

## AMENDMENT OF SOLICITATION

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1. AMENDMENT/MODIFICATION NO.  0001	2. EFFECTIVE DATE  OCT 11, 2002	
3. ISSUED BY  DEPARTMENT OF THE ARMY, BALTIMORE DISTRICT CORPS OF ENGINEERS P.O. BOX 1715 BALTIMORE, MARYLAND 21203-1715  CODE: _____		
4. NAME AND ADDRESS OF CONTRACTOR (Name, street, county, State and ZIP Code)	4A. AMENDMENT OF SOLICITATION NO.  DACW31-02-B-0039 <hr/> 4B. DATED (SEE ITEM 5)  SEP 18, 2002	
5. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS  The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers <b>X</b> is extended, ___ is not extended. SEE BELOW Others must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 4 and 8, and returning <u>1</u> copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of the amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.		
6. ACCOUNTING AND APPROPRIATION DATA (If required) COAN RIVER JETTY, NORTHUMBERLAND COUNTY, VIRGINIA		
7. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)  (1) THE TIME AND DATE FOR RECEIVING BIDS FOR THIS PROJECT IS EXTENDED TO 2:00 PM, LOCAL TIME OCT 22, 2002. REVISE STANDARD FORM SF 1442, BLOCK 13A OF THE SOLICITATION TO REFLECT THIS CHANGE.  <u>SPECIFICATIONS:</u>  (2) <u>Section 01050, Page 1, Paragraph 1.2.2:</u> Delete this paragraph, as originally issued, and substitute therefor the following new paragraph 1.2.2:  "1.2.2 Explorations  The physical conditions indicated on the drawings and in the specifications are the result of site investigations by surveys and drill holes. Foundation exploration logs and soil test results (Geotechnical Design Analysis) are inserted at the end of this Section. Soils samples are also available for  Except as provided herein, all terms and conditions of the document referenced in Item 4A, as heretofore changed, remains unchanged and in full force.		
8. NAME AND TITLE OF SIGNER (Type or print)	9. CONTRACTOR/OFFEROR  _____ (Signature of person authorized to sign)	10. DATE SIGNED

inspection; however, prospective bidders are required to call (410) 962-4045 between the hours of 9:00 a.m. and 3:30 p.m., Monday through Friday (excluding Federal Holidays), a minimum of 24 hours in advance to arrange a time and date for the inspection of the samples."

(3) Section 01050, Page 4, Paragraph 1.16: Delete this paragraph in its entirety.

(4) Section 01050: Immediately at the end of this section insert the attached Geotechnical Design Analysis.

(5) Section 02272, Page 3, Table 1: Delete Table 1, as originally issued, replace with the following:

TABLE 1. GEOTEXTILE PHYSICAL PROPERTIES  
(FOR USE IN THE JETTY FOUNDATION)

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>TEST VALUE</u>
Apparent Opening	ASTM D 4751	No finer than the (U.S. Sieve) No. 100 and no coarser than the No. 40
Permittivity, sec <sup>-1</sup>	ASTM D 4491	0.15
Puncture, lbs.	ASTM D 4833	120
Grab Tensile, lbs.	ASTM D 4632	315
Burst Strength, psi	ASTM D 3786	750
Trapezoidal Tear, lbs.	ASTM D 4533	120
Ultraviolet Degradation (percent strength retained at 500 hours)	ASTM D 4355	70%
Factory Seam Strength, (seam efficiency in percent of fabric strength as determined by ASTM D 4595)	ASTM D 4884	90%
Field Seam Strength, (percent of grab tensile strength of the geotextile)	ASTM D 4632	85%

(6) Section 02272, Page 3, Table 2: Add the following Table after Table 1:

TABLE 2. GEOTEXTILE PHYSICAL PROPERTIES  
(FOR USE IN THE ACCESS ROAD - AS INDICATED IN SECTION 01510)

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>TEST VALUE</u>
Apparent Opening	ASTM D 4751	No finer than the (U.S. Sieve) No. 100 and no coarser than the No. 40
Permittivity, sec <sup>-1</sup>	ASTM D 4491	0.2
Puncture, lbs.	ASTM D 4833	80
Grab Tensile, lbs.	ASTM D 4632	200
Burst Strength, psi	ASTM D 3786	300
Trapezoidal Tear, lbs.	ASTM D 4533	120
Ultraviolet Degradation (percent strength retained at 500 hours)	ASTM D 4355	70%
Factory Seam Strength, (seam efficiency in percent of fabric strength as determined by ASTM D 4595)	ASTM D 4884	90%
Field Seam Strength, (percent of grab tensile strength of the geotextile)	ASTM D 4632	85%

(7) Section 02486, Page 6, Paragraph 1.7: Delete the first sentence of this paragraph and substitute therefor the following new sentence: "A SMQC Supervisor or SMQC Inspector shall be present at all times that stone production and stone handling are taking place at the stone source.".

(8) Section 02486, Page 16, Paragraph 2.6: Delete the first sentence of this paragraph and substitute therefor the following new sentence: "During the contract period, both prior to and after the materials are delivered to the job site, the Government reserves the right to conduct visual QA inspections and measurements of all stone produced for this project.".

(9) Section 02486, Page 19, Paragraph 3.7.3, line 31: Change "... and one (1) test on intermediate stone..." to read "... and two (2) tests on intermediate stone...".

DRAWINGS:

(10) Sheets C-1, C-2, E&S-1 and E&S-2, Access Road:

Revise the access road width from 10 (ten) feet to 12 (twelve) feet.  
(Alignment of road will not change. Widening shall be accomplished by adding  
1 foot to each side of the access road centerline.) In addition, the width  
and location of the sedimentation fence shall not change and will remain as  
shown on the drawings.

ATTACHMENTS: A/S

Coan River  
Northumberland County, Virginia  
Feasibility Study

**C-2 Geotechnical Design Analysis.**

1. Foundation Exploration: The initial drilling was accomplished in August 1997 and included five holes (DH-1 through DH-5) located along the proposed jetty alignment off of Walnut Point, and six holes (DH-C1 through DH-C6) located within the limits of the proposed channel excavation. In April 2001, due to later re-consideration of the channel alignment and a slight modification of the jetty alignment one additional hole was accomplished for the jetty (DH-6) and three additional holes were accomplished along the revised channel (DH-C7 through DH-C9). Drill hole locations are shown on Plate B-1. All drilling was accomplished using Standard Penetration Test (SPT) drive sample methodology obtaining samples in a 1<sup>3</sup>/<sub>8</sub>-inch split spoon sampler. Three undisturbed Shelby tube samples were pressed along the proposed jetty alignment in DH-3, 4. And 6.
2. Testing: Laboratory visual classifications were made on all samples. Classification testing performed on representative split spoon samples includes mechanical and hydrometer analysis (gradation), Atterberg limits determinations, and determination of natural water content. Consolidation tests were performed through 16 tons/ft<sup>2</sup> with rebounds on undisturbed samples. Laboratory test results and final drill logs are included at the end of this section.
3. Jetty Foundation: The surface deposits along the proposed jetty alignment consist of a layer of generally poorly graded sand and silty sand up to about 5.5 feet in thickness extending from the proposed tie-in on Walnut Point out to about Station 6+00. Below the sand and for the entire drilling depth beyond about Station 6+00, the foundation consists of very soft clay material to full depth of drilling, which extended up to 31.5 feet. For the most part this soft clay is Weight of Rod (WR) or Weight of Hammer (WH) material as determined by SPT drive sampling. The foundation profile for the proposed jetty is shown on Plate B-2.
4. Channel Foundation: As indicated on the channel foundation profile (for the revised channel) as shown on Plate B-3, the channel material proposed to be excavated consists generally of poorly graded sand (SP) to a silty sand (SM) with fines ranging from about 2% to 25% to the north end of the excavation. There is the possibility that some clay material (CH) could be encountered on the west edge of the excavation as evidenced by the 1997 drilling for the original alignment. Dredging of the proposed channel to the proposed overdepth elevation of -11 MLLW will require removal of approximately 6000 cubic yards of material.
5. Jetty Foundation Assessment: Due to the extremely soft clay foundation along the proposed jetty alignment, excessive settlement would be expected due to jetty construction. Although difficult to predict precisely, a rough analysis performed indicates possible settlement due to foundation consolidation of about 2 feet. This was confirmed by the additional consolidation analysis performed on the sample from DH-6. This would not account for any lateral displacement (mud-waving) which would likely result as well unless sufficient stabilizing berms are constructed. Consolidation and lateral displacement of the foundation is difficult to

predict with the accuracy required to economically design and construct a stone jetty based on testing data alone.

6. Upland Placement Site: A 2.5 acre (approx.) site has been identified in an agricultural field as shown on Plate C-2 for use as an upland placement site for containing the material dredged from the channel. In order to assess the suitability of the foundation and suitability of the dike construction materials to be excavated from within the area, three hand auger borings were taken in July 2001. Since it was subsequently determined that the placement would be via overboard placement to nourish oyster beds, and that the area would therefore not be utilized, testing of the material was not accomplished. Based on visual analysis of the materials, it can be assumed that the area poses no obvious problems for use as a placement area should it later be needed. Materials are suitable for dike construction down to about 5 or 6 feet where a firm, lean clay material was encountered. Should it later be determined to utilize this area (in the near future) testing of the samples and more detailed analysis can be made. It is estimated that a dike height of 5-<sup>1</sup>/<sub>2</sub> feet would be required considering a mixed material being deposited (1000 <sup>cy</sup>/<sub>acre-ft</sub>) plus 1 foot for ponding and 2 feet of freeboard.
7. Recommendations: It is recommended that the jetty be constructed with an overbuild of 2-feet and placed on a high-strength geotextile to better distribute the load and prevent movement of fine-grained foundation material up into the jetty structure during construction. A typical jetty section is shown on Plate C-4.

SUBSURFACE EXPLORATION NOTES  
COAN RIVER  
LEWISSETTA, NORTHUMBERLAND COUNTY, VA  
PHASES I & II

1. EXPLORATION WAS PERFORMED DURING AUGUST 1997 AND MARCH 2001.
2. ALL BORINGS WERE ACCOMPLISHED AS INDICATED USING EITHER A TRIPOD WITH CATHEAD OR A CME 45 SKID-RIG PLACED ON A BARGE.
3. DRILL HOLES (DH-1 THRU DH-6) WERE ACCOMPLISHED BY STANDARD PENETRATION TEST PROCEDURE (SPT) USING A 1-3/8" X 2'-8" LONG SPLIT SPOON. SAMPLE SPOONS WERE ADVANCED BY A 140# HAMMER FALLING 30". THESE HOLES WERE ADVANCED BETWEEN SAMPLING EVENTS BY DRIVING A 4" ID CASING WHILE JETTING WATER UNDER PRESSURE AT THE SAME TIME. BLOW COUNTS ARE FOR 0.5' OF DRIVE, UNLESS OTHERWISE INDICATED.

DRILL HOLES (DH-C1 THRU DH-C9) WERE ACCOMPLISHED BY STANDARD PENETRATION TEST PROCEDURE (SPT) USING A 1-3/8" X 2'-8" LONG SPLIT SPOON. SAMPLE SPOONS WERE ADVANCED BY A 140# HAMMER FALLING 30". THE RIVER SEDIMENTS WERE COLLECTED CONTINUOUSLY THROUGH THE CASING BY SPT METHOD. THESE HOLES WERE ADVANCED BETWEEN SAMPLING EVENTS BY DRIVING A 4" ID CASING WHILE JETTING WATER UNDER PRESSURE AT THE SAME TIME. BLOW COUNTS ARE FOR 0.5' OF DRIVE, UNLESS OTHERWISE INDICATED.

WH - DENOTES WEIGHT OF HAMMER

WR - DENOTES WEIGHT OF ROD

P - INDICATED LOCATION OF PRESSED SHELBY TUBE SAMPLE

4. BLOW COUNTS REQUIRED TO ADVANCE SAMPLE ARE SHOWN IN COLUMN (a).
5. COLUMN (b) SHOWS THE NATURAL WATER CONTENTS IN PERCENT OF DRY WEIGHT OF THOSE SAMPLES TESTED.
6. SOIL DESCRIPTIONS ARE SHOWN IN COLUMN (c).
7. SOIL DESCRIPTIONS ARE LABORATORY CLASSIFICATIONS BASED ON THE UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487/2488), EXCEPT THOSE INDICATED THUS (\*\*), WHICH ARE FIELD INSPECTOR'S CLASSIFICATIONS.

THE ORGANIC TEST (ASTM D 2974, METHOD "C"; OR LOSS ON IGNITION TEST (LOI) (AASHTO-T-267) WAS USED TO EVALUATE AND DESCRIBE THE ORGANIC CONTENT OF SOILS FOR DESIGN AND CONSTRUCTION AS FOLLOWS:

<u>LOI</u>	<u>SOIL DESCRIPTION</u>
<12	INORGANIC
12 TO 24	ORGANIC
25 TO 60	VERY ORGANIC
>60	PEAT (Pt)

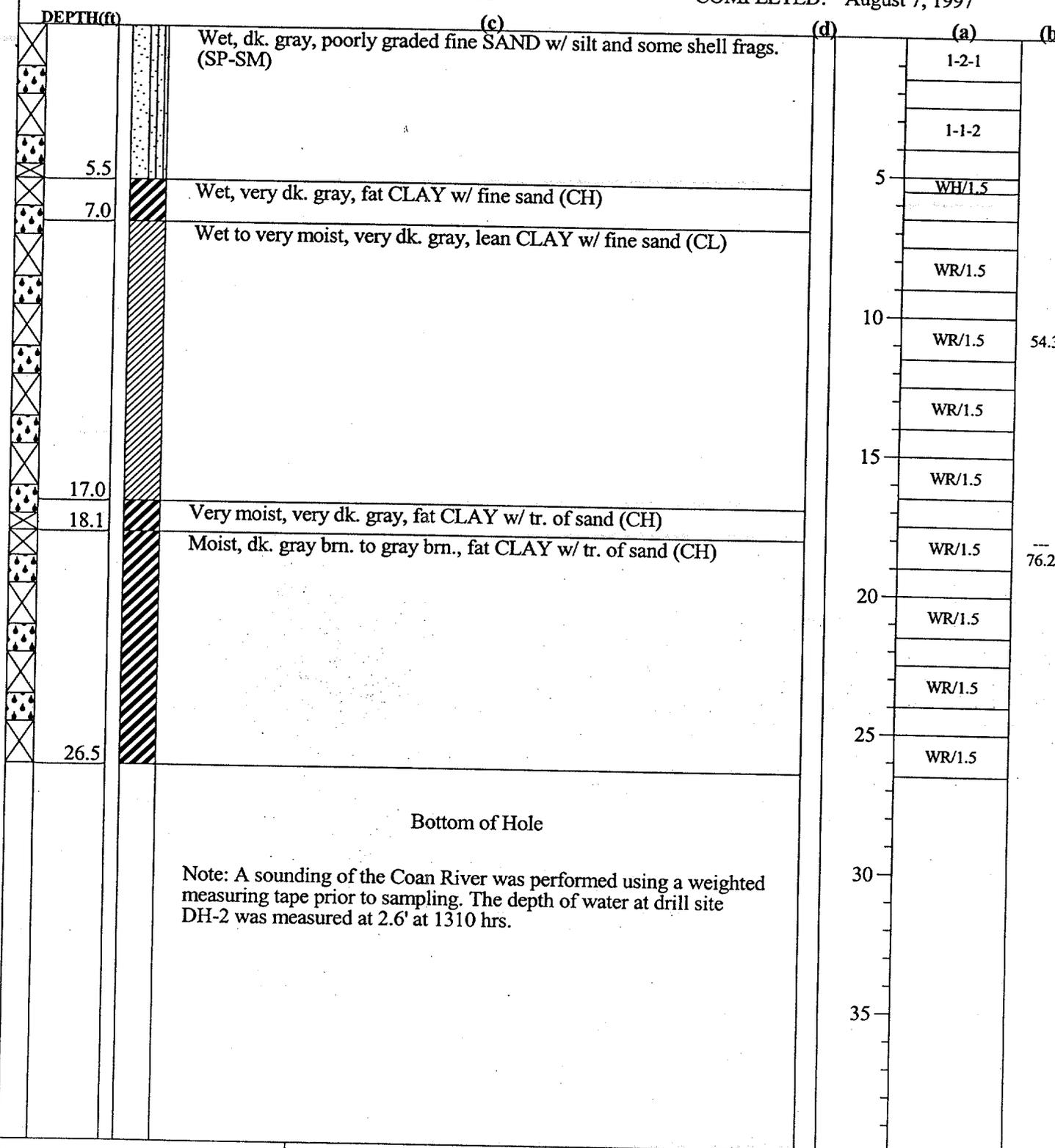
8. A SOUNDING OF THE COAN RIVER WAS PERFORMED USING A WEIGHTED MEASURING TAPE PRIOR TO SAMPLING. THE DEPTH OF WATER AT EACH DRILL SITE WAS MEASURED AND RECORDED. DEPTHS ARE REFERENCED TO MLLW.
9. ELEVATIONS SHOWN ON THE BORING LOGS ARE GROUND SURFACE ELEVATIONS AT THE TIME OF EXPLORATION. THEY WERE DETERMINED BY ESTIMATION FROM SPOT ELEVATIONS ON SURVEY MAPS.
10. POSITIONING FOR THE BORINGS DRILLED IN MARCH 2001 WAS OBTAINED USING EITHER A TRIMBLE DMS 212 GPS SYSTEM.
11. FOR LOCATIONS OF SUBSURFACE EXPLORATIONS, SEE BORING LOCATION PLAN.



STA.  
 OFFSET:  
 TOP ELEV: -1.200

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6684349.000  
 E 12069365.000  
 COMPLETED: August 7, 1997  
**DH-2**  
 1 of 1



GEO-2 COAN-RV.GPJ 7/23/01 15:48

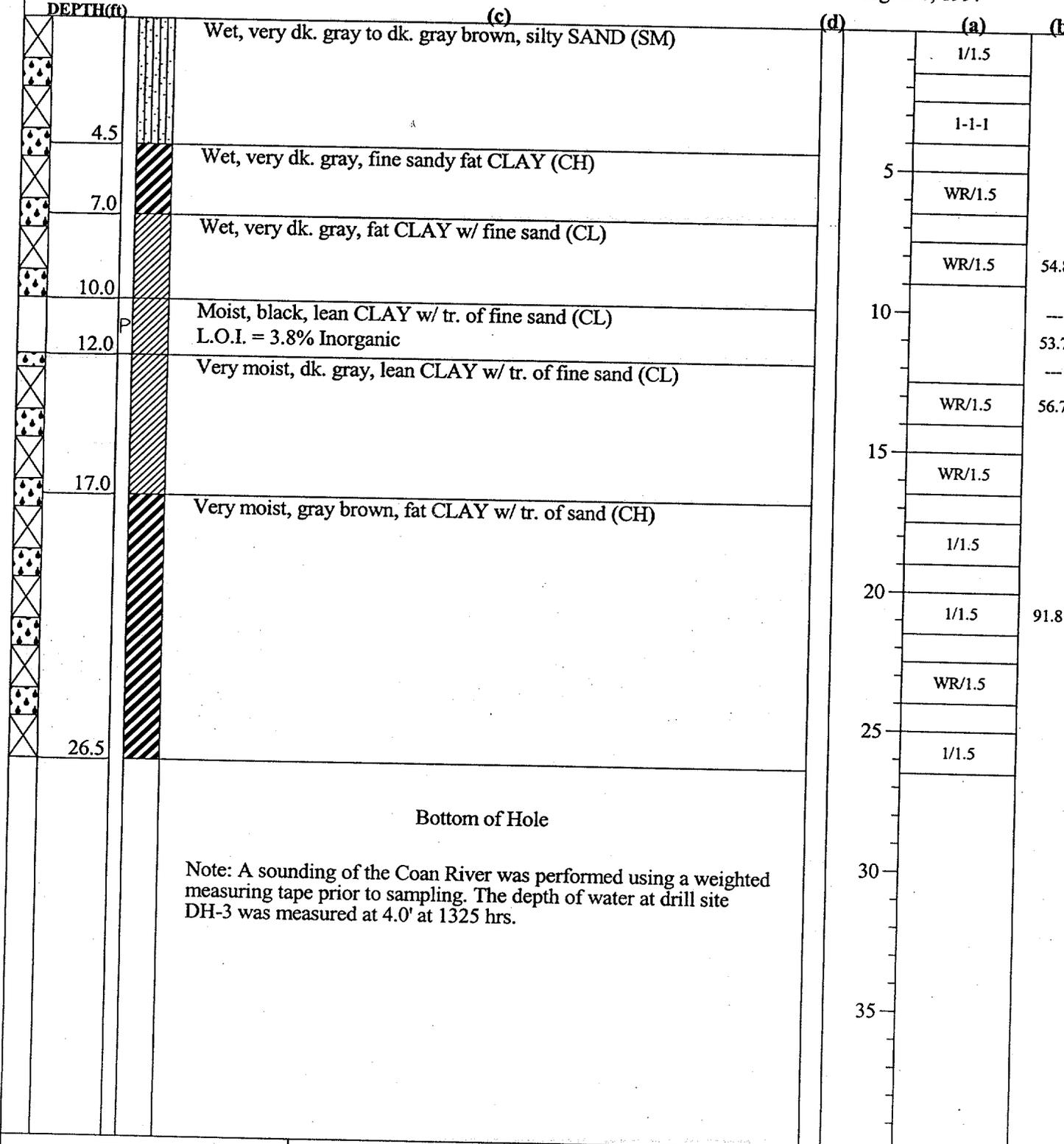
DH-2  
 GROUNDWATER DATA  
 WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

- Fill
- Auger
- SPT
- RB
- Cored
- 300 lb
- Tubex
- Hand
- Fish Tail
- Vibra Core
- Water Jet
-

STA.  
 OFFSET:  
 TOP ELEV: -2.200

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6684541.000  
 E 12069312.000  
 COMPLETED: August 6, 1997  
**DH-3**  
 1 of 1



Note: A sounding of the Coan River was performed using a weighted measuring tape prior to sampling. The depth of water at drill site DH-3 was measured at 4.0' at 1325 hrs.

DH-3  
 GROUNDWATER DATA  
 WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

- Fill
- Auger
- SPT
- RB
- Cored
- 300 lb
- Tubex
- Hand
- Fish Tail
- Vibra Core
- Water Jet
- 

GEO-2 COAN-RIV.GPJ 7/23/01 15:48

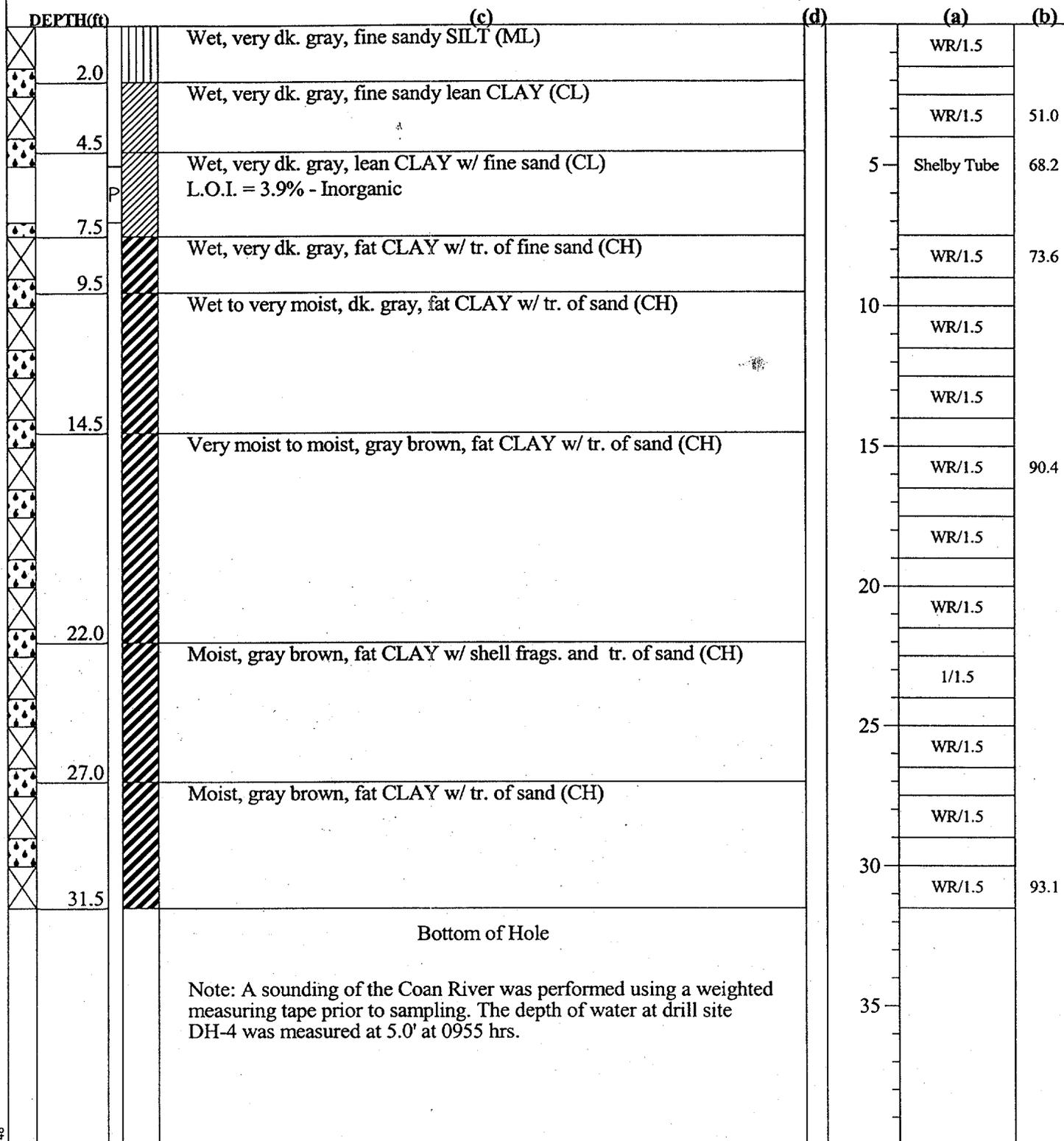
STA.  
 OFFSET:  
 TOP ELEV: -4.100

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6684734.000  
 E 12069259.000  
 COMPLETED: August 7, 1997

**DH-4**

1 of 1



GEO-2 COAN-RIV.GPJ 7/23/01 15:48

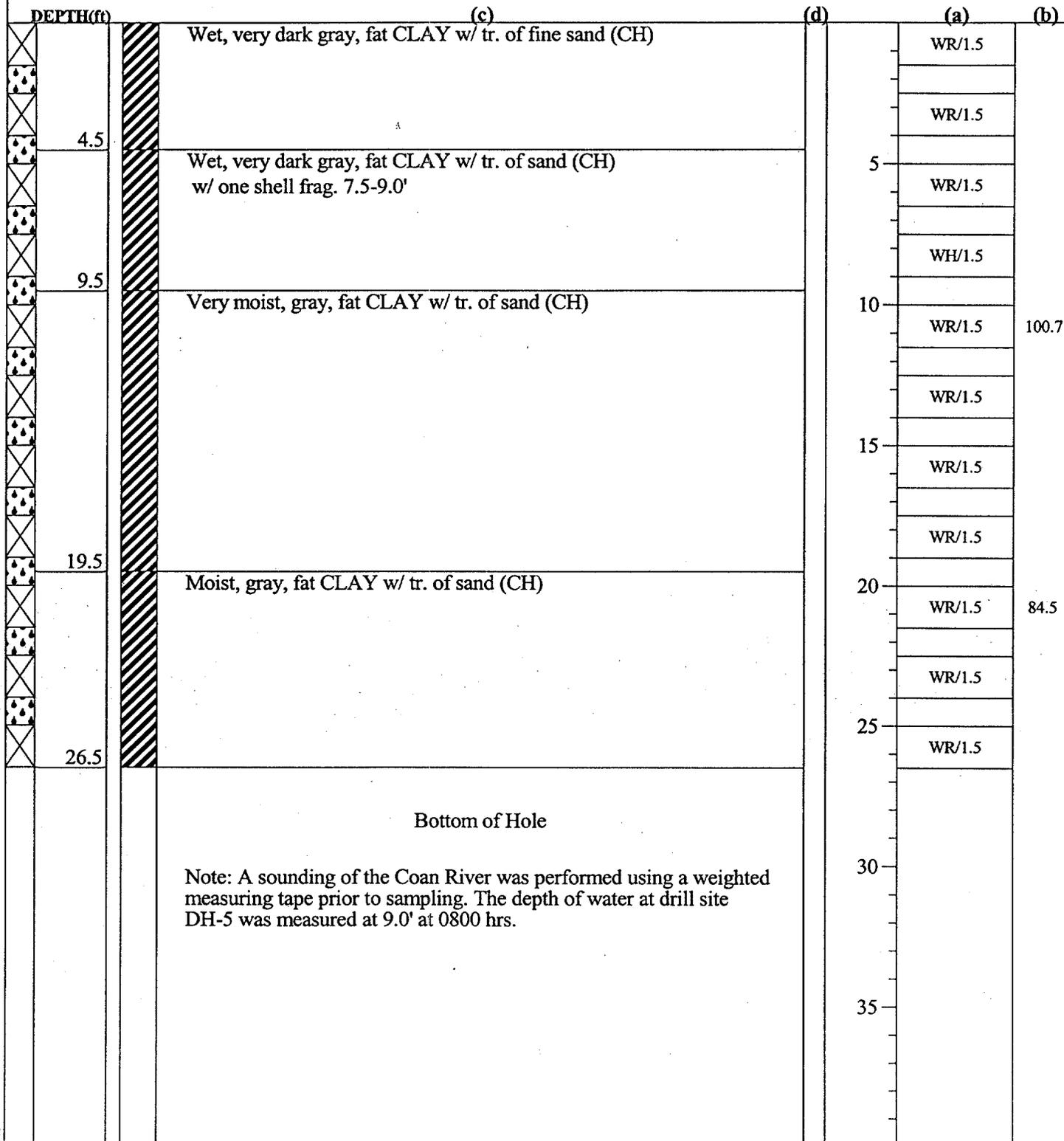
DH-4  
 GROUNDWATER DATA  
 WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

-  Fill
-  Auger
-  SPT
-  RB
-  Cored
-  300 lb
-  Tubex
-  Hand
-  Fish Tail
-  Vibra Core
-  Water Jet
-  -

STA.  
 OFFSET:  
 TOP ELEV: -7.600

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6684927.000  
 E 12069206.000  
 COMPLETED: August 7, 1997  
**DH-5**  
 1 of 1



DH-5  
 GROUNDWATER DATA  
 WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

- Fill
- Auger
- SPT
- RB
- Cored
- 300 lb
- Tubex
- Hand
- Fish Tail
- Vibra Core
- Water Jet
- \_



STA.

Coan River

N 6683749.000

DH-C1

OFFSET:

Lewisetta, Northumberland County, VA

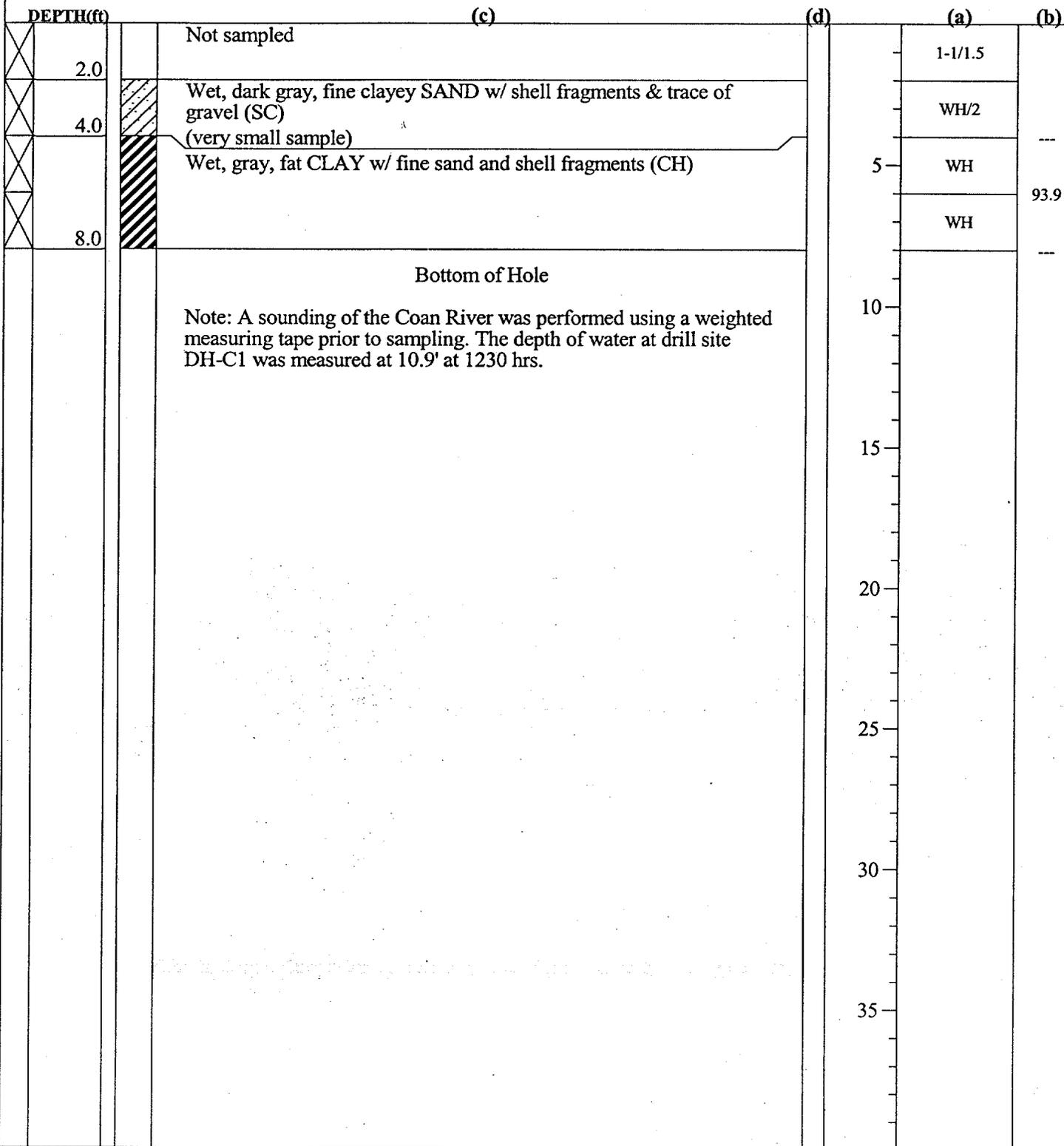
E 12069002.000

1 of 1

TOP ELEV: -9.100

Phase I

COMPLETED: August 6, 1997



GEO-2 COAN-RIV.GPJ 7/23/01 15:48

DH-C1  
GROUNDWATER DATA

WHILE DRILLING:

ON COMPLETION:

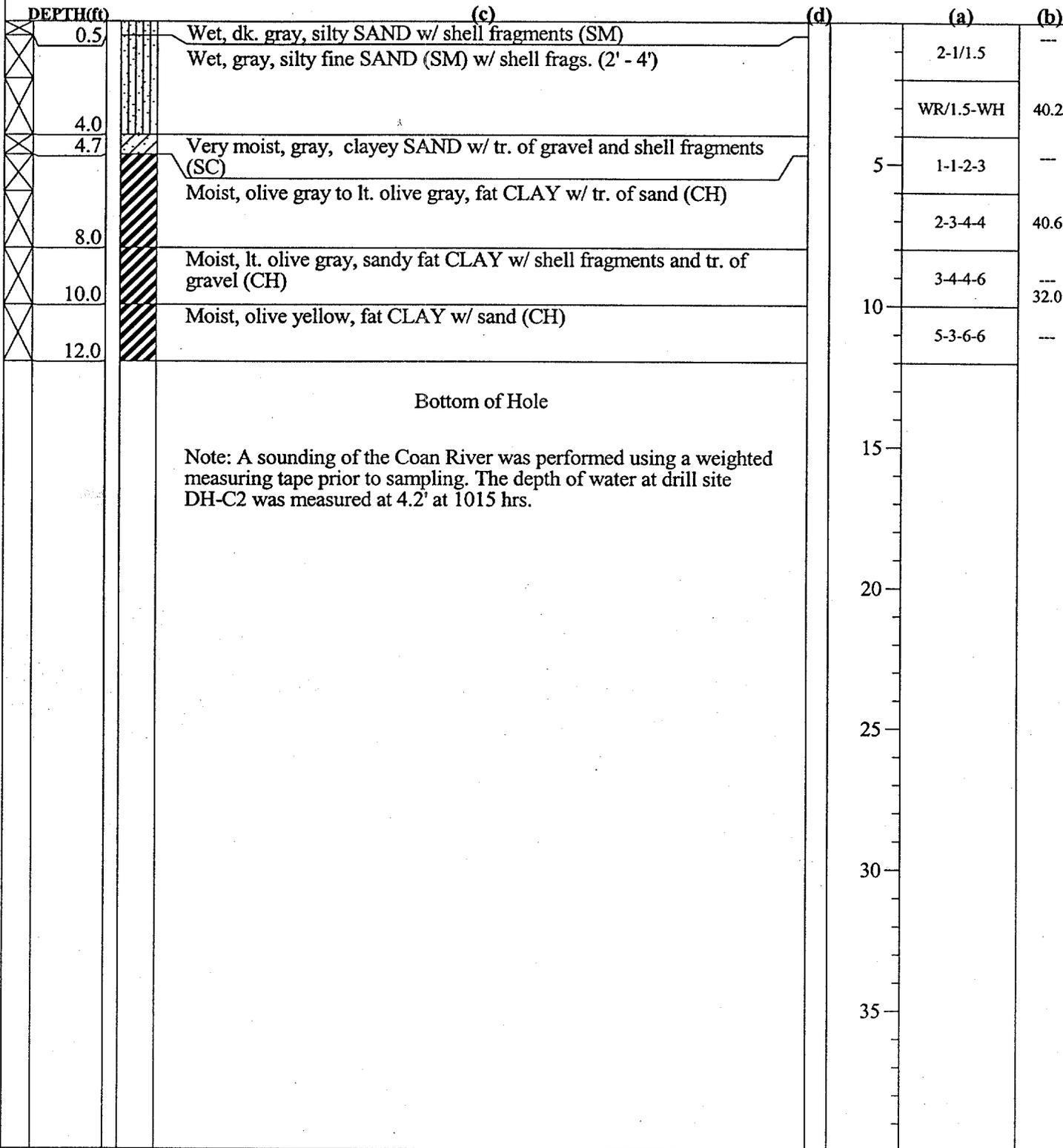
Hr. READING:

- Fill
- Auger
- SPT
- RB
- Cored
- 300 lb
- Tubex
- Hand
- Fish Tail
- Vibra Core
- Water Jet
- \_

STA.  
 OFFSET:  
 TOP ELEV: -3.000

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6683783.000  
 E 12068869.000  
 COMPLETED: August 6, 1997  
**DH-C2**  
 1 of 1



GEO-2 COAN-RIV.GPJ 7/23/01 15:48

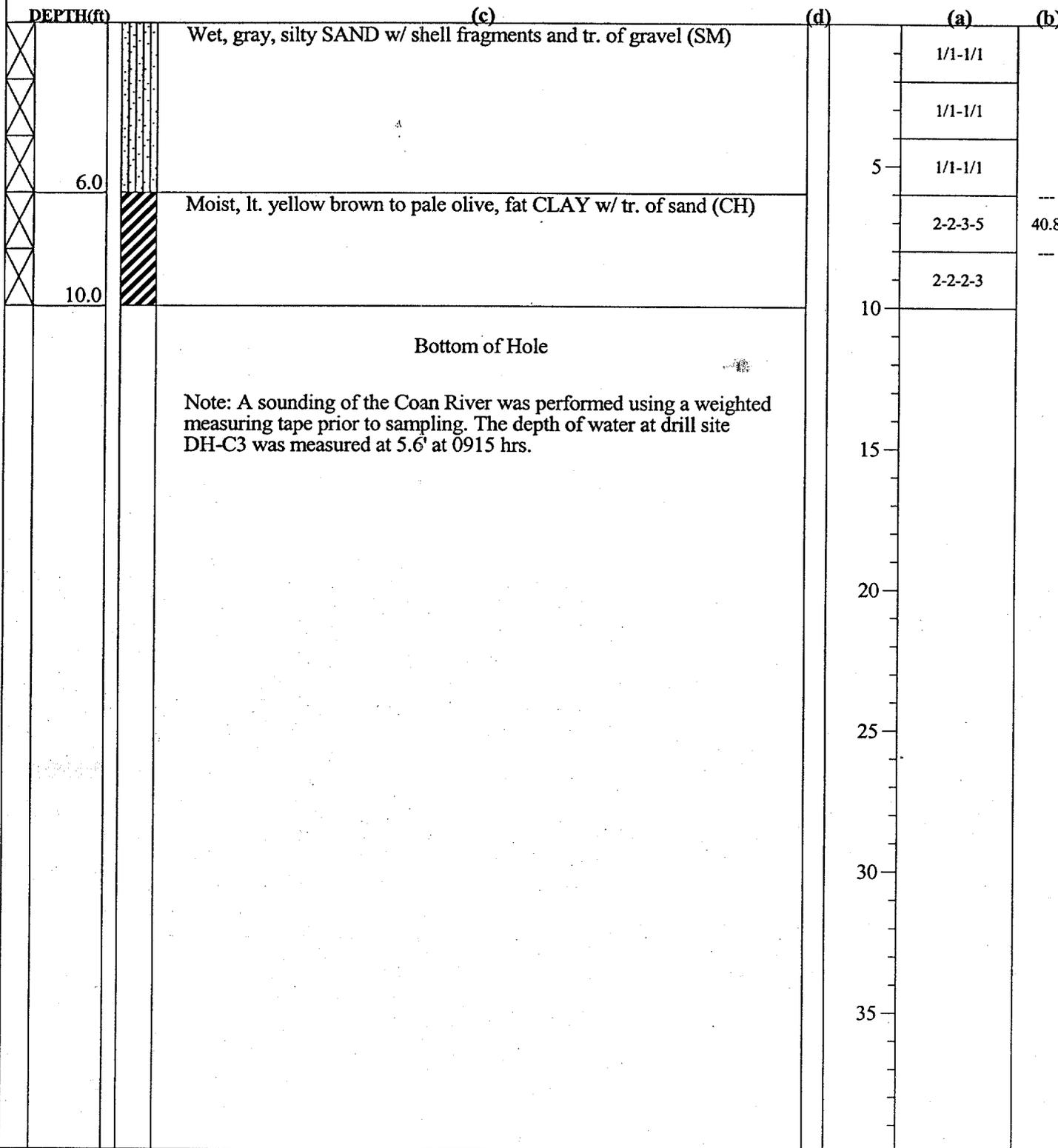
DH-C2  
 GROUNDWATER DATA  
 WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

-  Fill
-  Auger
-  SPT
-  RB
-  Cored
-  300 lb
-  Tubex
-  Hand
-  Fish Tail
-  Vibra Core
-  Water Jet
- 

STA.  
 OFFSET:  
 TOP ELEV: -4.400

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6683860.000  
 E 12068980.000  
 COMPLETED: August 6, 1997  
**DH-C3**  
 1 of 1



GEO-2 COAN-RIV.GPJ 7/23/01 15.48

DH-C3  
 GROUNDWATER DATA  
 WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

- Fill
- Auger
- SPT
- RB
- Cored
- 300 lb
- Tubex
- Hand
- Fish Tail
- Vibra Core
- Water Jet
- \_



STA.

Coan River

N 6684131.000

DH-C5

OFFSET:

Lewisetta, Northumberland County, VA

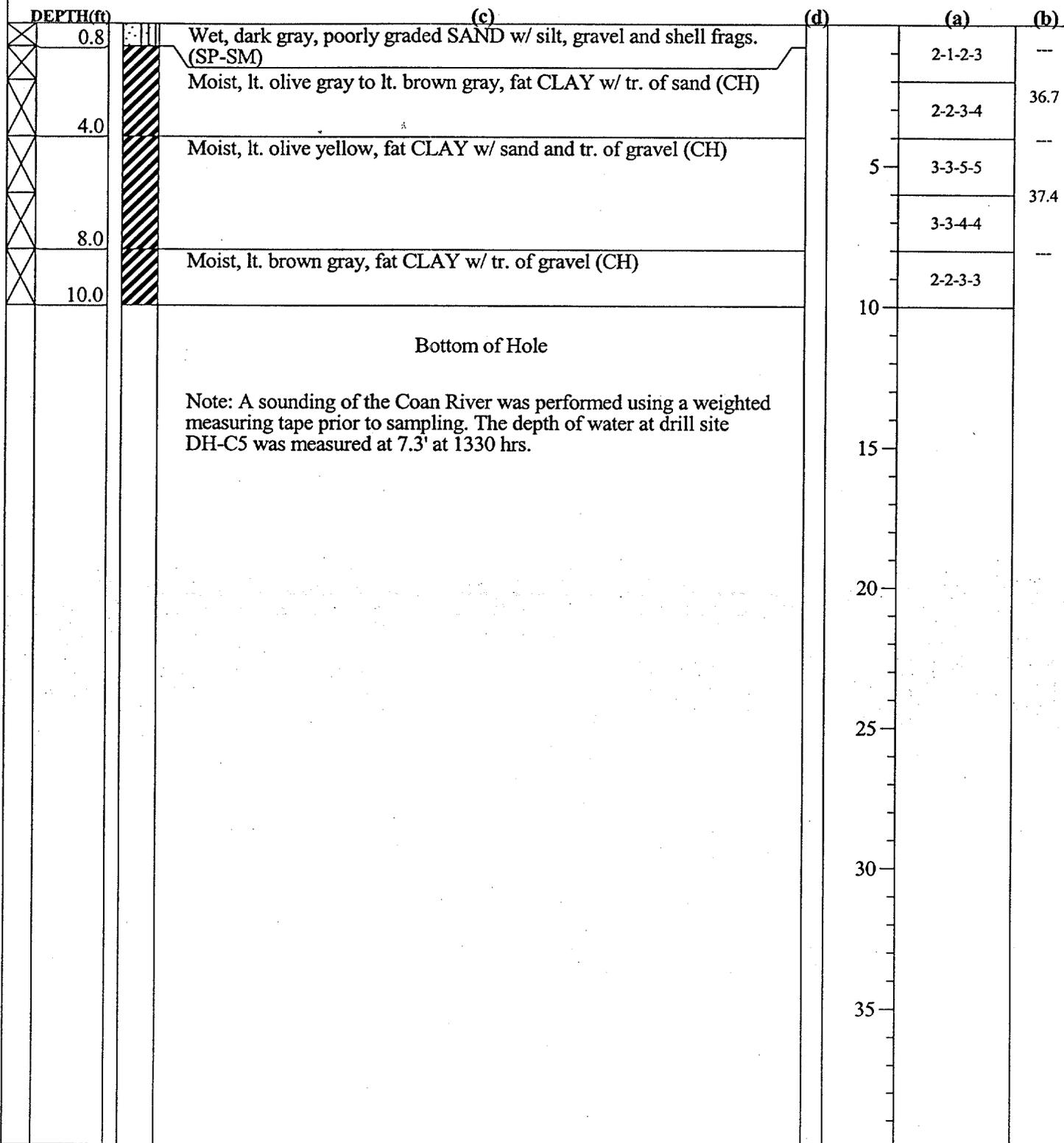
E 12068842.000

1 of 1

TOP ELEV: -5.300

Phase I

COMPLETED: August 5, 1997



DH-C5  
GROUNDWATER DATA

WHILE DRILLING:

ON COMPLETION:

Hr. READING:



Fill



Auger



SPT



RB



Cored



300 lb



Tubex



Hand



Fish Tail



Vibra Core



Water Jet



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GEO-2 COAN-RIV.GPJ 7/23/01 15:48

STA.  
 OFFSET:  
 TOP ELEV: -6.500

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6684316.000  
 E 12068788.000  
 COMPLETED: August 5, 1997  
**DH-C6**  
 1 of 1

DEPTH(ft)	(c)	(d)	(a)	(b)
2.0	Wet dark gray, poorly graded SAND w/ silt, shell fragments & tr. of gravel (SP-SM)		3-2-1-1	
2.9	Wet pale yellow clayey SAND w/ shell fragments & gravel (SC)			
4.0	(very small sample)		1-1-1-3	
	Very moist, brown yellow, clayey SAND (SC)			
6.0	Wet, pale yellow, clayey SAND (SC)		5-11-10-5-6	
	Wet, pale yellow, clayey SAND (SC)			
8.0			2-2-3-5	
Bottom of Hole				
<p>Note: A sounding of the Coan River was performed using a weighted measuring tape prior to sampling. The depth of water at drill site DH-C6 was measured at 7.3' at 1230 hrs. The depth of water at drill site DH-C6a was measured at 7.6' at 0845 hrs.</p>				

GEO-2 COAN-RIV.GPJ 7/23/01 15:48

DH-C6  
 GROUNDWATER DATA  
 WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

-  Fill
-  Auger
-  SPT
-  RB
-  Cored
-  300 lb
-  Tubex
-  Hand
-  Fish Tail
-  Vibra Core
-  Water Jet
- 

STA.  
 OFFSET:  
 TOP ELEV: -0.570

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6683893.000  
 E 12069142.000  
 COMPLETED: March 29, 2001  
**DH-C7**  
 1 of 1

DEPTH(ft)	(c)	(d)	(a)	(b)
1.5	Very moist, brown & lt. brown, poorly graded med. to fine SAND (SP)		WR/1-WH	
3.0	Wet, dk. brown, poorly graded SAND (SP)		1-1-1	
4.5	Very moist, brownish yellow, poorly graded med. to fine SAND (SP)		1-1-1	
7.5	Very moist, brownish yellow & black, poorly graded med. to fine SAND (SP)	5	WH/1-1	
9.0	Very moist, black & brownish yellow, poorly graded med. to fine SAND (SP)		WH/1.5	
10.5	Very moist, black & brownish yellow, poorly graded med. to fine SAND (SP)	10	WH/1-1	
BOTTOM OF HOLE				
<p>Note: A sounding of the Coan River was performed using a weighted measuring tape prior to sampling. The depth of water at drill site DH-C7 was measured at 2.0' at 1630 hrs on 03/29/01. The approximate MLLW for this area is -6.0'.</p>				

GEO-2 COAN-RIV.GPJ 7/23/01 15:48

DH-C7  
 GROUNDWATER DATA  
 WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

-  Fill
-  Auger
-  SPT
-  RB
-  Cored
-  300 lb
-  Tubex
-  Hand
-  Fish Tail
-  Vibra Core
-  Water Jet
-  -

STA.  
 OFFSET:  
 TOP ELEV: -6.630

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6684017.000  
 E 12069095.000  
 COMPLETED: March 29, 2001  
**DH-C8**  
 1 of 1

DEPTH(ft)	(c)	(d)	(a)	(b)
1.5	Wet, very dk. gray, poorly graded SAND w/ silt and shell frags. and tr. of gravel (SP-SM)		1-1-1	
3.0	Wet, dk. reddish brown, poorly graded SAND w/ silt and shell frags. and tr. of gravel (SP-SM)		1/1.5	
	Wet, dk. grayish brown to brown, poorly graded SAND (SP)		1-1-1	
6.0			WH/1.5	
BOTTOM OF HOLE				
<p>Note: A sounding of the Coan River was performed using a weighted measuring tape prior to sampling. The depth of water at drill site DH-C8 was measured at 8.0' at 1530 hrs on 03/29/01. The approximate MLLW for this area is -7.0'.</p>				

DH-C8  
 GROUNDWATER DATA

WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

-  Fill
-  Auger
-  SPT
-  RB
-  Cored
-  300 lb
-  Tubex
-  Hand
-  Fish Tail
-  Vibra Core
-  Water Jet
-  \_

STA.  
 OFFSET:  
 TOP ELEV: -6.210

Coan River  
 Lewisetta, Northumberland County, VA  
 Phase I

N 6684165.000  
 E 12069003.000  
 COMPLETED: March 29, 2001  
**DH-C9**  
 1 of 1

DEPTH(ft)	(c)	(d)	(a)	(b)
1.5	No Recovery		WH/1.5	
3.0	Wet, pale brown & yellow, silty coarse to fine SAND w/ tr. of gravel & shell (SM)		4-3-8	
4.5	Very moist, lt. gray & lt. yellowish brown, silty coarse to fine SAND w/ tr. of gravel & shell (SM)		2-3-2	
6.0	Moist, lt. gray to brownish yellow, silty coarse to fine SAND w/ tr. of gravel & shells (SM)		5 WH-1-2	
BOTTOM OF HOLE				
<p>Note: A sounding of the Coan River was performed using a weighted measuring tape prior to sampling. The depth of water at drill site DH-C8 was measured at 7.0' at 1310 hrs on 03/29/01. The approximate MLLW for this area is -8.0'.</p>				

GEO-2 COAN-RV.GPJ 7/23/01 15:48

DH-C9  
 GROUNDWATER DATA  
 WHILE DRILLING:  
 ON COMPLETION:  
 Hr. READING:

- Fill
- Auger
- SPT
- RB
- Cored
- 300 lb
- Tubex
- Hand
- Fish Tail
- Vibra Core
- Water Jet
- \_

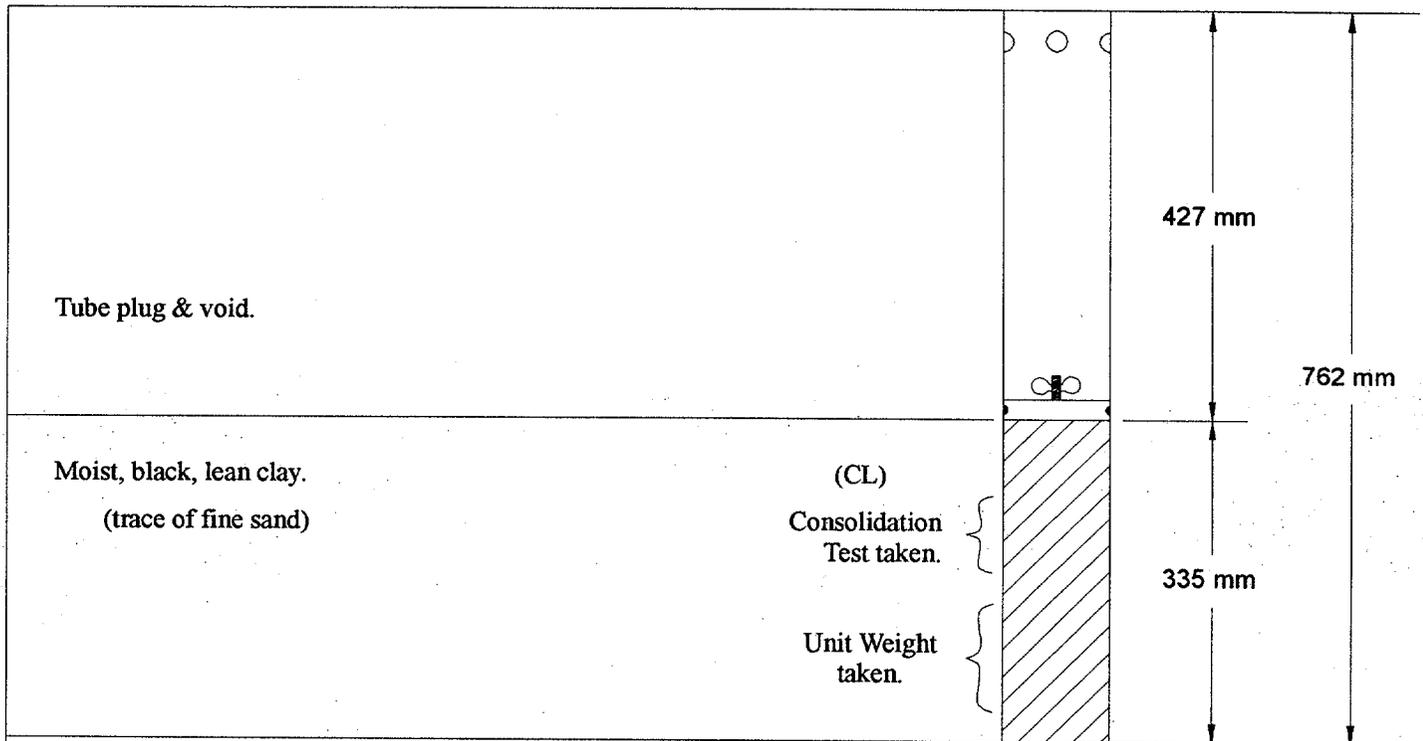
# VISUAL CLASSIFICATION

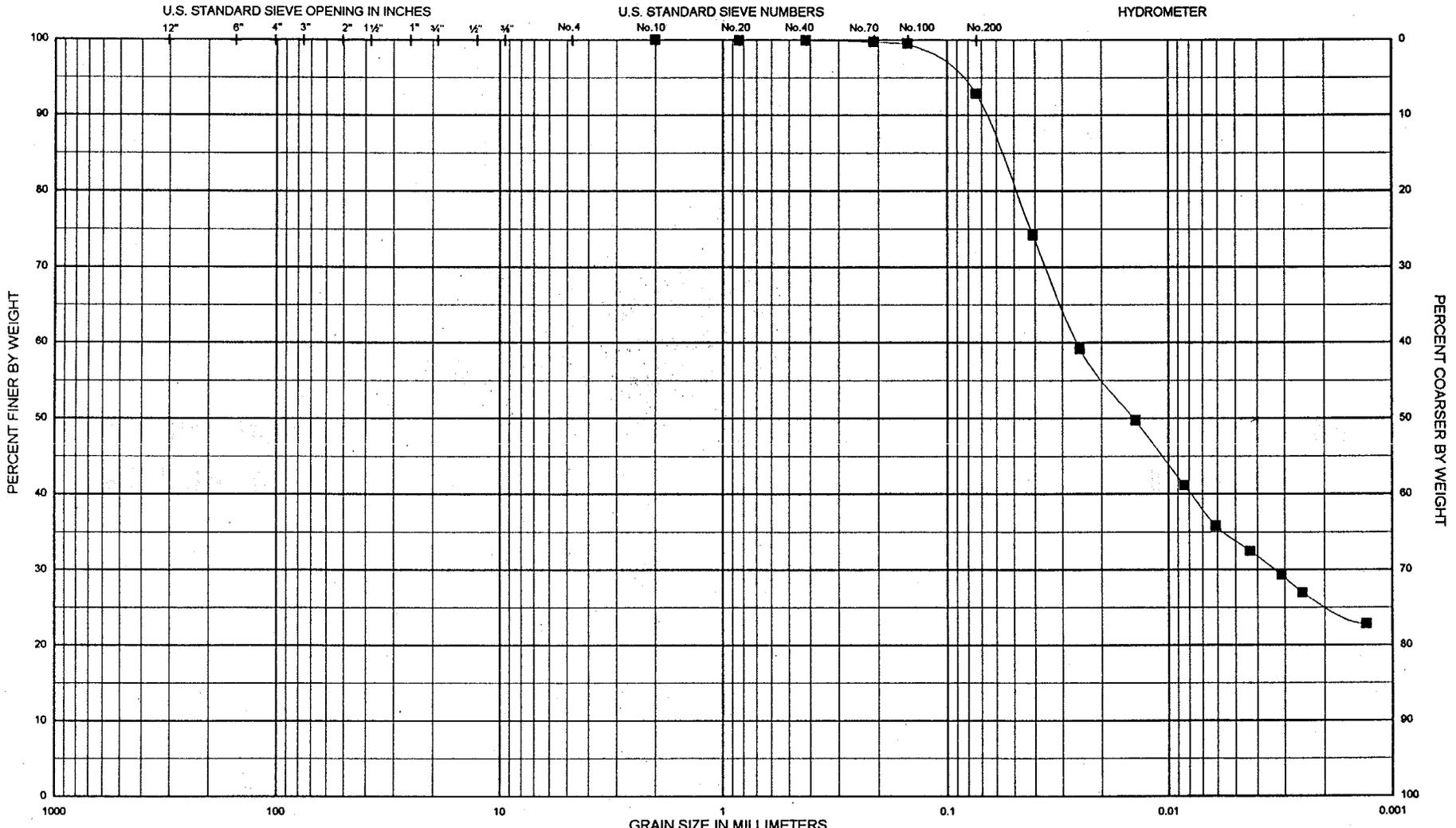
PROJECT: Coan River

DATE: Sep. 1997

AREA: Northumberland County, VA

Hole No.	Sample No.	Depth (ft)
DH-3	Shelby-1	10.0-12.0

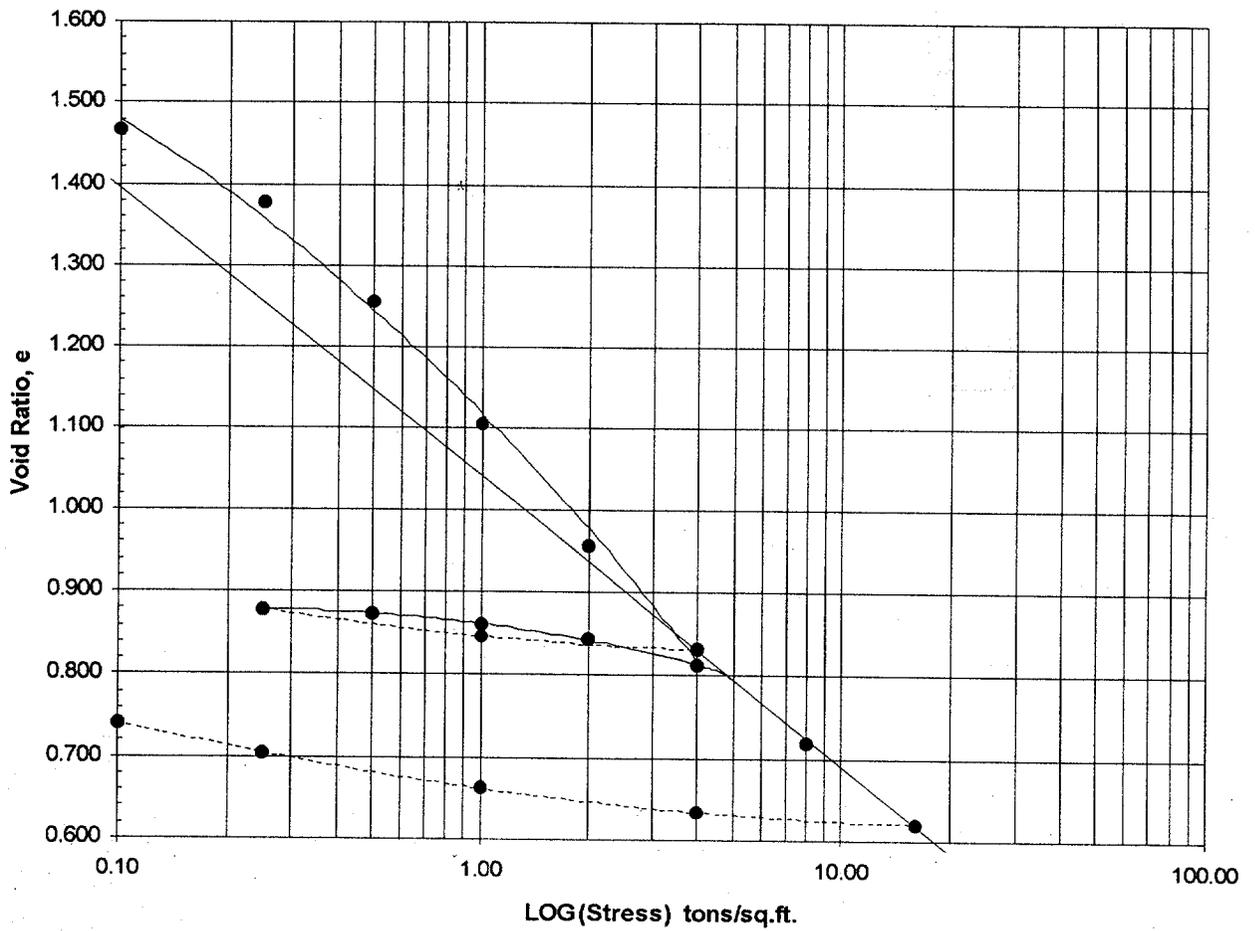




BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
—■—	Shelby-1*	10.0-12.0	Lean clay (tr. sand) (CL)	53.7	47	19	28
	"	"	* L.O.I. = 3.8% - Inorganic				

PROJECT: Coan River  
 AREA: Northumberland County, VA  
 Boring No.: DH-3 - Shelby 1  
 DATE: Sep 1997



Type of Specimen: <b>Undisturbed</b>		Before Test		After Test	
Diameter= <b>2.50</b> in.	Height= <b>0.75</b> in.	Water Content, %	$w_o$ <b>53.7</b>	$w_f$ <b>29.2</b>	
Overburden Pressure, $p_o$ =	tons/sq.ft.	Void Ratio	$e_o$ <b>1.529</b>	$e_f$ <b>0.772</b>	
Preconsol. Pressure, $p_c$ =	tons/sq.ft.	Saturation, %	$S_o$ <b>94.9</b>	$S_f$ <b>101.9</b>	
Compression Index, $C_c$ =	<b>0.352</b>	Dry Density	$\gamma_d$ <b>66.6</b>	<b>lbs./cu.ft.</b>	
Classification: <b>Moist, black, lean clay. (CL)</b> <b>(trace of sand)</b>					
LL = <b>47</b>	PL = <b>19</b>	PI = <b>28</b>	$G_s$ = <b>2.70</b>		
Remarks:		PROJECT: <b>Coan River</b>			
		AREA: <b>Northumberland County, VA</b>			
		Hole No.: <b>DH-3</b>	Sample No.: <b>Shelby-1</b>		
		Depth (ft.): <b>10.0-12.0</b>	Date: <b>Sep.1997</b>		
ENG FORM 2090		CONSOLIDATION TEST REPORT			

Estimated Settlement

Sta 6+00 (DH-3)

Depth of Sample  $\rightarrow$  Say 11.5'Assumed overburden  $(130.1 - 62.4) = 67.7$  pcf

$$(67.7)(11.5') = 779 \text{ psf} = \underline{\underline{.389 \text{ tsf}}}$$

Assumed loading

$$4.5 + 2.2 = 6.7' \text{ (assume no water)}$$

$$6.7' \times 105 \text{ pcf} = 703.5 \text{ psf} = \underline{\underline{.352 \text{ tsf}}}$$

$$P_0 + \Delta P = \underline{\underline{.741 \text{ tsf}}}$$

$$C_c = \underline{\underline{.352}} \text{ (Compression Index from test)}$$

$$\text{OR } C_c = .009(W_L - 10) = .009(47 - 10) = \underline{\underline{.333}} \text{ (skempton)}$$

$$e_0 = 1.529 \text{ (from test)}$$

Assume 40' thickness (actual unknown)

$$S = \frac{C_c}{1 + e_0} H \log_{10} \left( \frac{P_0 + \Delta P}{P_0} \right)$$

$$S = \left( \frac{.352}{2.529} \right) (40) \log_{10} \left( \frac{.741}{.389} \right)$$

$$S = (5.5674) \times \log_{10}(1.9049)$$

$$S = (5.5674)(.2799) = \underline{\underline{1.56'}} \text{ estimated settlement}$$

Try using higher plasticity CH material at depth (21')

$$C_c = .009(W_L - 10) = .009(88 - 10) = .702$$

$$P_0 = 67.7 \times 21 = 1421.7 \text{ pcf} = .712 \text{ tsf}$$

$$S = \left( \frac{.702}{2.529} \right) (40) \log_{10} \left( \frac{.712 + .352}{.712} \right)$$

↑ Assume same

$$S = (1.2776)(40) \log_{10}(1.4944)$$

$$S = (11.104)(.1745) = \underline{\underline{1.937'}}$$

Assume, for estimating purposes only, settlement from primary consolidation in 2 Feet.

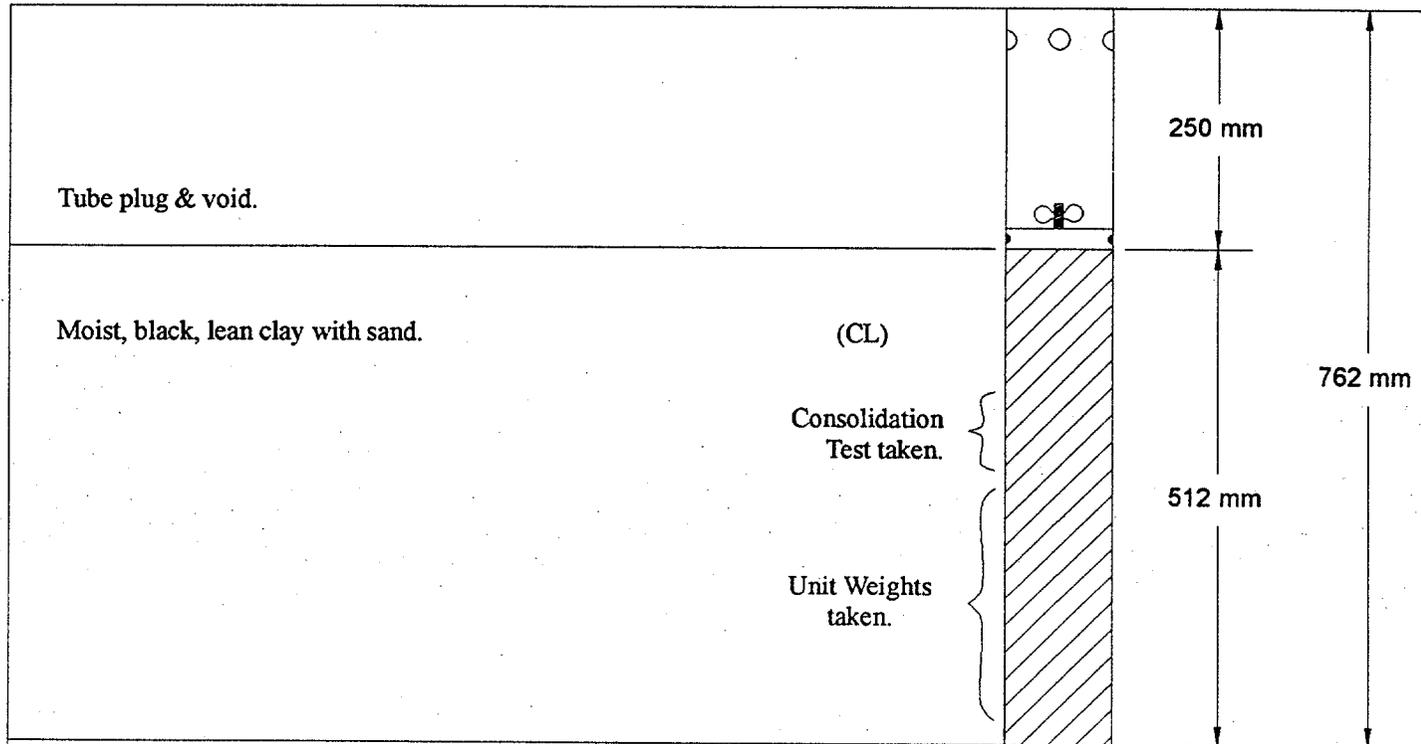
# VISUAL CLASSIFICATION

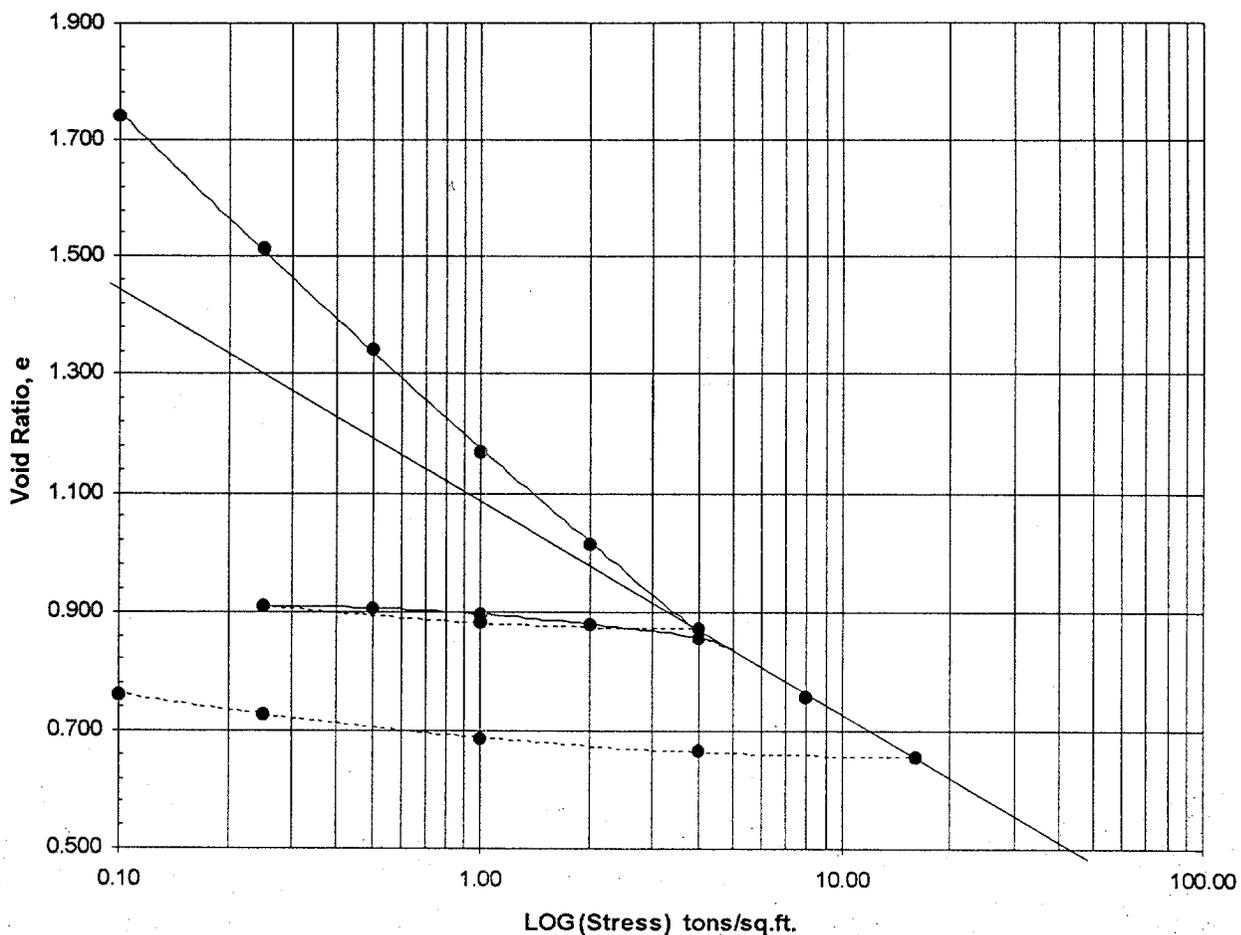
PROJECT: Coan River

DATE: Sep. 1997

AREA: Northumberland County, VA

Hole No.	Sample No.	Depth (ft)
DH-4	Shelby-1	5.0-7.0





Type of Specimen: <b>Undisturbed</b>		Before Test		After Test	
Diameter= <b>2.50</b> in.	Height= <b>0.75</b> in.	Water Content, %	$w_o$ 68.2	$w_f$ 29.9	
Overburden Pressure, $p_o$ = _____ tons/sq.ft.		Void Ratio	$e_o$ 1.861	$e_f$ 0.794	
Preconsol. Pressure, $p_c$ = _____ tons/sq.ft.		Saturation, %	$S_o$ 97.5	$S_f$ 100.3	
Compression Index, $C_c$ = <b>0.358</b>		Dry Density	$\gamma_d$ 58.0	lbs./cu.ft.	
Classification: <b>Moist, black, lean clay with sand. (CL)</b>					
LL = <b>44</b>	PL = <b>20</b>	PI = <b>24</b>	$G_s$ = <b>2.66</b>		
Remarks:		PROJECT: <b>Coan River</b>			
		AREA: <b>Northumberland County, VA</b>			
		Hole No.: <b>DH-4</b>	Sample No.: <b>Shelby-1</b>		
		Depth (ft.): <b>5.0-7.0</b>	Date: <b>Sep.1997</b>		
ENG FORM 2090		CONSOLIDATION TEST REPORT			



# VISUAL CLASSIFICATION

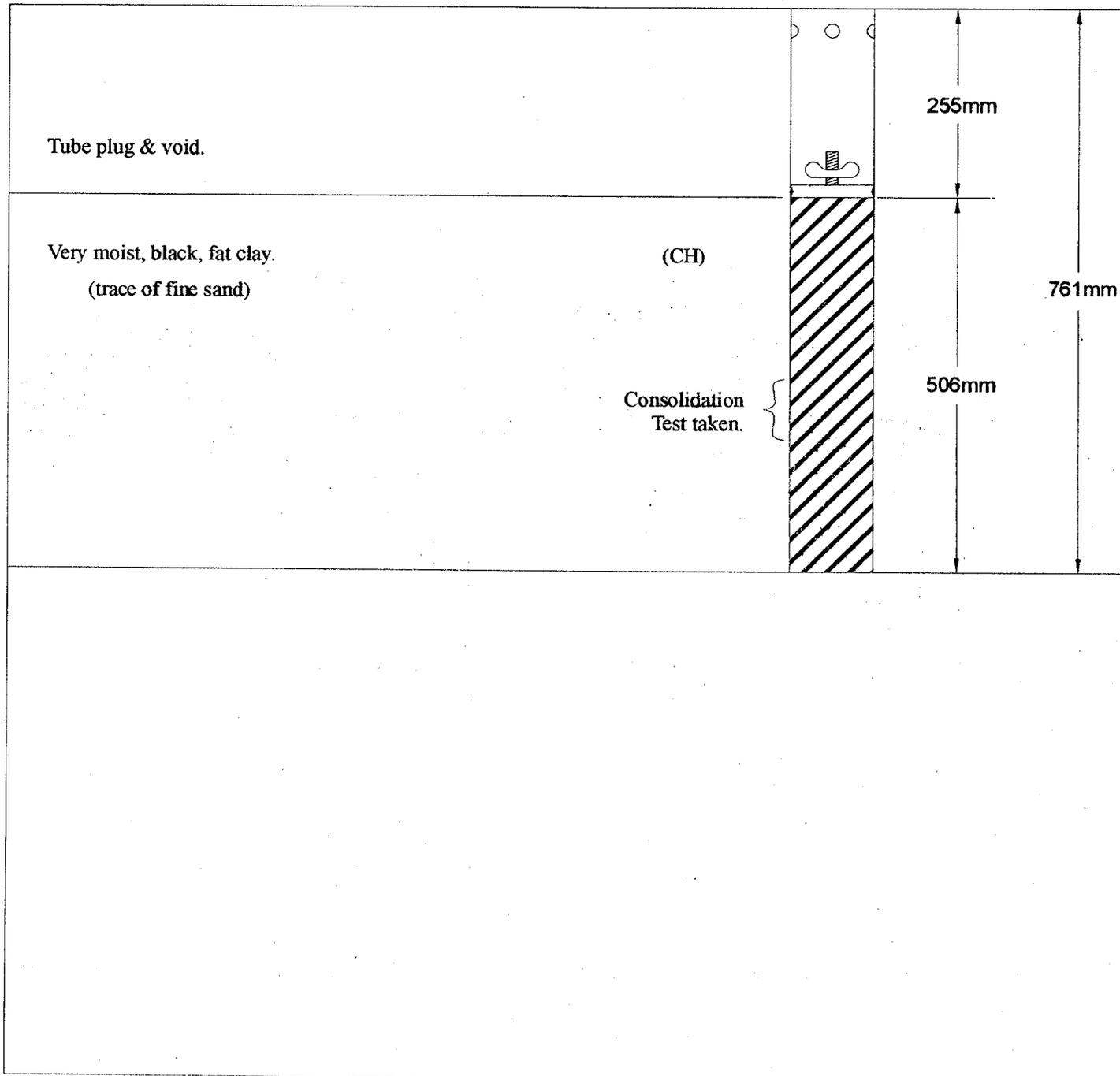
**PROJECT:** Coan River

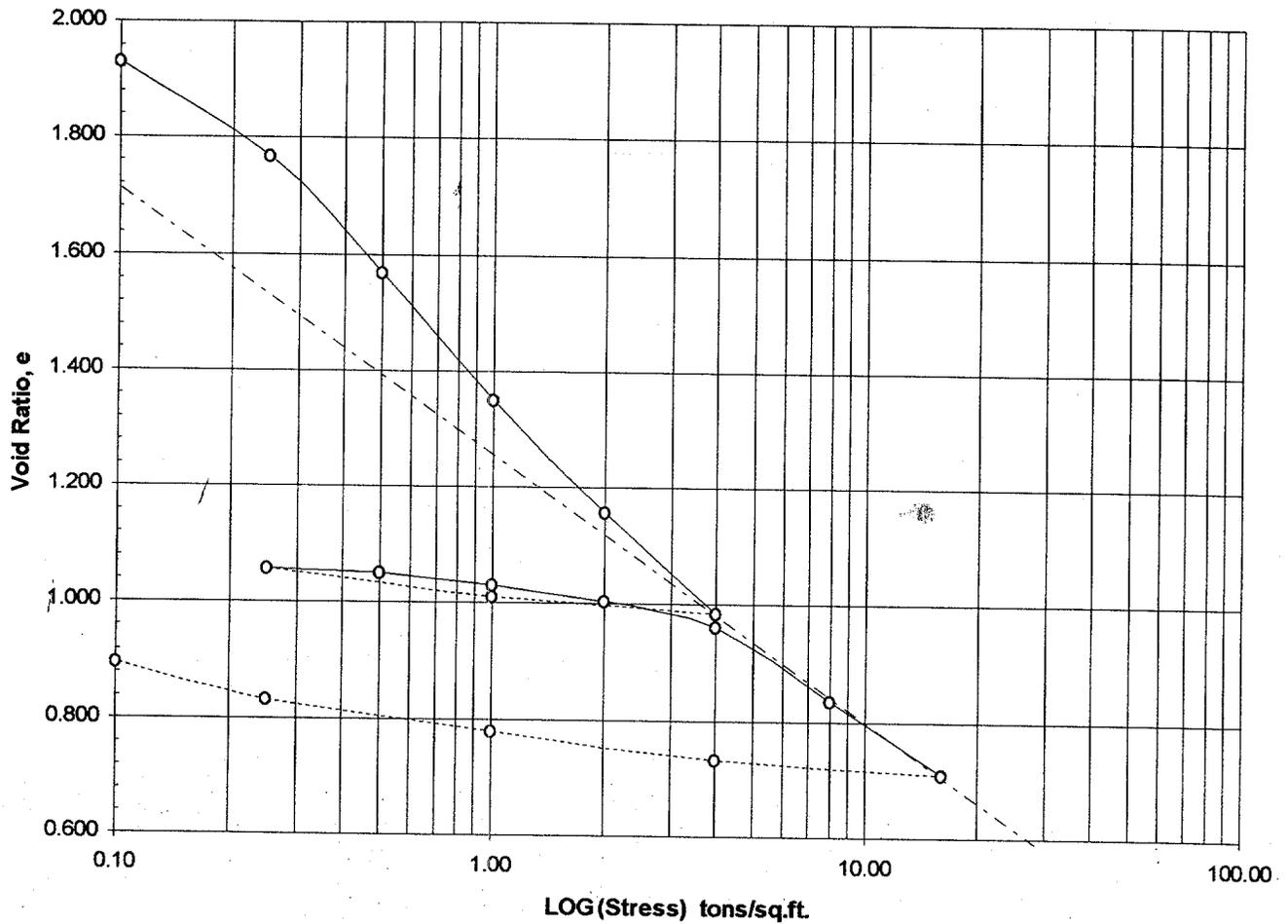
**DATE:** May 2001

**AREA:** Northumberland County, VA

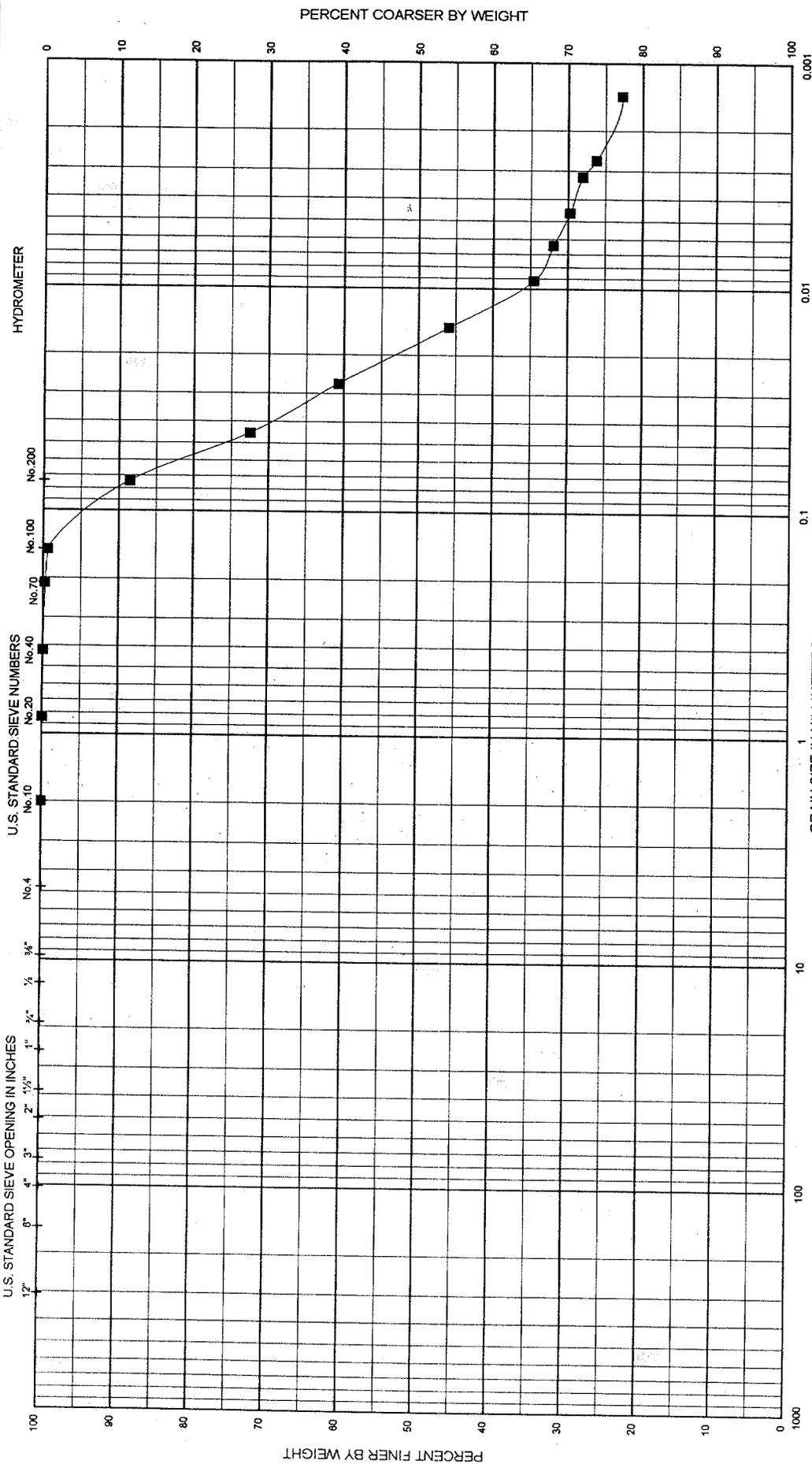
Hole No.	Sample No.	Depth (ft.)
DH-6B	Shelby-1	9.2-11.2

*check*





Type of Specimen: <b>Undisturbed</b>		Before Test		After Test	
Diameter= <b>2.50</b> in.	Height= <b>0.75</b> in.	Water Content, %	$w_o$ = <b>70.8</b>	$w_f$ = <b>34.2</b>	
Overburden Pressure, $p_o$ =	tons/sq.ft.	Void Ratio	$e_o$ = <b>1.995</b>	$e_f$ = <b>0.936</b>	
Preconsol. Pressure, $p_c$ =	tons/sq.ft.	Saturation, %	$S_o$ = <b>97.9</b>	$S_f$ = <b>100.8</b>	
Compression Index, $C_c$ =	<b>0.457</b>	Dry Density	$\gamma_d$ = <b>57.5</b>	lbs./cu.ft.	
Classification: <b>Moist, black, fat clay. (CH)</b> (trace of sand)					
LL = <b>55</b>	PL = <b>21</b>	PI = <b>34</b>	$G_s$ = <b>2.76</b>		
Remarks:		PROJECT: <b>Coan River</b>			
		AREA: <b>Northumberland County, VA</b>			
		Hole No.: <b>DH-6B</b>	Sample No.: <b>Shelby-1</b>		
		Depth (ft.): <b>9.2-11.2</b>	Date: <b>May.2001</b>		
ENG FORM 2090 (Test method: ASTM D2435)		<b>CONSOLIDATION TEST REPORT</b>			



BOULDERS		COBBLES		GRAVEL		SAND			SILT or CLAY			
	COARSE	FINE	COARSE	MEDIUM	FINE							
Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)			Nat w%	LL	PL	PI	PROJECT: Coan River		
■	Shelby-1*	9.2-11.2	Fat clay (tr. sand)			70.8	55	21	34	AREA: Northumberland County, VA		
			* L.O.I. = 3.9% - Inorganic							Boring No.: DH-6B		
										DATE: May 2001		
GRADATION CURVES												(Sieve Analysis: ASTM D422)

Estimated settlement based on DH-6 Shelby  
sample consolidation analysis.

Sta. 3+35 (DH-6)

Depth of sample say - 10.6 FT

Assumed overburden

$$\gamma_d = 57.5 \text{ lb/ft}^3$$

$$57.5 \times 10.6' = 609.5 \text{ psf} = \underline{.305 \text{ tsf}}$$

\* Assumed loading - 6.7' (assume no water)

$$6.7 \times 105 \text{ pcf} = 703.5 \text{ psf} = \underline{.352 \text{ tsf}}$$

$$P_0 + \Delta P = \underline{.657 \text{ tsf}}$$

$$C_c = \underline{.457} \text{ (Compression index from test)}$$

$$\text{or } C_c = .009 (w_L - 10) = .009 (55 - 10) = .405 \text{ (skempton)}$$

$$e_0 = 1.995 \text{ (from test)}$$

Assume 40' thickness (actual unknown)

$$S = \frac{C_c}{1 + e_0} H \log_{10} \left( \frac{P_0 + \Delta P}{P_0} \right)$$

$$S = \frac{.457}{2.995} (40) \log_{10} \left( \frac{.657}{.305} \right)$$

$$S = (6.1035) \log_{10} (2.1541)$$

$$S = (6.1035) (.3333) = \underline{2.03' \text{ say } 2'}$$

\* somewhat conservative, assumed Full jetty loading.