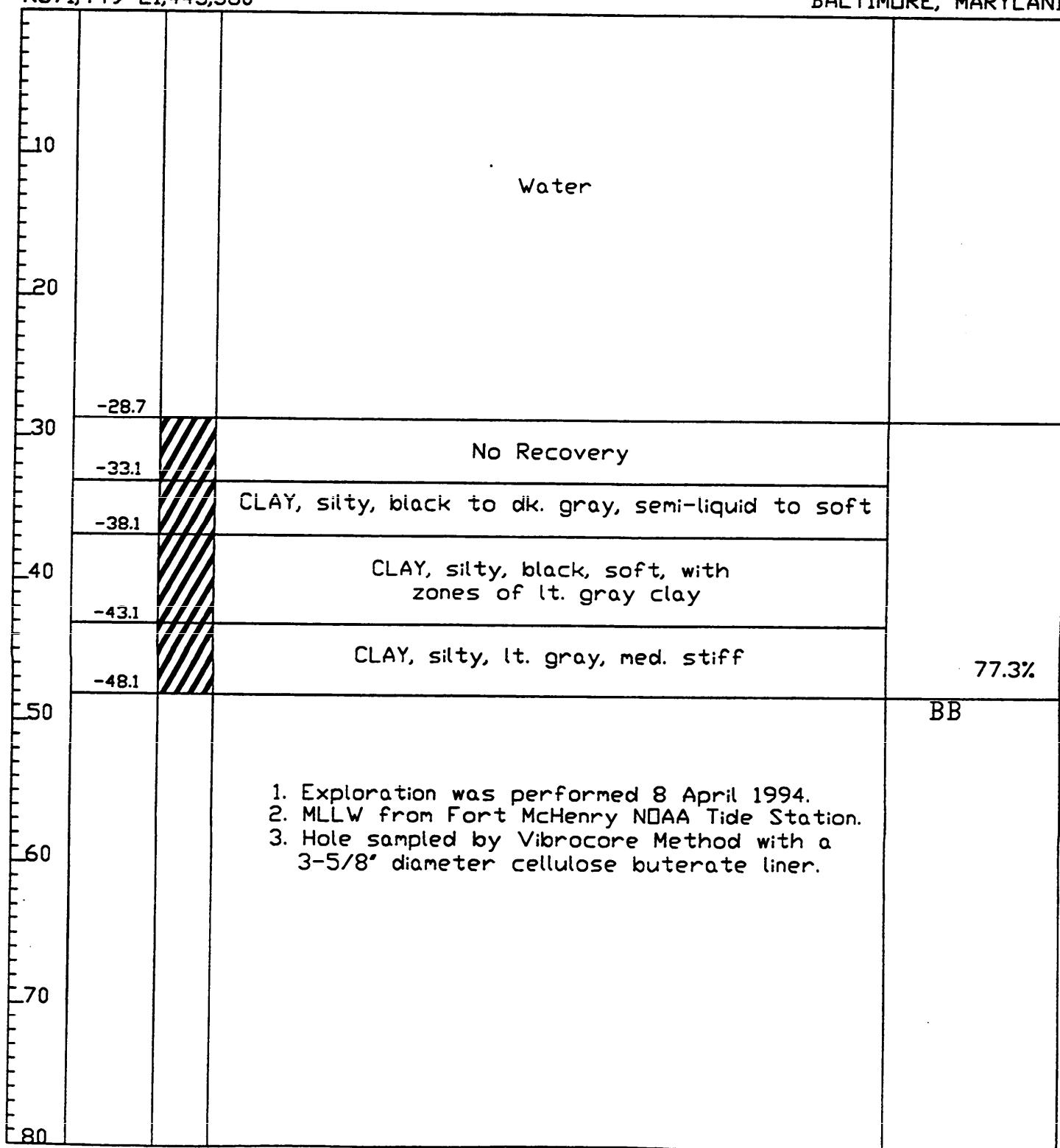


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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

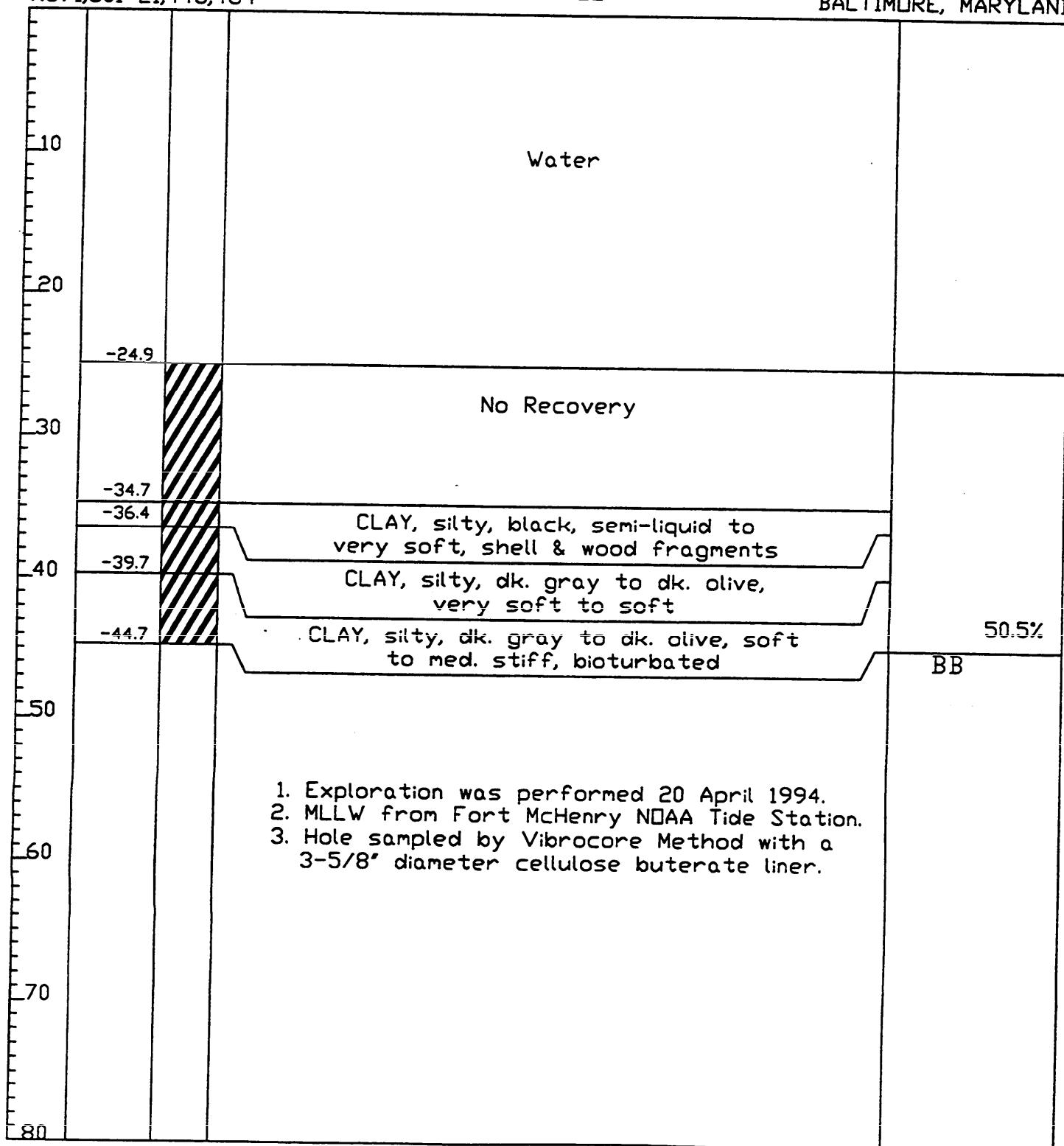


EB-18C-94

N571,501 E1,443,484

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

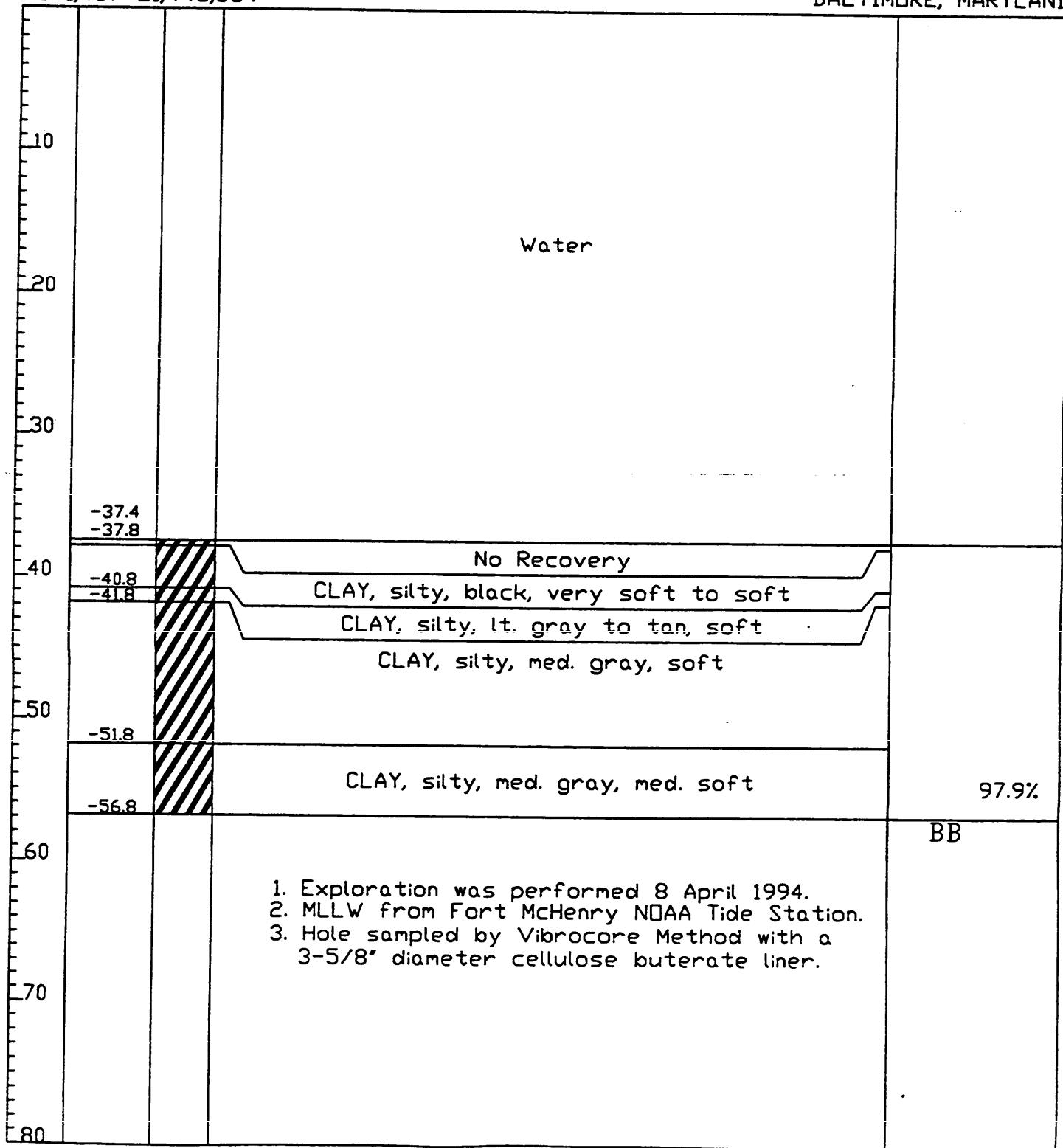


EB-19-94

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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

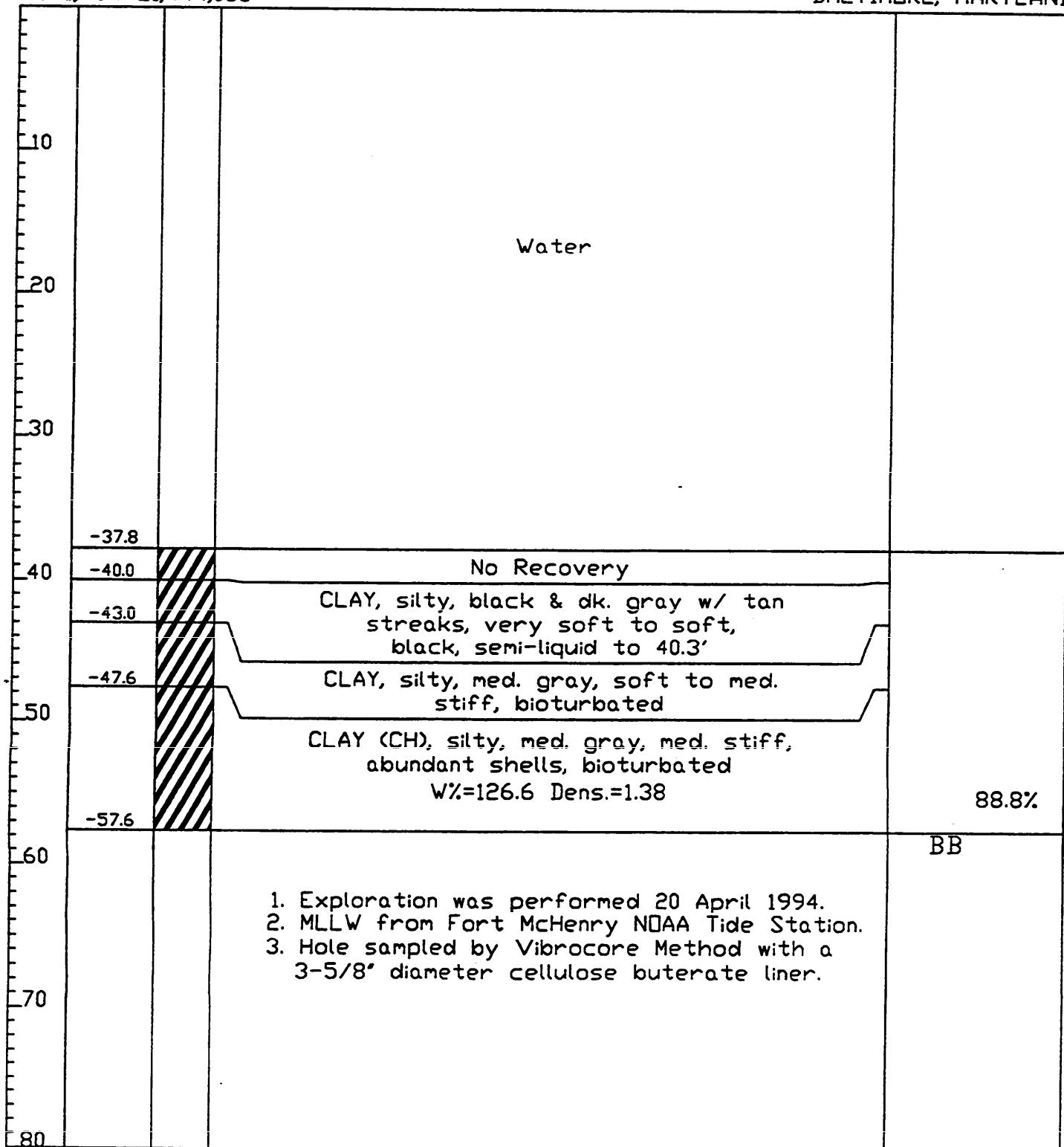


EB-19A-94

N571,494 E1,444,055

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

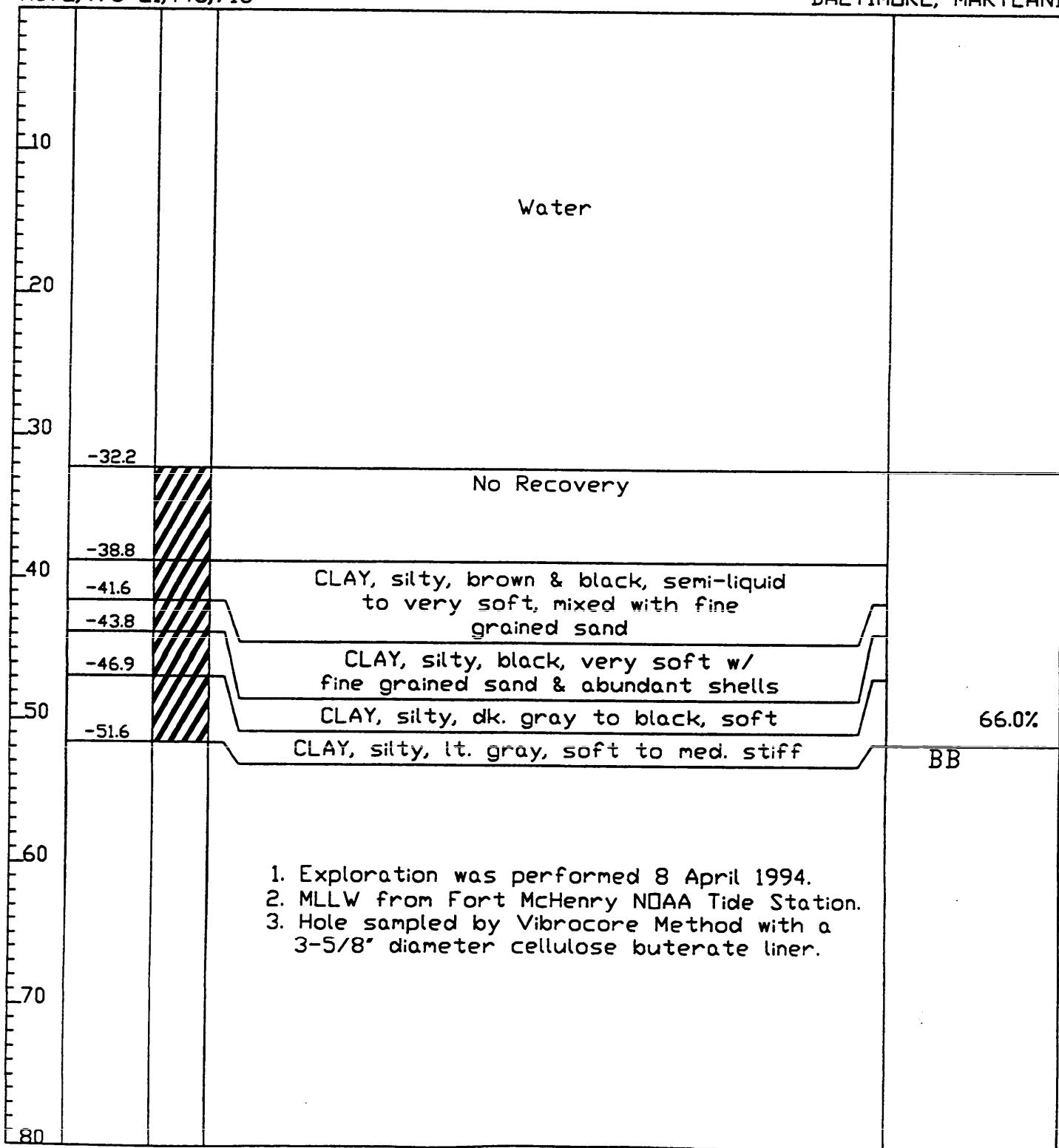


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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

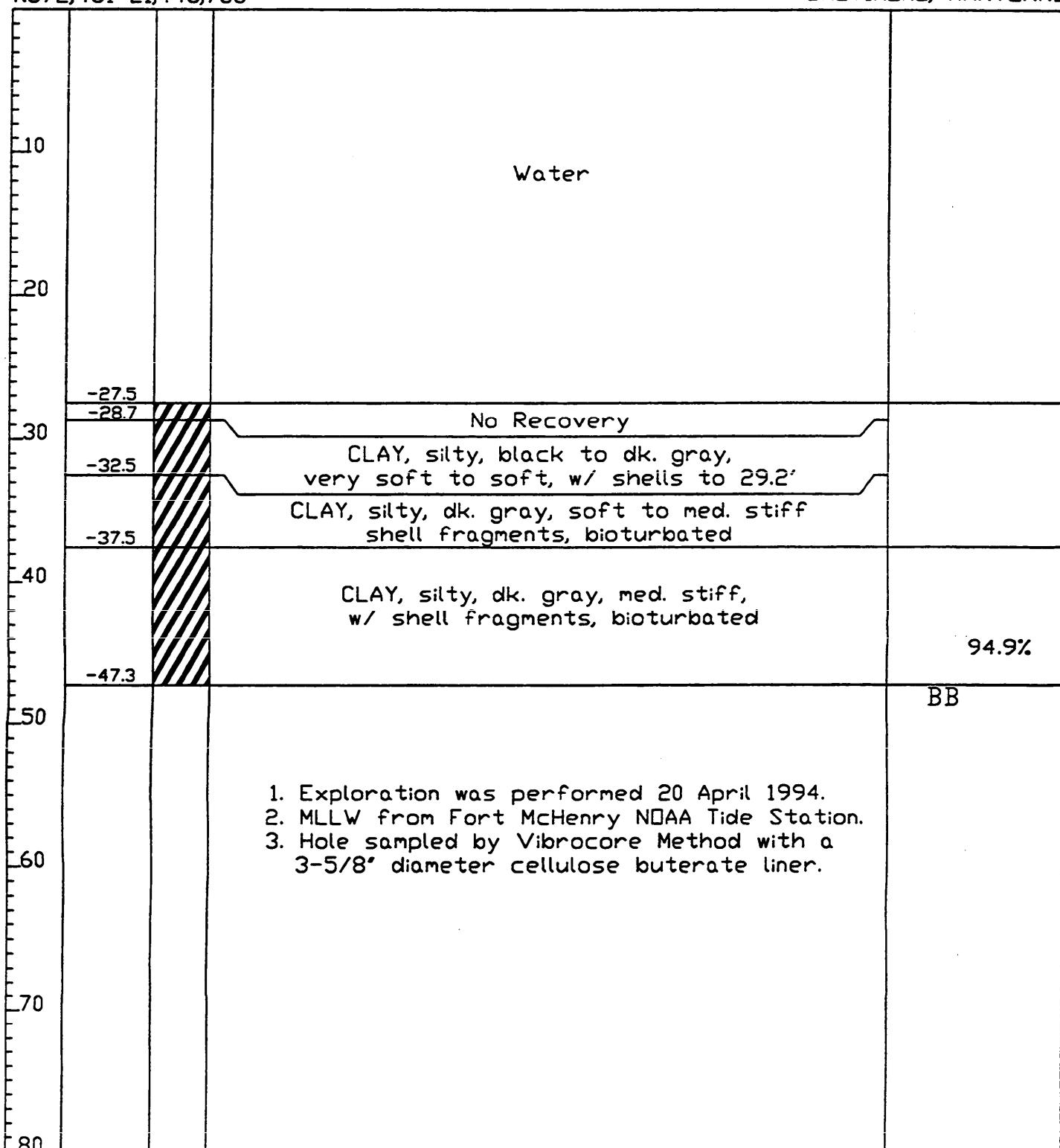


EB-20A-94

N572,461 E1,443,736

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

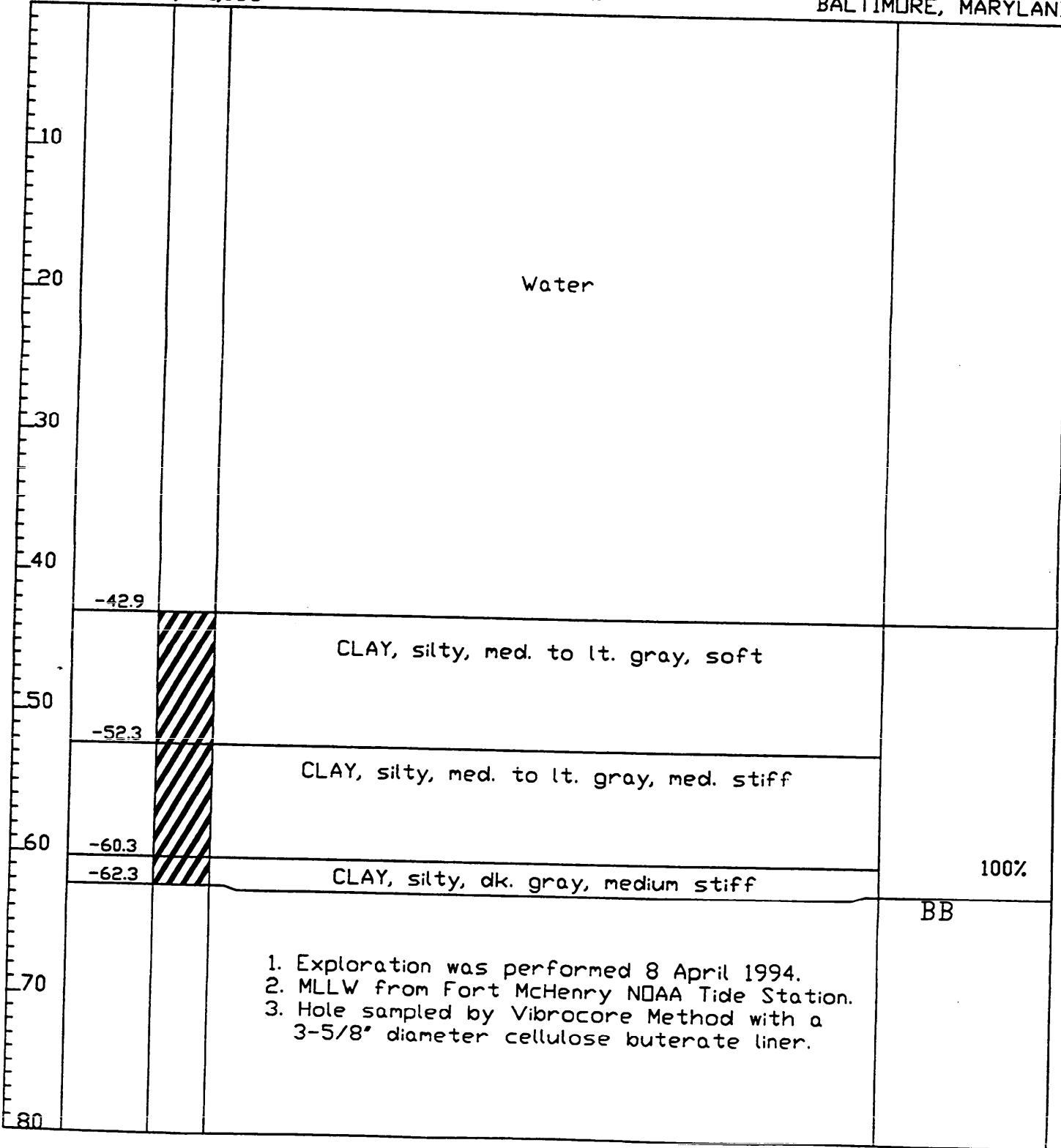


EB-21-94

N572,554 E1,441,088

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

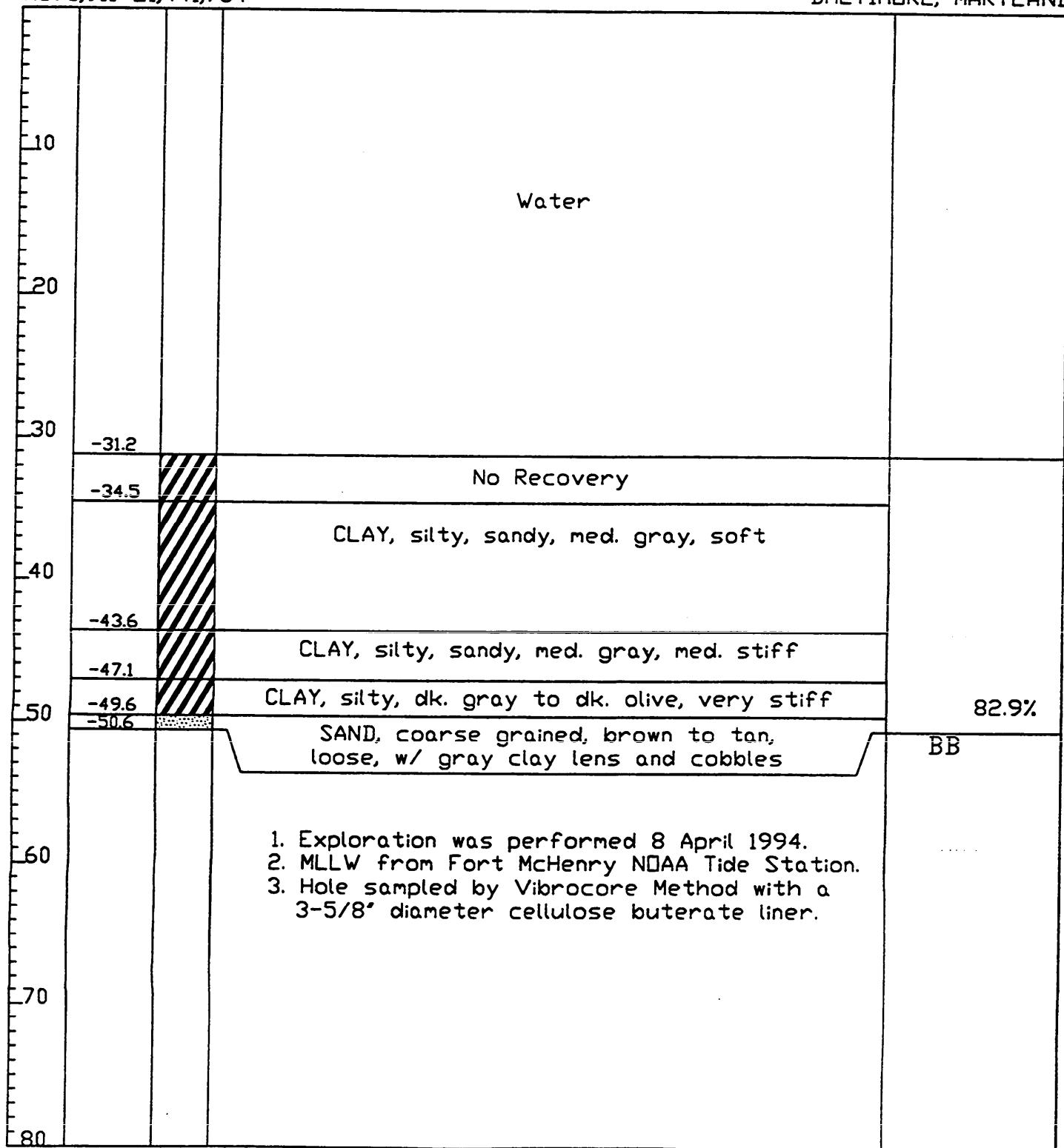


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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

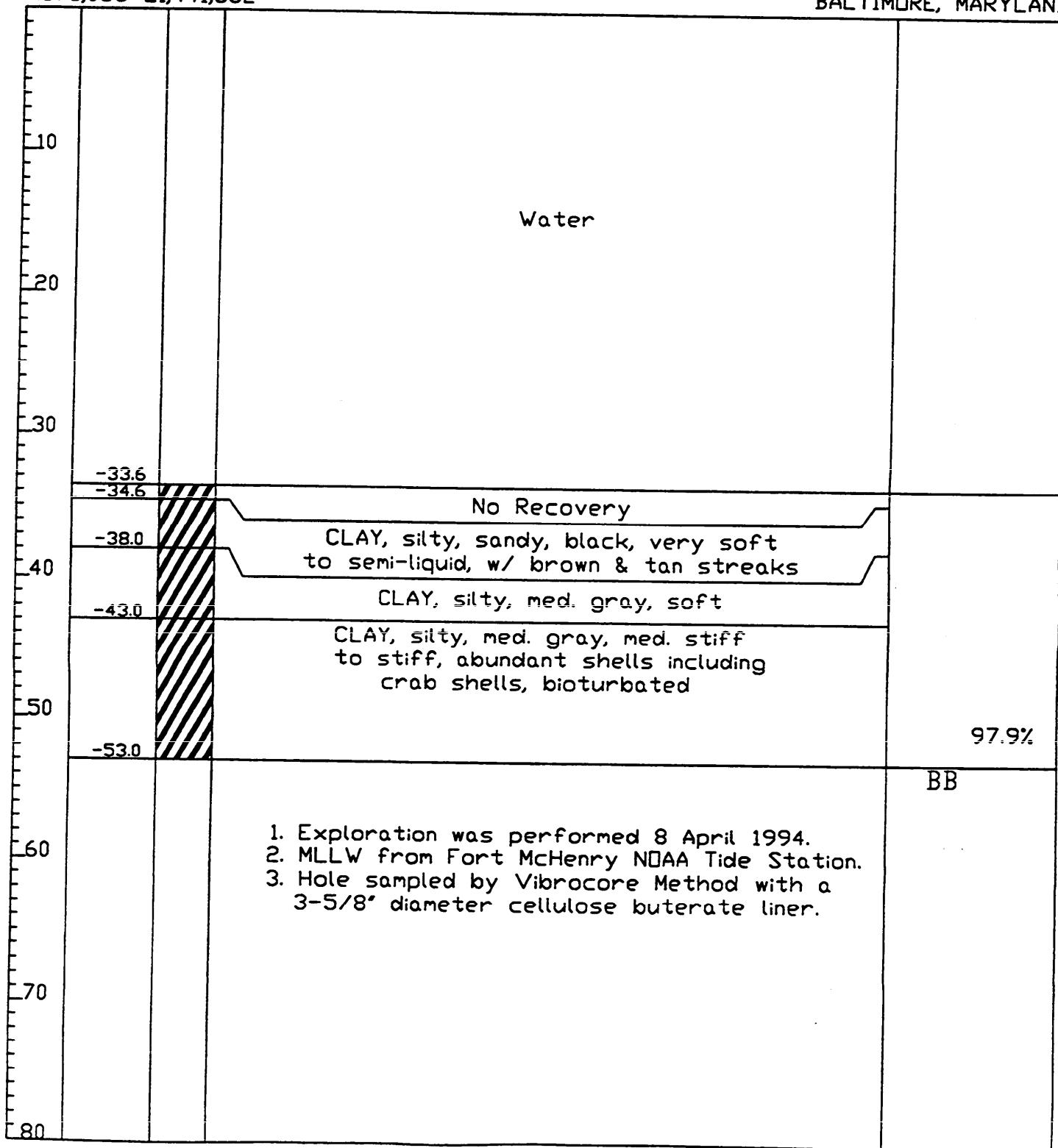


EB-23-94

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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

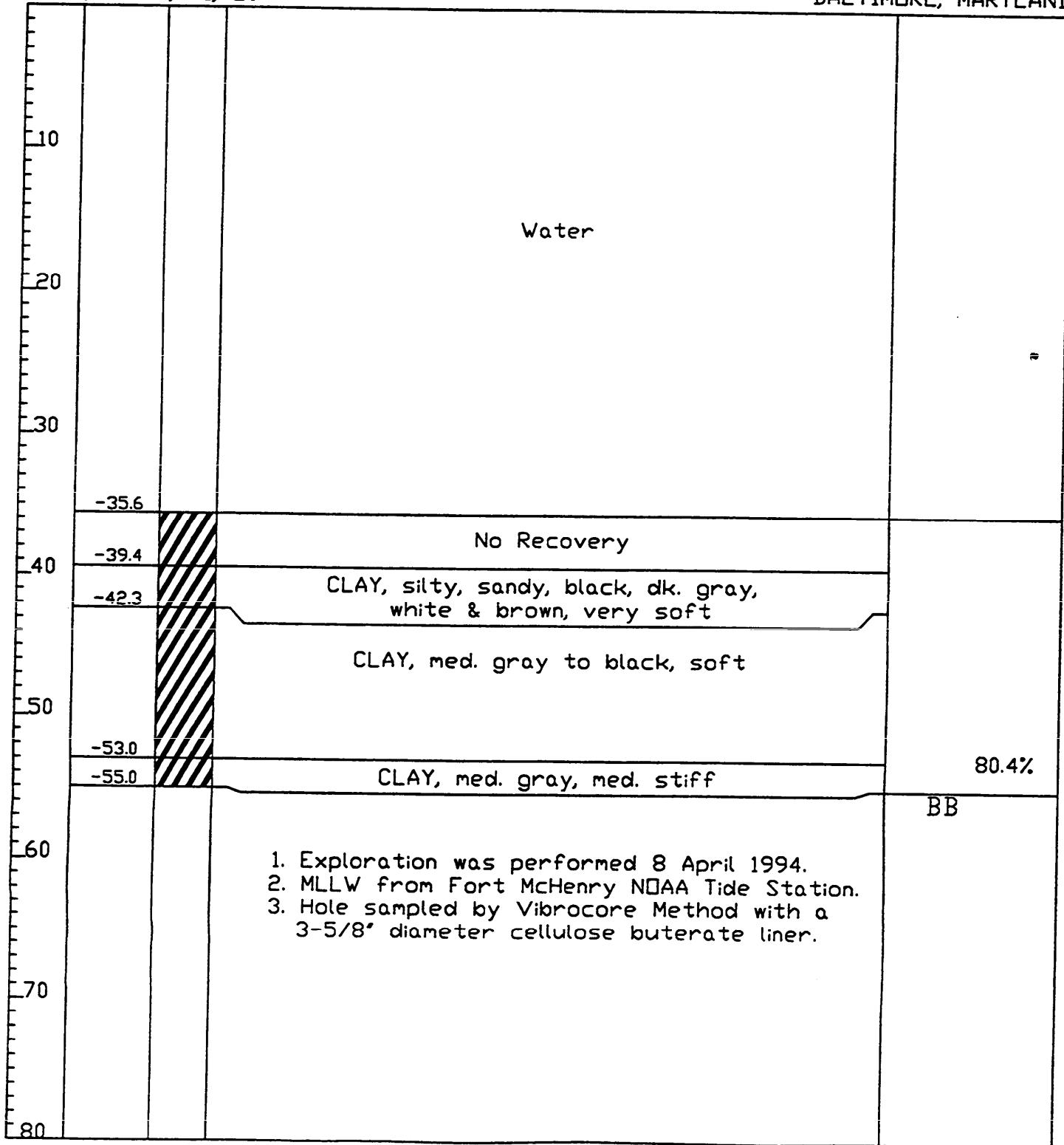


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N576,877 E1,441,429

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

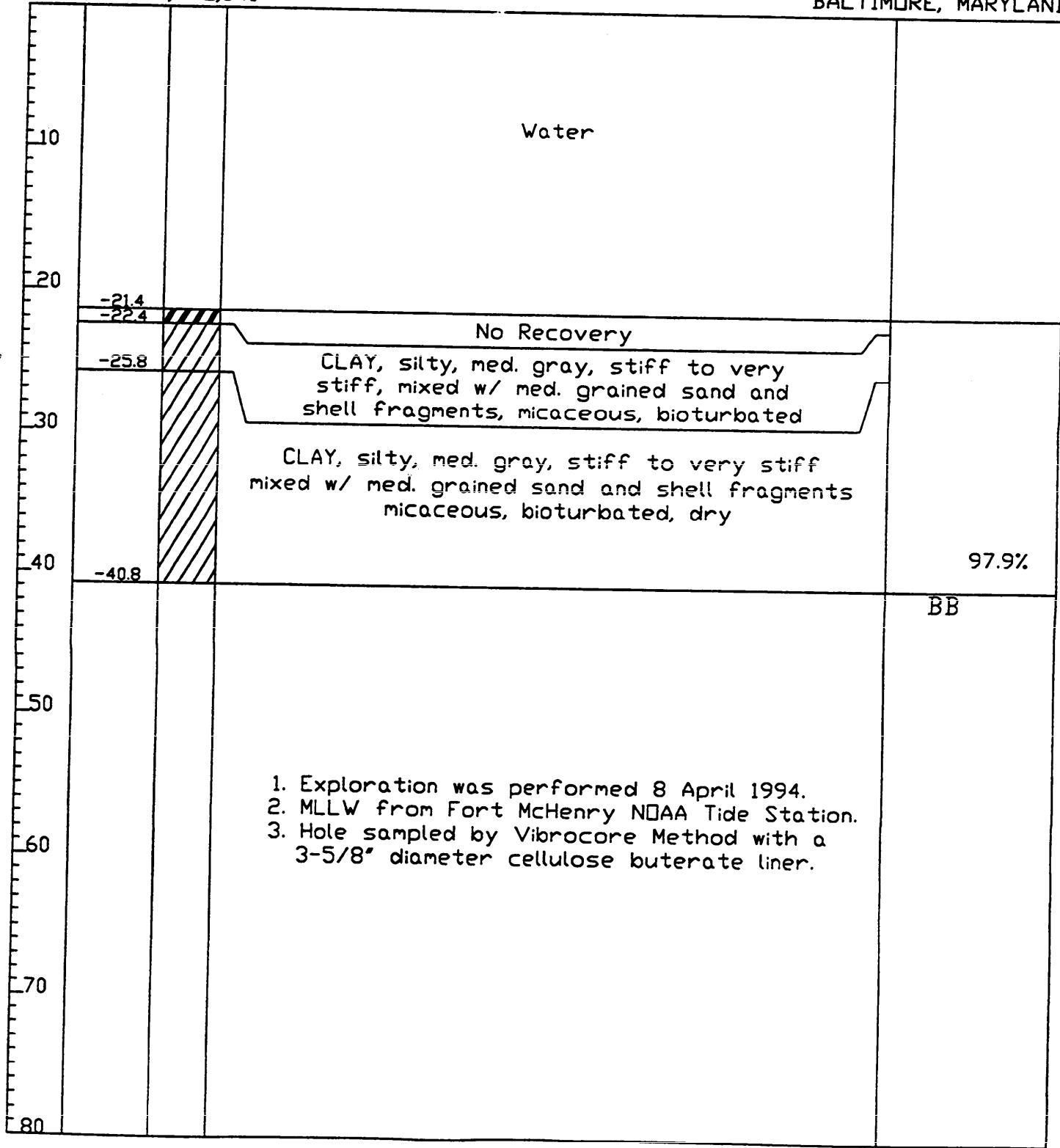


EB-25-94

N576,028 E1,442,541

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND



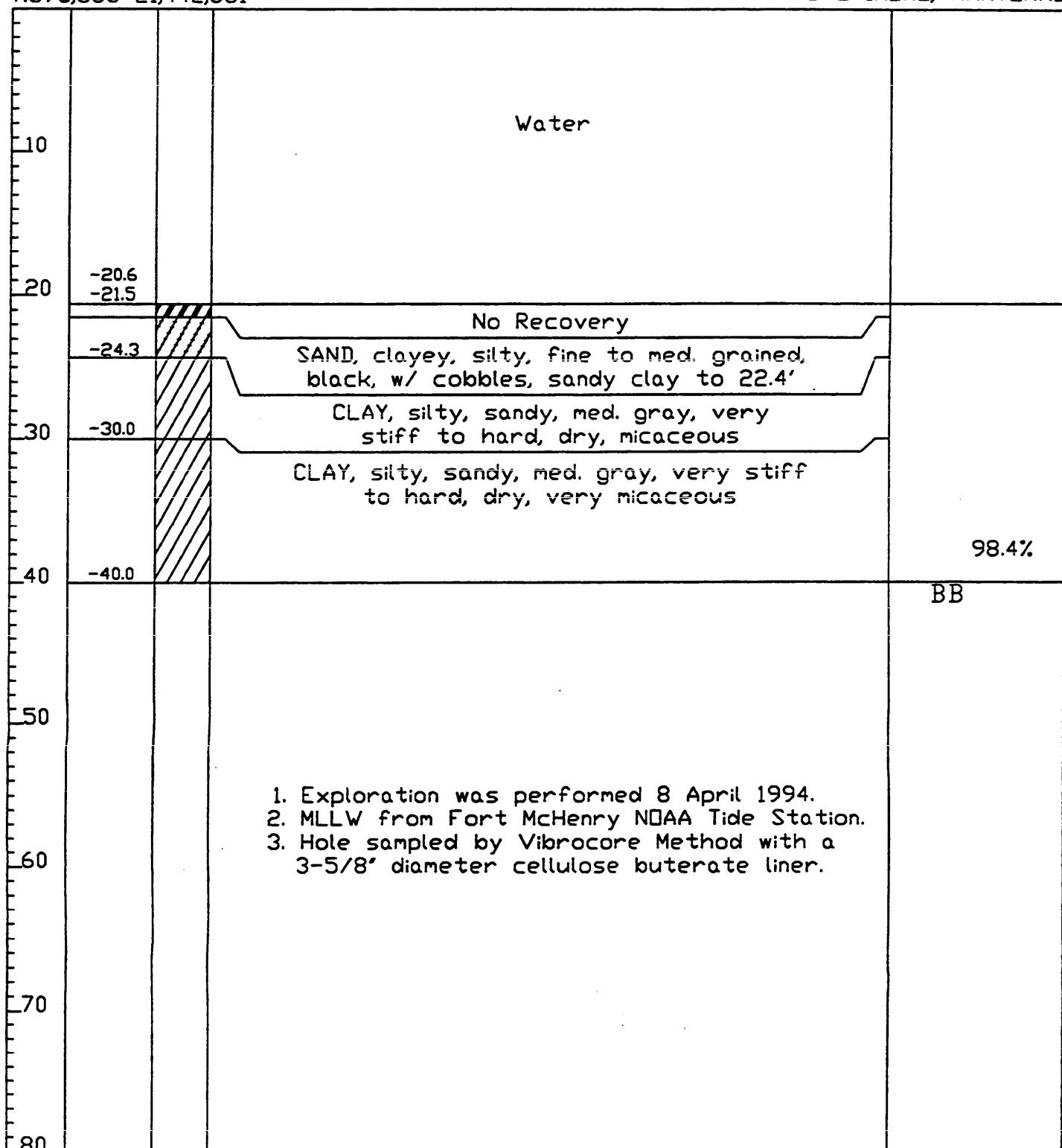
1. Exploration was performed 8 April 1994.
2. MLLW from Fort McHenry NOAA Tide Station.
3. Hole sampled by Vibrocore Method with a 3-5/8" diameter cellulose buterate liner.

EB-26-94

N576,358 E1,442,381

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND



GEOTECHNICAL BORING LEGEND

WATER SURFACE
 LOCATION
 NAD 1983 GRID
 N-NORTH E-EAST
 N580,528 E1,428,352

GB-1-94

ELEV. MLLW

BORING NUMBER
 REFERENCE DATUM
 MEAN LOWER LOW WATER
 BALTIMORE HARBOR
 FEASIBILITY STUDY
 BALTIMORE, MARYLAND

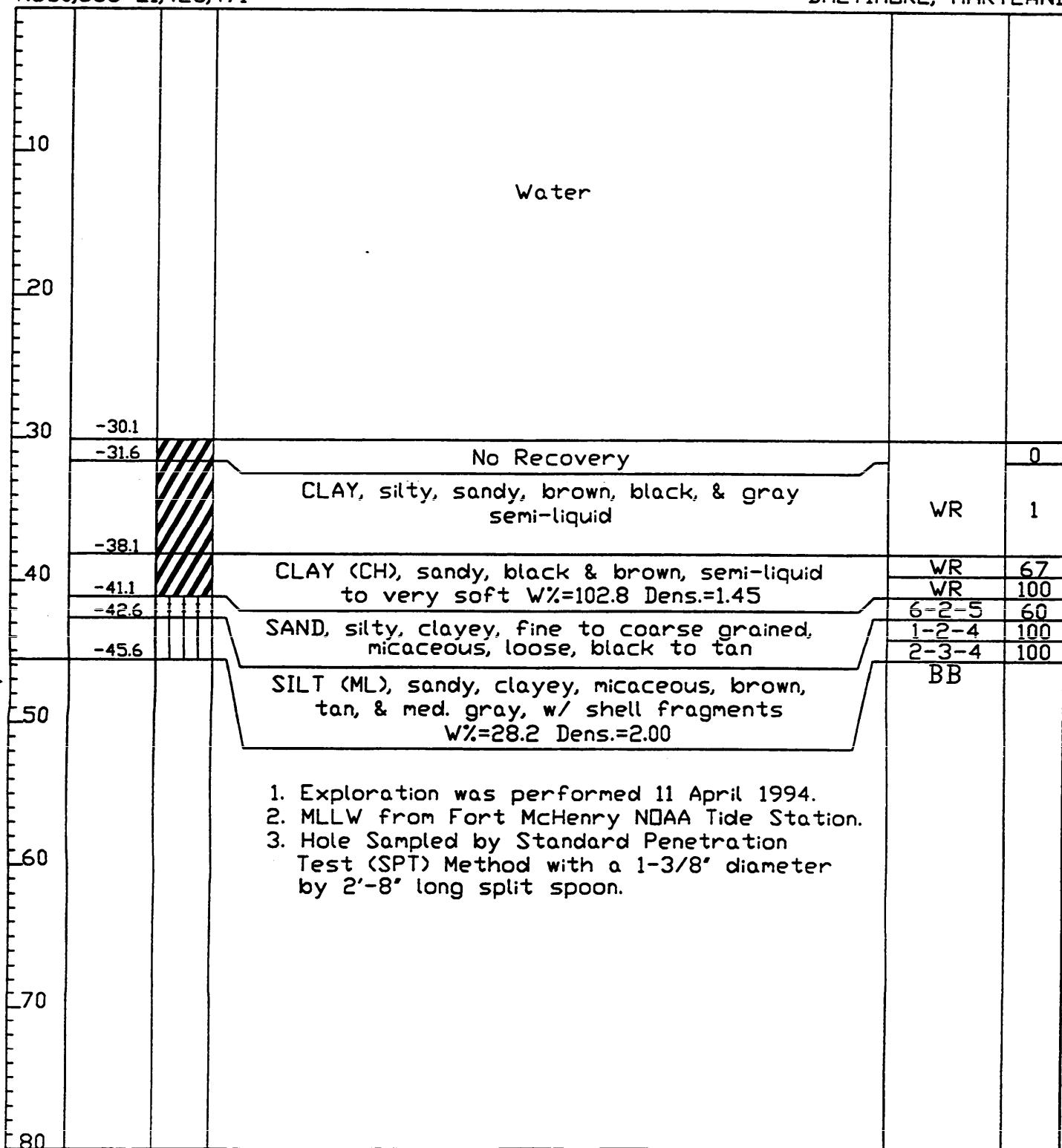
DEPTH (REF. MLLW)	USCS SYMBOL	WATER		BLOW COUNTS SPT FOR 0.5 FT	% RECOVERY	
		BOTTOM OF CHANNEL				
SOIL DESCRIPTION:						
-3.1		CLAY, HIGH PLASTICITY	(CH)	WR	0	
-4.1		CLAY, LOW PLASTICITY	(CL)	WR		
-5.1		SILT, HIGH PLASTICITY	(MH)	WH	35	
-6.1		SILT, LOW PLASTICITY	(ML)	2-2		
-7.1		CLAYEY SAND	(SC)	3-4	50	
-8.1		SILTY SAND	(SM)	5-13		
-9.1		POORLY GRADED SAND	(SP)	10-14	100	
-10.1		WELL GRADED SAND	(SW)	20-25	100	
SUBSURFACE EXPLORATION NOTES:						
11		1. Exploration was performed 11-21 April 1994. 2. MLLW from Fort McHenry NOAA Tide Station. 3. Hole sampled by Standard Penetration Method (SPT) Method with a 1-3/8" diameter by 2'-8" long split spoon. 4. Abbreviations:		BB		
12		WR - Weight of Rod WH - Weight of Hammer W% - Water content (percent) Dens. - In-situ Density (g/cc)	med. - medium dk. - dark lt. - light	BOTTOM OF BORING		
14						
16						

GB-1-94

N580,553 E1,428,471

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

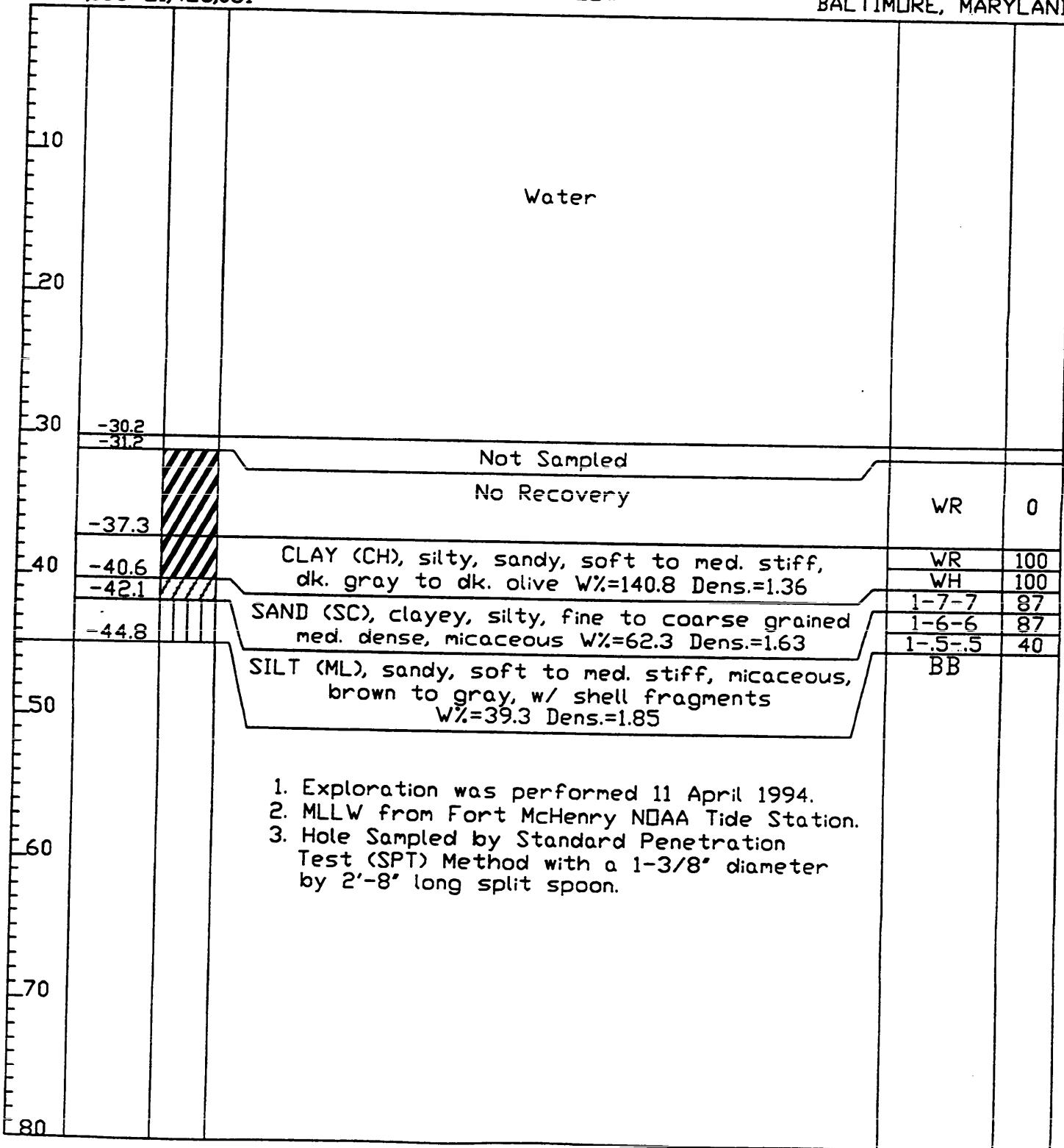


GB-2-94

N580,156 E1,428,031

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND



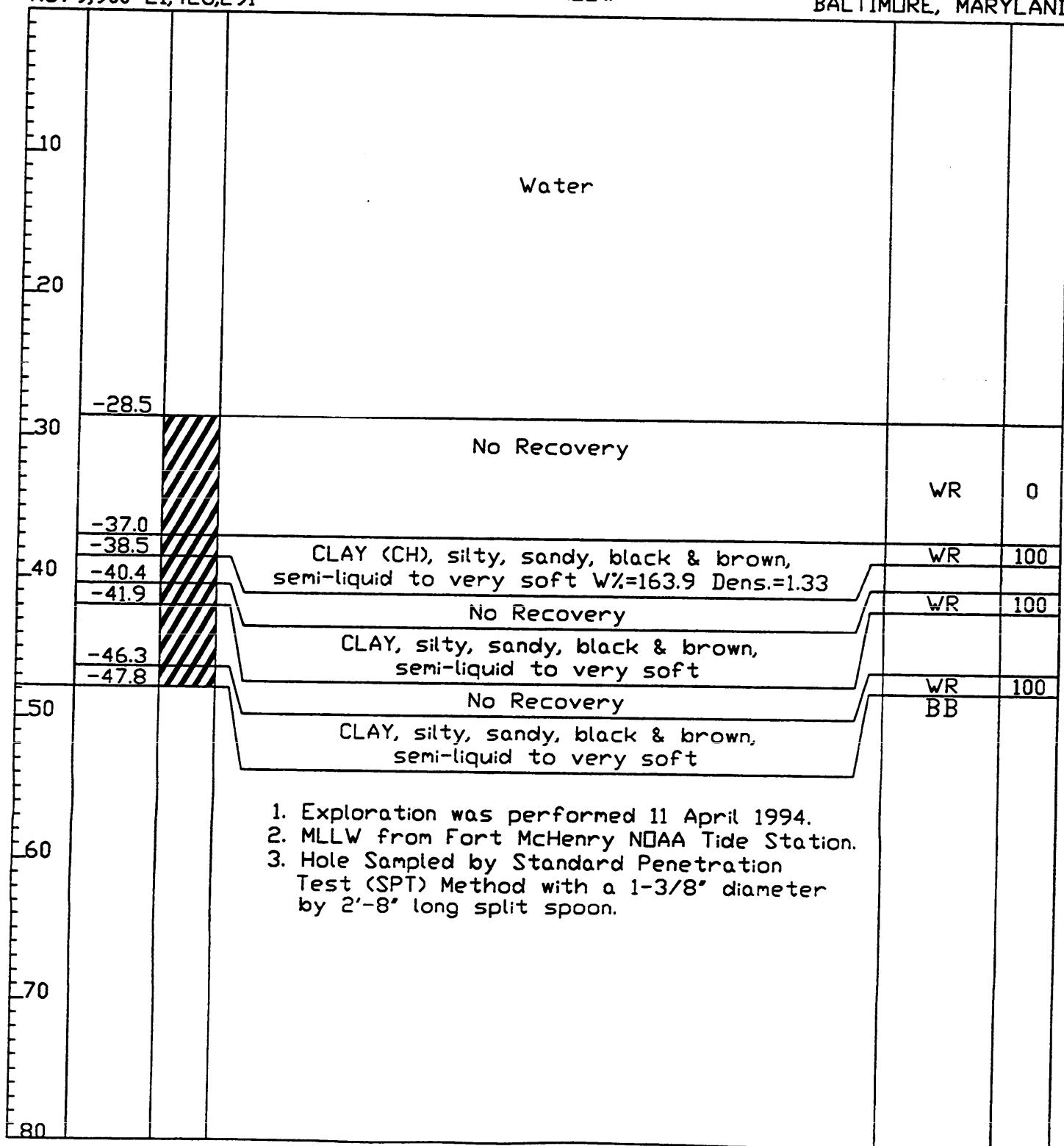
1. Exploration was performed 11 April 1994.
2. MLLW from Fort McHenry NOAA Tide Station.
3. Hole Sampled by Standard Penetration Test (SPT) Method with a 1-3/8" diameter by 2'-8" long split spoon.

GB-3-94

N579,900 E1,428,291

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

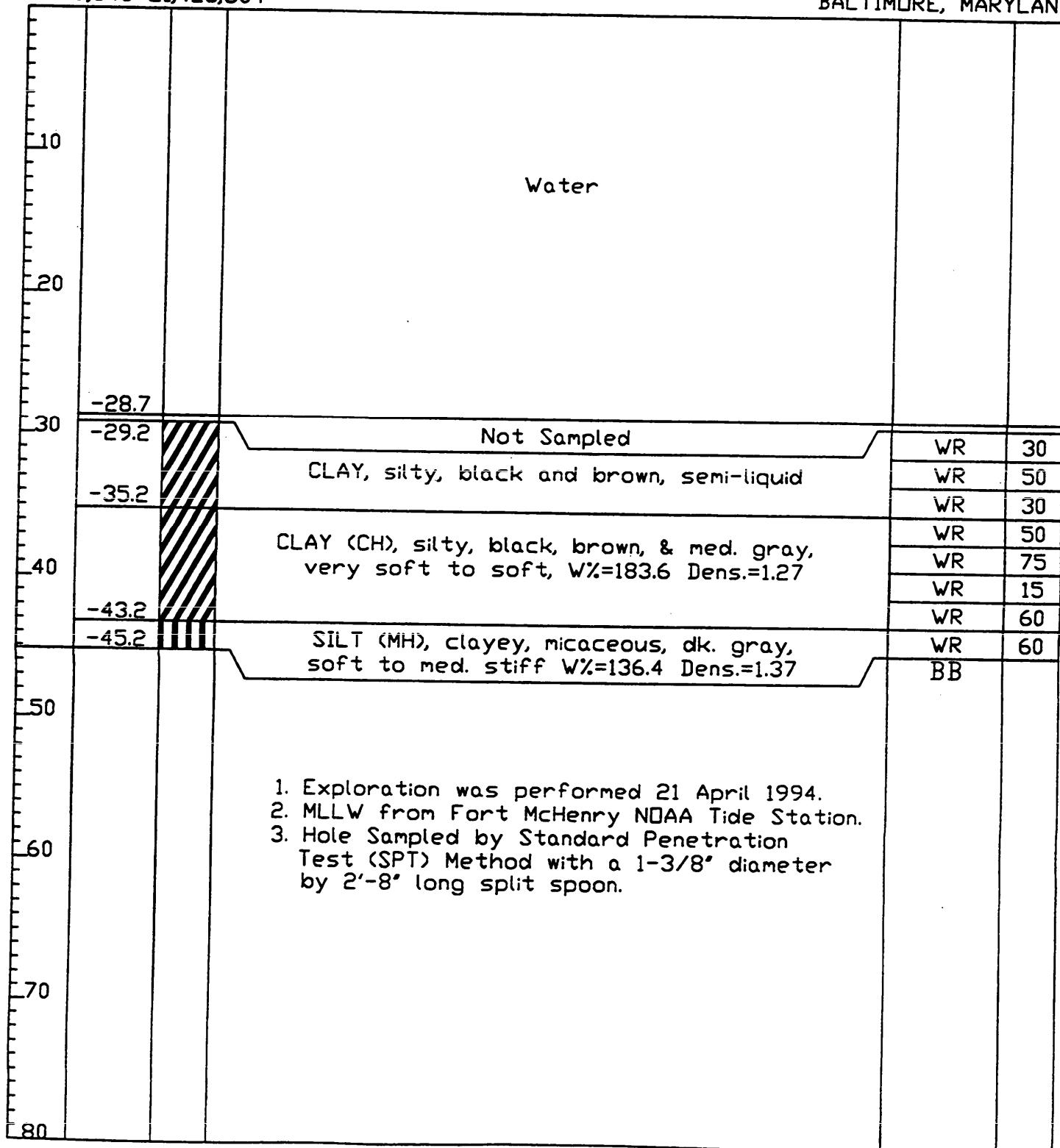


GB-3A-94

N579,843 E1,428,304

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

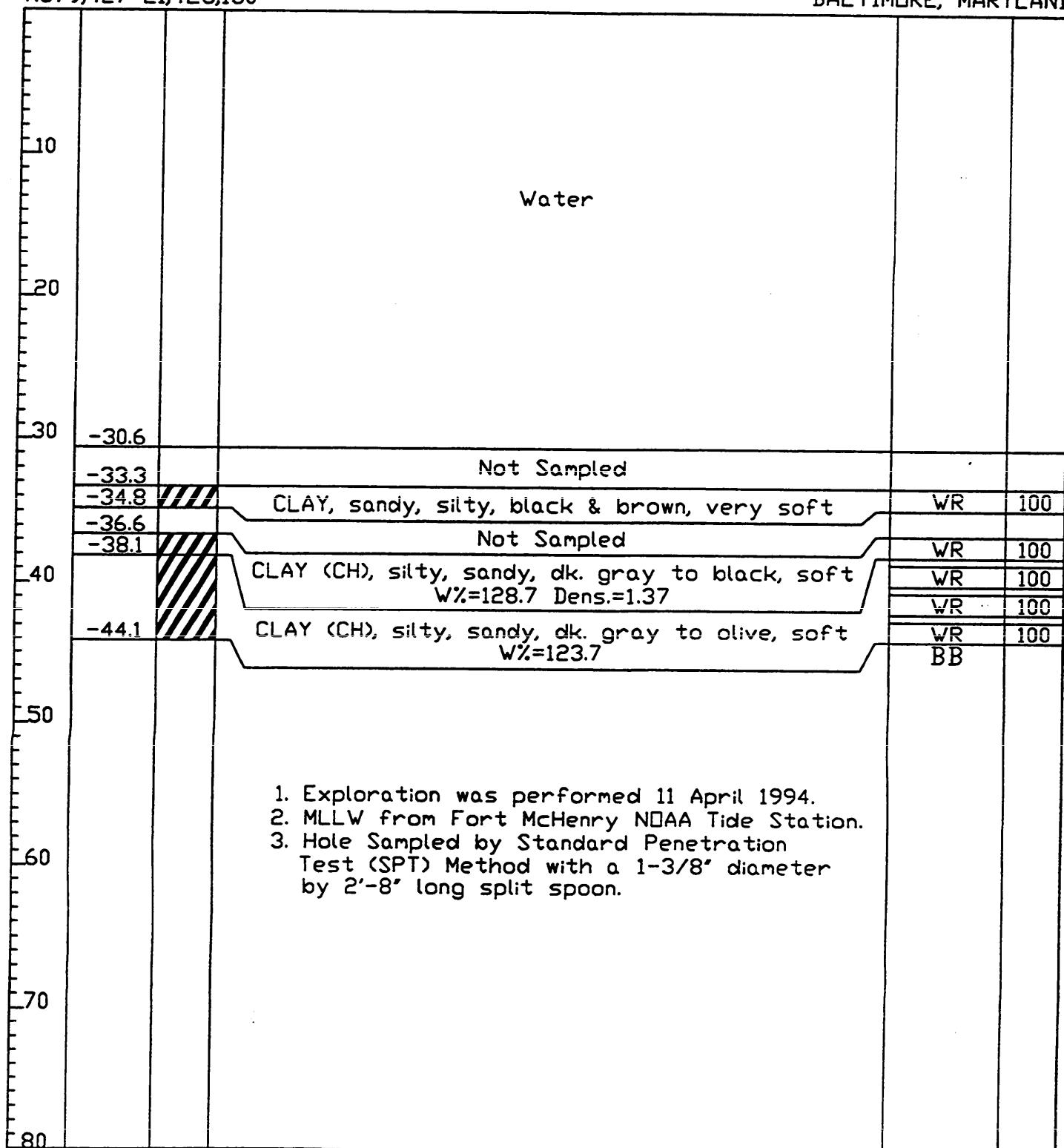


GB-4-94

N579,427 E1,428,130

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND



1. Exploration was performed 11 April 1994.
2. MLLW from Fort McHenry NOAA Tide Station.
3. Hole Sampled by Standard Penetration Test (SPT) Method with a 1-3/8" diameter by 2'-8" long split spoon.

GB-5-94

N576,639 E1,439,304

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

10			Water			
20						
-25.2						
-27.9			Not Sampled			
30			CLAY (CH), silty, black & brown, very soft W% = 170.1 Dens. = 1.30	WR	87	
-35.4				WR	100	
40			CLAY (CH), silty, sandy, black to med. gray, soft W% = 163.4	WR	60	
-43.4				WR	100	
50				WR	100	
60				WR	100	
70				BB		
80						

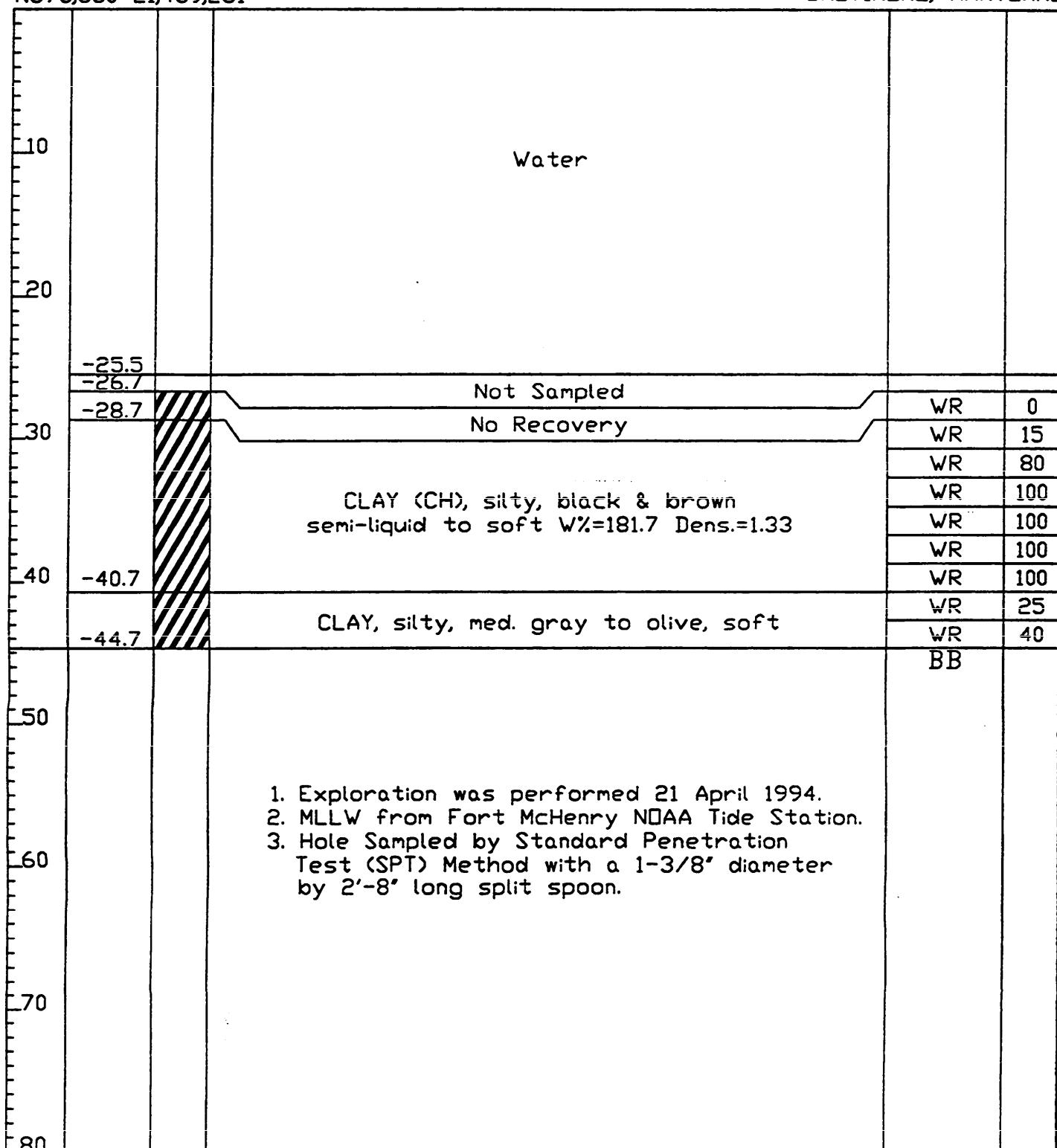
1. Exploration was performed 11 April 1994.
2. MLLW from Fort McHenry NOAA Tide Station.
3. Hole Sampled by Standard Penetration Test (SPT) Method with a 1-3/8" diameter by 2'-8" long split spoon.

GB-5A-94

N576,630 E1,439,261

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

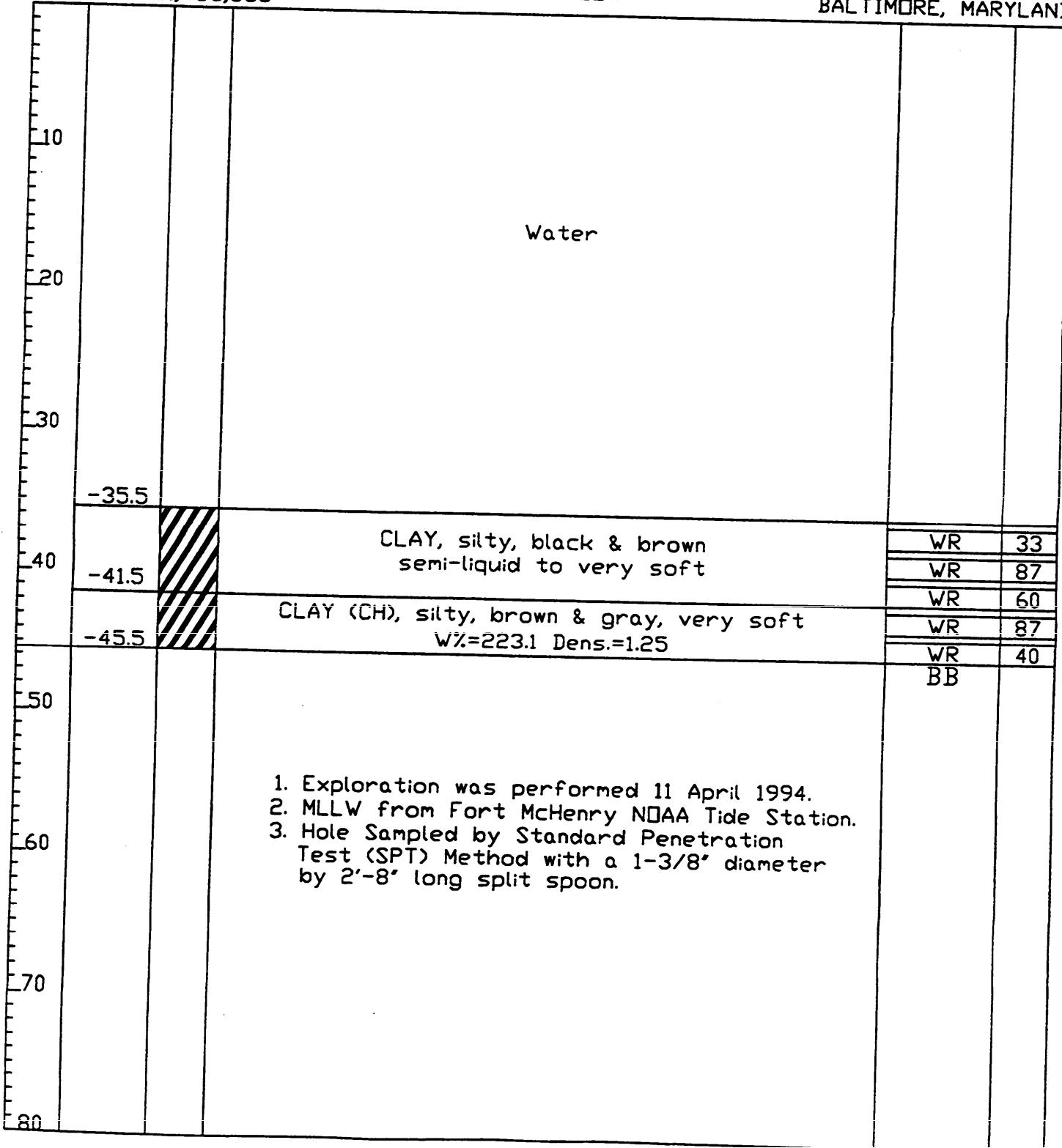


GB-6-94

N575,884 E1,438,868

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

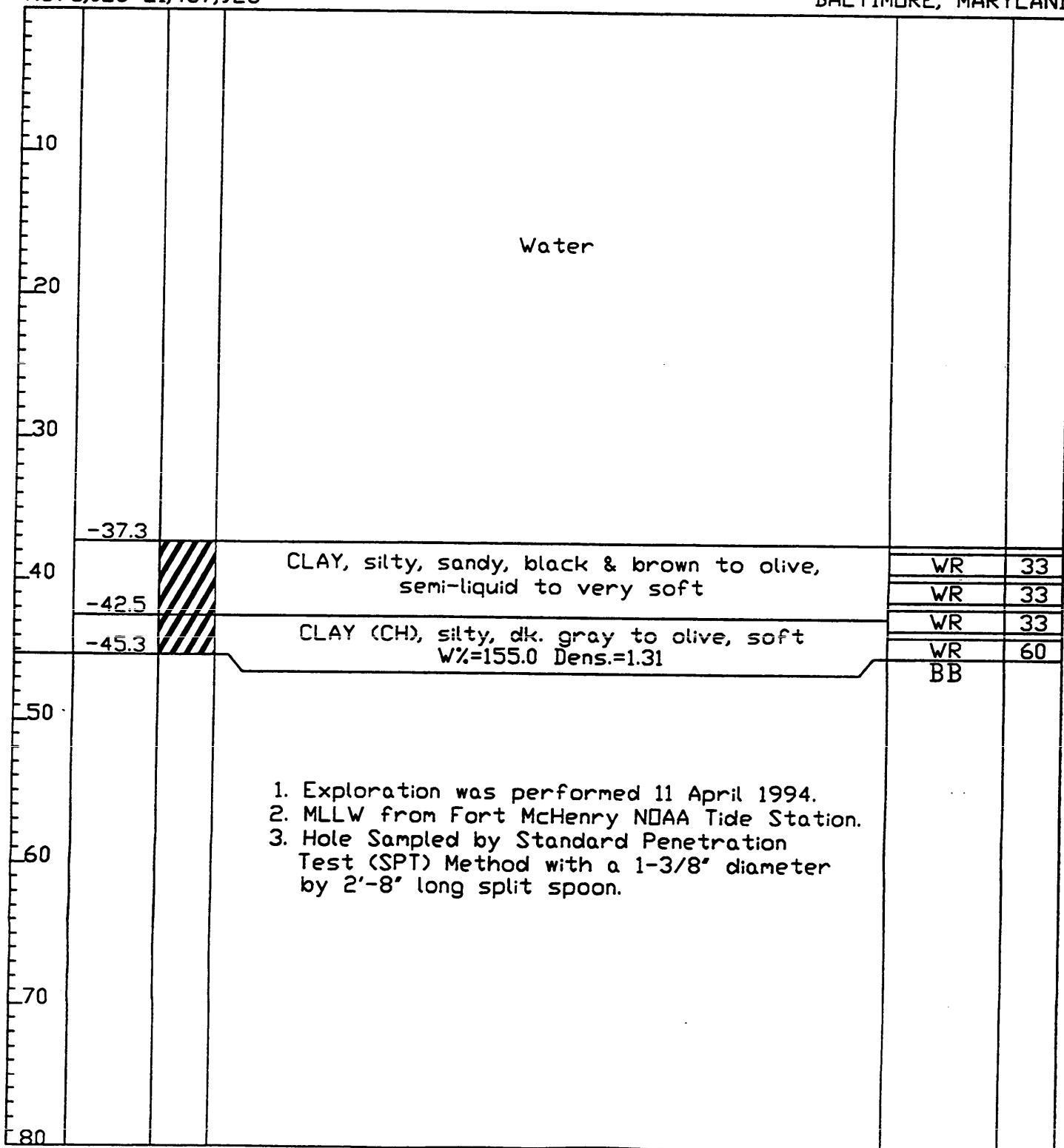


GB-7-94

N576,025 E1,437,926

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

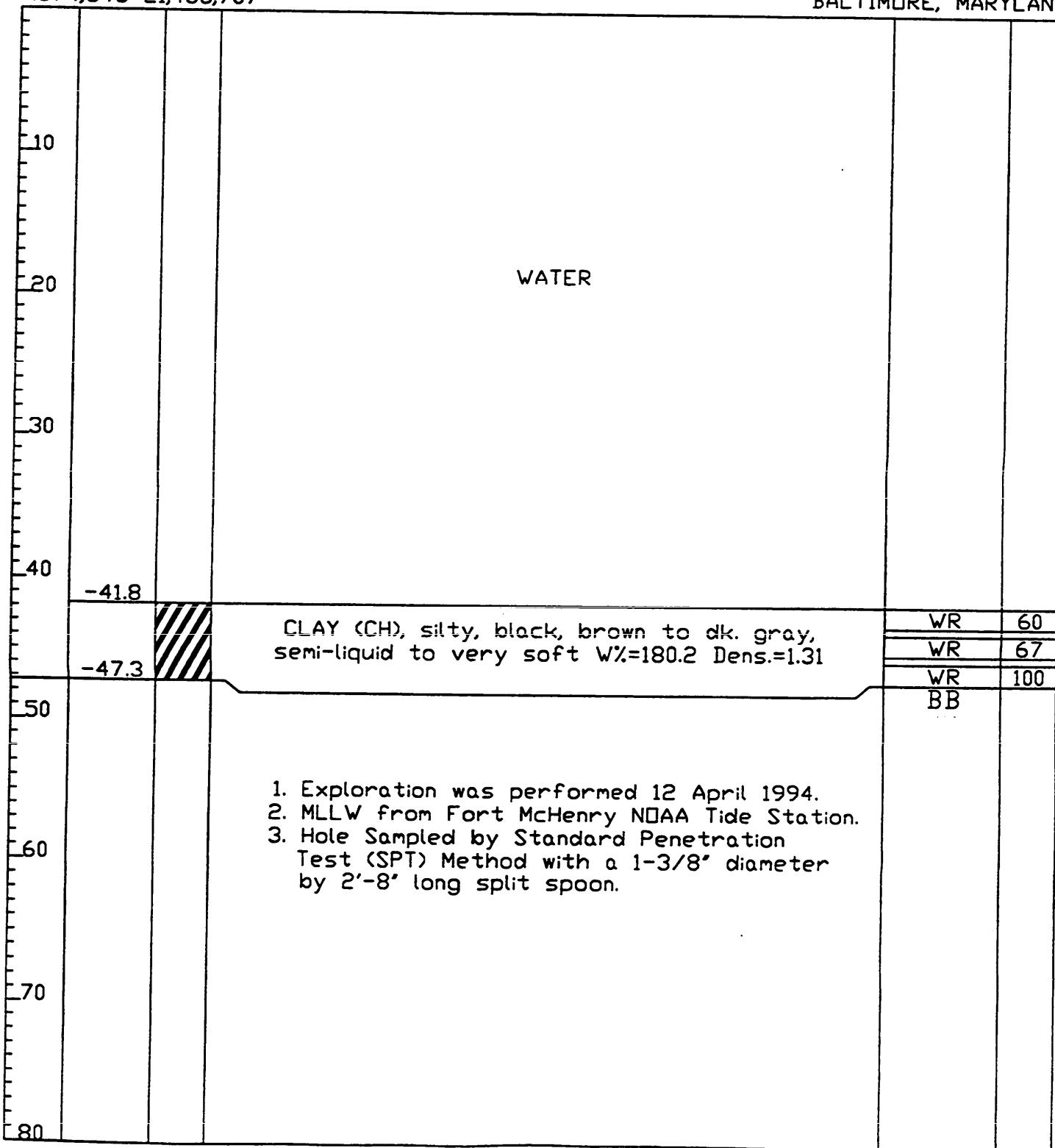


GB-8-94

N574,546 E1,438,707

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

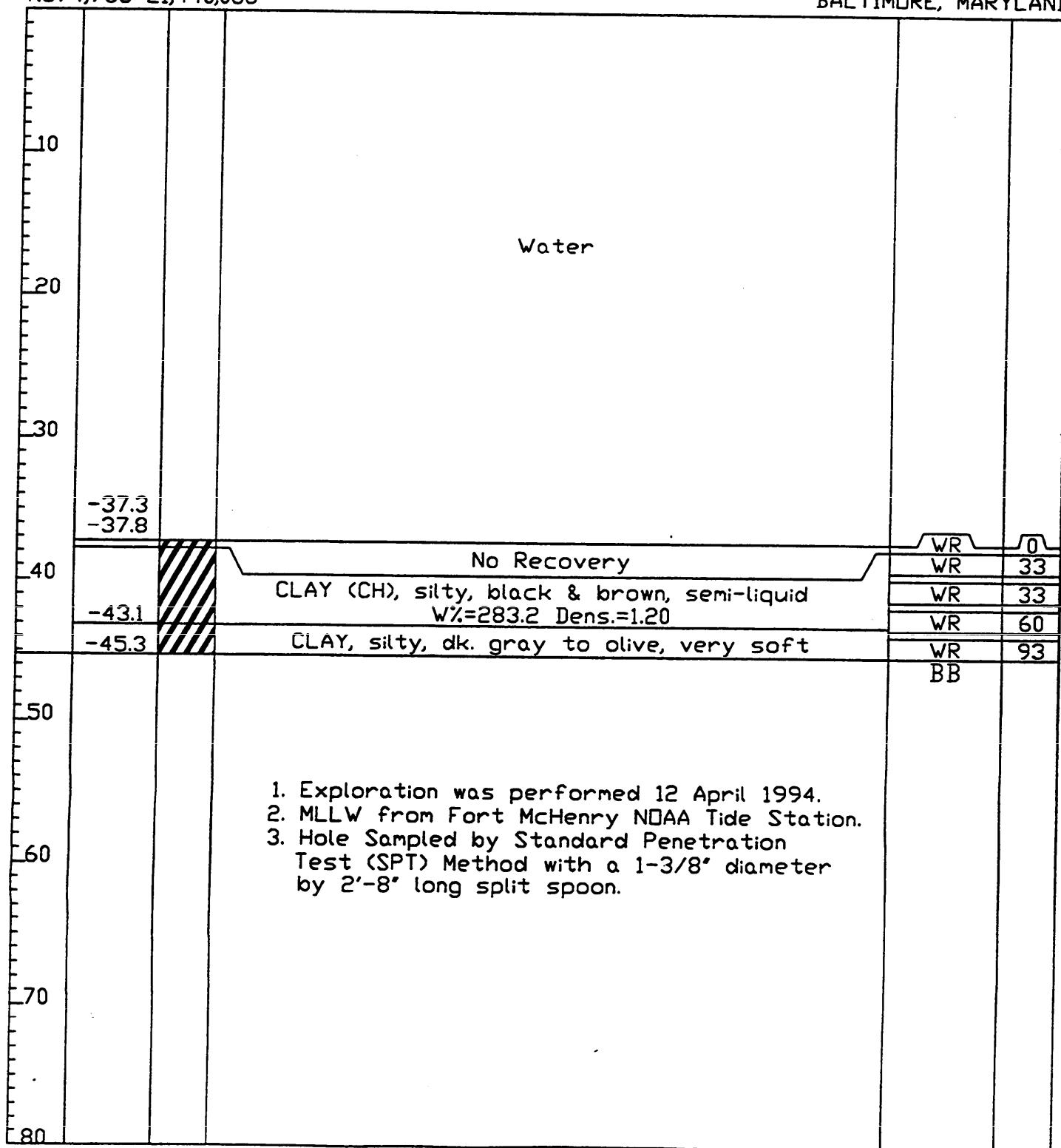


GB-9-94

N574,765 E1,440,088

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

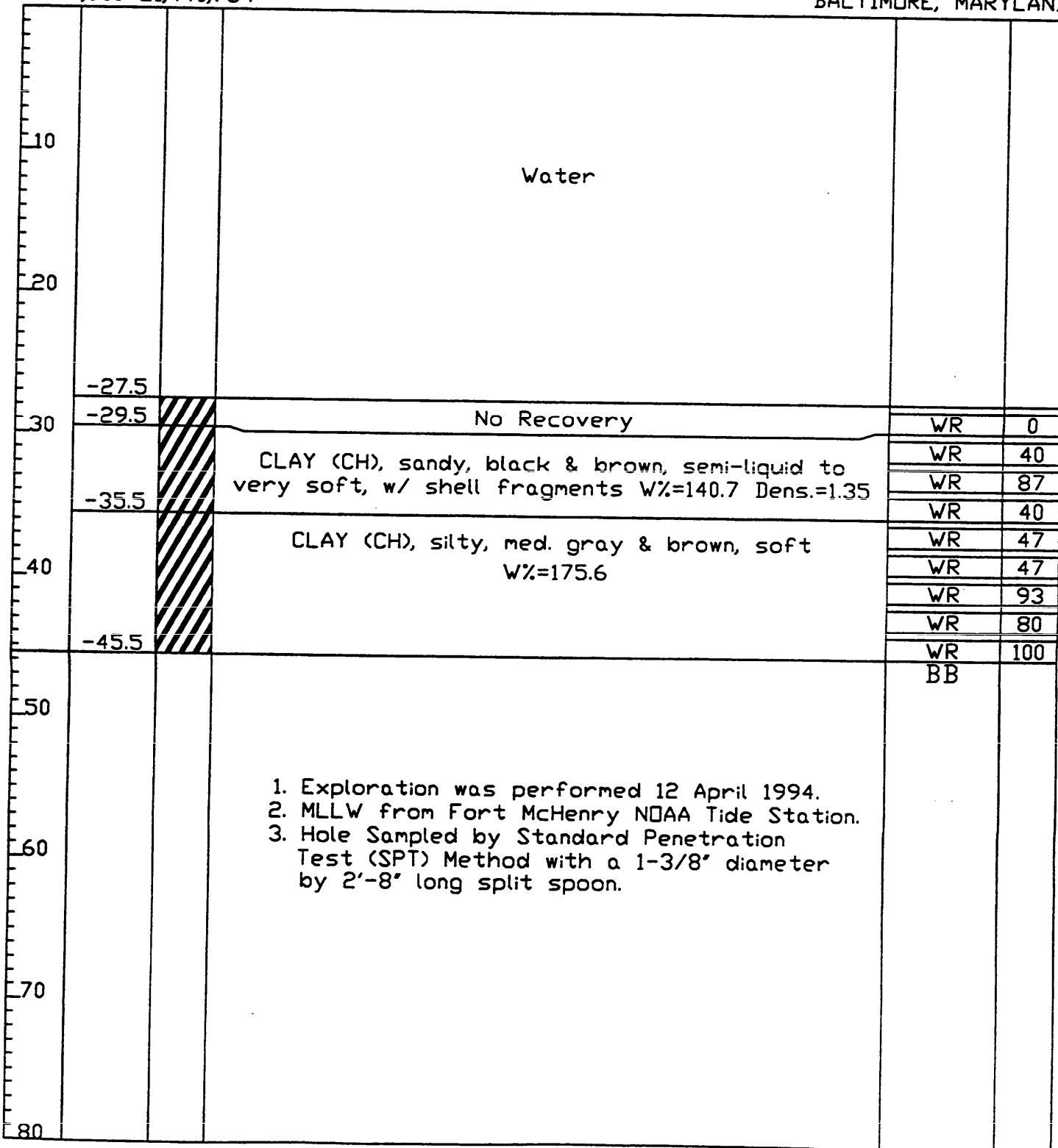


GB-10-94

N574,900 E1,440,754

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

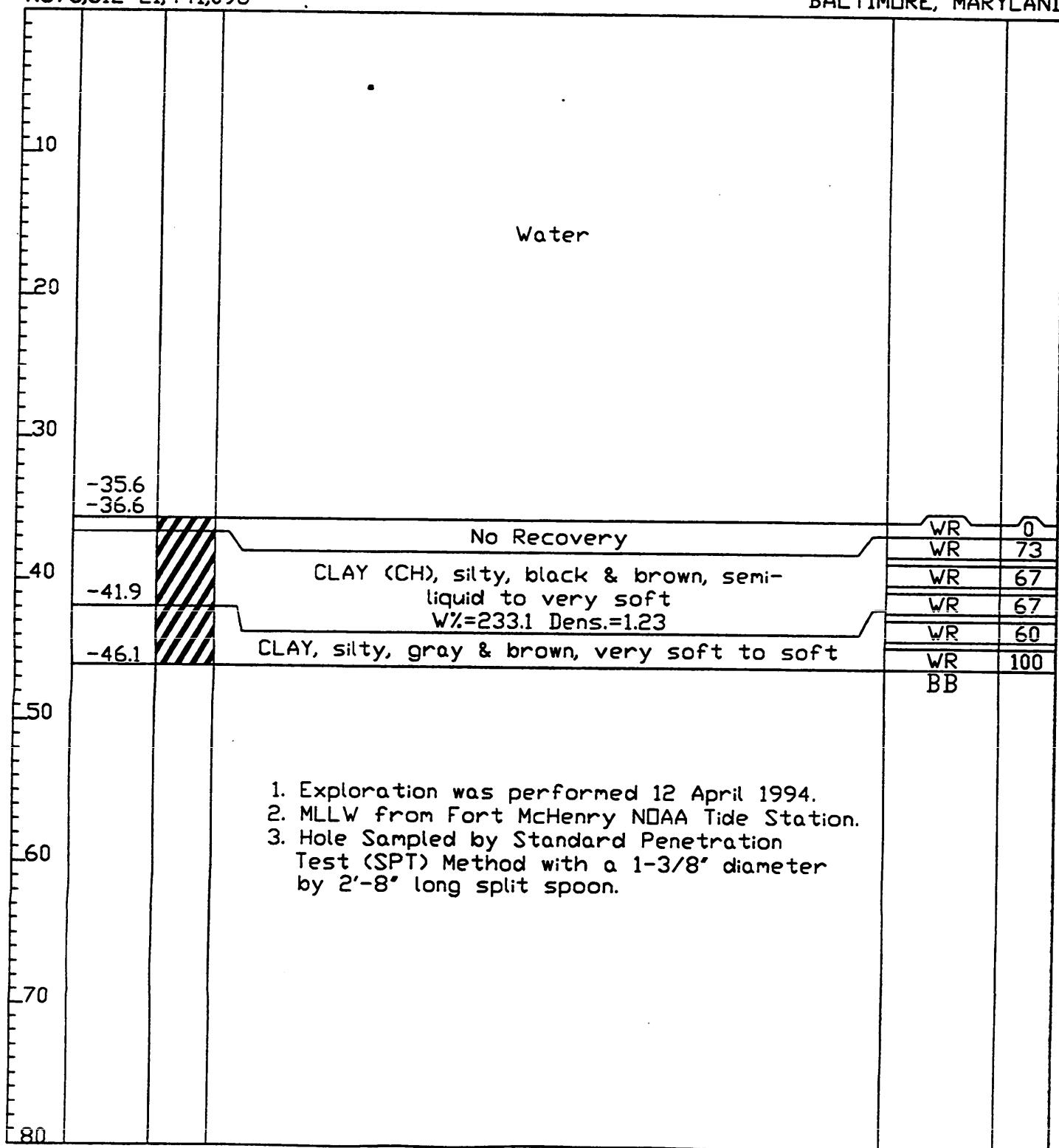


GB-11-94

N573,512 E1,441,096

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

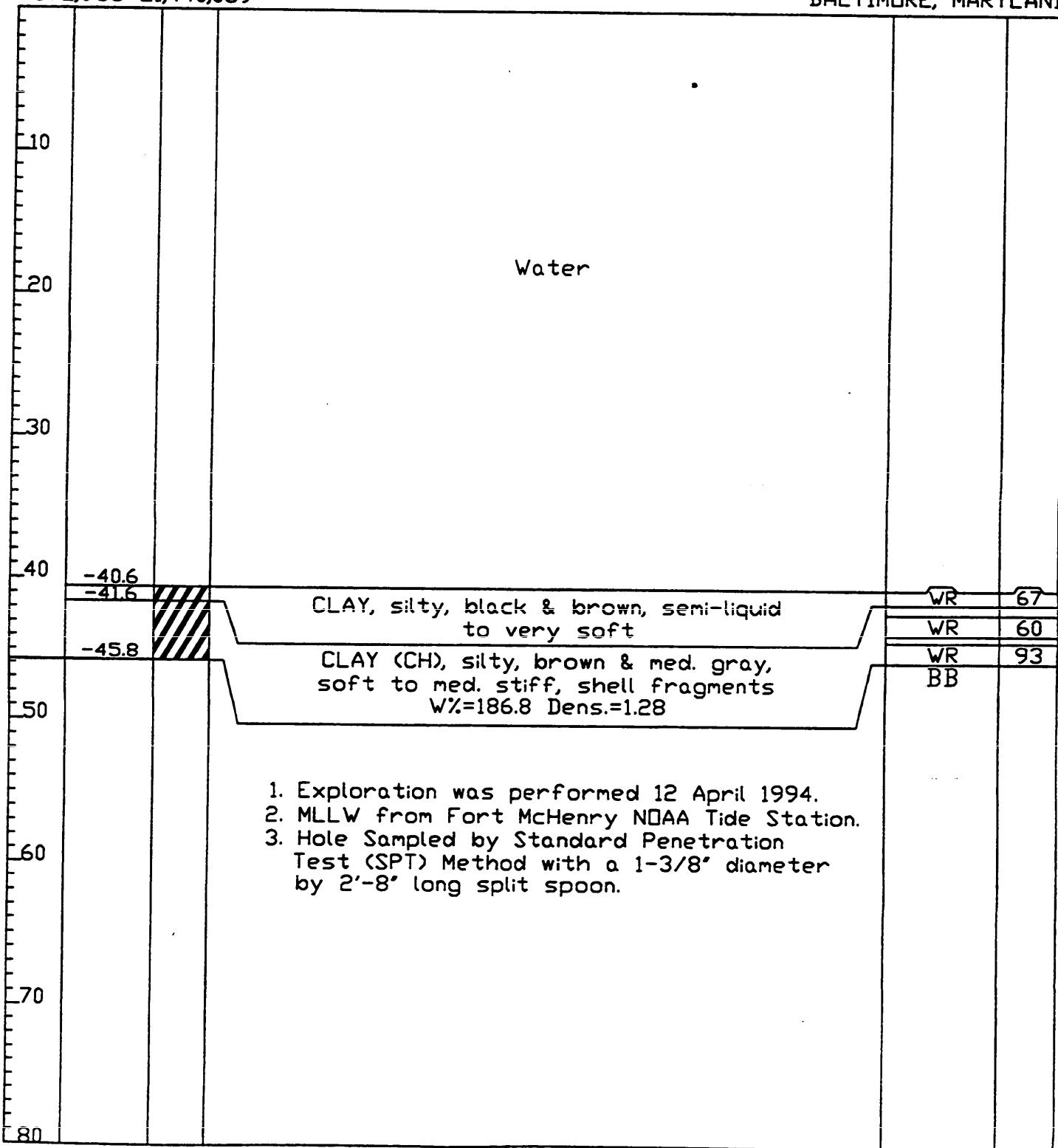


GB-12-94

N572,965 E1,440,039

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

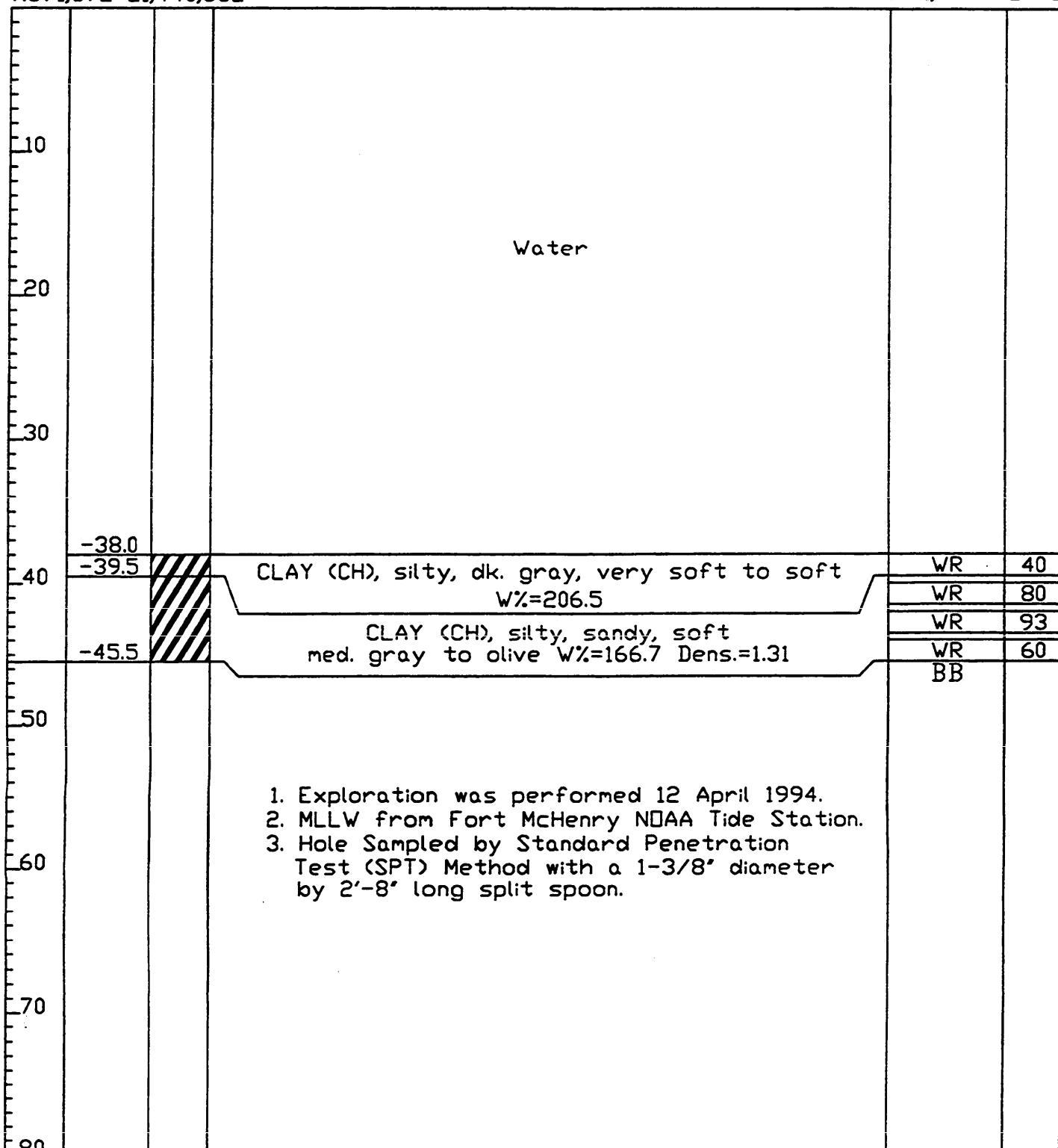


GB-13-94

N571,872 E1,440,882

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

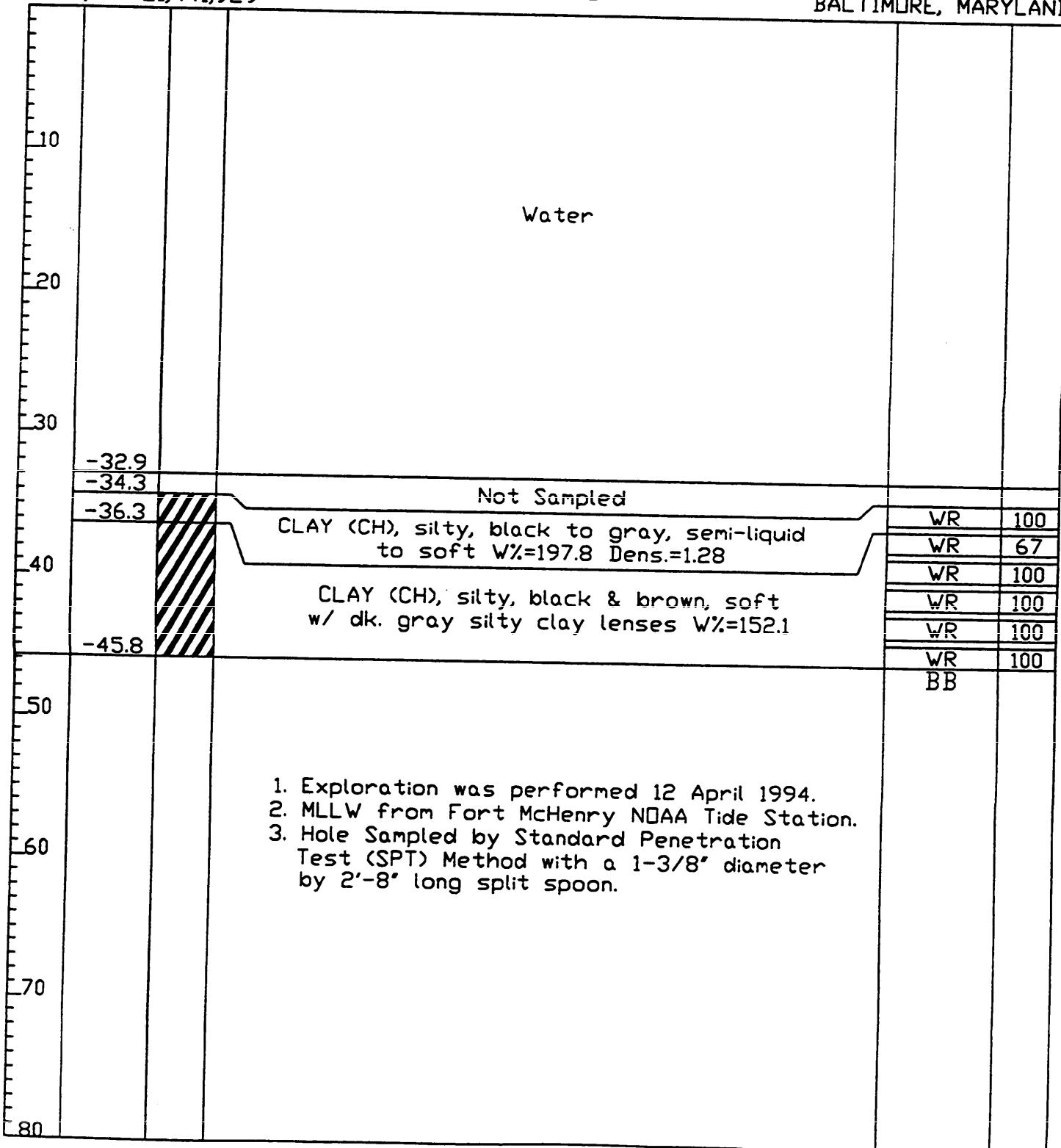


GB-14-94

N572,174 E1,441,929

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

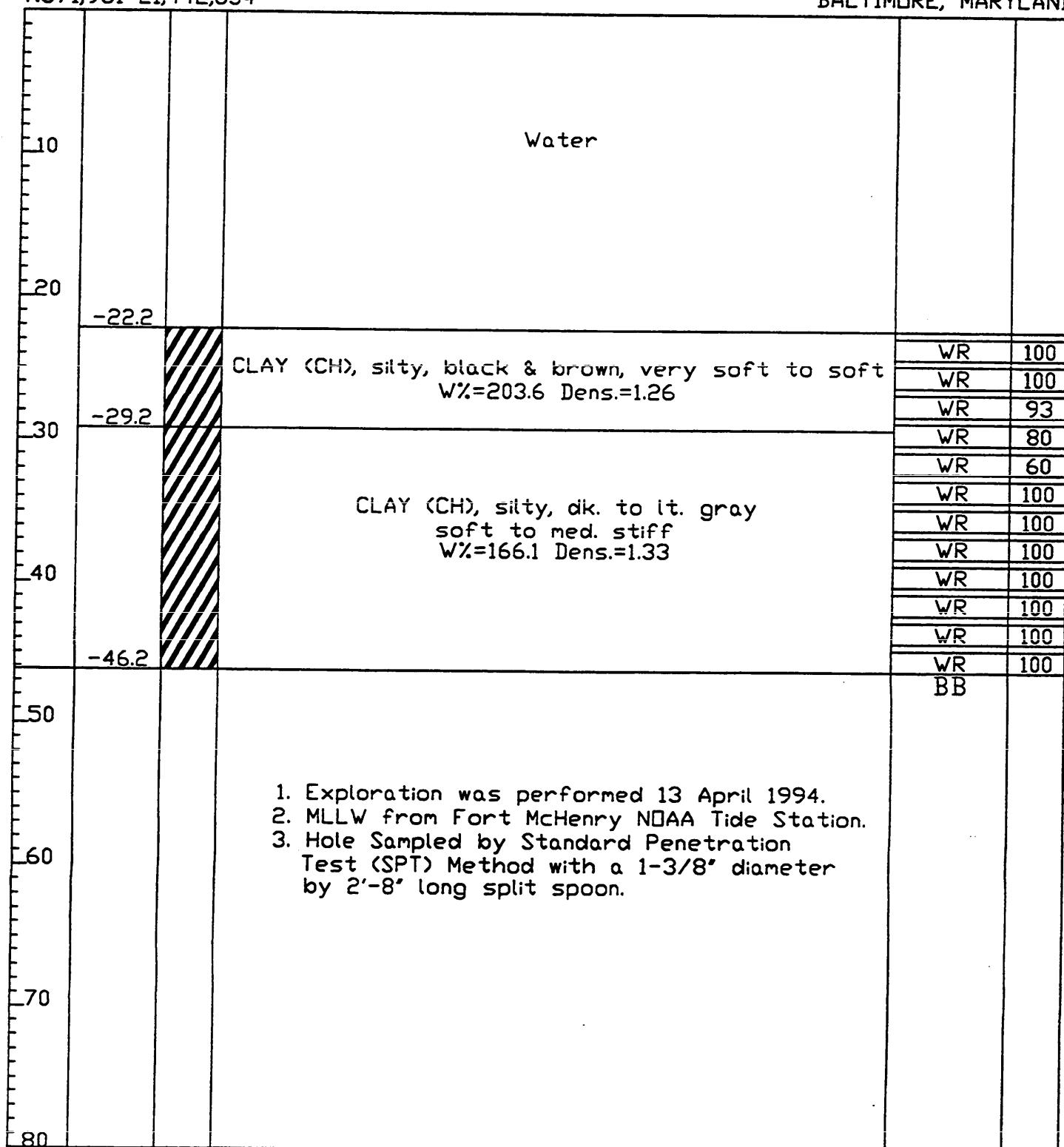


GB-15-94

N571,931 E1,442,634

ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

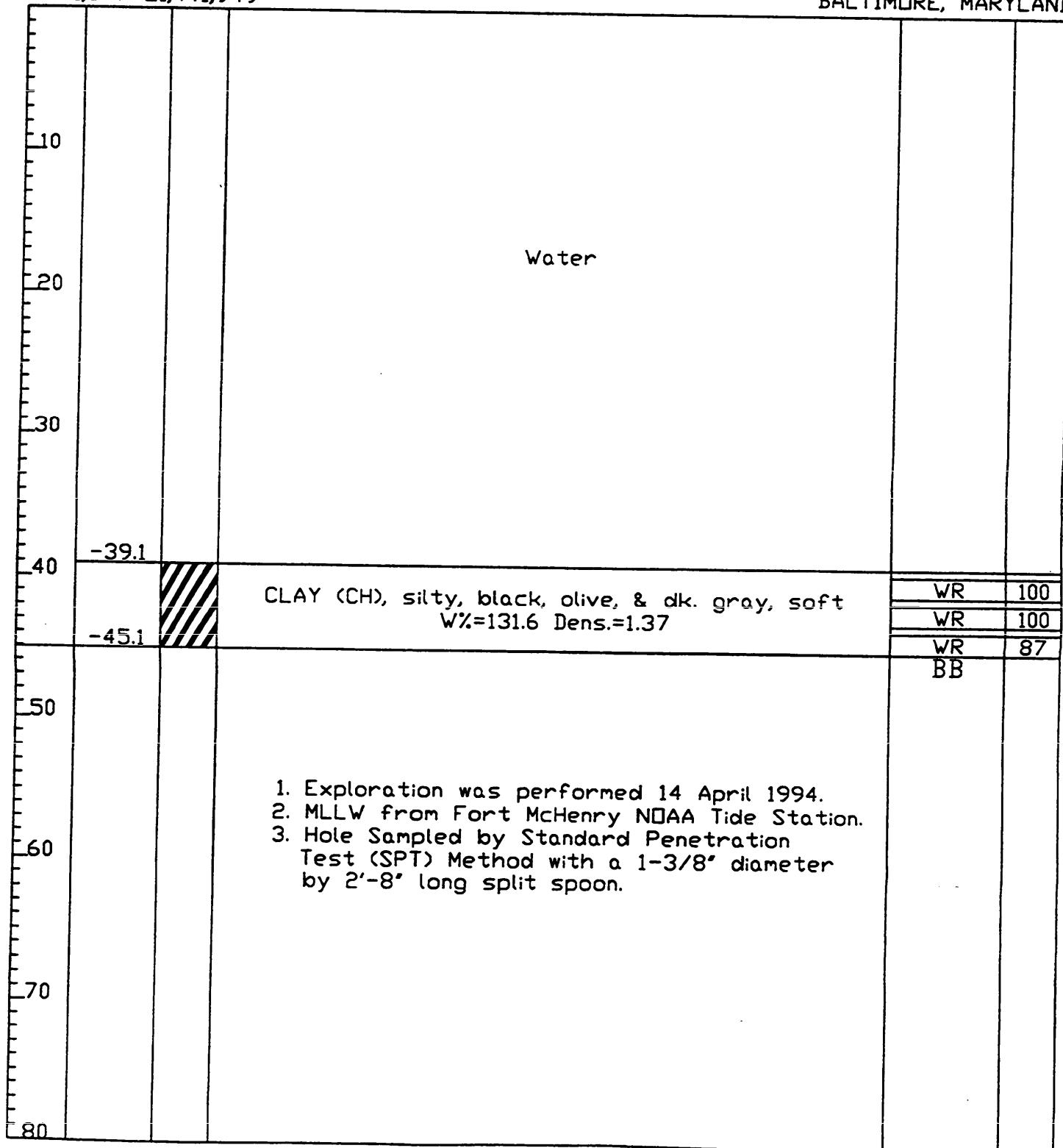


GB-16-94

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ELEV. MLLW

BALTIMORE HARBOR
FEASIBILITY STUDY
BALTIMORE, MARYLAND

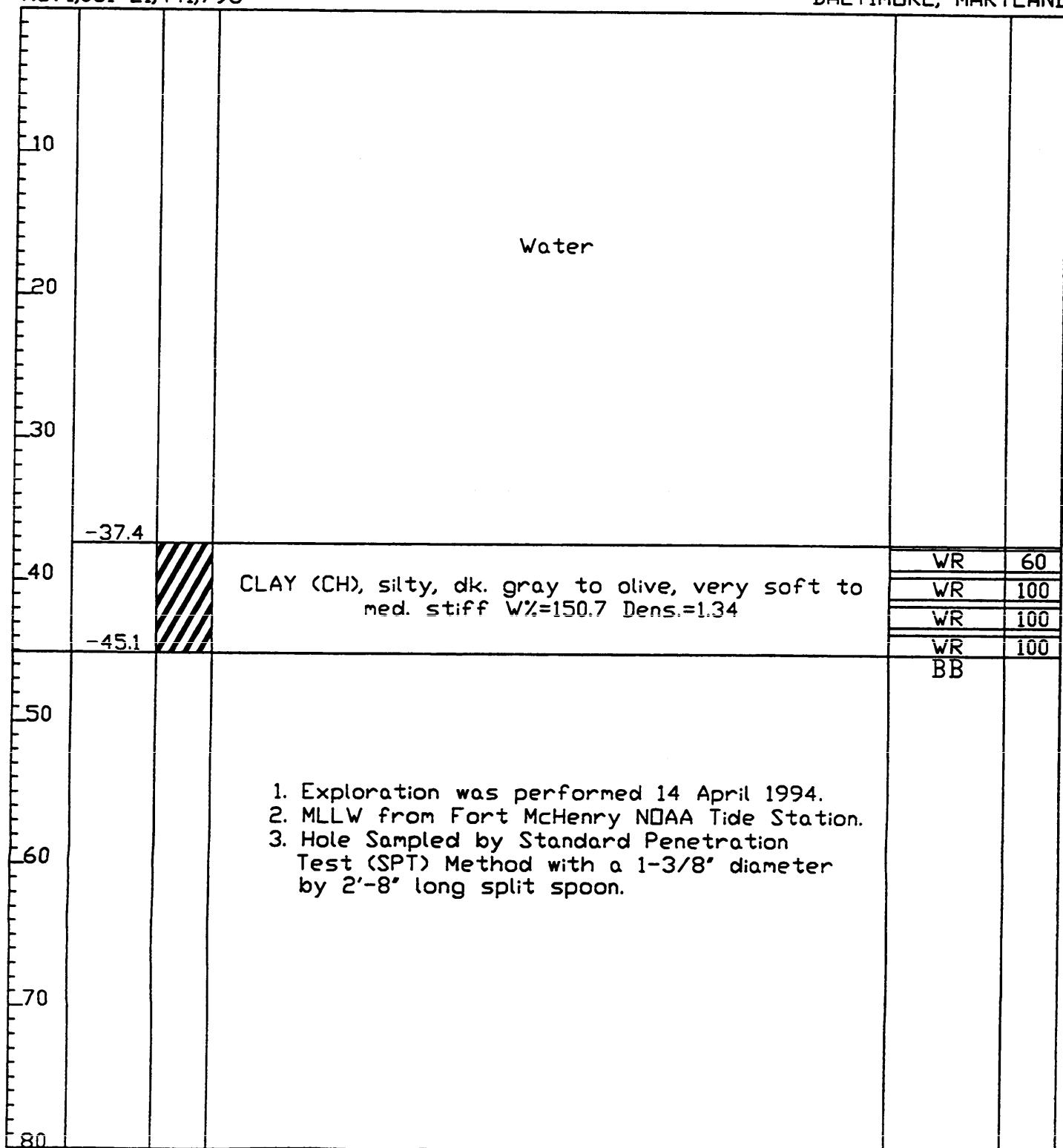


GB-17-94

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FEASIBILITY STUDY
BALTIMORE, MARYLAND

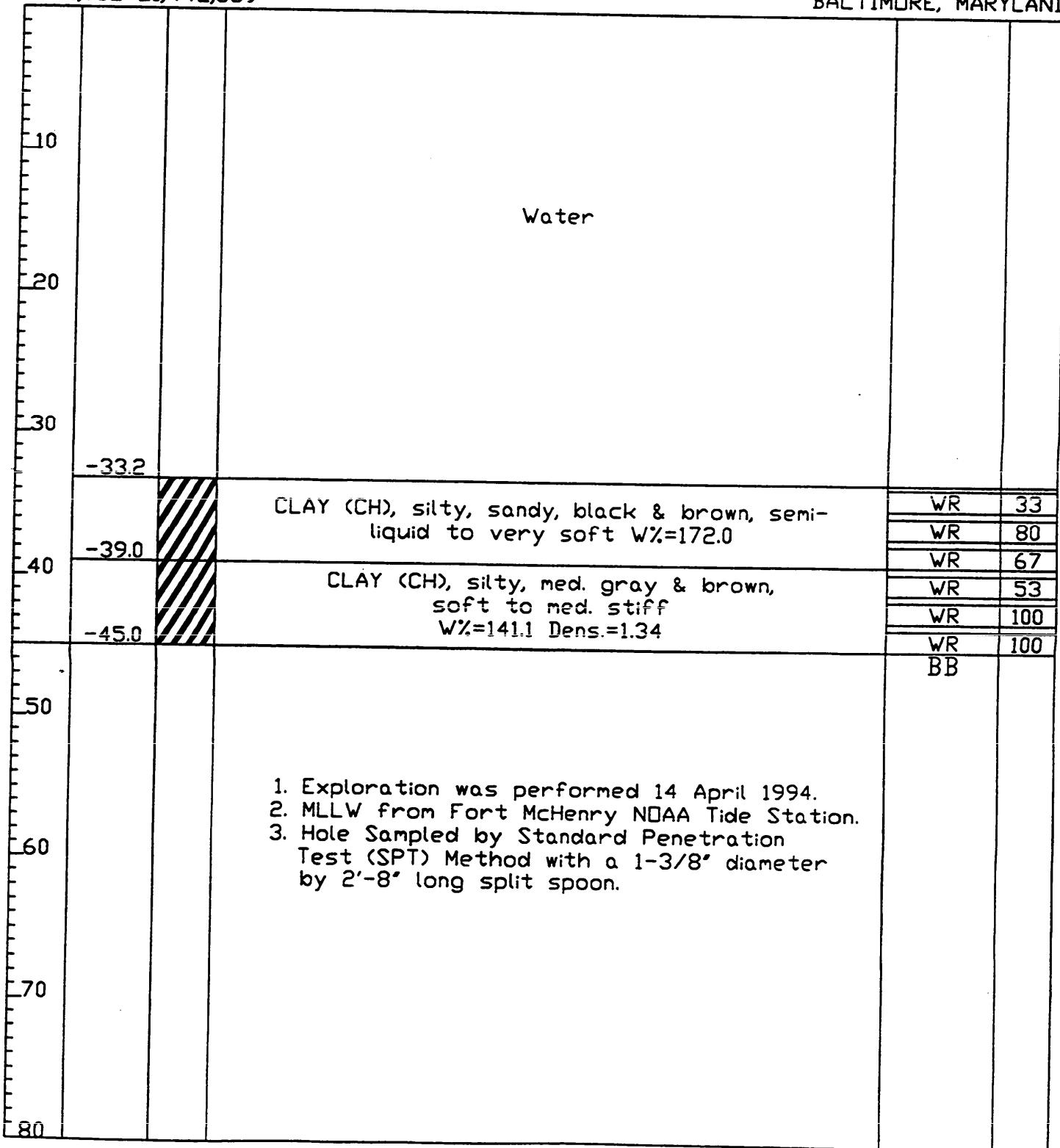


GB-18-94

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FEASIBILITY STUDY
BALTIMORE, MARYLAND

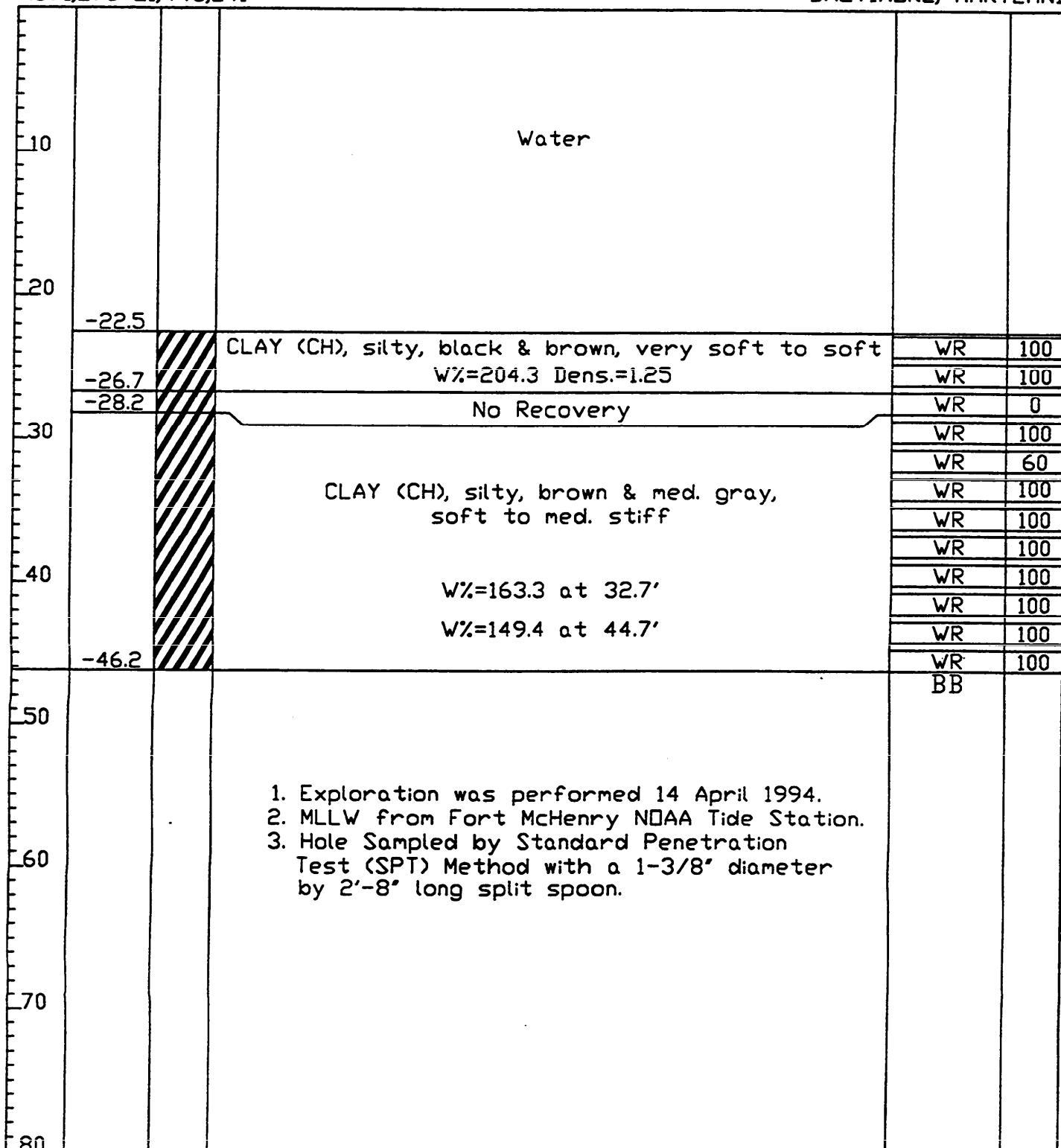


GB-19-94

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ELEV. MLLW

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FEASIBILITY STUDY
BALTIMORE, MARYLAND

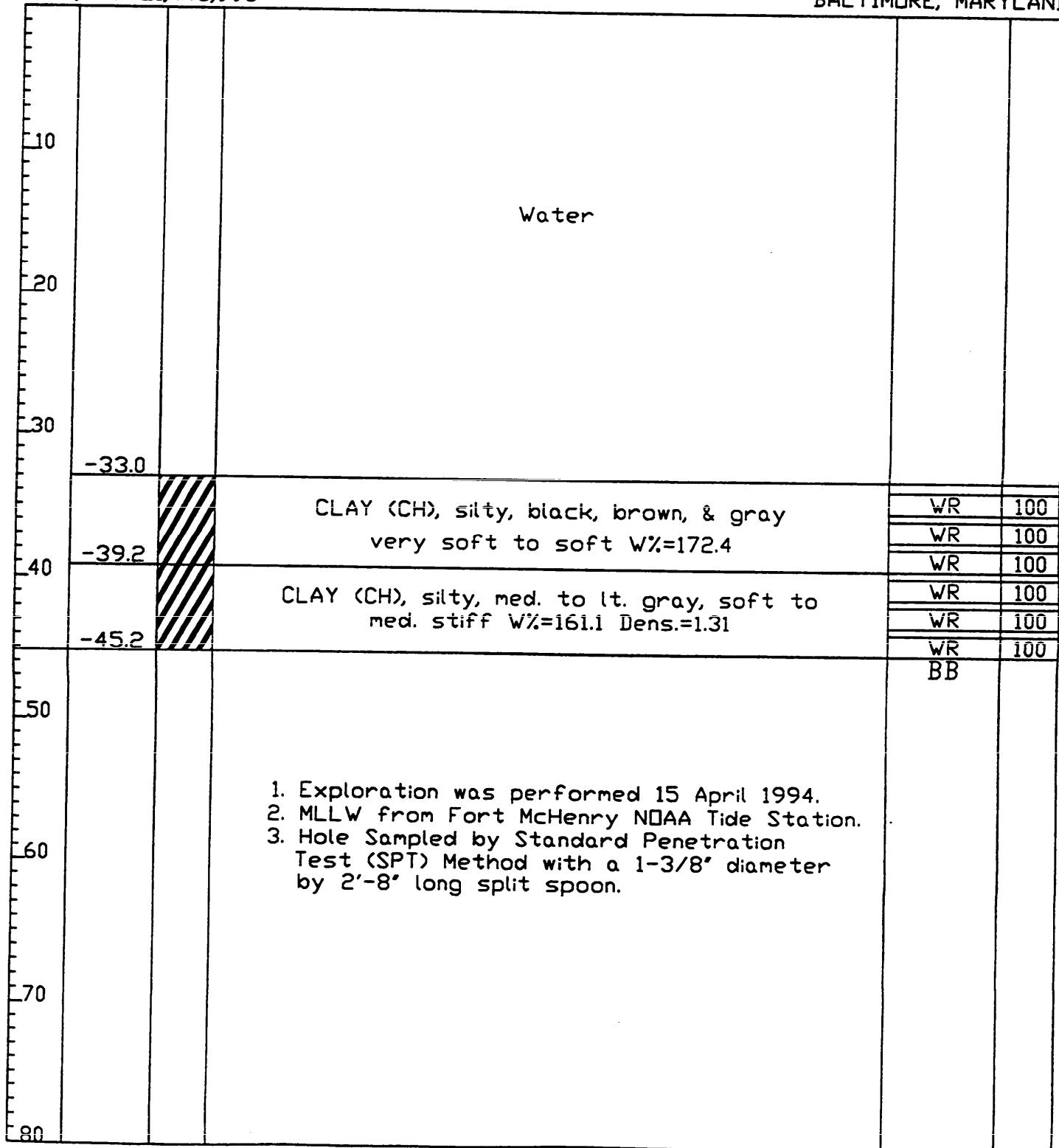


GB-20-94

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BALTIMORE, MARYLAND

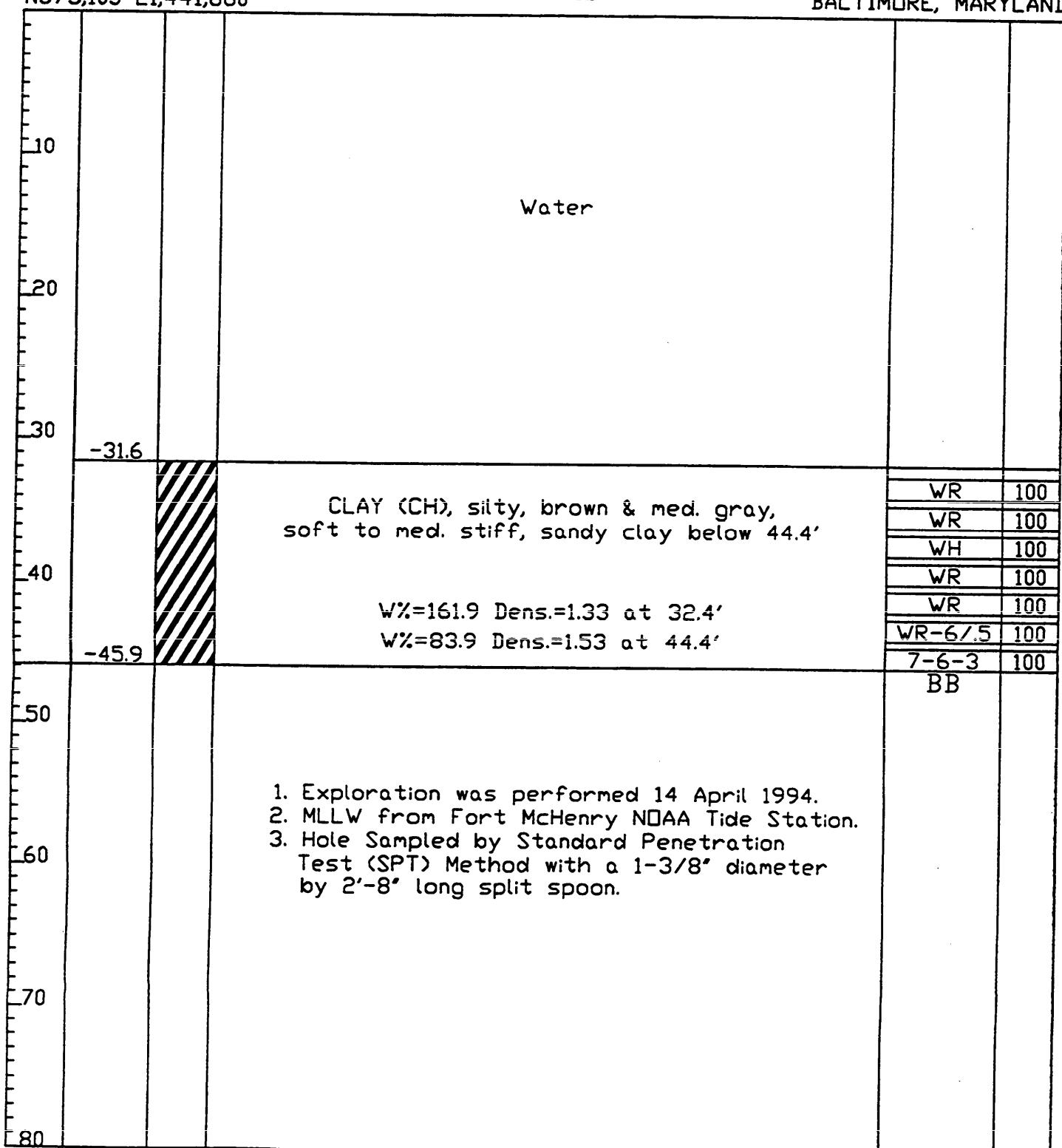


GB-21-94

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BALTIMORE, MARYLAND

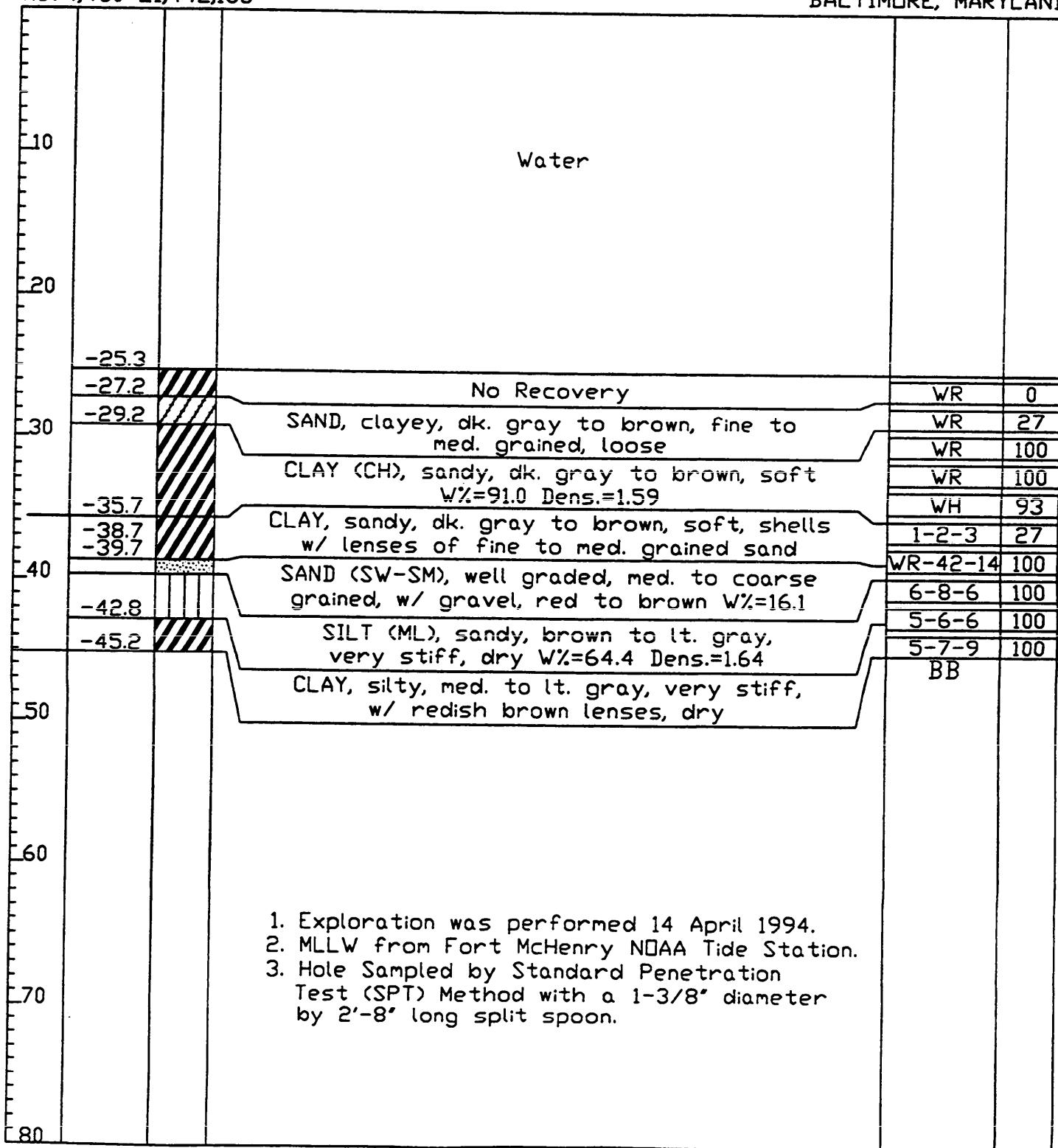


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ELEV. MLLW

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FEASIBILITY STUDY
BALTIMORE, MARYLAND

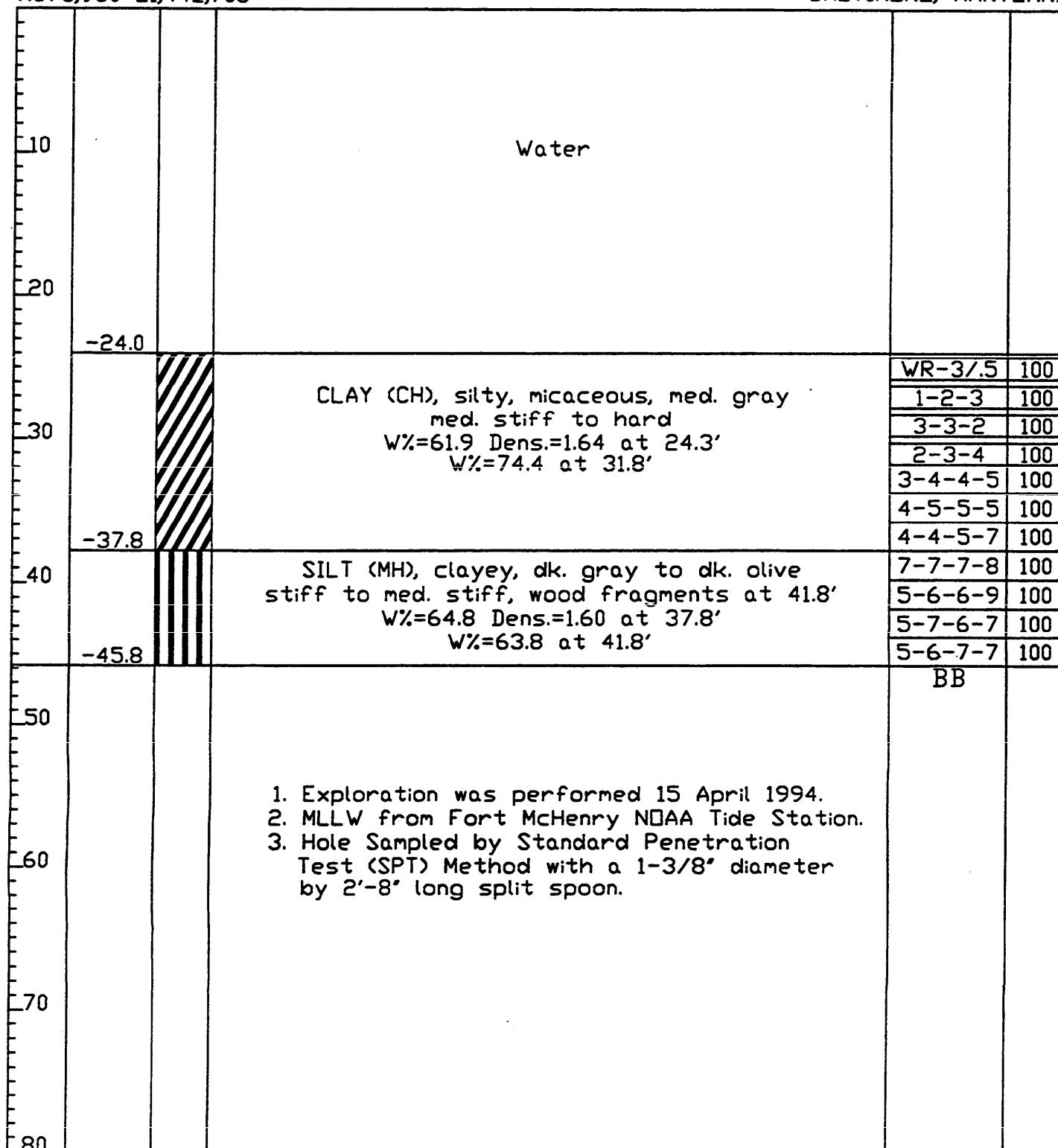


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FEASIBILITY STUDY
BALTIMORE, MARYLAND

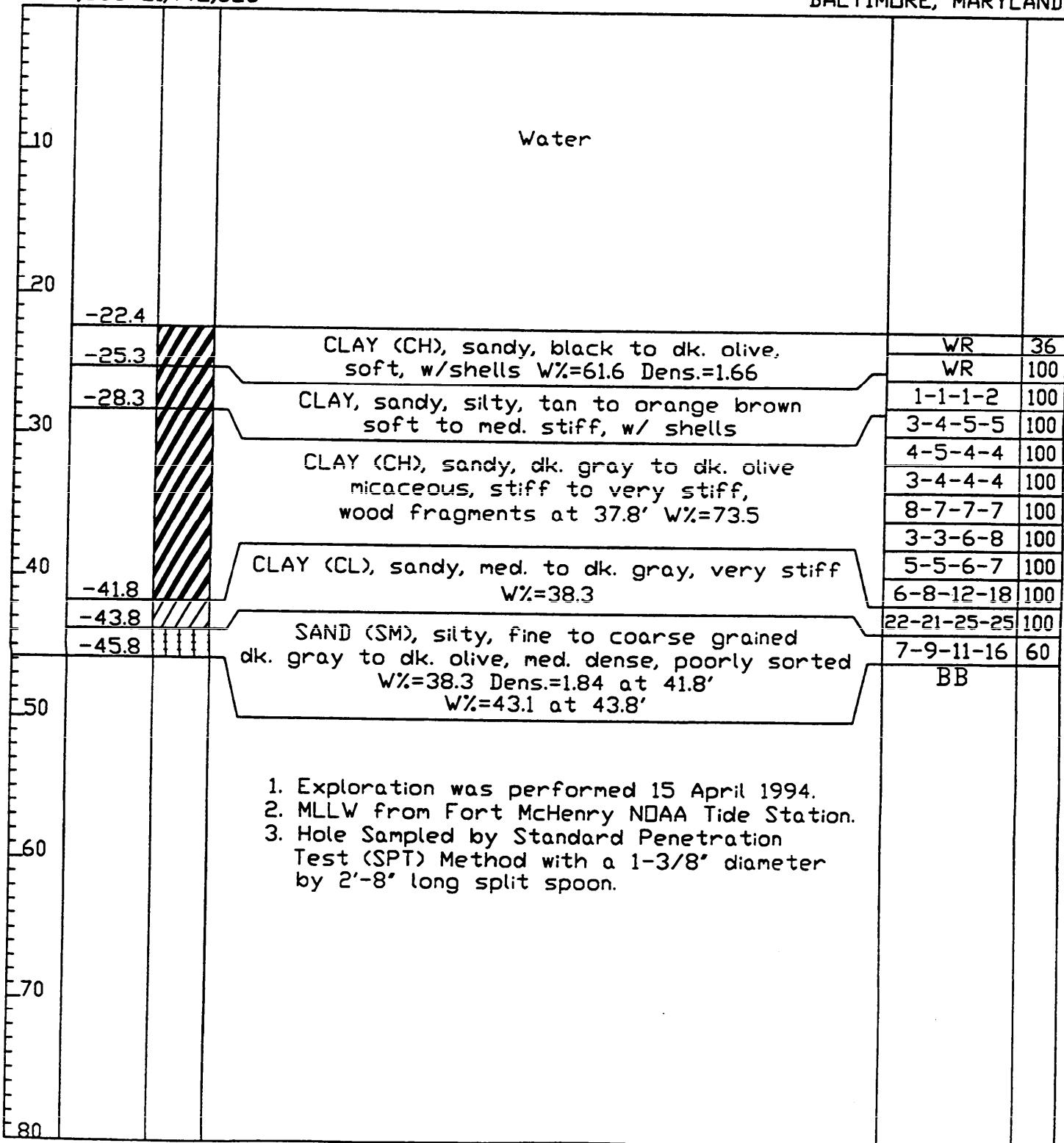


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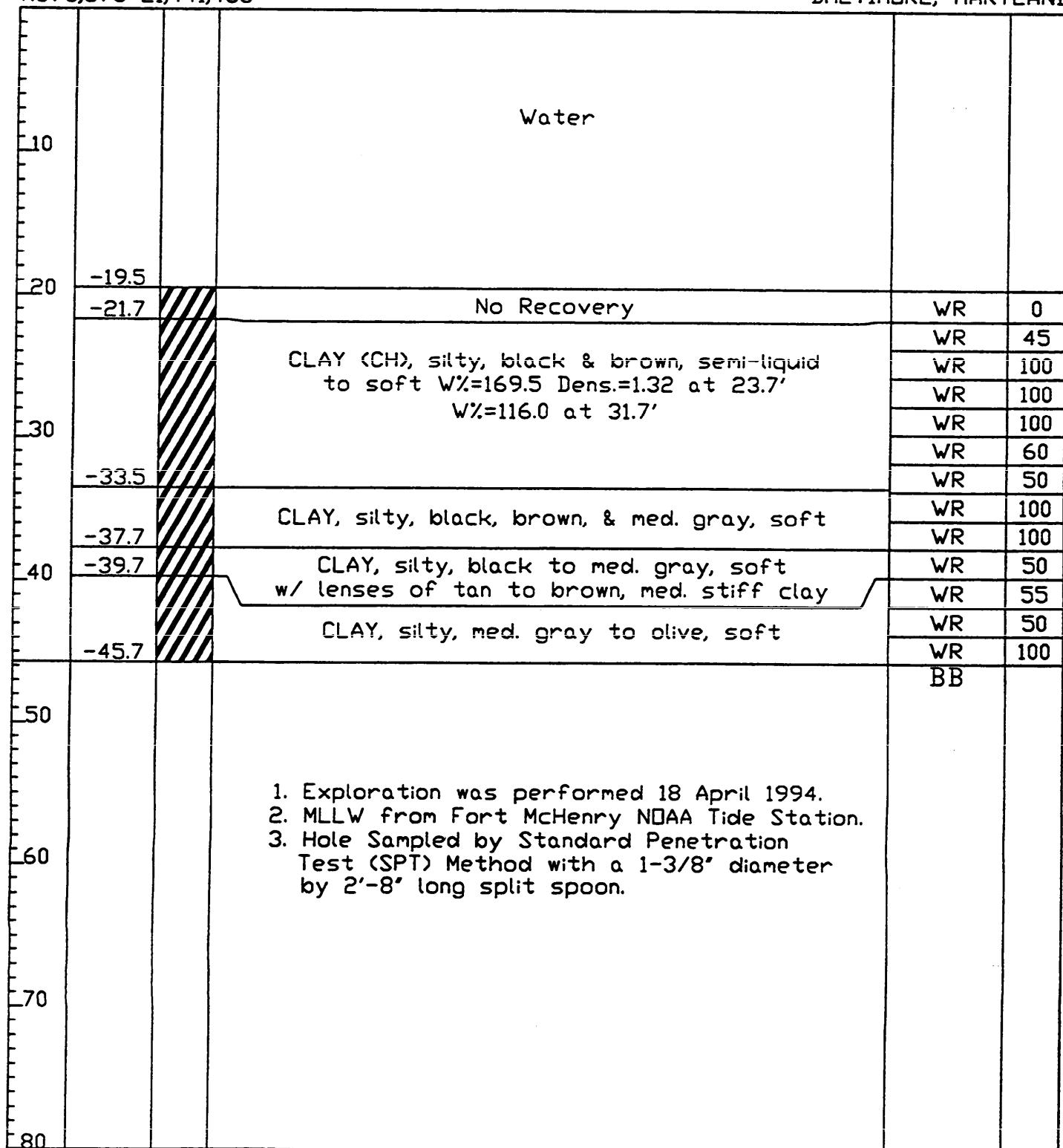


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BALTIMORE, MARYLAND

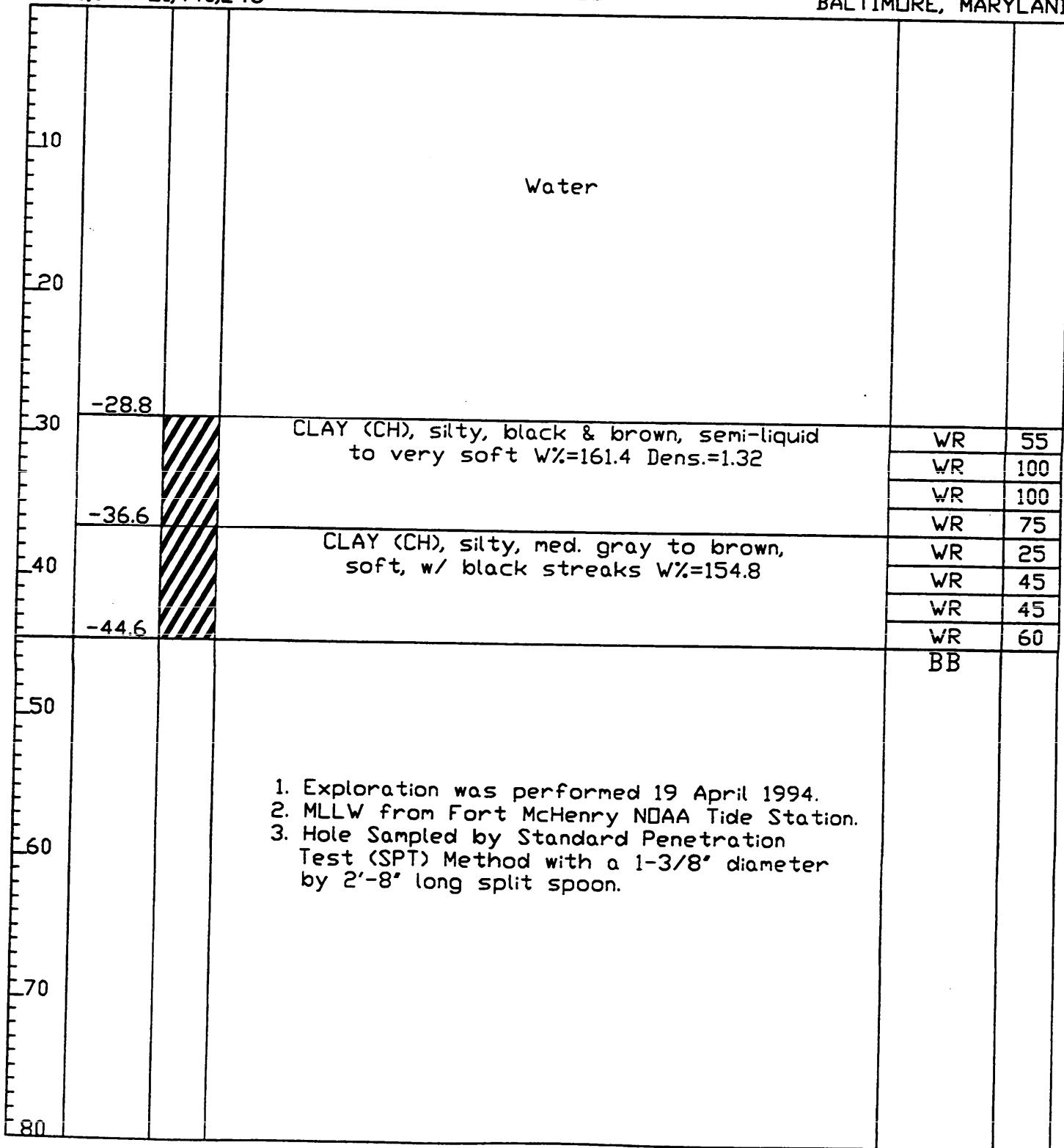


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BALTIMORE, MARYLAND

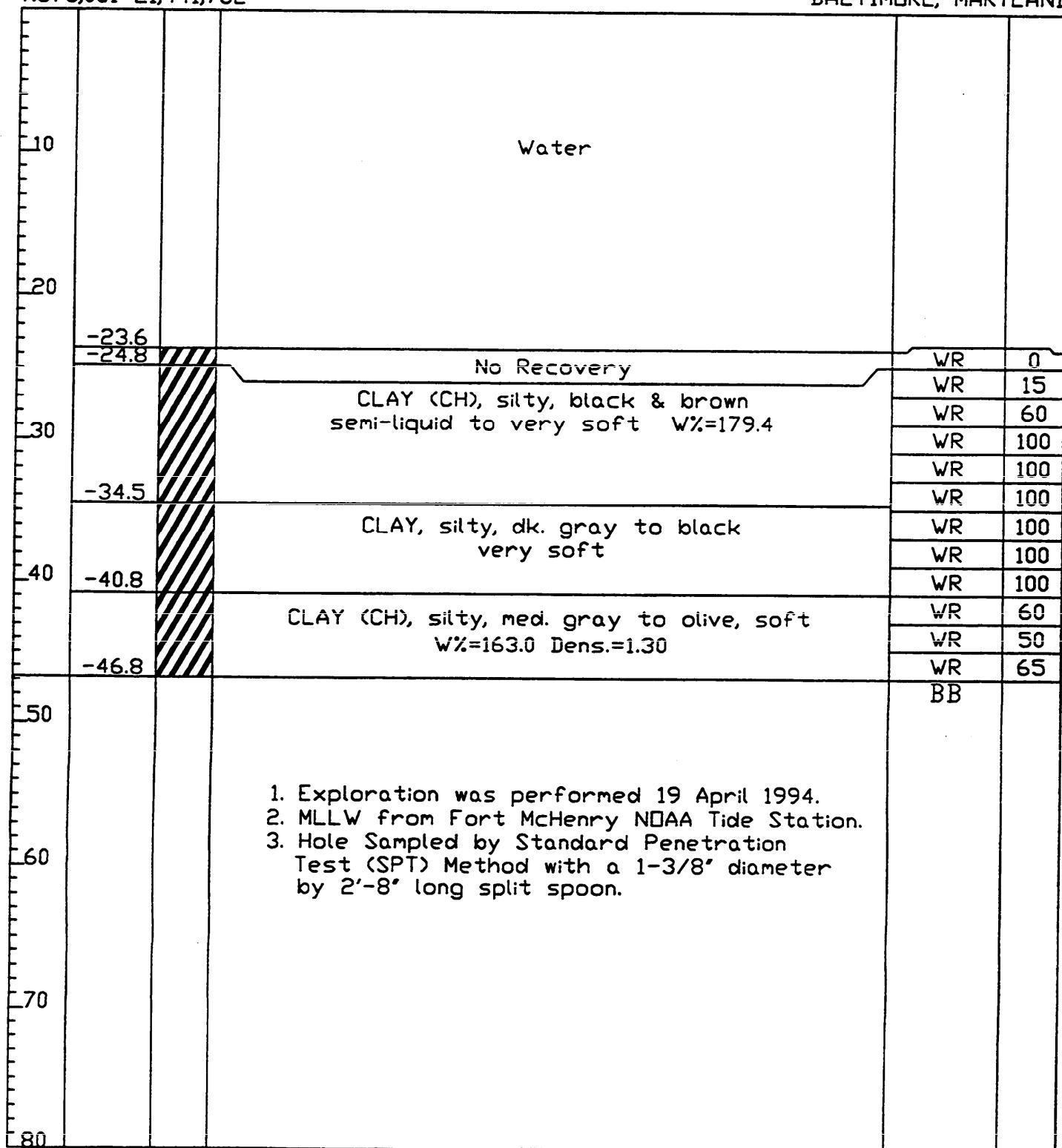


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ELEV. MLLW

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FEASIBILITY STUDY
BALTIMORE, MARYLAND

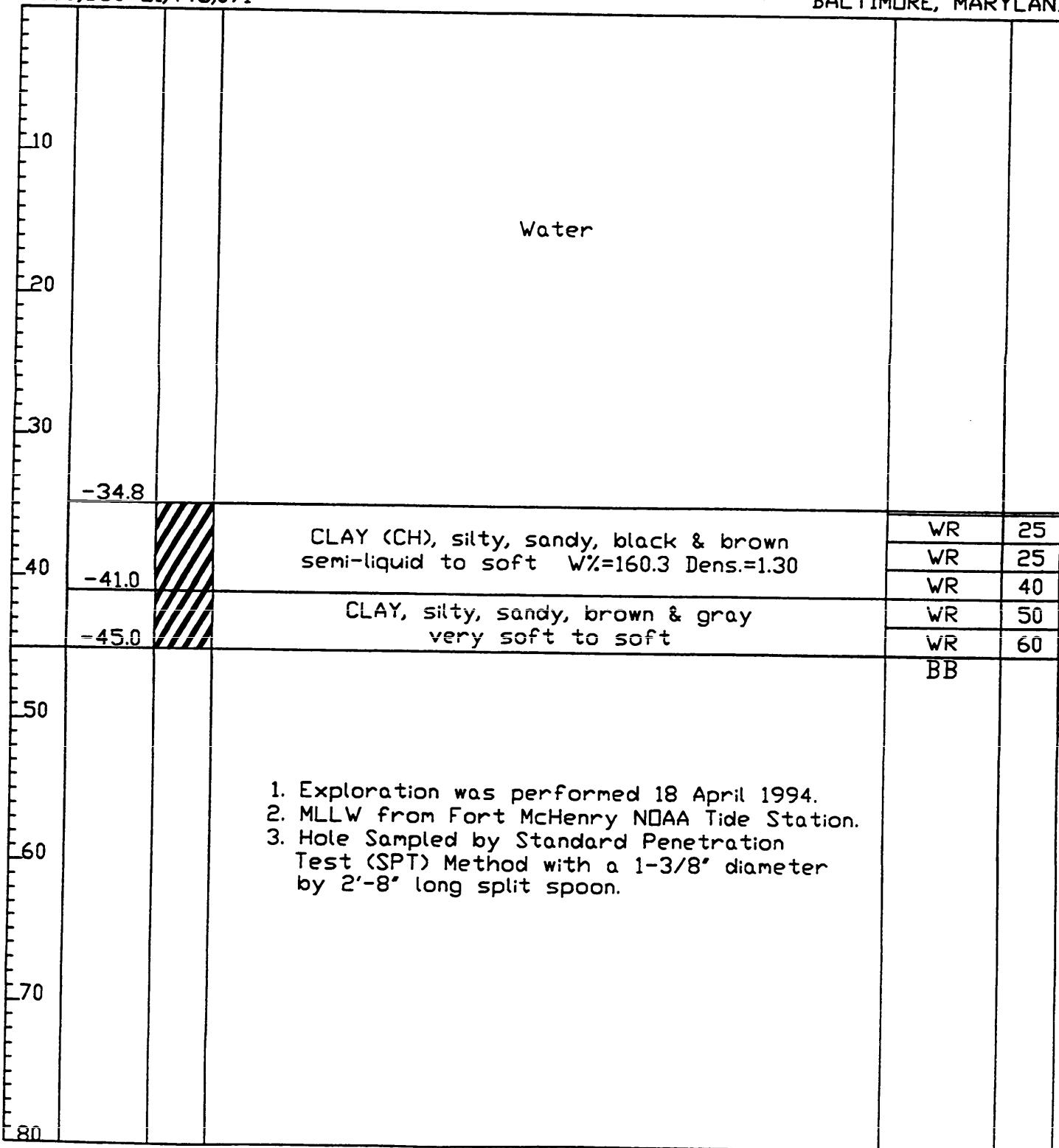


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FEASIBILITY STUDY
BALTIMORE, MARYLAND

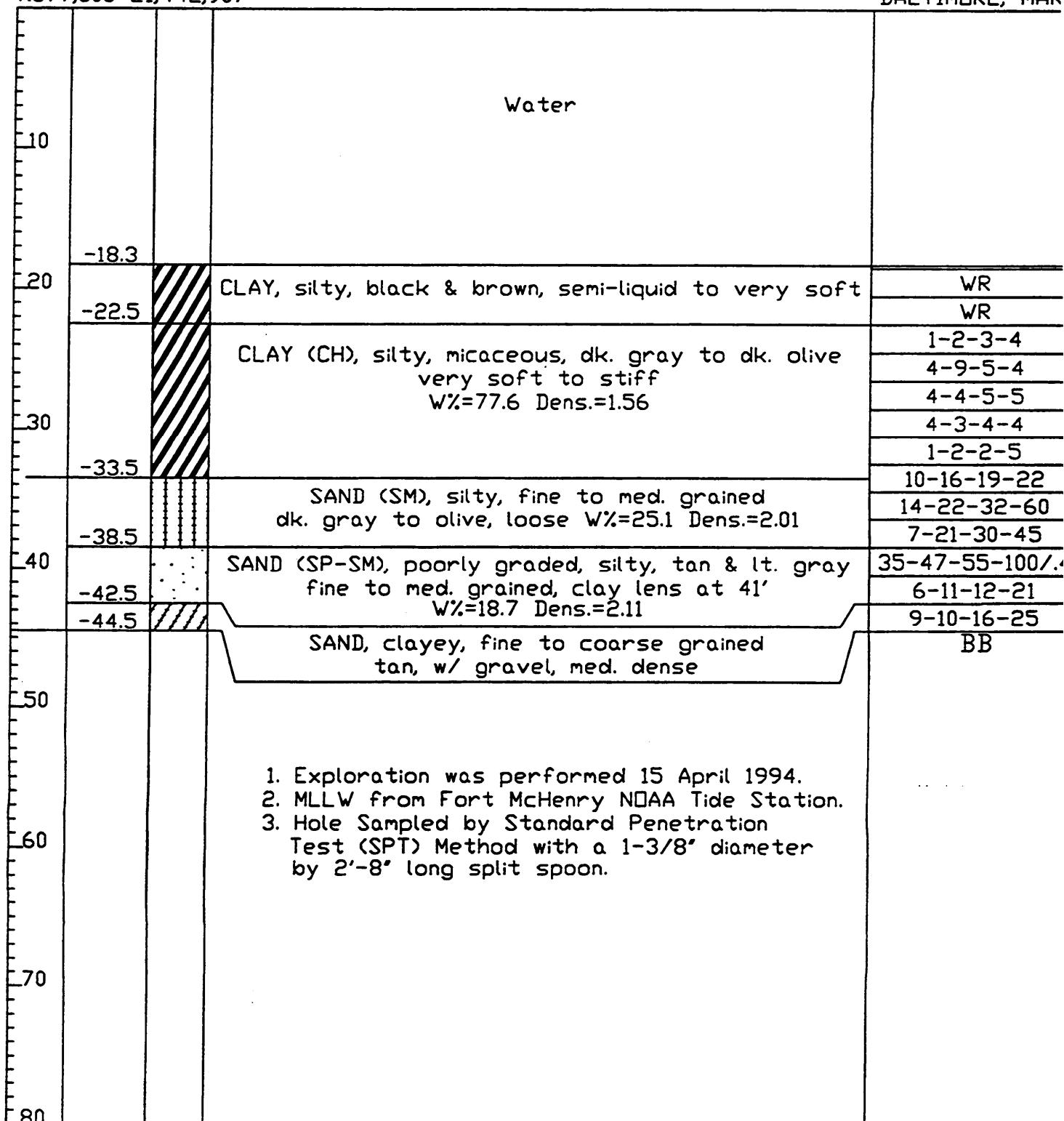


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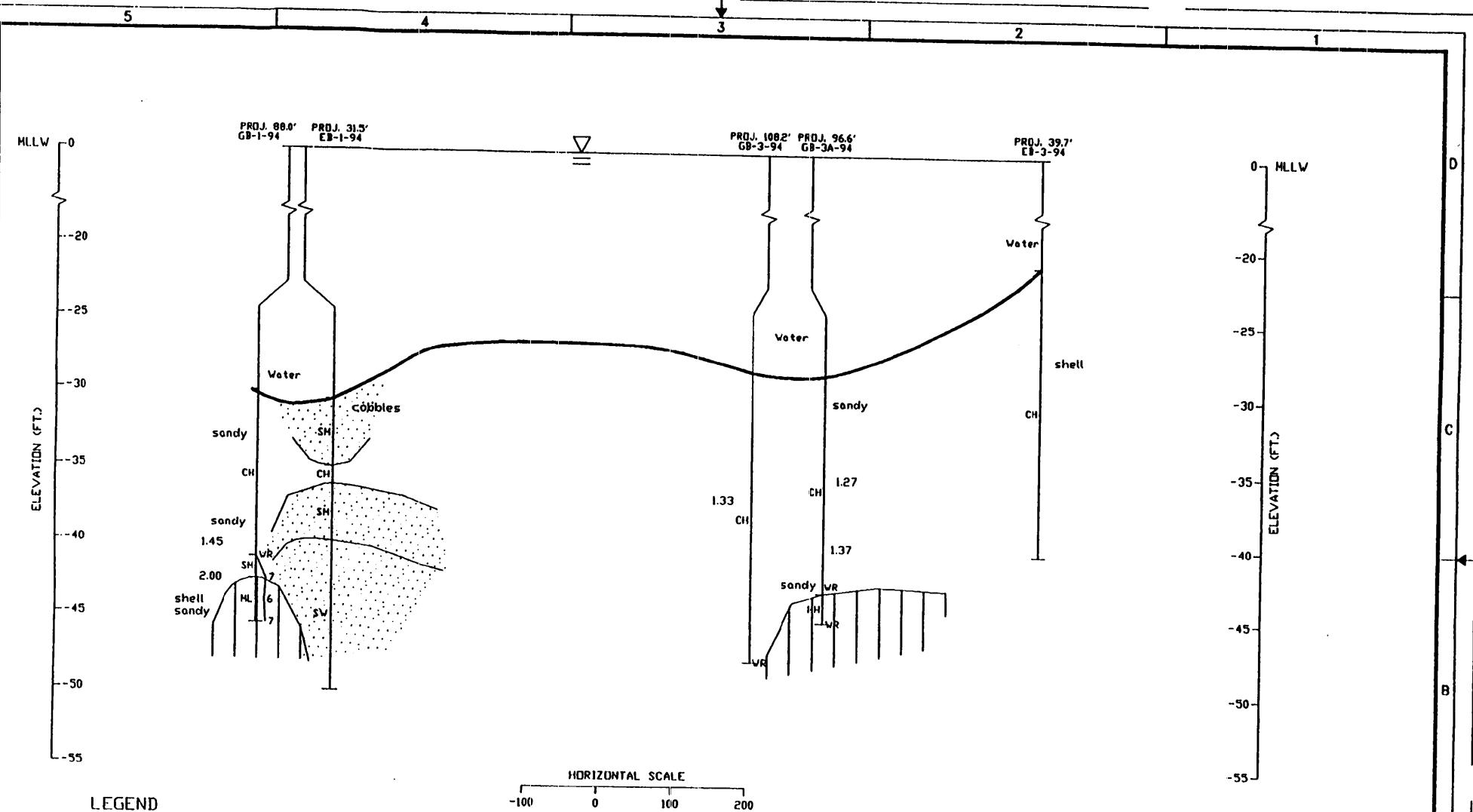
ELEV. MLLW

BALTIMORE +
FEASIBILITY
BALTIMORE, MAR

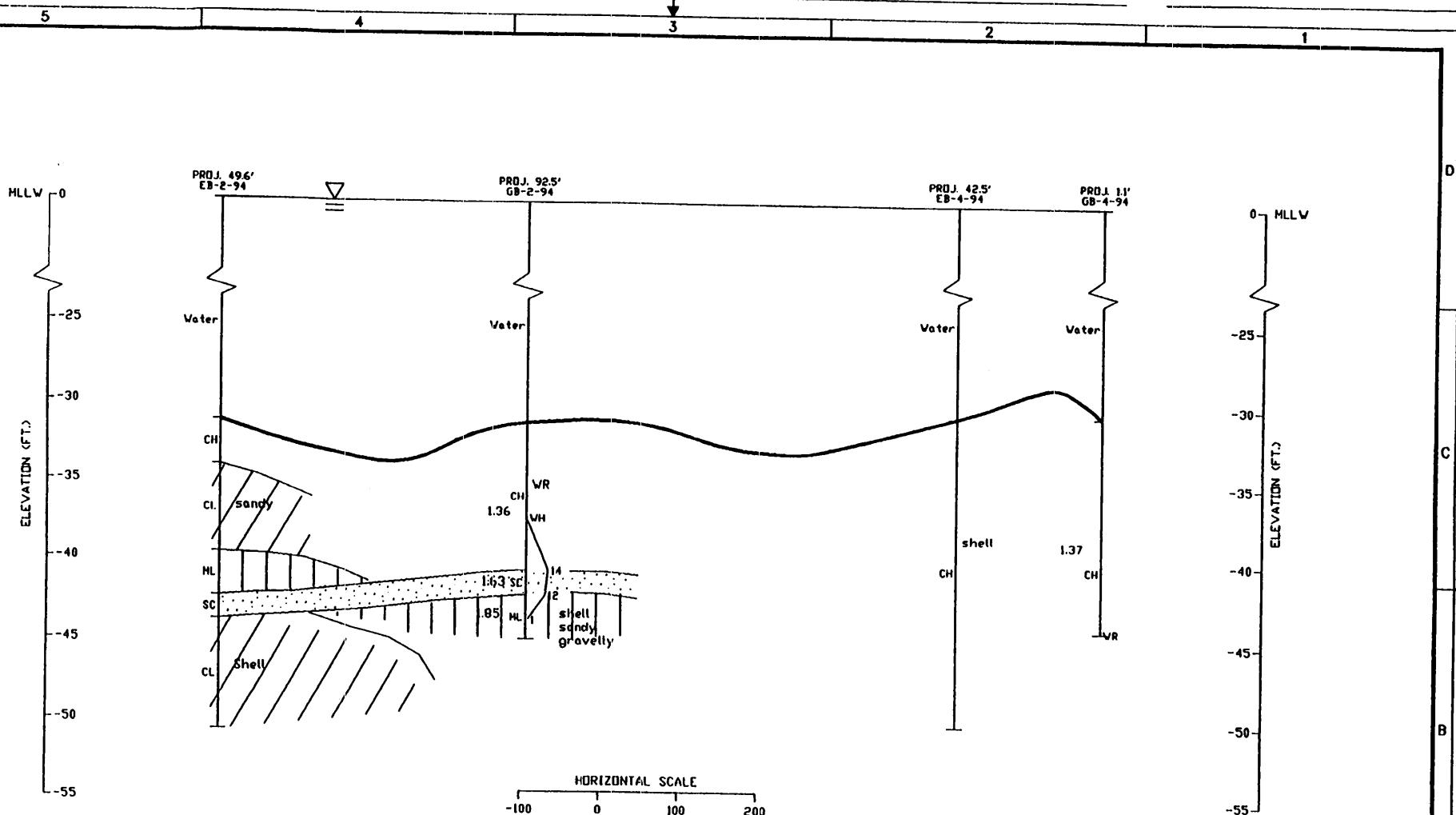


APPENDIX E

PLATES



DATE	RECD-PRIN
U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND	BY
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY	
GEOLOGIC PROFILE NO. 1	
SOILED AS SHOWN	JULY 10 19



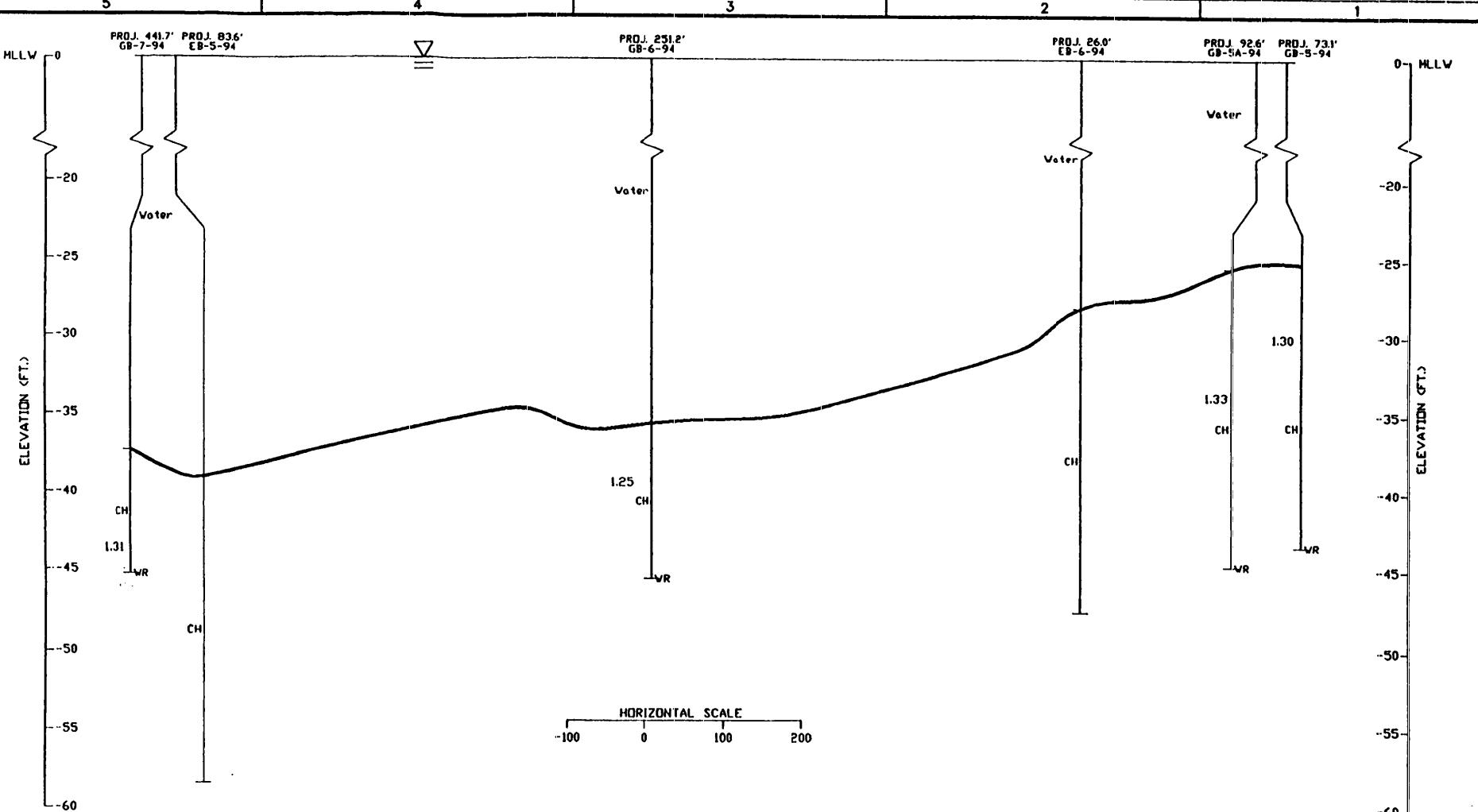
LEGEND

- WR - Weight of Rod
- WH - Weight of Hammer
- CH - Clay, High Plasticity
- CL - Clay, Low Plasticity
- MH - Silt, High Plasticity
- ML - Silt, Low Plasticity
- SC - Clayey Sand
- SM - Silty Sand
- SP - Poorly Graded Sand
- SW - Well Graded Sand

SPT Blow Counts per foot

I.56 In Situ Density
(g/cm^3)

FIG.	DATE	DESCRIPTION	WT
1	2/28/94	U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND	
BALTIMORE		MARYLAND	A
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY			
GEOLOGIC PROFILE NO. 2			
SCALE AS SHOWN	DATE	1	WEIGHT



LEGEND

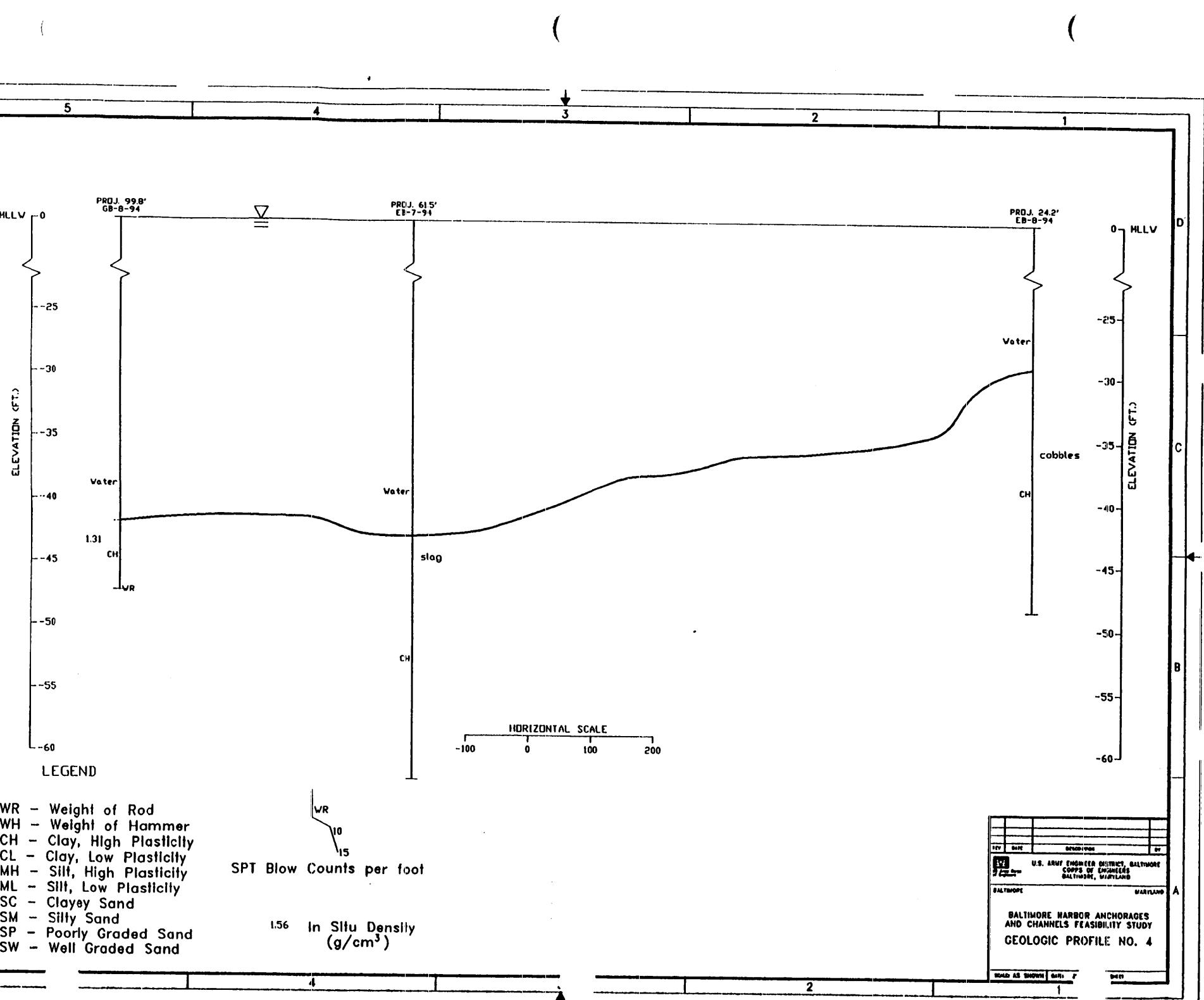
- WR - Weight of Rod
- WH - Weight of Hammer
- CH - Clay, High Plasticity
- CL - Clay, Low Plasticity
- MH - Silt, High Plasticity
- ML - Silt, Low Plasticity
- SC - Clayey Sand
- SM - Silty Sand
- SP - Poorly Graded Sand
- SW - Well Graded Sand

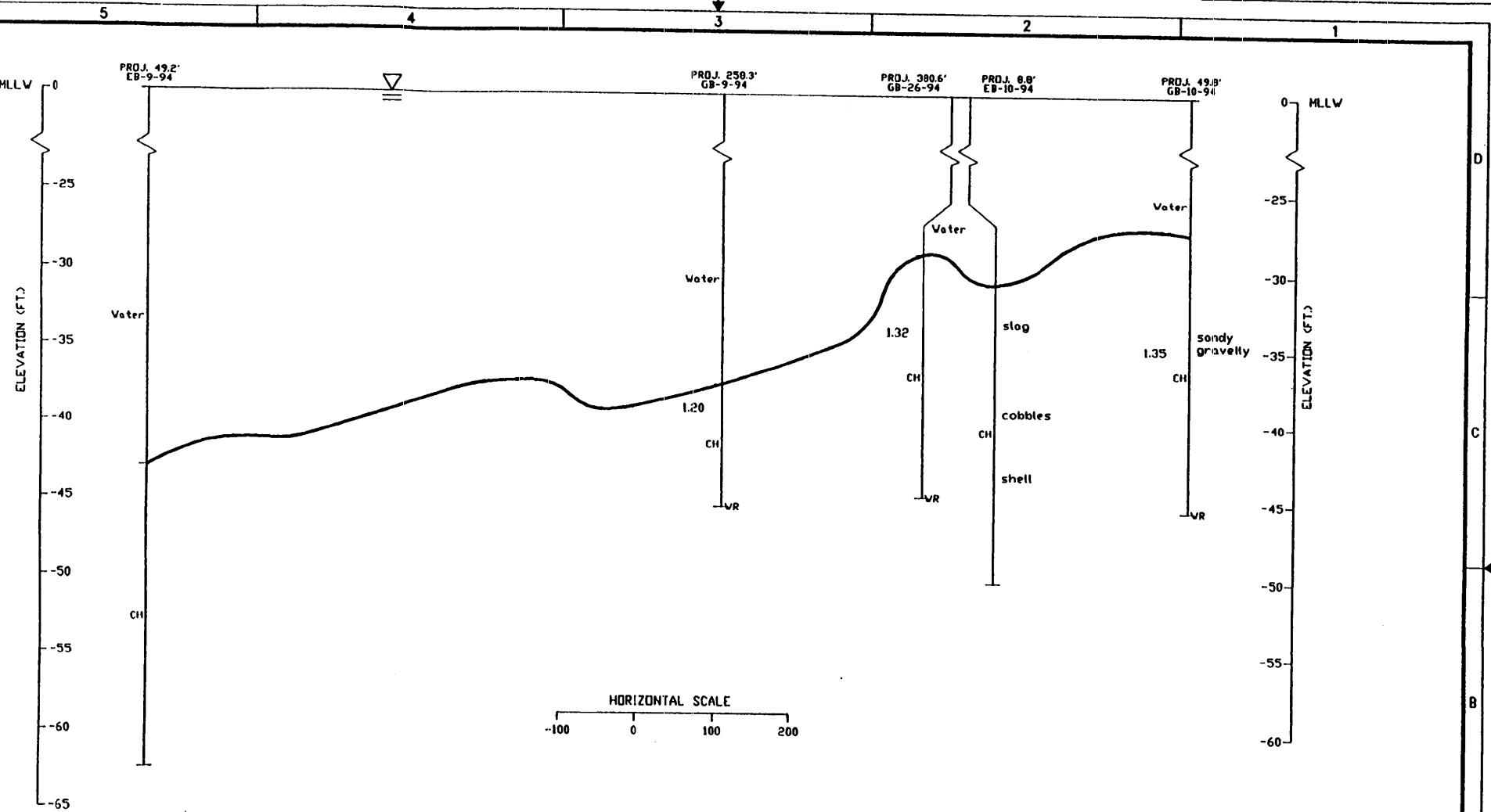
SPT Blow Counts per foot

1.56 In Situ Density
(g/cm^3)

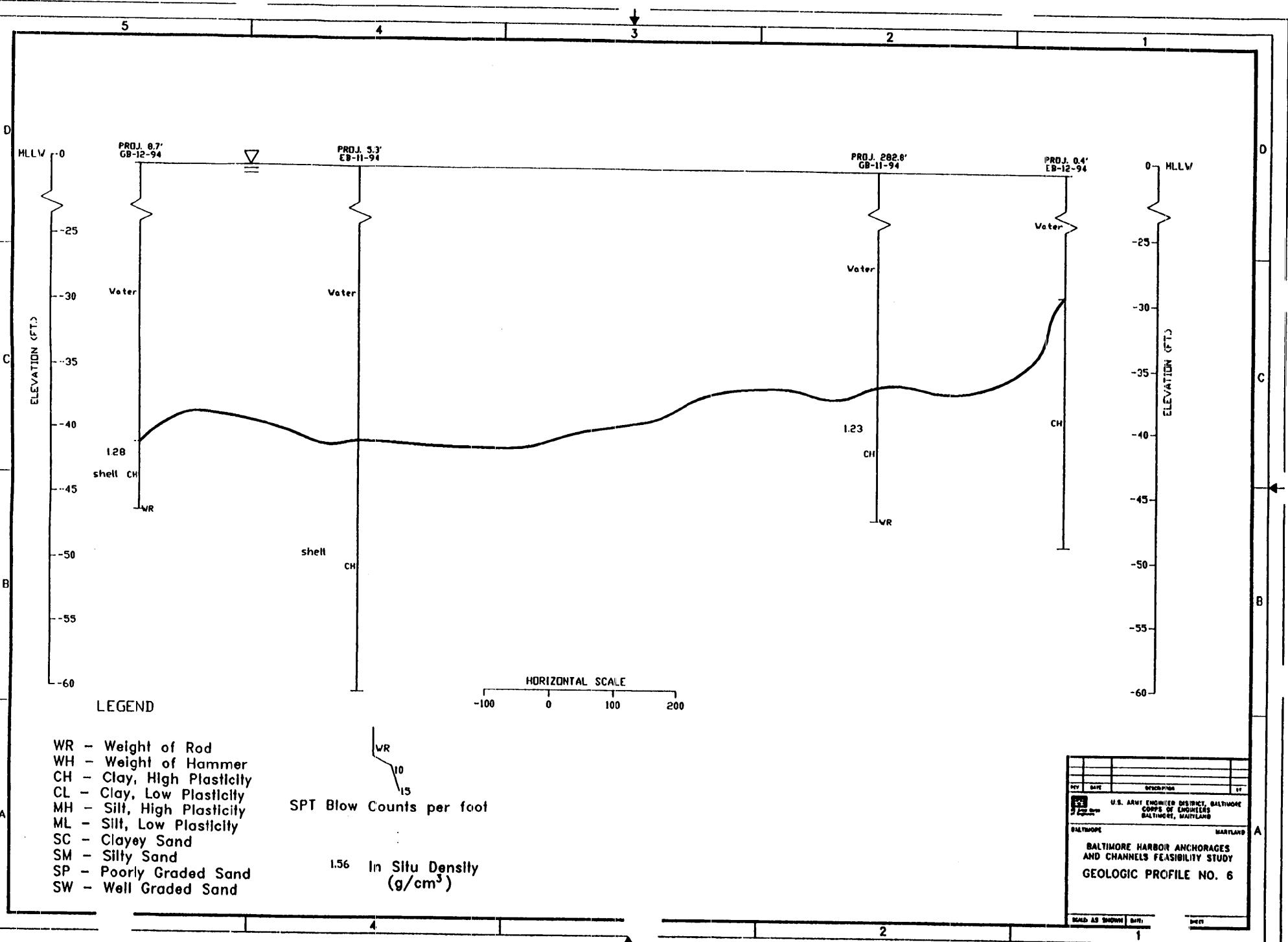
WR
10
15

REV	DATE	DESCRIPTION	BY
17	10/20/94	U.S. ARMY ENGINEER DISTRICT, BALTIMORE DIVISION OF PORTS AND HARBORS BALTIMORE, MARYLAND	
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY			
GEOLOGIC PROFILE NO. 3			
DRAWN AS SHOWN DATE 10/20/94 BY			

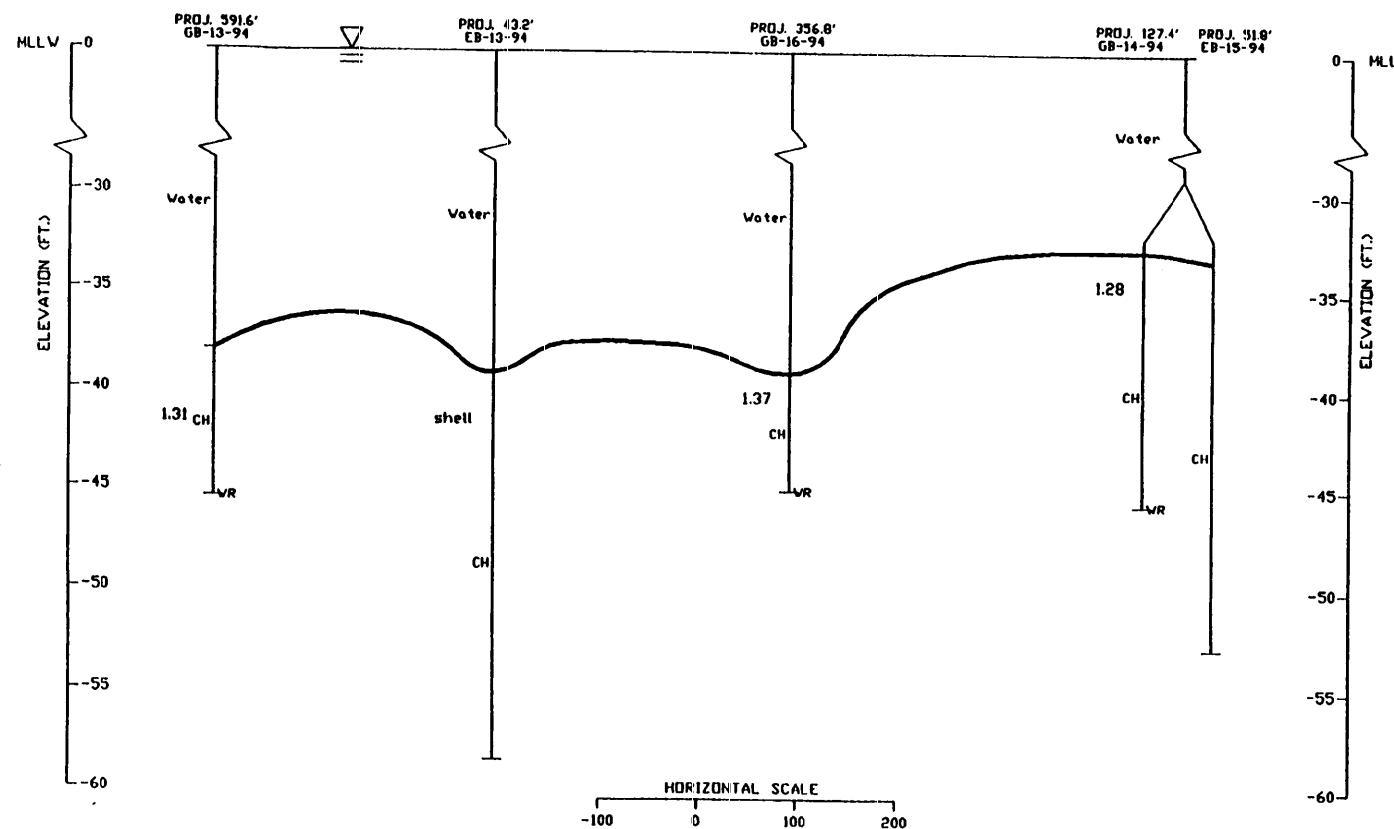




REV	DATE	DESCRIPTION	BY
U.S. ARMY ENGINEER DISTRICT, BALTIMORE BALTIMORE COAST GUARD BALTIMORE, MARYLAND			
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY			
GEOLOGIC PROFILE NO. 5			
DRAWN AS SHOWN		DATE	JULY 94
SHEET		1	1



5 4 3 2 1



LEGEND

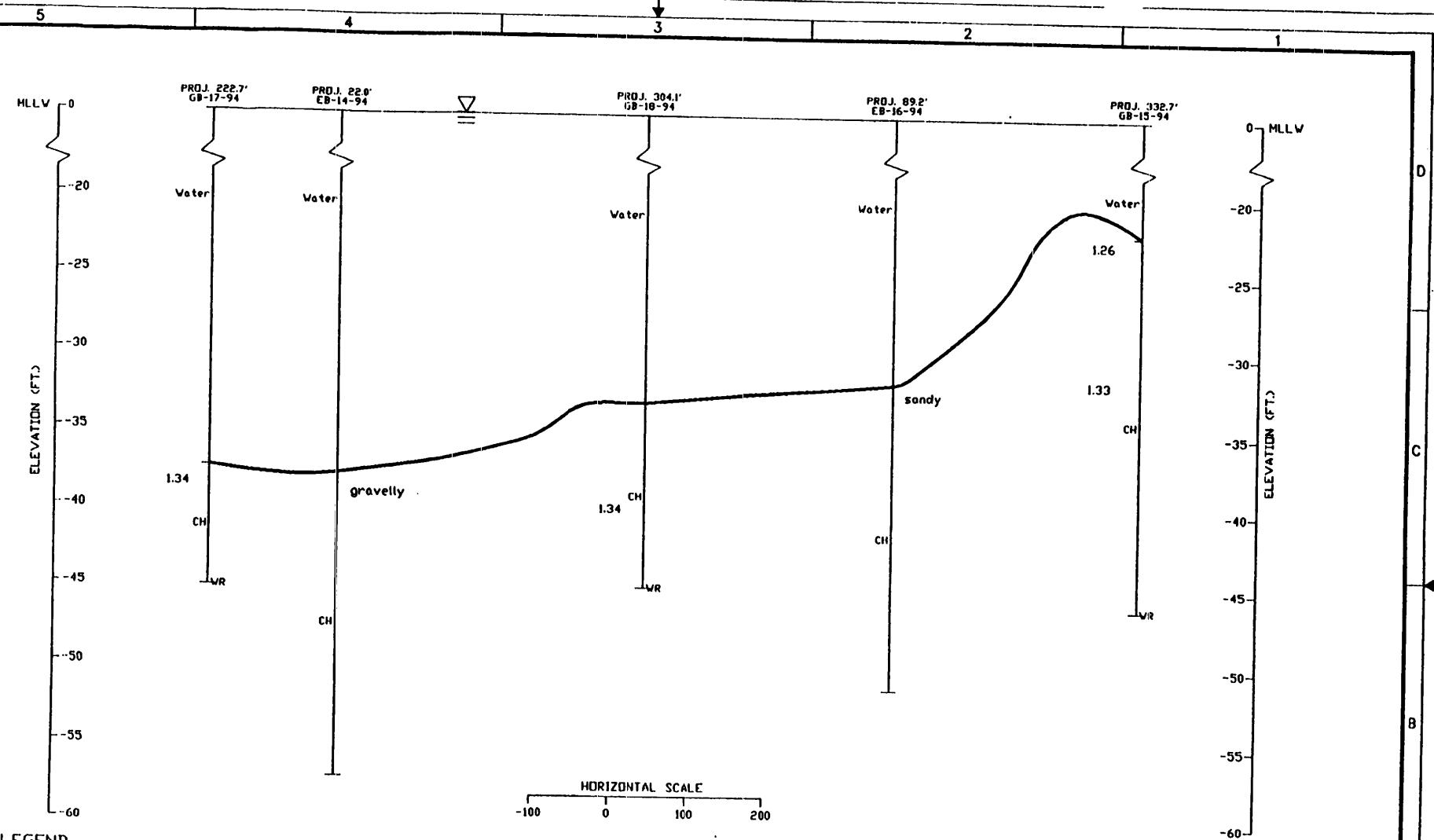
- WR - Weight of Rod
- WH - Weight of Hammer
- CH - Clay, High Plasticity
- CL - Clay, Low Plasticity
- MH - Silt, High Plasticity
- ML - Silt, Low Plasticity
- SC - Clayey Sand
- SM - Silty Sand
- SP - Poorly Graded Sand
- SW - Well Graded Sand

SPT Blow Counts per foot

1.56 In Situ Density
(g/cm^3)

REV	DATE	DESIGNER	BY
1	2/28/94		
U.S. ARMY ENGINEER DISTRICT, BALTIMORE COAST GUARD BALTIMORE, MARYLAND			
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY GEOLOGIC PROFILE NO. 7			
ISSUED AS SHOWN		DATE	BY

5 4 3 2 1



LEGEND

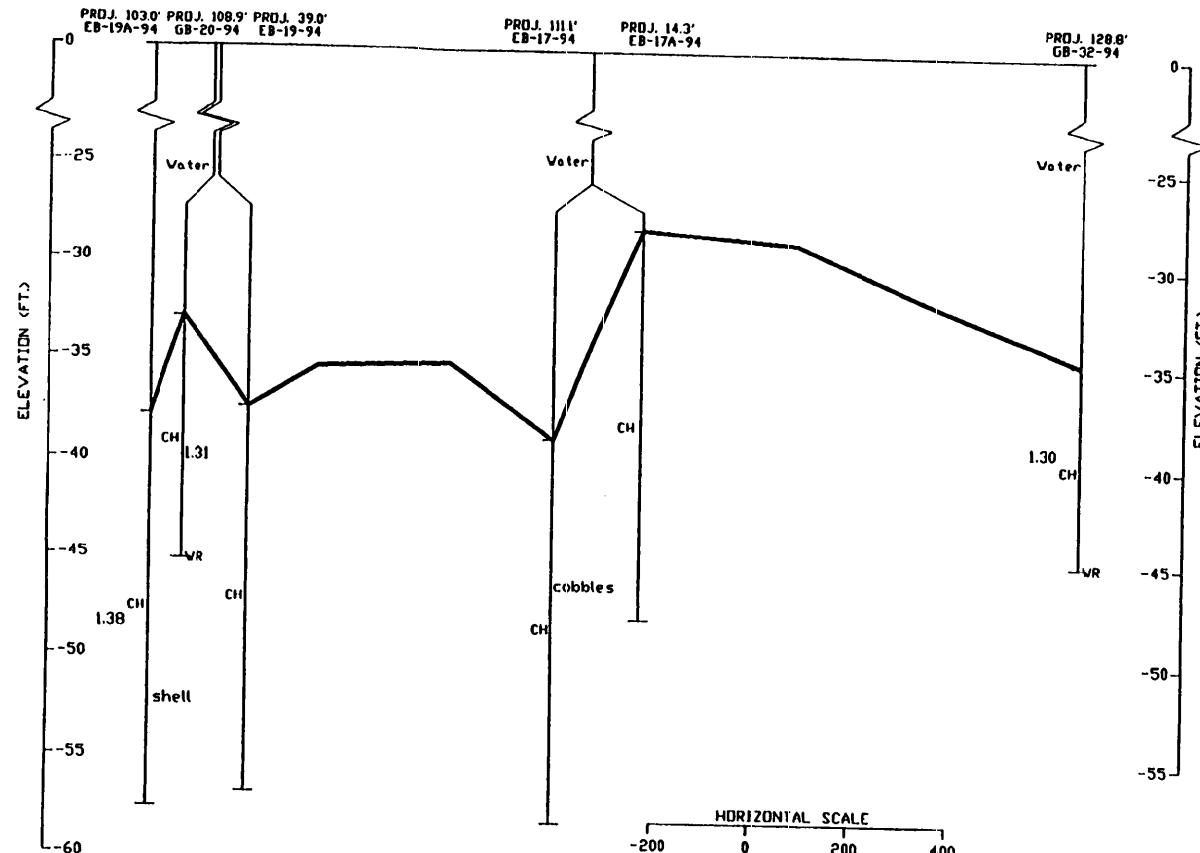
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WH	- Weight of Hammer
CH	- Clay, High Plasticity
CL	- Clay, Low Plasticity
MH	- Silt, High Plasticity
ML	- Silt, Low Plasticity
SC	- Clayey Sand
SM	- Silty Sand
SP	- Poorly Graded Sand
SW	- Well Graded Sand

SPT Blow Counts per foot

**1.56 In Situ Density
(g/cm³)**

REV	DATE	DESCRIPTION	BY
		U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND	
BALTIMORE		MARYLAND	
<p align="center">BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY</p> <p align="center">GEOLOGIC PROFILE NO. 8</p>			
RECALLED AS SHOWN		DRAWN BY	DRAFT

5 4 3 2 1



LEGEND

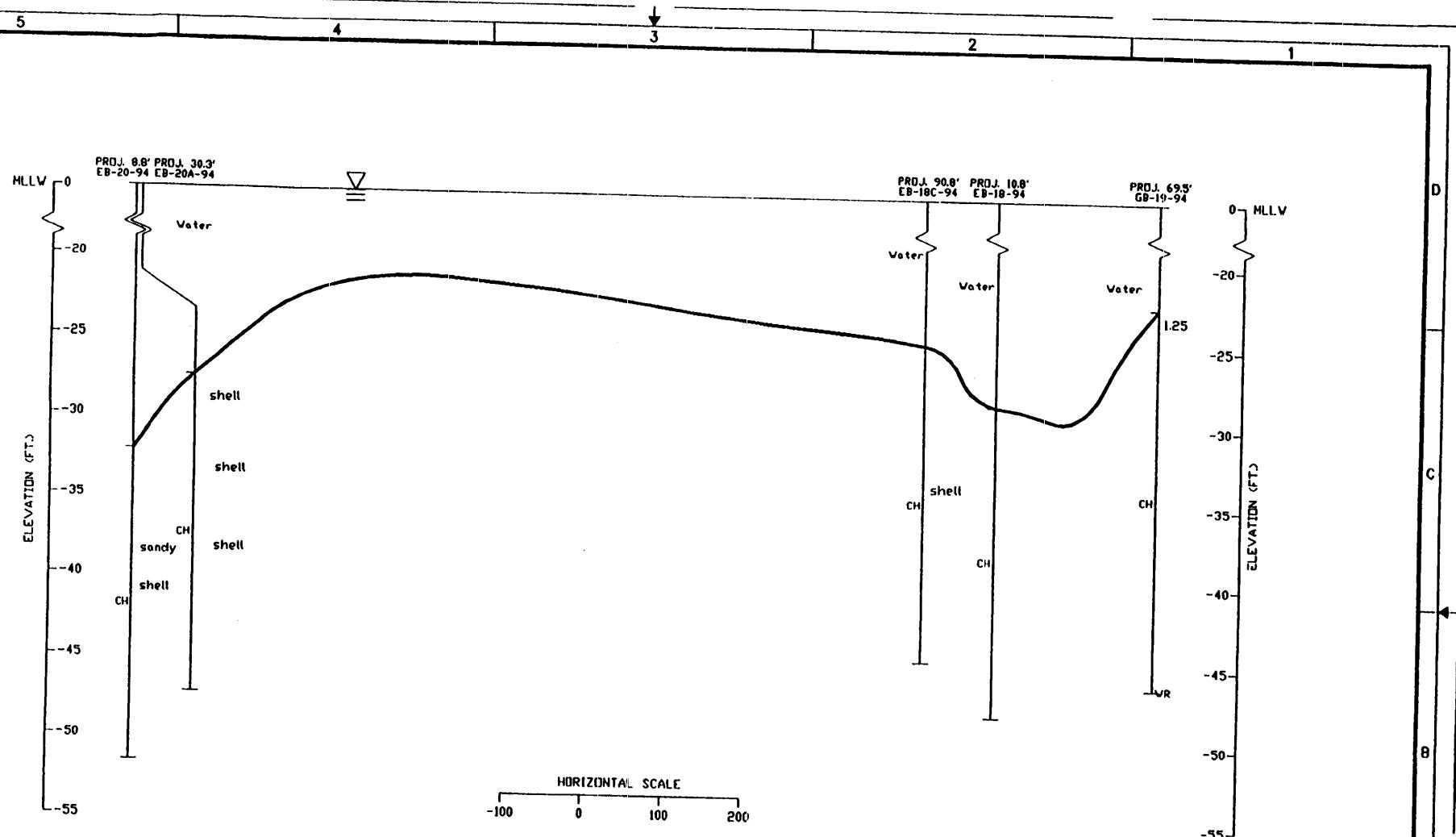
- WR - Weight of Rod
- WH - Weight of Hammer
- CH - Clay, High Plasticity
- CL - Clay, Low Plasticity
- MH - Silt, High Plasticity
- ML - Silt, Low Plasticity
- SC - Clayey Sand
- SM - Silty Sand
- SP - Poorly Graded Sand
- SW - Well Graded Sand

WR
10
15

SPT Blow Counts per foot

1.56 In Situ Density
(g/cm^3)

REV.	DATE	DESCRIPTION	BY
2			
U.S. ARMY ENGINEER DISTRICT, BALTIMORE COASTAL DEPT. CORPS OF ENGINEERS BALTIMORE, MARYLAND			
BALTIMORE MARYLAND			
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY			
GEOLOGIC PROFILE NO. 9			
SCALE AS SHOWN DATE: JULY 16 1994			

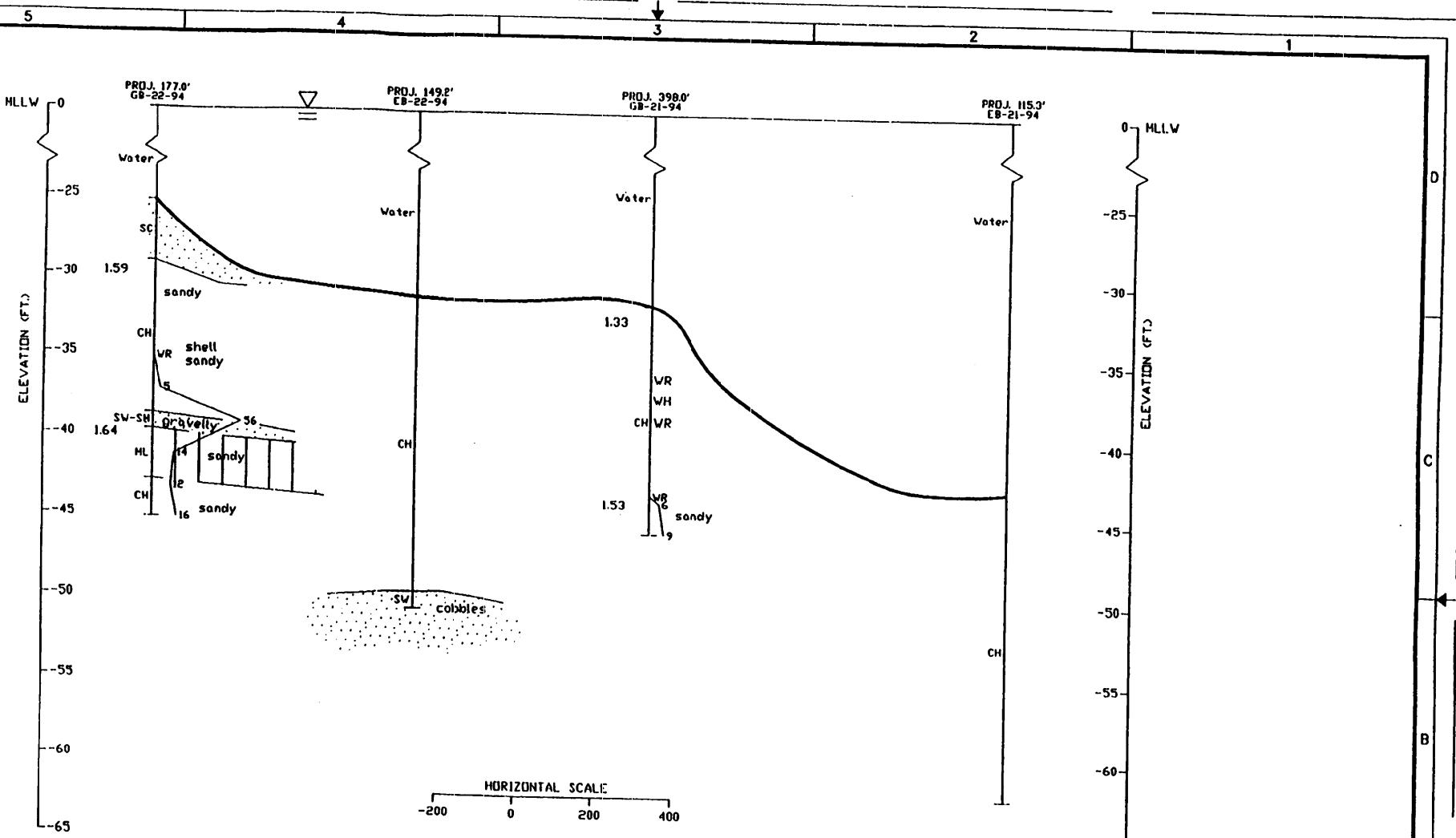


LEGEND

- WR - Weight of Rod
- WH - Weight of Hammer
- CH - Clay, High Plasticity
- CL - Clay, Low Plasticity
- MH - Silt, High Plasticity
- ML - Silt, Low Plasticity
- SC - Clayey Sand
- SM - Silty Sand
- SP - Poorly Graded Sand
- SW - Well Graded Sand

1.56 In Situ Density
(g/cm^3)

REV	DATE	REVISIONS	BY
			U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND
BALTIMORE MARYLAND			
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY			
GEOLOGIC PROFILE NO. 10			
DRAFT AS SHOWN DATE 1/18/94 BY J. SMITH			

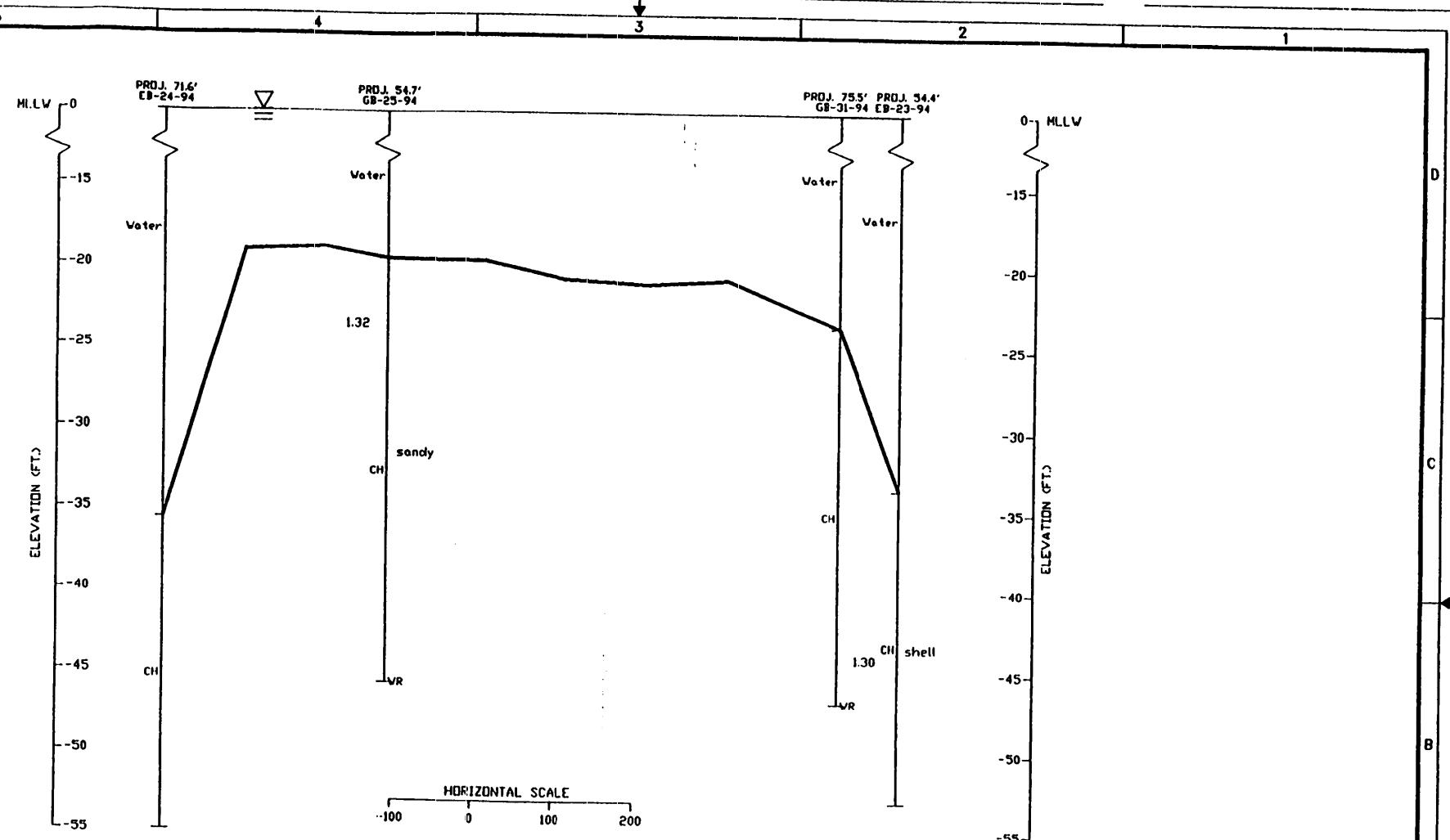


LEGEND

- WR - Weight of Rod
- WH - Weight of Hammer
- CH - Clay, High Plasticity
- CL - Clay, Low Plasticity
- MH - Silt, High Plasticity
- ML - Silt, Low Plasticity
- SC - Clayey Sand
- SM - Silty Sand
- SP - Poorly Graded Sand
- SW - Well Graded Sand

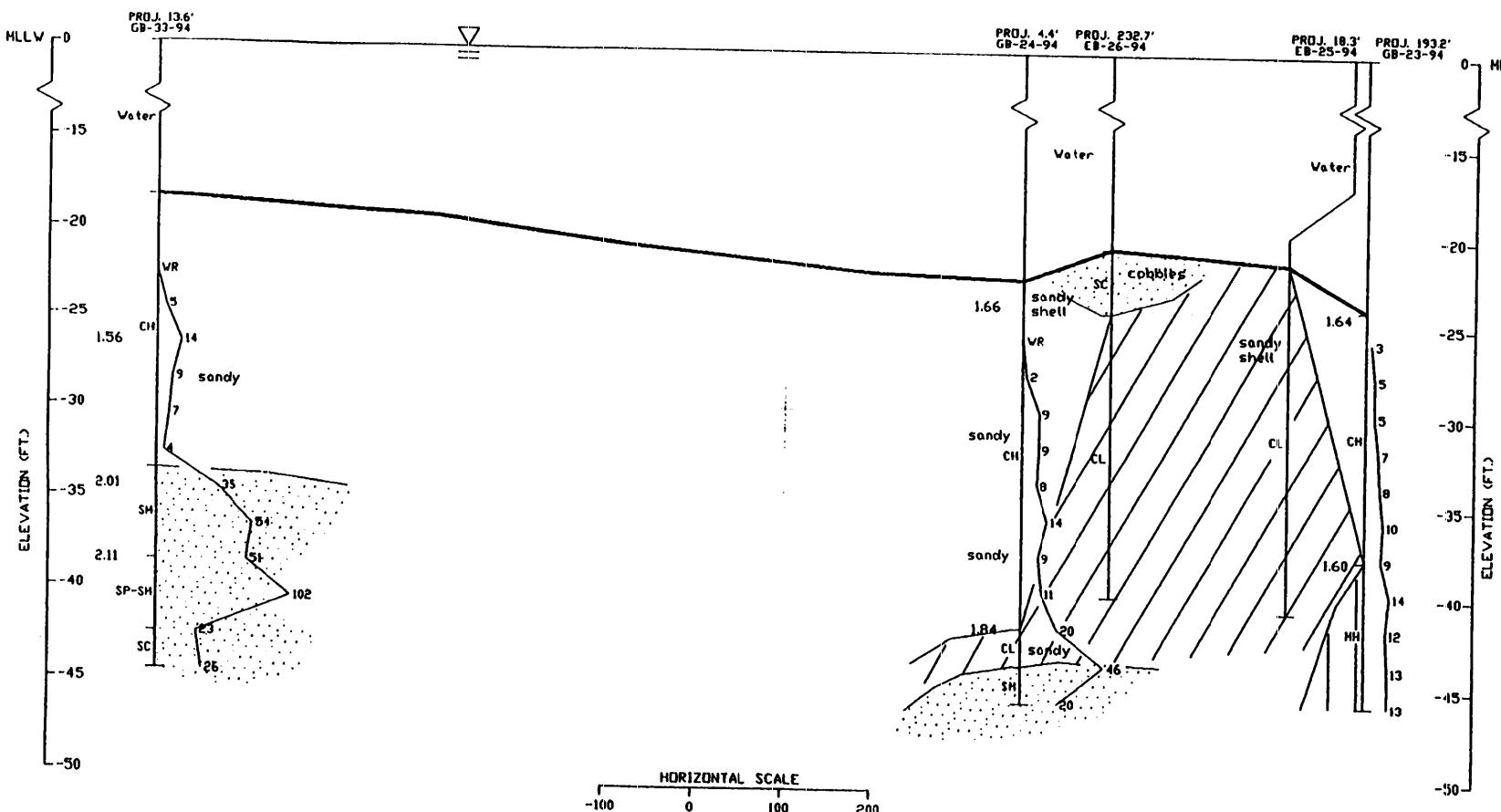
1.56 In Situ Density
(g/cm^3)

REV. DATE	SPECIMEN	OR
10/01/04	100-1000	10
U.S. ARMY ENGINEER DISTRICT, BALTIMORE COAST OF ENGINEERS BALTIMORE, MARYLAND		
BALTIMORE	MARYLAND	A
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY		
GEOLOGIC PROFILE NO. 11		
SCALE AS SHOWN DATE: JULY 04 SHEET 1		



I.56 In Situ Density
(g/cm^3)

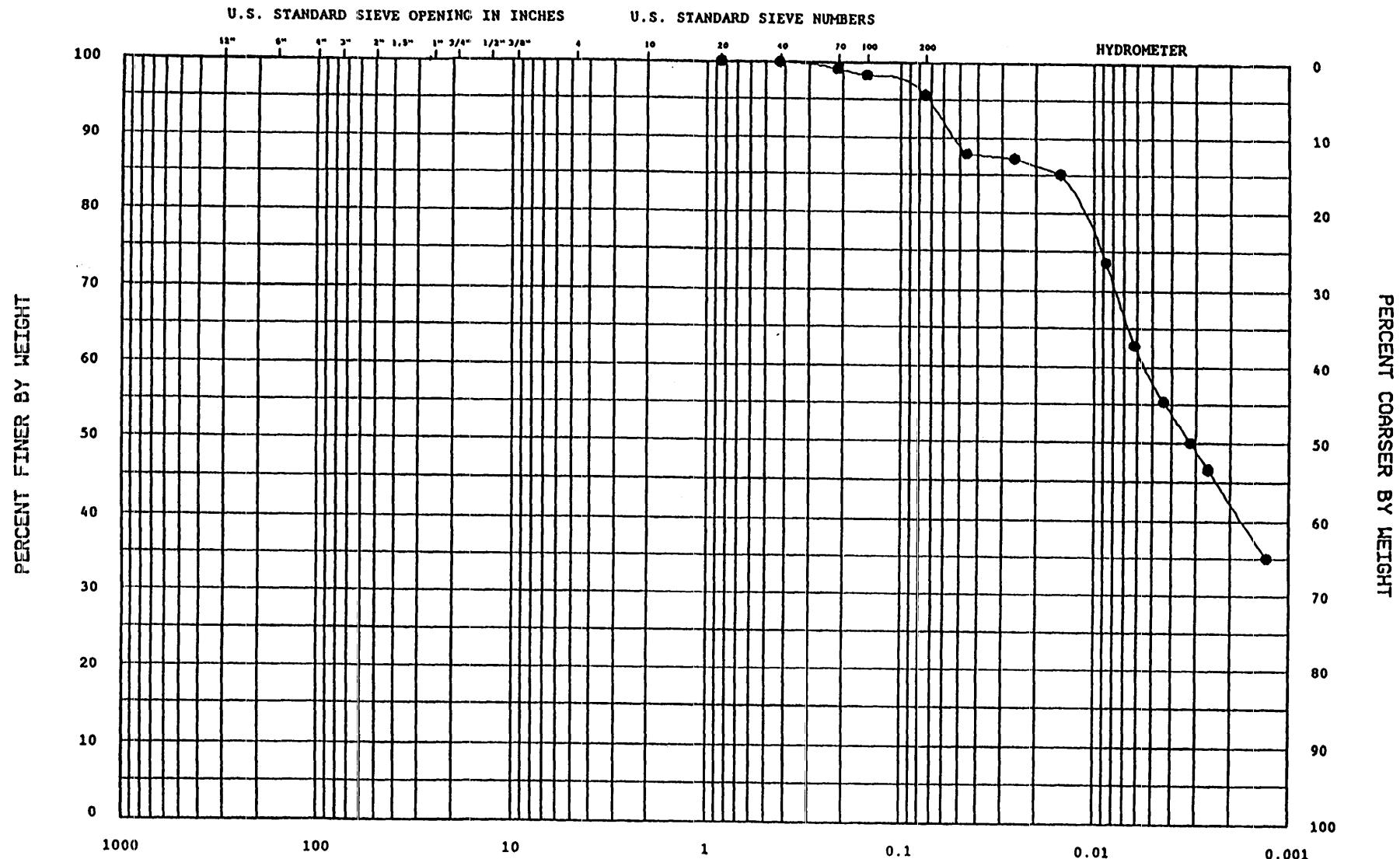
BY	DATE	DESCRIPTION	BY
U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND			
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDY			
GEOLOGIC PROFILE NO. 12			
ISSUED AS SHOWN		SITE	SENT



SPT Blow Counts per foot

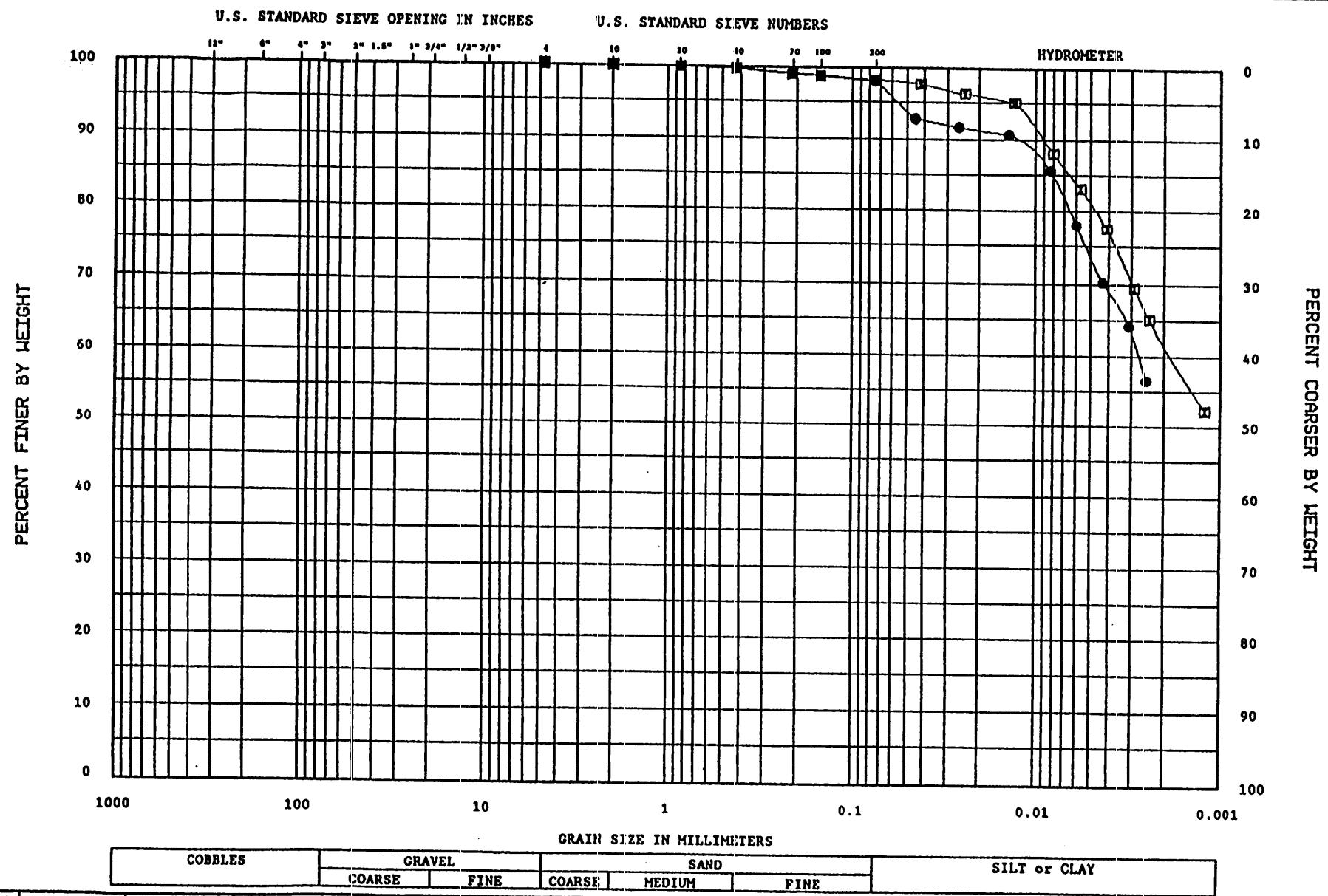
1.56 In Situ Density
(g/cm^3)

IV	III	II	I
IV	III	II	I
SPT BLOW COUNTS			
U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND			
BALTIMORE			
MARYLAND			
BALTIMORE HARBOR ANCHORAGES AND CHANNELS FEASIBILITY STUDIES			
GEOLOGIC PROFILE NO. 13			
DRAWN AS SHOWN DATE: MAY 94 BY:			



COBBLES	GRAVEL			SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

Legend	Sample No.	pth (ft)	Classification	Nat w%	LL	PL	PI	
●	JAR-3	31.2-33.2	FAT CLAY	CHI	255.6	176	57	119
—								PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
—								SOUTH LOCUST POINT
—								ANCHORAGE & CHANNELS
								BORING NO. GB-27-94
REMARKS:								DATE: JUN 1994
ENG FORM 2087								GRADATION CURVES



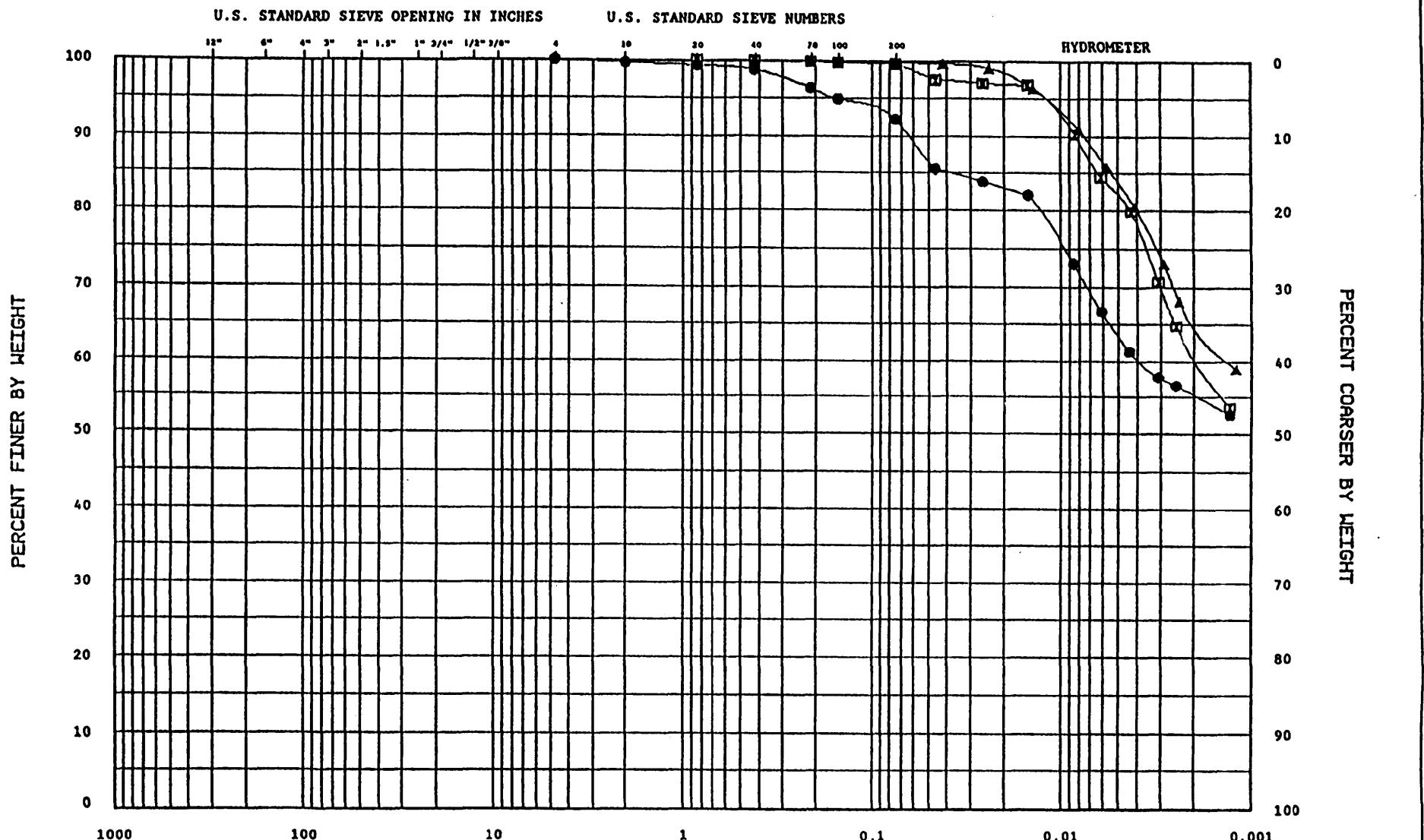
COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

**PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS**

REMARKS:

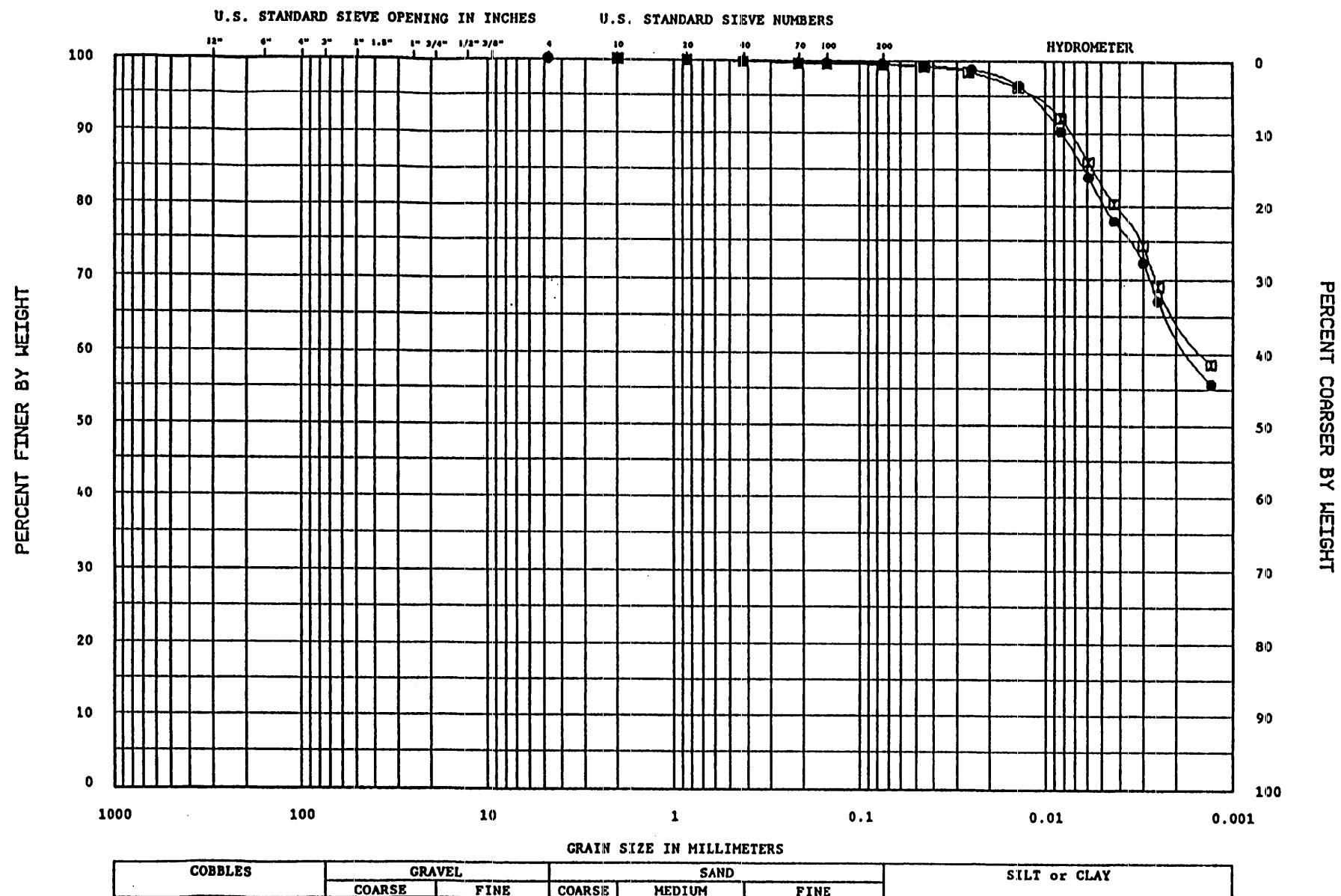
ENG FORM 2087

GRADATION CURVES

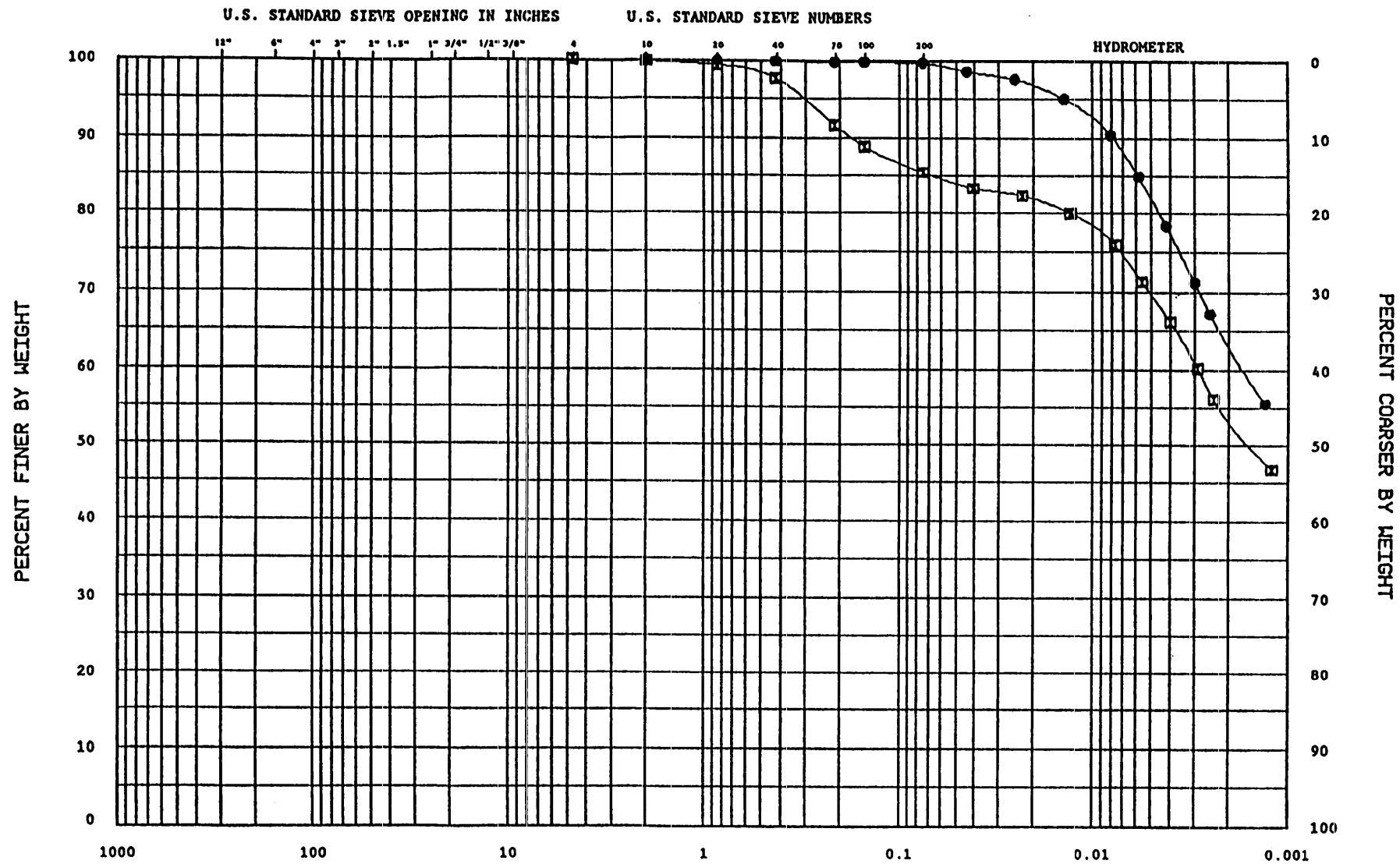


GRAIN SIZE IN MILLIMETERS						
COBBLES	GRAVEL			SAND		SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification	Nat w/o%	LL	PL	PI	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY SOUTH LOCUST POINT ANCHORAGE & CHANNELS
●	JAR-1	22.7-24.2	FAT CLAY	CH	204.3	153	47	106
□	JAR-5	32.7-34.2	FAT CLAY	CH	163.3			
▲	JAR-11	44.7-46.2	FAT CLAY	CH	149.4			
—								BORING NO. GB-19-94
REMARKS:								DATE: JUN 1994
ENG FORM 2087				GRADATION CURVES				

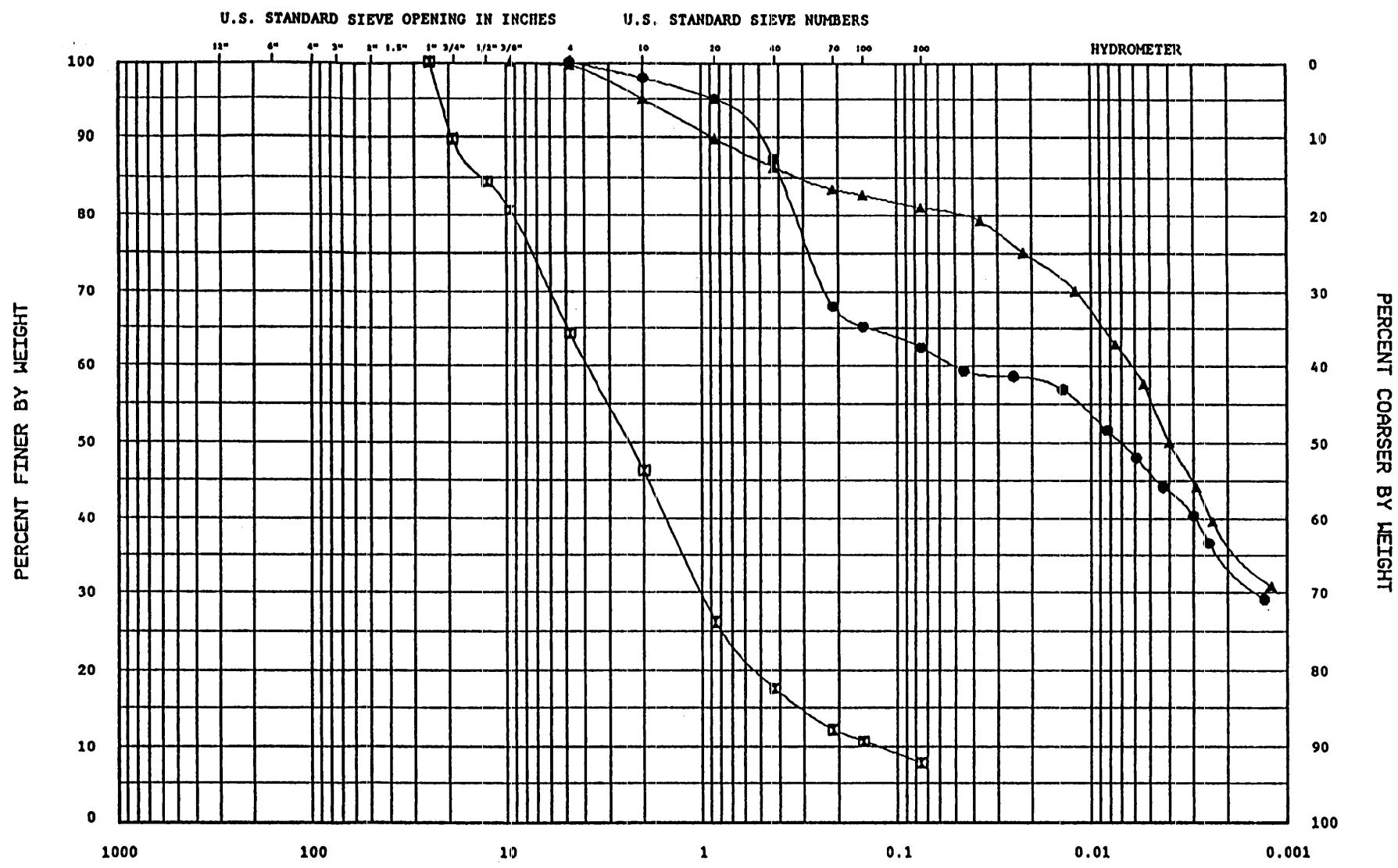


REMARKS:		PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY SOUTH LOCUST POINT ANCHORAGE & CHANNELS					
ENG FORM 2087	GRADATION CURVES	BORING NO.	GB-20-94	DATE:	JUN 1994		

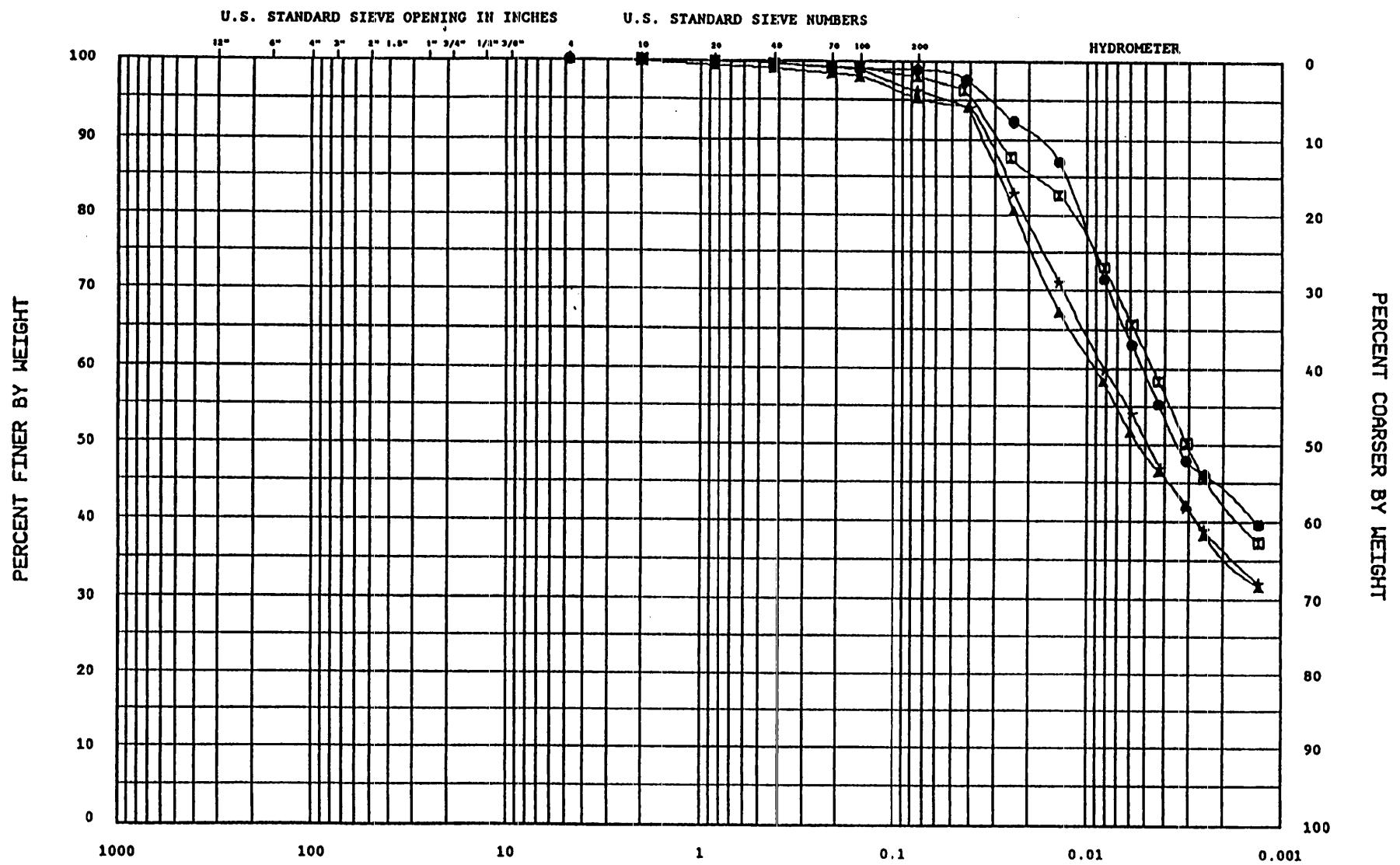


COBBLES			GRAVEL		SAND			SILT or CLAY	
	COARSE	FINE	COARSE	MEDIUM	COARSE	MEDIUM	FINE		
●	JAR-1	32.4-33.9	FAT CLAY		CH	161.9	136	39	97
□	JAR-7	44.4-45.9	FAT CLAY with SAND		CH	83.9	96	33	63
—									
—									

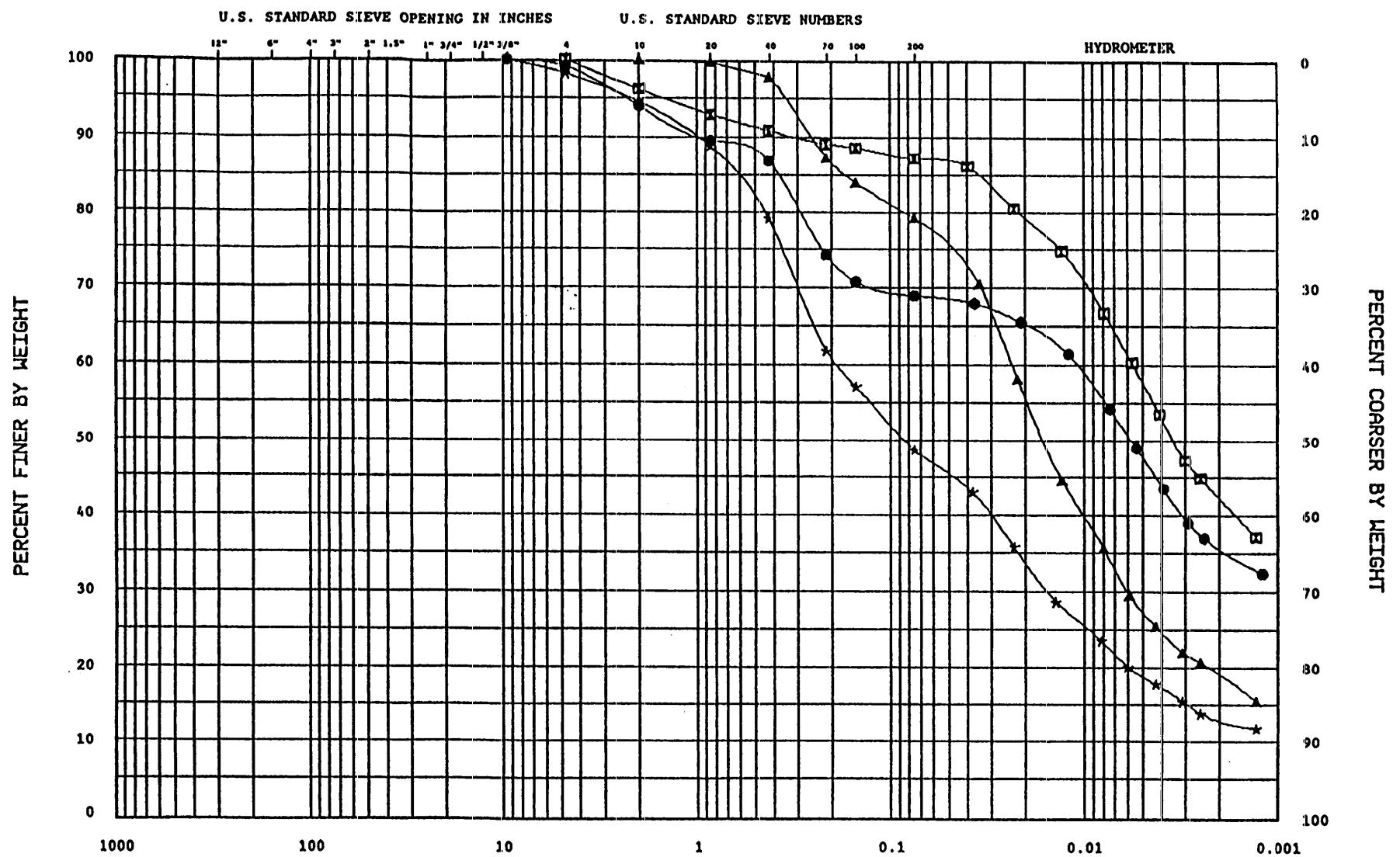
Legend	Sample No.	Depth (ft)	Classification	Nat w/c	LL	PL	PI	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY SOUTH LOCUST POINT ANCHORAGE & CHANNELS			
●	JAR-1	32.4-33.9	FAT CLAY	CH	161.9	136	39	97			
□	JAR-7	44.4-45.9	FAT CLAY with SAND	CH	83.9	96	33	63			
—											
—											
REMARKS:											
ENG FORM 2087			GRADATION CURVES						BORING NO. GB-21-94		
									DATE: JUN 1994		



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



COBBLES		GRAVEL		SAND			SILT or CLAY	
		COARSE	FINE	COARSE	MEDIUM	FINE		

Legend	Sample No.	Depth (ft)	Classification	Nat wt%	LL	PL	PI
●	JAR-2	23.8-25.8	SANDY FAT CLAY	CH	61.6	59	23
□	JAR-6	31.8-33.8	FAT CLAY with SAND tr. MICA	CH	73.5		
▲	JAR-11	41.8-43.8	LEAN CLAY with SAND tr. MICA	CL	38.3	36	24
★	JAR-12	43.8-45.8	SILTY SAND with MICA	SM	43.1		12

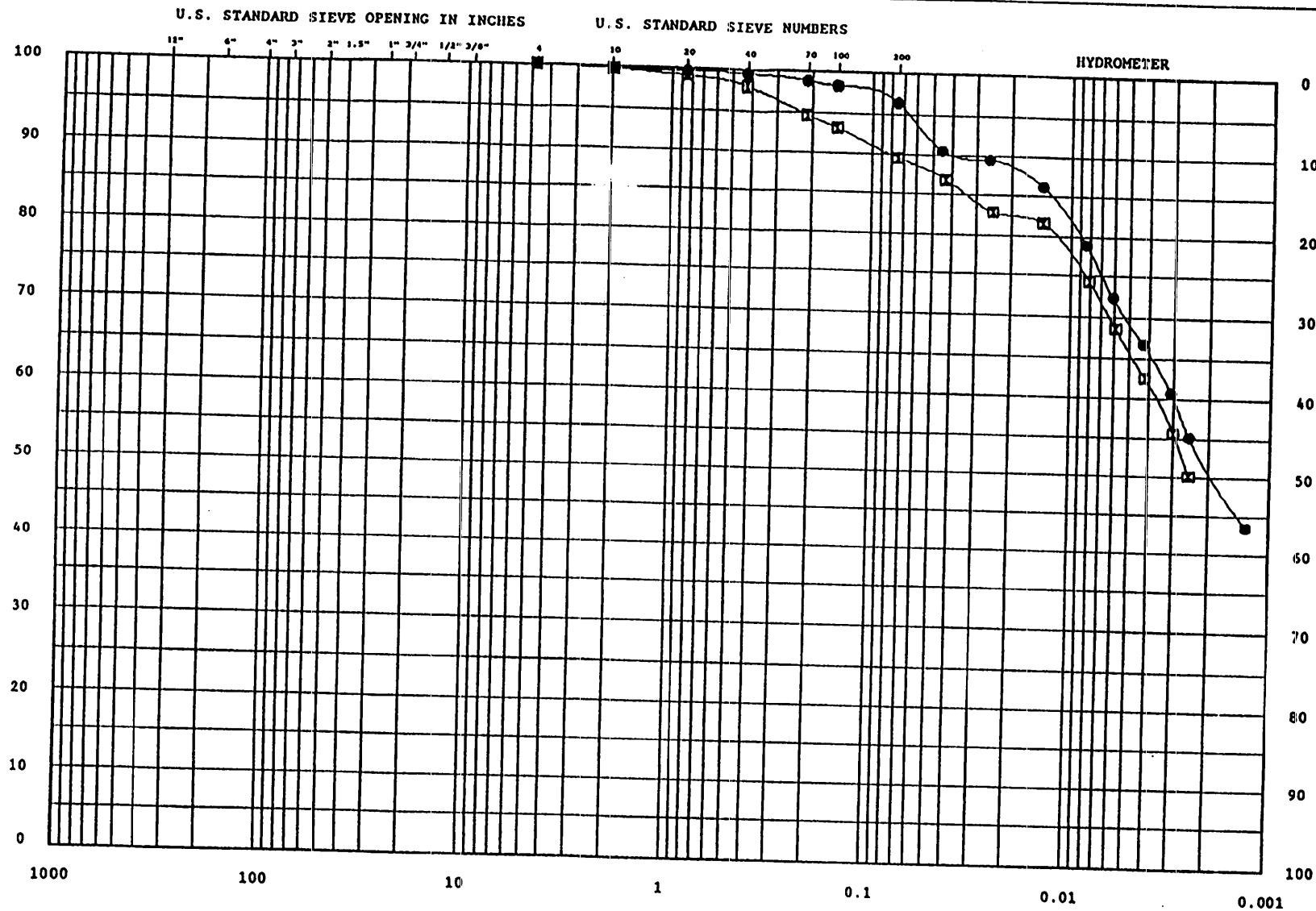
REMARKS:

ENG FORM 2087

GRADATION CURVES

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS
BORING NO. GB-24-94
DATE: JUN 1994

PERCENT FINER BY WEIGHT



COBBLES		GRAVEL		SAND			SILT or CLAY	
		COARSE	FINE	COARSE	MEDIUM	FINE		
●	JAR-2	23.7-25.7	FAT CLAY	CH	169.5	117	41	76
■	JAR-6	31.7-33.7	FAT CLAY tr. SAND	CH	116.0			

Legend	Sample No.	Depth (ft)	Classification	Nat w/c%	LL	PL	PI	
●	JAR-2	23.7-25.7	FAT CLAY	CH	169.5	117	41	76
■	JAR-6	31.7-33.7	FAT CLAY tr. SAND	CH	116.0			
—								
—								

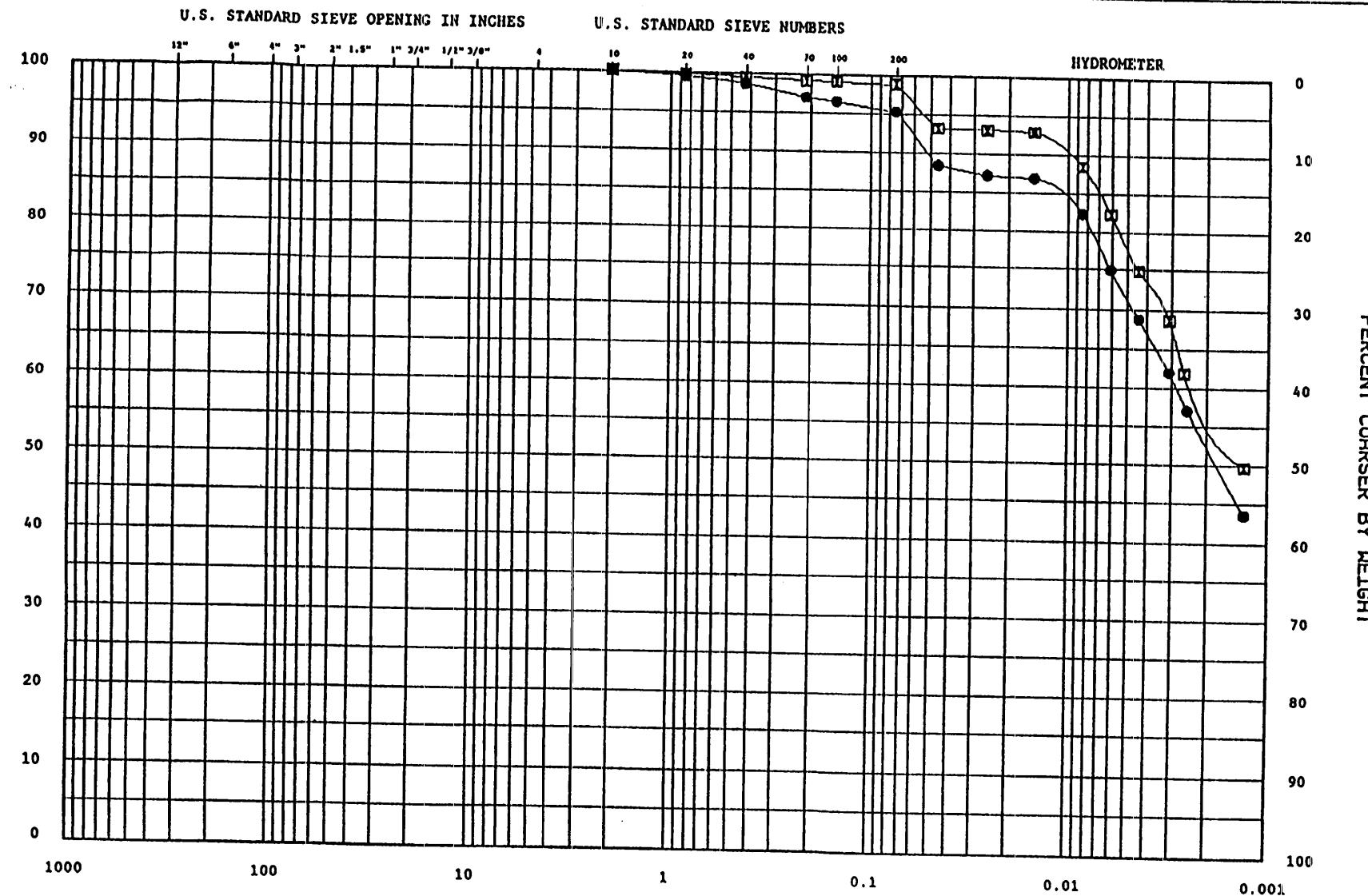
PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS

REMARKS:
ENG FORM 2087

BORING NO. GB-25-94
DATE: JUN 1994

GRADATION CURVES

PERCENT FINER BY WEIGHT



Legend	Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY SOUTH LOCUST POINT AREA: ANCHORAGE & CHANNELS
●	JAR-3	32.6-34.6	FAT CLAY	CH	161.4	140	47	93
◻	JAR-6	38.6-40.6	FAT CLAY	CH	154.8			
—								
—								

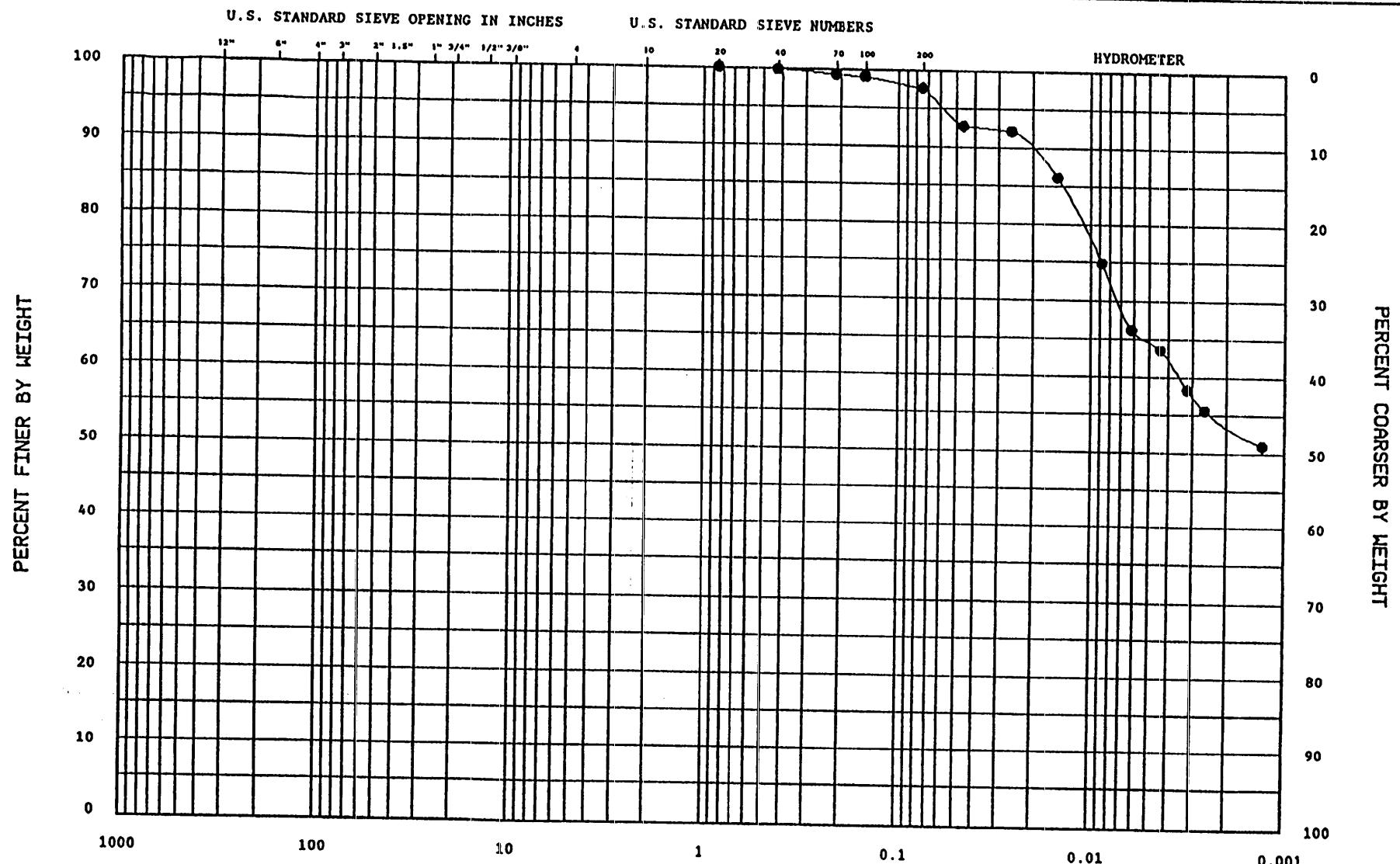
REMARKS:

ENG FORM 2087

GRADATION CURVES

BORING NO. GB-26-94

DATE: JUN 1994



COBBLES			GRAVEL		SAND			SILT or CLAY	
	COARSE	FINE	COARSE	MEDIUM	COARSE	MEDIUM	FINE		
●	JAR-3	31.9-33.9	FAT CLAY	CH	302.7	179	60	119	

Legend	Sample No.	Depth (ft)	Classification	Nat w/c	LL	PL	PI	
●	JAR-3	31.9-33.9	FAT CLAY	CH	302.7	179	60	119
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PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
AREA: SOUTH LOCUST POINT
ANCHORAGE & CHANNELS

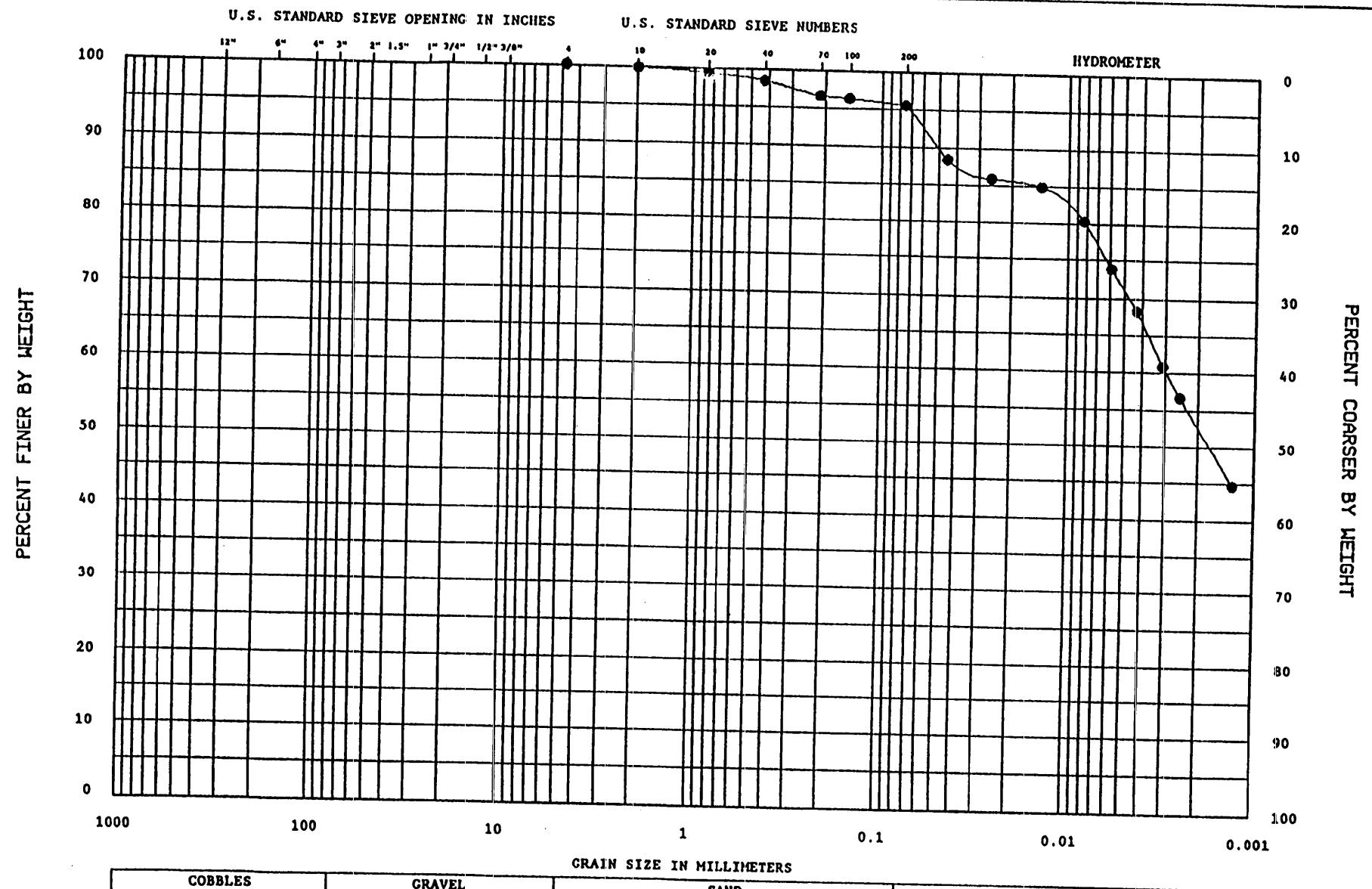
REMARKS:

ENG FORM 2087

GRADATION CURVES

BORING NO. GB-28-94

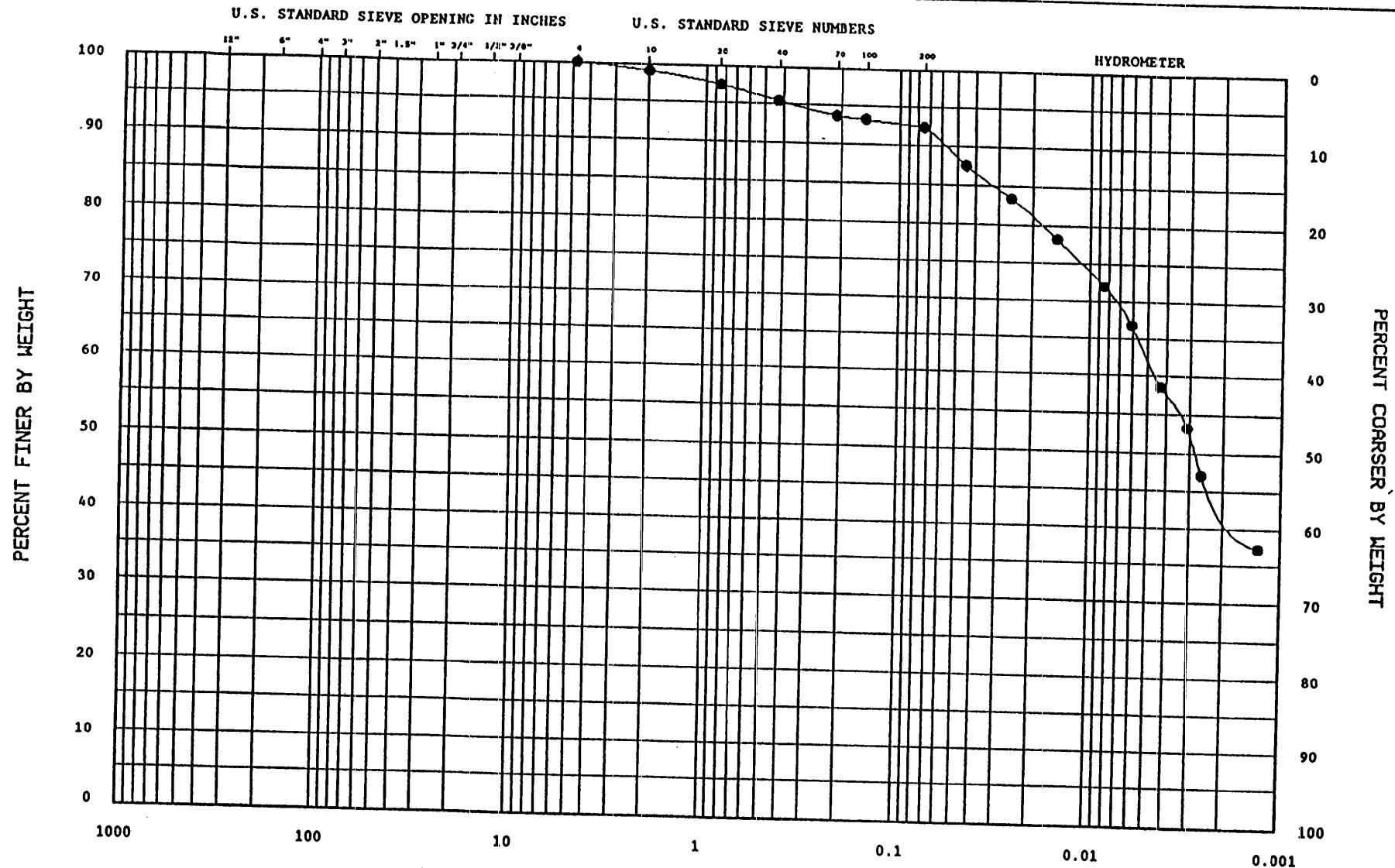
DATE: JUN 1994



COBBLES		GRAVEL		SAND			SILT or CLAY	
		COARSE	FINE	COARSE	MEDIUM	FINE		
●	JAR-4	42.0-44.0	FAT CLAY	CH	154.8	153	51	102

Legend	Sample No.	Depth (ft)	Classification	Nat w/c	LL	PL	PI	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY SOUTH LOCUST POINT ANCHORAGE & CHANNELS
●	JAR-4	42.0-44.0	FAT CLAY	CH	154.8	153	51	
—								

REMARKS:	ENG FORM 2087	GRADATION CURVES		BORING NO.	GEI-29-94			
				DATE:	JUN 1994			



COBBLES		GRAVEL		SAND			SILT or CLAY	
		COARSE	FINE	COARSE	MEDIUM	FINE		
Legend	Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI	
●	JAR-3	44.0-44.6	FAT CLAY	CH	149.9	160	52	108

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS

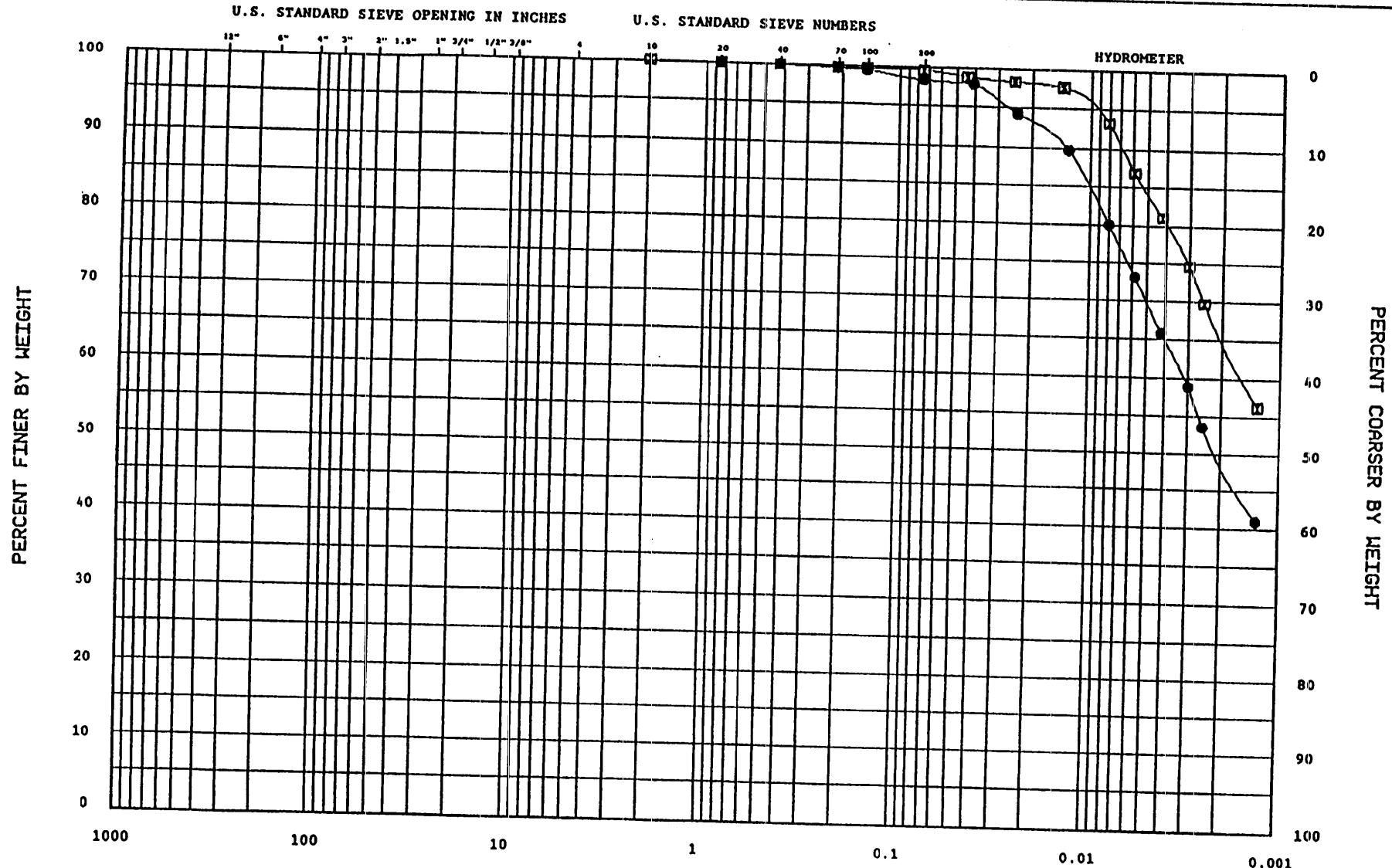
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DATE: JUN 1994

REMARKS:

ENG FORM 2087

GRADATION CURVES

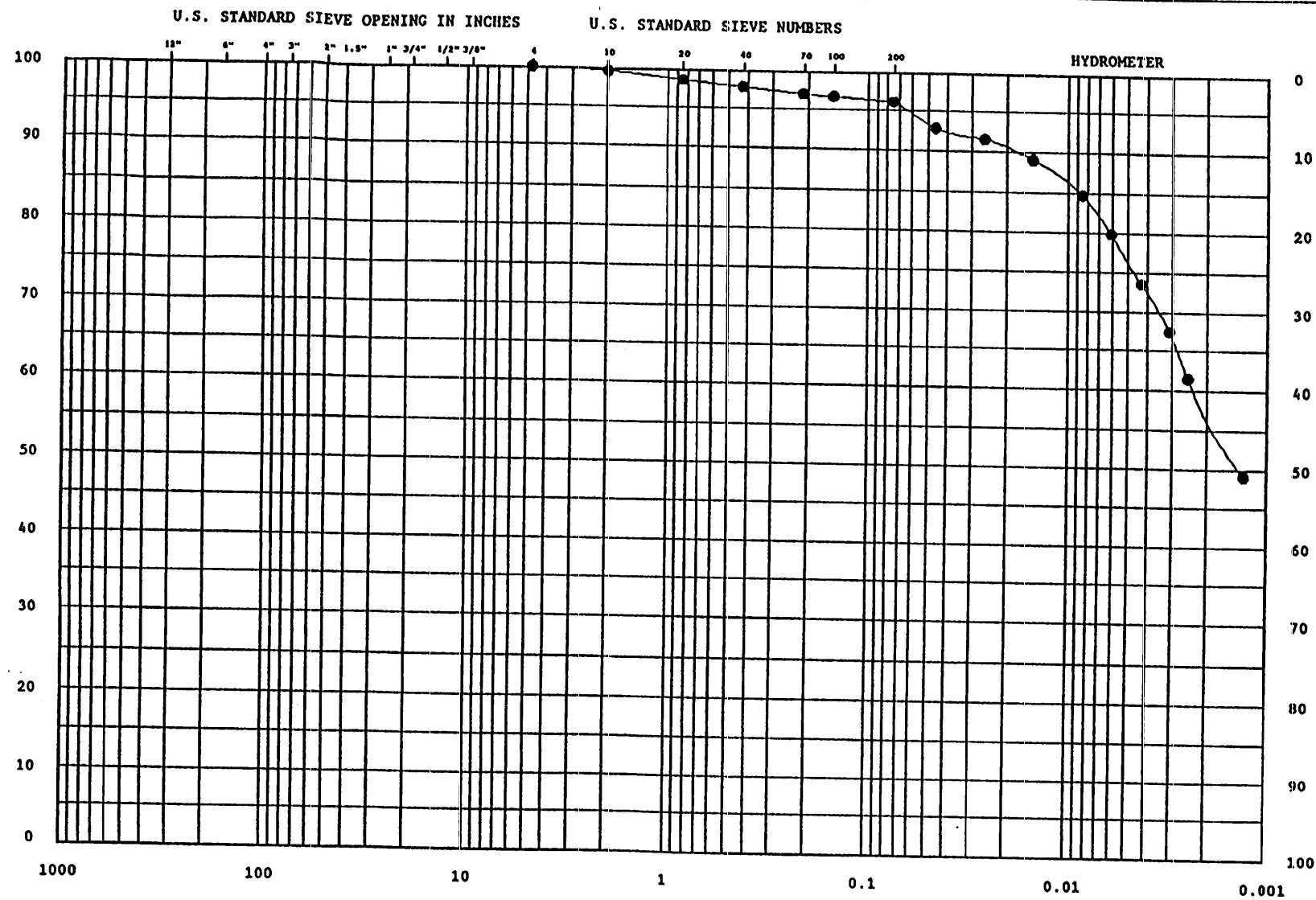


COBBLES			GRAVEL			SAND			SILT or CLAY		
			COARSE	FINE		COARSE	MEDIUM	FINE			
●	JAR-2	26.8-28.8	FAT CLAY tr.	SAND tr.	MICA	CH	179.4		LL	PL	PI
□	JAR-9	40.8-42.8	FAT CLAY			CH	163.0	139	43	96	
—											
—											
REMARKS:											
ENG FORM 2087											
GRADATION CURVES											

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS

BORING NO. GB-31-94
DATE: JUN 1994

PERCENT FINER BY WEIGHT



PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS

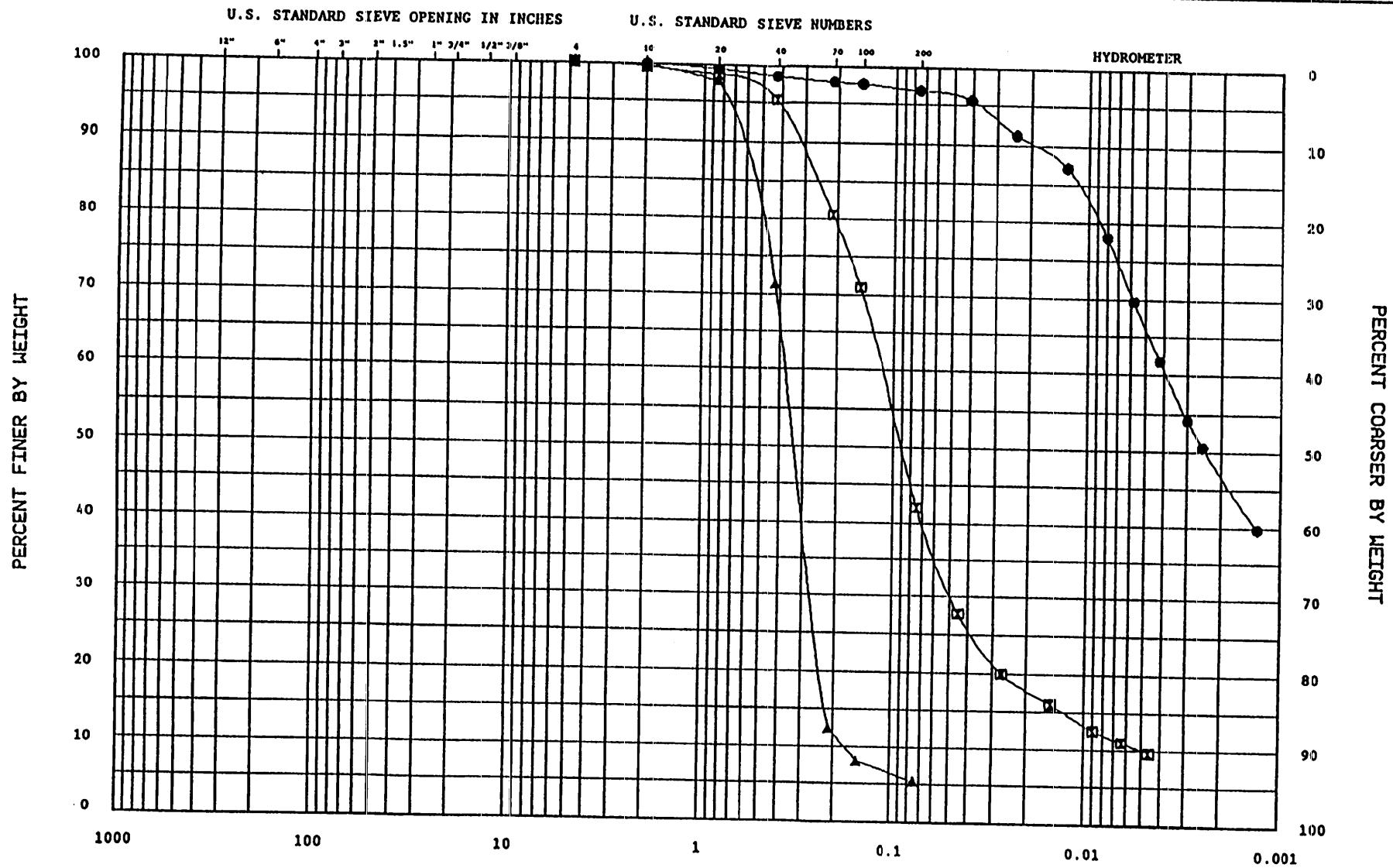
REMARKS:

ENG FORM 2087

GRADATION CURVES

BORING NO. GB-32-94

DATE: JUN 1994



COBBLES			GRAVEL		SAND			SILT or CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE				
●	JAR-5	26.5-28.5	FAT CLAY tr. MICA	CH	77.6	96	39	57	
■	JAR-9	34.5-36.5	SILTY SAND tr. MICA	SM	25.1	NP	NP	NP	
▲	JAR-11	38.5-40.5	POORLY GRADED SAND with SILT	SP-SM	18.7	NP	NP	NP	

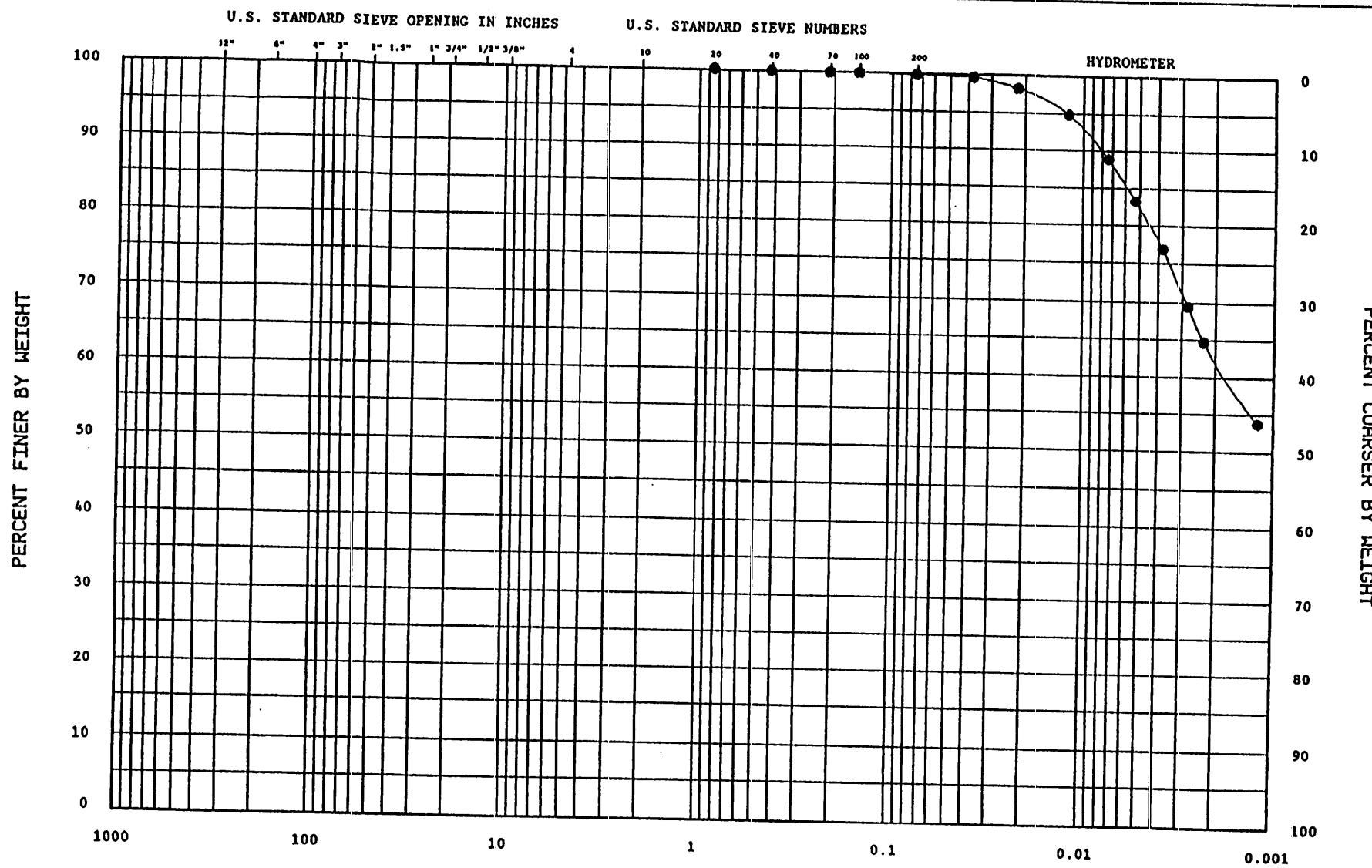
Legend	Sample No.	Depth (ft)	Classification	Nat w/c%	LL	PL	PI
●	JAR-5	26.5-28.5	FAT CLAY tr. MICA	CH	77.6	96	39
■	JAR-9	34.5-36.5	SILTY SAND tr. MICA	SM	25.1	NP	NP
▲	JAR-11	38.5-40.5	POORLY GRADED SAND with SILT	SP-SM	18.7	NP	NP
—							

REMARKS:

ENG FORM 2087 GRADATION CURVES

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
ANCHORAGE & CHANNELS

BORING NO. GB-33-94
DATE: JUN 1994



GRAIN SIZE IN MILLIMETERS						
COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
Depth (ft.)	Classification					

Legend	Sample No.	Depth (ft)	Classification	Nat w/c%	LL	PL	P
●	JAR-1	54.0-56.0	FAT CLAY	CH	126.6	110	38
—							
—							
—							

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS

REMARKS:

ENG FORM 2087

GRADATION CURVES

APPENDIX E
LABORATORY TEST RESULTS

LABORATORY TEST RESULTS

PROJECT: Baltimore Harbor Feasibility Study
 Baltimore Anchorage & Channel
AREA: South Locust Point, MD

DATE: Jun. 1994

TEST: Natural Moisture Contents and In Situ Densities

Hole No.	Sample No.	Depth (ft)	Water Content, %	Specific Gravity, G _s	In-Situ Density ^a lb/ft ³	In-Situ Density ^a g/cm ³
GB-1-94	Jar-3	39.6-41.1	102.8	2.78	90.3	1.45
	Jar-5	42.6-44.1	28.2		124.7 ^c	2.00
GB-2-94	Jar-1	37.3-38.8	140.8	2.67	84.9	1.36
	Jar-3	40.3-41.8	62.3		101.6 ^c	1.63
GB-3-94	Jar-4	41.8-43.3	39.3	2.77	115.4 ^c	1.85
	Jar-1	37.0-38.5	163.9		83.0	1.33
GB-3A-94	Jar-5	37.2-39.2	183.6	2.67	79.1	1.27
	Jar-8	43.2-45.2	136.4		85.7	1.37
GB-4-94	Jar-2	36.6-38.1	128.7		85.2	1.37
GB-5-94	Jar-2	29.9-31.4	170.1		81.0	1.30
GB-5A-94	Jar-3	32.7-34.7	181.7	2.69	83.2	1.33
GB-6-94	Jar-2	38.0-39.5	223.1		78.3	1.25
GB-7-94	Jar-4	43.8-45.3	155.0		81.7	1.31
GB-8-94	Jar-2	43.8-45.3	180.2	2.74	81.5	1.31
GB-9-94	Jar-2	39.8-41.3	283.2		75.0	1.20
GB-10-94	Jar-3	34.0-35.5	140.7		84.4	1.35
GB-11-94	Jar-2	38.6-40.1	233.1		76.9	1.23
GB-12-94	Jar-2	42.3-43.8	186.8		79.9	1.28
GB-13-94	Jar-3	42.0-43.5	166.7		81.6	1.31
GB-14-94	Jar-1	34.3-36.8	197.8		80.0	1.28
GB-15-94	Jar-1	22.7-24.2	203.6	2.69	78.7	1.26
	Jar-6	32.7-34.2	166.1		82.8	1.33
GB-16-94	Jar-1	39.6-41.1	131.6		85.3	1.37
GB-17-94	Jar-2	39.6-41.1	150.7		83.5	1.34
GB-18-94	Jar-5	41.5-43.0	141.1		83.7	1.34
GB-19-94	Jar-1	22.7-24.2	204.3	2.72	78.0	1.25
GB-20-94	Jar-4	39.7-41.2	161.1		81.7	1.31
GB-21-94	Jar-1	32.4-33.9	161.9	2.74	83.2	1.33
	Jar-7	44.4-45.9	83.9		95.4 ^c	1.53
GB-22-94	Jar-2	29.7-31.2	91.0	2.69	98.9	1.59
	Jar-8	39.7-41.2	64.4		102.0 ^c	1.64
GB-23-94	Jar-1	24.3-25.8	61.9	2.71	102.1	1.64
	Jar-8	37.8-39.8	64.8		99.6 ^b	1.60
GB-24-94	Jar-2	23.8-25.8	61.6	2.71	103.5	1.66
	Jar-11	41.8-43.8	38.3		114.8 ^c	1.84
GB-25-94	Jar-2	23.7-25.7	169.5		82.3	1.32
GB-26-94	Jar-3	32.6-34.6	161.4		82.1	1.32
GB-31-94	Jar-9	40.8-42.8	163.0		81.3	1.30
GB-32-94	Jar-3	39.0-41.0	160.3		81.4	1.30
GB-33-94	Jar-5	26.5-28.5	77.6	2.74	97.2 ^b	1.56
	Jar-9	34.5-36.5	25.1		125.4 ^c	2.01
	Jar-11	38.5-40.5	18.7		131.5 ^c	2.11
EB-19A-94	Jar-1	54.0-56.0	126.6		86.3	1.38

^a All densities were determined using a pycnometer for semi-fluid materials unless otherwise noted.

^b Density determined by volumetric method.

^c Density was calculated from the specific gravity.

SUMMARY OF MATERIAL PROPERTIES

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY - ANCHORAGE & CHANNELS

NUMBER:

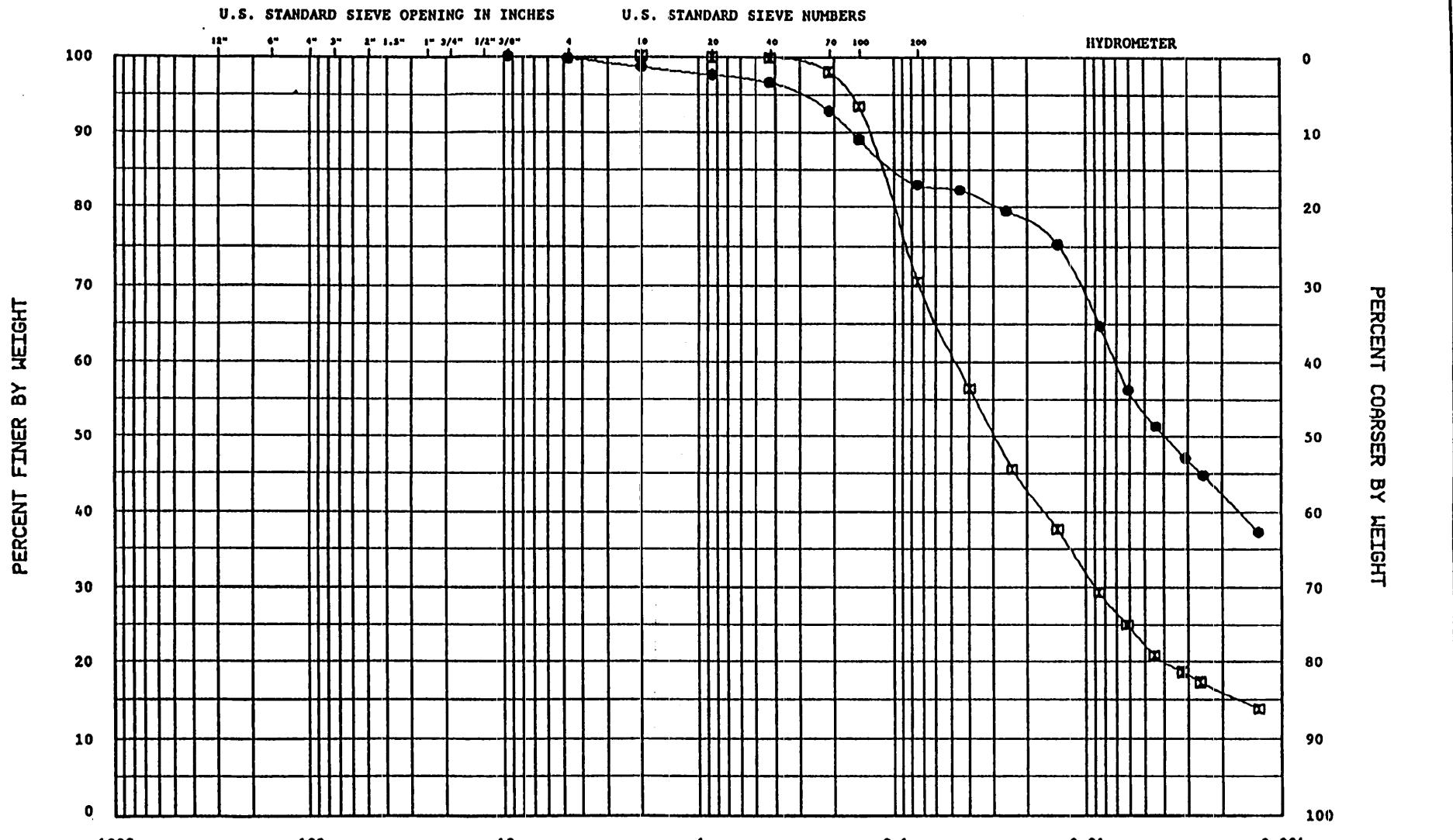
Borehole	Depth (feet)	ASTM Description	ASTM Classification	Water Content %	Dry Density pcf	Liquid Limit %	Plastic Limit %	Plast- city %	<#200 Sieve %	D60 mm	D30 mm	D10 mm
EB19A-94	54.0	FAT CLAY	CH	127		110	38	72	100	0.002		
GB-1-94	39.6	FAT CLAY with SAND	CH	103		88	30	58	83	0.007		
GB-1-94	42.6	SANDY SILT	ML	28		33	25	8	71	0.047	0.009	
GB-10-94	34.0	FAT CLAY with SAND	CH	141		117	39	78	73	0.019	0.009	
GB-10-94	40.0			176					100	0.001		
GB-11-94	38.6	FAT CLAY	CH	233		141	46	95	93	0.006		
GB-12-94	42.3	FAT CLAY	CH	187		132	42	90	99	0.003		
GB-13-94	38.0			207					99	0.002		
GB-13-94	42.0	FAT CLAY	CH	167		113	39	74	100	0.002		
GB-14-94	34.3	FAT CLAY	CH	198		147	43	104	96	0.002		
GB-14-94	38.3			152					99			
GB-15-94	22.7	FAT CLAY	CH	204		144	44	100	98	0.007		
GB-15-94	32.7	FAT CLAY	CH	166		132	39	93	99	0.002		
GB-16-94	39.6	FAT CLAY	CH	132		135	39	96	97	0.003		
GB-17-94	39.6	FAT CLAY	CH	151		120	36	84	98	0.002		
GB-18-94	35.5			172					98	0.003		
GB-18-94	41.5	FAT CLAY	CH	141		123	38	85	98	0.002		
GB-19-94	22.7	FAT CLAY	CH	204		153	47	106	92	0.004		
GB-19-94	32.7			163					100	0.002		
GB-19-94	44.7			149					100	0.001		
GB-2-94	37.3	FAT CLAY	CH	141		141	42	99	96	0.003		
GB-2-94	40.3	CLAYEY SAND	SC	62		74	30	44	49	0.142	0.010	
GB-2-94	41.8	SANDY SILT	ML	39		42	26	16	66	0.051	0.012	
GB-20-94	33.7			172					100	0.002		
GB-20-94	39.7	FAT CLAY	CH	161		113	36	77	99	0.001		
GB-21-94	32.4	FAT CLAY	CH	162		136	39	97	100	0.002		
GB-21-94	44.4	FAT CLAY with SAND	CH	84		96	33	63	85	0.003		
GB-22-94	29.7	SANDY FAT CLAY	CH	91		114	36	78	62	0.051	0.001	
GB-22-94	38.9	WELL GRADED SAND	SW-SH	16		NP	NP	NP	8	3.863	0.999	0.127
GB-22-94	38.9	with										
GB-22-94	38.9	SILT and										
GB-22-94	38.9	GRAVEL										
GB-22-94	39.7	SILT with SAND	ML	64		NP	NP	NP	81	0.006		
GB-23-94	24.3	FAT CLAY	CH	62		69	29	40	99	0.005		
GB-23-94	31.8			74					98	0.005		
GB-23-94	37.8	ELASTIC SILT	MH	65		86	39	47	95	0.009		
GB-23-94	41.8			64					96	0.008		
GB-24-94	23.8	SANDY FAT CLAY	CH	62		59	23	36	69	0.011		
GB-24-94	31.8			74					87	0.006		
GB-24-94	41.8	LEAN CLAY with SAND	CL	38		36	24	12	79	0.024	0.006	
GB-24-94	43.8			43					49	0.186	0.015	
GB-25-94	23.7	FAT CLAY	CH	170		117	41	76	96	0.003		
GB-25-94	31.7			116					90	0.004		

SUMMARY OF MATERIAL PROPERTIES

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY - ANCHORAGE & CHANNELS

NUMBER:

Borehole	Depth (feet)	ASTM Description	ASTM Classifi- cation	Water Content %	Dry Density pcf	Liquid Limit %	Plastic Limit %	Plast- icity Index %	<#200 Sieve %	D60 mm	D30 mm	D10 mm
GB-26-94	32.6	FAT CLAY	CH	161	140	47	93	95	95	0.003		
GB-26-94	38.6			155					99	0.002		
GB-27-94	31.2	FAT CLAY	CH	256	176	57	119	96	0.005			
GB-28-94	31.9	FAT CLAY	CH	303	179	60	119	98	0.004			
GB-29-94	42.0	FAT CLAY	CH	155	153	51	102	96	0.003			
GB-3-94	37.0	FAT CLAY	CH	164	113	40	73	97	0.007			
GB-30-94	44.0	FAT CLAY	CH	150	160	52	108	92	0.005			
GB-31-94	26.8			179					98	0.003		
GB-31-94	40.8	FAT CLAY	CH	163	139	43	96	100	0.002			
GB-32-94	39.0	FAT CLAY	CH	160	135	40	95	96	0.002			
GB-33-94	26.5	FAT CLAY	CH	78	96	39	57	97	0.004			
GB-33-94	34.5	SILTY SAND	SM	25	NP	NP	NP	42	0.115	0.049	0.005	
GB-33-94	38.5	POORLY GRADED SAND	SP-SM	19	NP	NP	NP	5	0.372	0.261	0.174	
GB-33-94	38.5	with SILT										
GB-3A-94	37.2	FAT CLAY	CH	184	126	42	84	97	0.007			
GB-3A-94	43.2	ELASTIC SILT	MH	136	145	55	90	98	0.005			
GB-4-94	36.6	FAT CLAY	CH	129	134	44	90	96	0.003			
GB-4-94	40.6			124					99	0.003		
GB-5-94	29.9	FAT CLAY	CH	170	133	44	89	97	0.007			
GB-5-94	35.9			163					98	0.004		
GB-5A-94	32.7	FAT CLAY	CH	182	144	47	97		0.013	0.008		
GB-6-94	38.0	FAT CLAY	CH	223	148	48	100	96	0.008			
GB-7-94	43.8	FAT CLAY	CH	155	149	44	105	99	0.002			
GB-8-94	43.8	FAT CLAY	CH	180	138	41	97	99	0.002			
GB-9-94	39.8	FAT CLAY	CH	283	149	52	97	95	0.005	0.002		



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

REMARKS:

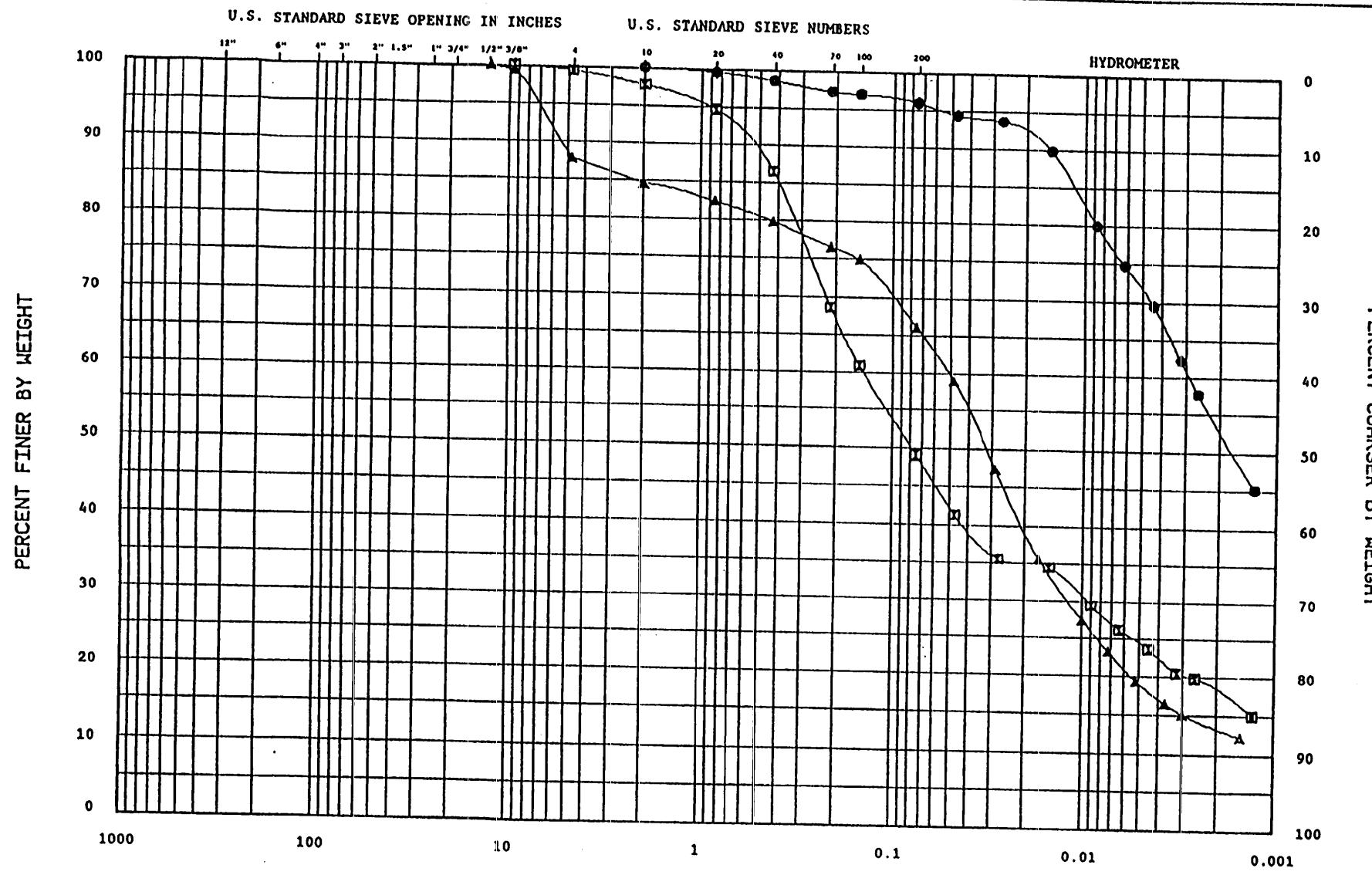
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GRADATION CURVES

**PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS**

BORING NO. **GB-1-94**

DATE: JUN 1994



GRAIN SIZE IN MILLIMETERS						
COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
Dense (ft.)	0.00	0.00	0.00	0.00	0.00	0.00

Legend

REMARKS:

ENG FORM 2087

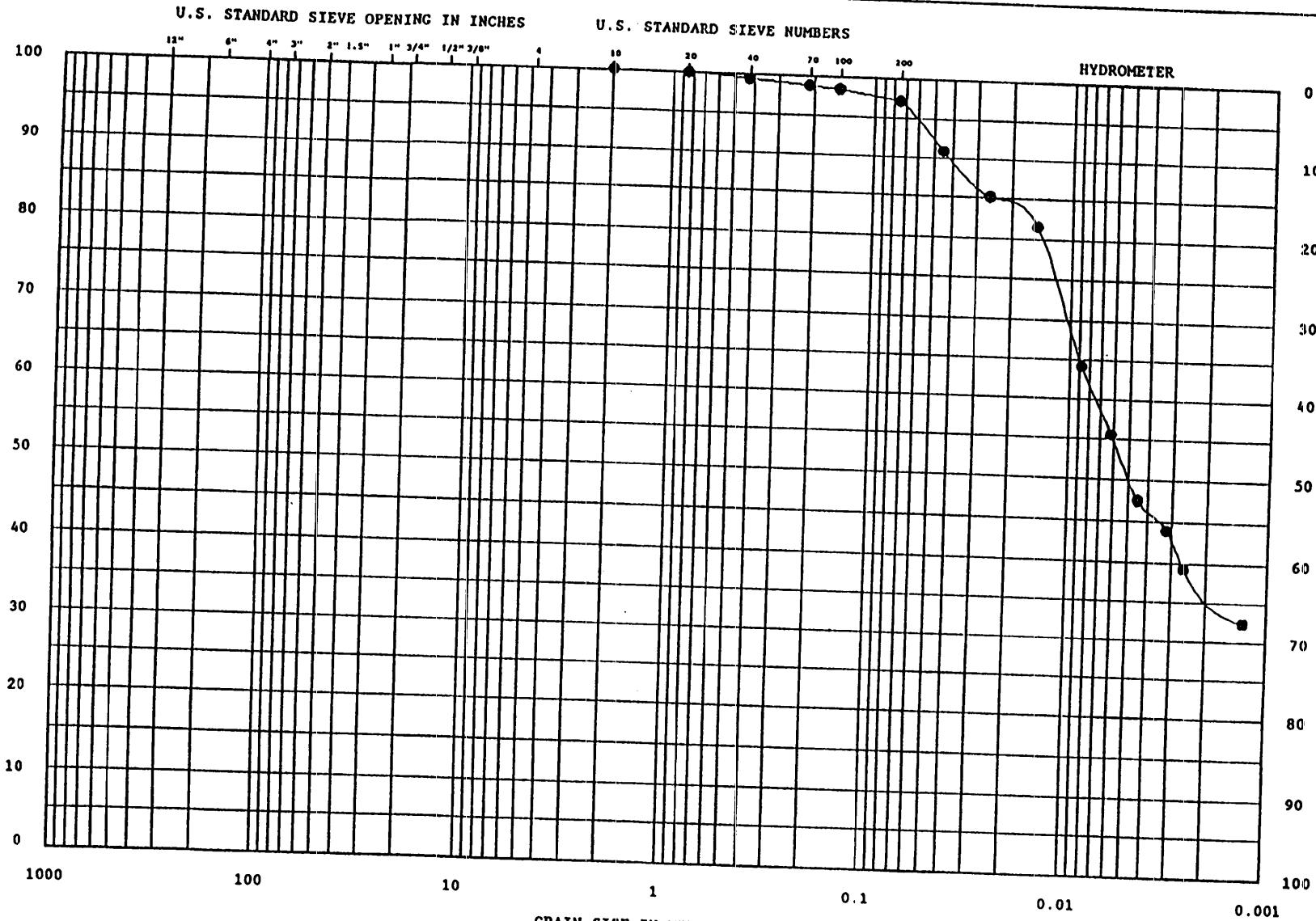
GRADATION CURVES

**PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT**

BORING NO. CB 24

DATE: JUN 1994

PERCENT FINER BY WEIGHT



COBBLES			GRAVEL		SAND			SILT or CLAY	
			COARSE	FINE	COARSE	MEDIUM	FINE		
●	JAR-1	37.0-38.5	FAT CLAY tr. MICA		CH	163.9	113	40	73

Legend	Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
●	JAR-1	37.0-38.5	FAT CLAY tr. MICA	CH	163.9	113	40
—							73
—							
—							

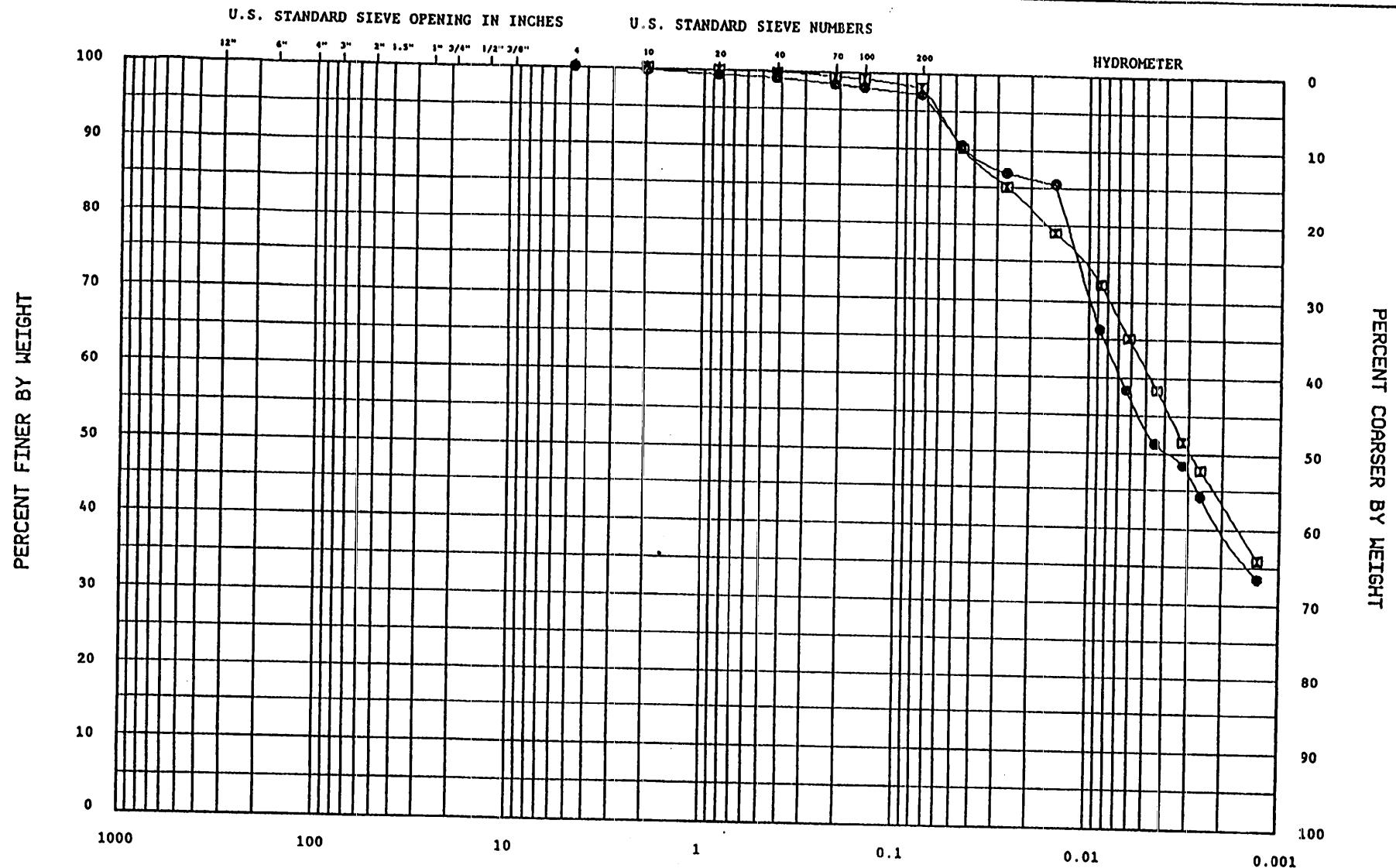
PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS

BORING NO. GB-3-94
DATE: JUN 1994

REMARKS:

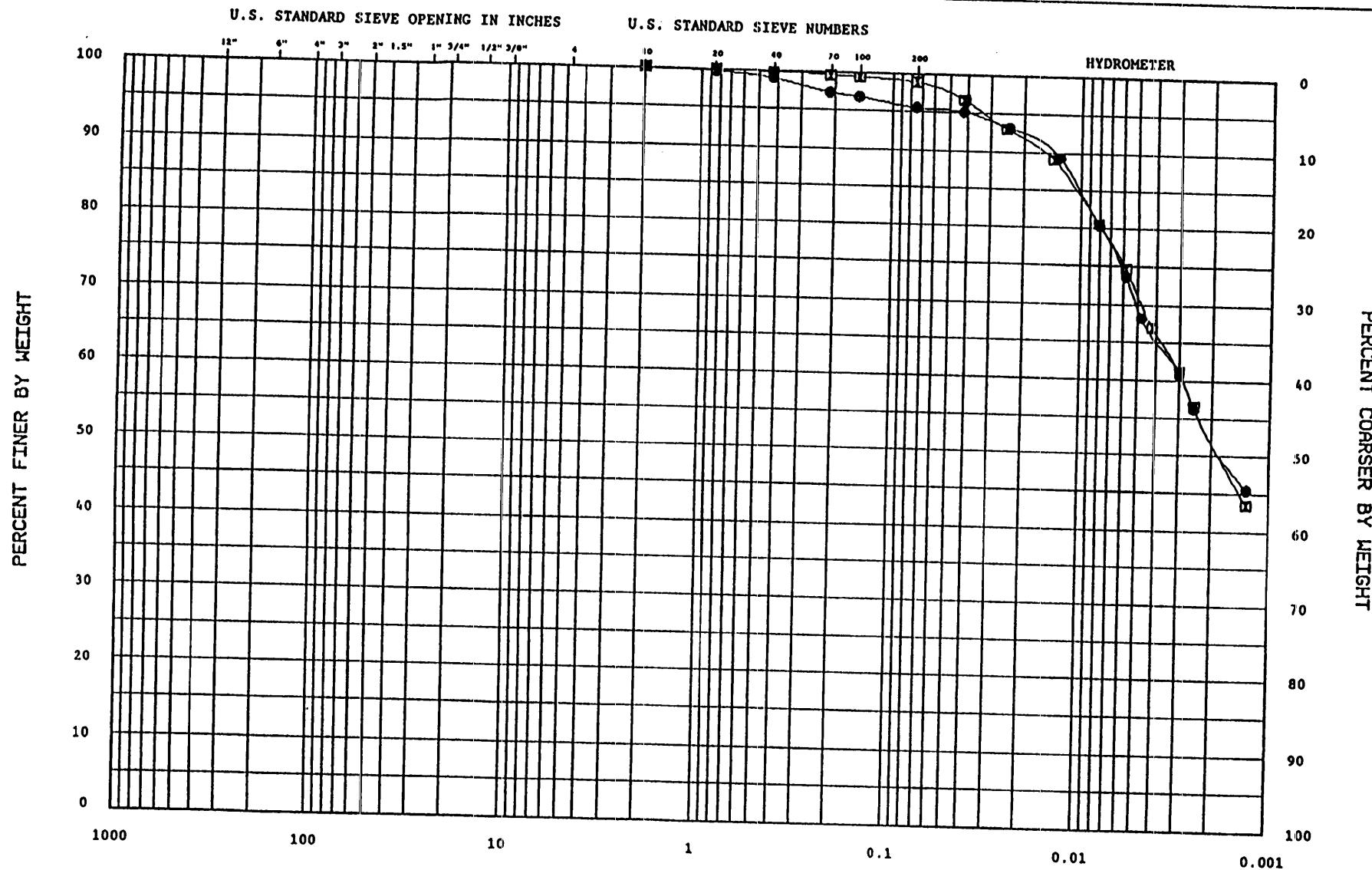
ENG FORM 2087

GRADATION CURVES



COBBLES		GRAVEL		SAND			SILT or CLAY	
		COARSE	FINE	COARSE	MEDIUM	FINE		
Legend	Sample No.	Depth (ft)	Classification	Nat w/c	LL	PL	PI	
●	JAR-5	37.2-39.2	FAT CLAY tr. MICA	CH	183.6	126	42	84

Legend	Sample No.	Depth (ft)	Classification	Nat w/c	LL	PL	PI	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY AREA: SOUTH LOCUST POINT ANCHORAGE & CHANNELS
●	JAR-5	37.2-39.2	FAT CLAY tr. MICA	CH	183.6	126	42	84
■	JAR-8	43.2-45.2	ELASTIC SILT tr. MICA	MH	136.4	145	55	90
REMARKS:								BORING NO. GE-3A-94
ENG FORM 2087								DATE: JUN 1994
GRADATION CURVES								



GRAIN SIZE IN MILLIMETERS						SILT or CLAY
COBBLES	GRAVEL		SAND			
	COARSE	FINE	COARSE	MEDIUM	FINE	
Depth (ft)	Classification					

**PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS**

REMARKS:

ENG FORM 2087

GRADATION CURVES

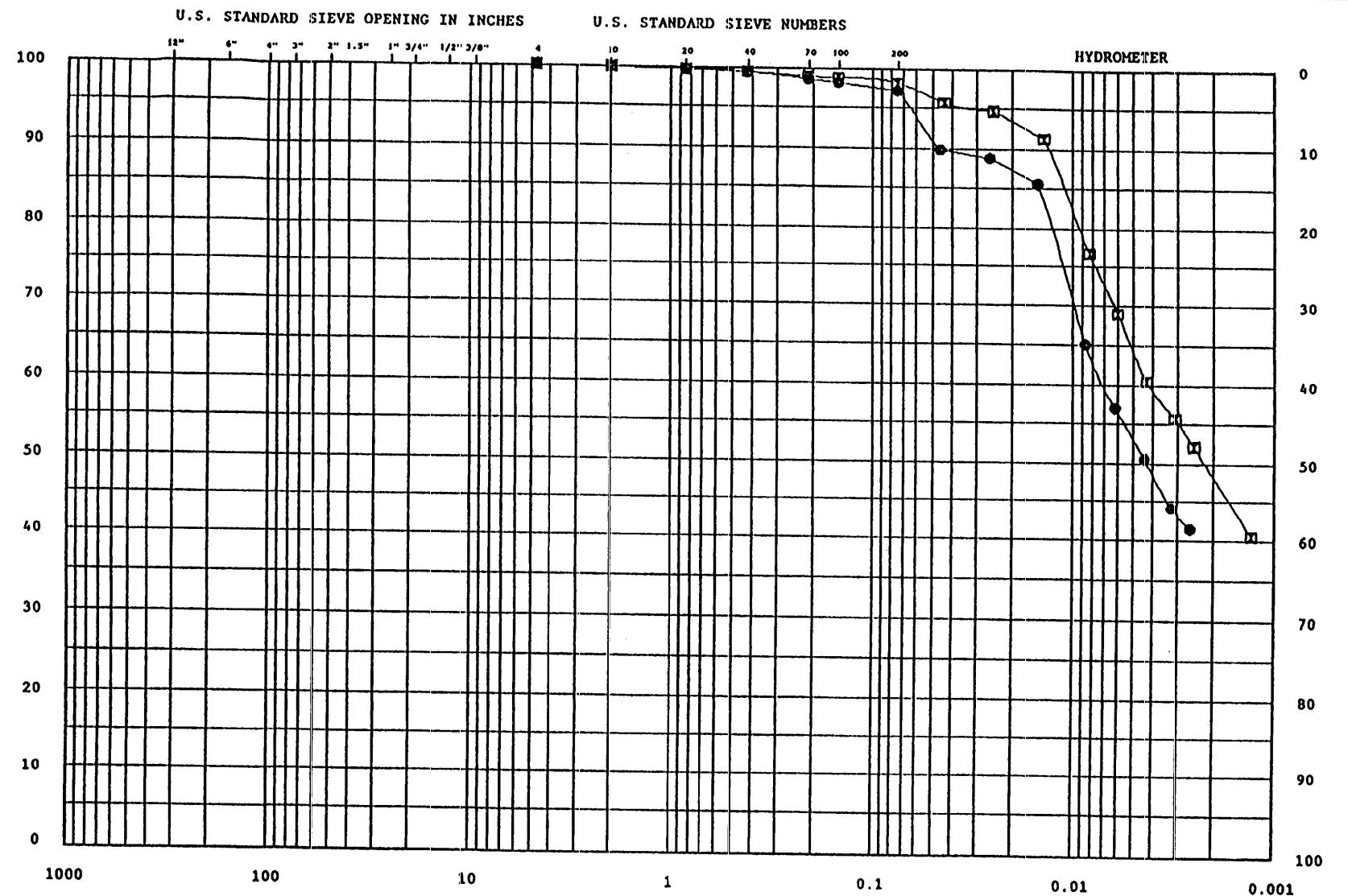
BORING NO.

GB-4-94

DATE

JUN 1994

PERCENT FINER BY WEIGHT



GRAIN SIZE IN MILLIMETERS

COBBLES			GRAVEL		SAND			SILT or CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE				
●	JAR-2	29.9-31.4	FAT CLAY		CHI	170.1	133	44	89
○	JAR-5	35.9-37.4	FAT CLAY tr. MICA		CHI	163.4			

Legend

● JAR-2

○ JAR-5

— — —

REMARKS:

ENG FORM 2087

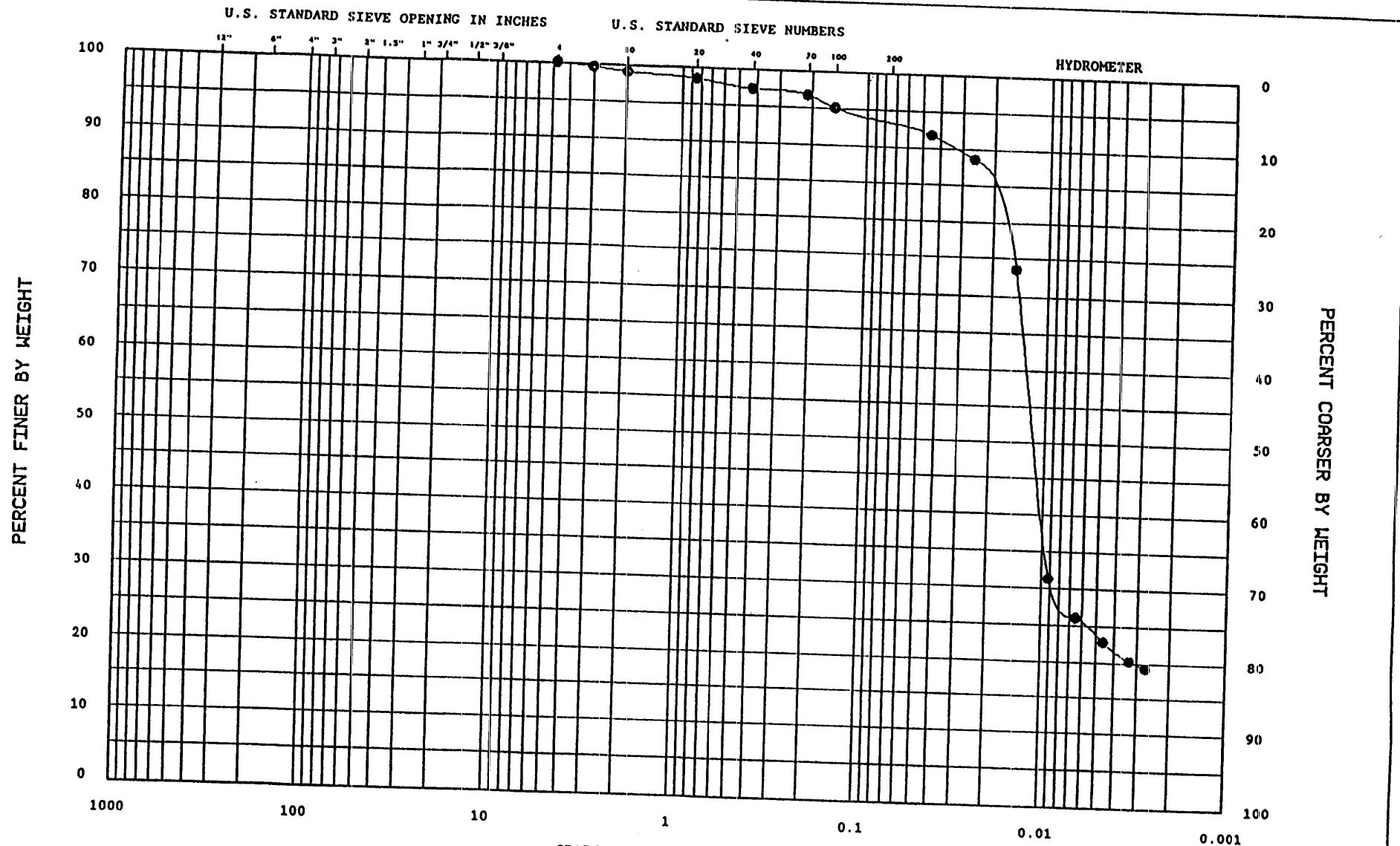
GRADATION CURVES

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS

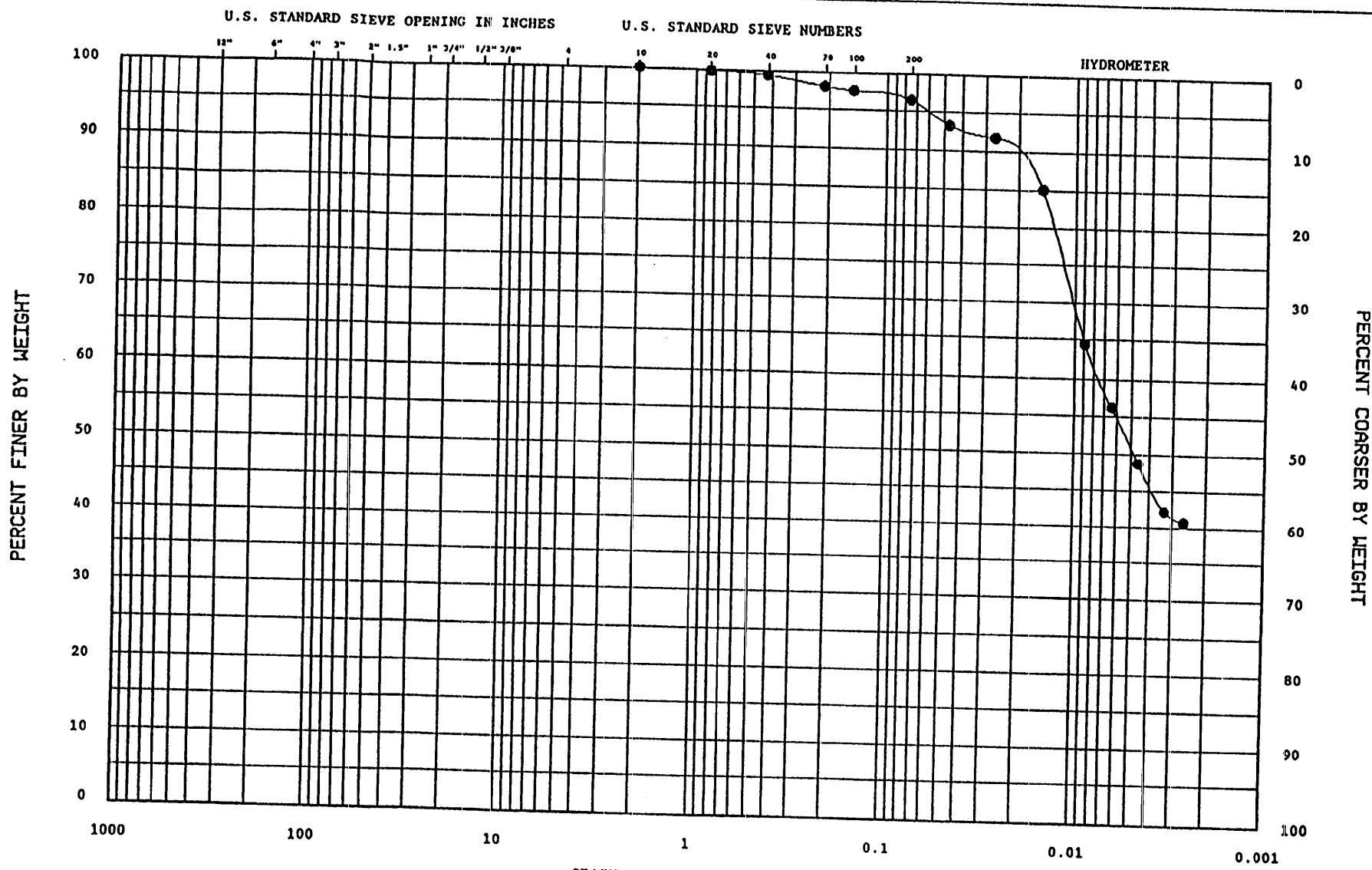
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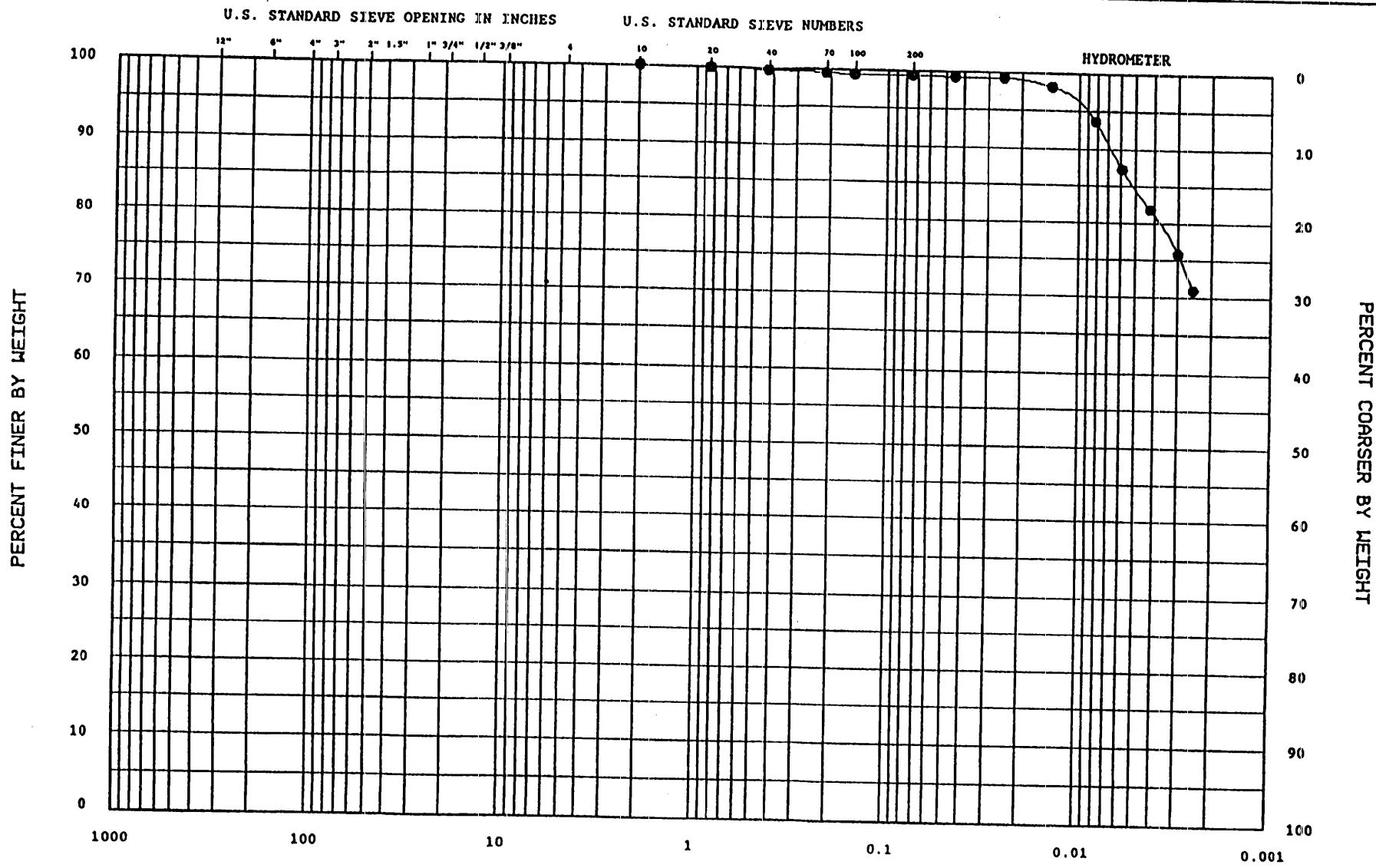
DATE: JUN 1994

PERCENT COARSER BY WEIGHT



COBBLES			GRAVEL		SAND				SILT or CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE					
Legend	Sample No.	Depth (ft)	Classification		Nat w/c%	LL	PL	PI		
●	JAR-3	32.7-34.7	FAT CLAY	CH	181.7	144	47	97	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY	
—									AREA: SOUTH LOCUST POINT	
—									ANCHORAGE & CHANNELS	
REMARKS:					BORING NO.	GB-5A-94				
ENG FORM 2087	GRADATION CURVES				DATE:	JUN 1994				





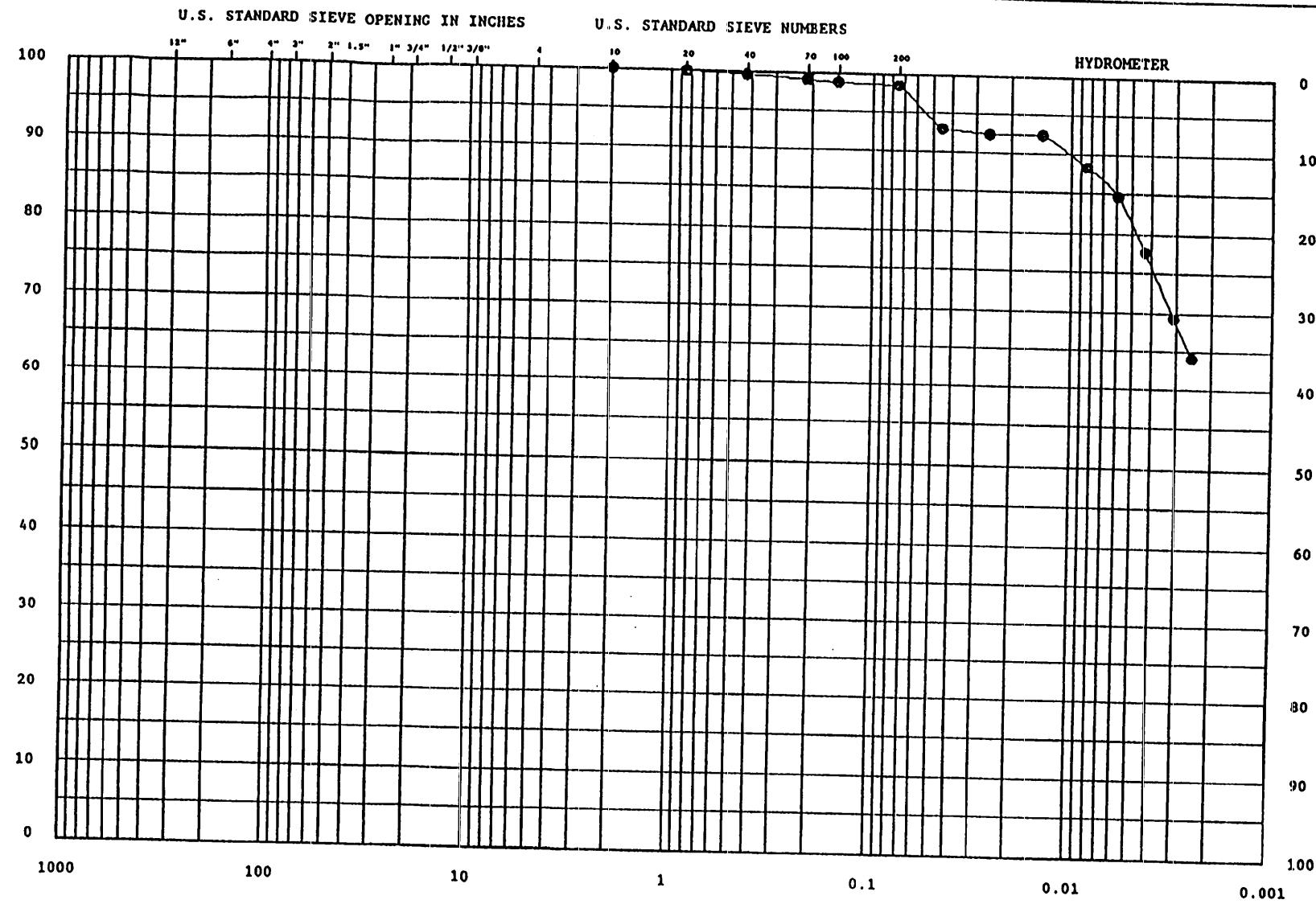
GRAIN SIZE IN MILLIMETERS						
COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
1.0	0.5	0.25	0.125	0.063	0.031	0.015

Legend	Sample No.	Depth (ft)	Classification	Nat w/c	LL	PL
●	JAR-4	43.8-45.3	FAT CLAY	CH	155.0	149
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**PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS**

BORING NO.	GB-7-94
DATE:	JUN 1994

PERCENT FINER BY WEIGHT

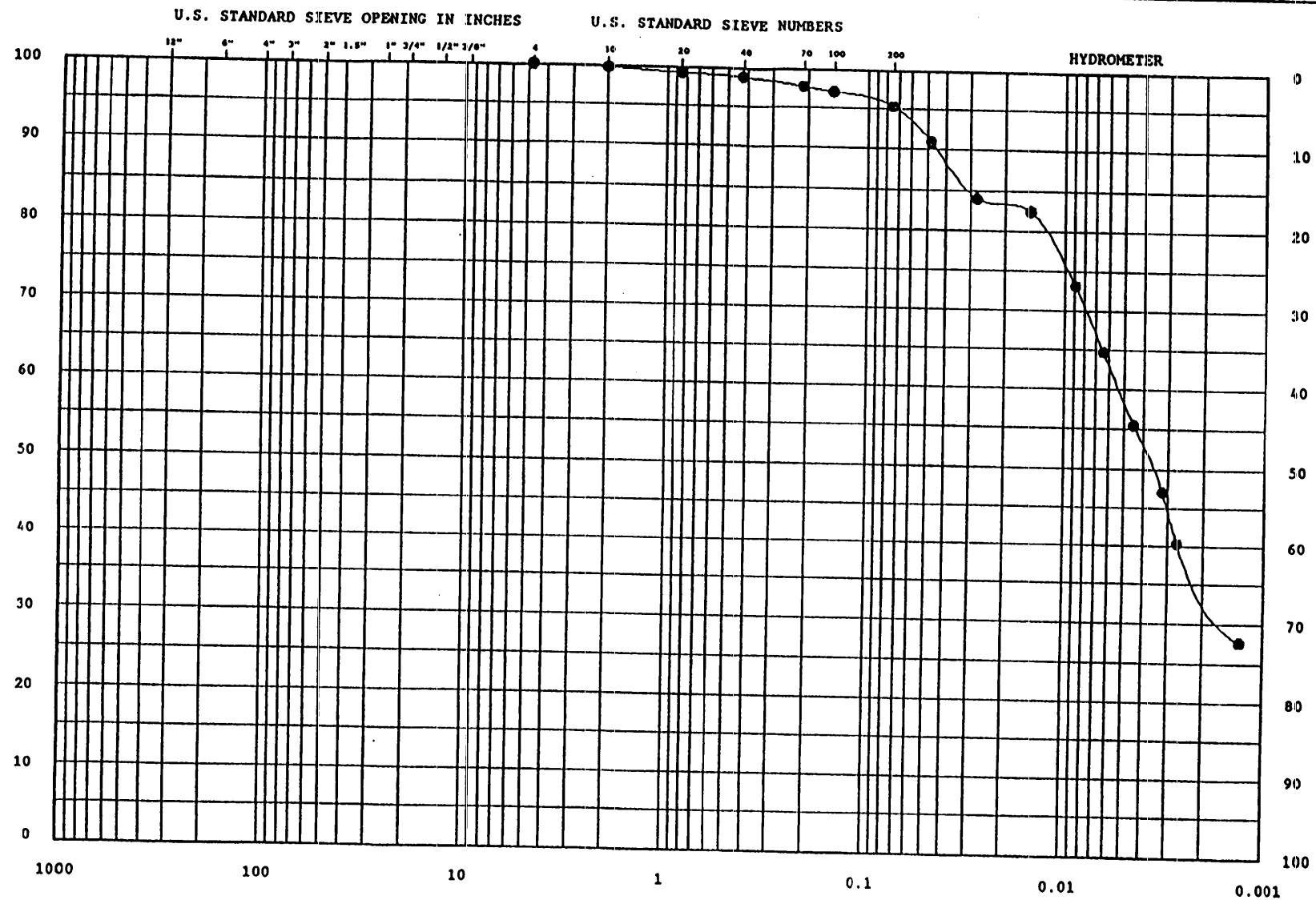


COBBLES			GRAVEL		SAND			SILT or CLAY	
			COARSE	FINE	COARSE	MEDIUM	FINE		
●	JAR-2	43.8-45.3	FAT CLAY		CH	180.2	138	41	97

Legend	Sample No.	Depth (ft)	Classification	Nat w/c%	LL	PL	PI	
●	JAR-2	43.8-45.3	FAT CLAY	CH	180.2	138	41	97
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REMARKS:	ENG FORM 2087	GRADATION CURVES						

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS
BORING NO. GB-8-94
DATE: JUN 1994

PERCENT FINER BY WEIGHT



GRAIN SIZE IN MILLIMETERS

COBBLES			GRAVEL		SAND			SILT or CLAY	
			COARSE	FINE	COARSE	MEDIUM	FINE		
◆	JAR-2	39.8-41.3	FAT CLAY		CH	283.2	149	52	97

Legend	Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI	
◆	JAR-2	39.8-41.3	FAT CLAY	CH	283.2	149	52	97
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—								

REMARKS:

ENG FORM 2087

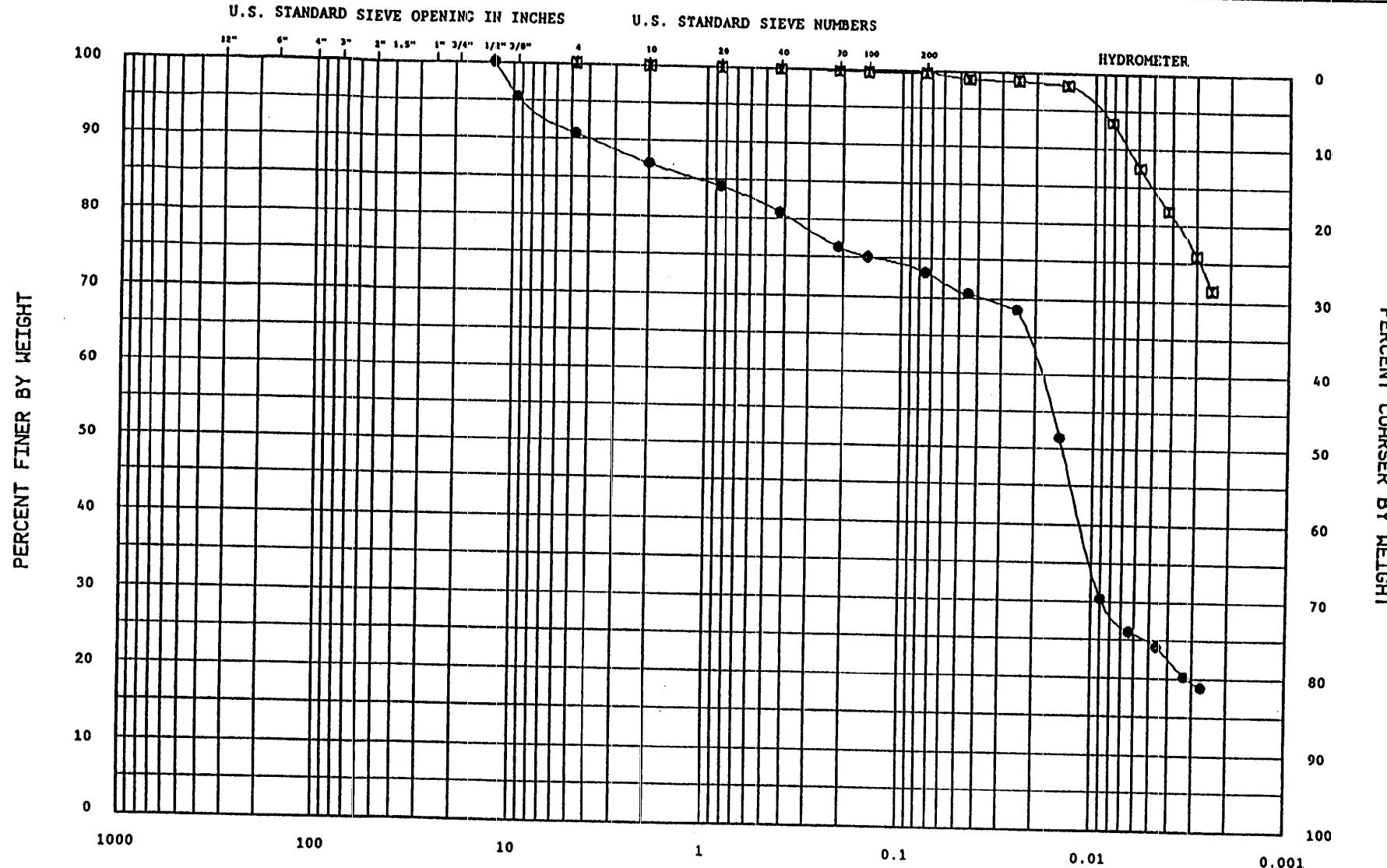
GRADATION CURVES

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT

AREA: ANCHORAGE & CHANNELS

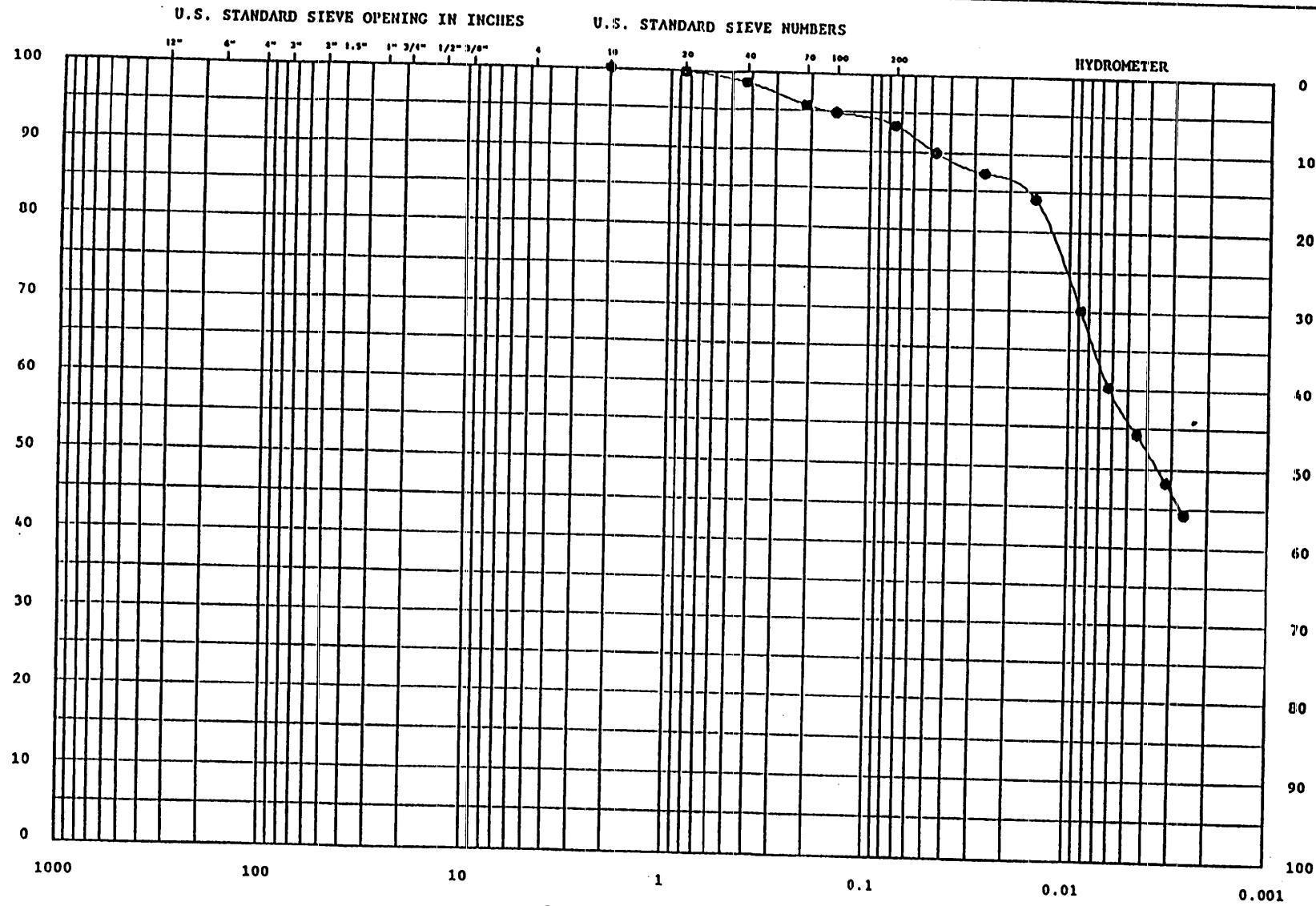
BORING NO. GB-9-94

DATE: JUN 1994



Legend	Sample No.	Depth (ft)	Classification			Nat wt%	LL	PL	PI	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY SOUTH LOCUST POINT AREA: ANCHORAGE & CHANNELS		
●	JAR-3	34.0-35.5	FAT CLAY with SAND			CII	140.7	11.7	39	78		
(X)	JAR-6	40.0-41.5	FAT CLAY			CII	175.6					
—												
REMARKS:										DIGGING NO.	GB-10-94	
										DATE:	JUN 1994	
	ENG FORM 2087		GRADATION CURVES									

PERCENT FINER BY WEIGHT



GRAIN SIZE IN MILLIMETERS

COBBLES		GRAVEL		SAND			SILT or CLAY	
		COARSE	FINE	COARSE	MEDIUM	FINE		
●	JAR-2	30.6-40.1	FAT CLAY	CII	233.1	141	46	95

Legend	Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI	
●	JAR-2	30.6-40.1	FAT CLAY	CII	233.1	141	46	95
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PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
AREA: ANCHORAGE & CHANNELS

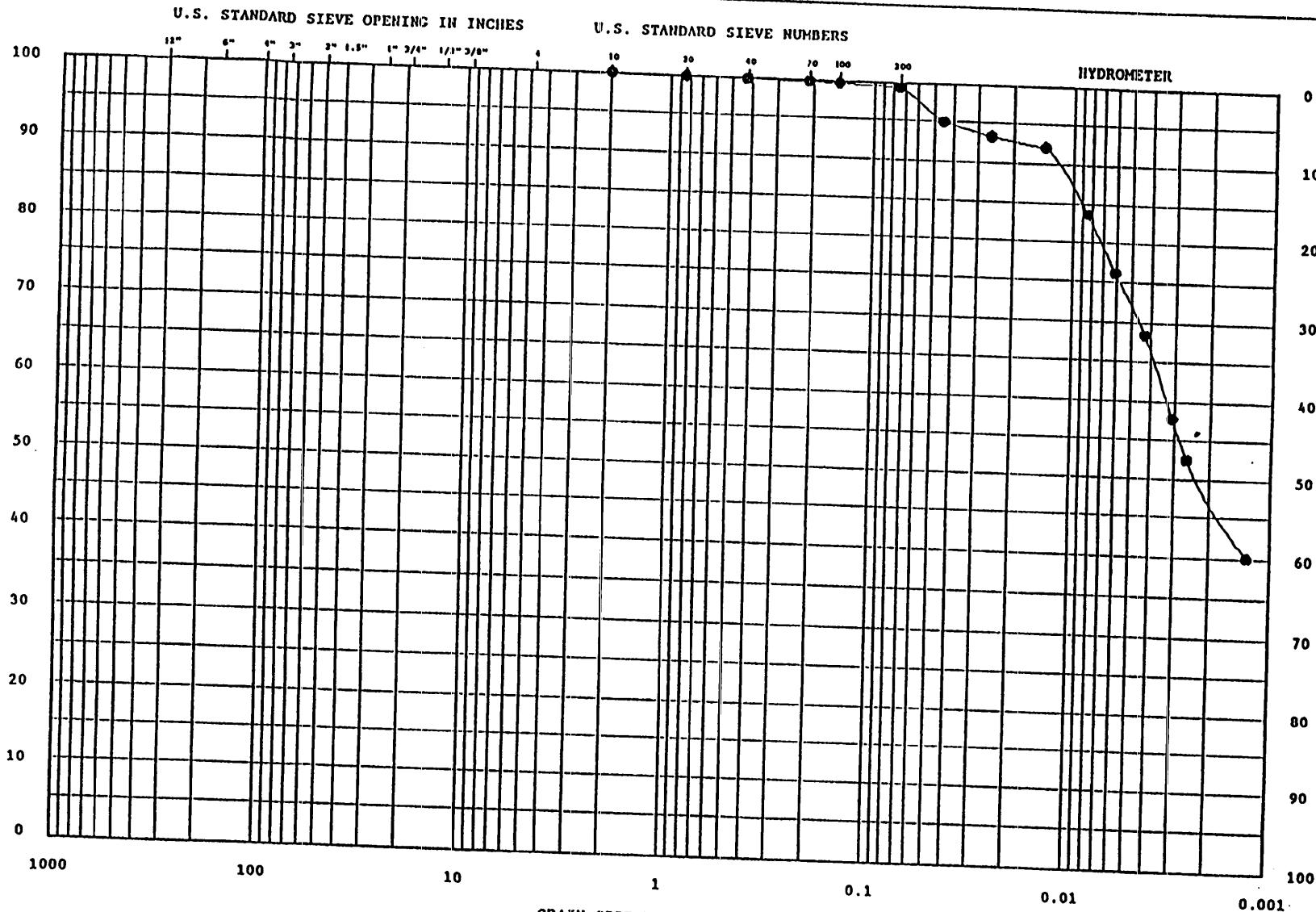
REMARKS:
ENG FORM 2007

GRADATION CURVES

BORING NO. GB-11-94
DATE: JUN 1994

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT



COBBLES			GRAVEL		SAND			SILT or CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE				
Legend	Sample No.	Depth (ft)	Classification	Nat w/w	LL	PL	PI		
●	JAR-2	42.3-43.8	FAT CLAY	CII	186.8	132	42	90	
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REMARKS:

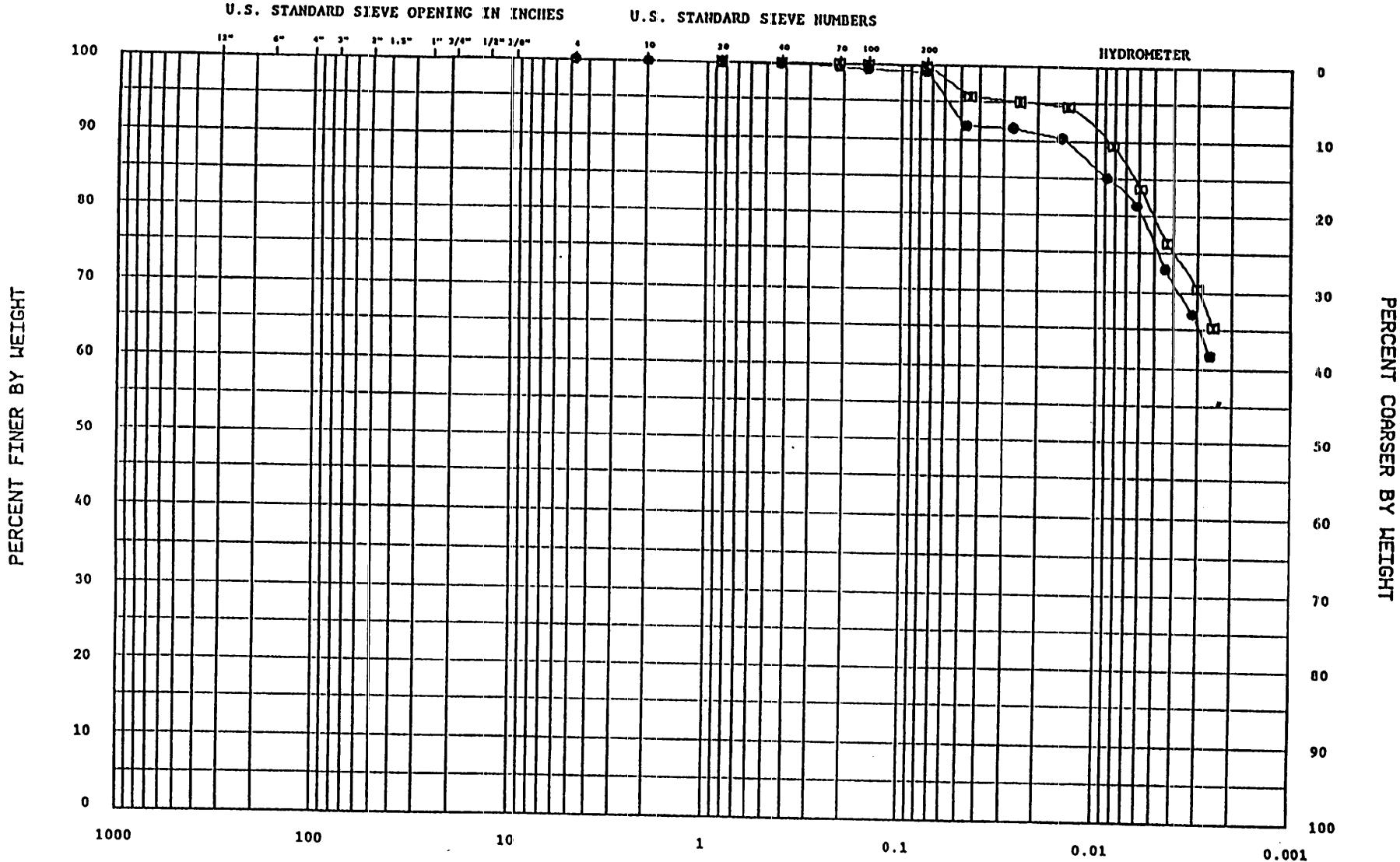
ENG FORM 2087

PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
 AREA: SOUTH LOCUST POINT
 ANCHORAGE & CHANNELS

BORING NO. GB-12-94

DATE: JUN 1994

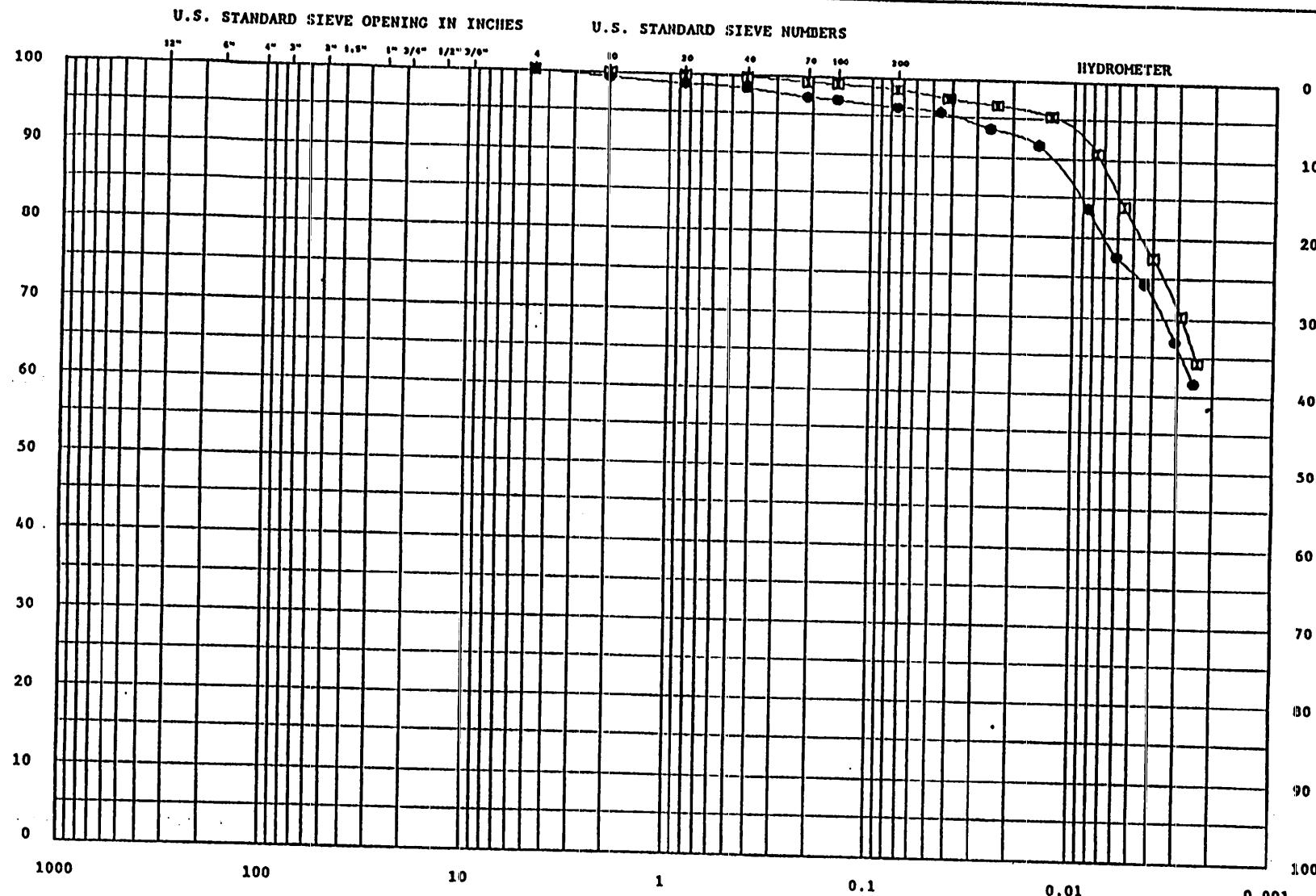
GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT or CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE		
JAR-1	FAT CLAY		CII	206.5			
JAR-3	FAT CLAY		CII	166.7	113	39	74

Legend	Sample No.	Depth (ft)	Classification	Nat w/c%	LL	PL	PI	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY SOUTH LOCUST POINT AREA: ANCHORAGE & CHANNELS		
●	JAR-1	38.0-39.5	FAT CLAY	CII	206.5					
□	JAR-3	42.0-43.5	FAT CLAY	CII	166.7	113	39	74		
—										
—										
REMARKS:										
ENG FORM 2007	GRADATION CURVES						BORING NO. GB-13-94			
							DATE: JUN 1994			

PERCENT FINER BY WEIGHT



COBBLES			GRAVEL		SAND			SILT or CLAY	
			COARSE	FINE	COARSE	MEDIUM	FINE		
●	JAR-1	34.3-36.8	FAT CLAY		CII	197.0	147	43	104
○	JAR-3	38.3-39.8	FAT CLAY		CII	152.1			

Legend:

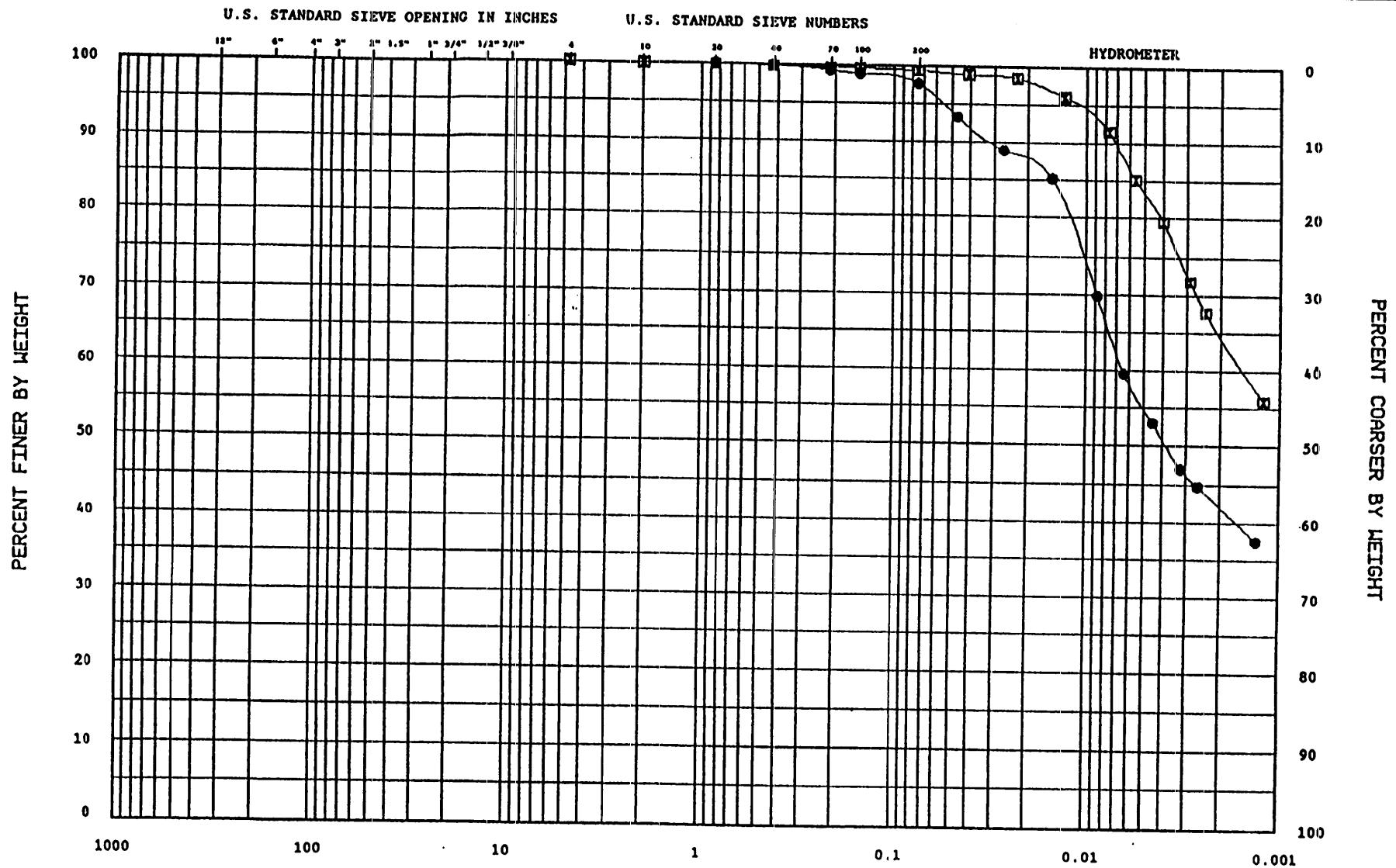
- JAR-1 34.3-36.8 FAT CLAY CII 197.0 147 43 104
- JAR-3 38.3-39.8 FAT CLAY CII 152.1

REMARKS:
ENG FORM 2007

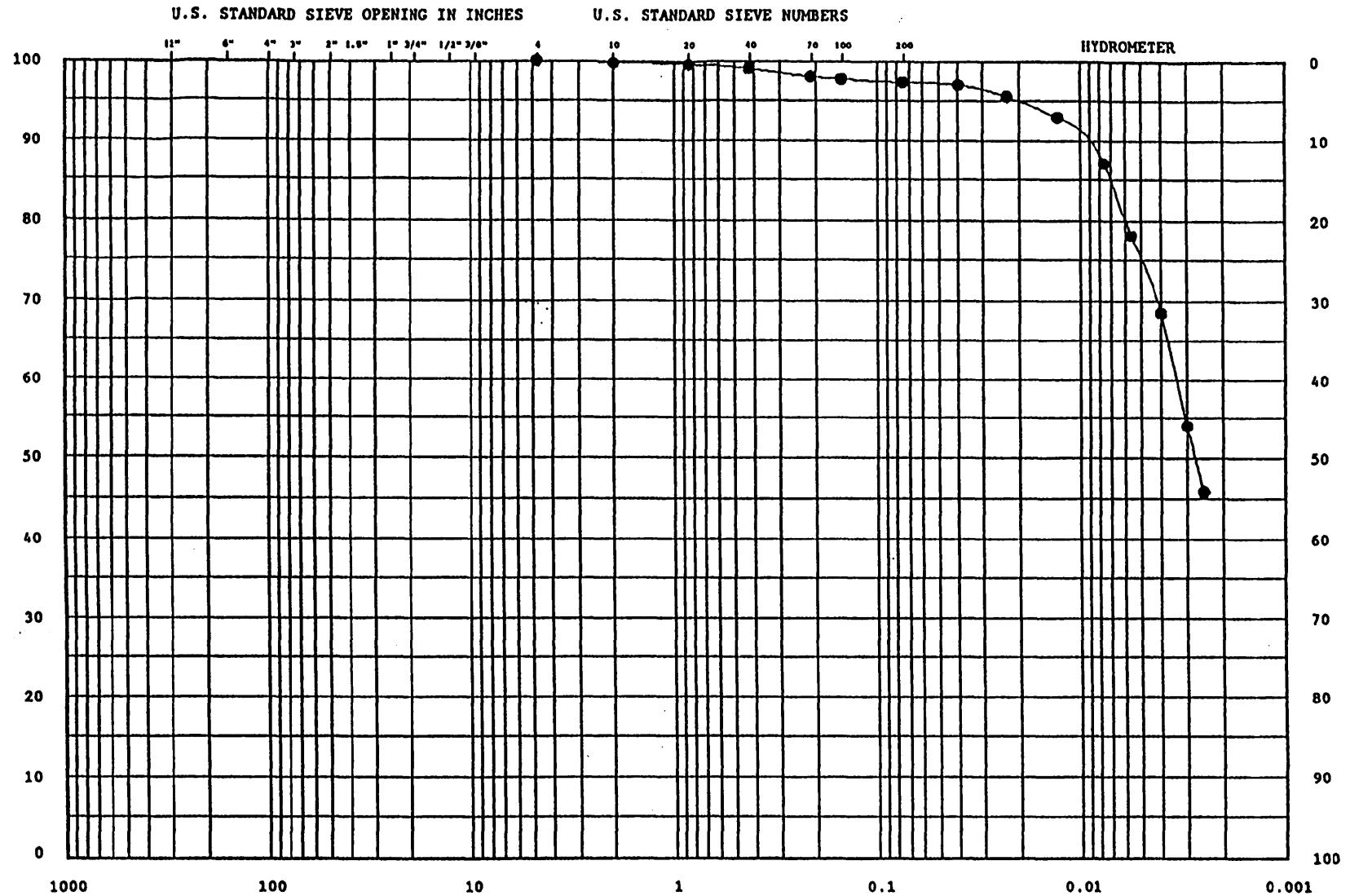
PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY
SOUTH LOCUST POINT
ANCHORAGE & CHANNELS

BORING NO. GE-14-94
DATE: JUN 1994

GRADATION CURVES



PERCENT FINER BY WEIGHT



COBBLES

GRAVEL

SAND

SILT or CLAY

COARSE

FINE

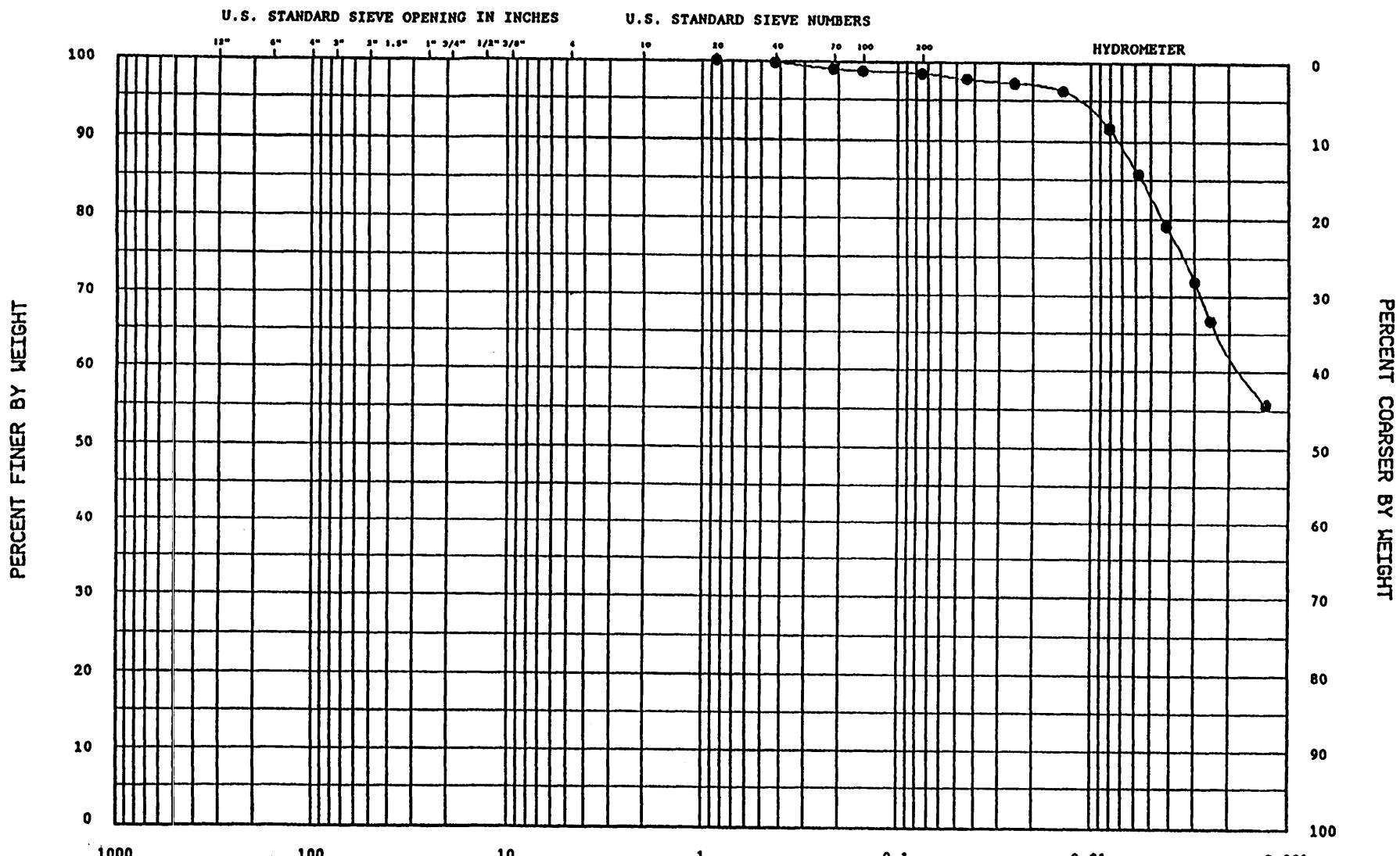
COARSE

MEDIUM

FINE

Legend	Sample No.	Depth (ft)	Classification	Nat w/c	LL	PL	PI	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY SOUTH LOCUST POINT ANCHORAGE & CHANNELS
●	JAR-1	39.6-41.1	FAT CLAY	CH	131.6	135	39	
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—								
REMARKS:								BORING NO. GB-16-94
ENG FORM 2067								DATE: JUN 1994

GRADATION CURVES



COBBLES

GRAVEL

SAND

SILT or CLAY

COARSE

FINE

COARSE

MEDIUM

FINE

Legend	Sample No.	Depth (ft)	Classification	Nat w/o	LL	PL	PI	PROJECT: BALTIMORE HARBOR FEASIBILITY STUDY SOUTH LOCUST POINT ANCHORAGE & CHANNELS
●	JAR-2	39.6-41.1	FAT CLAY	CH	150.7	120	36	84
—								AREA:
—								BORING NO.
—								JUN 1994
REMARKS:								DATE:
ENG FORM 2087								JUN 1994
GRADATION CURVES								