DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +644.9' **Hole No.** PF-107

PROJECT: Hartwell Lake | INSTALLATION: Clemson Lower Dam | SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
	30		MH-Pink micaceous silt		21		39
					22		17
				27.1	23		12
					24		43
609.4	35		SP-Brown, poorly graded sand (alluvium)		25		57
					26		48
				19.5	27		40
	40				28		28
			With wood and gravel		29		54
				31.2	30		21
	45		Spoon full of wood		31		58
			With gravel		32		58
					33		44
593.9	50				34	NOTE: Scale change	41
			Top of Rock 51.8'	%Core RECOV	35	at 55'.	100+
593.1			Granite Gneiss - Tan and brown, foliation poor to absent, moderately hard to soft and crumbly, garnetiferous, medium grained.	60		Pull 1 From 51.5' to 56.5 Run 5.0' Rec 3.0' CL 2.0'	
	55		51.8-56.9 numerous very closely spaced, open, intersecting near horizontal to high angle joints and fractures with Fe stain 51.8-53.6.	RQD 0			
	56		56.9-61.5 gray-white, moderately hard, slight weathering 57.3-57.4 20° open fracture, slightly weathered.	100			56.5
	58		58.0 near horizontal open fracture, slightly weathered. 59.1-59.7 60° open joint with Fe stain.	RQD 64		Pull 2 From 56.5' to 61.5' Run 5.0' Rec 5.0' CL 0.0'	
	60		60.9 machine break along healed fracture, "spotty", discolored				
583.9	61		Continued on Sheet 3				

DRILLING LOG (Cont Sheet) | TION TOP OF HOLE +644.9' | **Hole No.** PF-107

PROJECT: Hartwell Lake | INSTALLATION: Clemson Lower Dam | SHEET 3 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
583.9	61		Granite Gneiss-Gray-white moderately hard to soft, 61.5-63.9 slightly weahtered 63.0-63.9 several closely spaced high angle open joints, parallel, slightly weathered with Fe stain. 63.9-64.8 tan, badly weathered with numerous high angle open joints with Fe stain, broken. 64.8-66.5 tan-gray, moderately hard to soft, weathered. 65.4-66.5 numerous very closely spaced near horizontal to near vertical intersecting, open joints with Fe stain		61.1	Pull 2 continued
	62			100	BOX 2	Pull 3 From 61.5' to 66.5' Run 5.0' Rec 5.0' CL 0.0'
	64			RQD 32		
	66				66.5	
578.4			Bottom of Boring 66.5'			
	68					

Hole No. PF-110

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 7 SHEETS

1. PROJECT Clemson Lower Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 4x5½ core bbl
2. LOCATION (Coordinates or Station) Sta. 8+90, 5' Upstream of dam centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45
4. HOLE NO. (As shown on drawing title and file number) PF-110	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 18; UNDISTURBED 0
5. NAME OF DRILLER A. Padgett	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER +636.0'
	16. DATE HOLE: STARTED 5 Dec 79; COMPLETED 20 Dec 79
7. THICKNESS OF OVERBURDEN 81.0'	17. ELEVATION TOP OF HOLE +681.0'
8. DEPTH DRILLED INTO ROCK 15.5'	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE 96.5'	19. SIGNATURE OF INSPECTOR CARD SMITH

ELEVATION a	DEPTH 0 b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
681.0			SC-Dark brown, clayey, fine to medium sand, moist 1.5'	13.4	1		2 17 14
679.5	2		MH-Tannish red, clayey silt with sand, micaceous, soft, slightly moist with occasional fine to medium gravel	18.1	2		13 11 10
	4		Reddish tan, increase sand below 9.0'		3		3 8 9 7 14
	6						15 5 11 13
	8				4		8 9 9 7 14
	10			20.8	UD-6 (1)		17 3 10 13
	12		Continued on sheet 2				

Sample No	Lab Class	LL	PL	PI
2	SM	43	28	15
9	SM	38	29	9
14	SM-H	50	42	8
17	SM	NP	NP	NP
UD6(1)	SM	48	32	16
UD6(2)	SM-H	54	34	20
UD6(3)	SM-H	54	37	17

DRILLING LOG (Cont Sheet) ION TOP OF HOLE +681.0' **Hole No.** PF-110

PROJECT Clemson Lower Dam | INSTALLATION Hartwell Lake | SHEET 2 OF 7 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
			MH-Reddish tan, clayey silt with sand, micaceous, slightly moist				6 13 17 5 9 14 12 17 22 11 15 17 10 12 20 5 11 14 5 11 14 7 12 17 9 13 18 8 14 20 11 19
	14						
			Tannish red below 15.0'	22.1	5		
	16						
	18						
	20				6		
	22						
				24.9	UD-6 (2)		
	24			20.1	7		
	26						
			Soft 27.0'-30.0'				
	28						

Continued on sheet 3

DRILLING LOG (Cont Sheet)	ION TOP OF HOLE +681.0'	Hole No. PF-110
PROJECT Clemson Lower Dam	INSTALLATION Hartwell Lake	SHEET 3 OF 7 SHEETS

ELEVATION a	DEPTH 28	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
			MH-Tannish red, clayey silt with sand, micaceous, slightly moist				12
							4
							4
							8
	30				8		4
							13
							18
							11
	32						10
							17
							11
							15
	34			17.3	9		17
			Mottled tan, pink, and red below 34.5'				12
							14
							19
	36						10
							16
							23
							10
	38						18
							26
							14
					10		14
	40						15
							13
							15
							17
	42						9
							16
							14
							8
	44						

Continued on sheet 4

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +681.0' | **Hole No.** PF-110

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 4 OF 7 SHEETS

ELEVATION a	DEPTH 44b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
			MH-Mottled tan, pink, and red, clayey silt with sand, micaceous, slightly moist				12 17 8 14
	46				11		15 10 15 20
	48						11 18 21
			Thin Kaolinitic seams 49.5'-51.0'	20.2	12		12 17 20
	50			30.0	UD-6 (3)		10 17 22
	52						11 16 20
	54				13		13 13 17 12
	56						15 20 13 16
	58						17 15 18 22
	60		Continued on sheet				

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +681.0' **Hole No.** PF-110

PROJECT Clemson Lower Dam | INSTALLATION Hartwell Lake | SHEET 5 OF 7 SHEETS

ELEVATION a	DEPTH	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
	60						14
				22.4	14		17
							20
							16
	62						17
							23
			Very sandy, wet 63.0'-66.0'				9
							12
	64						19
							11
							13
					15		18
	66						10
							14
							20
							11
	68						12
							17
							10
					16		17
	70		Mottled tan, purple and red				27
							11
							16
							26
	72						12
							17
608.0'			SP-Tan-brown, fine to medium, poorly graded sand, micaceous with silt and thin dark gray MH seams, wet	15.4	17		75
	74						58
							45
							27
							38
							21
	76						

Continued on sheet 6

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +681.0' | **Hole No.** PF-110

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 6 OF 7 SHEETS

ELEVATION a	DEPTH 76	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
			SP-Tan-brown, fine to medium, poorly graded sand, micaceous with silt and thin dark gray MH seams, wet				23
							12
							14
							15
	78						11
							11
						Splitspoon Refusal 80.0'	14
							100
601.0	80		GP-Poorly graded, medium to coarse gravel with sand, rounded	0%	BOX	Pull 1 From 80.0' to 85.0' Run 5.0' Rec 0.0' CL 4.0' NOTE: Cored slowly from 80.0' to 81.0' as in hard rock - Cored rapidly 81.0'-85.0' as in soft rock.	
600.0			Top of Rock 81.0'				
	82			RQD 0			
	84			84 55%			85.0'
						Pull 2 From 85.0' to 89.0' Run 4.0' Rec 2.2' CL 1.8'	
	86		86.8'-91.7' Granite Gneiss-Tannish gray and green, very micaceous with weathered garnets, foliation poor to absent, badly weathered.	RQD 55	BOX 1	NOTE: Approximately 1.0 of gravel on top of core on this pull.	
	88		86.8'-88.6' soft to very soft with crumbled zones. 88.6'-88.8' moderately hard with 45° open joint, weathered (88.6'-89.0')	89%		Pull 3 From 89.0' to 93.5' Run 4.5' Rec 4.0' CL 0.5'	
	90		88.8'-91.7' very soft to soft with crumbled zones. 91.7'-93.3' Quartz-Feldspar (Pegmatite) very hard. 88.6' Approx Top of Firm Rock	RQD 38			
589.0	92						

Continued on sheet 7

DRILLING LOG (Cont Sheet)	ION TOP OF HOLE +681.0'	Hole No. PF-110
PROJECT Clemson Lower Dam	INSTALLATION Hartwell Lake	SHEET 7 OF 7 SHEETS

ELEVATION a	DEPTH 92	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
589.0'			Quartz-Feldspar Pegmatite 92.1-93.1' Numerous very closely spaced near horizontal open joints with heavy Fe stain and slightly clayey, reddish tan silt and sand fillings.	93.0' 77%	BOX 1	Pull 3 continued 93.5'
	94		93.3'-95.3' Granite Gneiss greenish-gray, very micaceous, very hard, solid, fresh.	RQD 100 95.3'	2	Pull 4 From 93.5' to 96.5' Run 3.0' Rec 2.3' CL 0.7' NOTE: 95.3'-96.5' left in hole.
	96		94.0'-94.7' and 95.3' near horizontal fractures along mineralized seams, fresh			
584.5'			Bottom of Boring 96.5'			NOTE: A piezometer 2.0' long with 2" OD was set (bottom) at 91.2' in this boring and casing pulled.

Hole No. PF-110-A

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION CLEMSON, S.C.	SHEET 1 OF 4 SHEETS

1. PROJECT: CLEMSON LOWER DIVERSION DAM
2. LOCATION (Coordinates or Station): STA. 9+00 8.5' LEFT OF CONCRETE WALL
3. DRILLING AGENCY: SAVANNAH DISTRICT
4. HOLE NO. (As shown on drawing title and file number): PF-110-A
5. NAME OF DRILLER: C. D. JUSTISS
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 80.2'
8. DEPTH DRILLED INTO ROCK: 13.7'
9. TOTAL DEPTH OF HOLE: 93.9'
10. SIZE AND TYPE OF BIT: 1 3/8" ID SPLITSPOON 4x5 1/2 CORE BBL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 16; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 2
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 9-NOV-1982; COMPLETED 15-NOV-82
17. ELEVATION TOP OF HOLE: + 675.9'
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: Marden Delano (GEOLOGIST)

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
+ 675.9'	0'		RIP-RAP			NOTE: USED 4x5 1/2 STARTER BARREL TO CORE THROUGH SURFACE RIP-RAP.	
	5'						
			SM-ORANGE, FINE GRAINED, VERY MICACEOUS, DRY, SILTY SAND		1		17, 14
	10'		PINK, ABUNDANT CLAYS				17
			FINE GRAINED GRAVELS				21
			GREENISH BROWN, FINE TO MEDIUM GRAINED		2		28, 27
	15'		SC-PINK AND ORANGE, FINE TO MEDIUM GRAINED, CLAYEY SAND.		3		12
					4		19
			SM-PINK, FINE GRAINED, VERY MICACEOUS SILTY SAND.				21
	20'				5		30
			SC-RED AND YELLOW, FINE TO MEDIUM GRAINED, MICACEOUS CLAYEY SAND WITH SILTS.				30, 26
			VERY CLAYEY				
	25'		SM-GRASSY BROWN, FINE GRAINED, VERY MICACEOUS, DRY, SILTY SAND WITH MINOR GRAVELS AND ORANGE CLAYEY SEAMS		6		30, 25, 25, 41
645.9'	30'		CONTINUED ON SHEET # 2				

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +675.4' | Hole No. PF-110-A

PROJECT: CLEMSON LOWER DIVERSION DAM | INSTALLATION: CLEMSON, S.C. | SHEET 2 OF 4 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
+645.4'	36'	c	d	e	JAR	g	
			SM - BRASSY BROWN. FINE GRAINED, MICACEOUS SILTY SAND WITH CLAYEY LENSES AND KAOLINITIC POCKETS.		7		44
							43
							30
	35'						25
			BRASSY BROWN AND PINK		8		31
							30
	40'						24
							25
			VERY MICACEOUS		9		24
	45'						30
			FINE TO MEDIUM GRAINED				25
							28
			BROWN, FINE GRAINED, SLIGHTLY PLASTIC WITH MINOR BLACK AND WHITE SPECKLED SOFT GRANITE GNEISS SAPROLITE GRAVELS.		10		40
	50'						37
							27
							31
	55'				11		32
							30
							33
							33
	60'		BANDED YELLOW, ORANGE, RED, WHITE, WITH LARGE, BADLY WEATHERED PLATEY MICAS.		12		30
							35
							33
	65'						29
					13		32
							60
+606.9'			SM - GREEN. FINE TO MEDIUM GRAINED LOOSE SILTY SAND				
+605.4'	70'				14		80
			CONTINUED ON SHEET # 3				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE + 675.4' | Hole No. PF-110-A

PROJECT: CLEMSON LOWER DIVERSION DAM | INSTALLATION: CLEMSON, S.C. | SHEET 3 OF 4 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
+605.4'	70'	c	d	e	JAR	g	
			SM-GREEN, FINE TO MEDIUM GRAINED, LOOSE, SILTY SAND				60
							32
			MINOR QUARTZ GRAVELS			NOTE: SCALE CHANGE AT 75.0'	33
	75'		GREEN AND BROWN, WITH ABUNDANT QUARTZ GRAVELS.		15	NOTE: USING 5" ROCK BIT TO OPEN HOLE BELOW 77.0' DUE TO EXCESSIVE GRAVELS.	70
	77'						84
	79'		MINOR SAPROLITIC GRAVELS			NOTE: SPLIT SPOON REFUSAL AT 80.2' SET 6" CASING TO 79.9' AND STARTED CORING AT 80.2'	100
			GRANITE GNEISS SAPROLITE (SM) - WHITE, BROWN, BLACK, FINE TO COARSE GRAINED, SILTY, MICACEOUS, FRIABLE.	100	16	PULL #1 FROM 80.2' TO 80.7' RUN 0.5' REC 0.5' NOTE: THIS CORE SAMPLE WAS DIVIDED IN HALF BY A WELL DEFINED ARCHED CONTACT OF DIAMETER LARGER THAN THAT OF THE CORE BBL. ARC WAS FILLED WITH QUARTZ AND GNEISS GRAVELS, SANDS, SILTS, AND CLAYS. MATERIAL WAS WELL PACKED.	100/.2
	81'		YELLOW AND GOLD, BADLY WEATHERED, VERY FRIABLE				
			ML-GREENISH GRAY, SOFT, SLIGHTLY PLASTIC LEAN SILT	100 RQD 0%			
	83'		GRANITE GNEISS SAPROLITE (SM) - BRASSY BROWN, FINE TO COARSE GRAINED, BADLY WEATHERED, REMNANT FOLIATION, COMPLETELY BROKEN DURING REMOVAL.		BOX 1		
	85'		PEPPERED BLACK AND WHITE. TOP OF FIRM ROCK - 85.5'				
			GRANITE GNEISS - MUD STAINED, FINE TO COARSE GRAINED, SLIGHTLY WEATHERED, MODERATELY HARD, HORIZONTAL FOLIATION	100 RQD 93.5%		PULL #2 FROM 80.7' TO 85.2' RUN: 4.5' REC 4.5' NOTE: SCALE CHANGE AT 85.0'	
	86'		85.9 - NEAR HORIZONTAL JOINT 86.4 - HARD, FRESH, HORIZONTAL JOINT.			PULL #3 FROM 85.2' TO 89.8' RUN 4.6' REC 3.9' C.L. 0.7'	
	87'		86.9 - FINE TO MEDIUM GRAINED HORIZONTAL JOINT.				

CONTINUED ON SHEET # 4

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +675.4' | Hole No. PF-110-A

PROJECT: CLEMSON LOWER DIVERSION DAM | INSTALLATION: CLEMSON, S.C. | SHEET 4 OF 4 SHEETS

ELEVATION a	DEPTH 88.0'	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			GRANITE GNEISS - WHITE WITH BLACK FOLIATION. FINE TO MEDIUM GRAINED, HARD, FRESH			PULL # 3 - CONT. NOTE: CORE LOSS WAS "STUMP" LEFT IN BOTTOM OF HOLE.
	88'		87.0' - HEALED JOINT 87.4' TO 87.9' - MUD STAINED WITH OPEN JOINT AT 87.6'. 88.7' - 55° OPEN JOINT			NOTE: RQD CALCULATED USING RUN DEPTHS AND RECOVERY OF "STUMP" ON PULL #4.
	89'		89.2' - HORIZONTAL JOINT.		BOX 2	
			89.6' - HEALED HORIZONTAL JOINT.			
	90'		89.9 TO 90.1 - QUARTZ PEGMATITE. 90.4 TO 90.5 - QUARTZ PEGMATITE.			PULL # 4 FROM 89.8' TO 93.9 RUN 4.1' REC 4.7' C.L. 0.0' NOTE: RECOVERED 0.7' "STUMP" FROM PREVIOUS PULL (#3).
	91'		91.0' - 65° OPEN JOINT	100 RQD 78%		0.1' OF JOINTED ROCK FELL OUT OF BOTTOM OF CORE BBL.
	92'		92.1' TO 92.8' - 65° OPEN JOINTS INCLINED TO EACH OTHER AT 40°.			NOTE: RQD CALCULATED USING RUN DEPTHS.
	93'		93.7' - NEAR HORIZONTAL JOINT INTERSECTING WITH 45° JOINT			
			BOTTOM OF HOLE: 93.9'.			

Hole No. PF-116

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 2 SHEETS

1. PROJECT	Clemson Lower Dam
2. LOCATION (Coordinates or Station)	Sta 6+48 offset 235' DS of Dam centerline
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	PF-116
5. NAME OF DRILLER	A. L. Padgett
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	30.5'
8. DEPTH DRILLED INTO ROCK	4.9'
9. TOTAL DEPTH OF HOLE	40.4'
10. SIZE AND TYPE OF BIT	1 3/8" ID splitspoon & 4x5½ core bit
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 45
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 5 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	1
15. ELEVATION GROUND WATER	+624.9+
16. DATE HOLE	STARTED 16 Jan 80 / COMPLETED 1 Feb 80
17. ELEVATION TOP OF HOLE	+627.9+
18. TOTAL CORE RECOVERY FOR BORING	61 %
19. SIGNATURE OF INSPECTOR	CARD SMITH (Geologist)

ELEVATION a	DEPTH 0 b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
627.9			SM-Brown-tan, silty fine to medium silty sand with roots and SC pockets, micaceous, wet		1		2
624.9						W. T. 3.0' Date 16 Jan 80 Depth to water during drilling.	8
			SC-Dark brown, fine to medium clayey sand, moderately stiff with occasional gravel. -large rocks (6") below 4.5.		2		3
	5						25
						NOTE: Rock bitted through large boulders 7.5 to 10.5.	50
617.4	10			27.6	3		4
			MH-Dark greenish-brown, clayey silt with some sand, micaceous.				10
						NOTE: WH=Weight of hammer only.	WH
	15						WH
							WH
						W. T. not recorded.	WH
	20						WH
			Thin gray SM seams below 21.0.		4	Sample No / Lab Class / LL PL PI: 3 ML 47 29 18; 5 SM NP NP NP	9 8
603.9	25		SM-Dark gray, silty fine to medium sand with mica and MH seams.	43.0	5		6
							3
							11
			Granite Gneiss Saprolite with ½" size gravel below 28.5.				50
597.9	30						

Continued on Sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) | TION TOP OF HOLE +627.9± | **Hole No.** PF-116

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
597.9	30		SM-Granite Gneiss Saprolite with large gravel			NOTE: Scale change at 30.0
			Granite Gneiss - medium grained, foliation poor to absent 30.5-34.7 not recovered.	20	BOX 1	Pull 1 From 30.5 to 35.4 Run 4.9 Rec 1.0 CL 3.9
	32					NOTE: After setting casing to core, hole began making water at approximately one gal/min.
				RQD 0		NOTE: Core loss believed due to blocked bit and soft, badly weathered rock.
	34		34.7-35.4 Brownish-gray, badly weathered, soft to moderately hard.			
			35.7-35.8 30° open joint with slight Fe stain.	35.4		
	36		36.5 Near horizontal fracture along mineralized surface, fresh.	100		Pull 2 From 35.4 to 40.4 Run 5.0 Rec 5.0 CL 0.0
			37.2 Near horizontal fracture, fresh.			
	38		37.6-38.0 45° open joint, slightly Fe stained.	RQD 96		
	40		40.2-40.4 30° joint, no stain		40.4	
587.5			Bottom of Boring 40.4'			NOTE: Piezometer set with 3.0' of 2" screen and 8.7' of 3/4" pvc riser. Bottom at 34.0'.

Hole No. PF-117

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 3 SHEETS

1. PROJECT Clemson Lower Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon and 4x5½ core bbl
2. LOCATION (Coordinates or Station) Sta. 14+90 offset approx 270' DS Dam CL	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45
4. HOLE NO. (As shown on drawing title and file number) PF-117	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6; UNDISTURBED 0
5. NAME OF DRILLER A. L. Padgett	14. TOTAL NUMBER CORE BOXES 8
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER +625.6 ±
7. THICKNESS OF OVERBURDEN 33.0'	16. DATE HOLE: STARTED 21 Jan 80; COMPLETED 29 Jan 80
8. DEPTH DRILLED INTO ROCK 67.0'	17. ELEVATION TOP OF HOLE + 626.3' ±
9. TOTAL DEPTH OF HOLE 100.0'	18. TOTAL CORE RECOVERY FOR BORING 87 %
	19. SIGNATURE OF INSPECTOR CARD SMITH, Geologist

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. %	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
626.3			SM-Brown, silty fine to medium sand, slightly clayey, micaceous with roots, moist.		1		18
623.3			ML-Greenish brown silt and fine sand, micaceous with occasional organics.		2	W. T. 7.0' Date 21 Jan 80 Depth to water during drilling.	15
	5		Increase sand below 7.5'			W. T. not recorded Water table reading 24 hours after hole completed.	13
617.3							7
	10		MH-Dark green, clayey silt with fine sand, micaceous, soft -Brownish tan below 10.5'	32.8	3		2
				46.7	UD-4	NOTE: Water table 24 hours after boring began was 0.7' - depth of boring 15.0'.	4
	15		Decrease sand below 15.0'				1
							5
	20						3
							3
							4
							6
							8
							9
							7
							7
602.3	25		SM-Brown, silty, fine to medium sand, highly micaceous with SC seams -Medium to coarse sand with fine gravel below 25.5'	11.5	4		11
							9
							16
597.8			GP-Poorly graded gravel with clayey sand and silt		5		24
596.3	30		Continued on Sheet 2				

Sample No / Lab Class / LL PL PI

Sample No	Lab Class	LL	PL	PI
5	SM	NP	NP	NP
6	SM	39	28	11
UD-4	ML	38	25	13

NOTE: Soils field classified in accordance with the Unified Soil Classification Systems.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) | TION TOP OF HOLE +626.3± | **Hole No.** PF-117

PROJECT Clemson Lower Dam | INSTALLATION Hartwell Lake | SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH 30	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
596.3			GP-Poorly graded gravel (continued)			38
593.3						NOTE: Due to fall-in of gravel, casing was set and coring begun. 42
			SC-Tannish-green, clayey sand with silt and badly weathered rock fragments. (Granite Gneiss Saprolite)	16.0 % CORE RECOV	6	45
590.7	35					50
			Granite Gneiss (Saprolite) very badly weathered to slightly clayey SM, very soft, crubmles when handled. 35.6-42.8 Tan-yellow 42.8-65.0 Orange-tan-yellow	96 RQD 0	BOX 1	Pull 1 From 35.6 to 40.2 Run 4.6 Rec 4.4 CL 0.2 NOTE: Large gravel (4") on top of core.
	40			100 RQD 0	43.2 2	Pull 2 From 40.2 to 45.2 Run 5.0 Rec 5.0 CL 0.0
	45			83 RQD 0	50.0 3	Pull 3 From 45.2 to 50.0 Run 4.8 Rec 4.0 CL 0.8
	50			100 RQD 0		Pull 4 From 50.0 to 55.0 Run 5.0 Rec 5.0 CL 0.0
	55			100 RQD 0	57.0 4	Pull 5 From 55.0 to 60.0 Run 5.0 Rec 5.0 CL 0.0
	60			100 RQD 0		Pull 6 From 60.0 to 65.0 Run 5.0 Rec 4.0 CL 1.0
	65		65.0-75.0 Slightly less weathered, soft with remnant near verticle joint 65.0-65.7	100 RQD 0	65.7 5	Pull 7 From 65.0 to 70.0 Run 5.0 Rec 5.0 CL 0.0
556.3	70		Continued on Sheet 3			

DRILLING LOG (Cont Sheet) | TION TOP OF HOLE +626.3± | **Hole No.** PF-117

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 3 OF 3 SHEETS

ELEVATION a	DEPTH 70	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. BOX	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
556.3			Granite Gneiss (Saprolite) very badly weathered, very soft, crumbles easily	80 RQD 0	5 73.0	Pull 8 From 70.0 to 75.0 Run 5.0 Rec 4.0 CL 1.0
	75		75.0-93.4 Tan-brown, medium to coarse grained, moderately hard to soft, badly weahtered with many very closely spaced near horizontal to near vertical open joints with Fe stain, some intersecting.	40 RQD 0	6	Pull 9 From 75.0 to 80.0 Run 5.0 Rec 2.0 CL 3.0
	80			100 RQD 0	85.0	Pull 10 From 80.0 to 85.0 Run 5.0 Rec 5.0 CL 0.0
	85			100 RQD 0	7	Pull 11 From 85.0 to 90.0 Run 5.0 Rec 5.0 CL 0.0
	90		93.4-95.0 Bluish-gray, hard moderately weathered with numberous very closely spaced near horizontal to 45° open joints, all with Fe stain. 95.0-96.8 Tan-brown moderately hard, moderately weathered with near horizontal open joints at 95.6, 96.0, 96.1, 96.7 and 96.8	100 RQD 0	92.3 8	Pull 12 From 90.0 to 95.0 Run 5.0 Rec 5.0 CL 0.0
	95		96.8-100.0 Greenish-tan, moderately hard with 45° partially healed joint with mineralization (96.8-97.1)	100 RQD 24		Pull 13 From 95.0 to 100.0 Run 5.0 Rec 5.0 CL 0.0 NOTE: Scale change at 95.0.
	97		97.2 Near horizontal open joint, no stain. 97.2-100.0 Numerous very closely spaced, partially healed to open, near horizontal joints, some slightly Fe stained.			
	99				100.0	
526.3			Bottom of Boring 100.0'			NOTE: Piexometer consisting of 5.0' of 2" screen with 88.8' of 3/4" PVC riser was set. Bottom of piezometer at 92.0'.

Hole No. PF-122

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 4 SHEETS

1. PROJECT Clemson Lower Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 4x5½ BBL
2. LOCATION (Coordinates or Station) Sta 6+77, 5.0' Upstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) PF-122	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 14; UNDISTURBED 0
5. NAME OF DRILLER A. Padgett	14. TOTAL NUMBER CORE BOXES 4
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE: STARTED 13 Dec 79; COMPLETED 27 Feb 80
7. THICKNESS OF OVERBURDEN 87.2'	17. ELEVATION TOP OF HOLE +681.0 ±
8. DEPTH DRILLED INTO ROCK 19.9'	18. TOTAL CORE RECOVERY FOR BORING 92 %
9. TOTAL DEPTH OF HOLE 107.1'	19. SIGNATURE OF INSPECTOR CARD SMITH, Geologist

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. %	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
681.0			SC-Dark gray, fine to medium clayey sand with silt, moist		1		4
679.5			SM-Tan-orange silty fine to medium sand, micaceous, some badly weathered rock fragments, slightly moist 4.5		2		7
						W. T. 13.0 Date 13 Dec 79 Depth to water during drilling.	7
676.5	5		SC-Red clayey fine to medium sand with brown ML seams, micaceous with occasional coarse sand	17.8	3		10
							3
						NOTE: This water table believed to be perched.	0
	10		Red-brown, decrease clay below 9.0'		4		1
							4
							2
			Wet below 13.5'	25.7	5	Sample No / Lab Class / LL / PL / PI: 3 SC 36 22 14; 6 SM 30 29 1; 9 SM-H 57 46 11; 13 SM NP NP NP	3
	15						5
							6
			19.5				8
661.5	20		SM-Reddish brown silty fine to medium sand, micaceous with occasional gravel, saturated	22.8	6		2
							16
							13
	25				7		7
							19
							24
651.0	30		Pockets of dark brown SC below 28.5				21

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb hammer falling 30".

DRILLING LOG (Cont Sheet) | TION TOP OF HOLE +681.0' | **Hole No.** PF-122

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 2 OF 4 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
651.0	30		SM-Red-brown silty sand with cement grout 30.0'-31.5'		8		40
649.5			MH-Tan-red clayey silt with sand, micaceous, soft with much cement grout	32.1	9		70
							31
	35		36.0				47
645.0			ML-Tannish-pink, fine sand and silt, slightly clayey, micaceous	20.4	10		36
							39
							36
	40						25
							26
							30
	45		46.5				30
634.5			MH-Red and tan clayey silt, micaceous, slightly sandy with ML seams		11		22
							25
	50						40
							37
							30
	55						28
							24
							27
			Cement grout zones 58.5-63.0		12		56
	60						29
							50
			64.0				44
617.0			SM-Tannish-gray silty fine to medium sand	21.8	13		33
	65					NOTE: Splitspoon Refusal at 68.0'.	40
			Cement grout with dark greenish gray clayey silt seams 67.5-68.0				50/0.5
611.0	70				14		
			Continued on sheet 3				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +681.0 | **Hole No.** PF-122

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 3 OF 4 SHEETS

ELEVATION a	DEPTH	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
611.0	70		SM-Tannish-gray silty fine to medium sand with MH seams and cement grout zones			NOTE: Upon splitspoon refusal rock bit was used to advance hole through grout and sand. Very resistant zone 67.5-72.0.
	75				76.4	At 76.4 core barrel was used to obtain sample from 76.4 to 81.4.
604.6			Solid cement grout 76.4-76.8		Core Box 1	
	80				81.4	NOTE: Rock bitted 81.4 to 87.2. Very resistant to rock bit at 87.2. NOTE: Set 89.5' 6" casing to begin core.
	85					87.2
593.8			GP-Poorly graded gravel, coarse 88.1			
592.9			Granite Gneiss- Brown, very badly weathered, very soft to soft, medium grained, micaceous with numerous near horizontal to 45° remnant joints	82%	BOX 2	Pull 1 From 87.2 to 92.2 Run 5.0 Rec 4.1 CL 0.9
	90			RQD 0		NOTE: Scale change at 90.0'.
	92			92.2		92.2
				72%		Pull 2 From 92.2 to 96.1 Run 3.9 Rec 2.8 CL 0.0
	94			RQD 0	94.0 BOX 3	
				95.0		
	96					96.1
						Pull 3 From 96.1 to 97.3 Run 1.2 Rec 2.3 CL 0.0
			97.6-101.5 tan-brown moderately hard to soft	97.3		Pull 4
583.0	98					

Continued on sheet 4

Hole No. PF-122 A

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 2 SHEETS

1. PROJECT Clemson ~~Upper~~ Lower Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 2 3/4 X 3 7/8
2. LOCATION (Coordinates or Station) Sta. 6+77, 15.0' Upstream of wall	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) PF-122 A	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED
5. NAME OF DRILLER D. Justiss	14. TOTAL NUMBER CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER +616.5
	16. DATE HOLE: STARTED 17 Sep 82; COMPLETED 21 Sep 82
7. THICKNESS OF OVERBURDEN 82.8'	17. ELEVATION TOP OF HOLE +675.0
8. DEPTH DRILLED INTO ROCK 5.2'	18. TOTAL CORE RECOVERY FOR BORING 64% %
9. TOTAL DEPTH OF HOLE 88.0'	19. SIGNATURE OF INSPECTOR Card Smith (Geologist)

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blows
675.0	0		No Samples taken 0'-45' Used rock bit			W.T. 58.5' Date: 17 Sep 82 Depth to water during drilling.	
			45.0		1		
635.0	45		SC-Red clayey fine to medium sand with brown ML seams, micaceous with occasional coarse sand, slightly moist.				21
							27
							22
	50						24
							29
							28
	55					Note: Embankment alluvial contact @ 58.5'.	40
							17
			58.5				38
	60		SM-Ran gray fine to medium silty sand with occasional gray MH seams micaceous, saturated		2		24
							26
			MH-Dark brown, gray clayey silt, micaceous with some fine sand.		3		7
							10
610.0	65		Continued on Sheet 2			Blows Per Foot: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".	
			Note: Soils field classified in accordance with the Unified Soil Classification System.				

DRILLING LOG (Cont Sheet) ATION TOP OF HOLE +675.0 **Hole No.** PF-122 A

PROJECT Clemson ~~Upper~~ Lower Dam | INSTALLATION Hartwell Lake | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH 65b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
610.0			MH-(Continued) 66.0		4	13
			SM-Tan brown fine to medium silty sand, micaceous, saturated with pockets of brown MH and ML.			19
						21
	70					28
						25
						44
						43
	75					26
						33
597.0			78.0		5	Note: Scale change at 80.0' 28
			GP-Poorly graded gravel up to 1 inch diameter with medium to coarse sand, micaceous, wet.			25
	80					
						100
	82					
			Some 2" gravel below 82.5			82.5
592.2			Granite Gneiss saprolite very badly weathered with numerous remnant horizontal to 45 joints. Brown and gray very soft to soft, medium grained.	16% RQD 0	Box 1	Pull 1 From 82.5' To 84.4' Run 1.9' Rec 0.3' CL 1.6'
	84			0%		Pull 2 From 84.4' To 84.8' Run 0.4' Rec 0.0' CL 0.4'
				83% RQD 0		
	86			100% RQD 0		Pull 3 From 84.8' To 86.0' Run 1.2' Rec 1.0' CL 0.1'
						Pull 4 From 86.0' To 88.0' Run 2.0' Rec 2.2' CG 0.2'
587.0	88		Bottom of Hole: 88.0'			

Note: Set 2.6' of 2" PVC screen with 88.4' of 3/4" riser. Bottom of screen at 87.5'

Note: Depth to water in piezometer on 22 Sep 82 was 17.1'.

Hole No. PF-125

DRILLING LOG	DIVISIC South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 4 SHEETS

1. PROJECT Clemson Lower Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 4x5½ core bbl
2. LOCATION (Coordinates or Station) Sta 15+08, 3' Upstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) PF-125 (CLD UD-1)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 19; UNDISTURBED 0
5. NAME OF DRILLER A. Padgett	14. TOTAL NUMBER CORE BOXES 3
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER +618.5 ±
	16. DATE HOLE: STARTED 4 Mar 80; COMPLETED 18 Mar 80
7. THICKNESS OF OVERBURDEN 88.0'	17. ELEVATION TOP OF HOLE 681.0
8. DEPTH DRILLED INTO ROCK 29.7'	18. TOTAL CORE RECOVERY FOR BORING 89 %
9. TOTAL DEPTH OF HOLE 117.7'	19. SIGNATURE OF INSPECTOR CARMEL A. JONES & CARD SMITH

ELEVATION a	DEPTH Ob	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. %	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
681.0			SM-Reddish brown, micaceous, medium to coarse grained silty sand with yellow-brown SC seams		1		28
				12.6	2		24
676.5			4.5				10
	5		SC-Red-brown to brown, clayey sand, micaceous, contains some coarse sand		3	6.0'-7.5' encountered what appeared to be perched water table.	29 47 37
	10		Red-brown, increase in mica content	17.6	4		24
			Brown				26 26
667.5			13.5				
	15		MH-Tan-brown, clayey silt, spongy, contains sand, micaceous		5	Sample No / Lab Class / LL PL PI: 2 SM 30 24 6; 4 SM-H 55 36 19; 6 MH 61 36 25; 9 CL 47 27 20; 13 CH 52 29 23; 15 ML 31 23 8; 17 SW-SM NP NP NP; 19 SM 42 28 14; UD1(1) MH 59 37 22; UD1(2) SM 41 27 14; UD1(3) CL	25 28 27 20 26 20 17
			Clay seams from 18.0'-21.0'				
	20			25.2	6		
			Tan-brown with some fine to medium sand				
			Green-brown				
	25				7		18
			Tan-brown, mottled with purple, black and yellow, contains fine gravel, some mica 28.5	26.8	UD-1 (1)		18 24
652.5			SC-Red-brown clayey sand		8		11
651.0	30						

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb hammer falling 30".

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +681.0 ± | **Hole No.** PF-125

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 2 OF 4 SHEETS

ELEVATION a	DEPTH 30	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
651.0			SC-Purple-brown with black and yellow mottling, clayey sand				18 25
			Red-brown				25
	35			20.3	9		24
			Tan-brown with pockets of green and yellow-brown, medium sand		10		20
			Red-brown to orange near 39.0' fine, micaceous				47
640.5	40		40.5			W. T. 39.5 Water table reading 48 hrs. after hole completed.	35
			MH-Tan-purple, clayey silt micaceous, fine material	22.7	11		35
			Tan-brown with some sand and occasional gravel				26 27
	45		Brown with black, yellow and purple mottling	21.3	12 UD-1(2)		26 38 38
	50		Red-brown to green-brown, micaceous, fine grained SM seams with fine gravel and SC seams	20.4	13		27 32
					14		29
	55		Purple, fine grained, micaceous				23 25 22
622.0			59.0 SM-Greenish brown, very fine silty sand, occasional organics	15.5	15		26
	60		Very fine sand, small seam of purple, dark brown material, micaceous, very wet between 61.5' and 63.0'				35 19
						W. T. 63.0 Date 18 Mar 80 Depth to water during drilling.	19
	65		Dark brown				26
			Tan brown	28.3	UD-1 (3)		17 15
611.0	70						15

Continued on sheet 3

DRILLING LOG (Cont Shee | ION TOP OF HOLE +681.0 ± | **Hole No.** PF-125

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 3 OF 4 SHEETS

ELEVATION a	DEPTH 7ft	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
611.0			SM-Tan-brown, silty sand				18
							18
							24
	75						14
							17
			Tan-brown, uniform sand, mica content increased				11
	80		Gray, fine sand with little or no fines		16		21
							5
							17
			85.5				41
595.5	85		SP-Yellow, poorly graded sand with occasional gravel	10.9	17		50
593.0			88.0				28
			Granite Gneiss-Saprolite (SC) Orange, brown, gray, medium grained, very soft to soft, crumbles easily		18		38
	90						60
							100
							79
	95			22.0	19	NOTE: Scale change at 95.0'.	80
						NOTE: Began coring at 97.3' due to splitspoon shoe left in hole.	60
							50
	97			% CORE RECOV			97.3
			97.8-97.9 near horizontal joint	96.0	BOX 1	Pull 1 From 97.3 to 102.3 Run 5.0 Rec 4.8 CL 0.2	
			98.3-98.4 near horizontal joint	RQD 0		NOTE: Plunking hole gave false reading this ~~run~~ due to fall-in.	
	99		99.0-99.1 near horizontal joint				
			100.9-101.1 45° joint				
580.0	101		Continued on sheet 4				

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +681.0 ± **Hole No.** PF-125

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 4 OF 4 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
580.0	102		Granite Gneiss Saprolite (SC) Orange, brown-gray, medium grained, very soft to soft, crumbles easily		BOX 1	Pull 1 continued 102.3
	103		103.3 mechanical break	90 RQD 0	103.9 BOX 2	Pull 2 From 102.3 to 106.3 Run 4.0 Rec 3.6 CL 0.0 NOTE: Left 105.9 to 106.3 in hole.
	105		104.3-104.5 45° angle joint; 105.4-105.7 45° angle joint	105.9		106.3
	107		108.3-108.4 near horizontal joint	50 RQD 0		Pull 3 From 106.3 to 109.3 Run 3.0 Rec 1.5 CL 1.5 NOTE: Plunking hole gave false reading due to fall-in for all successive readings below this pull. 109.3
	109		109.4-109.7 45° joint; 110.1 near horizontal joint	89 RQD 0	110.6 BOX-3	Pull 4 From 109.3 to 113.8 Run 4.5 Rec 4.0 CL 0.2 NOTE: Due to false plunk depths, core loss on this run is based on core recovered for pulls 4 and 5. 113.8
	111		112.4-113.1 3 parallel near horizontal joints			
	113			100 RQD 0	115.6	Pull 5 From 113.8 to 117.7 Run 3.9 Rec 4.2 CL 0.0 117.7
	115					
	117					
563.3			Bottom of Boring at 117.7			

Hole No. PF-125-A

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION CLEMSON, S.C.	SHEET 1 OF 2 SHEETS

1. PROJECT CLEMSON LOWER DIVERSION DAM	10. SIZE AND TYPE OF BIT 1 3/8" ±D SPLITSPOON
2. LOCATION (Coordinates or Station) STA. 15+00, 11' LEFT of CONCRETE WALL	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY SAVANNAH DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 314
4. HOLE NO. (As shown on drawing title and file number) PF-125-A	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 12; UNDISTURBED 0
5. NAME OF DRILLER C.D. JUSTISS	14. TOTAL NUMBER CORE BOXES 0
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE: STARTED 22-NOV.-'82; COMPLETED 1-DEC-'82
7. THICKNESS OF OVERBURDEN 83.0'	17. ELEVATION TOP OF HOLE + 675.5'
8. DEPTH DRILLED INTO ROCK 25.0'	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE 108.0'	19. SIGNATURE OF INSPECTOR Marcelo Delano (GEOLOGIST)

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
+675.5'	0'		RIP-RAP AND EMBANKMENT MATERIAL.			NOTE: SCALE CHANGE AT 45.0'. USED 5" ROCK BIT FROM 0.0' TO 45.0'. STARTED SPLIT-SPOONING AT 45.0'	
+630.5'	45'		SC-REDDISH-ORANGE, FINE GRAINED, MICACEOUS, CLAYEY SAND WITH SILTS.		1		35
							29
+627.5'			SM-PINK, GRASSY-BROWN, FINE GRAINED, MICACEOUS, SILTY SAND.		2		35
	50'						32
							25
			CLAYEY LENSES				32
+620.6'	55'		SM (ALLUVIAL) - GREEN, FINE GRAINED, SLIGHTLY PLASTIC SILTY SAND.		3		42
+618.5'							22
+617.0'			ML - GREENISH-BROWN, LEAN, STIFF SILT WITH ABUNDANT FINE GRAINED SANDS		4		9
	60'				5		15
							17
+614.0'			CL - GREENISH BROWN, PLASTIC, LEAN CLAY.		6		18
			SM - TAN BROWN, FINE GRAINED, VERY FAT, PLASTIC, SILTY SAND.				13
	65'						13
							13
			LESS SILTS				10
+605.5'	70'						11
			CONTINUED ON SHEET # 2				

BLOWS PER FOOT:

Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".

NOTE: Soils field classified in accordance with the Unified

LLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE: +675.5' | **Hole No. PF-125-A**

OJECT: CLEMSON LOWER DIVERSION DAM | INSTALLATION: CLEMSON, S.C. | SHEET 2 OF 2 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
+605.5'	70'	c	d	e	JAR	g	
			SM - TAN BROWN, FINE GRAINED, VERY SILTY SAND WITH MINOR CLAYS.				10
							15
							17
	75'		GREENISH GRAY, LOOSE		7		27
							26
							39
	80'		ABUNDANT QUARTZ GRAVELS		8		28
							42
+592.5'			GRANITE GNEISS SAPROLITE (SM) - BANDED YELLOW, ORANGE, WHITE, MEDIUM GRAINED, BADLY WEATHERED. SOFT. SILTY.		9		30
	85'						28
							36
							41
	90'		BROWN, YELLOW, WHITE, WITH COARSE QUARTZ GRAINS.				60
							80
			MINOR CLAYEY SEAMS		10		63
							96
	95'		VERY BADLY WEATHERED, REMNANT FOLIATION			NOTE: FISHTAILED THROUGH REMAINDER OF 100 BLOW DRIVES AND CONTINUED SPLITSPOONING.	100/.7
			LIGHT YELLOW AND WHITE				100/.8
							100/.9
	100'				11		100/.7
							100/.9
							100/.8
			LESS WEATHERED				100/.6
	105'						100/.7
+567.5'					12		100/.4
			BOTTOM OF HOLE: 108.0'				

Hole No. PF-128

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 3 SHEETS

1. PROJECT Clemson Lower Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID Splitspoon & 4x5½ core bbl
2. LOCATION (Coordinates or Station) Sta 15+08, 131.4' downstream centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL CME-75
4. HOLE NO. (As shown on drawing title and file number) PF-128	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 12; UNDISTURBED 0
5. NAME OF DRILLER Archie Padgett	14. TOTAL NUMBER CORE BOXES 2
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER 628.0
	16. DATE HOLE: STARTED 25 Mar 80; COMPLETED 27 Mar 80
7. THICKNESS OF OVERBURDEN 52.5	17. ELEVATION TOP OF HOLE 644.9
8. DEPTH DRILLED INTO ROCK 17.4	18. TOTAL CORE RECOVERY FOR BORING 88.0 %
9. TOTAL DEPTH OF HOLE 69.9'	19. SIGNATURE OF INSPECTOR CARMEL A. JONES

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. %	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
644.9			SM-Gray brown, silty sand, micaceous, medium grained, high moisture content.		1	W. T. 0.0 Date 27 Mar 80 Depth to water during drilling.	2 6 7
641.9			MH-Green brown, clayey silt, moist, micaceous.	26.5	2		15
638.9	5						
637.4			SC-Red brown, clayey sand, micaceous, fine grained.	19.6	3	W. T. 16.9 Water table reading 84 hrs. after hole completed.	21
			MH-Tan brown, clayey silt, micaceous, damp, mottled with black organics, fine sand. 9.0-10.5 contains clay seams	23.7	4 5		24 25 23 28
	10		Red brown, increase in mica	21.8	6		30
	15		Light brown, mottled with yellow	24.7 25.1	UD-5A UD-5B		25
			Red brown 18.5-19.0 clay seams present		7		27 19
623.9	20						20
622.4			SP-Gray, poorly graded sand, contains some silt & coarse gravel		8		27
			ML-Dark brown, fine sandy silt, micaceous, wet, contains some organic matter	25.6	9		15 17
	25		Brown				5 8
614.9	30		Tan brown				5

Sample No	Lab Class	LL	PL	PI
2	SM	47	41	6
3	ML	49	33	16
6	ML	48	31	17
9	SC	30	22	8
11	SP	NP	NP	NP
UD-5A	SM-H	56	34	22
UD-5B	SM	47	32	15
UD-5C	SP	NP	NP	NP

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb hammer falling 30".

DRILLING LOG (Cont Sheet) | ELEVATION ON TOP OF HOLE +644.9 ± | **Hole No.** PF-128

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH 30	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W. C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
614.9			ML-Tan brown, fine sandy silt, micaceous, wet				6
			Tan brown, mottled with gray and green				7
							7
	35		Tan brown, no mottling				15
608.9			SM-Tan brown, silty sand, micaceous, fine grained		10		18
							30
	40		Gray, medium grained sand				35
							25
				7.4	UD-5C		23
			Brown, gray, orange, coarse grained sand				25
	45					NOTE: After 48.0-49.5 drive, fishtail refused. Rock bitted to 52.5'.	30
							66
596.9			SP-Brown, gray, orange, poorly graded sand, coarse to fine grained	4.2	11		78
	50					NOTE: Scale change at 50.0'.	
						NOTE: Rock bitted 52.5 to 55.0'.	
592.4	52						100/.9
			Granite Gneiss - Orange, brown, gray, medium grained, soft to very soft with some quartz seams, crumbles easily 55.1-55.2 moderately hard zone		12		
	54			% CORE RECOV			
			55.4-55.5 near horizontal joint	92.0	BOX 1	Pull 1 From 55.0 to 60.0 Run 5.0 Rec 4.6 CL 0.2	
	56		55.7-55.8 near horizontal joint 56.0 near horizontal joint 56.2-56.4 - 45° joint	RQD 0		TD 59.8 NOTE: Left 59.8 to 60.0' in hole.	
586.9	58						

Continued on sheet 3

DRILLING LOG (Cont Sheet)	ON TOP OF HOLE +644.9±	Hole No. PF-128
PROJECT Clemson Lower Dam	INSTALLATION Hartwell Lake	SHEET 3 OF 3 SHEETS

ELEVATION a	DEPTH 58	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. BØX	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
586.9			Granite Gneiss orange, brown, gray, medium grained, soft to very soft		1	Pull 1 continued
				59.8		
	60		Gray, black, orange, tan, much more weathered, fine to medium grain	82.0		Pull 2 From 60.0 to 64.9 Run 4.9 Rec 4.0 CL 1.1
	62			RQD 0		
			62.9-63.4 - zone of moderately hard, weathered quartz		BOX 2	
	64					TD 64.9
			65.3-65.5 acute angle joint	64.9		
			65.9-66.0 - near horizontal joint 66.7-67.0 - 45° joint	90.0		Pull 3 From 64.9 to 69.9 Run 5.0 Rec 4.5 CL 0.5' NOTE: 69.4 to 69.9 left in hole.
	66					
	68			RQD 0		
				69.4		TD 69.4
575.0	70		Bottom of Boring 69.9'			NOTE: Piezometer set with 2.5' of 2" screen and 67.9' of 3/4" pvc riser. Bottom of screen at 69.0'.

Hole No. PF-131

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 2 SHEETS

1. PROJECT	Clemson Lower Dam
2. LOCATION (Coordinates or Station)	Sta. 6+20, 125' Downstream of centerline
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	PF-131
5. NAME OF DRILLER	Archie Padgett
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	38.0'
8. DEPTH DRILLED INTO ROCK	10.9'
9. TOTAL DEPTH OF HOLE	48.9'
10. SIZE AND TYPE OF BIT	1 3/8" ID splitspoon & 4x5½ core bbl
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	CME-75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 12 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	1
15. ELEVATION GROUND WATER	638.0+
16. DATE HOLE	STARTED 1 Apr 80 / COMPLETED 4 Apr 80
17. ELEVATION TOP OF HOLE	640.6±
18. TOTAL CORE RECOVERY FOR BORING	82 %
19. SIGNATURE OF INSPECTOR	CARMEL A. JONES

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. % e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
640.6			SM-Tan brown, silty sand, medium grained, organics present		1		12
637.6							30
			MH-Orange and yellow brown, clayey silt, fine sand, micaceous, SC seams present throughout	23.6	2	W. T. 8.0' Date 1 Apr 80 Depth to water during drilling.	18
	5			24.7	3		19
							22
						W. T. 2.6' Water table reading 18 hrs. after hole completed.	19
	10				4		30
629.1			ML-Orange brown, very fine clayey silt with sand	24.7	5		33
			Red, coarse grained sand present	27.6	UD8-1 6		42
			Orange brown, some mica				35
	15		Red brown with tan mottling		7		34
						Sample No / Lab Class / LL / PL / PI: 3 SM 46 38 8; 6 CH 57 30 27; 9 SM NP NP NP; 11 SC 38 24 14; UD-8 SM-H 54 40 14; UD-1 SC 28 20 8 (Bottom); UD-1 ML 45 34 11 (Top)	28
							32
	20						22
619.6			MH- Gray, brown, black, clayey silt, very micaceous	25.0	8		24
616.6							45
615.1	25		GP-Yellow gray, poorly graded gravel, little fines	12.8	9		22
			MH-Red brown, clayey silt, fine sand, micaceous		10		26
			Gray brown, some mica	29.2	11		27
610.6	30		Black, micaceous with fine grained sand	46.6 / 20.2	UD-8-2B / UD-8-2T		4

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 640.6 **Hole No.** PF-131

PROJECT Clemson Lower Dam | INSTALLATION Hartwell Lake | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
610.6	30		MH-Black, silty, micaceous, clayey silt with fine grained sand, moist at 31.0'			6 0 0
	35					NOTE: Top of rock based on splitspoon and fishtail refusal. No sample 38.0-40.0 8 NOTE: Scale change at 35.0'. 16
603.6	37		SM-Tan brown, silty fine sand		12	
			Gray and black, medium grained sand			100/0.4
602.6			Top of Rock 38.0'			NOTE: Refusal with split spoon and fishtail at 38.0' Rock bitted to 40.0' refusal with splitspoon and rock bit. Began coring
	39		Granite Gneiss - Black and gray, medium grained, very soft to very hard, foliation poor to absent	64.0	BOX 1	at 40.0. Casing set at 40.7'. Pull 1 From 40.0 to 43.9 Run 3.9 Rec 2.5 CL 1.3'
	41		40.2-40.6 near horizontal joint, badly weathered 40.9 near horizontal joint, moderate staining, clay present weathered	RQD 31		NOTE: Plunking hole showed that 0.1' left in hole.
	43		41.3-41.5 pair of parallel, near horizontal joints, some weathering, joint stained and clay present	43.8		
			41.8-42.5 near horizontal joint, very badly weathered, completely crumbled	96.0		Pull 2 From 43.9 to 48.9 Run 5.0 Rec 4.8 CL 0.3'
	45		45.2 mechanical break 46.7-46.8 three near horizontal parallel joints, clay present			
	47		48-3-48.4 45° angle joint, intersecting with 3 parallel acute angle joints between 48.4-48.8	RQD 88		
				48.6		NOTE: 48.6-48.9 left in hole - determined by plunking hole.
591.7	49		Bottom of Boring 48.9'			NOTE: Set 50.4' of piezometer with 2' of 2" screen and 48.4 of 3/4" pvc riser. Bottom of piezometer at 49.6'.

Hole No. PF-136

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 6 SHEETS

1. PROJECT: Clemson Lower Dam	10. SIZE AND TYPE OF BIT: 1 3/8" ID splitspoon & 4x5½ core bol
2. LOCATION (Coordinates or Station): Sta 22+00, 150' downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL: Failing
4. HOLE NO. (As shown on drawing title and file number): PF-136	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 12; UNDISTURBED 0
5. NAME OF DRILLER: C. L. Hall	14. TOTAL NUMBER CORE BOXES: 10
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 630.6'
	16. DATE HOLE: STARTED 9 Jul 80; COMPLETED 16 Jul 80
7. THICKNESS OF OVERBURDEN: 49.5'	17. ELEVATION TOP OF HOLE: +642.6'
8. DEPTH DRILLED INTO ROCK: 71.3'	18. TOTAL CORE RECOVERY FOR BORING: 92 %
9. TOTAL DEPTH OF HOLE: 120.8'	19. SIGNATURE OF INSPECTOR: ROBERT GREEN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% Moisture e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
642.6			SM-Brown, medium to fine grained, silty sand		1		13
639.6			3.0			Sample Lab No Class LL PL PI	16
			MH-Reddish brown, clayey silt	17.2	2	2 SM 49 36 13	16
	5		6.0' micaceous, color change to red		3	6 SP-SM NP NP NP 10 SM 26 25 1 11 SM NP NP NP 12 SM 43 35 8	19 16
							12
	10		10.5' two inch seam of orange clay		4		14
							19
						W. T. 16.5' Date 9 Jul 80 Depth to water during drilling.	18
626.6	15		16.0		5		15
			SM-Brown, medium to fine grained silty sand	13.6	6	W. T. 12.0' Water table reading 18 hrs. after hole completed.	34
623.1			19.5				29 14
	20		CH-Red to brown clay, fat, very plastic		7		13
							16
							17
	25		25.5' seams of silty sand				28 24
							27
612.6	30		30.0				25

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification Systems.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) | TION TOP OF HOLE +642.6' | **Hole No.** PF-136

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 2 OF 6 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% Moisture	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
612.6	30		MH-Tan, clayey silt		8		28 21 15
608.1			34.5				
	35		SM-Tan, medium to fine grained, silty sand 36.0' color change to red		9		14 31
605.1			37.5' color change to tan 37.5				
	40		GM-Brown, coarse grained silty gravel 41.0 seams of silty sand 42.0' decrease in amount of large cobbles 43.0' increase in clay content 43.5' color change to orange, now micaceous	12.4	10		49 50 91 53 50
	45					NOTE: Scale change at 50.0'. Casing (50.0) set at 49.5'.	83 55
			Top of Rock 49.5	15.3 10.3	11 12		97
593.1	50		Granite Gneiss-Brown, badly weathered. 49.5' to 49.7' very badly weathered. 49.7' to 50.0' closely spaced horizontal joints, brown stained.	100 RQD 0	BOX 1	Pull 1 From 49.5' to 52.5' Run 3.0' Rec 3.0' CL 0.0'	
	52		50.0' to 50.8' badly weathered rock. 50.8' to 51.1' closely spaced horizontal joints, brown stained.	100 RQD 0		Pull 2 From 52.5' to 54.7' Run 2.2' Rec 2.4' CG 0.2'	52.5
	54		51.1' to 56.6' badly weathered rock, friable. 56.6' to 56.7' layer of Biotite. 56.7' to 56.8' layer of Quartz. 56.8' to 57.1' badly weathered. 57.1' to 57.2' layer of Biotite	100 RQD 0		Pull 3 From 54.7' to 62.2' Run 7.5' Rec 7.8' CG 0.3'	54.7
	56		57.1' to 57.6' closely spaced horizontal joints, brown stained. 57.6' to 57.8' layers of Biotite. 57.8' to 58.8' badly weathered.		56.4 BOX 2		
584.6	58		Continued on sheet 3				

DRILLING LOG (Cont Sheet) | TION TOP OF HOLE +642.6' | **Hole No.** PF-136

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 3 OF 6 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
584.6	58		Granite Gneiss (continued) friable. 58.8' to 59.6' closely spaced, high angle joints, brown stained. 58.8' to 61.6' badly weathered. 60.6' to 61.4' very closely spaced horizontal with high angle joints, brown stained. 61.6' to 61.7' 3/8" Quartz vein.		BOX 2	Pull 3 continued 62.2
	60					
	62		61.7' to 64.0' bad to moderately weathered. 64.0' to 64.1' 1/2" layer of Quartz overlying a 1/8" layer of Biotite.	100	63.2	Pull 4 From 62.2' to 69.2' Run 7.0' Rec 7.0' CL 0.0'
	64		64.1' to 64.3' bad to moderately weathered. 64.3' to 64.5' layer if Biotite. 64.5' to 65.4' bad to moderately weathered.	RQD 0	BOX 3	
	66		64.7' to 65.1' closely spaced horizontal joints, brown stained. 65.4' to 65.6' layer of Biotite. 65.6' to 68.0' bad to moderately weathered.			
	68		66.8' to 68.0' closely spaced horizontal and high angle joints, brown stained. 68.0' to 69.2' very badly weathered.	68		69.2 Pull 5 From 69.2' to 77.0' Run 7.8' Rec 5.3' CL 2.5'
	70		69.2' to 69.4' vein of Quartz. 69.4' to 70.0' very closely spaced horizontal joints, brown stained. 69.4' to 69.7' bad to moderately weathered.	RQD 54	70.6 BOX 4	
	72		69.7' to 69.8' two 3/8" layers of Biotite. 69.8' to 70.6' moderately weathered. 70.6' to 76.9' slight to moderately weathered.			
568.6	74		Continued on sheet 4			

DRILLING LOG (Cont Sheet) | TION TOP OF HOLE +642.6' | **Hole No.** PF-136

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 4 OF 6 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
568.6	74		Granite Gneiss (continued) 71.3' to 72.2' close spaced horizontal joints, slight brown stains. 73.0' to 74.3' nearly horizontal close spaced joints, slight brown stains. 76.9' to 77.0' 3/8" Biotite layer overlying 1/2" Quartz vein.		BOX 4	Pull 5 continued 77.0
	76		77.0' to 77.7' slight to moderately weathered rock. 77.7' to 77.8' 1/2" Quartz vein. 77.8' to 80.1' slight to moderately weathered. 77.3' to79.8' very closely spaced horizontal joints, brown stained.	61 RQD 29		Pull 6 From 77.0' to 84.0' Run 7.0' Rec 4.3' CL 2.7'
	78					
	80		80.1' to 81.0' slight to moderately weahtered. 80.1' to 81.0' closely spaced horizontal joints, brown stained.		80.1 BOX 5	
	82		81.0' to 84.0' core loss.			84.0
	84		84.0' to 86.0' highly fractured, bad to moderately weathered. 86.0' to 89.2' slight to moderately weathered. 87.0' to 88.7' healed vertical joint.	100 RQD 40		Pull 7 From 84.0' to 91.0' Run 7.0' Rec 7.1' CG 0.1'
	86		88.9' to 89.2' Biotite layer. 89.2' to 91.0' highly fractured, slight to moderately weathered. 91.0' to 91.8' slight to moderately weathered.			
	88		91.8' to 91.9' Biotite layer. 91.9' to 96.7' slight to moderately weathered. 92.5' to 93.3' very closely spaced vertical joints.			
552.6	90					

Continued on sheet 5

DRILLING LOG (Cont Sheet) | TION TOP OF HOLE +642.6' | **Hole No.** PF-136

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 5 OF 6 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
552.6	90		Granite Gneiss (continued)		90.3	Pull 7 continued
			94.3' to 96.3' closely spaced horizontal joints, slight brown stains.		BOX 6	
			96.7' to 99.1' slight to moderately weathered.	100		Pull 8 From 91.0' to 101.0' Run 10.0' Rec 10.0' CL 0.0'
	92		98.6' to 98.9' closely spaced horizontal joints, brown stained.	RQD 79		
			99.1' to 99.8' Quartz vein.			
			99.8' to 100.4' Biotite predominate.			
	94		100.4' to 101.0' highly fractured, bad to moderately weathered.			
			101.0' to 102.6' Biotite predominate.			
	96		101.6' to 102.5' vertical joint.			
			102.6' to 103.5' slight to moderately weathered.		96.7	
			103.5' to 104.0' Biotite.		BOX 7	
			103.7' to 103.8' Quartz vein 3.8" thick.			
	98		104.0' to 104.4' slight to moderately weathered.			
			104.4' to 105.1' Biotite predominate.			
			105.1' to 105.3' Quartz vein.			
	100		105.3' to 111.0' Biotite predominate, slight to moderately weathered.			
			111.0' to 111.2' Quartz vein.			
			111.2' to 117.9' slight to moderately weathered.	96 RQD 82		Pull 9 From 101.0' to 111.0' Run 10.0' Rec 9.6' CL 0.4'
	102		111.5' to 113.8' Biotite predominate.			
			113.8' to 117.9' Quartz predominate.			
			114.2' to 117.9' very closely spaced vertical and high angle joints, some healed, some stained.		104.0	
	104		117.9' to 120.4' slight to moderately weathered rock, very closely spaced, vertical joints, some brown stained.		BOX 8	
536.6	106					

Continued on sheet 6

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +642.6' | **Hole No.** PF-136

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 6 OF 6 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
536.6	106					Pull 9 continued
	108					
	110					
					111.0	111.0
				96	BOX 9	Pull 10 From 111.0' to 120.8' Run 9.8' Rec 9.5' CL 0.3'
	112			RQD 83		
	114					
	116					
					117.9	
	118				BOX 10	
	120					
521.8			Bottom of Boring 120.8'			NOTE: Depth indicated for pressure test is depth of bottom of packer.

Pressure Test:

Depth	Air Pressure	Water Pressure	Water Taken (gal)
53.0	96	40	145
58.0	96	40	31
63.0	94	40	0

Hole No. PF-139

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 5 SHEETS

1. PROJECT Clemson Lower Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 4x5½ core bbl
2. LOCATION (Coordinates or Station) Sta 22+00, 284' downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) PF-139	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 9; UNDISTURBED 0
5. NAME OF DRILLER C. L. Hall	14. TOTAL NUMBER CORE BOXES 6
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER 627.7
	16. DATE HOLE: STARTED 17 Jul 80; COMPLETED 22 Jul 80
7. THICKNESS OF OVERBURDEN 39.0'	17. ELEVATION TOP OF HOLE +632.2
8. DEPTH DRILLED INTO ROCK 43.0'	18. TOTAL CORE RECOVERY FOR BORING 93 %
9. TOTAL DEPTH OF HOLE 82.0'	19. SIGNATURE OF INSPECTOR ROBERT GREEN

ELEVATION a	DEPTH 0 b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% Moisture e	BOX OR SAMPLE NO. JAR f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
632.2			SM-Brown, medium to fine grained, silty sand, organics. 3.0' micaceous	3.3	1		24 15
627.2	5		5.0			W. T. 6.0' Date 17 Jul 80 Depth to water during drilling.	16
625.7			MH-Dark gray, clayey silt 6.5		2		2 7
			CH-Tan clay		3	W. T. 4.5' Water table reading 24 hrs. after hole completed.	10
621.7	10		10.5				16
			MH-Tan, clayey silt		4		17
				24.3	5	Sample No / Lab Class / LL PL PI: 1 SM 32 28 4; 5 ML 35 25 10; 9 SP-SM NP NP NP	21 19
	15		15.5' seams of gray MH				14
			18.5' color change to gray 19.5' micaceous				20 11
	20		24.0				7
608.2			SM-Brown to orange, medium to fine grained, silty sand 25.0' some gravel				8 13
606.7	25		25.5				42
			GM-Brown, medium to coarse grained silty gravel 27.0		6		56
605.2			SM-Brown to red, medium to fine grained silty sand		7 8		39 62
602.2	30						

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +632.2 | **Hole No.** PF-139

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 2 OF 5 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% Moisture	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
602.2	30		SM (continued)				72
			31.5' seams of white SM				86
							67
	35		34.5' micaceous				64
						NOTE: Scale change at 50.0'.	85
593.2			Top of Rock 39.0'	16.6	9		50
	40		Granite Gneiss 39.0' to 44.3' brown, very badly weathered, very soft	94	BOX 1	Pull 1 From 39.0' to 44.0' Run 5.0' Rec 4.7' CL 0.3'	
				RQD 0			
	42						
							44.0
	44		44.3' to 45.8' brown, badly weathered, soft	93		Pull 2 From 44.0' to 48.0' Run 4.0' Rec 3.7' CL 0.3'	
			45.1' to 45.8' high angle joint, brown stained	RQD 0			
			45.8' to 54.6' brown, very badly weathered, very soft				
	46						
					46.8 BOX 2		
							48.0
	48		48.5' to 49.0' vein of Quartz	96		Pull 3 From 48.0' to 53.0' Run 5.0' Rec 4.8' CL 0.2'	
			49.0' to 50.0' very closely spaced horizontal joints, brown stained	RQD 0			
	50		51.0' to 52.0' closely spaced horizontal joints, brown stained				
580.2	52						

Continued on sheet 3

DRILLING LOG (Cont Sheet) | ION TOP OF HOLE | **Hole No.** PF-139

PROJECT	INSTALLATION	SHEET 3 OF 5 SHEETS
Clemson Lower Dam	Hartwell Lake	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
580.2	52		Granite Gneiss (continued)	53.0		Pull 3 continued 53.0
	54		52.4' to 52.5' Quartz vein 53.8' to 55.2' high angle joint, healed 54.6' to 55.8' slight to moderately weathered, hard 55.8' to 56.5' bad to moderately weathered, moderately hard	92 RQD 78	54.6 BOX 3	Pull 4 From 53.0' to 59.0' Run 6.0' Rec 5.5' CL 0.5'
	56		56.3' to 57.5' closely spaced horizontal joints, brown stained 56.5' to 59.6' slight to moderately weathered, hard			
	58		58.4' to 59.6' closely spaced horizontal joints, brown stained	59.0		59.0
	60		59.6' to 60.1' bad to moderately weathered, moderately hard 60.1' to 63.4' slight to moderately weathered, hard	91 RQD 72		Pull 5 From 59.0' to 66.5' Run 7.5' Rec 6.8' CL 0.7'
	62				62.2 BOX 4	
	64		63.4' to 66.3' very badly weathered, very soft			
	66		66.3' to 82.0' slight to moderately weathered, hard	66.5 100 RQD 84		66.5 Pull 6 From 66.5' to 73.3' Run 6.8' Rec 7.3' CG 0.5'
564.2	68		67.9' horizontal joint, brown stained			

Continued on sheet 4

DRILLING LOG (Cont Sheet) E ON TOP OF HOLE +632.2' **Hole No.** PF-139

PROJECT Clemson Lower Dam | INSTALLATION Hartwell Lake | SHEET 4 OF 5 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
564.2	68		Granite Gneiss (continued)		BOX 4	Pull 6 continued
	70		70.6' to 71.5' very closely spaced low angle joints 71.8' to 72.8' very closely spaced horizontal joints, brown stained		70.5 BOX 5	
	72			73.3		73.3
	74		73.3' to 73.7' very closely spaced horizontal joints, brown stained 74.0' to 74.3' very closely spaced low angle joints, no stains 74.7' to 74.9' very closely spaced low angle joints, brown stained	83 RQD 82		Pull 7 From 73.3' to 82.0' Run 8.7' Rec 7.2' CL 1.5'
	76				77.2 BOX 6	
	78					
	80		80.0' to 80.6' very closely spaced horizontal joints, brown stained			
550.2	82				82.0	82.0
			Bottom of Boring 82.0'			

DRILLING LOG (Cont Sheet)	ION TOP OF HOLE +632.2	Hole No. PF-139
PROJECT Clemson Lower Dam	INSTALLATION Hartwell Lake	SHEET 5 OF 5 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g

Pressure Test:

Depth	Air Pressure	Water Pressure	Water Taken (gal)
42.5	96	40	120
47.5	96	40	118
52.5	96	40	99
59.0	96	40	118
59.0	96	40	101
64.0	96	40	110
69.0	96	40	79
74.0	96	40	123
79.0	96	40	71
80.9	96	40	0

NOTE: Depth indicated is depth of bottom of packer.

Hole No. PW-1

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 2 SHEETS

1. PROJECT Clemson Lower Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 12" rock bit
2. LOCATION (Coordinates or Station) Sta 9+66, 150' downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) PW-1	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 9; UNDISTURBED 0
5. NAME OF DRILLER C. Fuller	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER 631.3'
	16. DATE HOLE: STARTED 28 Jul 80; COMPLETED 29 Jul 80
7. THICKNESS OF OVERBURDEN 46.0'	17. ELEVATION TOP OF HOLE 642.9
8. DEPTH DRILLED INTO ROCK 0.0'	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE 46.0'	19. SIGNATURE OF INSPECTOR JAMES KOTTI

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% Moisture	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
642.9			SM-Light tan, silty sand, organic, very dry. 1.5	2.8	1		22
641.4			SC-Reddish tan, clayey sand, seams of dark reddish brown, sandy clay (CL).		2	W. T. 11.6' Date 30 Jul 80 Depth to water during drilling.	28 16
	5		6.0				
636.9			SM-Grayish tan, silty sand, occasional seam of red sandy clay, occasional quartz gravel.	15.6	3		29
					4	Sample No / Lab Class / LL / PL / PI: 1 SM NP NP NP; 3 SM 44 35 9; 8 GP NP NP NP; 9 SP-SM NP NP NP	27 42
	10		Pink and tan with seams of red and pink sandy silt.		5		13 11
	15				6		40 24 18
			Pockets of orange yellow Saprolite.				38
	20		Pink and yellow, very silty, occasional clay seam.				16 18
			Seams of red and yellow, sandy clay (CL).				20 18
	25		Occasional Quartz gravel.				22 22 20
612.9	30						17

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

Sample No	Lab Class	LL	PL	PI
1	SM	NP	NP	NP
3	SM	44	35	9
8	GP	NP	NP	NP
9	SP-SM	NP	NP	NP

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 642.9 | **Hole No.** PW-1

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% Moisture	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
612.9	30		SM-Pinkish red and yellow, silty sand (continued).				26
							16
608.9							18
	35		SM-Light brownish gray, medium grained, alluvial, silty sand, organics.		7	NOTE: Upon encountering gravel 3"x5' spoon and 300 lb. hammer was installed.	34
							34
						NOTE: Spoon refusal at 46.0'.	25
	40						27
							18
							19
598.4			44.5	8.8	8		34
	45		GM-Brownish gray, sandy, silty gravel 46.0	11.9	9		50/0.5
596.9			Top of Rock 46.0'				
			Bottom of Boring 46.0'			NOTE: 8.0' of 6" galvanized, .150 slot, well screen was placed in this boring with gravel pack. Screen bottom placed at 44.0'.	

Hole No. PW-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 2 SHEETS

1. PROJECT Clemson Lower Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 12" rockbit
2. LOCATION (Coordinates or Station) Sta. 17+35, 149.0' downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) PW-2	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 12; UNDISTURBED 0
5. NAME OF DRILLER C. Fuller	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER Not recorded
	16. DATE HOLE: STARTED 4 Aug 80; COMPLETED 4 Aug 80
7. THICKNESS OF OVERBURDEN 49.0'	17. ELEVATION TOP OF HOLE 643.6'
8. DEPTH DRILLED INTO ROCK 0.0'	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE 49.0'	19. SIGNATURE OF INSPECTOR JIM KOTTI

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% Moisture	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
643.6	0						
			SC-Reddish brown, clayey sand, organic, very dry. 2.5		1		31
641.1			SM-Pinkish red and yellow, silty sand, organic, 35% micaceous. 5.5		2	Sample No / Lab Class / LL / PL / PI: 5 SM 49 42 7; 9 ML 30 24 6; 12 SM NP NP NP	20, 24
638.1	5		CL-Red, sandy clay. Seams of pinkish red, sandy silt (MH). 9.5		3		19, 11
634.1			SM-Red and pink, silty, clayey sand.		4		18, 18, 19
	10						17
	15			24.7	5		21, 32
			Seam of red, sandy clay (CL)				24
625.6			SM-Greenish gray, medium grained silty sand. 19.5		6		34
624.1	20		ML-Brownish gray, silt, very fine sand, slightly clayey, occasional Quartz gravel. 22.5		7		18
621.1			MH-Tannish brown, sandy silt, moist. 25.5		8		6, 4
618.1	25		ML-Tannish brown, sandy silt, very fine sand, micaceous, moist. 30.0	23.7	9		4, 6, 6, 4
613.6	30						

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) | ATION TOP OF HOLE 643.6' | **Hole No.** PW-2

PROJECT: Clemson Lower Dam | INSTALLATION: Hartwell Lake | SHEET 2 OF 2 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% Moisture	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
613.6	30	c	d		JAR	g	
			MH-Tannish brown, sandy silt, slightly clayey, very fine sand, moist. 34.0		10	NOTE: Upon encountering alluvial gravel, 3"x5" spoon and 300 lb. hammer were installed.	3 2 13
609.6	35		SM-Brownish tan, silty sand, 20% micaceous, fine grained.		11	NOTE: Splitspoon refusal and top of rock at 49.0'.	20 19 17
	40		Tannish brown, increase in grain size.				20 16 19 20
	45						24
596.1			SM-Medium to coarse grained.	10.8	12		88
594.6			GM-Tannish brown, silty, sandy gravel. 49.0				62
	50		Top of Rock 49.0'			NOTE: 8.0' of 6" galvanized, .150 slot, well screen was placed in this boring with a gravel pack. Screen bottom placed at 48.5'.	

Hole No. PZ-1

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Clemson, S.C.	SHEET 1 OF 3 SHEETS

1. PROJECT Clemson Lower Dam Piezometer Installation	10. SIZE AND TYPE OF BIT 1 3/8"splitspoon, 7 1/4" rock bit, 6 1/2"fishtail bit
2. LOCATION (Coordinates or Station) Sta.9+00, centerline of dam	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL CME 55
4. HOLE NO. (As shown on drawing title and file number) PZ-1	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 30; UNDISTURBED 0
5. NAME OF DRILLER Perry Rountree	14. TOTAL NUMBER CORE BOXES N/A
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN 83.5'	16. DATE HOLE: STARTED 14 Oct 1988; COMPLETED 14 Oct 1988
8. DEPTH DRILLED INTO ROCK 0.4'	17. ELEVATION TOP OF HOLE 680.2'
9. TOTAL DEPTH OF HOLE 83.9'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR Charles Griffin

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
680.2'	0		(ML)Red, inorganic SILT. Slightly sandy, traces of loose granite rocks.		1	No water level recorded, due to the use of drilling fluid. Perry Rountree operated catline/hammer throughout boring using 2 1/4" wraps. From 0.0' to 58.5', splitspoon drives were taken on 5.0' centers. From 58.5' to 83.9', splitspoon drives were taken continuously. After hole completed set piezometer to specifications.	7 14 20
	5		Red, with some traces of grey, sandy, micaceous.		2		6 13 17
671.2'	10		(SM)Reddish-orange & tan, fine grained, silty SAND. Saprolitic.		3		8 12 16
666.7'	15		(ML)Red, inorganic SILT. Micaceous.		4		6 13 17
	20		Red & orange, sandy, saprolitic.		5		7 9 10
	25		Red.		6		5 12 13
			Dark red to tan, sandy, micaceous.		7		6 9 13
650.2'	30		Continued on sht 2				

NOTE: Soils visually field classified in accordance with the Unified Soil Classification System.

BLOWS PER 0.5 FOOT: Number required to drive 1 3/8"ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 680.2' **Hole No.** PZ-1

PROJECT Clemson Lower Dam Piezometer Install. INSTALLATION Clemson, S.C. SHEET 2 OF 3 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
650.2'	80'	c	d	e	JAR	g	
			(ML)Dark red to tan,inorganic SILT.Sandy,micaceous.				11
	35				8		18 27
			Brown & red,very sandy & highly micaceous,saprolitic.				9
	40		Sandy & micaceous.		9		15 20
					10		7 14 18
	45						12
	50		Saprolitic.		11		19 23
							17 14
	55		Sandy,micaceous.		12		12
			Brown,w/some traces of purple,sandy & micaceous.			Began continuous splitspooning @ 58.5'.	15
			Reddish brown & brown,w/ a trace of gravel.		13		16 20
	60		Brown & orange,sandy,micaceous,saprolitic.		14		9 16 19
					15		11 18 20
			Tan,red,brown,very sandy, saprolitic.		16		10 15 21
	65		Red,brown,orange.		17		18 23 35
			Brown & tan,saprolitic.		18		12 18 27
			Tan,brown,w/traces of black, sandy,saprolitic.		19	Scale change @ 70.0'.	11 21 29
			Orange,tan,micaceous.		20		10 12
610.2'	70		Continued on sht 3				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 680.2' | **Hole No.** PZ-1

PROJECT: Clemson Lower Dam Piezometer Install. | INSTALLATION: Clemson, S.C. | SHEET 3 OF 3 SHEETS

ELEVATION 610.2'	DEPTH 70'	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
			(ML)Orange & tan,inorganic SILT. Micaceous. Reddish brown.		21		12 8 12 75
608.7'	72		(SM)Tan & grey,fine & med. grained,silty SAND.		22		
					23		75 75 58
606.7'	74		(SP)Tan,med.grained,poorly graded SAND. With some wood particles encountered @ 74.5',probable stump or log.		24		28 45 100/0.7
	76				25	No splitspoon drive taken from 74.5' to 76.5' due to stump or log encountered. Cleaned out w/fishtail to 76.5'.	
			Tan, med.grained, poorly graded SAND.				20 29 33
	78				26		25 37 45
600.7'	80		(SM)Brown & tan,fine & med. grained,silty SAND. With some gravel.		27		64 88 75
	82				28		75 43 33
597.7'			Yellowish tan.		29		28 54
596.7' 596.3'			(SM-CM)Tan,silty SAND & GRAVEL.		30		100/0.9
			(GRANITE-SAPROLITE)Grey & white,intensely wea.,easily crumbled.				
			Bottom of Boring 83.9'				

Hole No. PZ-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Clemson, S.C.	SHEET 1 OF 3 SHEETS

1. PROJECT Clemson Lower Dam Piezometer Installation	10. SIZE AND TYPE OF BIT 1 3/8"splitspoon,7 1/4" rock bit,6 1/2"fishtail bit
2. LOCATION (Coordinates or Station) Sta.15+00,centerline of dam	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL CME 55
4. HOLE NO. (As shown on drawing title and file number) PZ-2	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 31; UNDISTURBED 0
5. NAME OF DRILLER Perry Rountree	14. TOTAL NUMBER CORE BOXES N/A
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
	16. DATE HOLE: STARTED 25 Oct 1988; COMPLETED 27 Oct 1988
7. THICKNESS OF OVERBURDEN 93.0'	17. ELEVATION TOP OF HOLE 680.5'
8. DEPTH DRILLED INTO ROCK 0.0'	18. TOTAL CORE RECOVERY FOR BORING N/A %
9. TOTAL DEPTH OF HOLE 93.0'	19. SIGNATURE OF INSPECTOR Charles Griffin

ELEVATION 680.5'	DEPTH 0'	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g BLOWS
			(ML)Red,inorganic SILT. Slightly sandy,w/trace of saprolitic rock.		1	6 15 33
	5		Red & brown.		2	9 16 14
	10		Red,slightly sandy,micaceous.		3	7 11 15
	15				4	8 9 12
	20		Red & tan,w/traces of purple,sandy & micaceous.		5	5 9 16
	25		Red & tan.		6	8 11 14
			Red & brown,w/a layer of white saprolite.		7	9 9 12
650.5'	30		Continued on sht 2			

No water level recorded,due to the use of drilling fluid.
Perry Rountree operated catline/hammer throughout boring using 2 1/4" wraps.
Splitspoon drives were taken on 5.0'centers,from 0.0'to 64.5'.
Splitspoon drives were taken continuously from 64.5'to bottom of boring.
0 blows indicate that sampler w/ drill rods & 140 lb. hammer penetrated 0.5'without a hammer drop.
Piezometer was set in boring to specifications.

NOTE: Soils visually field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8"ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 680.5' | **Hole No.** PZ-2

PROJECT: Clemson Lower Dam Piezometer Install. | INSTALLATION: Clemson, S.C. | SHEET 2 OF 3 SHEETS

ELEVATION 650.5'	DEPTH 30'	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
			(ML)Red & brown,inorganic SILT. Sandy,saprolitic.				
	35		Dark reddish brown,sandy w/ traces of white gravel		8		9 14 14
641.5'	40		(SM)Dark reddish brown,fine grained,silty SAND. Saprolitic.		9		13 19 18
637.0'	45		(ML)Red,inorganic SILT.Slightly sandy,micaceous.		10		10 15 15
	50				11		5 6 10
	55		Reddish brown,w/some traces of pink, sandy.		12		6 11 16
622.0'	60		(SC)Dark brown,very fine grained clayey SAND.		13	NOTE:Began continuous splitspoon drives at 64.5'.	15 18 20
616.0'	65		(MH)Brown,fat clayey SILT. Very soft.		14		0 0 0
614.5'			(SC)Brown,very fine grained, clayey SAND.		15		6 10 12
					16		4 3 2
610.5'	70				17		4 5

Continued on sht 3

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 680.5' **Hole No.** PZ-2

PROJECT Clemson Lower Dam Piezometer Install. INSTALLATION Clemson, S.C. SHEET 3 OF 3 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
610.5'	70.5	c	d	e	JAR	g	
610.0'			(SC)Brown,very fine grained clayey SAND.		18		3 2 3
			(ML)Brown,inorganic SILT.		19		4 4 4
			Slightly sandy.		20		3 3 3
605.5'	75		(SM)Brown,very fine grained, silty SAND.		21		5 5 9
			Fine grained.		22		5 9 12
			Tan.		23		12 19 26
	80				24		8 18 26
			Tan & grey.		25		13 13 26
			Fine & med. grained.		26		20 36 34
596.5'			(SP)Tan & grey,med.grained, poorly graded SAND. With some gravel		27		21 30 50
	85						21 23 20
593.5'			(SM)Yellowish tan & white,fine grained,silty SAND.(Saprolitic) w/some gravel.		28		15 16 18
					29		11 19 24
	90		Tan & white (saprolitic).		30		16 21 23
			Yellowish tan & white.		31		16 24 74
587.5'			(SAPROLITE)Tan,yellow,white, silty SAND. Intensely wea. rock.				
			Bottom of Boring 93.0'				

A.5 Current Boring Logs - Clemson Lower Dam

Boring No.	Date Drilled	Station	Offset (feet)	Elevation (feet, NGVD)	Comments
CLD-601	11-14-01	4+95	130	643.1	
CLD-602	11-14-01	6+85	170	639.9	
CLD-603	10-19-01	8+60	134	643.3	
CLD-604	11-15-01	10+75	167	640.3	
CLD-605	10-18-01	11+56	123	643.2	
CLD-606	11-16-10	14+00	162	641.0	
CLD-607	10-16-01	15+50	120	643.3	
CLD-608	10-16-01	18+22.5	121	643.7	
CLD-609	10-20-01	19+02	170	639.6	
CLD-610	10-22-01	20+58	173	640.1	
CLD-611	10-17-01	21+50	123	643.1	
CLD-613	11-29-01	10+75	165	640.5	
CLD-621A	11-28-01	7+95	143	642.5	Undisturbed Tubes
CLD-622A	11-17-01	11+52	123	643.3	
CLD-622B	11-18-01	11+62	123	642.4	
CLD-622C	11-29-01	11+56	130	642.3	
CLD-623A	11-27-01	18+27.5	121	643.4	
CLD-623B	11-18-01	18+19.5	121	643.6	
CLD-623C	12-6-01	18+17	121	643.6	Undisturbed Tubes
CLD-623D	12-7-01	18+15	121	643.7	Undisturbed Tubes

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LOG OF DRILL HOLE

LEGEND

PAGE: 1 OF 1

DATE: /

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC
GROUND SURFACE ELEVATION (FT):
NORTHING: EASTING:
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: DOWNSTREAM OFFSET (FT):
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: TOTAL DEPTH (FT):

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES:

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
0							EMBANKMENT FILL
							DRAIN LAYER
							ALLUVIUM
5							SAND & GRAVEL
							BEDROCK
10							Note: Subsurface strata breaks are indicated at the top of sample intervals. Actual strata breaks will differ from that shown.
15							

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LOG OF DRILL HOLE

CLD-601

PAGE: 1 OF 1

DATE: 11/14/2001 / 11/14/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.12
NORTHING: 1036997.319 EASTING: 1442962.886
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 4+95 DOWNSTREAM OFFSET (FT): 130
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: M. Cole TOTAL DEPTH (FT): 27.75

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 20.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
15							0-??, -EMBANKMENT FILL-
							Driller hit some rip-rap ~6-8" thick, at ~3'; two pieces hit.
20	S1	34 35 31	18	10			S1 - CLAYEY SAND WITH GRAVEL (SC); mostly medium sand; ~25% clay in pockets; ~15% angular gravel, max size ~1"; actual sand had <10% fines. -EMBANKMENT FILL-
	S2	5 5 7	18	6			S2 - CLAYEY SAND (SC); mostly medium to fine, sand; ~15-20% fines; 1/4" seams of black micaceous sand; red/brown. -EMBANKMENT FILL-
	S3	8 32 100/4"	16	14			S3 - WIDELY GRADED SAND WITH SILT (SW-SM); mostly fine to medium sand; ~10-15% fines; <1/4" seams of black sand; tan/brown. -EMBANKMENT FILL-
	S4	100/5"	5	0			Note: S3 Appears to be a very dense, almost cemented sand.
25							S4 - No Recovery.
	S5	18 57 100/3"	15	15			S5 - WIDELY GRADED SAND WITH SILT (SW-SM); Similar to S3. -EMBANKMENT FILL-
	S6	100/3"	3	0			S6 - No Recovery.
							Bottom of Borehole, 27.75 ft.
30							

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LOG OF DRILL HOLE

CLD-602

PAGE: 1 OF 2

DATE: 11/14/2001 / 11/15/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 639.86
NORTHING: 1037173.648 EASTING: 1442935.111
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 6+85 DOWNSTREAM OFFSET (FT): 170
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: M. Cole TOTAL DEPTH (FT): 44.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 20.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
15							0-20.5', -EMBANKMENT FILL-
20	S1	3 18 19	18	10			S1 - Top 5" CLAYEY SAND (SC); mostly fine to medium-fine, micaceous sand; ~20% fines; red/brown. -EMBANKMENT FILL-
							Top of Drain Layer, 20.5 ft.
	S2	8 8 10	18	2			20.5-21.5', -DRAIN LAYER-
							S1 - Bottom 5" NARROWLY GRADED SAND WITH SILT (SP-SM); mostly medium to coarse sand; ~10% fines; tan/brown. -DRAIN LAYER-
	S3	4 4 7	18	8			Top of Alluvium, 21.5 ft.
							21.5-42.5', -ALLUVIUM-
25	S4	4 3 4	18	5			S2 - CLAYEY SAND WITH GRAVEL (SC); fine sand; ~30% clayey fines; piece of rounded gravel, max size ~1"; red/brown. -ALLUVIUM-
	S5	2 1 3	18	18			S3 - SANDY CLAY (CL); Second attempt classification, no recovery first attempt; medium to high plasticity fines; ~30-40% fine, micaceous sand; dark brown/black, with red oxidized lenses. -ALLUVIUM-
	S6	WOH WOH 2	18	18			S4 - SANDY SILT WITH GRAVEL (ML); medium plasticity fines; ~20% fine, micaceous sand; ~10-15% gravel, max size 3/4"; dark brown/gray with few red lenses. -ALLUVIUM-
	S7	2 1 1	18	12			S5 - SANDY SILT (ML); medium plasticity; ~30% fine sand; brown/gray. -ALLUVIUM-
30							S6 - SANDY SILT (ML); Similar to S5. -ALLUVIUM-
	S8	4 3 3	18	11			S7 - SANDY SILT (ML); Similar to S5. -ALLUVIUM-
							S8 - SANDY SILT (ML); Similar to S5. -ALLUVIUM-
	S9	2 1 2	18	18			S9 - SANDY SILT (ML); Similar to S5; except less sand. -ALLUVIUM-
	S10	1 1 1	18	18			S10 - SANDY SILT (ML); Similar to S5. -ALLUVIUM-
35	S11	1 2	18	15			S11 - SANDY SILT (ML); Similar to S5; except ~40% fine sand, low to medium plasticity. -ALLUVIUM-

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LOG OF DRILL HOLE

CLD-602

DATE:11/14/2001 / 11/15/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		5					
	S12	9 8 5	18	5			S12 - SILTY SAND (SM); mostly fine to medium, micaceous sand; ~20% fines; gray with black streaks. -ALLUVIUM-
	S13	5 8 12	18	7			S13 - SILTY SAND (SM); Similar to S12. -ALLUVIUM-
40	S14	10 9 11	18	6			S14 - SILTY SAND (SM); Similar to S12; more medium sized sand than fine sand; ~15% fines; more black streaks. -ALLUVIUM-
	S15	10 8 15	18	5			S15 - SILTY SAND (SM); mostly medium sand; ~20% fines; ~5% gravel, max size 1/4-1/2"; gray/black. -ALLUVIUM-
							Top of Sand & Gravel, 42.5 ft.
	S16	22 35 45/4"	16	5			42.5-44.0', -SAND & GRAVEL- S16 - SILTY SAND (SM); mostly medium to coarse sand; ~15% fines; ~10% gravel, max size 1/2"; tan/gray. -SAND & GRAVEL-
45	S17	100/0"	0	0			S17 - No Recovery; sample refusal.
							Bottom of Borehole, Estimated Top of Bedrock, 44.0 ft.
50							

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LOG OF DRILL HOLE

CLD-603

DATE: 10/19/2001 / 10/19/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.34
NORTHING: 1037294.016 EASTING: 1442864.739
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 8+60 DOWNSTREAM OFFSET (FT): 134
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 45.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 30.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
25							0-35.3', -EMBANKMENT FILL-
30	S1	3 4 5	18	11			S1 - CLAYEY SAND (SC); fine, micaceous sand; ~30-40% medium plasticity clay; red/brown. -EMBANKMENT FILL-
	S2	3 2 4	18	8			S2 - CLAYEY SAND (SC); Similar to S1. -EMBANKMENT FILL-
	S3	2 3 3	18	13			S3 - CLAYEY SAND (SC); Similar to S1; with 1/4" oxidized (orange) lenses throughout; red/brown. -EMBANKMENT FILL-
35	S4	2 5 8	18	10			S4 - Top 4" CLAYEY SAND (SC); Similar to S1. -EMBANKMENT FILL-
							Estimated Top of Drain Layer, ~35.3 ft.
	S5	4 8 9	18	8			35.3-37.5', -DRAIN LAYER-
							S4 - Bottom 6" SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; gray/brown. -DRAIN LAYER-
	S6	3 6 7	18	11			S5 - SILTY SAND (SM); Similar to Bot S4. -DRAIN LAYER-
							Estimated Top of Alluvium, ~37.5 ft.
	S7	5 9 12	18	12			37.5-45.0', -ALLUVIUM-
40							S6 - SANDY SILT (ML); low plasticity fines; ~20-35% fine sand; gray/black with minor organic material, micaceous. -ALLUVIUM-
	S8	11 13 14	18	7			S7 - NARROWLY GRADED SAND WITH SILT (SP-SM); fine sand; ~5-10% nonplastic fines; gray/brown with ~1/16" organic silt zone. -ALLUVIUM-
	S9	6 11 17	18	5			S8 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S7. -ALLUVIUM-
	S10	7 11 29	18	8			S9 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S7. -ALLUVIUM-
45							S10 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S7; ~5% fine gravel, wood. -ALLUVIUM-

GEI Consultants, Inc.	LOG OF DRILL HOLE	CLD-603
		PAGE: 2 OF 2
		DATE:10/19/2001 / 10/19/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION

Bottom of Borehole, 45.0 ft.

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LOG OF DRILL HOLE

CLD-604

DATE: 11/15/2001 / 11/16/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 640.34
NORTHING: 1037507.286 EASTING: 1442883.54
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 10+75 DOWNSTREAM OFFSET (FT): 167
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: M. Cole TOTAL DEPTH (FT): 46.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash to 25.0' with 6" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
20							0-??, EMBANKMENT FILL-
							Note: Drain Layer must be above 25'. See CLD-613 for location of drain..
25	S1	5 2 3	18	3			??-44.0', -ALLUVIUM-
							S1 - SILTY SAND WITH GRAVEL (SM); mostly fine sand; ~30% fines; ~10-15% gravel, max size 1/4-1/2"; brown/gray. -ALLUVIUM-
	S2	1 1 2	18	8			S2 - SILTY SAND WITH GRAVEL (SM); Second attempt classification, no recovery first attempt; Similar to S1. -ALLUVIUM-
	S3	2 2 3	18	4			S3 - SILTY SAND WITH GRAVEL (SM); Second attempt classification, no recovery first attempt; Similar to S1; ~5% gravel, max size ~2.5". -ALLUVIUM-
30	S4	2 3 3	18	3			S4 - SILTY SAND (SM); Second attempt classification, no recovery first attempt; mostly fine to medium-fine sand; ~25-30% low plasticity fines; brown/gray. -ALLUVIUM-
	S5	5 3 4	18	0			S5 - SILTY SAND WITH GRAVEL (SM); Second attempt classification, no recovery first attempt; Similar to S3; one large piece of gravel, ~2"; one 1/2" thick seam of red/brown medium-coarse sand. -ALLUVIUM-
	S6	2 2 6	18	5			S6 - SILTY SAND (SM); Similar to S4. -ALLUVIUM-
35	S7	4 2 2	18	2			S7 - SILTY SAND (SM); Second attempt classification, no recovery first attempt; Similar to S4; with one thin red/brown coarse sand layer. -ALLUVIUM-
	S8	2 1 4	18	10			S8 - SILTY SAND (SM); mostly fine sand; ~40% medium to low plasticity fines; brown/gray. -ALLUVIUM-
	S9	3 4 8	18	11			S9 - SILTY SAND (SM); mostly fine sand; ~20-30% low plasticity fines; gray with black streaks. -ALLUVIUM-
	S10	6 9 11	18	6			S10 - SILTY SAND (SM); Similar to S9. -ALLUVIUM-
40	S11	6 7	18	8			S11 - SILTY SAND (SM); Similar to S9. -ALLUVIUM-

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LOG OF DRILL HOLE

CLD-604

PAGE: 2 OF 2

DATE:11/15/2001 / 11/16/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		12					
	S12	7 11 17	18	6			S12 - SILTY SAND (SM); Similar to S9. -ALLUVIUM-
	S13	14 24 60	18	5			S13 - SILTY SAND WITH GRAVEL (SM); mostly fine to medium sand; ~20% fines; ~10-15% gravel, max size ~1/2"; brown/tan/gray/black. -ALLUVIUM-
45	S14	30 88 20	18	4			Top of Sand & Gravel, 44.0 ft. 44.0-46.0', -SAND & GRAVEL- S14 - SILTY SAND WITH GRAVEL (SM); Similar to S13; except tan. -SAND & GRAVEL- Bottom of Borehole, 46.0 ft.
50							

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LOG OF DRILL HOLE

CLD-605

DATE: 10/18/2001 / 10/18/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.18
NORTHING: 1037594.633 EASTING: 1442832.291
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 11+56 DOWNSTREAM OFFSET (FT): 123
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 45.5

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 20.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
15							0-24.8', -EMBANKMENT FILL-
20	S1	4 12 17	18	11			S1 - SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; red/brown with oxidized spots throughout. -EMBANKMENT FILL-
	S2	4 7 9	18	11			S2 - SILTY SAND (SM); Similar to S1; ~1/4" oxidized lenses; micaceous; red. -EMBANKMENT FILL-
	S3	3 6 8	18	13			S3 - SILTY SAND (SM); Similar to S1; low plasticity fines; slightly clayey. -EMBANKMENT FILL-
							Estimated Top of Drain Layer, 24.8 ft.
25	S4	8 36 44	18	11			S4 - Top 4" SILTY SAND (SM); Similar to S1. -EMBANKMENT FILL-
							24.8-27.6', -DRAIN LAYER-
	S5	16 31 22	18	6			S4 - Bottom 7" SILTY SAND (SM); fine sand; ~20-25% nonplastic fines; gray. -DRAIN LAYER-
	S6	11 18 21	18	12			S5 - SILTY SAND (SM); Similar to Bot S4. -DRAIN LAYER-
							Estimated Top of Alluvium, 27.6 ft.
	S7	6 5 7	18	10			27.6-45.5', -ALLUVIUM-
30							S6 - Top 5" FAT CLAY with Sand (CH); medium plasticity, high toughness, no dilatency fines; red/brown. -ALLUVIUM-
	S8	3 2 3	18	4			S6 - Bottom 7" SILTY SAND (SM); fine sand; ~30-40% low plasticity fines; black/gray. -ALLUVIUM-
	S9	5 5 5	18	4			S7 - SILTY SAND (SM); Similar to Bot S6. -ALLUVIUM-
							S8 - SILTY SAND (SM); Second attempt classification, wood in first spoon; Similar to Bot S6; possible red soil from wash. -ALLUVIUM-
	S10	2 2 2	18	8			S9 - SILTY SAND (SM); Similar to Bot S6; wood; gray/black. -ALLUVIUM-
							S10 - SILTY SAND (SM); Similar to Bot S6. -ALLUVIUM-
35	S11	2 3	18	10			S11 - SILTY SAND (SM); Similar to Bot S6. -ALLUVIUM-

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LOG OF DRILL HOLE

CLD-605

DATE: 10/18/2001 / 10/18/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		6					
	S12	3 2 3	18	0			S12 - No Recovery first or second attempt; wash to 38.0'.
	S13	4 6 6	18	11			S13 - SILTY SAND (SM); Similar to Bot S6; some organic matter. -ALLUVIUM-
40	S14	3 2 3	18	9			S14 - SILTY SAND (SM); Similar to Bot S6. -ALLUVIUM-
	S15	5 7 8	18	11			S15 - SILTY SAND (SM); fine sand; ~30-40% nonplastic fines; gray/black. -ALLUVIUM-
	S16	2 10 14	18	8			S16 - SILTY SAND (SM); mostly fine sand; ~5-10% coarse sand; some black organic matter; lenses ~1/16"; ~25-30% nonplastic fines; gray/brown. -ALLUVIUM-
	S17	15 18 15	18	5			S17 - SILTY SAND (SM); Similar to S16; ~2" wood in sample. -ALLUVIUM-
45							Bottom of Borehole, 45.5 ft.
50							

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LOG OF DRILL HOLE

CLD-606

DATE: 11/16/2001 / 11/17/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 641.02
NORTHING: 1037835.785 EASTING: 1442852.649
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 14+00 DOWNSTREAM OFFSET (FT): 162
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: M. Cole TOTAL DEPTH (FT): 45.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 20.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
15							0-~20.0', -EMBANKMENT FILL-
	S1	4 8 6	18	9			S1 - CLAYEY SAND (SC); mostly fine to medium sand, some coarse sand and occasional gravel; ~40-50% medium to high plasticity fines; red/brown. -EMBANKMENT FILL-
	S2	8 25 28	18	9			S2 - Top 4" CLAYEY SAND (SC); Similar to S1; except ~10% gravel. -EMBANKMENT FILL-
20							Estimated Top of Drain Layer, 20.0 ft.
	S3	13 17 25	18	7			~20.0-~22.5', -DRAIN LAYER-
	S4	7 4 4	18	6			S2 - Bottom 5" SILTY SAND (SM); mostly medium-fine to medium sand; contains gravel; ~10-15% fines; wood; brown. -DRAIN LAYER-
	S5	1 2 1	18	16			S3 - SILTY SAND (SM); Similar to Bot S2; except ~25% fines; no gravel or wood; contains a few <1/4" thick seams of red oxidized sand. -DRAIN LAYER-
25							Estimated Top of Alluvium, 22.5 ft.
	S6	1/12" - 2	18	10			~22.5-~41.5', -ALLUVIUM-
	S7	1 2 1	18	16			S4 - SILTY SAND (SM); Second attempt classification, no recovery first attempt; mostly fine-medium to fine sand; ~20-30% medium to low plasticity fines; gray/brown. -ALLUVIUM-
	S8	2 2 3	18	16			S5 - LEAN CLAY (CL); medium plasticity fines; ~15-20% fine sand; reddish brown. -ALLUVIUM-
30	S9	3 3 4	18	12			S6 - SANDY SILT (ML); medium plasticity fines; ~30-40% fine sand; reddish brown/gray. -ALLUVIUM-
	S10	1 2 2	18	15			S7 - SILTY SAND (SM); mostly fine sand; ~30% medium plasticity fines; gray/brown. -ALLUVIUM-
	S11	1 2 2	18	16			S8 - Top 10" SILTY SAND (SM); Similar to S7. -ALLUVIUM-
35	S12	3 3 5	18	16			S8 - Bottom 6" LEAN CLAY (CL); Similar to S5. -ALLUVIUM-
							S9 - LEAN CLAY (CL); Similar to S5; except contains mottled light gray material. -ALLUVIUM-
							S10 - LEAN CLAY (CL); Similar to S5; except contains mottled light gray material, but less than S9. -ALLUVIUM-
							S11 - LEAN CLAY (CL); Similar to S5; except more sand; less plastic fines; contains mottled light gray material, but less than S9. -ALLUVIUM-
							S12 - SILTY SAND (SM); mostly fine sand; ~30% medium to low plasticity

GEI Consultants, Inc.

LOG OF DRILL HOLE

CLD-606

DATE:11/16/2001 / 11/17/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
	S13	4 4 9	18	11			fines; tan with mottled reddish brown. -ALLUVIUM- S13 - Top 9" SILTY SAND (SM); Similar to S12. -ALLUVIUM- S13 - Bottom 2" SILTY SAND (SM): mostly medium to fine sand; ~20-30% fines; tan/gray. -ALLUVIUM-
	S14	5 7 10	18	9			S14 - SILTY SAND (SM); Similar to Bot S13. -ALLUVIUM-
	S15	7 12 17	18	5			S15 - Top 4" SILTY SAND (SM); Similar to Bot S13. -ALLUVIUM- S15 - Bottom 1" SILTY SAND (SM): mostly medium sand; ~15% fines; tan. -ALLUVIUM-
40	S16	13 26 26	18	6			S16 - Top 4" SILTY SAND (SM); Similar to Bot S13. -ALLUVIUM- Estimated Top of Sand & Gravel, 41.5 ft. ~41.5-45.0', -SAND & GRAVEL-
	S17	20 20 31	18	3			S16 - Bottom 2" SILTY SAND WITH GRAVEL (SM); ~20% gravel, max size ~1/4"; ~15% fines; tan. -SAND & GRAVEL- S17 - SILTY SAND WITH GRAVEL (SM); widely graded sand; ~30% subrounded gravel, max size ~1.5"; ~10-15% fines; tan. -SAND & GRAVEL-
	S18	32 23 16	18	3			S18 - SILTY SAND WITH GRAVEL (SM); Similar to S17, except max size ~3/4". -SAND & GRAVEL- Bottom of Borehole, 45.0 ft.
45							
50							

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LOG OF DRILL HOLE

CLD-607

DATE: 10/16/2001 / 10/16/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.31
NORTHING: 1037982.652 EASTING: 1442802.354
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 15+50 DOWNSTREAM OFFSET (FT): 120
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 37.5

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 15.0' with 5-1/2" paddle (fish tail). Un-cased borehole.

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
10							0-20.2', -EMBANKMENT FILL-
15	S1	5 12 16	18	14			S1 - SILTY SAND (SM); fine, micaceous sand; ~40-50% medium plasticity fines; red/brown. -EMBANKMENT SOILS-
	S2	8 11 14	18	11			S2 - SILTY SAND (SM); Similar to S1.
	S3	6 8 10	18	6.5			S3 - SILTY SAND (SM); Similar to S1.
20	S4	8 20 72/4"	16	15.5			S4 - Top 8" SILTY SAND (SM); Similar to S1.
							Top of Drain Layer, 20.2 ft.
							20.2-22.5', -DRAIN LAYER-
	S5	30 41 17	18	3			S4 - Bottom 7.5" SILTY SAND (SM); mostly fine sand,~5% coarse sand; ~15-20% nonplastic fines; gray. -DRAIN LAYER-
	S6	6 5 5	18	13			S5 - SILTY SAND (SM); Similar to Bot 7.5" S4; with wood; ~5-10% gravel. -DRAIN LAYER-
	S7	3 3 4	18	12			Top of Alluvium, 22.5 ft.
25							22.5-37.5', -ALLUVIUM-
	S8	2 1 2	18	17			S6 - SILTY SAND (SM); fine sand; ~30-40% low plasticity fines; brown; minor organic matter. -ALLUVIUM-
							S7 - SILTY SAND (SM); Similar to S6. -ALLUVIUM-
	S9	2 1 2	18	17.5			S8 - SILTY SAND (SM); Similar to S6. -ALLUVIUM-
							S9 - SILTY SAND (SM); Similar to S6. -ALLUVIUM-
	S10	WOR/1" 2 1 3	18	15			S10 - SILTY SAND (SM); Similar to S6. -ALLUVIUM-
30	S11	3 2	18	18			S11 - SILTY SAND (SM); Similar to S6. -ALLUVIUM-

GEI Consultants, Inc.

LOG OF DRILL HOLE

CLD-607

DATE: 10/16/2001 / 10/16/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		4					
	S12	WOH 4 5	18	14			S12 - SILTY SAND (SM); fine sand; medium plasticity, slight dilatency fines; red/brown; with 1/16" gray sandy lenses at ~32.7'. -ALLUVIUM-
	S13	2 2 4	18	16			S13 - SILTY SAND (SM); fine sand; ~40-45% medium plasticity fines; red/brown with minor gray lenses. -ALLUVIUM-
35	S14	6 10 15	18	13			S14 - SILTY SAND (SM); Similar to S13; with ~30-35% fines. -ALLUVIUM-
	S15	8 17 18	18	5			S15 - SILTY SAND (SM); Similar to S13; with ~20-30% fines. -ALLUVIUM-
							Bottom of Borehole, 37.5 ft.
40							
45							
50							

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LOG OF DRILL HOLE

CLD-608

DATE: 10/16/2001 / 10/17/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.69
NORTHING: 1038252.709 EASTING: 1442784.494
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 18+22.5 DOWNSTREAM OFFSET (FT): 121
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 37.5

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 15.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
10							0-17.9', -EMBANKMENT FILL-
15	S1	5 10 16	18	11			S1 - SANDY SILT (ML); medium plasticity fines; ~30-40% fine, micaceous sand; red. -EMBANKMENT FILL-
	S2	10 12 18	18	13			S2 - Top 12" SANDY SILT (ML); Similar to S1; minor oxidized mica flakes. -EMBANKMENT FILL-
							~~Top of Drain Layer, 17.0 ft.~~
	S3	22 44 48	18	10			17.9-20.0', -DRAIN LAYER-
	S4	14 28 20	18	1			S2 - Bottom 1" SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; gray. -DRAIN LAYER-
20							S3 - SILTY SAND (SM); Similar to Bot S2; with ~1-5% gravel, max size 3/4"; gray/brown. -DRAIN LAYER-
	S5	10 10 10	18	8			S4 - ~1-3/4" gravel piece plugged spoon tip.
							Top of Alluvium, 20.0 ft.
	S6	6 3 6	18	16			20.0-37.5', -ALLUVIUM-
							S5 - SILTY SAND (SM); fine sand; ~20-30% low plasticity fines; brown/gray. -ALLUVIUM-
	S7	2 2 2	18	15			S6 - SANDY SILT (ML); low plasticity fines; ~35-45% fine sand; red/brown. -ALLUVIUM-
25	S8	WOR WOH WOH	18	7			S7 - LEAN CLAY WITH SAND (CL); medium plasticity fines; ~20-30% fine sand; red/brown with minor gray sandy lenses ~1/16" thick. -ALLUVIUM-
							S8 - LEAN CLAY WITH SAND (CL); Similar to S7. -ALLUVIUM-
	S9	WOH WOH 3	18	12			S9 - LEAN CLAY WITH SAND (CL); Similar to S7. -ALLUVIUM-
	S10	WOH WOH 2	18	13			S10 - SANDY SILT (ML); low to medium plasticity fines; ~25% fine sand; red/brown. -ALLUVIUM-
30	S11	1 1	18	12			S11 - SANDY SILT (ML); Similar to S10; low plasticity fines; ~30-40% sand; brown. -ALLUVIUM-

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LOG OF DRILL HOLE

CLD-608

DATE:10/16/2001 / 10/17/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		2					
	S12	6 4 4	18	15			S12 - SANDY SILT (ML); Similar to S11. -ALLUVIUM-
	S13	2 2 3	18	16			S13 - SANDY SILT (ML); Similar to S10. -ALLUVIUM-
35	S14	6 2 8	18	13			S14 - SILTY SAND (SM); fine, micaceous sand; 30-40% low plasticity fines; brown. -ALLUVIUM-
	S15	9 13 15	18	8			S15 - SILTY SAND (SM); fine to medium, micaceous sand; 25-35% low plasticity fines; brown. -ALLUVIUM-.
							Bottom of Borehole, 37.5 ft.
40							
45							
50							

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LOG OF DRILL HOLE

CLD-609

DATE: 10/20/2001 / 10/20/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 639.61
NORTHING: 1038334.722 EASTING: 1442827.648
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 19+02 DOWNSTREAM OFFSET (FT): 170
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 37.5

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 15.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
10							0-15.8', -EMBANKMENT FILL-
15	S1	8 19 22	18	11			Rip rap at 7.0' roller bitting through; roller bitting slow; trying 6" OD core barrel to get through; ~6' of Rip Rap recovered; Granite Gneiss.
							~~S1 - Top 6" LEAN CLAY with Sand (CL); medium plasticity fines; ~20-30%~~ fines sand; red/brown. -EMBANKMENT FILL-
	S2	18 19 14	18	4			Top of Drain Layer, 15.8 ft.
							15.8-17.3', -DRAIN LAYER-
	S3	5 6 5	18	5			S1 - Bottom 5" SILTY SAND (SM); fine sand; ~10-20% nonplastic fines; gray. -DRAIN LAYER-
	S4	2 3 3	18	15			S2 - Top 2" SILTY SAND (SM); Similar to Bot S1. No sample recovery mixed with drilling mud.
20							Top of Alluvium, 17.3 ft.
	S5	2 2 3	18	17			17.3-37.5', -ALLUVIUM-
							S2 - Bottom 2" SANDY SILT (ML); low plasticity fines; ~20-30% fine sand; brown/black. -ALLUVIUM-
	S6	1 2 3	18	14			S3 - SANDY SILT (ML); Similar to Bot S2. -ALLUVIUM-
							S4 - SANDY SILT (ML); Similar to Bot S2; ~10-20% fine sand. -ALLUVIUM-
	S7	3 4 5	18	15			S5 - SILT WITH SAND (ML); low plasticity, slow dilatency fines; ~10-15% fine sand; brown. -ALLUVIUM-
25	S8	2 2 2	18	14			S6 - SILT (ML); low to medium plasticity, medium toughness fines; ~5% sand; brown. -ALLUVIUM-
							S7 - Top 11" SILT WITH SAND (ML); low to medium plasticity fines; ~10-20% fine sand; brown. -ALLUVIUM-
	S9	2 2 2	18	16			S7 - Bottom 4" SANDY SILT (ML); low plasticity fines; ~15% fine sand; micaceous; brown. -ALLUVIUM-
	S10	2 2 2	18	18			S8 - SANDY SILT (ML); Similar to Bot S7. -ALLUVIUM-
							S9 - SANDY SILT (ML); Similar to Bot S7. -ALLUVIUM-
30	S11	1 2	18	17			S10 - SANDY SILT (ML); Similar to Bot S7. -ALLUVIUM-

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LOG OF DRILL HOLE

CLD-609

PAGE: 2 OF 2

DATE:10/20/2001 / 10/20/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		2					S11 - SILT WITH SAND (ML); nonplastic, slow dilatency fines; 15-20% fine, micaceous, sand; brown. -ALLUVIUM-
	S12	2 2 2	18	15			S12 - SILT WITH SAND (ML); Similar to S11. -ALLUVIUM-
	S13	3 8 10	18	8			S13 - SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; tan/brown. -ALLUVIUM-
35	S14	6 6 14	18	9			S14 - SILTY SAND (SM); Similar to S13. -ALLUVIUM-
	S15	5 9 17	18	7			S15 - SILTY SAND (SM); Similar to S13. -ALLUVIUM-
							Bottom of Borehole, 37.5 ft.
40							
45							
50							

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LOG OF DRILL HOLE

CLD-610

DATE: 10/22/2001 / 10/22/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 640.13
NORTHING: 1038490.753 EASTING: 1442816.496
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 20+58 DOWNSTREAM OFFSET (FT): 173
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 40.5

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 15.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
10							0-17.0', -EMBANKMENT FILL-
15	S1	6 9 10	18	8			S1 - SANDY SILT (ML); medium plasticity clayey fines; ~20-30% fine sand; micaceous; red/brown. -EMBANKMENT FILL-
	S2	8 19 14	18	13			S2 - Top 5" SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
							Estimated Top of Drain Layer, 17.0 ft.
	S3	10 10 11	18	5			17.0-19.5', -DRAIN LAYER- S2 - Bottom 7" SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; gray; minor wood particles; -DRAIN LAYER-
20	S4	4 11 14	18	3			S3 - SILTY SAND (SM); Similar to Bot S2; 2 ~3/4" pieces of rounded gravel; -DRAIN LAYER-
							Estimated Top of Alluvium, 19.5'.
	S5	7 8 10	18	11			19.5-40.5', -ALLUVIUM-
	S6	2 3 4	18	14			S4 - SANDY SILT (ML); low to medium plasticity fines; ~20-30% fine sand; black/brown. -ALLUVIUM-
	S7	WOR 2 2	18	13			S5- SANDY SILT (ML); medium plasticity, no dilatency fines; ~10-25% fine sand; dark brown. -ALLUVIUM-
25							S6 - LEAN CLAY WITH SAND (CL); medium plasticity, no dilatency fines; 20-25% fine sand; dark brown/tan. -ALLUVIUM-
	S8	WOR 2 4	18	11			S7 - LEAN CLAY WITH SAND (CL); Similar to S6. -ALLUVIUM- S8 - LEAN CLAY WITH SAND (CL); Similar to S6. -ALLUVIUM-
	S9	2 1 3	18	12			S9 - SANDY SILT (ML); medium to low plasticity, slow dilatency fines; 35-45% fine sand; tan/brown. -ALLUVIUM-
	S10	WOR 1 1	18	11			S10 - SANDY SILT (ML); Similar to S9. -ALLUVIUM-
30	S11	1 3	18	9			S11 - SILTY SAND (SM); fine sand; ~40-50% nonplastic fines; tan/brown. -ALLUVIUM-

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LOG OF DRILL HOLE

CLD-610

DATE:10/22/2001 / 10/22/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		1					
	S12	3 3 4	18	17			S12 - SILTY SAND (SM); Similar to S11; oxidized orange lenses throughout. -ALLUVIUM-
	S13	2 3 3	18	16			S13 - SILTY SAND (SM); Similar to S11; oxidized orange lenses ~1/4" thick; black organic spots throughout. -ALLUVIUM-
35	S14	2 4 5	18	18			S14 - SILTY SAND (SM); Similar to S13. -ALLUVIUM-
	S15	4 6 8	18	17			S15 - SILTY SAND (SM); fine sand; ~30-40% low plasticity, slow dilatency fines; micaceous; tan. -ALLUVIUM-
	S16	4 7 10	18	8			S16 - SILTY SAND (SM); fine, micaceous sand; ~20-30% nonplastic fines; tan. -ALLUVIUM-
40	S17	5 7 17	18	6			S17 - SILTY SAND (SM); Similar to S16; 3/4" piece of gravel. -ALLUVIUM-
							Bottom of Borehole, 40.5 ft.
45							
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CLD-611

DATE: 10/17/2001 / 10/18/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.06
NORTHING: 1038582.559 EASTING: 1442764.81
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 21+50 DOWNSTREAM OFFSET (FT): 120
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 40.5

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 15.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
10							0-17.9', -EMBANKMENT FILL-
15	S1	5 10 16	18	11			S1 - Top 6" SANDY SILT (ML); low plasticity fines; ~40-50% fine sand; micaceous; red/brown. -EMBANKMENT FILL- S1 - Bottom 5" SILTY SAND (SM); fine sand; ~40-50% medium plasticity fines; brown/black. -EMBANKMENT FILL-
	S2	7 8 14	18	8			S2 - Top 7" SANDY SILT (SM); Similar to Top S1. -EMBANKMENT FILL-
	S3	22 44 50	18	10			Top of Drain Layer, 17.9 ft. 17.9-~22.5', -DRAIN LAYER- S2 - Bottom 1" SILTY SAND (SM); mostly fine sand; ~15-25% nonplastic fines; gray/brown. -DRAIN LAYER-
20	S4	14 17 19	18	12			S3 - SILTY SAND (SM); Similar to Bot S2. -DRAIN LAYER-
	S5	6 5 7	18	0			S4 - SILTY SAND (SM); Similar to Bot S2. -DRAIN LAYER- S5 - No Recovery.
	S6	4 5 9	18	13			Estimated Top of Alluvium, 22.5 ft. ~22.5-39.0', -ALLUVIUM- S6 - Sandy LEAN CLAY (CL); homogeneous medium plasticity fines; micaceous; red/brown. -ALLUVIUM-
	S7	2 4 6	18	10			S7 - SANDY LEAN CLAY (CL); Similar to S6; ~20-30% fine sand; red/brown; Sv=0.25 tsf. -ALLUVIUM-
25	S8	3 4 5	18	17			S8 - CLAYEY SAND (SC); fine, micaceous sand; ~25-35% high plasticity clay; red/brown; Sv=0.25 tsf. -ALLUVIUM-
	S9	3 5 7	18	17			S9 - Top 5" CLAYEY SAND (SC); Similar to S8. -ALLUVIUM- S9 - Bottom 12" FAT CLAY WITH SAND (CH); no dilatency, medium to high plasticity fines; ~10-30% fines sand; red/brown; Sv=0.3 tsf. -ALLUVIUM-
	S10	1 4 5	18	18			S10 - FAT CLAY (CH); no dilatency, medium to high plasticity fines; red/brown; Sv=0.3 tsf. -ALLUVIUM-
30	S11	4 6	18	15			

GEI Consultants, Inc.

LOG OF DRILL HOLE

CLD-611

DATE:10/17/2001 / 10/18/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		6					S11 - Top 1" FAT CLAY (CH); Similar to S10. -ALLUVIUM-
	S12	3 3 9	18	18			S11 - Bottom 14" SANDY SILT (ML); slow dilatency, medium plasticity fines; ~20-30% fine sand; tan/brown. -ALLUVIUM-
							S12 - SILTY SAND (SM); fine, micaceous sand; ~30-40% low plasticity fines; tan/brown. -ALLUVIUM-
	S13	7 11 11	18	12			S13 - SILTY SAND (SM); fine, micaceous sand; ~20-30% low plasticity fines; tan/brown, oxidized orange/black lenses throughout. -ALLUVIUM-
35	S14	6 8 14	18	11			S14 - SILTY SAND (SM); Similar to S13. -ALLUVIUM-
	S15	7 8 14	18	9			S15 - SILTY SAND (SM); Similar to S13; oxidized zones ~1/4" thick. -ALLUVIUM-
	S16	6 11 11	18	8			S16 - SILTY SAND (SM); Similar to S13. -ALLUVIUM-
							Estimated Top of Sand & Gravel, 39.0 ft.
	S17	12 30 38	18	11			~39.0-40.5', -SAND & GRAVEL-
40							S17 - SILTY SAND WITH GRAVEL (SM); fine to coarse sand; ~20-30% fines; ~20-25% gravel; max size 1"; brown. -SAND & GRAVEL-
							Bottom of Borehole, 40.5 ft.
45							
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CLD-613

DATE: 11/29/2001 / 11/30/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 640.52
NORTHING: 1037510.802 EASTING: 1442882.071
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 10+75 DOWNSTREAM OFFSET (FT): 165
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 29.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash to 15.0' with 5-1/2" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
10							0.0-~22.4', -EMBANKMENT FILL-
							Rip rap in upper 15'.
15	S1	5 12 19 24	24	5			S1 - CLAYEY SAND (SC); fine, micaceous sand; ~30-40% medium plasticity clayey fines; red/brown. -EMBANKMENT FILL-
	S2	10 9 10 22	24	4			S2 - CLAYEY SAND (SC); Similar to S1. -EMBANKMENT FILL-
20	S3	6 8 10 16	24	12			S3 - CLAYEY SAND (SC); Second attempt classification, 2" recovery first attempt; Similar to S1. -EMBANKMENT FILL-
	S4	5 11 19 53	24	14			S4 - Top 10" CLAYEY SAND (SC); Similar to S1. -EMBANKMENT FILL-
							Estimated Top of Drain Layer, 22.4 ft.
							~22.4-~24.4', -DRAIN LAYER-
	S5	5 12 21 31	24	5			S4 - Bottom 4" SILTY SAND (SM); fine, quartz sand; ~15-20% nonplastic fines; gray/brown. -DRAIN LAYER-
25	S6**	5 7 6 7	24	8	** 3" OD Sampler 140 lb Hammer.		S5 - Top 3.5" SILTY SAND (SM); Second attempt classification, poor recovery first attempt; Similar to Bot S4. -DRAIN LAYER-
							Estimated Top of Alluvium, 24.4 ft.
							~24.4-29.0', -ALLUVIUM-
	T7	PUSH	24	20			S5 - Bottom 1.5" SILTY SAND (SM); Second attempt classification, poor recovery first attempt; fine sand; ~30-40% low plasticity fines; black/brown. -ALLUVIUM-
							S6** - SANDY SILT (ML); low plasticity fines; ~40-50% fine sand; organic material; black/brown. -ALLUVIUM-
30							T7 - SANDY SILT (ML); Similar to S6*; Sv=0.15, 0.10, 0.15 tsf. -ALLUVIUM-

GEI Consultants, Inc.	LOG OF DRILL HOLE	CLD-613
		PAGE: 2 OF 2
		DATE:11/29/2001 / 11/30/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION

Bottom of Borehole, 29.0 ft.

GEI Consultants, Inc.

LOG OF DRILL HOLE

CLD-621A

PAGE: 1 OF 1

DATE: 11/28/2001 / 11/28/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.46
NORTHING: 1037229.714 EASTING: 1442880.709
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 7+95 DOWNSTREAM OFFSET (FT): 143
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 38.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash to 25.0' with 8" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
20							0.0-??', -EMBANKMENT FILL-
25	S1*	6 10 11 12	24	19	* 3" OD Sampler 300 lb Hammer.		??-~25.8', -DRAIN LAYER-
							S1* - Top 7" SANDY SILT (ML); nonplastic fines; ~40-50% fine, quartz sand; gray/brown. -DRAIN LAYER-
							Estimated Top of Alluvium, 25.8 ft.
	T2	PUSH	24	8			~25.8-38.0', -ALLUVIUM-
							S1* - Bottom 12" SANDY SILT (ML); ~50% nonplastic fines; ~20-25% fine sand; gray/black. -ALLUVIUM-
	T3	PUSH	28	28			T2 - SANDY SILT (ML); Second attempt classification, no recovery first attempt; Similar to Bot S1*. -ALLUVIUM-
30							T3 - SILT WITH SAND (ML); low to medium plasticity fines; ~15-20% fine sand; organic material within; brown/black. -ALLUVIUM-
	U1	PUSH	24	19			U1 - SANDY SILT (ML); medium plasticity fines; ~30-40% fine sand; brown/gray; Sv=0.20, 0.20 tsf. -ALLUVIUM-
	U2	PUSH	24	16			U2 - SILTY SAND (SM); ~35-45% nonplastic fines; gray/brown; Sv=0.15, 0.15 tsf. -ALLUVIUM-
35	T5	PUSH	24	16			T5 - SILTY SAND (SM); Similar to U2; grading with depth to more sandy (SM). -ALLUVIUM-
							Bottom of Borehole, 38.0 ft.
40							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CLD-622A

DATE: 11/17/2001 / 11/17/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.34
NORTHING: 1037588.895 EASTING: 1442832.964
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 11+52 DOWNSTREAM OFFSET (FT): 123
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: M. Cole TOTAL DEPTH (FT): 51.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 27.0' with 7" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
20, 25							0-~27.0', -EMBANKMENT FILL-
	S1*	4 7 11 12	24	19	* 3" OD Sampler 300 lb Hammer.		~27.0-~27.5, -DRAIN LAYER-
							S1 - Top 4" SILTY SAND (SM); fine sand; ~20-25% fines; gray. -DRAIN LAYER-
							Estimated Top of Alluvium, 27.5 ft.
							~27.5-47.5', -ALLUVIUM-
30							S1* - Middle 9" SILTY SAND (SM); Similar to Top S1. -ALLUVIUM-
							S1* - Bottom 6" SILTY SAND (SM); low plasticity fines; ~40% fine sand; gray/black. -ALLUVIUM-
	S2*	7 8 7 6	24	14			S2* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
	S3*	2 3 3 4	24	15			S3* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
	S4*	3 2 2 4	24	18			S4* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
35	S5*	3 2 2 3	24	15			S5* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
	S6*	2 2 1 2	24	13			S6* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
40	S7*	3 1 2 1	24	18			S7* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-

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LOG OF DRILL HOLE

CLD-622A

DATE: 11/17/2001 / 11/17/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
	S8*	1 2 2 6	24	21			S8* - Top 10" SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM- S8* - Middle 6" NARROWLY GRADED SAND WITH SILT (SP-SM); ~10-15% nonplastic fines; contains fibrous/wood. -ALLUVIUM- S8* - Bottom 5" SILTY SAND (SM); mostly fine to medium-fine sand; ~30% fines; black/gray. -ALLUVIUM-
	S9*	3 4 7 8	24	18			S9* - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to Mid S8. -ALLUVIUM-
45	S10*	7 10 13 22	24	22			S10* - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to Mid S8. -ALLUVIUM-
	S11*	5 15 17 31	24	18			S11* - Top 6" NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to Mid S8. -ALLUVIUM- Top of Sand & Gravel, 47.5 ft. 47.5-51.0', -SAND & GRAVEL-
50	S12*	36 21 38 70	24	16			S11* - Bottom 12" SILTY SAND WITH GRAVEL (SM); widely graded sand; ~30% gravel, max size ~2"; ~10-15% fines; tan. -SAND & GRAVEL- S12* - Top 6" SILTY SAND WITH GRAVEL (SM); Similar to Bot S11. -SAND & GRAVEL- S12 - Bottom 10" SAND (SP); mostly medium sand; ~10% fines; salt & pepper colored. -SAND & GRAVEL- Bottom of Borehole, 51.0 ft.
55							
60							

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LOG OF DRILL HOLE

CLD-622B

PAGE: 1 OF 1

DATE:11/18/2001 / 11/18/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.41
NORTHING: 1037610.871 EASTING: 1442831.85
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 11+62 DOWNSTREAM OFFSET (FT): 123
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: M. Cole TOTAL DEPTH (FT): 43.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 27.0' with 7" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
25							0-~27.0', -EMBANKMENT FILL-
	S1*	4 8 12 15	24	17	* 3" OD Sampler 300 lb Hammer.		~27.0-43.0'. -ALLUVUIM- S1* - Top 5" CLAY WITH SAND (CL); high toughness, medium plasticity; fine sand; red brown. -ALLUVIUM- S1* - Bottom 12" SILTY SAND (SM); fine sand; ~35-45% low plasticity fines; black/gray. -ALLUVIUM-
	S2*	5 8 6 5	24	16			S2* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
30	S3*	2 2 2 2	24	17			S3* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
	S4	2 2 2 3	24	14			S4* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
35	S5*	2 2 2 3	24	18			S5* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
	S6*	1 1 1/12" -	24	17			S6* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
	S7*	1/12" - 1 2	24	16			S7* - SILTY SAND (SM); Similar to Bot S1. -ALLUVIUM-
40	S8*	2 2 4 7	24	18			S8* - Top 12" SILTY SAND (SM); Similar to Bot S1; more sand; black. -ALLUVIUM- S8* - Bottom 6" SILTY SAND (SM); mostly fine to medium sand; ~30-40% fines; gray/black. -ALLUVIUM-
							Bottom of Borehole, 43.0 ft.
45							

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LOG OF DRILL HOLE

CLD-622C

PAGE: 1 OF 1

DATE: 11/29/2001 / 11/29/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.32
NORTHING: 1037585.486 EASTING: 1442838.605
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 11+56 DOWNSTREAM OFFSET (FT): 130
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 38.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash to 28.0' with 8" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
25							0.0-??', -EMBANKMENT FILL-
	T1	PUSH	24	17			??-38.0', -ALLUVIUM- T1 - SILTY SAND (SM); fine sand; ~25-30% nonplastic fines; organic material within; brown. -ALLUVIUM-
30	T2	PUSH	24	18			T2 - SANDY SILT (ML); nonplastic fines; ~30-40% fine sand; gray/black. -ALLUVIUM-
	T3	PUSH	24	17			T3 - SANDY SILT (ML); Similar to T2. -ALLUVIUM-
	T4	PUSH	24	19			T4 - SANDY SILT (ML); Similar to T2. -ALLUVIUM-
35	T5	PUSH	24	14			T5 - SANDY SILT (ML); Similar to T2; contamination from drilling mud in sample. -ALLUVIUM-
							Bottom of Borehole, 38.0 ft.
40							
45							

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LOG OF DRILL HOLE

CLD-623A

DATE: 11/27/2001 / 11/28/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.45
NORTHING: 1038250.846 EASTING: 1442786.35
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 18+27.5 DOWNSTREAM OFFSET (FT): 121
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 48.1

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash to 20.0' with 7" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
15							0.0-??', -EMBANKMENT FILL-
20	S1*	10 11 11 9	24	19	* 3" OD Sampler 300 lb Hammer.		??-~47.0', -ALLUVIUM- S1* - SILTY SAND (SM); fine sand; ~30-40% nonplastic fines; brown/black. -ALLUVIUM-
	S2*	4 4 4 6	24	6			S2* - SILTY SAND (SM); Second attempt classification, no recovery first attempt; Similar to S1*; low plasticity fines. -ALLUVIUM-
	S3*	2 3	12	11			S3* - SANDY LEAN CLAY (CL); medium plasticity fines; 30-35% fine sand; brown. -ALLUVIUM-
25	T4	PUSH	24	16			T4 - SANDY LEAN CLAY (CL); Third attempt spoon classification, no recovery first two tube attempts; Similar to S3*. -ALLUVIUM-
		PUSH	24	0			No Recovery three attempts between 27.0-29.0'.
30	S5*	3 4 4 5	24	16			S5* - SANDY SILT (ML); low plasticity fines; ~30-40% fine sand; brown. -ALLUVIUM-
	S6*	WOH 2 3 3	24	21			S6* - SANDY SILT (ML); Similar to S5*; slightly micaceous. -ALLUVIUM-
	S7*	2 2 2 4	24	21			S7* - SILTY SAND (SM); fine, micaceous sand; 35-45% low to nonplastic fines; brown/tan. -ALLUVIUM-
35	S8*	2 2	24	17			S8* - SILTY SAND (SM); Similar to S7*; ~35-45% fines; grading with depth to more sandy. -ALLUVIUM-

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LOG OF DRILL HOLE

CLD-623A

DATE:11/27/2001 / 11/28/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		4 6					
	S9*	3 7 8 10	24	20			S9* - SILTY SAND (SM); Similar to S7*; ~35-45% nonplastic fines. -ALLUVIUM-
40	S10	8 9 10 16	24	8			S10 - SILTY SAND (SM); Similar to S9*; gray/brown. -ALLUVIUM-
	S11	12 21 18 20	24	6			S11 - SILTY SAND (SM); fine sand; ~15-20% nonplastic fines; brown. -ALLUVIUM-
	S12	12 14 17 20	24	5			S12 - SILTY SAND (SM); Similar to S11; tan/gray. -ALLUVIUM-
45	S13	10 15 17 26	24	4			S13 - SILTY SAND (SM); Similar to S11; tan/gray. -ALLUVIUM-
							Estimated Top of Sand & Gravel, 47.0 ft.
	S14	40 60	13	NA			~47.0-48.1', -SAND & GRAVEL-
		100/1"					S14 - SILTY GRAVEL WITH SAND (GM); fine to coarse, angular to subrounded gravel; ~20-30% fine to coarse sand; ~15-20% nonplastic fines; brown/oxidized orange. -SAND & GRAVEL-
50							Bottom of Borehole, 48.1 ft.

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LOG OF DRILL HOLE

CLD-623B

DATE: 11/18/2001 / 11/19/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.61
NORTHING: 1038260.671 EASTING: 1442784.413
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 18+19.5 DOWNSTREAM OFFSET (FT): 121
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: M. Cole TOTAL DEPTH (FT): 50.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash down to 20.0' with 7" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
15							0-~20.0', -EMBANKMENT FILL-
20	S1*	6 7 7 7	24	13	* 3" OD Sampler 300 lb Hammer.		~20.0-47.0', -ALLUVIUM- S1 - SILTY SAND (SM); mostly fine sand; ~40% low plasticity fines; gray/black. -ALLUVIUM-
	S2*	4 4 4 5	24	22			S2 - Top 16" SANDY LEAN CLAY (CL); medium to low plasticity fines; ~35-40% fine sand; brown/gray. -ALLUVIUM- S2 - Bottom 6" SANDY LEAN CLAY (CL); medium to low toughness, medium plasticity fines; ~30-35% fine sand; brown/red/gray. -ALLUVIUM-
	S3*	3 3 4 4	24	13			S3 - SANDY LEAN CLAY (CL); Similar to Bot S2. -ALLUVIUM-
25	S4*	2 2 2 2	24	20			S4 - SANDY LEAN CLAY (CL); Similar to Bot S2. -ALLUVIUM-
	S5*	3 2 3 4	24	22			S5 - SANDY LEAN CLAY (CL); low to medium toughness, medium plasticity fines; ~40-45% fine sand; tannish-red/brown. -ALLUVIUM-
30	S6*	2 2 2 2	24	13			S6 - SANDY LEAN CLAY (CL); Similar to S5. -ALLUVIUM-
	S7*	2 3 2 4	24	24			S7 - LEAN CLAY WITH SAND (CL); medium toughness, medium to high plasticity fines; ~25-30% fine sand; tan/red-brown. -ALLUVIUM-
35	S8*	2 3 6 8	24	22			S8 - Top 8" LEAN CLAY WITH SAND (CL); Similar to S7; contains ~5% gravel. -ALLUVIUM- S8 - Bottom 14" SILTY SAND (SM); mostly fine to medium, micaceous sand; ~20-30% silt; tan/brown. -ALLUVIUM-

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LOG OF DRILL HOLE

CLD-623B

DATE: 11/18/2001 / 11/19/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
	S9*	2 4 4 9	24	16			S9 - SILTY SAND (SM); Similar to Bot S8. -ALLUVIUM-
	S10*	5 6 8 9	24	22			S10 - SILTY SAND (SM); Similar to Bot S8. -ALLUVIUM-
40	S11*	6 9 8 11	24	22			S11 - SILTY SAND (SM); Similar to Bot S8. -ALLUVIUM-
	S12*	6 8 8 9	24	17			S12 - SILTY SAND (SM); Similar to Bot S8. -ALLUVIUM-
	S13*	7 7 7 8	24	18			S13 - SILTY SAND (SM); Similar to Bot S8; less fines; less brown and more tan. -ALLUVIUM-
45	S14*	8 7 16 35	24	19			S14 - Top 11" SILTY SAND (SM); Similar to S13. -ALLUVIUM-
							~~Top of Sand & Gravel, 47.0 ft.~~
							47.0-50.0', -SAND & GRAVEL-
	S15*	24 50 33 52	24	12			S14 - Bottom 8" SILTY SAND WITH GRAVEL (SM); widely graded sand; ~30-40% subrounded gravel, max size ~2"; ~10-15% fines; brown. -SAND & GRAVEL-
50							S15 - SILTY SAND WITH GRAVEL (SM); Similar to Bot S14. -SAND & GRAVEL-
							Bottom of Borehole, 50.0 ft.
55							
60							

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LOG OF DRILL HOLE

CLD-623C

PAGE: 1 OF 1

DATE: 12/6/2001 / 12/6/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.57
NORTHING: 1038257.432 EASTING: 1442785.497
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 18+17 DOWNSTREAM OFFSET (FT): 121
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 33.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash to 25.0' with 6" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
20							0-??', -EMBANKMENT FILL-
25	U1	PUSH	24	24			??-33.0', -ALLUVIUM- U1 - LEAN CLAY WITH SAND (CL); medium plasticity fines; ~20-30% fine sand; brown; Sv=0.20, 0.25 tsf. -ALLUVIUM-
	U2	PUSH	24	0			U2 - No Recovery.
30	U3	PUSH	24	0			U3 - No Recovery.
							Bottom of Borehole, 33.0 ft.
35							
40							

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LOG OF DRILL HOLE

CLD-623D

PAGE: 1 OF 1

DATE: 12/7/2001 / 12/7/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Lower Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.71
NORTHING: 1038255.346 EASTING: 1442785.931
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 18+15 DOWNSTREAM OFFSET (FT): 121
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 28.0

LEGEND

1) BLOWS PER 6 in.-140 LB. HAMMER FALLING 30 in. TO DRIVE A 2.0 in. OD SPLIT SPOON SAMPLER
2) PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL
3) REC - RECOVERY LENGTH OF SAMPLE

S - SPLIT SPOON SAMPLER 2.0 in. OD
T - SHELBY TUBE
U - UNDISTURBED TUBE

NOTES: Borehole advanced through drill/wash technique. Drilling mud used.
Wash to 26.0' with 6" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
20							0-??', -EMBANKMENT FILL-
25	U1	PUSH	24	24			??-28.0', -ALLUVIUM- U1 - SANDY LEAN CLAY (CL); low to medium plasticity fines; ~30-40% fine sand; tan/brown; Sv=0.10, 0.20 tsf. -ALLUVIUM-
							Bottom of Borehole, 28.0 ft.
30							
35							
40							

UPPER DAM

NO LOGS WERE MADE FOR THE FOLLOWING BORINGS WHICH WERE DRILLED TO OBTAIN UNDISTURBED TUBE SAMPLES:

CUD-526	CUD-531
CUD-527	CUD-533
CUD-528	CUD-534
CUD-529	CUD-535

Hole No. CUD-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 4 SHEETS

1. PROJECT Clemson Upper Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon &
2. LOCATION (Coordinates or Station) Sta. 3+50, 4.0' downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) 4x5½ core b MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-2	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 20; UNDISTURBED 0
5. NAME OF DRILLER Edward Wood	14. TOTAL NUMBER CORE BOXES 2
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER +613.5'±
	16. DATE HOLE: STARTED 6 Apr 81; COMPLETED 13 Apr 81
	17. ELEVATION TOP OF HOLE +681.5±
7. THICKNESS OF OVERBURDEN 80.0'	18. TOTAL CORE RECOVERY FOR BORING 83 %
8. DEPTH DRILLED INTO ROCK 13.2'	19. SIGNATURE OF INSPECTOR JAMES D. KOTTI
9. TOTAL DEPTH OF HOLE 93.2'	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
681.5	0		SM-Dark brown, fine, silty sand, dry, organic, brownish tan after 1.5'.		1	W.T. 68.0' Date 7 Apr 81 Depth to water during drilling.	6 19 27
			20% micaceous				
675.5	5		6.0		2	W.T. 31.0'(at cave in) Water table reading 24 hrs. after hole completed.	
			SC-Reddish tan, fine to medium grained, clayey sand, dry, 25% micaceous.		3		37 20
672.2			9.3				
	10		SM-Light tan, fine to medium grained, silty sand, dry, 35% micaceous.		4	NOTE: Rock bit was used to cut through boulder at 5.5' to 6.0'.	17 13 18
			Seams of red sandy clay.				
			Reddish tan, slightly moist.		5		19
	15						16
			Slightly clayey.				16 14
	20		Seams of red and brown, sandy clay.		6		26 14
							16
	25				7		26 18
							18
651.5	30				8		23

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +681.5± **Hole No.** CUD-2

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 2 OF 4 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
651.5	30	c	d	e	JAR	g	
			SM-Reddish tan, fine to medium grained, silty sand, slightly moist. 34.5				11, 19, 20
647.0	35		SP-Gray, fine to medium grained, poorly graded sand, dry. 37.0		9		11
644.5			SC-Dark red, fine to medium grained, clayey sand, dry, 25% micaceous, some Quartz gravel.		10		11, 25
	40				11		23, 27
	45				12		17, 36, 30, 42
			48.5' to 49.5' seam of dark brown, lean clay. 51.5				24
	50				13		23
630.0			SM-Yellowish tan, fine, silty sand, slightly moist, 20% micaceous.		14		23, 40
	55		Reddish tan, 35% micaceous. 59.5		15		35, 44, 25
622.0	60		SC-Tannish red, fine to medium grained, clayey sand, slightly moist, 35% micaceous.		16		30, 20, 28
	65		Reddish brown, moist. 68.3		17	NOTE: Top of alluvial material at 68.3'.	11, 24, 28
613.2			SM-Grayish brown, fine to medium grained, silty sand, very moist, 10% micaceous, trace organic.		18		20
611.5	70						

Continued on sheet 3

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +681.5± | Hole No. CUD-2

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | SHEET 3 OF 4 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
611.5	70	c	d	e	JAR	g	
610.5			SM-Grayish brown, fine to medium grained, silty sand, very moist. 71.0		19	NOTE: At 79.5' began 3" spoon and 300 lb. hammer. Refusal at 80.0'.	16, 21, 30
	75		SP/SM-Grayish tan, fine to medium grained, slightly silty, poorly graded sand, moist. 78.1			NOTE: Hole reamed with fishtail to 80.0'. Casing was set at 81.4' and coring began.	29, 33, 35
603.4			SM-Blackish gray, fine, silty sand, moist.	80.0	20		50
601.5	80		Granite Gneiss-Gray, black, fresh, very hard, fine to medium grained, micaceous (biotite).	50	BOX 1	Pull 1 From 80.0' to 84.0' Run 4.0' Rec 2.0' CL 2.0'	
				RQD 90			
	82		82.1', 82.9', 83.6', 84.0' nearly horizontal, undulated, open joints, no stain.			NOTE: Scale change at 80.0'. NOTE: 80.0' to 82.0' washed away with drilling mud.	
	84		84.3' to 84.7' Quartz-Feldspar zone, with nearly horizontal, undulated, open joints at 84.5' and 84.7', no stain. 85.6' mechanical break.	84.0 100		Pull 2 From 84.0' to 88.7' Run 4.7' Rec 4.7' CL 0.0'	84.0
				RQD 94			
	86		86.5', 87.8', 88.1' nearly horizontal, undulated, open joints, light brown stain.				
	88		88.7' low angle, open joint, no stain. 90.1' low angle, undulated open joint, no stain. 91.3' mechanical break.	88.7 93	88.7 BOX 2	Pull 3 From 88.7' to 93.2' Run 4.5' Rec 4.2' CL 0.3'	88.7
				RQD 100			
	90		92.9' low angle, undualted, open joint, no stain.				
589.5	92						

Continued on sheet 4

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +681.5-±	Hole No. CUD-2
PROJECT Clemson Upper Dam	INSTALLATION Hartwell Lake	SHEET 4 OF 4 SHEETS

ELEVATION 589.5	DEPTH 92	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
588.3			Granite Gneiss-Gray, black, fresh, very hard, fine to medium grained, micaceous (biotite).	93.2		Pull 3 continued 93.2
	94		Bottom of Boring 93.2'			Pressure test resulted with the hole taking the following amounts of water at the corresponding depths: Depth of Water Packer Take Leakage 82.9 0 gl/ 10 min 0 gl NOTE: Depth indicated for pressure test is depth of bottom of packer. Water pressure 40 psi.

Hole No. CUD-3

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 5 SHEETS

1. PROJECT Clemson Upper Diversion Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon
2. LOCATION (Coordinates or Station) Sta. 8+50, 4.0' downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-3	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 19; UNDISTURBED 0
5. NAME OF DRILLER W. J. Kyser	14. TOTAL NUMBER CORE BOXES 5
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER 626.0'
	16. DATE HOLE: STARTED 23 Mar 81; COMPLETED 31 Mar 81
7. THICKNESS OF OVERBURDEN 85.8'	17. ELEVATION TOP OF HOLE 681.0'
8. DEPTH DRILLED INTO ROCK 33.4'	18. TOTAL CORE RECOVERY FOR BORING 88 %
9. TOTAL DEPTH OF HOLE 119.2'	19. SIGNATURE OF INSPECTOR JAMES D. KOTTI

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)	BLOWS
681.0	0		SM-Brownish tan, fine to medium, silty sand, slightly moist, trace mica.		1	W.T. 55.0' Date 23 Mar 81 Depth to water during drilling.	19, 30, 42
	5		Pinkish tan, dry, clayey, 25% micaceous, occasional Quartz gravel.		2	W.T. 10.0' Water table reading 24 hrs. after hole completed.	18, 33, 28
	10		Seams of red, clayey sand.		3	NOTE: Drilling mud still present in boring at 24 hr. reading.	29, 18, 23
			Brownish tan, slightly moist, 25% micaceous.		4		26, 12, 22
	20		Pinkish tan, slightly moist to dry, 35% micaceous, occasional Quartz and granitoid gravel.		5		30, 20, 30
	25		Brownish tan		6		19, 24, 21
651.0	30		Rock flour		7		28, 37

Sample Lab

No.	Class	LL	PL	PI
1	SM	NP	NP	NP
5	SM	41	30	11
9	SP-SM	NP	NP	NP
14	SM	NP	NP	NP
19	SP-SM	NP	NP	NP

Continued on sheet 2

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 681.0' **Hole No.** CUD-3

PROJECT Clemson Upper Diversion Dam | INSTALLATION Hartwell Lake | SHEET 2 OF 5 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
651.0	30.0	c	d	e	JAR	g	
			SM-Brownish tan, fine to medium, silty sand, slightly moist to dry, 35% micaceous. 33.8				20, 27
647.2					8		11
	35		SP-Tannish gray, fine to medium, poorly graded sand, dry, silty. 38.2		9		16, 10
642.8					10		19
	40		SM-Pinkish tan, fine to medium, silty sand, dry, 30% micaceous, slightly clayey.		11		13
			Pink, 40% micaceous, occasional Quartz gravel.				34, 30
					12		18
	45		Brownish tan, slightly moist, 30% micaceous.				25, 21, 29
	50				13		20
			Pinkish tan, dry, 40% micaceous, lenses of red, sandy clay.				35
626.5			Blackish brown, fine, silty sand, clayey, 10% micaceous. 54.5		14	NOTE: Embankment-alluvial contact believed to be at 54.5'.	22, 36
	55		MH-Black, plastic silt, slightly moist, trace fine sand, 10% micaceous.				25
					15		16, 25
	60						14, 18
616.5			64.5				13
	65		SM-Dark brown, fine to medium, silty sand, moist, 20% micaceous. 68.5		16		18, 16
612.5			MH-Dark brown, plastic silt, moist to very moist, little fine sand, 10% micaceous.		17		18
611.0	70						

Continued on sheet 3

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 681.0' | **Hole No.** CUD-3

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | SHEET 3 OF 5 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)	BLOWS
611.0	70						
608.0			MH-Dark brown, plastic silt, moist to very moist, little fine sand, 10% micaceous, clayey after 71.0'.		18	NOTE: Began using 3" spoon and 300 lb. hammer at 82.5'. Rock bit was used to advance hole to 82.5' through gravel and sand.	12, 25, 20, 70, 18
	75		SM-Brown, gray, fine, silty sand, moist, 10% micaceous.				
			Gray, fine to medium, slightly moist, occasional Quartz gravel. 81.0'			NOTE: Encountered 3" spoon refusal at 85.5'. Casing was set at 85.8' and coring was begun at 85.8'.	45, 46, 43
600.0	80		SW-Grayish tan, fine to coarse, well graded sand, slightly moist, some rounded Quartz gravel.		19		100+, 100+
595.2	85		Top of Rock 85.8'	85.8		85.8	100+
			Granite Gneiss-Gray, white, pink, very badly weathered, very soft, fine to medium grained, micaceous. 87.5' to 89.6' near vertical, healed joint with tan mineral filling. 87.4' nearly horizontal, open joint, no apparent stain. 89.8' to 95.2' grayish white, badly to moderately weathered, sot to moderately hard, micaceous. 89.8' to 90.9' nearly horizontal joints with light green stain. 90.9' to 91.6' gray, fine to medium, silty sand. 91.6' to 91.9' fracture zone with light green stain and in some areas rusty orange stain. 95.0' to 95.2' nearly horizontal joints, rusty brown stain. 95.6' to 96.3' high angle, open joint, light green stain.	95 RQD 0 89.8		Pull 1 From 85.8' to 89.8' Run 4.0' Rec 3.8' CL 0.2 89.8	
	90			40		Pull 2 From 89.8' to 95.0' Run 5.2' Rec 2.1' CL 3.1'	
	92			RQD 0		NOTE: Scale change at 90.0'	
						NOTE: Substantial water loss observed in this pull.	
	94			95.0		95.0	
	96			100 RQD 0 95.2		Pull 3 From 95.0' to 95.2' Run 0.2' Rec 0.5' CG 0.3' 95.2	
				96		Pull 4 From 95.2' to 100.2' Run 5.0' Rec 4.8' CL 0.2'	
				RQD 85			
583.0	98						

Continued on sheet 4

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 681.0±	Hole No. CUD-3
PROJECT Clemson Upper Diversion Dam	INSTALLATION Hartwell Lake	SHEET 4 OF 5 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
583.0	98	c	d	e	f	g
			Granite Gneiss-Grayish white, slightly weathered to fresh, very hard, fine to medium grained, micaceous after 95.2'.			Pull 4 continued
	100		97.3', 98.1', 98.4' nearly horizontal, open joints, dark gray stain.	100.2		100.2
			99.6', 99.7' nearly horizontal, very closely spaced, open joints, greenish gray stain.	86		Pull 5 From 100.2' to 105.2' Run 5.0' Rec 4.3' CL 0.7'
	102		100.5', 100.9', 101.1' nearly horizontal, open joints, greenish gray stain.	RQD 87	102.5 BOX 3	
			102.3' nearly horizontal, open joint, light brown stain.			
	104		103.6' nearly horizontal, open joint, undulated, dark gray stain.	105.2		105.2
			105.7', 106.5' nearly horizontal, open joints, light greenish gray stain.	100		Pull 6 From 105.2' to 110.2' Run 5.0' Rec 5.0' CL 0.0'
	106		107.0, 108.3, 109.4' areas of very closely spaced, nearly horizontal, open joints, light brown stain.	RQD 80		
	108		108.8' to 109.0' biotite zone with nearly horizontal joint, open at 108.9'.			
	110			110.2	110.2	110.2
				96	BOX 4	Pull 7 From 110.2' to 115.2' Run 5.0' Rec 4.8' CL 0.2'
			111.6', 111.8', 111.9', 113.3' nearly horizontal, open joint, greenish gray stain.	RQD 90		
	112		112.4' high angle joint, healed with a white mineral.			
567.0	114					
			Continued on sheet 5			

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 681.0'±	Hole No. CUD-3
PROJECT Clemson Upper Diversion Dam	INSTALLATION Hartwell Lake	SHEET 5 OF 5 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
567.0	114	c	d	e	f	g
			Granite Gneiss-Grayish white, slightly weathered to fresh, very hard, fine to medium grained, micaceous.	115.2		Pull 7 continued 115.2
	116		115.8, 116.3', 116.5', 116.9' nearly horizontal, open joints, no apparent stain.	100 RQD 84	117.0 BOX 5	Pull 8 From 115.2' to 119.2' Run 4.0' Rec 4.0' CL 0.0'
	118		118.0' nearly horizontal, open joint, undulated, no apparent stain. 118.4', 118.7', 119.0' nearly horizontal, open joints, no stain.			
561.8						119.2
			Bottom of Boring 119.2'			
	120					

NOTE: Upon completion of the boring, hole was pressure tested using a 4" packer with air pressure set at 125 psi. Water was pumped in at a pressure of 40 psi at various depth intervals for 10 minutes. Water take in gallons was recorded, as well as leakage from inside the casing.

NOTE: Water pressure was lowered to 20 psi at 92.5' due to excessive leakage.

NOTE: After Pull 1, hole was grouted 85.5' to 89.8' to prevent leakage during pressure testing. Grout was cored after setting 24 hrs. and rock coring continued.

Depth of Packer	Water Pressure psi	Total Gls/ 10 Min	Leakage From inside casing
87.5	40	274	5 gal
92.5	20	206	35 gal
97.5	40	113	20 gal
103.5	40	180	35 gal
108.5	40	122	30 gal
113.5	40	86	35 gal
116.0	40	86	35 gal

Hole No. CUD-4

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 7 SHEETS

1. PROJECT Clemson Upper Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 4x5½ core bbl
2. LOCATION (Coordinates or Station) Sta. 13+50; 4.0' downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-4	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 20; UNDISTURBED 0
5. NAME OF DRILLER Jerry Mathews	14. TOTAL NUMBER CORE BOXES 9
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER 613.5'
	16. DATE HOLE: STARTED 10 Mar 81; COMPLETED 19 Mar 81
7. THICKNESS OF OVERBURDEN 87.0'	17. ELEVATION TOP OF HOLE 681.0'+
8. DEPTH DRILLED INTO ROCK 64.7'	18. TOTAL CORE RECOVERY FOR BORING 96 %
9. TOTAL DEPTH OF HOLE 151.7'	19. SIGNATURE OF INSPECTOR JAMES KOTTI

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
681.0	0		SM-Reddish brown to grayish tan, fine to medium, silty sand, slightly moist to dry, slightly clayey. Micaceous.		1	NOTE: Encountered splitspoon resistance due to rock debris, preventing reliable blow count. Hole was augered to 1.5' sample retained from 6" spiral auger.	26, 31
	5		Pinkish tan, dry, 40% micaceous.		2		26, 30
			Very clayey.		3	NOTE: Encountered boulders at 13.5'-15.0' and 18.0' - 19.5' resulting in high blow counts.	21, 27
	10		Decrease in clay.				19, 27
			Tan, sandy clay lenses.		4	W.T. 67.5' Date 11 Mar 81 Depth to water during drilling.	54, 36
	15		Occasional zones of Quartz gravel.		5	W.T. 13.2' Water table reading 24 hrs. after hole completed.	25, 72, 41
	20		Tan, tannish yellow, tannish white, decrease in mica.			NOTE: Boring still filled with drilling mud at 24 hr. reading.	44, 43
	25		Tan, grayish tan, slightly moist, 30% micaceous, clayey		6		38, 24
			Tan, pink.		7		30, 17
651.0	30		Continued on sheet 2				

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 681.0' **Hole No.** CUD-4

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 2 OF 7 SHEETS

ELEVATION	DEPTH	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
651.0	30		SM-Tan, pink, fine to medium, silty sand, slightly moist, clayey, 30% micaceous.				33 35
			Seam of red, sandy clay 33.5' to 34.0' 35.0				32
646.0	35		SP-Light tannish gray, fine to medium, poorly graded sand, slightly moist, trace rounded Quartz gravel. 39.0		8		35 30 17
642.0	40		SM-Gray, brownish red, fine to medium, silty sand, slightly moist, 40% micaceous, clayey.		9		12 15
			Tan, 45% micaceous. Lenses of red sandy clay.		10		28 25
635.0	45		46.0 SC-Red, fine to medium, clayey sand, slightly moist, 45% micaceous, trace Quartz pebbles. 48.5		11		17 26
632.5	50		SM-Tan, fine to medium, silty sand, slightly moist, 45% micaceous, clayey, seam of red sandy clay 49.7' - 50.2'.		12 13		32 30 34
			Light brownish tan.		14		45 35 25 25
619.5	60		Seam of red, clayey sand 60.5' - 61.5' 61.5		15 16	NOTE: Contact between embankment material and alluvium at 61.5'.	20 20 35 13
	65		MH-Black, dark gray, plastic silt, slightly moist, trace organic, 10% micaceous. 67.5		17		24 15
613.5			SM-Dark brownish gray, fine to medium, silty sand, moist, 10% micaceous.		18		4
611.0	70		Continued on sheet 3				

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 681.0± **Hole No.** CUD-4

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 3 OF 7 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
611.0	70	c	d	e	JAR	g	
			SM-Dark brownish gray, fine to medium, silty sand, moist, 10% micaceous, fine grained below 70.5'.			NOTE: Began using 3" spoon and 300 lb. hammer at 82.5'.	15, 17
	75					NOTE: Contact between alluvium and top of rock at 85.0'.	12, 16
			Dark gray, tan.			NOTE: 3" spoon refusal at 87.0'. Set 86.4' 6" casing to begin core.	13, 22, 17
	80		81.5				14
599.5			SW-Yellowish tan, fine to coarse, well graded sand, moist, clayey, some rounded Quartz gravel.		19		80, 66
596.0	85		Top of Rock 85.0' Granite Gneiss-Yellowish tan, very badly weathered, soft to very soft, fine to medium grained, micaceous. Tannish gray below 90.0'.		20	NOTE: Scale change at 90.0'.	56, 100
				100 RQD 0 90.0	BOX 1	Pull 1 From 87.0' to 90.0' Run 3.0' Rec 3.0' CL 0.0'	
	90			79 RQD 0		Pull 2 From 90.0' to 94.7' Run 4.7' Rec 3.7' CL 1.0'	
	92						
	94				94.7		
			95.7' to 96.7' Biotite zone.	90 RQD 0	BOX 2	Pull 3 From 94.7' to 99.6' Run 4.9' Rec 4.4' CL 0.5'	
	96		96.7' to 96.8' Quartz-Feldspar pegmatite vein.				
583.0	98						

Continued on sheet 4

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 681.0'±	Hole No. CUD-4
PROJECT Clemson Upper Dam	INSTALLATION Hartwell Lake	SHEET 4 OF 7 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
583.0	98	c	d	e	f	g
			Granite Gneiss-Tannish gray, very badly weathered, soft to very soft. 98.8' to 99.6' Quartz-Feldspar pegmatite vein.			Pull 3 continued 99.6
	100			100 RQD 0		Pull 4 From 99.6' to 101.7' Run 2.1' Rec 2.9' CG 0.8' 101.7
	102			87 RQD 0		Pull 5 From 101.7' to 104.7' Run 3.0' Rec 2.6' CL 0.4' 104.7
	104		103.9' to 104.3' Quartz-Feldspar pegmatite vein.			
	106			100 RQD 0		Pull 6 From 104.7' to 109.8' Run 5.1' Rec 5.1' CL 0.0'
			107.0' to 108.3' Near vertical joint, closely spaced, slight brown stain.			
	108		108.4' to 108.7' Quartz-Feldspar pegmatite vein.	109.8	109.8	109.8
	110		111.3' White, grayish white, badly weathered to very badly weathered, soft, rusty brown stain in micaceous areas.	100 RQD 0		Pull 7 From 109.8' to 114.4' Run 4.6' Rec 4.6' CL 0.0'
	112		111.8' to 112.3' High angle joint, healed with light green mineral. 112.5' Joint nearly horizontal, closely spaced, absence of stain.			
567.0	114		Continued on sheet 5			

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 681.0'± **Hole No.** CUD-4

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 5 OF 7 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
567.0	114	c	d	e	f	g
			Granite Gneiss-White, grayish white, badly to very badly weathered, soft. 115.9' Nearly horizontal joint, absence of stain.	114.4		Pull 7 continued 114.4
				94		Pull 8 From 114.4' to 119.3' Run 4.9' Rec 4.6' CL 0.3'
	116			RQD 0		
					117.6 BOX 5	
	118					119.3
				100		Pull 9 From 119.3' to 123.2' Run 3.9' Rec 4.6' CL 0.7'
	120					
			121.0' to 121.6' Joints nearly horizontal, closely spaced, slight brown stain. 121.9' Healed joint, nearly horizontal.	RQD 0		
	122					123.2
			123.8', 124.6', 124.7', 127.9' joints nearly horizontal, closely spaced, slight orange brown stain. 125.0' to 125.3' Joint, 45° closely spaced, slight brown stain.	98	124.1	Pull 10 From 123.2' to 128.3' Run 5.1' Rec 5.0' CL 0.1'
	124			RQD 0	BOX 6	
	126					
	128					128.3
			Approx. Top of Firm Rock 128.3'. 128.3' White, grayish white, badly to moderately weathered, soft to moderately hard, fine to medium grained, micaceous.	78		Pull 11 From 128.3' to 133.4' Run 5.1' Rec 4.0' CL 1.1'
551.0	130					

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 681.0± **Hole No.** CUD-4

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 6 OF 7 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
551.0	130	c	d	e	f	g
			Granite Gneiss-White, grayish white, badly to moderately weathered, soft to moderately hard.		131.3	Pull 11 continued
			with 60° joint.		BOX 7	
	132		128.3' to 128.9' Slight brown stain. 129.8', 130.7', 131.7', 131.9' Joints nearly horizontal, closely spaced, rusty brown stain.			133.4
	134		129.2' to 129.4' Fracture zone with brownish black stain. 129.4' to 129.6' Quartz zone 129.6' to 129.8' Biotite zone 130.2' to 130.5' Quartz zone	92 RQD 0		Pull 12 From 133.4' to 138.4' Run 5.0' Rec 4.6' CL 0.4'
	136		134.0', 134.4', 134.8', 136.6', 137.5' Joints, nearly horizontal, very closely to closely spaced, slight brown stain.			
	138		133.4' to 135.8' Brown stain more prominent. 133.7' to 134.1' Near vertical joint, light brown stain.			138.4
				100	139.0	Pull 13 From 138.4' to 142.5' Run 4.1' Rec 4.8' CG 0.7'
			136.7' to 137.0' Fracture zone, slight brown stain.	RQD 0	BOX 8	
	140		138.4' Moderately hard, moderately weathered except at fracture zones and joint areas. 139.4', 140.9' Joints nearly horizontal, closely spaced, light brown stain.			
	142					142.5
			141.5' to 142.3' Fracture zone of numerous joints, vertical to horizontal, rusty brown stain.	72		Pull 14 From 142.5' to 147.1' Run 4.6' Rec 3.3' CL 1.3'
	144		142.3' to 142.8' Biotite zone. 142.8' to 143.1' Fracture zone in pegmatite vien, slight brown stain.	RQD 0		
535.0	146		143.2' to 144.5' Near vertical joint, rusty brown stain,			

Continued on sheet 7

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 681.0'	Hole No. CUD-4
PROJECT Clemson Upper Dam	INSTALLATION Hartwell Lake	SHEET 7 OF 7 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
535.0	146	c	d	e	f	g
			Granite Gneiss - White grayish white, moderately weathered, moderately hard.		147.1	Pull 14 continued 147.1
	148		(Cont) intersected by nearly horizontal joints at 143.5', 143.9', 144.0'. 144.7' Intersecting joints, 45° and nearly horizontal, closely spaced, slight brown stain. 144.8' to 145.7' Near vertical joint, light brown stain.	100 RQD 0	BOX 9	Pull 15 From 147.1' to 151.7' Run 4.6' Rec 4.9' CG 0.3'
	150		147.7' Blackish gray, Biotite rich, moderately to badly weathered, soft to moderately hard.		151.7	151.7
529.3	152		147.5', 147.7', 148.6', 149.3', 149.8', 151.3' Joints, nearly horizontal, closely spaced, slight brown stain. 149.9' to 150.4' Fracture zone of high and low angle joints intersecting, slight rusty brown stain. 150.6' to 150.8' High angle joint, slight brown stain.			NOTE: After completion of core, hole was pressure tested isomg 5"x4.2' packer with water pumped in at 40 psi for 10 min. Packer pressure was maintained at 100-125 psi.
			Bottom of Boring 151.7'			

PRESSURE TEST

Depth of Packer	Gal Pumped in	Estimated Leakage Up Casing
88.5	287	-
93.5	296	-
98.5	250	-
103.5	333	-
108.5	333	-
113.5	158	-
118.5	136	150 gal
123.5	184	150 gal
128.5	175	150 gal
133.5	178	150 gal
138.5	166	150 gal
143.5	43	30 gal
148.5	8	-

NOTE: Leakage up casing due to poor seating of packer in soft rock.

Hole No. CUD-5

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 10 SHEETS

1. PROJECT Clemson Upper Diversion Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 4x5½ core bbl
2. LOCATION (Coordinates or Station) Sta. 18+50, 4.0' downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-5	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 20; UNDISTURBED 0
5. NAME OF DRILLER Gerald Mathews	14. TOTAL NUMBER CORE BOXES 14
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER 618.0'
	16. DATE HOLE: STARTED 23 Mar 81; COMPLETED 7 Apr 81
	17. ELEVATION TOP OF HOLE 681.0' ±
7. THICKNESS OF OVERBURDEN 88.5'	18. TOTAL CORE RECOVERY FOR BORING 90 %
8. DEPTH DRILLED INTO ROCK 104.9'	19. SIGNATURE OF INSPECTOR JAMES KOTTI
9. TOTAL DEPTH OF HOLE 193.4'	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS h
681.0	0		SM-Dark red-brown, fine to medium, silty sand, slightly moist with roots. Brownish tan after 1.3'.		1	W.T. 63.0' Date 24 Mar 81 Depth to water during drilling.	35, 37, 36
	5		Occasional Quartz and Granite gravel, 25% micaceous.		2	W.T. 32.0' (at cave-in). Water table reading 24 hrs. after hole completed.	21, 33, 34
	10		Pink-tan, dry to slightly moist, 35% micaceous.		3		24, 15, 27
	15				4		42, 28, 37
	20				5		44, 27, 29
	25		Clayey		6		27, 19, 24
651.0	30		Continued on sheet 2		7		22, 26

Sample No.	Lab Class	LL	PL	PI
3	SM	35	29	6
8	SM	NP	NP	NP
13	SM	46	40	6
17	ML	42	30	12
20		NP	NP	NP

NOTE: Soils field classified in accordance with the Unified Soil Classification System.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 681.0'+ | **Hole No.** CUD-5

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | SHEET 2 OF 10 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f) JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)	BLOWS
651.0	30		SM-Pink-tan, fine to medium silty sand, dry to slightly, moist, 35% micaceous, clayey.				24
			Seam of red, clayey sand, 32.0-33.0. 33.5				27
647.5			SP-Gray-tan, fine to medium, poorly graded sand, dry. 35.0		8		14
646.0	35		SM-Brown-tan, fine to medium, silty sand, dry, 25% micaceous.		9		16
			Seam of orange, clayey sand, 37.9'-38.3'.				10
			Pink-tan, slightly moist, 40% micaceous. 41.0				11
	40				10		10
640.0			SC-Red, fine to medium, clayey sand, slightly moist, 30% micaceous.		11		17
							23
	45				12		24
							25
							28
							33
	50		Seam of red-tan, fine to medium, silty sand, slightly moist, 40% micaceous, clayey 50.0'-51.0'.		13		32
							28
							34
	55				14		30
							36
							27
					15	NOTE: Top of alluvial material at 60.8'.	23
620.2	60		60.8		16		24
			MH-Brown-black, plastic silt, slightly moist, very clayey. 63.5				21
617.5			CL-Orange-tan, lean clay, trace fine sand, slightly moist.		17		18
	65						20
							16
							26
					18		27
611.0	70						

Continued on sheet 3

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 681.0'±	Hole No. CUS-5
PROJECT Clemson Upper Diversion Dam	INSTALLATION Hartwell Lake	SHEET 3 OF 10 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
611.0	70	c	d	e	JAR	g	
			MH-Gray-tan, plastic silt, slightly moist, some fine sand below 70.0'.			NOTE: At 81.0' began using 3" spoon and 300 lb. hammer.	26 26
	75		Gray, slightly clayey. 77.0			NOTE: Casing was set to 88.5' and coring begun.	23 18
604.0			SM-Gray, rusty brown, fine, silty sand, slightly moist, 10% micaceous.		19	NOTE: After Pull 1, hole was grouted with portland cement from 92.5' extending up into casing.	35 36
	80		Rusty tan, some rounded Quartz gravel. 81.0				68
600.0			SP/SM-Orange-tan, fine to medium, slightly silty, poorly graded sand, moist, frequent Quartz gravel.		20		65 65
	85						42 70
592.5			Top of Rock 88.2'		88.5		48
	90		Granite Gneiss-Light orange, tan and white, very badly weathered, very soft, fine to medium grained, micaceous, joints throughout core are predominantly high angle to nearly vertical, most frequently healed or partially healed. 90.0' partially healed, nearly horizontal joint.	88 RQD 0	BOX 1	Pull 1 From 88.5' to 92.5' Run 4.0' Rec 3.5' CL 0.5' NOTE: Scale change at 90.0'. 92.5	
	92			92.5 100 RQD 0 93.2		Pull 2 From 92.5' to 93.2' Run 0.7' Rec 0.7' CL 0.0' 93.2	
	94			19 RQD 0		Pull 3 From 93.2' to 98.4' Run 5.2' Rec 1.0' CL 4.2' NOTE: 93.2'-97.4' washed away.	
	96						
583.0	98						

Continued on sheet 4

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 681.0'±	Hole No. CUD-5
PROJECT Clemson Upper Diversion Dam	INSTALLATION Hartwell Lake	SHEET 4 OF 10 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
583.0	98	c	d	e	f	g
			Granite Gneiss-Light orange-tan and white, very badly weathered, very soft, 98.8' low angled, undulating open joint.	98.4		Pull 3 continued 98.4
				90		Pull 4 From 98.4' to 103.6' Run 5.2' Rec 4.7' CL 0.5'
	100		98.9' low angled joint, partially healed with white mineral filling.	RQD 0	100.3	
			101.2' 45° joint, healed with white mineral filling.		BOX 2	
	102		101.7' to 102.4' dark orange-brown zone, with a high angle joint from 102.0' to 102.3'.			
				103.6		103.6
	104			84		Pull 5 From 103.6' to 108.6' Run 5.0' Rec 4.2' CL 0.8'
			104.6' to 106.2' high angle joints, healed with white mineral filling.			
	106		105.7' to 106.1' high angled, partially healed joint.	RQD 0		
			105.2' nearly horizontal, open joint.			
	108			108.6	108.6	108.6
				100	BOX 3	Pull 6 From 108.6' to 111.6' Run 3.0' Rec 3.0' CL 0.0'
	110			RQD 0		
			Yellow-tan and white after 111.6'.	111.6		111.6
			112.0' intersection of closely spaced, high angled open joints with brown stain.	84		Pull 7 From 111.6' to 116.1' Run 4.5' Rec 3.8' CL 0.7'
	112		113.4' to 114.1' near vertical joint, partially healed with Quartz.	RQD 0		
567.0	114		Continued on sheet 5			

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 681.0'	Hole No. CUD-5
PROJECT Clemson Upper Diversion Dam	INSTALLATION Hartwell Lake	SHEET 5 OF 10 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
567.0	114	c	d	e	f	g
			Granite Gneiss-Yellow-tan and white, very badly weathered, very soft.			Pull 7 continued
	116		116.3, 117.4' nearly horizontal, open joint.	116.1	116.1	116.1
				100	BOX 4	Pull 8 From 116.1' to 120.7' Run 4.6' Rec 5.0' CG 0.4'
	118		117.8' to 118.0' Quartz-Feldspar zone. 118.2' to 118.9' intersection of vertical and horizontal joints, open, brown stain. 119.0' to 119.3' area with rusty brown stain.	RQD 0		
	120		119.3' to 119.9' near vertical joint, healed with Quartz. Brown-tan and white after 120.7'.	120.7		120.7
				91		Pull 9 From 120.7' to 125.4' Run 4.7' Rec 4.3' CL 0.4'
	122		121.8' to 122.4' high angle joint with yellow-white mineral.	RQD 0	122.8	
	124		123.5' to 124.9' near vertical joint, partially healed with white mineral filling. 122.4', 123.6', 124.4' nearly horizontal, open joints, light brown stain. Brown-tan and white, very badly weathered, very soft to soft, after 125.4'.	125.4	BOX 5	125.4
				96		Pull 10 From 125.4' to 130.1' Run 4.7' Rec 4.5' CL 0.2'
	126					
	128		127.1' to 127.5', 129.3' to 129.7' high angled joints, healed with white mineral filling. 126.4', 127.7', 128.3' nearly horizontal open joints, light brown stain. 128.8' to 129.6' rusty brown stain.	RQD 0		
551.0						

Continued on sheet 6

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 681.0'±	Hole No. CUD-5
PROJECT Clemson Upper Diversion Dam	INSTALLATION Hartwell Lake	SHEET 6 OF 10 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
551.0	130	c	d	e	f	g
				130.1		Pull 10 continued 130.1
			Granite Gneiss-Brown-tan and white, very badly weathered, soft to very soft. 130.1' to 130.9', 133.0' to 134.4' high angled joints, partially healed with white mineral filling. 131.4' to 131.7' high angled, open joint, orange-black stain. 131.7' to 132.1' high angled joint, healed with white mineral filling. 131.1', 131.7', 133.0' nearly horizontal, open joint, light brown stain. 134.4' to 134.9' very closely spaced, nearly horizontal, open joints, orange stain. 135.8' brown-gray, white, very badly to badly weathered, soft to very soft below 135.8'. 136.5' to 136.8' high angled joint, healed with Quartz. 137.4' to 138.3' white, Quartz-Feldspar zone, spotty orange stain. 137.0', 138.2', 138.5' nearly horizontal, open joints, brown stain. 139.9' to 141.0', 141.8' to 142.2' high angled joints, healed with a black mineral. 142.3' blue-gray and white, infrequent orange stain, badly weathered, soft below 142.3'. 145.7' nearly horizontal, open joint. 145.8' to 146.7' high angled joint, healed with white mineral filling. 145.9' biotite zone.	100	BOX 6	Pull 11 From 130.1' to 134.9' Run 4.8' Rec 4.9' CG 0.1'
	132			RQD 0		
	134			134.9		134.9
				RQD 0		Pull 12 From 134.9' to 135.8' Run 0.9' Rec 0.6' CL 0.3'
	136			135.8		135.8
				98		Pull 13 From 135.8' to 139.9' Run 4.1' Rec 4.0' CL 0.1'
					137.3	
				RQD 0	BOX 7	
	138					
				139.9		139.9
	140			91		Pull 14 From 139.9' to 144.6' Run 4.7' Rec 4.3' CL 0.4'
				RQD 0		
	142					
	144			144.6	144.6	144.6
				98	BOX 8	Pull 15 From 144.6' to 149.5' Run 4.9' Rec 4.8' CL 0.1'
				RQD 0		
535.0	146					

Continued on sheet 7

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 681.0' | **Hole No.** CUD-5

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | SHEET 7 OF 10 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
535.0	146	c	d	e	f	g
			Granite Gneiss-Brown-tan and white with orange stain in micaceous areas, badly weathered, soft below 146.6'.			Pull 15 continued
	148		147.6' nearly horizontal, open joint.			
				149.5		149.5
				90 RQD 0		Pull 16 From 149.5' to 150.5' Run 1.0' Rec 0.9' CL 0.1'
	150			150.5		150.5
				100		Pull 17 From 150.5' to 154.8' Run 4.3' Rec 4.3' CL 0.0'
					151.5 BOX 9	
	152			RQD 0		
	154		153.6' intersection of high angled and nearly horizontal, open joints, brown stain. 154.1' to 154.8' near vertical joint, partially healed with green-white mineral filling.	154.8		154.8
				93		Pull 18 From 154.8' to 159.4' Run 4.6' Rec 4.3' CL 0.3'
	156		154.8' to 156.0' white, Quartz-Feldspar zone, orange-brown stain. 156.1' to 156.4', 158.6' to 158.8' high angled joints, partially healed with green-white mineral.	RQD 0		
	158		156.6' to 156.8' intersection of high angled and nearly horizontal, open joints with brown stain.		158.8	
			159.4' to 160.1' high angled joint, partially healed with green-white mineral.	159.4	BOX 10	159.4
	160			100		Pull 19 From 159.4' to 164.4' Run 5.0' Rec 5.0' CL 0.0'
			161.2' to 161.4' intersection of high angled and nearly horizontal joints, open, with brown stain.	RQD 0		
519.0	162		161.9' to 163.1' near vertical joint, partially healed, brown stain.			
			Continued on sheet 8			

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 681.1+ **Hole No.** CUD-5

PROJECT Clemson Upper Diversion Dam | INSTALLATION Hartwell Lake | SHEET 8 OF 10 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
519.0	162		Granite Gneiss-Brown-tan and white, badly weathered, soft.			Pull 19 continued
	164		163.7' to 164.4' fracture zone of intersecting joints of various angles, brown stain.	164.4		164.4
			163.1' nearly horizontal joint, healed with a white mineral.	100	165.9	Pull 20 From 164.4' to 169.4' Run 5.0' Rec 5.0' CL 0.0'
	166		165.1' to 166.1', 167.6' to 168.5' near vertical joints, healed with green-white mineral. 166.8' to 167.2' high angled, open joint with brown stain.	RQD 0	BOX 11	
	168		168.7' to 169.4' fracture zone at intersection of two high angled, open joints, brown stain.	169.4		169.4
	170		169.9' to 170.8' near vertical joint, partially healed with white mineral, intersected by high angled joint, partially healed with white mineral at 170.1' to 170.3'. 171.2' to 171.6' high angled open joint with brown stain.	82 RQD 0		Pull 21 From 169.4' to 174.4' Run 5.0' Rec 4.1' CL 0.9'
	172		172.3' to 173.5' fracture zone of near vertical and high angled, open joints, brown stain.		172.8 BOX 12	
	174		172.0' brown-tan, white with brown stain im imcaceous areas.	174.4		174.4
			174.6' to 175.1' high angled joint, partially healed with a white mineral.	100		Pull 22 From 174.4' to 179.1' Run 4.7' Rec 4.7' CL 0.0'
	176		175.1' to 176.5', 177.4' to 178.8' near vertical, open joint with brown stain. 176.6' to 177.5' near vertical joint, partially healed with a green-white mineral.	RQD 0		
503.0	178					

Hole No. CUD-8

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Clemson, SC	SHEET 1 OF 3 SHEETS

1. PROJECT Clemson Upper Diversion Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon 4X5½ core
2. LOCATION (Coordinates or Station) Sta. 19+70 3' Downstream of Centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-8	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 13; UNDISTURBED 0
5. NAME OF DRILLER C.D. Justiss	14. TOTAL NUMBER CORE BOXES 2
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE: STARTED 14 Dec 82; COMPLETED
7. THICKNESS OF OVERBURDEN 82.2'	17. ELEVATION TOP OF HOLE 681.0' ±
8. DEPTH DRILLED INTO ROCK 7.5'	18. TOTAL CORE RECOVERY FOR BORING 89.3' %
9. TOTAL DEPTH OF HOLE 89.7'	19. SIGNATURE OF INSPECTOR Matthew Delano, Geologist

ELEVATION +681.	DEPTH 0 b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blows
			Embankment Material No Samples 0'-30'			Note: Fishtail from 0.0' to 30.0' and began splitspooning Scale change at 30.0'	
651.0	30		SC-Orange and pink, fine grained, micaceous, clayey sand with silty seams. Bits of charred wood 33.0		1		27
648.0			SM-Gray, fine grained silty sand with badly weathered feldspars.		2	Note: Used revert drilling mud.	13
	35		Small seam of tan, medium grained, loose, dry sand.		3		13
							18
							10
							12
	40		Greenish Gray		4		10
			Brown with badly weathered granite cobbles. 43.5'				16
							43
637.5			SC-Orange and brown, fine to medium grained, micaceous clayey sand with Quartz gravel.		5		22
	45						9
			Soft silty seams				14
							13
	50				6		13
							12
			53.5				8
627.5			CH-Black and brown, fat, stiff clay with fine grained sands and minor organics.		7		20
626.0	55		Continued on Sheet # 2			Blows Per Foot: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".	
			Note: Soils field classified in accordance with the Unified Soil Classification System.				

48

DRILLING LOG (Cont Sheet) | VATION TOP OF HOLE 681.0' ± | **Hole No.** CUD-8

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Clemson, SC | SHEET 2 OF 3 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	Blows
+626.	55		CH-Brown, fat, stiff clay				
			SC-Orange, fine grained, very clayey sand				19, 16, 16
	60		Light brown				13, 9, 13
616.5	65		CL-Layered brown, gray, orange, very lean clay 66.0				20
615.0			ML-Black to tannish gray, lean, crumbly silt with distinct black laminae. 70.5				12, 13
610.5	70		SM-Gray, very fine grained, silty sand.				25, 15, 11, 13
	75					Note: Scale change at 75.0'.	18
	77		Dark yellow, fine to coarse grained.				52
	79		79.4				100/.9
601.6			GP-Tan and orange, coarse grained poorly graded Quartz cobbles with minor Saprolitic gravels	52.2 RQD 0%	Box 1	Pull # 1 79.9 to 81.7' Run 2.3 Rec 1.2 CL 1.1 Note: Core loss was loose sand washed away during coring.	
	81		Quartz gravels, very silty Top of Rock 82.2'				
598.8			Saprolite-Continued			Pull # 2 Continued	
	83		Continued on Sheet # 3				

DRILLING LOG (Cont Sheet) | ATION TOP OF HOLE 681.0 ± | **Hole No.** CUD-8

PROJECT	INSTALLATION	SHEET 3 OF 3 SHEETS
Clemson Upper Diversion Dam	Clemson, SC	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	Blows
+598.	83	c	d	e	JAR	g	
			Granite Gneiss Saprolite- Dark orange, medium grained, soft, friable, badly weathered. 83.2' to 86.8'-Tan and white fine grained, remnant foliation, abundant chlorite micas and weathered garnets. 86.8' to 87.6'-Abundant coarse Quartz grains. 87.6' to 89.7'-Orange, no chlorites, less friable	100 RQD 0 %		Pull #2 (Continued) 81.7' to 84.8' Run 3.1' Rec 3.1'	
	85				Box 1 Cont.	Pull #3 84.8' to 89.7' Run 4.9' Rec 4.9'	
	87			100 RQD 0 %			
	89				Box 2		
+591.3'			Bottom of Hole: 89.7'				

Hole No. CUD-9

DRILLING LOG	DIVISION South Atlanic	INSTALLATION Clemson, S.C.	SHEET 1 OF 2 SHEETS

1. PROJECT Clemson Upper Diversion Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID and 3" ID splitspoon
2. LOCATION (Coordinates or Station) 18+75 150' Downstream of Centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-9	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 16; UNDISTURBED 0
5. NAME OF DRILLER C.D. Justiss	14. TOTAL NUMBER CORE BOXES -0-
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE: STARTED 16 Dec 82; COMPLETED 17 Dec 82
7. THICKNESS OF OVERBURDEN 44.9'	17. ELEVATION TOP OF HOLE +642 ±
8. DEPTH DRILLED INTO ROCK 0.1'	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE 45.0'	19. SIGNATURE OF INSPECTOR Matthew Delano, Geologist

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blows
+642	0		SM-Dark brown, fine grained, silty sand.		1	W.T. 15.5' Date 16 Dec 82 Depth to water during drilling.	11 13 18
			Kaolinitic seams				
	5		White, brown, and orange		2	Note: Began revert at 18.0'	14 18
			Minor clayey seams				18
	10		11.5		3	W.T. Not Recorded Water table reading 24 hrs. after hole completed.	14 19
630.5			SC-Dark orange, fine grained micaceous clayey sand. 14.5		4		19
627.5	15		SP-Tan, medium grained, poorly graded sand slightly moist 16.5		5	Blanket Drain	28 13
625.7			ML-Orange and brown, lean, plastic, micaceous silt 19.0		6		10 13
623.0	20		SM-Dark orange, medium grained very silty sand		7	Fill	11
			Seams of lean silt				7 9
616.5	25		25.5				11
615.0			CL-Tannish brown, slightly plastic clay with minor fine grained sands 27.0		8		8
			ML-Tan and gray, slightly plastic lean silt		9	ML	7 9
612.2	30		Continued on Sheet # 2			Blows Per Foot: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".	

Note: Soils field calssified in accordance with the Unified Soil Classification System.

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +642 ± **Hole No.** CUD-9

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Clemson, S.C. | SHEET 2 OF 2 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	Blows
+612	30.0'	c	d	e	JAR	g	
			MH-Gray, slightly plastic, fat silt	MH	10	Note: Weight of hammer pushed spoon from 30.0' to 31.5'	0 5
			No Recovery 33.0				
	35		ML-Light gray, lean silt with abundant fine grained sands. 38.0		11	Note: Sample fell out of spoon from 31.5' to 33.0'.	6 6 7
604.0			SM- Orange and brown, medium grained, very silty sand, abundant well rounded quartz gravels. 42.0	SM	12	Note: 3" spoon with 300 lb hammer below 39.0'.	30
	40				13	Note: Set 2"X2' Piezometer with tip at 44.0'. Fine grained gravel backfill to 29.5' Bentonite mudballs to 26.0'.	56
					14		88
600.0			GM-Bright orange, coarse grained, silty gravels and cobbles, abundant sands		15		51
					16		32
597.0	45		Bottom of Hole: 45.0' Top of Saprolite: 44.9'				

I would call v. si. v. fn SAND!

Hole No. CUD-10

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Clemson, S.C.	SHEET 1 OF 2 SHEETS

1. PROJECT	Clemson Upper Diversion Dam
2. LOCATION (Coordinates or Station)	Sta. 20+11, 150' D.S. Centerline
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	CUD-10
5. NAME OF DRILLER	A. Yates
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	26.0'
8. DEPTH DRILLED INTO ROCK	8.5'
9. TOTAL DEPTH OF HOLE	34.5'
10. SIZE AND TYPE OF BIT	1 3/8" ID splitspoon
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 7 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	-0-
15. ELEVATION GROUND WATER	630.3
16. DATE HOLE	STARTED 20 Dec 82 / COMPLETED 20 Dec 82
17. ELEVATION TOP OF HOLE	642.5' ±
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	Matthew Delano, Geologist

ELEVATION 642.5'	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
			SM-Dark brown, fine grained silty sand 3.0		1		13 18
639.5	5		SC-Orange and brown, medium grained, clayey sand		2		12
			Minor gravels				19
			Dark orange				12 11
	10		Fine to medium grained		3	W.T. 25.5' Date 20 Dec 82 Depth to water during drilling.	15
			Minor large gravels				13 11
	15		Very clayey				19
			Minor gravels		4	W.T. 12.2' Water table reading 24 hrs. after hole completed.	13 13 11
	20						13
			Fine to coarse grained		5		13
			Brown and orange				13
	25		Top of Rock 26.0		6		9
616.5			Granite Gneiss Saprolite-Brown and tan, fine grained, micaceous, badly weathered.				16 12
612.5	30						20
			Continued on Sheet #2 Note: Soils field classified in accordance with the Unified Soil Classification System.			Blows Per Foot: Number required to drive 1 3/8" ID split-spoon w/140 lb. hammer falling 30".	

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 642.5 ± **Hole No.** CUD-10

PROJECT Clemson Upper Diversion Dam | INSTALLATION Clemson, S.C. | SHEET 2 OF 2 SHEETS

ELEVATION 612.5' a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g Blows
			Granite Gneiss Saprolite-Gold, brown, white, fine to coarse grained, badly weathered with coarse Quartz grains.		7	13 23 21
608.0			Bottom of Hole: 34.5'			Note: Set 2"X 2' Piezometer with tip at 29.0'. Backfilled to 26.5' with fine grained gravel; and to 24.0' with Bentonite Mudballs.

Hole No. CUD-11

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 2 SHEETS

1. PROJECT: Clemson Upper Dam	10. SIZE AND TYPE OF BIT: 1 3/8" I.D. Cont. Split-spoon
2. LOCATION (Coordinates or Station): Sta. 7+90; 150' Downstream Centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 314
4. HOLE NO. (As shown on drawing title and file number): CUD-11	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7; UNDISTURBED 0
5. NAME OF DRILLER: D. Justiss	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE: STARTED 7 Jan 83; COMPLETED 8 Jan 83
	17. ELEVATION TOP OF HOLE: +642.47' ±
7. THICKNESS OF OVERBURDEN: 46.5'	18. TOTAL CORE RECOVERY FOR BORING: %
8. DEPTH DRILLED INTO ROCK: 0.0'	19. SIGNATURE OF INSPECTOR: Bob Green, Geologist
9. TOTAL DEPTH OF HOLE: 46.5'	

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)	Blows
642.47	0		SM-Dark brown, dine grained, silty sand, with some organic		1		10, 18, 18
			Light brown				
	5				2	W.T. 21.0' Date: 7 Jan 83 Depth to water during drilling.	16, 18
	10				3	W.T. Not Recorded Water table reading 24 hrs. after hole completed.	20, 15, 14
			Seams of orange SC		4		19, 20
	15						
626.27			16.2-18.0: Filter blanket-Gray, fine to medium grained, silty sand, loosely packed with lesser amounts of black silt.				27, 19
624.47	20		18.0'-Top of Alluvium, black, fine grained, SM 21.0'-Slightly micaceous		5		7, 13, 11, 5
	25						5, 5
			Dark brown				3
612.47	30						5
			Continued on Sheet # 2				
			Note: Soils field classified in accordance with the Unified Soil Classification System.			Blows Per Foot: Number required to drive 1 3/8' ID splitspoon w/140 lb. hammer falling 30"	

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +642.47' ± **Hole No.** CUD-11

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 2 OF 2 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
612.47[a]	30[b]	c	d	e	JAR	g	Blows
			SM-Dark brown, fine grained, silty sand (Continued)				5
							5
							8
	35						6
							9
			Fine to medium grained				16
601.97	40						25
			GM-Gray to brown, fine to coarse grained, silty gravel		6		35
							70
							67
596.47					7		51
595.97			Granite Gneiss-(saprolite) Brown, fine to medium grained				
			Bottom of Hole: 46.5'				

Hole No. CUD-12

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 1 SHEETS

1. PROJECT Clemson Upper Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon
2. LOCATION (Coordinates or Station) Sta. 3+50; 230' Downstream Centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-12	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED
5. NAME OF DRILLER D. Justiss	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE: STARTED 6 Jan 83; COMPLETED 6 Jan 83
	17. ELEVATION TOP OF HOLE + 626.19' ±
7. THICKNESS OF OVERBURDEN 29.0'	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK 0.0'	19. SIGNATURE OF INSPECTOR Bob Green, Geologist
9. TOTAL DEPTH OF HOLE 29.0'	

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)	Blows
626.19	0		SM-Dark brown, fine grained, silty sand, slightly micaceous, with some organics				16
						W.T. 3.0' Date: 6 Jan 83 Depth to water during drilling.	13
	5						25
							12
						W.T. 0.0' Water table reading 24 hrs. after hole completed.	4
			Seams of dark gray ML				3
	10						4
			12.0				4
614.19			ML-Black to dark gray, fine, silt, with seams of SM				4
	15						7
			16.0				4
610.19			SM-Gray fine to medium silty sand, micaceous below 21.0'				5
	20						7
							4
							3
	25						3
							11
			27.0				12
599.19			GM-Gray, fine to coarse grained, silty gravel 28.5'				100
597.69							50+
597.19	30		Granite Gneiss-(saprolite) Gray, fine to medium grained, micaceous.			Blows Per Foot: Number required to drive 1 3/8" ID split-spoon w/140 lb. hammer falling 30".	

Note: Soils field classified in accordance with the Unified Soil Classification System.

Hole No. CUD-13

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake	SHEET 1 OF 1 SHEETS

1. PROJECT Clemson Upper Dam	10. SIZE AND TYPE OF BIT 1 3/8" I.D. Cont. Split-spoon
2. LOCATION (Coordinates or Station) Sta. 2+95, 235' Downstream of Centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-13	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2; UNDISTURBED –
5. NAME OF DRILLER D. Justiss	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE: STARTED 7 Jan 83; COMPLETED 7 Jan 83
7. THICKNESS OF OVERBURDEN 9.0'	17. ELEVATION TOP OF HOLE +626.55' ±
8. DEPTH DRILLED INTO ROCK 0.0'	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE 9.0'	19. SIGNATURE OF INSPECTOR Bob Green, Geologist

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
626.55	0					
	5		SM-Brown, fine grained, silty sand, slightly micaceous (fill)		1	W.T. 4.5' Date: 7 Jan 83 Depth to water during drilling. W.T. Not Recorded Water table reading 24 hrs. after hole completed. 12 36 19 14 1 1
620.55			SC-Brownish orange, fine grained, clayey sand (residual soil)		2	
617.55	10		Bottom of Hole: 9.0' Note: Soils field classified in accordance with the Unified Soil Classification System.			Blow Per Foot: Number required to drive 1 3/8" ID splitspoon w/140 lb hammer falling 30".

HOLE NO. CUD-14

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake, SC	SHEET 1 OF 3 SHEETS

1. PROJECT Clemson Upper Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon & 4X5½ barrel
2. LOCATION (Coordinates or Station) Sta. 2+25 - Centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-14	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7; UNDISTURBED
5. NAME OF DRILLER C.D. Fuller	14. TOTAL NUMBER CORE BOXES 2
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER +652.4
	16. DATE HOLE: STARTED 19 Mar 83; COMPLETED 21 Mar 83
7. THICKNESS OF OVERBURDEN 30.0'	17. ELEVATION TOP OF HOLE +681.22'
8. DEPTH DRILLED INTO ROCK 20.3'	18. TOTAL CORE RECOVERY FOR BORING 56% %
9. TOTAL DEPTH OF HOLE 50.3'	19. SIGNATURE OF INSPECTOR Bob Green

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
681.22	0		SM-Dark brown, fine grained, silty sand, with some organics		1		30, 27
	5		Brown, Micaceous		2	W.T. Not Encountered Date: 19 Mar 83 Depth to water during drilling.	36, 34, 23
	10		Reddish brown		3	W.T. 28.8' Water table reading 24 hours after hole completed.	40, 30, 26, 22
	15				4		22, 20, 17, 30
661.22	20		TOP OF ROCK 20.0'				
			Granite Gneiss-Brown, very badly weathered, very soft, medium grained, micaceous.		5		20, 17, 24
	25				6	Note: 31.5' of 6" casing was set with bottom at 29.5'.	30, 24, 22
651.22	30				7		100/0.9
			Continued on Sheet 2			Blows Per Foot: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".	

Note: Soils field classified in accordance with the Unified Soil Classification System.

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +681.22' | **Hole No.** CUD-14

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake, SC | SHEET 2 OF 3 SHEETS

ELEVATION (651a.22)	DEPTH (30b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
			Gray, slightly weathered, hard, medium grained. Top of firm rock at 30.0'. 31.8-32.0' Closely spaced, horizonal, open joints, slightly brown stained.	43% RQD 45	Box 1	Pull 1 From 30.0' To 32.3' Run 2.3' Rec 1.0' C.L. 1.3'
	32			32.3		32.3
			32.3-35.8' No Recovery	37% RQD 88		Pull 2 From 32.3' To 42.3' Run 10.0' Rec 3.7' C.L. 6.3'
	34					
			35.8-50.3' Gray, fresh to slightly weathered rock, very hard.			Note: The driller brought the core barrel up at 35.8' to see if it was blocked off. The depth of No Recovery was given to the inspector after the end of the Pull at 42.3'.
	36					
	38					
	40					
	42			42.3		42.3
			43.0': 25° open joint, slightly brown stained.	83% RQD 91		Pull 3 From 42.3' To 50.3' Run 8.0' Rec 6.6' C.L. 1.4'
	44				44.6	
					Box 2	
635.22	46					

Continued on Sheet 2

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +681.22	Hole No. CUD-14
PROJECT Clemson Upper Dam	INSTALLATION Hartwell Lake, SC	SHEET 3 OF 3 SHEETS

ELEVATION 635a. 22	DEPTH 46b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Granite Gneiss-Gray, fresh to slightly weathered, very hard		Box 2	Pull 3 (Continued)
	48					
	50					
630.92						50.3

Bottom of Hole: 50.3'

Pressure Test

Bottom of Packer	Length of Rods	Water Pressure	Gal/ Ten Min.
33.8	51.5	20	73
33.8	51.5	40	223
38.8	51.5	40	185
43.8	61.5	40	130
48.8	61.5	40	0

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake, SC	SHEET 1 OF 3 SHEETS

1. PROJECT	Clemson Upper Dam
2. LOCATION (Coordinates or Station)	Sta. 4+75 - Centerline
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	CUD-15
5. NAME OF DRILLER	C.D. Fuller
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	84.5'
8. DEPTH DRILLED INTO ROCK	22.2'
9. TOTAL DEPTH OF HOLE	106.7'
10. SIZE AND TYPE OF BIT	1 3/8" ID splitspoon 4X5½ barrel
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: 2 / UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	3
15. ELEVATION GROUND WATER	+655.8
16. DATE HOLE	STARTED: 28 Mar 83 / COMPLETED: 30 Mar 83
17. ELEVATION TOP OF HOLE	+681.23'
18. TOTAL CORE RECOVERY FOR BORING	81% %
19. SIGNATURE OF INSPECTOR	Bob Green

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blows
681.23	0		0.0-55.0' No Sample, Fishtailed. 55.0			Note: Scale change at 55.0' 1 in=5 ft.	
626.23	55		SM-Orangish brown, fine grained, silty sand, micaceous		1	W.T. Not Observed Date 28 Mar 83 Depth to water during drilling.	29, 32, 27, 37
	60		Embankment-Alluvium contact at 63.0' 63.0				32
618.23			SM-Dark gray, fine grained, silty sand, with some organics. 64.0' Black, micaceous			W.T. 25.4' Water table reading 24 hrs. after hole completed.	18, 16, 16, 18, 32, 21, 11
	65						
	70						
	75		Black and gray				13, 13, 13, 20
601.23	80		Continued on Sheet 2			Blows Per Foot: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".	

Note: Soils field classified in accordance with the Unified Soil Classification System.

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +681.23 **Hole No.** CUD-15

PROJECT Clemson Upper Dam 84.5 -5.0 79 INSTALLATION Hartwell Lake, SC SHEET 2 OF 3 SHEETS

ELEVATION 601a.23	DEPTH 80 b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blows
			SM-Black and gray, fine grained, silty sand, micaceous TOP OF ROCK 84.5'		2	Note: 85.8' of 6" casing was set with bottom at 84.6'.	29 22 5 100/0.6
596.73	85		84.5-86.2' No Recovery Top of firm rock at 86.2'. 86.2' Granite Gneiss-Gray, slightly weathered, very hard, medium grained. 87.6-87.8' Gray, bad to moderately weathered rock, moderately hard. 87.8-97.7' Gray, fresh to slightly weathered rock, very hard. 89.1-91.9' Near vertical open joint.	48% RQD 83 87.8	Box 1	Pull 1 From 84.5' To 87.8' Run 3.3' Rec 1.6' C.L. 1.7' Note: Change of scale at 85.0' 1 in=2 ft	87.8
	87						
	89			72% RQD 83 92.4		Pull 2 From 87.8' To 92.4' Run 4.6' Rec 3.3' C.L. 1.3'	92.4
	91						
	93			91% RQD 88		Pull 3 From 92.4' To 100.2' Run 7.8' Rec 7.1' C.L. 0.7'	
	95				95.4		
	97		97.6' Nearly horizonal, open joints. 97.7-98.6' Gray, bad to moderately weathered, moderately hard.		Box 2		
582.23	99						

Continued on Sheet 3

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +681.23 **Hole No.** CUD-15

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake, SC | SHEET 3 OF 3 SHEETS

ELEVATION 582a.23	DEPTH 99b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Granite Gneiss-Gray, fresh to slightly weathered, very hard, with intermittent occurrence of moderately weathered rock.	100.2	Box 2	Pull 3 (Continued) 100.2
	101			92% RQD 81		Pull 4 From 100.2' To 106.7' Run 6.5' Rec 6.0' C.L. 0.5'
	103				103.1 Box 3	
	105					106.7
574.53	107		Bottom of Hole: 106.7'			

Pressure Test

Bottom of Packer	Length of Rods	Water Pressure	Gal/Ten Min.
87.0	106.7	20	1
87.0	106.7	40	6.5

Hole No. CUD-17

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Hartwell Lake, SC	SHEET 1 OF 5 SHEETS

1. PROJECT Clemson Upper Dam	10. SIZE AND TYPE OF BIT 1 3/8" ID splitspoon, 4X5½
2. LOCATION (Coordinates or Station) Sta. 9+75 - Centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) Barrel MSL
3. DRILLING AGENCY Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) CUD-17	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2; UNDISTURBED
5. NAME OF DRILLER C.D. Fuller	14. TOTAL NUMBER CORE BOXES 6
6. DIRECTION OF HOLE [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER +639.67
	16. DATE HOLE: STARTED 25 Mar 83; COMPLETED 28 Mar 83
7. THICKNESS OF OVERBURDEN 84.5'	17. ELEVATION TOP OF HOLE +680.77'
8. DEPTH DRILLED INTO ROCK 48.1'	18. TOTAL CORE RECOVERY FOR BORING 82% %
9. TOTAL DEPTH OF HOLE 132.6'	19. SIGNATURE OF INSPECTOR Bob Green

ELEVATION 680.77	DEPTH 0 b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blows
			0.0-65.0' No Sample, Fishtailed			Note: Change of scale at 65.0'. 1in=5 ft	
615.77	65		65.0				
			SM-Purplish brown, fine grained, silty sand, micaceous		1	W.T. Not Observed Date 25 Mar 83 Depth to water during drilling.	49 45
	70						19
			Embankment-Alluvium contact at 73.0'.			W.T. 41.1' Water table reading 24 hrs. after hole completion.	17 17
607.77			73.0				
	75		SM-Dark gray, fine to medium grained, silty sand, micaceous, with some gravel.				100/0.7 100/0.4
			Brownish gray				64 39
	80		Dark gray, fine grained, SM, micaceous			Note: 85.8' of 6" casing was set with the bottom at 84.6'.	33 41
597.77			83.0				100/0.8
596.77	85		GM-Gray, fine to coarse grained, silty gravel TOP OF ROCK 84.0'		2	Note: Change of scale at 85.0' 1in= 2 ft.	100/0.5
			Granite Gneiss-Dark gray, intensely weathered, very soft, medium grained.	75% RQD 0 86.5	Box 1	Pull 1 From 84.5' To 86.5' Run 2.0' Rec 1.5' C.L. 0.5'	86.5
593.77	87					Pull 2	
			Continued on Sheet 2				
			Note: Soil field classified in accordance with the Unified Soil Classification System.			Blow Per Foot: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".	

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 680.77' | **Hole No.** CUD-17

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake, SC | SHEET 2 OF 5 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
593.77	87					
	89		Granite Gneiss-Dark gray, intensley weathered, very soft, crumbles when handled 86.7': 45° open joint, brown stained.	42% RQD 0	Box 1	Pull 2 (Continued) From 86.5' To 92.5' Run 6.0' Rec 2.5' C.L. 3.5'
	91			92.5		92.5
	93		92.0-92.8' Closely spaced horizontal joints, brown stained.	92% RQD 0		Pull 3 From 92.5' To 96.1' Run 3.6' Rec 3.3' CL 0.3'
	95			96.1	96.1	96.1
	97		97.3-98.5' Nearly vertical open joint.	78% RQD 0	Box 2	Pull 4 From 96.1' To 101.1' Run 4.9' Rec 3.8' C.L. 1.1'
	99					
	101			101.0		101.0
				67% RQD 0		Pull 5 From 101.0' To 106.1' Run 5.1' Rec 3.4' C.L. 1.7'
577.77	103					

Continued on Sheet 3

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +680.77'	Hole No. CUD-17
PROJECT Clemson Upper Dam	INSTALLATION Hartwell Lake, SC	SHEET 3 OF 5 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
577.77	103	c	d	e	f	g
			Granite Gneiss-Brown, intensely weathered, very soft, crumbles when handled.	67% RQD 0	Box 2	Pull 5 (Continued)
	105			106.1		106.1
				69% RQD 52	106.5 Box 3	Pull 6 From 106.1' To 112.2' Run 6.1' Rec 4.2' C.L. 1.9'
	107					
	109		109.8-112.7' Brown, moderate to badly weathered, rock, hard. Top of firm rock at 109.8'.			
	111		112.2-112.5' Very closely spaced, high angle (>60°), open joint.			
			112.7-124.9' Gray, moderately weathered rock, hard.	112.2		112.1
	113		113.5-116.7' Closely spaced, high angle and horizontal open joint	101% RQD 63		Pull 7 From 112.2' To 121.6' Run 9.4' Rec 9.5' C.G. 0.1'
	115					
			116.7-124.9' Closely spaced, very high angle (>75°), open and healed joints.		116.7 Box 4	
	117					
561.77	119					

Continued on Sheet 4

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +680.77"	Hole No. CUD-17
PROJECT Clemson Upper Dam	INSTALLATION Hartwell Lake, SC	SHEET 4 OF 5 SHEETS

ELEVATION 561.77'	DEPTH 119	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Granite Gneiss-Gray, moderately weathered, hard.	101% RQD 63	Box 4	Pull 7 (Continued)
	121			121.6		121.6
	123			111% RQD 92		Pull 8 From 121.6' To 127.1' Run 5.5' Rec 6.1' C.G. 0.6'
			124.9-132.6' Gray, slight to moderately weathered, rock, hard.		124.9	
	125		124.9-127.3' Closely spaced, high angle (>60°) open and healed joints.		Box 5	
	127		127.9-132.6' Closely spaced, high angle (>60°) open and healed joints.	127.1		127.1
				96% RQD 94		Pull 9 From 127.1' To 132.6' Run 5.5' Rec 5.3' C.L. 0.2'
	129					
	131				131.4	
					Box 6	132.6
548.17	133		Bottom of Hole: 132.6'			

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +680.77'	Hole No. CUD-17
PROJECT Clemson Upper Dam	INSTALLATION Hartwell Lake, SC	SHEET 5 OF 5 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g

Pressure Test

Bottom of Packer	Length of Rods	Water Pressure	Gal. Ten Min.
87.0	106.7	20	1
87.0	106.7	40	140
92.0	106.7	40	109
97.0	106.7	40	95
102.0	116.7	40	108
107.0	116.7	40	104
112.0	126.7	40	17
117.0	126.7	40	15
122.0	136.7	40	0.5

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Hartwell Lake, S.C.
SHEET	1 OF 6 SHEETS
1. PROJECT	Clemson Upper Dam
2. LOCATION (Coordinates or Station)	Sta. 12+25 - Centerline
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	CUD-18
5. NAME OF DRILLER	C.D. Fuller
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	85.0'
8. DEPTH DRILLED INTO ROCK	65.1'
9. TOTAL DEPTH OF HOLE	150.1'
10. SIZE AND TYPE OF BIT	1 3/8" ID splitspoon
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
	4X5½ barrel
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 1 / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	8
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 31 Mar 83 / COMPLETED 4 Apr 83
17. ELEVATION TOP OF HOLE	+680.87'
18. TOTAL CORE RECOVERY FOR BORING	91% %
19. SIGNATURE OF INSPECTOR	Bob Green

ELEVATION 680.87	DEPTH 0 b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blows
			0.0-50.0' No Sample, Fishtailed 50.0			Note: Change of scale at 50.0' 1in.=5 ft.	
630.87	50		SM-Brown, fine grained, silty sand, micaceous			W.T. Not Observed Date 31 Mar 83 Depth to water during drilling.	38 48 28
	55		Embankment-Alluvium contact at 60.0' 60.0			W.T. Not Observed Water table reading 24 hrs. after hole completed.	35 50 37
620.87	60		SM-Dark gray, fine grained, silty sand, micaceous, with some organics.			Note: No 24 hrs. water table reading taken because mud was bailed out and hole was backfilled on our last day (hurried to finish).	27 30 28 22 25 17 21 24 18 20
605.87	65						
	70						
	75						

Continued on Sheet 2

Note: Soil field classified in accordance with the Unified Soil Classification System.

Blows Per Foot: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +680.87'	Hole No. CUD-18
PROJECT Clemson Upper Dam	INSTALLATION Hartwell Lake, SC	SHEET 2 OF 6 SHEETS

ELEVATION 605a87	DEPTH 75b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blows
			SM-Dark gray, fine grained, silty sand, micaceous				38 52 45 33 29 37
	80					Note: 75.0' of 6" casing was set.	
	85		TOP OF ROCK 85.0'				100/0.5 100/0.1
			Granite Gneiss-Greenish gray, intensely weathered, very soft, medium grained, crumbles when handled.	89% RQD 0	Box 1	Pull 1 From 85.0' To 90.6' Run 5.6' Rec 5.0' C.L. 0.6'	
	87						
	89						
				90.6			90.6
	91			79% RQD 0		Pull 2 From 90.6' To 100.6' Run 10.0' Rec 7.9' C.L. 2.1'	
	93				93.3		
					Box 2		
	95						
583.87	97		Continued on Sheet 3				

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +680.87	Hole No. CUD-18
PROJECT Clemson Upper Dam	INSTALLATION Hartwell Lake, SC	SHEET 3 OF 6 SHEETS

ELEVATION 583a.87	DEPTH 97b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Granite Gneiss-Greenish gray, intensely weathered, very soft, crumbles when handled 98.4' Color change to brown		Box 2	Pull 2 (Continued)
	99					
				100.6	100.8	100.6
	101			126% RQD 0	Box 3	Pull 3 From 100.6' To 108.8' Run 8.2' Rec 10.3' C.G. 2.1'
	103					
	105					
	107					
					108.5	
				108.8		108.8
	109			79% RQD 0	Box 4	Pull 4 From 108.8' To 118.6' Run 9.8' Rec 7.7' C.L. 1.4'
	111					
567.87	113					

Continued on Sheet 4

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +680.87' **Hole No.** CUD-18

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake, SC | SHEET 4 OF 6 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
567a.87	11b	c	d	e	f	g
			Granite Gneiss-Brown intensely weathered, very soft, crumbles when handled.		Box 4	Pull 4 (Continued)
	115					
					116.2	
	117				Box 5	
				118.6		118.6
	119			0%		Pull 5 From 118.6' To 122.5' Run 3.9' Rec 0.0' C.L. 3.9'
				RQD 0		
	121					Note: No Recovery for Pull 5 From 118.6' To 122.5'.
			122.5-136.4' Gray, intensely weathered rock, soft, crumbles when handled.	122.5		122.5
	123			90%		Pull 6 From 122.5' To 127.6' Run 5.1' Rec 4.6' C.L. 0.5'
				RQD 0		
	125		125.9-128.3' Closely spaced, near vertical, healed joints, white stained.			
					126.9	
	127			127.6	Box 6	127.6
				177% RQD 0		Pull 7 From 127.6' To 131.5' Run 3.9' Rec 6.9' CG 3.0'
551.87	129					

Continued on Sheet 5