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

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake, SC | SHEET 5 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)
551.87	129	c	d	e	f	g
			Granite Gneiss-Gray intensely weathered, soft, crumbles when handled	177%	Box 6	Pull 7 (Continued)
				RQD 0		
	131		131.0-132.4 Very closely spaced, near vertical, healed joints, white stained	131.5		131.5
				51%		Pull 8 From 131.5' To 140.8' Run 9.3' Rec 4.7' C.L. 4.6'
	133			RQD 0		
					134.5	
					Box 7	
	135					
			136.4-137.2' Gray, bad to moderately weathered rock, hard.			
	137		137.2-141.7' Brown intensely weathered, rock, soft, crumbles when handled.			
			137.2-139.8' Very closely spaced near vertical, healed joints, white stained.			
	139					
				140.8		140.8
	141		141.7' Top of firm rock			Pull 9 From 140.8' To 146.3' Run 5.5' Rec 9.1' C.G. 3.6'
			141.7-150.1' Brown, badly weathered rock, moderately hard.	165%		
			142.4-145.4' Closely spaced near vertical, healed joints white stained.	RQD 77	142.4	
	143				Box 8	
535.87	145					

Continued on Sheet 6

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

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake, SC | SHEET 6 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)
535.87	145	c	d	e	f	g
			Granite Gneiss-Brown, badly weathered, moderately hard		Box 8	Pull 9 (Continued)
			147.0-150.1' Very closely spaced, near vertical, healed joints, white stained.	146.3		146.3
	147			76% RQD 90		Pull 10 From 146.3' To 150.1' Run 3.8' Rec 2.9' C.L. 0.9'
	149					
530.77						150.1
			Bottom of Hole: 150.1'			Note: Runs were not plunked because the thickness of drilling mud inhibited an accurate reading.
			Note: No pressure test was done on this boring.			

Hole No. CUD-20

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake, SC

SHEET 1 OF 6 SHEETS

1. PROJECT: CLemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 17+25 - Centerline
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): CUD-20
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: 66.1'
9. TOTAL DEPTH OF HOLE: 151.1'
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 4 | UNDISTURBED
14. TOTAL NUMBER CORE BOXES: 7
15. ELEVATION GROUND WATER: +655.9
16. DATE HOLE: STARTED 21 Mar 83 | COMPLETED 25 Mar 83
17. ELEVATION TOP OF HOLE: +680.43'
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.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)	Blows
680.43	0		0.0-50.0' No Sample, Fishtailed		JAR	Note: Change of scale at 50.0' 1 in.=5 ft	
			50.0				
630.43	50		SM-Orangish brown, fine grained, silty sand, micaceous		1	W.T. Not Observered Date 21 Mar 83 Depth to water during drilling.	36
			Brown				34
	55					W.T. 24.5' Water table reading 24 hrs. after hole completed.	36
							34
							48
	60						46
			Embankment-Alluvium contract at 63.0'				35
							36
617.43			63.0				
			SM-Dark gray, fine grained silty sand, micaceous				38
	65						22
614.93			65.5				
			ML-Dark gray, fine silt		2		17
							22
			Brown				23
	70						14
			71.0				
609.43			SM-Gray, fine grained, silty sand.		3		18
							22
605.43	75						

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 +680.43' | **Hole No.** CUD-20

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake, SC | SHEET 2 OF 6 SHEETS

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)
603.43	75				JAR	Blows
			SM-Black and gray fine grained, silty sand, micaceous			25
	80		77.0' Gray, fine to medium grained, silty sand			28
						32
						45
597.93			82.5			Note: 86.6' of 6" casing was set with the bottom at 85.3'. 100/0.9
			GM-Brown, fine to coarse, grained, silty gravel		4	100
	85		TOP OF ROCK 85.0			100/0.4
595.43			Granite Gneiss-Brown, intensly weathered, very soft medium grained, crumbles when handled.	57% RQD 0	Box 1	Pull 1 From 85.0' To 90.3' Run 5.3' Rec 3.0' CL 2.3' Note: Change of scale at 85.0' 1in.=2 ft
	87					
	89					
				90.3		90.3
	91			54% RQD 0		Pull 2 From 90.3' To 96.8' Run 6.5' Rec 3.5' CL 3.0'
	93					
	95					
				96.8		96.8
583.43	97					
			Continued on Sheet 3			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +680.43 | **Hole No.** CUD-20

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake, SC | SHEET 3 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)
583.43	97 b	c	d	e	f	g
	97		Granite Gneiss-Brown, intensely weathered, very soft, crumbles when handled. 98.7-108.9' Closely spaced, horizontal and high angle (>60°), open joints	93% RQD 0	Box 1	Pull 3 From 96.8' To 102.4' Run 5.6' Rec 5.2' C.L. 0.4'
	98.7					
	99				Box 2	
	101					
	102.4					102.4
	103			88% RQD 0		Pull 4 From 102.4' To 108.9' Run 6.5' Rec 5.7' C.L. 0.8'
	105					
	107					
	107.9					
	108.9				Box 3	108.9
	109			77% RQD 0		Pull 5 From 108.9' To 112.4' Run 3.5' Rec 2.7' C.L. 0.8'
	111		112.4' Brown, intensely rock, soft, crumbles when handled.			
	112.4					112.4
567.43	113		Continued on Sheet 4			Pull 6

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +680.43' | **Hole No.** CUD-20

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)
567.43	113	c	d	e	f	g
			Granite Gneiss-Brown, intensely weathered, soft crumbles when handled	58%	Box 3	Pull 6 (Continued) From 112.4' To 121.6' Run 9.2' Rec 5.3' C.L. 3.9'
				RQD 0		
	115					
	117		117.7-118.1' Nearly vertical open joint			
	119		119.7-121.6' Closely spaced, nearly vertical, open joint, brown stained.		120.1	
					Box 4	
	121		121.6-128.5' Closely spaced, nearly vertical, joint, some open with brown stains, and some healed with white stains	121.6		121.6
				88%		Pull 7 From 121.6' To 129.6' Run 8.0' Rec 7.0' C.L. 1.0'
	123			RQD 0		
	125					
	127					
					128.5 Box 5	
551.43			Continued on Sheet 5			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +680.43 | **Hole No.** CUD-20

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake, SC | SHEET 5 OF 6 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOV-ERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
551.43	129		Granite Gneiss-Brown, intensely weathered soft, crumbles when handled. 129.6-132.4' Closely spaced nearly vertical, open joints.	129.6	Box 5	Pull 7 (Continued)
	131			97% RQD 0		Pull 8 From 129.6' To 138.6' Run 9.0' Rec 8.7' C.L. 0.3'
	133		133.8-134.8' Nearly vertical, open joint.			
	135					
					136.8	
	137				Box 6	
			138.0-147.1' Closely spaced, nearly vertical and horizontal, open and healed joints, open joints are brown stained, and healed joints are brown or white stained.	138.6		138.6
	139			96% RQD 0		Pull 9 From 138.6' To 147.1' Run 8.5' Rec 8.2' C.L. 0.3'
	141					
	143					
					144.5	
535.43	145				Box 7	

Continued on Sheet 6

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +680.43' | Hole No. CUD-20

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake, SC | SHEET 6 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)
535.43	145	c	d	e	f	g
			Granite Gneiss-Brown, intensely weathered, soft, crumbles when handled	96% RQD 0	Box 7	Pull 9 (Continued)
	147			147.1		147.1
			148.2-151.1' Closely spaced, high angle (60) open joints, brown stained.	100% RQD 0		Pull 10 From 147.1' To 151.1' Run 4.0' Rec 4.0' C.L. 0.0'
	149					
529.33	151					151.
			Bottom: of Boring: 151.1'			Note: Firm rock was not encountered in this boring.

Bottom of Packer	Length of Rods	Water Pressure	Gal/ Ten Min.
88.0	108.7	20	5
88.0	108.7	40	146
93.0	108.7	40	143
98.0	108.7	40	154
103.0	108.7	40	167
108.0	118.7	40	153
113.0	118.7	40	172
118.0	128.7	20	0
118.0	128.7	40	0
123.0	128.7	20	0
123.0	128.7	40	0

Hole No. CUD-506

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

1. PROJECT: Clemson Upper Dam Seismic Study
2. LOCATION (Coordinates or Station): Sta.8+50,305.0'Rt. of centerline of dam
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): CUD-506
5. NAME OF DRILLER: Claude Robbins
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 32.5'
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 32.5'
10. SIZE AND TYPE OF BIT: 1 3/8" splitspoon, 6 1/2" fishtail bit
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 22; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 11 Aug 1988; COMPLETED 12 Aug 1988
17. ELEVATION TOP OF HOLE: 625.5' ±
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: Charles D. Griffin

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
625.5'	0					
			(SM)Brown,fine grained silty SAND. With a pine stump encountered at 1.0'.		1	5 12 36
624.0'			(SP)Brown,coarse to med. grained,poorly graded SAND. Fine silty sand,w/traces of granite rock.		2	No water level recorded due to the use of drilling fluid. 6 7 5
	2					
622.5'			(SM)Brown & grey,fine grained, silty SAND.		3	Mr. Claude Robbins operated catline/ hammer throughout boring using 1 3/4" wraps. Continuous splitspoon from 0.0'to 32.5'. 7 10 9
			Dark brown,very fine grained.			
	4				4	0 Blows indicate that sampler w/drill rods & hammer penetrated 0.5' without a hammer drop. 6 5 7
619.5'	6		(CL)Dark brown,silty CLAY. Soft, highly saturated.		5	1 1 1
618.0'			(MH) Dark brown,clayey SILT. Very soft,highly saturated.		6	NOTE: Scale change @ 10.0'. 0 0 0
	8				7	0 0 0
	10				8	0 2 1
613.5'			(SM)Brown,very fine grained, silty SAND. Soft.		9	1 0 0
612.0'			(CL)Brown,silty CLAY.Very soft.		10	0 0 3
610.5'	15		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 625.5' ± | **Hole No.** CUD-506

PROJECT: Clemson Upper Dam Seismic Study | INSTALLATION: Clemson, S.C. | 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
			(SM)Dark brown,very fine grained silty SAND. Micaceous, very soft,highly saturated.		11	0 0 0
					12	0 2 1
			Very fine to fine grained.		13	0 0 3
	20				14	3 4 4
					15	1 2 2
	22					
603.0'			(SM-SP)Brown & grey,fine silty SAND to med.grained, poorly graded sand w/some GRAVEL.		16	1 4 8
601.5'	24		(SM-GM)Green,tan,grey,med. to coarse grained silty SAND.Saprolite,w/some chunks of ROCK & GRAVEL.		17	14 19 22
			Brown,tan,fine to coarse grained sand & gravel,w/some chunks of rock.		18	56 50 28
	26					
			Greenish grey & purple,fine grained,silty sand,saprolitic, w/some coarse sand & gravel.		19	37 27 25
	28					
597.0'			(GRANITE)Greenish grey & white, saprolitic,sandy,intensely wea.		20	27 45 53
			Greenish grey & white,to tan & orange.			
	30				21	23 37 49
594.0'			(SM)Tan,fine grained,silty SAND. Saprolitic.		22	71 100/0.3
	32					
593.0'			Bottom of Boring 32.5'			

Hole No. CUD-507

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

1. PROJECT: Clemson Upper Dam Seismic Study
2. LOCATION (Coordinates or Station): Sta.13+50,340'Right of Bottomline
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): CUD-507
5. NAME OF DRILLER: Claude Robbins
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 33.0'
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 33.0'
10. SIZE AND TYPE OF BIT: 1 3/8"splitspoon,6 1/2" fishtail bit
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 22; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 15 Aug 1988; COMPLETED 16 Aug 1988
17. ELEVATION TOP OF HOLE: 623.4'±
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: Charles D. 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
623.4'					JAR		
			(ML)Red & brown,inorganic SILT.Slightly sandy, micaceous.		1		9 12 15
					2		3 4 3
620.4'			(SC)Brown to grey,very fine grained,clayey SAND.Micaceous.		3		2 3 3
618.9'	5		(SM)Dark brown to grey,very fine grained,silty SAND. Organic.		4	No water level recorded due to the use of drilling fluid Mr. Claude Robbins operated catline/ hammer throughout boring using 1 3/4" wraps. 0 Blows indicate that sampler w/drill rods & 140 lb.hammer penetrated 0.5' w/o a hammer drop.	1 0 0
					5		1 1 1
615.9'			Grey,highly organic.		6		0 0 1
	10				7		1 0 1
			(MH)Grey,clayey SILT.Very soft.		8		1 1 1
					9		0 0 1
609.9'			Dark greyish brown,very fine sandy.		10		0 0 0
	15				11		3 5 5
			(SM)Dark greyish brown,very fine grained,silty SAND. Very soft.		12		1 1 1
					13		3 4 4
			Grey,fine grained.		14		1 5 6
	20		Grey & black to greenish grey,fine grained.		15		3 7 10
					16	NOTE: Scale change @ 25.0'.	3 7 8
599.4'			Grey.				
			Tan.		17		5 9 10
	25		(SP)Tan,fine to med.grained,poorly graded SAND.		18		9 10 12
			Med.grained,w/traces of gravel.				
596.4'	27		Continued on sht 2			BLOWS PER 0.5 FOOT: Number required to drive 1 3/8"ID splitspoon w/ 140 lb. hammer falling 30".	

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

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 623.4' ± | **Hole No.** CUD-507

PROJECT: Clemson Upper Dam Seismic Study | 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
		c	d	e	JAR	g	
596.4'	27'		(SM) Brown,purple,green,fine grained,silty SAND. Saprolitic,w/some chunks of broken rock.		19		33 36 38
594.9'	29		(GRANITE)Saprolite,green & white,intensely wea.rock. Easily crumbled.		20		18 43 48
					21		12 28 35
	31		Green & white to tan & white.		22		17 41 69
590.4'	33		Bottom of Boring 33.0'				

Hole No. CUD-525

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Clemson, SC

SHEET 1 OF 2 SHEETS

1. PROJECT: Clemson Upper Dam Seismic Evaluation
2. LOCATION (Coordinates or Station): Sta 16+00 266' D/S ℄ of DAM
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): CUD-525
5. NAME OF DRILLER: Perry Roundtree
6. DIRECTION OF HOLE: [x] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 28.5'
8. DEPTH DRILLED INTO ROCK: -
9. TOTAL DEPTH OF HOLE: 28.5'
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: CME 55
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 15; UNDISTURBED Ø
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: see remarks
16. DATE HOLE: STARTED 7 Nov 89; COMPLETED 7 Nov 89
17. ELEVATION TOP OF HOLE: ~624.0'
18. TOTAL CORE RECOVERY FOR BORING: NOT applicable %
19. SIGNATURE OF INSPECTOR: Dan Foreman

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
624.0			Fishtailed without sampling (not to SCALE)			No groundwater level recorded due to use of drilling fluid from start of drilling.	
	5						
618.5							
	6		(SM) Grayish-brown fine-medium silty SAND	0.6'		NR = No Recovery	5 7
			lenses of clean coarse sand, very micaceous	0.5'			4 2
	8					*splitspoon redriven with "baggie"-still NR	1
615.5			No RECOVERY	NR			WH
	10					**splitspoon redriven with "baggie", sample recovered.	WH 1
				NR*			0 1
612.5			(CH) Gray very soft highly plastic CLAY			Soils visually classified in accordance with the Unified Soil Classification System.	1
	12			NR**			WH WH
			some silty zones			WH = Weight of Hammer	1
	14			1.6'			1 1
			mottled gray and rust brown, moderately stiff				4
				NR**			3
608.0	16		(MH) Gray mottled w/rust brown clayey SILT				4 5
			continued on sheet #2				

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE ~624.0' msl **Hole No.** CUD-525

PROJECT Clemson Upper Dam Seismic Evaluation | INSTALLATION Clemson, SC | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV. e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
			mottled zones of high & low plasticity	1.0'			1 3 3
	18		moderately plastic & micaceous				
			slightly sandy, v. fine grained, to very sandy	1.0'			ND 3 4
605.0			(SM) Gray fine grained, slightly silty → silty SAND with layers of sandy silt & thin lenses of highly plastic clay				
	20			0.4'			2 2 4
			slightly silty greenish-gray w/occ thin lenses of black SILT & carb. material	0.6'			1 3 4
	22		same, with rootlet	0.7'			3 4 5
	24		gray, slightly silty fine → medium w/some coarse grains	0.4'			4 5 5
				0.6'			3 6 12
	26		Lt. brown, fine → coarse grained w/ two subrounded chert gravels 3/8" and 3/4" diameter				13 ND ND
	28		numerous fine-small chert gravels				
595.5			Bottom of boring @ 28.5'			ND indicates "no drive"	

Hole No. CUD-530

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Clemson, SC	SHEET 1 OF 2 SHEETS

1. PROJECT Clemson Upper Dam, Seismic Evaluation
2. LOCATION (Coordinates or Station) STA 8+00 150' D/S ℄ DAM
3. DRILLING AGENCY Savannah District
4. HOLE NO. (As shown on drawing title and file number) CUD-530
5. NAME OF DRILLER Perry Roundtree
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN 39.5'
8. DEPTH DRILLED INTO ROCK –
9. TOTAL DEPTH OF HOLE 39.5'
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 CME 55
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 18; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES N/A
15. ELEVATION GROUND WATER NOT RECORDED
16. DATE HOLE: STARTED 18 NOV 89; COMPLETED 18 NOV 89
17. ELEVATION TOP OF HOLE ~ 642.0
18. TOTAL CORE RECOVERY FOR BORING NOT APPLICABLE %
19. SIGNATURE OF INSPECTOR Ann C. Halpin

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
642.0	0		Fish tailed through embankment material - not classified and no samples taken (NOT TO SCALE)			No water level recorded due to use of drilling fluid from start of drilling. Perry Roundtree operated Catline / hammer throughout boring.
626.0	16		(SM) Grayish brown medium - coarse slightly silty sand fine grained & micaceous	0.9'		BLOWS 13 37 36 * Sampler driven additional 0.5'
	18			0.5'		6 8 6
622.0	20		(MH) Dark gray plastic silt with trace fine sand	0.3'		1 1 2
			sandy			soils visually classified in accordance with the Unified soil classification system.
619.5	22		(SM) Brownish - dark gray fine silty sand, silt % decreases with depth	1.0' *		2 2 5
	24		grayish brown - brown, fine-medium, micaceous	0.7' *		3 3 6
	26		very fine grained, slightly mica., few small pockets of black organic material	0.6'		5 7
			Continued on sheet #2			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE ~642.0' msl | Hole No. CUO-530

PROJECT: Clemson Upper Dam Seismic Evaluation | INSTALLATION: Clemson, SC | 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
	28		Lt. brown - grayish brown, fine - medium grained with few very small pockets of black organic material, less silt with depth	0.7' *		7 3 5 7
	30		more fine grained	0.6' *		4 4 5
	32		more pockets of black organics	0.6' *		3 6 8
	34			0.7' *		5 5 7
606.0	36		(MH) Gray slightly sandy → sandy fine grained plastic silt with some lenses of silty sand, slightly micaceous	0.9' *		3 2 2
	38		less silt, more sand			
603.5			(SM) Lt. brown & Lt. gray medium → coarse sl. silty sand, some weathered rock (saprolitic) up to ½" ϕ	1.1'		0 2 20
602.5			Bottom of boring @ 39.5'			

Hole No. CUD-532

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Clemson, SC

SHEET 1 OF 2 SHEETS

1. PROJECT: Clemson Upper Dam Seismic Evaluation
2. LOCATION (Coordinates or Station): Sta 14+00 155' D/S ℄ DAM
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): CUD-532
5. NAME OF DRILLER: Perry Roundtree
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 39.5'
8. DEPTH DRILLED INTO ROCK: –
9. TOTAL DEPTH OF HOLE: 39.5'
10. SIZE AND TYPE OF BIT: 13/8" ID Splitspoon
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 11; UNDISTURBED Ø
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: see remarks
16. DATE HOLE: STARTED 20 Nov 89; COMPLETED 20 Nov 89
17. ELEVATION TOP OF HOLE: ≈ 642.0
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: Ellen C. Hodgins

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
642.0			Fishtailed through EMBANKMENT material - not classified and no samples taken (not to scale)			No groundwater level recorded due to use of drilling fluid from start of drilling.
624.0	18		(ML) Orange-brown fine-grained sandy SILT, moderately plastic and slightly micaceous (embankment material)	0.65'		NR = No Recovery 3 3 5
622.0	20		(SP-SM) Brown medium → coarse slightly silty SAND, appears to be filter material	0.5'		Soils visually classified in accordance with the Unified Soil Classification System. 6 6 5
620.0	22		(ML) Dark gray moderately plastic to plastic SILT w/trace fine sand more plastic and slightly micaceous	1.5'		1 1 1
618.0	24		(MH) Brownish dark gray plastic SILT w/trace fine sand and small rootlets, slightly micaceous. no rootlets	1.5'		2 2 2
	26		dark gray less plastic	1.2'		
615.0			(SM) Brown fine-medium silty SAND micaceous w/few pockets of black organics			1 1 3
	28		continued on sheet #2			

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE ~642.0' msl **Hole No.** CUD 532

PROJECT Clemson Upper Dam Seismic Evaluation | INSTALLATION Clemson, S.C. | 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
	28		Brown fine-medium silty SAND micaceous w/ few pockets black organics	1.1'		2 3 6
	30		Lt. brown → brown	0.8'		1 3 5
	32		greater % silt, mostly fine grained, some lenses classify as moderately plastic SILT (ML)	1.4'		1 2 5
	34		gray and brown, only slightly silty, fine-medium grained	1.0'		1 6 6
606.0	36		(SP-SM) Lt. gray w/ dark gray spots medium grained, very slightly silty SAND, slightly micaceous saprolitic	0.5'		5 14 18
	38		with quartz gravels up to 0.7" in diameter	NR		7 14 17
602.5			Bottom of hole @ 39.5'			

Hole No. INCL 12

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION HARTWELL LAKE	SHEET 1 OF 2 SHEETS

1. PROJECT: CLEMSON UPPER DIVERSION DAM
2. LOCATION (Coordinates or Station): STATION 7+70, 150 FT DOWNSTREAM OF ℄
3. DRILLING AGENCY: SAVANNAH DISTRICT
4. HOLE NO. (As shown on drawing title and file number): INCL 12
5. NAME OF DRILLER: DAVID JUSTISS
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 43.9 FT
8. DEPTH DRILLED INTO ROCK: 0.0 FT
9. TOTAL DEPTH OF HOLE: 43.9 FT
10. SIZE AND TYPE OF BIT: 6 - INCH UPWARD DISCHARGE FISHTAIL
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 11; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 0
15. ELEVATION GROUND WATER: SEE REMARKS
16. DATE HOLE: STARTED 23 MAR 1995; COMPLETED 23 MAR 1995
17. ELEVATION TOP OF HOLE: 642.5
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR:

ELEVATION a	DEPTH FTb	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	JAR OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			(SM) ORANGE VERY SILTY FINE SAND, MOIST, WITH SOME MICA, GRASS ROOTS AT SURFACE			BLOWCOUNT
					1	5 9 12
	5					MUD ROTARY DRILLING WAS USED FROM THE TOP OF HOLE. THEREFORE, DEPTH TO GROUNDWATER WAS NOT RECORDED
636			(ML) MOTTLED TAN, DARK ORANGE, AND BROWN FINE SANDY SILT, MOIST, WITH SOME MICA		2	4 4 6
	10					
631			MOTTLED TAN, DARK ORANGE, AND WHITE (WHITE MATERIAL APPEARS TO BE SEVERLY WEATHERED ROCK)		3	6 8 11
627.5	15		(SM) BROWN SILTY VERY FINE SAND, MOIST, WITH SOME MICA		4	4 4 3
624			GREY			
	20				5	3 5 5
620.5			VERY MOIST			
619			(ML) BROWN VERY FINE SANDY SILT, VERY MOIST, WITH SOME MICA AND TRACE OF VERY FINE ROOTS		6	5 6 6
	25				7	3 2 3
615			(SM) BROWN SILTY VERY FINE SAND, VERY MOIST, WITH SOME MICA		8	2 3 4
	30		CONTINUED ON SHEET 2			
			NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.			

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE 642.5

Hole No. INCL 12

PROJECT CLEMSON UPPER DIVERSION DAM

INSTALLATION HARTWELL LAKE

SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH 30b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	JAR OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			(ML) MOTTLED GREY AND DARK ORANGE SILT, WITH A LITTLE SAND, CLAY, AND MICA, VERY MOIST		9	31.5 TO 32.5 WEIGHT OF HAMMER AND RODS 0 0 2
608.5	35		DARK GREY, WITH SOME VERY FINE SAND AND SOME MICA, TRACE OF VERY FINE ROOTS		10	1 1 5
605.5			BLACK AND BROWN, MOIST, WITH LAMINATIONS		11	3 6 14
604	40		(GM) GREY AND WHITE SILTY GRAVEL, WITH SOME MEDIUM TO COARSE SAND, GRAVEL SIZES UP TO 1/2 INCH			
598.6	45		BOTTOM OF BORING AT 43.9 FEET			BLOWCOUNT BLOWCOUNTS SHOWN ARE THE NUMBER OF BLOWS PER 6 INCH INCREMENT REQUIRED TO DRIVE A 1 3/8 INCH ID SPLIT-BARREL SAMPLER WITH A 140 LB. HAMMER FALLING 30 INCHES. THE SUM OF THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER OVER THE DEPTH INTERVAL OF 6 TO 18 INCHES IS THE STANDARD PENETRATION TEST RESISTANCE, "N", IN BLOWS PER FOOT. (ASTM D1586)

NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

Hole No. MW-9

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell

SHEET 1 OF 2 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 12+50 150.0' Downstream of C_L
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): MW-9
5. NAME OF DRILLER: W.J. Kyser
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 48.0'
8. DEPTH DRILLED INTO ROCK: 0.0
9. TOTAL DEPTH OF HOLE: 48.0'
10. SIZE AND TYPE OF BIT:
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): TBM
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 9; UNDISTURBED
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER: 617.0'
16. DATE HOLE: STARTED 29 Apr 81; COMPLETED 01 May 81
17. ELEVATION TOP OF HOLE: 642.5
18. TOTAL CORE RECOVERY FOR BORING: %
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. JAR f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g BLOWS
642.5	0		No samples taken 0-15'			Note: Augered to 15.0' where splitspooning was begun. W.T. 25.5 Date 30 Apr 81 Depth to water during drilling.
	5					
	10					
627.5	15		SM- Pinkish tan, yellow, fine to medium, silty sand; dry; 30% micaceous		1	15.0' Note; Top of alluvium at 22.5
	20		Grayish brown, moist, 10% micaceous Pinkish tan, dry, 35% micaceous Dark grayish brown, fine to very fine, very silty sand; moist; < 10% micaceous, after 22.5'		2 3 4	22 14 21 16 30 13 8 9
612.5	30		Continued on sheet 2 Note: Soils field classified in accordance with the Unified Soil Classification System.		5	8 13 Blows Per Foot: Number required to drive 1 3/8" splitspoon w/140 lb hammer falling 30".

Sample Lab

No.	Class	LL	PL	PI
2	SM	NP	NP	NP
6	ML	36	31	5
10	SM	NP	NP	NP

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 642.5 **Hole No.** MW-9

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

ELEVATION a	DEPTH 30 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
612.5			SM-Dark grayish brown, fine to very, fine, very silty sand; moist;<10% micaceous				5
							10
	35				6		5
							3
							5
						Note: 3" spoon and 300lb hammer 46.5'.	7
	40		Gray,fine, decrease in silt		7		20
							14
							10
					8		40
	45						
			Fine to medium with frequent quartz gravel up to 2 inch size.		9	Note: Top of rock at 48.0'	60
594.5							55
			Bottom of Boring 48.0'			Note: A piezometer was set at 47.6' with 2.5' of 1" screen and 47.5' of 3/4" riser.	
	50						

Hole No. MW-10

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 2 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 13+00 150.0' downstream of centerline,
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): MW-10
5. NAME OF DRILLER: W. J. Kyser
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 49.5'
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 49.5'
10. SIZE AND TYPE OF BIT: 1 3/8" ID splitspoon
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): TBM
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER: 618.4'
16. DATE HOLE: STARTED 4 May 81; COMPLETED 5 May 81
17. ELEVATION TOP OF HOLE: 642.4'
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: JAMES D. KOTTI

ELEVATION a	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
642.4			No samples taken 0-15.0'			Note: Augered to 15.0', where splitspooning was begun. W.T. 24.0' Date 4 May 81 Depth to water during drilling
627.4	15		SM- Tan, pinkish tan, fine to medium, silty sand, slightly moist, 35% micaceous.		1	15.0' 23 35 Note: Top of alluvium at 25.0'.
	20				2	12 11 Sample Lab No. Class LL PL PI 1 SM 40 35 5 4 ML 36 27 9
			Tannish gray, moist, 10% micaceous.		3	14 13
	25		Black, very fine, very silty sand, moist, 20% micaceous.		4	9 15
			Brown, very moist, 30% micaceous.		5	5
612.4	30		Continued on sheet			19

Note: Soils fields 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 642.4 | **Hole No.** MW-10

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

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
612.4			SM-Brown, very fine, very silty sand, very moist, 30% micaceous			Note: No sample recovery for 34.5'-36.0', 36.0'-37.5' and 37.5'-39.0'. Loss believed to be due to softness of soil. 6 11 9 13
			Wet			Note: Began using 3" spoon and 300lb hammer at 46.5'. 7 11
	35					
			Blackish gray, moist		6	4 11 16
	40					
			Gray, fine.		7	25
	45				8	35
			Gray, yellowish gray, fine to medium, slightly moist, frequent quartz gravel up to 3/4"			36 38
592.9	50		Bottom of Boring 49.5			Note: A piezometer was set 47.8', with 2.5' of 1" screen and 47.5' of 3/4" riser.

Hole No. MW-11

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 2 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 14+00, 150' downstream of centerline.
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): MW-11
5. NAME OF DRILLER: W. J. Kyser
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 45.0'
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 45.0'
10. SIZE AND TYPE OF BIT: 1 3/8" ID Splitspoon
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): TBM
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER: 621.0'
16. DATE HOLE: STARTED 5 May 81; COMPLETED 6 May 81
17. ELEVATION TOP OF HOLE: 641.0'
18. TOTAL CORE RECOVERY FOR BORING: %
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
641.0	0		No samples taken 0-15'			Note: Hole was augered to 15.0' where splitspooning was begun. W.T. 20.0' Date 5 May 81 Depth to water during drilling.	
	5						
	10						
626.0	15						
			SM-Pinkish tan, fine to medium, silty sand, slightly moist, 30% micaceous.		1	Note: Top of alluvium at 22.0'.	20
	20		Gray, very moist, 10% micaceous.		2	Sample Lab No. 2 Class SW-SM LL NP PL NP PI NP	18
			Black, fine to very fine, very silty sand, moist, 20% micaceous.		3	Sample Lab No. 5 Class SP-SM LL NP PL NP PI NP	22
	25		Brown, moist.				17
							8
							6
							10
							4
							10
611.0	30				4		7

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 1' hammer falling 30".

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 641.0' | **Hole No.** MW- 11

PROJECT: Clemson Upper Diversion 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.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
611.0	30		SM-Brown, very fine to fine, very silty sand, moist.			13
						Note: Began using 3" spoon at 40.5'. 7
	35		Gray, fine.			13
						Note: Top of rock at 44.6'. 12
						20
						12
	40		Yellowish gray, fine to medium, moist, frequent 3/4" quartz gravel.		5	53
						19
						26
			Red, gray.			28
596.0	45		Bottom of Boring 45.0'			Note: A piezometer was set at 44.0', with 2.5' of 1" screen and 43.4' of 3/4" riser.

Hole No. MW-12

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Hartwell Lake
SHEET	1 OF 2 SHEETS
1. PROJECT	Clemson Upper Dam
2. LOCATION (Coordinates or Station)	Sta 14+50 150.0 downstream of centerline
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	MW-12
5. NAME OF DRILLER	W.J. Kyser
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	46.5'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	46.5'
10. SIZE AND TYPE OF BIT	
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	TBM
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 4 / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	620.2'
16. DATE HOLE	STARTED 07 May 81 / COMPLETED 07 May 81
17. ELEVATION TOP OF HOLE	641.2
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	JAMES D. KOTTI

ELEVATION a	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
641.2			No samples taken 0-15			Note: Hole was augered to 15.0'. At 15.0 began splitspooning	
	5					W.T. 21.0' Date 07 May 81 Depth to water during drilling	
	10					W.T. 16.5 Water table reading 24 hrs after hole completed.	
						15.0'	
626.2	15		SM-Pinkish tan, fine to medium, silty sand; dry; 30% micaceous		1	Note: Top of alluvium at 22.3	15 13 17
			Seam of red, sandy clay.		2	Sample No. 4 Lab Class SM LL NP PL NP PI NP	8
	20		Grayish tan, fine to medium, 10% micaceous.		3		8 8
618.9			MH-Black, plastic silt; moist.				18
	25		Brown				8 14
611.2	30		Continued on sheet 2				5
			Note: Soils field classfied in accordance with the Unified Soil Classification System.			Blows Per Foot: Number required to drive 1 3/8" splitspoon w/140lb hammer falling 30".	

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 641.2 | **Hole No.** MW-12

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

ELEVATION a	DEPTH 30b	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
611.2			SM-Brown, fine to very fine, very silty sand, moist 20% micaceous.		4		11
						Note: Began using 3" spoon at 42.0'.	9
	35						8
							13
			Grayish tan, fine, moist, decrease in silt an mica			Note: Top of rock at 46.0'.	24
	40						13
			Fine to medium, frequent quartz gravel up to 1 3/4". Greenish gray				19
							50
	45		Top of Rock 46.0				38
							37
							65
594.7			Granite gneiss Bottom of Boring 46.5'			Note: A piezometer was set at 45.8', with 2.5' of 1" screen and 45.5' of 3/4" riser.	
	50						

Hole No. PF-201

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Hartwell Lake
SHEET	1 OF 6 SHEETS
1. PROJECT	Clemson Upper Dam
2. LOCATION (Coordinates or Station)	Sta. 11+00, 3.5' upstream centerline dam
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	PF-201
5. NAME OF DRILLER	C. Hall
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	84.0'
8. DEPTH DRILLED INTO ROCK	58.0'
9. TOTAL DEPTH OF HOLE	142.0'
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	Failing 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 8 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	7
15. ELEVATION GROUND WATER	+629.66
16. DATE HOLE	STARTED 2 Oct 80 / COMPLETED 8 Oct 80
17. ELEVATION TOP OF HOLE	+681.36+
18. TOTAL CORE RECOVERY FOR BORING	91 %
19. SIGNATURE OF INSPECTOR	CHARLES WHITTEN, 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
681.36	0						
			SM-Brown, silty, fine to medium sand, micaceous, clayey with roots in upper 0.4'.		1	W.T. 51.7'	26
			4.5			Water table reading	19
676.86					2	168 hrs. after hole completed.	9
	5		ML-Tan to red silt with some fine sand, very micaceous with scattered Quartz and weathered Feldspar up to gravel size.				18
							24
							20
	10						21
							34
					3		43
							33
	15						17
							25
							36
	20						29
							29
					4		
							38
657.36			24.0		5		
655.86	25		SM-Tan, silty, fine sand, micaceous. 25.5				34
			ML-Tan to red silt with some fine sand, very micaceous with scattered Quartz and weathered Feldspar up to gravel size.				23
							44
651.36	30						39

Sample No. / Lab Class / LL / PL / PI

Sample No.	Lab Class	LL	PL	PI
1	SM	NP	NP	NP
3	SM	31	25	6
5	SM	29	24	5
6	SM	49	43	6
8	SW/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 +681.36+ | **Hole No.** PF-201

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | SHEET 2 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)	BLOWS
	a	b	c	d	e	JAR	g	
651.36	30		ML-Tan to red silt with some fine sand, very micaceous with scattered Quartz and weathered Feldspar up to gravel size.				33
							43
							32
	35						29
							39
							39
	40						40
							33
							28
							33
	45						27
							36
							35
	50						32
629.66							26
							45
	55						36
							33
							37
							47
	60						50
							56
							34
	65						33
					6		50
							38
611.36	70		Continued on sheet 3				33

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +681.36+ | **Hole No.** PF-201

PROJECT Clemson Upper 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)
					JAR	BLOWS
			ML-Tan to red with fine sand, micaceous, gravel size Quartz and Feldspar fragments scattered throughout. 73.0		7	28
608.36			SM-Tan to brown, fine to medium with some pea gravel, micaceous.			68
	75					83
						63
					8	51
						53
	80					66
						50
			Top of Rock 84.0'			93
597.36	85		Granite Gneiss-Very badly weathered, crumbles and breaks when handled. Micaceous, soft, mottled black and white with orange weathering stain, remnant foliation at 0° to 20° to normal, primary minerals are Quartz, Feldspar and Mica with Garnet scattered throughout.			NOTE: No sample from 84.0' to 86.0'. 86.0
				100 RQD 0	BOX 1	Pull 1 From 86.0' to 89.5' Run 3.5' Rec 3.5' CL 0.0' 89.5
	90			100		Pull 2 From 89.5' to 96.5' Run 7.0' Rec 7.0' CL 0.0'
						NOTE: Scale change at 90.0'.
	92				92.8	
					BOX 2	
	94					
				RQD 0		
	96		96.5' salt and pepper color, orange weathering stain less noticable.			96.5
				100		Pull 3 From 96.5' to 101.5' Run 5.0' Rec 5.0' CL 0.0'
583.36	98					
			Continued on sheet 4			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE + 681.36+ | **Hole No.** PF-201

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | 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)
583.36	98	c	d	e	f	g
			Granite Gneiss-Soft, breaks when handled, salt and pepper color.		BOX 2	Pull 3 continued
			99.5' - Open iron stained. 45° joint.		100.1	
	100			RQD 0	BOX 3	
						101.5
				96		Pull 4 From 101.5' to 106.5' Run 5.0' Rec 4.8' CL 0.2'
	102					
	104			RQD 0		
	106					106.5
				80		Pull 5 From 106.5' to 111.5' Run 5.0' Rec 4.0' CL 1.0'
	108				108.4	
				RQD 0	BOX 4	
	110					
						111.5
				100		Pull 6 From 111.5' to 116.0' Run 4.5' Rec 4.5' CL 0.0'
	112		112.2' to 112.8' - 45° open joint.			
			113.0' - 45° healed joint. 113.0' to 114.7' - vertical joint.			
567.36	114		Continued on sheet 5			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +681.36± | **Hole No.** PF-201

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | SHEET 5 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)
567.36	114	c	d	e	f	g
			Granite Gneiss-Weathered, soft to moderately hard, breaks easily, salt and pepper color.	RQD 0	BOX 4 115.6	Pull 6 continued 116.0
	116			100	BOX 5	Pull 7 From 116.0' to 119.7' Run 3.7' Rec 3.7' CL 0.0'
	118		118.0' to 122.5' - High mica content.	RQD 0		119.7
	120			77		Pull 8 From 119.7' to 124.5' Run 4.8' Rec 3.7' CL 1.1'
	122			RQD 0		
	124		124.5' to 125.4' - Open 45° joint. Joint nearly perpendicular to foliation in a zone of high mica content.		124.5	124.5
				100	BOX 6	Pull 9 From 124.5' to 127.0' Run 2.5' Rec 2.5' CL 0.0'
	126			RQD 0		127.0
				13		Pull 10 From 127.0' to 130.0' Run 3.0' Rec 0.4' CL 2.6'
	128			RQD 0		
551.36	130		Continued on sheet 6			130.0

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +681.36+ | **Hole No.** PF-201

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 6 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)
a	b	c	d	e	f	g
551.36	130		Granite Gneiss-Weathered, soft to moderately hard, breaks easily, salt and pepper color.	100	BOX 6	Pull 11 From 130.0' to 135.0' Run 5.0' Rec 5.0' CL 0.0'
	132			RQD 0		
					134.2	
	134				BOX 7	135.0
				100		Pull 12 From 135.0' to 142.0' Run 7.0' Rec 7.0' CL 0.0'
	136		137.0' - Two open 45° joints intersect.			
				RQD 0		
	138					
			139.2' to 140.0' - Open 45° joint.			
	140					
					142.0	142.0
539.36	142		Bottom of Boring 142.0'			Pressure Test - No take of water with bottom of packer at 91.5'. Water pressure 40 psi.

Hole No. PF-201A

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

1. PROJECT: Clemson Upper Diversion Dam
2. LOCATION (Coordinates or Station): Sta.11+00, 29' Upstream
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF-201A
5. NAME OF DRILLER: C.D. Justiss
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 79.5'
8. DEPTH DRILLED INTO ROCK: 13.5'
9. TOTAL DEPTH OF HOLE: 93.0'
10. SIZE AND TYPE OF BIT: 4X5 1/2"dia.6"rock bit, 1 3/8" splitspoon,6"fish-tail
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 14 | UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 1
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 14 Dec 1983 | COMPLETED 17 Dec 1983
17. ELEVATION TOP OF HOLE: 677.3'
18. TOTAL CORE RECOVERY FOR BORING: 60.0' %
19. SIGNATURE OF INSPECTOR: Thaddius J. Zielonka, Jr.

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
677.3'	0'	c	d	e	JAR	g	
			Riprap			NOTE: Riprap cored using 4X5 1/2" dia bit & starter barrel.	
	5						
668.8'	10		(SM) Light reddish-brown, fine-med.micaceous silty SAND. With trace of fine gravel.		1		25
					2		30
			Color change to light brown.				25
	15				3		19
			Light reddish-brown & fine grained w/no gravel below 15.0'.				20
							20
	20		Color change to red-brown.		4		25
							21
			Color change to tan-brown.		5		23
			25.5'				32
651.8'	25		No recovery.(Hit rock) 27.0'				64
650.3'					6		24
			(SM) Reddish-brown fine grained micaceous silty SAND. With trace of med. sand.				100/0.3
647.3'	30		Continued on sht 2				

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 677.3' | **Hole No.** PF-201A

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | 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
647.3'	30'	c	d	e	f	g	
			(SM) Continued. Red-brown fine grained micaceous silty SAND.		7		26
							25
			Tan-brown below 33.0'.		8		26
	35						29
							30
							40
	40		Red-brown fine to med.grained micaceous silty sand w/trace of white wea.feldspar grains (kaolinite).		9		30
							29
							38
	45						26
							36
							34
							30
	50		Light brown w/trace of fine gravel.		10		45
							63
			Color change to red-brown.				51
	55						28
			With trace of white wea. feldspar grains below 57.0'.		11		54
							37
							37
	60						25
							28
							32
	65				12		41
			Tan fine to med.silty sand w/some gravel.				30
							21
					13		29
607.3'	70		Continued on sht 3				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 677.3' | **Hole No.** PF-201A

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | 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
607.3'	70'	c	d	e	f	g	
			(SM) Continued. Tan, fine to med. grained silty SAND. With some gravel.		13		35
							28
	75					NOTE: Scale change @ 80.0'	21
			76.5'				59
600.8'			(GM) Tan silty sandy GRAVEL.		14		54
			79.5'				75
597.8'	80		(GRANITE GNEISS) Intensely wea., soft, tan to orange-brown w/some white to light grey zones, fine to coarse grained, micaceous, foliated.	71.1% RQD 0.0%	Box 1	Pull #1 From 79.5' To 85.1' Run 5.6' Rec 0.4' C.L. 5.2'	
	82						
	84						
			(GRANITE GNEISS)				85.1'
592.2'			(GRANITE GNEISS)	92.3% RQD 65.0%		Pull #2 From 85.1' To 86.4' Run 1.3' Rec 1.2' C.L. 0.1'	
590.9'	86						
				96.3% RQD 48.0%		Pull #3 From 86.4' To 89.1' Run 2.7' Rec 2.6' C.L. 0.1'	
	88						
							89.1'
588.2'			(GRANITE GNEISS)	100% RQD 82.0%		Pull #4 From 89.1' To 93.0' Run 3.9' Rec 3.9' C.L. 0.0'	
	90						
584.3'	93		Bottom of Boring 93.0'			NOTE: Scale change @ 90.0'	

Hole No. PF-202

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

1. PROJECT	Clemson Upper Dam
2. LOCATION (Coordinates or Station)	Sta. 11+10, 140' downstream centerline
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	PF-202
5. NAME OF DRILLER	Crawford Hall
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	48.9'
8. DEPTH DRILLED INTO ROCK	66.5'
9. TOTAL DEPTH OF HOLE	115.4'
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	Failing 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 6 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	8
15. ELEVATION GROUND WATER	+624.51
16. DATE HOLE	STARTED 26 Oct 80 / COMPLETED 1 Nov 80
17. ELEVATION TOP OF HOLE	+642.2+
18. TOTAL CORE RECOVERY FOR BORING	83 %
19. SIGNATURE OF INSPECTOR	CHARLES WHITTEN, 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
642.2	0						
640.7			CL-Brown with some fine sand, roots in upper 0.5'.		1	NOTE: Used 4" auger with splitspoon to the water table at 22.5'; then used fishtail bit and revert to top of rock.	16
			ML-Tan to red silt with some fine sand, micaceous, gravel size Quartz and weathered Feldspar fragments scattered throughout.		2		21
	5						20
							18
							31
						Sample Lab No. Class LL PL PI 1 SM 45 28 17 4 SW-SM NP NP NP 5 SW-SM NP NP NP 6 SM NP NP NP	19
	10						20
							21
							23
	15					W.T. 22.5' Date 26 Oct 80 Depth to water during drilling.	31
							22
							26
	20						25
							24
							29
	25						20
					3		19
							21
						APPENDIX X Page 7 of 123	23
612.2	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 +642.2+ | **Hole No.** PF-202 | SHEET 2 OF 6 SHEETS

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake

ELEVATION	DEPTH	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
612.2	30		ML-Tan to red silt with some fine sand, micaceous, Quartz and weathered Feldspar fragments scattered throughout.				28
609.2			SM-Brown, fine to medium, silty sand with high silt-clay content, scattered pea gravel.		JAR 4		32
	35						18
							23
							43
							31
	40						100
							18
			Light brown, medium to coarse silty sand with silt and pea gravel below 42.0'		5		27
598.7					6		73
			GP-Yellow to orange gravel with silt and medium to coarse sand.				89
	45						36
			Top of Rock at 48.9'				77
593.3			Granite Gneiss-Badly weathered, soft, breaks when handled, orange iron stain to 70.0', remnant foliation varies from 0° to 20°			NOTE: Scale change at 50.0'.	37
	50					NOTE: 3" spoon with 300 lb. hammer used from 48.0' to 52.0'	50
					52.0		52.0
	52				BOX 1	Pull 1 From 52.0' to 57.0' Run 5.0' Rec 5.0' CL 0.0'	
	54						
			55.0' Quartz, Feldspar and Mica chief minerals with Garnet scattered throughout. 45° open joint.				
					56.2		
	56				BOX 2		57.0
						Pull 2	
584.2	58		Continued on ~~sheet~~ 3				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 642.2+ | **Hole No.** PF-202

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 3 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)
584.2	58	c	d	e	f	g
	60		Granite Gneiss-Badly weathered, soft, crumbles when handled, iron stained to 70.0', foliation at 0° to 20°.	90 RQD 0	BOX 2	Pull 2 continued From 57.0' to 62.0' Run 5.0' Rec 4.5' CL 0.5'
	62		62.5' to 63.9' Concentrated zones of Mica and Feldspar, up to 0.3' thick, alternating.	100 RQD 0	64.3	62.0 Pull 3 From 62.0' to 67.0' Run 5.0' Rec 5.0' CL 0.0'
	64				BOX 3	
	66		65.0' 45° Healed joint.			67.0
	68		67.0' Vein of Feldspar and Quartz.	93		Pull 4 From 67.0' to 71.4' Run 4.4' Rec 4.1' CL 0.3'
	70		69.0' and 69.3' Feldspar-Quartz veins. Veins at 20° orientation. 69.3' to 69.9' Healed 45° joint.	RQD 0		71.4
	72			25 RQD 0	73.4	Pull 5 From 71.4' to 73.4' Run 2.0' Rec 0.5' CL 1.5' 73.4
568.2	74		Continued on sheet 4		BOX 4	Pull 6

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +642.2± | **Hole No.** PF-202

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | 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)
568.2	74	c	d	e	f	g
			Granite Gneiss-Weathered, soft, crumbles when handled.	84	BOX 4	Pull 6 continued From 73.4' to 78.4' Run 5.0' Rec 4.2' CL 0.8'
	76			RQD 0		
	78		78.4' to 79.6' Near vertical Feldspar-Quartz vein.			78.4
				94		Pull 7 From 78.4' to 85.4' Run 7.0' Rec 6.6' CL 0.4'
	80			RQD 0	81.4	
					BOX 5	
	82		82.5' to 83.5' High Mica content, soft to moderately hard, white and black, generally breaks parallel to foliation at 20°.			
	84					
			85.4' 45° open joint.			85.4
				72		Pull 8 From 85.4' to 90.4' Run 5.0' Rec 3.6' CL 1.4'
	86		86.4' 45° open iron stained joint.	RQD 0		
	88					
			89.0' to 91.9' High Mica content.			
552.2	90		Continued on sheet 5			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +642.2± | **Hole No.** PF-202 | SHEET 5 OF 6 SHEETS

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
		c	d	e	f	g
552.2	90				90.4	Pull 8 continued
			Granite Gneiss-Weathered, breaks when handled, moderately hard, breaks parallel to foliation, salt and pepper color from 91.9' to 95.4'	70	BOX 6	Pull 9 From 90.4' to 95.4' Run 5.0' Rec 3.5' CL 1.5'
	92					
	94			RQD 0		95.4
			95.4' to 99.1' High Mica content.	90		Pull 10 From 95.4' to 100.4' Run 5.0' Rec 4.5' CL 0.5'
	96					
	98			RQD 0		
			99.1' to 100.7' Salt and pepper.			
	100				100.4	100.4
			100.7' to 103.0' High Mica content; decreases downward.	100	BOX 7	Pull 11 From 100.4' to 105.4' Run 5.0' Rec 5.0' CL 0.0'
	102					
			103.0' to 115.4' Salt and pepper.	RQD 0		
	104					105.4
						Pull 12
536.2	106		Continued on sheet 6			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +642.2+ | **Hole No.** PF-202

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

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV-ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	c		d	e	f	g
536.2	106		Granite Gneiss-Weathered, breaks parallel to foliation (20°) moderately hard, breaks easily with hands.	100	BOX 7	Pull 12 From 105.4' to 115.4' Run 10.0' Rec 10.0' CL 0.0'
					107.6	
	108				BOX 8	
				RQD 0		
	110					
			111.7' to 112.0' High Mica content.			
	112					
	114					
526.8			Bottom of Boring at 115.4'			PRESSURE TEST No take of water at 30-40 psi for 10 min. with bottom of packer set at 54.0'. Piezometer set with bottom at 59.5' on 30 Oct 80.
	116					

Hole No. PF-203

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

1. PROJECT	Clemson Upper Diversion Dam
2. LOCATION (Coordinates or Station)	Sta. 11+00, 222' downstream
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	PF-203
5. NAME OF DRILLER	W. Kyser
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	39.0'
8. DEPTH DRILLED INTO ROCK	65.0'
9. TOTAL DEPTH OF HOLE	104.0'
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	Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: 9 / UNDISTURBED: 0
14. TOTAL NUMBER CORE BOXES	9
15. ELEVATION GROUND WATER	610.2+
16. DATE HOLE	STARTED: 12 Mar 81 / COMPLETED: 18 Mar 81
17. ELEVATION TOP OF HOLE	628.2+
18. TOTAL CORE RECOVERY FOR BORING	98 %
19. SIGNATURE OF INSPECTOR	ROBERT GREEN

ELEVATION (628.2)	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
	0		SM-Brown, fine grained, silty sand with organics and seams			W.T. 18.0'	8
626.2			of orange SC, micaceous, dry 2.0		1	Date 12 Mar 81	28
			SC-Orange, fine grained,			Depth to water	
	5		clayey sand, dry. 6.0		2	during drilling.	13
622.2			SM-Brown, fine grained, silty sand, dry.		3		20
			Micaceous, dry to moist.		4		15
							18
	10		Alternating colors of brown, red and orange.		5		12
							14
							14
	15				6		18
			Moist.				16
							14
			Black, coarse sand, wet			NOTE: Embankment	4
	20		below 19.0'		7	alluvium contact	18
						at 19.0'.	7
							23
	25		Seams of black MH				6
			Fine grained sand, wet. 27.0				24
601.2			GM-Gray, fine to coarse				35
			grained, silty gravel with		8		
598.2	30		rounded pebbles, wet.				40

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 628.2+ | **Hole No.** PF-203

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | SHEET 2 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)	BLOWS
	c		d	e	JAR	g	
598.2	30		GM-Gray, silty gravel.				38
							24
							23
592.7	35		35.5' SM-Gray, fine grained, silty sand, moist.		9		76
							86
							100
589.2			Top of Rock 39.0'		39.0		
	40		Granite Gneiss-Brown, very badly weathered, very soft, medium grained, micaceous, crumbles when handled.		BOX 1	Pull 1 From 39.0' to 44.0' Run 5.0' Rec 5.0' CL 0.0'	
	42						
							44.0
	44		44.0' to 49.0' Brown, badly weathered, soft, crumbles when handled. 44.3' to 44.4' vein of Quartz, hard.			Pull 2 From 44.0' to 49.0' Run 5.0' Rec 5.0' CL 0.0'	
	46				46.3 BOX 2		
	48						
							49.0
			49.0' to 64.0' brown, badly weathered, soft, crumbles when handled.			Pull 3 From 49.0' to 54.0' Run 5.0' Rec 5.0' CL 0.0'	
	50						
576.2	52		Continued on sheet 3				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 628.2+ | **Hole No.** PF-203

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | SHEET 3 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)
576.2	52		d	e	f	g
			Granite Gneiss-Brown, badly weathered, soft, crumbles when handled, medium grained, micaceous.		BOX 2	Pull 3 continued
				54.0	54.0	54.0
	54			100	BOX 3	Pull 4 From 54.0' to 59.0' Run 5.0' Rec 5.0' CL 0.0'
				RQD 0		
	56					
	58					
				59.0		59.0
				100		Pull 5 From 59.0' to 64.0' Run 5.0' Rec 5.0' CL 0.0'
	60			RQD 0	61.0	
			61.0' to 61.3' high angle, open joint. 61.4' to 61.7' vein of Quartz, hard.		BOX 4	
	62					
				64.0		64.0
	64		64.0' to 69.0' brown, very badly weathered, very soft, crumbles when handled. 64.4' to 66.6' closely spaced, near vertical, healed and open joints, white stains on healed joints.	100		Pull 6 From 64.0' to 69.0' Run 5.0' Rec 5.0' CL 0.0'
				RQD 0		
	66					
					68.0	
560.2	68		Continued on sheet 4			

ILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 628.2± | Hole No. PF-203 | SHEET 4 OF 6 SHEETS

JECT: Lemson Upper Diversion Dam | INSTALLATION: Hartwell Lake

EVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV-ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
		c	d	e	f	g
60.2	68				BOX 5	Pull 6 continued
			Granite Gneiss-Brown, very badly weathered, very soft, medium grained, micaceous, crumbles when handled.	69.0		69.0
				86		Pull 7 From 69.0' to 74.0' Run 5.0' Rec 4.3' CL 0.7'
	70			RQD 0		
			Approx. Top of Firm Rock 70.6' 70.6' to 74.0' brown, badly weathered, soft to moderately hard.			
	72		71.5' to 71.8' nearly vertical, open joint. 71.8' to 72.7' very closely spaced, nearly vertical, healed joints, brown stained. 73.8' to 74.0' zone of Biotite, very soft, crumbles.			74.0
				74.0		
	74			104		Pull 8 From 74.0' to 79.0' Run 5.0' Rec 5.2' CG 0.2'
				RQD 0		
			74.0' to 76.0' brown, badly weathered, soft to moderately hard. 74.0' to 75.0' closely spaced, nearly vertical, healed joints, brown stained.			
					76.0	
	76				BOX 6	
			76.0' to 79.0' brown, bad to moderately weathered, moderately hard. 76.4' to 78.6' very closely spaced, high angle, open and healed joints, white stains on healed joints.			
	78					79.0
				79.0		
			79.0' to 84.0' brown, moderately weathered, moderately hard. 80.3' to 83.5' closely spaced, near vertical, high angle, and horizontal, open joints.	100		Pull 9 From 79.0' to 84.0' Run 5.0' Rec 5.0' CL 0.0'
	80			RQD 0		
	82				82.5	
					BOX 7	
				84.0		84.0
544.2	84		Continued on sheet 5			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 628.2+ | **Hole No.** PF-203

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | SHEET 5 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)
544.2	84	c	d	e	f	g
			Granite Gneiss-Brown, moderately weathered, moderately hard, medium grained, micaceous from 84.0' to 104.0'. 84.0' to 87.0' closely spaced, near vertical, high angle and horizontal, open joints.	100 RQD 73 89.0	BOX 7	Pull 10 From 84.0' to 89.0' Run 5.0' Rec 5.0' CL 0.0' 89.0
			89.5' to 92.5' closely spaced, near vertical, high angle and horizontal, open joints.	100 RQD 65 94.0	89.5 BOX 8	Pull 11 From 89.0' to 94.0' Run 5.0' Rec 5.0' CL 0.0' 94.0
			94.4' to 96.5' closely spaced, high angle, open joints. 96.3' to 96.5' vein of Quartz, hard.	78 RQD 65 99.0	97.7 BOX 9	Pull 12 From 94.0' to 99.0' Run 5.0' Rec 3.9' CL 1.1' 99.0
						Pull 13
528.2	100		Continued on sheet 6			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 628.2+ | Hole No. PF-203

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | SHEET 6 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)
		c	d	e	f	g
528.2	100		Granite Gneiss-Brown, moderately weathered, moderately hard, medium grained, micaceous. 100.0' to 104.0' closely spaced, high angle and horizontal, open joints.	100 RQD 77	BOX 9	Pull 13 From 99.0' to 104.0' Run 5.0' Rec 5.0' CL 0.0'
	102					
					104.0	104.0
524.2	104		Bottom of Boring 104.0'			

Depth	Water Press.	Gal/ 10 Min	
41.0'	40	592	Leakage estimated at 35-40 gals.
46.0'	40	350	" " " 35-40 gals.
51.0'	40	285	" " " 90-100 gals.
56.0'	40	320	" " " 25-30 gals.
61.0'	40	225	" " " 20-25 gals.
71.0'	40		Packer would not seat - total leakage
76.0'	40		" " " " " "
81.0'	40		" " " " " "
86.0'	40	42	Leakage less than 10 gals.
91.0'	40	3	
96.0'	40	3	

Hole No. PF-204

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 3 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 4+06; 147' downstream
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF-204
5. NAME OF DRILLER: G. Matthews
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 36.0'
8. DEPTH DRILLED INTO ROCK: 15.0'
9. TOTAL DEPTH OF HOLE: 51.0'
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: Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 3
15. ELEVATION GROUND WATER: +630.4+
16. DATE HOLE: STARTED 2 Mar 81; COMPLETED 4 Mar 81
17. ELEVATION TOP OF HOLE: +643.5+
18. TOTAL CORE RECOVERY FOR BORING: 95 %
19. SIGNATURE OF INSPECTOR: ROBERT GREEN

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
643.5	0				JAR		
			SM-Brown, fine grained, silty sand.		1	W.T. 20.0' Date 2 Mar 81 Depth to water during drilling.	3
							19
			Seam of brown SC.				22
	5				2	W.T. 13.1' Water table reading 48 hrs. after hole completed.	22
			Slightly micaceous.				24
							22
	10				3		18
							14
630.0			13.5				16
			SC-Brown, fine grained, clayey sand.				17
	15				4		20
			Seams of brown SM.				16
624.0			19.5			NOTE: Embankment alluvium contact at 19.5'.	18
			SM-Black, fine grained, silty sand with seams of brown SC.				15
	20				5		7
							15
620.0			23.5				14
			SC-Red, fine grained, clayey sand with seams of gray SM.				7
	25				6		11
			Color change to black.				3
			Seams of organics.				
613.5	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 +643.5± | **Hole No.** PF-204

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | 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
613.5	30	c	d	e	JAR	g	
			SC-Red, clayey sand (cont.)				7
						NOTE: Scale change at 35.0'.	2
			34.5				4
609.0	35		SM-Gray, fine grained, silty sand.				
			Top of Rock 36.0'		7		100
607.5			Granite Gneiss-Gray, very badly weathered, very soft, medium grained, micaceous, crumbles when handled.	90	BOX 1	Pull 1 From 36.0' to 41.0' Run 5.0' Rec 4.5' CL 0.5'	
	37		36.9' to 37.4' Closely spaced, high angle, healed, joints.	RQD 60			
			37.4' Approx top of firm rock.				
	39		37.4' to 38.2' Gray, slightly weathered, hard.				
			37.4' to 38.2' Closely spaced, high angle, open and healed joints, brown stained.				
			38.2' to 39.6' Brown, very badly weathered, very soft, crumbles when handled.	41.0			41.0
	41		39.6' to 51.0' Gray, slightly weathered, very hard.	100		Pull 2 From 41.0' to 46.0' Run 5.0' Rec 5.0' CL 0.0'	
				RQD 60			
	43		43.4' to 46.3' Closely spaced, high angle, open joints, brown stained.		43.4 BOX 2		
	45			46.0			46.0
			46.8' to 47.1' Very closely spaced, horizontal, open joints, brown stained.	96		Pull 3 From 46.0' to 51.0' Run 5.0' Rec 4.8' CL 0.2'	
	47		48.1' to 48.4' High angle open joint.	RQD 100			
594.5	49		Continued on sheet 3				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +643.5+ | **Hole No.** PF-204

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

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV-ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
		c	d	e	f	g
594.5	49		Granite Gneiss-Gray, slightly weathered, very hard. 49.2' to 49.7' Very closely spaced, high angle, open joints.		BOX 2 50.6 BOX 3 51.0	Pull 3 continued 51.0
592.5	51		Bottom of Boring 51.0'			NOTE: with 2.7' of 1" screen and 39.3' of 3/4" riser with bottom at 40.0' was set in this boring.

PRESSURE TEST

Depth	Air P	Water P	Gal/8 Min
37.5	100	40	leakage
42.5	100	40	leakage
47.5	100	40	7

NOTE: Leakage is water leaked out from around the casing.

Hole No. PF-205

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 6 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 6+00, 4.0' upstream centerline
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF-205
5. NAME OF DRILLER: C. Fuller
6. DIRECTION OF HOLE: [x] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 82.0'
8. DEPTH DRILLED INTO ROCK: 55.6'
9. TOTAL DEPTH OF HOLE: 137.6'
10. SIZE AND TYPE OF BIT: 1 3/8" ID splitspoon, 3" spoon & 4x5½ 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 7; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 7
15. ELEVATION GROUND WATER: +634.23+
16. DATE HOLE: STARTED 25 Oct 80; COMPLETED 2 Nov 80
17. ELEVATION TOP OF HOLE: 680.64+
18. TOTAL CORE RECOVERY FOR BORING: 81 %
19. SIGNATURE OF INSPECTOR: CHARLIE WHITTEN, 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
			a	e	JAR	g	
680.64	0		SM-Yellow to brown, fine to medium, silty sand, brown silty clay with roots in upper 0.4', boulders at 4.0'.		1	NOTE: Boulders at 4.0'.	22
							30
							77
675.14	5		5.5				24
			ML-Tan to red silt with some fine sand, micaceous, gravel size Quartz and weathered Feldspar fragments scattered throughout.		2	W.T. 46.41 Water table reading 17 days after hole completed.	37
							31
	10						29
							23
							28
							15
	15						22
							19
							18
							20
	20						21
							20
							24
							26
	25						33
							35
650.64	30						

Sample No	Lab Class	LL	PL	PI
2	ML	45	35	10
5	ML	36	32	4
6	ML	48	34	14

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 +680.64+ | **Hole No.** PF-205

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

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
650.64	30		ML-Tan to red silt with some fine sand, micaceous, gravel size Quartz and weathered Feldspar fragments scattered throughout.		3		27
							24
							26
	35						34
							40
							36
	40						40
							37
							42
	45						35
							38
							34
							46
	50						36
							35
							38
	55						31
							31
							33
							37
	60						25
			Light brown with some fine sand, micaceous, scattered organics, alluvial below 61.0'.		4		27
							22
	65		Dark brown to black with fine sand, micaceous, scattered organics below 64.5'.		5		18
							19
							15
610.64	70						17
			Continued on sheet 3				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +680.64+ | Hole No. PF-205 | SHEET 3 OF 6 SHEETS

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV. ERY e	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
610.64	70	c	ML-continued				24
610.14			CL-Light brown clay with some silt and fine sand, mottled appearance, grades downward to black with scattered organics.		6		20
	75		76.5				18
							21
604.14			ML-Black silt with thin lenses of very fine sand 78.0				37
602.64			SM-Gray, fine sand with thin lenses of black silt and clay, scattered organics, some pea gravel near top of rock 82.0		7	NOTE: Set 6" casing to 83.5'. 82.0' to 83.0' No sample.	39
	80						39
							50+
598.64			Top of Rock 82.0' Granite Gneiss-Soft, crumbles when handled, foliation at 0° to 20°, most breaks are parallel to foliation, Quartz, Feldspar and Mica are primary minerals with Garnet scattered throughout.	83 RQD 0	BOX 1	Pull 1 From 83.0' to 86.6' Run 3.6' Rec 3.0' CL 0.6' 86.6	
	85			40 RQD 0		Pull 2 From 86.6' to 91.6' Run 5.0' Rec 2.0' CL 3.0' NOTE: Scale change at 90.0'.	
	90		82.0' to 104.2' Mica, dark green to black concentrated, thin zones of Quartz-Feldspar scattered throughout.		91.6	91.6	
	92			0 RQD 0	BOX 2	Pull 3 From 91.6' to 94.0' Run 2.4' Rec 0.0' CL 2.4' 94.0	
	94			100 RQD 0 100		Pull 4 From 94.0' to 94.5' Run 0.5' Rec 0.5' CL 0.0' 94.5	
	96			RQD 0		Pull 5 From 94.5' to 99.5' Run 5.0' Rec 5.0' CL 0.0'	
582.64	98		Continued on sheet 4				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +680.64+ | **Hole No.** PF-205

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | 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)
	c		d	e	f	g
582.64	98		Granite Gneiss-Soft, moderately hard, breaks and crumbles when handled, breaks parallel to foliation, approx. 20°.		BOX 2	Pull 5 continued 99.5
	100			79 RQD 0	100.5 BOX 3	Pull 6 From 99.5' to 104.2' Run 4.7' Rec 3.7' CL 1.0'
	102					
	104		104.2' to 118.1' Mica primary mineral, Quartz and Feldspar increase downward, breaks in thin 1" to 4" thick sections, parallel to foliation, moderately hard, mottled black and white.	82 RQD 0		Pull 7 From 104.2' to 108.7' Run 4.5' Rec 3.7' CL 0.8' 104.2 108.7
	106					
	108					
	110			92 RQD 0	109.3 BOX 4	Pull 8 From 108.7' to 113.7' Run 5.0' Rec 4.6' CL 0.4'
	112					113.7
566.64	114		Continued on sheet 5			

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +680.64± **Hole No.** PF-205

PROJECT Clemson Upper Dam INSTALLATION Hartwell Lake SHEET 5 OF 6 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV-ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
		c	d	e	f	g
566.64	114		Granite Gneiss-Weathered, moderately hard, breaks when handled.	100	BOX 4	Pull 9 From 113.7' to 118.1' Run 4.4' Rec 4.4' CL 0.0'
				RQD 0		
	116				116.8	
					BOX 5	
						118.1
	118			95		Pull 10 From 118' to 125.8' Run 7.7' Rec 7.3' CL 0.4'
			119.0' to 122.2' Moderately hard to hard, salt and pepper color, foliation at 0° to 20°, weathering not as noticeable, breaks easily, usually parallel to foliation, vertical healed joint. 119.0' Horizontal joint.	RQD 95		
	120					
					121.8	
	122				BOX 6	
						NOTE: Numerous breaks parallel foliation made while coring from 118.1' to 137.6'.
	124					
						125.8
	126			85		Pull 11 From 125.8' to 131.7' Run 5.9' Rec 5.0' CL 0.9'
				RQD 85		
	128					
550.64	130		Continued on sheet 6			

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +680.64+ **Hole No.** PF-205

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 6 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)
550.64	130	c	d	e	f	g
			Granite Gneiss-Moderately hard to hard, breaks easily with foliation 0° to 20°, salt and pepper color.		BOX 6	Pull 11 continued
					131.1	131.7
	132			100	BOX 7	Pull 12 From 131.7' to 137.6' Run 5.9' Rec 5.9' CL 0.0'
				RQD 100		
	134					
	136					
543.04						137.6
	138		Bottom of Boring at 137.6			NOTE: RQD calculated using run depths.
			PRESSURE TEST - 40 psi water pressure for 10 minutes.			NOTE: Piezometer set with bottom at 91.0' on 3 Nov 80.
			Depth Gal 85.5' 144 90.5' 0			

Hole No. PF-205A

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 3 SHEETS

1. PROJECT: Clemson Upper Diversion Dam
2. LOCATION (Coordinates or Station): 6+00, 30' Upstream
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF-205A
5. NAME OF DRILLER: H. Brown
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 79.5'
8. DEPTH DRILLED INTO ROCK: 11.3'
9. TOTAL DEPTH OF HOLE: 90.8'
10. SIZE AND TYPE OF BIT: 4X5 1/2"dia,6"rock bit & 6"fishtail
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: 2
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 30 Jan 1984; COMPLETED 1 Feb 1984
17. ELEVATION TOP OF HOLE: 677.0'
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: Thaddius J. Zielonka, Jr.

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
677.0'	0'	c	d	e	f	g
	5		Riprap			NOTE: Cored riprap w/ 4X5 1/2"diamond bit. Reamed hole w/6" rock bit.
			10.0'			
667.0'	10		Embankment.			NOTE: Fishtailed to 42.0'.
	15					
	20					
	25					
647.0'	30		Continued on sht 2			

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

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 677.0' | **Hole No.** PF-205A

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake | 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)
647.0'	30'	c	d	e	f	g
			Embankment Continued.			BLOWS
	35					
	40		42.0'			
635.0'			(SC) Red-brown, fine to med. grained, micaceous clayey SAND.		1	40
	45					40
						28
			48.0'			42
629.0'			(SM) Brown, fine to med. grained micaceous silty SAND. With minor clay.		2	42
	50					24
			Color change to reddish-brown.			27
						27
	55					40
			Color change to light brown.		3	18
						7
	60		Color change to dark grey.			6
						6
			Dark grey & fine grained.			9
					4	7
	65		Color change to brown.			10
						8
			69.0'			18
608.0'			(ML) Brown, micaceous lean SILT.		5	19
607.0'	70		Continued on sht 3			

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 677.0' | Hole No. PF-205A | SHEET 3 OF 3 SHEETS

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake

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
607.0'	70'	c	d	e	f	g	
					5		17
605.0'			(ML) Continued. Brown, micaceous, lean SILT. 72.0'		6		18
	75		(SM) Dark grey, fine grained micaceous silty SAND.				36
							36
							35
			Top of Rock 79.5'			NOTE: Scale change @ 80.0'.	40
597.5'	80		(GRANITE GNEISS)		7		35
							100/0.8
	82					Pull #1 From 81.8' To 86.9' Run 5.1'	
	84						
	86						
						Pull #2 From 86.9' To 90.8' Run 3.9'	
	88						
	90						
586.2'			Bottom of Boring 90.8'				
	92						

Hole No. PF-206

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 5 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 6+00, 140' downstream centerline
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF-206
5. NAME OF DRILLER: C. D. Fuller
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 44.5'
8. DEPTH DRILLED INTO ROCK: 51.4'
9. TOTAL DEPTH OF HOLE: 95.9'
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: Failing 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 6
15. ELEVATION GROUND WATER: 625.1+
16. DATE HOLE: STARTED 5 Nov 80; COMPLETED 3 Dec 80
17. ELEVATION TOP OF HOLE: +642.8+
18. TOTAL CORE RECOVERY FOR BORING: 87 %
19. SIGNATURE OF INSPECTOR: CHARLES WHITTEN, 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
642.8	0b	c	d	e	J&R	g	
641.3			SM-Brown, fine to medium, silty sand 1.5		1		4
			ML-Tan to red silt with fine sand, micaceous, gravel size Quartz and weathered Feldspar scattered throughout.		2	W.T. 19.5' Date 5 Nov 80 Depth to water during drilling.	23
	5						31
							25
							27
							24
	10						26
							27
							19
	15						25
					3		29
							28
			19.5				41
623.3			SM-Brown, fine to medium, silty sand, micaceous. 21.0		4		29
621.8	20		ML-Black, micaceous silt with fine sand and organics.				42
							14
	25				5		14
							13
			28.5				15
614.3			CL-Brown, mottled, micaceous clay.				3
612.8	30		Continued on sheet 2				

Sample Lab

No.	Class	LL	PL	PI
2	SM	43	38	5
5	ML	36	30	6
8	SM	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 +642.8+ | **Hole No.** PF-206

PROJECT: Clemson Upper 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
	c		d	e	JAR	g	
612.8	30		CL-Brown, mottled, micaceous clay.		6		6
							10
608.3			34.5				6
	35		SM-Gray, fine sand with thin, black, organic silt and clay layers.		7		6
							8
							34
	40						21
600.8			42.0				9
			GP-Pea gravel with fine to coarse sand. Top of Rock 44.5'		8	NOTE: Scale change at 45.0'.	18
598.3	45		Granite Gneiss-Moderately hard, breaks and crumbles when handled, foliation at 0° to 20°, breaks parallel to foliation, white and black or dark green color, Quartz, Feldspar and Mica are primary minerals, Garnet and Amphibole present.	No sample from 44.5' to 45.1'			32
				67 RQD 0	BOX 3	Pull 1 From 45.1' to 46.0' Run 0.9' Rec 0.6' CL 0.3'	
				31 RQD 0		Pull 2 From 46.0' to 47.3' Run 1.3' Rec 0.4' CL 0.9'	46.0
	47			96 RQD 0		Pull 3 From 47.3' to 52.3' Run 5.0' Rec 4.8' CL 0.2'	47.3
	49						
	51						52.3
	53		52.8' to 56.3' Hard, breaks parallel to foliation.	100 RQD 0	53.3 BOX 2	Pull 4 From 52.3' to 57.3' Run 5.0' Rec 5.0' CL 0.0'	
587.8	55		Continued on sheet 3				

RILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +642.8+ | Hole No. PF-206 | SHEET 3 OF 5 SHEETS

OJECT Clemson Upper Dam | INSTALLATION Hartwell Lake

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV-ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	c		d	e	f	g
87.8	55		Granite Gneiss-Weathered, salt and pepper color, foliation at 0° to 20°, breaks parallel to foliation.		BOX 2	Pull 4 continued
			56.3' to 58.0' High mica content, black to green color, moderately hard, 0° to 20° foliation, breaks easy parallel to foliation.	100		57.3 Pull 5 From 57.3' to 62.3' Run 5.0' Rec 5.0' CL 0.0'
57			58.0' to 65.7' Moderately hard, salt and pepper appearance, weathered, breaks easily parallel to foliation 0° to 20°.	RQD 0		
59						
61					61.9	62.3
				88	BOX 3	Pull 6 From 62.3' to 66.3' Run 4.0' Rec 3.5' CL 0.5'
63				RQD 0		
65			65.7' to 58.8' High mica content, dark green to black color, 0° to 20° foliation, breaks easily parallel to foliation.	65		66.3 Pull 7 From 66.3' to 71.2' Run 4.9' Rec 3.2' CL 1.7'
67						
			68.8' to 71.2' Moderately hard, salt and pepper appear-ance, breaks easily parallel to foliation 0° to 20°.	RQD 0		
69						
571.8	71		Continued on sheet 4			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +642.8+ | **Hole No.** PF-206

PROJECT Clemson Upper 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)
571.8	71	c	d	e	f	g
			Granite Gneiss-Weathered, salt and pepper color, breaks easily parallel to foliation 0° to 20°.	100	BOX 4	Pull 7 continued 71.2 Pull 8 From 71.2' to 74.8' Run 3.6' Rec 3.6' CL 0.0'
	73		71.2' to 71.4' High mica content. 71.4' to 84.9' Weathered zones, moderately hard, unweathered zone hard, 0° to 20° foliation, breaks easily parallel to foliation, salt and pepper appearance, weathered Garnet (orange stained) scattered throughout. 75.7 Open 45° joint.	RQD 0		74.8
	75			98		Pull 9 From 74.8' to 81.2' Run 6.4' Rec 6.3' CL 0.1'
	77			RQD 0		
					78.5	
	79				BOX 5	
	81					81.2
				83		Pull 10 From 81.2' to 85.6' Run 4.4' Rec 3.4' CL 1.0'
	83			RQD 0		
			84.9' to 95.9' Alternating zones of salt and pepper appearance rock dark green to black (high mica content) zones.			
	85					85.6
				100	86.5	Pull 11 From 85.6' to 86.7' Run 1.1' Rec 1.1' CL 0.0'
				RQD 0	BOX 6	86.7
555.8	87					Pull 12
			Continued on sheet 5			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +642.8+ | Hole No. PF-206

PROJECT: Clemson Upper 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)
a	b	c	d	e	f	g
555.8	87		Granite Gneiss - 0° to 20° foliation, breaks easily parallel to foliation. Zones of mica scattered throughout with hard zones, salt and pepper appearance.	88	BOX 6	Pull 12 continued From 86.7' to 90.0' Run 3.3' Rec 2.9' CL 0.4'
	89			RQD 0		90.0
				80		Pull 13 From 90.0' to 95.9' Run 5.9' Rec 4.7' CL 1.2'
	91			RQD 0		
	93					
	95					
546.9			Bottom of Boring at 95.9'			

PRESSURE TEST (40 psi water pressure for 10 minutes.

Depth (ft)	Water Take in Gal
51	220
56	347
61	395
66	382
71	411
76	863
81	350
86	67
91	79

NOTE: Piezometer set with bottom at 55.0'.

Hole No. PF-207

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 3 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta.6+11, 222' downstream centerline
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF-207
5. NAME OF DRILLER: W. Kyser
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 32.0'
8. DEPTH DRILLED INTO ROCK: 13.1'
9. TOTAL DEPTH OF HOLE: 45.1'
10. SIZE AND TYPE OF BIT: 1 3/8" ID splitspoon & 4x5½ core
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: 2
15. ELEVATION GROUND WATER: 630.9'
16. DATE HOLE: STARTED 25 Feb 81; COMPLETED 2 Mar 81
17. ELEVATION TOP OF HOLE: +629.1'
18. TOTAL CORE RECOVERY FOR BORING: 81 %
19. SIGNATURE OF INSPECTOR: ROBERT GREEN

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
629.1	0		SM-Brown, fine grained, silty sand with organics, moist.		1	W.T. 4.5' Date 25 Feb 81 Depth to water during drilling.	5
	5						WI
			Color change to black. Seams of brown SC			W.T. 0.5' Water table reading 24 hrs. after hole completed.	4
621.6			7.5				
			MH-Black, plastic, silt.		2		8
	10						WH
						NOTE: WH = the weight of the hammer.	
			13.5				
615.6			CH-Brown, fat, clay.				
	15				3		
			Seam of brown SM			NOTE: 24 hr. water table reading taken with 2.3' of stick-up above ground.	
			Seam of organics.				
	20		21.0				WI
608.1			MH-Brown, plastic, silt.				
					4		WH
			24.0				
605.1			SM-Gray, fine grained, silty sand.				
	25				5		
			Seam of black CH with organics.				
600.6			Encountered wood 28.5				24
			GM-Gray, fine to coarse grained, silty rounded gravel.		6		12
599.1	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 +629.1 | **Hole No.** PF-207

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | 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)
599.1	30	c	d	e	JAR	g BLOWS
			SM-Gray, fine grained, silty sand.		7	NOTE: Scale change at 30.0'. 90
			Top of Rock at 32.0'			100+
597.1	32		Granite Gneiss-Gray, very badly weathered, very soft, medium grained, micaceous, crumbles when handled.	45 RQD 0	BOX 1	Pull 1 From 32.0' to 35.1' Run 3.1' Rec 1.4' CL 1.7'
	34		34.4' Top of Firm Rock			
			34.4' to 35.1' Gray, badly weathered, soft to moderately hard.	35.1		35.1
			35.1' to 45.1' Gray, slight to moderately weathered, moderately hard.	94		Pull 2 From 35.1' to 38.1' Run 3.0' Rec 2.9' CL 0.1'
	36		35.1' to 35.4' High angle, open joint.			
			35.4' Horizontal open joint.	RQD 0		
			36.2' to 36.8' Closely spaced, nearly horizontal, open joints.			
	38			38.1		38.1
			37.8' to 38.1' High angle, healed joint, green stained.	65		Pull 3 From 38.1' to 40.1' Run 2.0' Rec 1.3' CL 0.7'
			38.4' to 39.0' Very closely spaced, high angle, healed and partially healed joints, brown stained.	RQD 0		
	40			40.1		40.1
			40.0' to 40.3' Very closely spaced, horizontal, healed, brown stained joints.	100		Pull 4 From 40.1' to 45.1' Run 5.0' Rec 5.0' CL 0.0'
			40.6' to 41.4' Closely spaced, high angle, open joints.	RQD 0	41.4 BOX 2	
	42		41.9' to 42.1' very closely spaced, horizontal, healed joints, brown stained.			
			42.8' to 42.9' Horizontal, healed joint, brown stained.			
	44				45.1	45.1
584.0			Bottom of Boring at 45.1'			NOTE: Piezometer with 3.0' of 1" screen and 35.6' of 3/4" riser with bottom at 36.0' was set in this boring.
	46		Continued on sheet 3			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | **Hole No.** PF-207

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | 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

PRESSURE TEST

Depth	Air P	Water P	Gals/ 8 Min
35.0	100	40	56
40.0	100	40	leakage
45.1	100	40	leakage

Leakage: Water came up from around the packer.

Hole No. PF-208

DRILLING LOG

DIVISION: South Atlantic
INSTALLATION: Hartwell Lake
SHEET 1 OF 6 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 16+04, 4.0' upstream centerline dam
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF-208
5. NAME OF DRILLER: Crawford Hall
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 85.6'
8. DEPTH DRILLED INTO ROCK: 53.9'
9. TOTAL DEPTH OF HOLE: 139.5'
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: Failing 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 10; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 7
15. ELEVATION GROUND WATER: 633.33
16. DATE HOLE: STARTED 15 Oct 80; COMPLETED 23 Oct 80
17. ELEVATION TOP OF HOLE: +680.52 +
18. TOTAL CORE RECOVERY FOR BORING: 05 %
19. SIGNATURE OF INSPECTOR: CHARLES WHITTEN, 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
680.52	0						
			SM-Tan to brown, silty sand with clay in upper 0.5', fine to medium sand; scattered gravel size rock fragments		1		41
					2		13
677.52			ML-Tan to red silt with some fine sand, micaceous, scattered pea gravel to gravel size pieces of Quartz and Feldspar. Feldspar weathered, crumbles easily; small scattered pockets of fine to medium sand.				12
	5				3		25
							21
						W.T. 47.19 Water table reading 72 hrs. after hole completed.	29
	10						10
							17
							28
							57
	15						45
							38
							43
	20						36
							38
							33
	25						29
							25
							39
							38
650.52	30						

Sample No	Lab Class	LL	PL	PI
2	SM	27	24	3
4	SM	44	33	11
7	SM	NP	NP	NP
9	SM	NP	NP	NP
10	SW-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 +680.52± **Hole No.** PF-208

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 2 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)	BLOWS
		c	d	e	JAR	g	
650.52	30		ML-Tan to red silt with some fine sand; micaceous; scattered pea gravel to gravel size pieces of Quartz and Feldspar; Feldspar weathered, crumbles easily; small scattered pockets of fine to medium sand.		4		23 14 20 20 24 19 19 45 22 32 41 32 27 45 29 29 33 29 29 38 39 52 29 23 22 25 19
	35						
	40						
	45						
633.33							
	50						
	55						
	60				5		
618.02			62.5		6		
	65		CL-Light brown to black clay, some scattered organics, micaceous.				
614.52			66.0		7		
			SM-Light brown, fine sand with some clay, micaceous, scattered organics.				
610.52	70		Continued on sheet 3				

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +680.52+ **Hole No.** PF-208

PROJECT Clemson Lower Dam | INSTALLATION Hartwell Lake | SHEET 3 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)	BLOWS
610.52	70	c	d	e	f	g	
			SM-Light brown, fine sand with silt and clay, micaceous, scattered organics.				14 19 31
606.02	75		Gray, fine to medium with scattered thin layers of black organic clay and silt below 74.5'.		8		24 31
602.52			Yellowish-orange sand, fine to medium with silt and clay below 78.0. 81.0		9		37 74
599.52	80		CP-Yellowish-orange gravel with sand, silt and clay.		10	NOTE: 3" spoon with 300 lb. hammer from 82.5' to 87.5'.	100 85 62
595.92	85		Top of Rock at 85.6' Granite Gneiss-Badly weathered, breaks and crumbles when handled: Quartz, Feldspar and mica are primary minerals with Garnet scattered throughout, orange iron stain from 85.6' to 89.5':, soft, foliation at 0° to 20°.	100	BOX 1		99
	90			100 RQD 0		Pull 1 From 87.5' to 92.5' Run 5.0' Rec 5.0' CL 0.0' NOTE: Scale change at 90.0'.	92.5
	92			100 RQD 0	93.0 BOX 2	Pull 2 From 92.5' to 93.0' Run 0.5' Rec 0.5' CL 0.0'	93.0
	94			100		Pull 3 From 93.0' to 98.0' Run 5.0' Rec 5.0' CL 0.0'	
	96		96.5' to 103.7' predominantly Feldspar with thin Quartz and mica veins scattered throughout.	RQD 0			98.0
582.52	98		Continued on sheet 4				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +680.52 + | **Hole No.** PF-208

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | 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)
582.52	98	c	d	e	f	g
			Granite Gneiss-Weathered, soft, breaks and crumbles when handled, salt and pepper color with some orange iron stain, generally breaks at 0° to 20° parallel to foliation.	100	BOX 2	Pull 4 From 98.0' to 103.0' Run 5.0' Rec 5.0' CL 0.0'
	100			RQD 0	100.0 BOX 3	
	102					119.5
				100		Pull 5 From 103.0' to 107.5' Run 4.5' Rec 4.5' CL 0.0'
	104					
				RQD 0		
	106				107.5	124.5
				100	BOX 4	Pull 6 From 107.5' to 112.5' Run 5.0' Rec 5.0' CL 0.0'
	108					
	110			RQD 0		
	112					129.5
						Pull 7 From 112.5' to 119.5' Run 7.0' Rec 6.5' CL 0.5'
566.52	114					

Continued on sheet 5

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +680.52 ± | **Hole No.** PF-208

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

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV-ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
566.52	114	c	d	e	f	g
			Granite Gneiss-Weathered, salt and pepper color, soft, breaks parallel to foliation, 60° open joint from 114.3' to 115.0'.	93	BOX 4 115.0	Pull 7 continued
					BOX 5	
	116			RQD 0		
	118					119.5
				80		Pull 8 From 119.5' to 124.5' Run 5.0' Rec 4.0' CL 1.0'
	120					
	122			RQD 0		
	124				124.5	124.5
				80	BOX 6	Pull 9 From 124.5' to 129.5' Run 5.0' Rec 4.0' CL 1.0'
	126			RQD 0		
	128					129.5
						Pull 10
550.52	130					

Continued on sheet 6

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +680.52 ± **Hole No.** PF-208

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | SHEET 6 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)
550.52	130	c	d	e	f	g
			Granite Gneiss-Weathered, soft, breaks and crumbles easily, salt and pepper color with some orange iron stain.	100	BOX 6	Pull 10 continued From 124.5' to 134.5' Run 5.0' Rec 5.0' CL 0.0'
	132		Near vertical open joint from 131.0' to 134.5'.		132.5	
				RQD 0	BOX 7	
	134					134.5
				100		Pull 11 From 134.5' to 139.5' Run 5.0' Rec 5.0' CL 0.0'
	136		75° healed joint from 136.0' to 137.5'			
				RQD 0		
	138					
541.02						139.5
	140		Bottom of Boring 139.5'			
			Pressure Test - No take of water at 30 to 40 psi for ten minutes.			
			Foundation Piezometer set at 96.0' on 25 Oct 80.			
			NOTE: Contact piezometer set in this boring at 82.7' after losing a piezometer in the hole at 90.0'. A new boring for the foundation piezometer was drilled at station 15+98, 4.0' upstream centerline of dam, to a depth of 98.0'.			

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

1. PROJECT: Clemson Upper Diversion Dam
2. LOCATION (Coordinates or Station): 16+00, 30' Upstream
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF-208A
5. NAME OF DRILLER: H. Brown
6. DIRECTION OF HOLE: [XX] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 82.5'
8. DEPTH DRILLED INTO ROCK: 12.5'
9. TOTAL DEPTH OF HOLE: 95.0'
10. SIZE AND TYPE OF BIT: 4X5 1/2"dia 6"fishtail & 6"rock bit
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: 1
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 16 Jan 1984; COMPLETED 19 Jan 1984
17. ELEVATION TOP OF HOLE: 677.0'
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: Thaddius J. Zielonka, Jr.

ELEVATION	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)
677.0'	0'		Riprap.			NOTE: Cored riprap w/ 4X5 1/2"dia. bit. Reamed w/6"rock bit.
	5					
				10.0'		
667.0'	10		Embankment.			NOTE: Fishtailed to 48.0'.
	15					
	20					
	25					
647.0'	30					

Continued on sht 2

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

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 677.0' | Hole No. PF-208A | SHEET 2 OF 3 SHEETS

PROJECT: Clemson Upper Diversion Dam | INSTALLATION: Hartwell Lake

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant:)
647.0'	30'	c	d	e	f	g
			Embankment Continued.			
	35					
	40					
	45					
				48.0'		BLOWS
629.0'			(SM) Red-brown fine to med. grained micaceous silty SAND.		1	22
	50					19
			Color change to brown.			25
			Color change to red-brown.		2	24
	55					34
						34
						22
						23
	60				3	34
			Brown & fine grained below 60.0'.			34
						14
	65					15
					4	31
						35
						14
607.0'	70		Continued on sht 3			

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 677.0' | Hole No. PF-208A

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

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV-ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
607.0'	b70'	c	d	e	f	g	
			(SM) Continued. Brown, fine grained micaceous silty SAND.				15
					5		36
			Dark grey to black.				32
	75						50
			Tan, fine to med. grained.		6		49
							49
			With fine & coarse gravel.				49
	80		Top of Rock 82.5'				78
594.5'					7	NOTE: Scale change @ 90.0'.	90
	85		(GRANITE GNEISS) Intensely wea., mottled brown, tan, & white, micaceous.				100
							100
							82
							100
	90						
					Box 1	Pull #1 From 90.0' To 95.0' Run 5.0' Rec N/A	
	92						
	94						
582.0'			Bottom of Boring 95.0'				

Hole No. PF-209

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 5 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 16+00, 140' downstream of centerline
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF-209
5. NAME OF DRILLER: Crawford Hall
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 45.5'
8. DEPTH DRILLED INTO ROCK: 57.0'
9. TOTAL DEPTH OF HOLE: 102.5'
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: Failing 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 9; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 8
15. ELEVATION GROUND WATER: +623.8+
16. DATE HOLE: STARTED 3 Nov 80; COMPLETED 6 Nov 80
17. ELEVATION TOP OF HOLE: 641.5 ±
18. TOTAL CORE RECOVERY FOR BORING: 94 %
19. SIGNATURE OF INSPECTOR: CHARLES WHITTEN, 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
641.5	0	c	d	e	JAR	g	
640.0			SM-Brown, fine to medium sand with clay and roots in upper 0.5'.		1		13
			ML-Red to tan silt with sand and mica, Quartz and weathered Feldspar gravel scattered throughout.		2	W.T. 19.5' Date 3 Nov 80 Depth to water during drilling.	17 21 20 23 18 20 18 17 20 19 21 23
	5						
	10						
	15						
					3		
622.0			19.5				
	20		SM-Brown, medium to coarse, silty sand, coarser sand at base.		4		26 22 27
617.5			24.0				
	25		CL-Dark brown to black, micaceous clay with scattered organics, silt content increases downward.		5		10 10 11 15
611.5	30						

Sample Lab

No.	Class	LL	PL	PI
2	SM	48	42	6
6	ML	39	27	12
9	SW-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 641.5+ | **Hole No.** PF-209

PROJECT: Clemson Upper 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
		c	d	e	JAR	g	
611.5	30		CL-Dark brown to balck, micaceous clay with scattered organics.				20
			35.5				23
	35						4
606.2			SM-Gray, fine to medium sand with thin lenses of black organic silty clay.				3
							15
	40						6
							9
							10
			43.0				24
598.5			GP-Orange stained gravel with silt and sand. Top of Rock at 45.5'				52
	45						30
596.5			Granite Gneiss-Soft, crumbles when handled, 0° to 20° foliation, salt and pepper coloration, has appearance of SM with medium to coarse sand, primary minerals are Quartz, Feldspar and Mica with Amphibole scattered throughout.	No sample from 45.5' to 46.5'			
				100 RQD 0	BOX 1	Pull 1 From 46.5' to 50.0' Run 3.5' Rec 3.5' CL 0.0'	50.0
	50			100 RQD 0		Pull 2 From 50.0' to 54.8' Run 4.8' Rec 4.8' CL 0.0' NOTE: Scale change at 50.0'.	
	52						
	54				54.8		54.8
					BOX 2	Pull 3 From 54.8' to 61.6' Run 6.8' Rec 6.8' CL 0.0'	
	56						
583.5	58		Continued on sheet 3				

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 641.5+ **Hole No.** PF-209

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | 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)
583.5	58	c	d	e	JAR	g BLOWS
			Granite Gneiss- 0° to 20° foliation, soft, breaks and crumbles when handled.	100 RQD 0	BOX 2	Pull 3 continued
	60				61.0 BOX 3	61.6
	62		63.0' to 102.5' Varies from soft, crumbly to moderately hard.	100 RQD 0		Pull 4 From 61.6' to 66.2' Run 4.6' Rec 4.6' CL 0.0'
	64					
	66			100 RQD 0		66.2 Pull 5 From 66.2' to 73.1' Run 6.9' Rec 6.9' CL 0.0'
	68				68.0 BOX 4	
	70					
	72					73.1 Pull 6
567.5	74		Continued on sheet 4			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 641.5+ | **Hole No.** PF-209

PROJECT: Clemson Upper 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)
567.5	74		Granite Gneiss-Weathered, varies from soft to moderately hard, breaks easily when handled, 0° to 20° foliation.	100	BOX 4	Pull 6 continued From 73.1' to 78.1' Run 5.0' Rec 5.0' CL 0.0'
					75.3	
	76			RQD 0	BOX 5	
						78.1
	78			77		Pull 7 From 78.1' to 87.8' Run 9.7' Rec 7.5' CL 2.2'
	80			RQD 0		
	82		82.0' 45° open joint.		82.9	
					BOX 6	
	84					
	86					
			87.8' to 100.7' Open vertical joint.			87.8
	88			91		Pull 8 From 87.8' to 92.5' Run 4.7' Rec 4.3' CL 0.4'
				RQD 0		
551.5	90		Continued on sheet 5			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 641.5+ | **Hole No.** PF-209

PROJECT: Clemson Upper 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)
a	b	c	d	e	f	g
551.5	90		Granite Gneiss - Weathered, varies from soft to moderately hard, breaks easily when handled, 0° to 20° foliation.		BOX 6	Pull 8 continued
	92				92.5	92.5
				100	BOX 7	Pull 9 From 92.5' to 102.5' Run 10.0' Rec 10.0' CL 0.0'
	94			RQD 0		
	96					
	98					
					99.5	
	100					
	102					102.5
539.0			Bottom of Boring at 102.5'			
			PRESSURE TEST 40 psi water pressure for 10 min. bottom of packer at 48.0' no take.			Note: Piezometer set at 54.0'.

Hole No. PF-210

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 5 SHEETS

1. PROJECT: Clemson Lower Dam
2. LOCATION (Coordinates or Station): Sta. 16+00; 240' downstream
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF 210
5. NAME OF DRILLER: E. Woods
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 36.0'
8. DEPTH DRILLED INTO ROCK: 50.0'
9. TOTAL DEPTH OF HOLE: 86.0'
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: Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 6
15. ELEVATION GROUND WATER: +623.3 +
16. DATE HOLE: STARTED 9 Feb 81; COMPLETED 18 Feb 81
17. ELEVATION TOP OF HOLE: +625.0+
18. TOTAL CORE RECOVERY FOR BORING: 81 %
19. SIGNATURE OF INSPECTOR: ROBERT GREEN

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
625.0	0						
623.5			SC-Brown, fine grained clayey sand with organics 1.5		1	W.T. 4.0' Date 9 Feb 81 Depth to water during drilling.	11
			SM-Brown to gray, fine grained, silty sand with organics and seam of red SC.		2		4 6
	5		6.5				5
618.5			CH-Black, fat clay		3		2 3
	10					NOTE: WH equals weight of hammer.	WH 3
							WH
	15						13
			Micaceous				9 12
			Seam of black MH. 19.0				5
606.0			SM-Gray, fine grained, silty sand.		4	Sample Lab No. Class LL PL PI: 2 SM 42 37 5; 3 ML 39 30 9; 4 SM NP NP NP; 5 SP-SM NP NP NP	11 5 14
	20						10
	25						19
			Color change to brown 27.0				23
598.0			GM-Brown, fine to coarse grained, silty gravel with rounded pebbles.		5	APPENDIX X Page 46 of 123	
595.0	30						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 +625.0+ | **Hole No.** PF-210

PROJECT Clemson Upper 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
595.0	30	c	d	e	JAR	g	
			GM-Brown, silty gravel (cont)			NOTE: Scale change at 35.0'.	46
591.5			33.5		6	NOTE: Splitspoon refusal at 36.0'. Set 37.0' casing and began coring rock.	12 / 70
	35		SM-Brown to gray, fine grained, silty sand.				
589.0			Top of Rock 36.0'				100
			Granite Gneiss-Brown, very badly weathered, very soft, medium grained, micaceous.	100 RQD 0	BOX 1	Pull 1 From 36.0' to 37.0' Run 1.0' Rec 1.0' CL 0.0'	
	37		37.0' to 42.0' Brown, very badly weathered, very soft, crumbles when handled.	66 RQD 0		Pull 2 From 37.0' to 42.0' Run 5.0' Rec 3.3' CL 1.7'	
	39						
	41						
				42.0			42.0
			42.0' to 46.0' Brown, very badly weathered, very soft, crumbles when handled.	70 RQD 0		Pull 3 From 42.0' to 46.0' Run 4.0' Rec 2.8' CL 1.2'	
	43		44.0' to 44.2' High angle joint, black stained.				
	45						
				46.0	46.0		46.0
			46.0' to 51.0' Brown, very badly weathered, very soft, crumbles when handled. 46.4' to 46.8' High angle joint, brown stained.	50 RQD 0	BOX 2	Pull 4 From 46.0' to 51.0' Run 5.0' Rec 2.5' CL 2.5'	
576.0	47						
	49		Continued on sheet 3				

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +625.0± **Hole No.** PF-210

PROJECT Clemson Upper Dam | INSTALLATION Hartwell Lake | 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)
576.0	49	c	d	e	f	g
			Granite Gneiss-Brown, very badly weathered, very soft.		BOX 2	Pull 4 continued
				51.0		51.0
	51		51.0' to 61.0' Brown, very badly weathered, very soft, crumbles when handled.	94 RQD 0		Pull 5 From 51.0' to 56.0' Run 5.0' Rec 4.7' CL 0.3'
	53					
	55					
				56.0	56.0	56.0
				90 RQD 0	BOX 3	Pull 6 From 56.0' to 61.0' Run 5.0' Rec 4.5' CL 0.5'
	57					
	59					
				61.0		61.0
	61		Approx. Top of Firm Rock 61.0' to 61.8' Gray, badly weathered, moderately hard. 61.8' to 62.0' Gray, badly weathered, soft. 62.0' to 63.5' Gray, badly weathered, moderately hard. 63.0' to 64.1' High angle joint, white stained. 63.5' to 71.0' Gray, bad to moderately weathered, moderately hard, friable.	108 RQD 82		Pull 7 From 61.0' to 66.0' Run 5.0' Rec 5.4' CG 0.4'
	63				63.5	
					BOX 4	
560.0	65					
			Continued on sheet 4			

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE +625.0+ **Hole No.** PF-210

PROJECT Clemson Upper 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)
560.0	65	c	d	e	f	g
			Granite Gneiss-Gray, moderately weathered, moderately hard.			Pull 7 continued
				66.0'		66.0'
				96		Pull 8
						From 66.0' to 71.0'
	67			RQD		Run 5.0' Rec 4.8'
				80		CL 0.2'
			67.9' to 68.5' Closely spaced horizontal and high angle joints, brown stained.			
	69					
						71.0'
	71		71.0' to 76.0' Gray, very badly weathered, very soft, crumbles when handled.	71.0		
				42		Pull 9
						From 71.0' to 76.0'
				RQD		Run 5.0' Rec 2.1'
				0		CL 2.9'
	73					
	75					
						76.0'
			76.0' to 81.0' Brown, bad to moderately weathered, hard.	76.0		
				84		Pull 10
						From 76.0' to 81.0'
	77			RQD		Run 5.0' Rec 4.2'
				86		CL 0.8'
	79					
						81.0'
			81.0' to 83.9' Brown, slight to moderately weathered, hard.	81.0		
544.0	81		Continued on sheet 5			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +625.0+ | Hole No. PF-210

PROJECT: Clemson Upper 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)
a	b	c	d	e	f	g
544.0	81					
			Granite Gneiss- Brown, slight to moderately weathered, hard.	100	BOX 5	Pull 11 From 81.0' to 86.0' Run 5.0' Rec 5.0' CL 0.0'
			81.2' to 81.6' Very closely spaced horizontal joints, brown stained.	RQD 92	BOX 6	
	83					
			83.9' to 84.2' Brown, badly weathered, soft. 84.2' to 86.0' Brown, slight to moderately weathered, hard. 84.4' to 86.0' Very closely spaced, high angle joints, no stains.			
	85				86.0	86.0
539.0			Bottom of Boring 86.0'			NOTE: Piezometer with 2.7' of screen and 40.2' of 3/4" riser with bottom at 41.0' was set in this boring.
	87					

PRESSURE TEST

Depth	Air P.	H_2OP	GAL/8 Min
37.0	100	40	217
42.0	100	40	135
47.0	100	40	leakage
52.0	100	40	leakage
57.0	100	40	leakage
62.0	100	40	leakage
67.0	100	40	40
72.0	100	40	6

NOTE: Leakage is water leaked out of the hole from around the packer.

Hole No. PF 210A

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 1 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): 5.0' S.W. of PF-210
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PF 210A
5. NAME OF DRILLER: D. Justiss
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 21.0'
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 21.0'
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 4; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 5 Jan 83; COMPLETED 5 Jan 83
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: Bob Green, Geologist

ELEVATION a	DEPTH 0 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
			SM-Brown to dark gray, fine grained silty sand, micaceous, with some organics		1		3
			Fine to medium grained			W.T. 6.0' Date 5 Jan 83 Depth to water during drilling.	8
	5						7
			Very fine grained, slightly micaceous 7.5		2		6
							5
			ML-Dark gray fine silt, micaceous, with a little sand		3	W.T. 0.0' Water table reading 24 hrs after hole completed.	0
	10						1
							2
							0
	15		Small lenses of brown CL				5
			19.0				10
			SM-Gray, fine grained silty sand, slightly micaceous		4		5
	20						5
							7
			Bottom of Hole: 21.0' 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. PF-211

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 & 4x5½ core bbl
2. LOCATION (Coordinates or Station): Sta. 18+45; 233' downstream	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-211	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8; UNDISTURBED 0
5. NAME OF DRILLER: W. Kyser	14. TOTAL NUMBER CORE BOXES: 5
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 634.6
	16. DATE HOLE: STARTED 3 Mar 81; COMPLETED 10 Mar 81
7. THICKNESS OF OVERBURDEN: 33.0'	17. ELEVATION TOP OF HOLE: 627.6
8. DEPTH DRILLED INTO ROCK: 42.0'	18. TOTAL CORE RECOVERY FOR BORING: 76 %
9. TOTAL DEPTH OF HOLE: 75.0'	19. SIGNATURE OF INSPECTOR: ROBERT 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)	BLOWS
627.6	0		SC-Orange, fine grained, clayey sand with organics, dry soil.		JAR 1	W.T. 4.5' Date 3 Mar 81 Depth to water during drilling.	10
623.1			Moist soil 4.5				2
	5		SM-Brown to gray, fine grained, silty sand with organics and seams of orange SC, wet.		2	W.T. 0.3' Water table reading 24 hrs. after hole completed.	3
			Color change to brown 9.0				15
618.6			SC-Brown, fine grained, clayey sand, moist.		3	NOTE: 24 W.T. reading taken with 4.2' stickup.	10
	10		11.5				6
616.4			CH-Brown, fat, clay, moist.				7
			15.0		4		9
612.6	15		MH-Gray, plastic, silt, moist to dry.				10
					5		7
	20						13
							4
							10
							3
							8
							3
			25.0				26
602.6	25		SM-Brown to gray, fine grained, silty sand, wet. 27.0				21
600.6			GM-Brown to orange, fine to coarse grained, silty gravel with rounded pebbles, wet.		6		26
597.6	30						33

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 627.6 | Hole No. PF-211

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)
	c		d	e	JAR	g BLOWS
597.6	30		GM-Brown to orange, fine to coarse, silty gravel. Color change to dark brown. 31.5'			NOTE: Scale change at 30.0'. 31
596.1	32		SM-Gray, fine grained, silty sand, dry. Top of Rock 33.0'		8	NOTE: Set 33.0' of 6" casing to begin core. 100
594.6	34		Granite Gneiss-Brown, very badly weathered, very soft, medium grained, micaceous, crumbles handled.	38 RQD 0	BOX 1	Pull 1 From 33.0' to 37.0' Run 4.0 Rec 1.5 CL 2.5
	36					37.0
			37.0' to 45.0' Brown, very badly weathered, very soft, crumbles when handled.	37.0 100 RQD 0		Pull 2 From 37.0' to 40.0' Run 3.0' Rec 3.0' CL 0.0'
	38					
				40.0		40.0
	40			72 RQD 0		Pull 3 From 40.0' to 45.0' Run 5.0' Rec 3.6' CL 1.4'
	42		41.9' to 42.0' High angle, open joint.			
					43.5 BOX 2	
	44		45.0' to 50.0' Brown, very badly weathered, very soft, crumbles when handled.	45.0		45.0
						Pull 4
581.6	46		Continued on sheet 3			

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 627.6 | **Hole No.** PF-211

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)
		c	d	e	f	g
581.6	46		Granite Gneiss-Brown, very badly weathered, very soft to soft, medium grained, micaceous.	70	BOX 2	Pull 4 From 45.0' to 50.0' Run 5.0' Rec 3.5' CL 1.5'
			46.6' to 47.0' Zone of Biotite, soft, friable.	RQD 0		
	48		47.3' to 47.8' Zone of biotite soft, friable			
				50.0		
	50		50.0' to 53.0' Brown, very badly weathered, very soft, crumbles when handled.	60		Pull 5 From 50.0' to 53.0' Run 3.0' Rec 1.8' CL 1.2'
				RQD 0		
	52		52.4' to 53.0' Zone of Biotite, very soft, crumbles when handled.			
			53.0' to 57.3' Black, very badly weathered, very soft, crumbles when handled.	53.0 48		Pull 6 From 53.0' to 58.0' Run 5.0' Rec 2.4' CL 2.6'
	54			RQD 0		NOTE: Boring began making water on outside of casing while coring during this pull although 26' additional casing was added. Flow was apparently from gravel just above top of rock.
	56				56.6	
			57.3' to 57.7' Gray, badly weathered, soft to moderately hard.		BOX 3	
				58.0		
	58		57.7' to 58.0' Brown, very badly weathered, very soft, crumbles when handled.	96		Pull 7 From 58.0' to 63.0' Run 5.0' Rec 4.8' CL 0.2'
			58.0' to 60.0' Gray, very badly weathered, very soft, crumbles when handled.	RQD 0		Mud balls placed around outside of casing to stop flow.
	60		60.0' to 62.6' Brown, very badly weathered, very soft, crumbles when handled.			
565.6	62					

Continued on sheet 4

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 627.6 | **Hole No.** PF-211

PROJECT: Clemson Upper Dam | INSTALLATION: Hartwell Lake | SHEET 4 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)
565.6	62	c	d	e	f	g
			Granite Gneiss-Brown, very badly weathered, very soft, medium grained, micaceous. 62.5' to 62.6' Nearly horizontal, healed joint, brown stained. 62.6' to 63.0' Brown, badly weathered, soft to moderately hard. 63.0' to 70.0' Brown, very badly weathered, very soft, crumbles when handled. 65.7' to 66.0' Zone of Biotite, moderately hard.	63.0	BOX 3	Pull 7 continued 63.0
				100 RQD 0	63.6 BOX 4	Pull 8 From 63.0' to 65.0' Run 2.0' Rec 2.0' CL 0.0' 65.0
	64			65.0		
	66			90 RQD 0		Pull 9 From 65.0' to 70.0' Run 5.0' Rec 4.5' CL 0.5' 70.0
	68					
	70		70.0' to 75.0' Brown, very badly weathered, very soft, crumbles when handled. 71.0' to 71.3' High angle, open joint.	70.0 100 RQD 0	71.0 BOX 5	Pull 10 From 70.0' to 75.0' Run 5.0' Rec 5.0' CL 0.0'
	72					
	74				75.0	75.0
552.6			Bottom of Boring 75.0'			NOTE: Piezometer with 2.7' of 1" screen and 40.0' of 3/4" riser with bottom at 38.0' was set in this boring.
	76					

PRESSURE TEST

Depth	Air P.	Water P.	Gal/8 Min
58	100	40	88
63	100	40	leakage
68	110	40	55
73	110	40	leakage

NOTE: Leakage indicates leakage around the packer.

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 2 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): Sta. 13+50, 150' downstream of centerline.
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PW-3
5. NAME OF DRILLER: W. J. Kyser
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 48.8'
8. DEPTH DRILLED INTO ROCK: 0.7'
9. TOTAL DEPTH OF HOLE: 49.5'
10. SIZE AND TYPE OF BIT: 1 3/8" ID splitspoon
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): TBM
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 33; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER: 623.2'
16. DATE HOLE: STARTED 2 Apr 81; COMPLETED 2 Apr 81
17. ELEVATION TOP OF HOLE: 641.2'
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: JAMES KOTTI

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
641.2	0		SM-Dark brown, fine, silty sand, slightly moist, with occasional roots, yellowish tan, fine to medium, 35% micaceous below 1.0', also slightly clayey.		1	W.T. 6.3' Water table reading 24 hrs. after hole completed.	14
					2		16
					3		13
	5		Light orange-red.		4	W.T. 18.0' Date 2 Apr 81 Depth to water during drilling.	13
			Seam of red, sandy clay 6.5' to 7.0'.		5		14
			Pink-tan.		6		9
					7	NOTE: Alluvial material encountered at 18.3'.	19
	10		Gray, 11.0' to 11.5'		8		12
			Red-tan.		9		17
					10	NOTE: Drilling mud still present in boring at 24 hr. reading.	16
	15				11		12
624.7			16.5		12		17
			SC-Red, fine to medium, clayey sand, slightly moist, 30% micaceous.		13		14
622.9			18.3				
			SP-Gray-tan, fine to medium, poorly graded sand, moist, slightly silty.		14		11
621.5	20		19.7		15		6
			MH-Black-gray, plastic, silt, moist, trace organic, 10% micaceous.		16		7
618.2			23.0		17	Sample Lab No. 6 Class SM LL 43 PL 37 PI 6	7
			SM-Gray-brown, fine, silty sand, moist, 10% micaceous.		18	12 SM 46 35 11	12
	25				19	18 SM NP NP NP	5
						23 SP-SM NP NP NP	
613.2			28.0		20	28 SP-SM NP NP NP	5
			MH-Black, plastic silt, very moist.				
611.2	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 641.2' **Hole No.** PW-3

PROJECT: Clemson Upper Diversion 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. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
611.2							
610.4			MH-Black, plastic silt. 30.8		21	NOTE: Sample #30, 43.5' to 45.0', is predominantly fall-in.	10
			SP/SM-Gray-tan, fine to medium, slightly silty, poorly graded sand, very moist.		22		13
			Yellow-brown, moderately silty, occasional Quartz gravel.		23		12
	35				24	NOTE: At 46.5' began using 3" spoon and 300 lb. hammer.	16
					25		19
					26		19
			White-gray. Frequent Quartz gravel, moist		27	NOTE: Top of rock encountered at 48.8'.	22
	40				28		30
					29		27
					30		23
	45				31		50
					32		51
			Top of Rock 48.8' 48.8				
592.4			Granite Gneiss - very badly		33	49.5	80
591.7			weathered.				
	50		Bottom of Boring 49.5'				

Hole No. PZ-1

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

1. PROJECT: Piezometer Installation	10. SIZE AND TYPE OF BIT: 1 3/8" splitspoon, 6 1/2" fishtail
2. LOCATION (Coordinates or Station): Sta. 11+00, D/S edge of crest	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 20; 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: 84.0'	16. DATE HOLE: STARTED 1 Aug 1988; COMPLETED 4 Aug 1988
8. DEPTH DRILLED INTO ROCK: 1.5'	17. ELEVATION TOP OF HOLE: 681.0' ±
9. TOTAL DEPTH OF HOLE: 85.5'	18. TOTAL CORE RECOVERY FOR BORING: N/A %
	19. SIGNATURE OF INSPECTOR: Charles D. Griffin

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
681.0'	0'		(ML) Tan, inorganic SILT. Very dry & powdery, w/some occasional loose rocks.		1		5 18 36
	5		Tan & brown, w/loose rocks, slightly micaceous.		2	NOTE: No water level recorded due to the use of drilling fluid.	7 9 11
			White, tan, reddish-orange micaceous, layers of saprolite, slightly sandy.				
	10		(SM) Tan & brown, fine grained, silty SAND. With some traces of wea. rock.		3	Splitspoon drives were taken on 5' centers from 0.0' to 66.0'. Mr. Perry Rountree operated catline/hammer throughout boring using 1 3/4" wraps. Piezometer set after hole completed.	12 14 12
667.5'			Tan, fine grained.				
	15		(ML) Brown, inorganic SILT. Very fine sandy, micaceous.		4		22 20 20
660.0'	20				5		23 29 35
	25				6		11 16 18
			Brown & orange.		7		12 19 22
651.0'	30		Continued on sht 2			BLOWS PER 0.5 FOOT: Number required to drive 1 3/8" ID splitspoon w/ 140 lb. hammer falling 30".	

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

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 681.0' | **Hole No.** PZ-1

PROJECT: Piezometer Installation | INSTALLATION: Clemson Upper Dam, 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
651a.0'	30'	c	d	e	JAR	g	
			(ML)Brown & orange,inorganic SILT.				
	35		Orange,white,purple,brown, sandy.		8		16 13 20
	40		Brown,orange,very sandy, micaceous.		9		10 16 21
	45		Orange,brown,purple,white, very sandy,saprolite.		10		16 20 19
631.5'	50		(SM)Tan,brown,white,fine grained,silty SAND. Saprolite, slightly micaceous.		11		17 22 23
627.0'	55		(ML)Brown,tan,inorganic SILT. Slightly sandy,slightly micaceous.		12		9 16 19
	60		Purple,brown,micaceous.		13	NOTE:Began continuous splitspooning at 66.0'.	14 18 21
	65		Red,slightly sandy,micaceous.		14		11 16 7 15 12 17
			Red,w/traces of purple & tan.		15		9 12 14 10 12
611.0'	70		Continued on sht 3				

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 681.0' ± | Hole No. PZ-1

PROJECT: Piezometer Installation | INSTALLATION: Clemson Upper Dam, S.C. | SHEET 3 OF 3 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV-ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
611a.0'	70'	c	d	e	JAR	g	
			(ML)Red,w/traces of purple & tan,inorganic SILT.				14 4 5 10
608.5'			Red & brown.		16		5 13 17
			(SM)Brown,fine & med.grained, silty SAND.				5 16 23
606.0'	75				17		6 14 20
			(SP)Tan & brown,med.grained, poorly graded SAND.				5 12 13
			Med. & coarse grained.				10 14 19
	80		W/some gravel.		18		20 22 24
			Med.to coarse grained,w/ gravel.				21 20 30
597.0'					19		24 28 30
595.5'	85		(GRANITE)Greenish-grey,& light tan,intensely wea., (Saprolite),easily crumbled, sandy.		20		30 60 73
							100/0.0
			Bottom of Boring 85.5'				

Hole No. PZ-2

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Clemson Upper Dam, S.C.

SHEET 1 OF 3 SHEETS

1. PROJECT: Piezometer Installation
2. LOCATION (Coordinates or Station): Station 16+00, D/S Edge of crest
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): PZ-2
5. NAME OF DRILLER: Perry Rountree
6. DIRECTION OF HOLE: [XX] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 82.5'
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 82.5'
10. SIZE AND TYPE OF BIT: 1 3/8" splitspoon, 6 1/2" fishtail bit, 7 1/4" rock bit
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 55
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 29; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 5 Aug 1988; COMPLETED 9 Aug 1988
17. ELEVATION TOP OF HOLE: 681.0 ±
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: Charles D. Griffin

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO. JAR	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
681.0'	0'		(ML)Brown & tan, inorganic SILT. Slightly micaceous, very sandy, some fiberous organics, loose rocks.		1	NOTE: No water level recorded due to use of drilling fluid. Splitspoon drives were taken on 5' centers to 60.0'. Continuous split-spoon to bottom of hole. Mr. Perry Rountree operated catline/hammer throughout boring using 1 3/4" wraps. Set piezometer after hole completed.	2 10 19
	5		Brown, sandy & micaceous, some traces of saprolite, loose rocks.		2		8 12 19
	10		Brown, tan, purple, w/layers of sandy saprolite, micaceous.		3		6 14 9
667.5'							
	15		(SM)Reddish brown & tan, fine to med. grained silty SAND. Saprolitic.		4		14 16 12
			Brown, fine grained.				
	20		(ML)Red & brown, inorganic SILT. Sandy & micaceous, saprolitic.		5		11 17 15
660.0'							
	25				6		11 17 24
			(SM)Brown, fine grained, silty SAND. Micaceous.				
652.5'					7		11 18 26
651.0'	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 681.0' ± | Hole No. PZ-2

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

ELEVATION (651.0')	DEPTH (30')	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	BLOWS
			(SM)Brown,fine grained,silty SAND. Micaceous,saprolitic.				
646.5'	35		(SP)Tan,med.grained,poorly graded SAND. With traces of gravel.		8		6 7 8
642.0'			(ML)Red & brown,inorganic SILT.Slightly plastic,highly micaceous.				
	40		Sandy, micaceous.		9		6 8 13
					10		8 31 33
	45					NOTE:Began continuous splitspoon at 60.0'.	
	50		With traces of white,saprolitic.		11		8 20 24
	55		Reddish brown,tan.		12		10 14 21
			Red,sandy & micaceous.				10 18 20
631.0'	60		(MH)Red,clayey SILT.Micaceous.		13		
					14		10 13 18
618.8'			(CL)Dark brownish grey,silty CLAY.Traces of mica,lenses of fine grained sand.		15 16 17		10 18 39
	65		Dark brownish grey to light brown,w/some fiberous organics.		18		19 18 19
					19		6 11 14
612.0'			Brown,very fine sandy.		20		6 12 12
611.0'	70		(SM)Brown,very fine grained, silty SAND.Micaceous.		21		7 5 10
							12 14
			Continued on sht 3				

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 681.0' ± **Hole No.** PZ-2

PROJECT: Piezometer Installation | INSTALLATION: Clemson Upper Dam, 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
611a.0'	70'	c	d	e	JAR	g	
			(SM)Brown,very fine grained, silty SAND. Micaceous.		22		17 9 10 13
			Brown to grey,silty & slightly clayey,micaceous.		23		7 10 15
	75				24		9 7 9
			Dark grey & black,to light grey,very fine grained to med.grained silty to poorly graded sand.		25		6 11 23
604.5'					26		15 20 25
					27	NOTE:Fishtail & splitspoon refusal at 82.5'.	18 25 27
	80		(SP)Grey,med.grained,poorly graded SAND.		28		21 20 39
600.0'			Tan.		29		100 60 39
598.5'			Yellowish tan,w/some gravel.				100/0.0
			(SM)Yellowish tan,fine to med.grained,(saprolite) w/some large size gravel. Intensely wea.rock.				
			Bottom of Boring 82.5'				

Hole No. UAP-1

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Hartwell Lake
SHEET	1 OF 1 SHEETS
1. PROJECT	Clemson Upper Dam
2. LOCATION (Coordinates or Station)	6+11; 306' Downstream of Centerline
3. DRILLING AGENCY	Savannah District
4. HOLE NO. (As shown on drawing title and file number)	UAP-1
5. NAME OF DRILLER	P. Rountree
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	12.0'
8. DEPTH DRILLED INTO ROCK	0.0
9. TOTAL DEPTH OF HOLE	12.0'
10. SIZE AND TYPE OF BIT	5" Spiral Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 550
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 3 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 19 May 82 / COMPLETED 19 May 82
17. ELEVATION TOP OF HOLE	+624.02' ±
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	Bob Green

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
624.02	0		ML-Black, silt, micaceous, with some sand.		1	W.T. 5.5' Date 19 May 82 Depth to water during drilling.
	2					W.T. 4.0' Water table reading 24 hrs. after hole completed.
	4				2	Note: a piezometer was set at 12.0'. The screen was 2.5' gravel was placed from 12.0' to 4.5'. Mudballs were placed from 4.5' to 3.0' and soil backfilled from 3.0' to 0.0'. There is a 2.1' stickup.
	6					
	8					
	10				3	
612.02	12		Bottom of Boring at 12.0'			
			Note: Soils field classified in accordance with the Unified Soil Classification System.			

Hole No. UAP-2

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 1 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): 10+00; 398' Downstream of Centerline
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): UAP-2
5. NAME OF DRILLER: P. Rountree
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 12.0'
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 12.0'
10. SIZE AND TYPE OF BIT: 6" Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 550
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 19 May 82; COMPLETED 19 May 82
17. ELEVATION TOP OF HOLE: +628.08' ±
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: Bob Green

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
628.08	0				JAR	
			ML-Brown, silt, slightly micaceous.		1	W.T. 11.0' Date 19 May 82 Depth to water during drilling.
	2					W.T. 10.0' Water table reading 24 hrs. after hole completed.
	4				2	
	6		Color change to black.			Note: A piezometer was set at 12.0'. The screen was 2.5'. Gravel was placed from 12.0' to 4.0'. Mudballs were placed from 4.0' to 2.5' and soil backfilled from 2.5' to 0.0'. There is a 2.0' stickup.
	8					
	10				3	
616.08	12		Bottom of Boring at 12.0'		4	

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

Hole No. UAP-3

DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Hartwell Lake

SHEET 1 OF 1 SHEETS

1. PROJECT: Clemson Upper Dam
2. LOCATION (Coordinates or Station): 16+00: 344' Downstream of Centerline
3. DRILLING AGENCY: Savannah District
4. HOLE NO. (As shown on drawing title and file number): UAP-3
5. NAME OF DRILLER: P. Rountree
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 12.0'
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 12.0'
10. SIZE AND TYPE OF BIT: 6" Spiral Auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 550
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: +622.82' ±
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 19 May 82; COMPLETED 19 May 82
17. ELEVATION TOP OF HOLE: +622.82' ±
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: Bob Green

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)
622.82	0				JAR	
			ML-Brown, silt, micaceous, with some sand.		1	W.T. 1.9' Date 19 May 82 Depth to water during drilling. W.T. 2.6' Water table reading 24 hrs. after hole completed.
	2					
619.82			SM-Brown, fine grained, silty sand, slightly micaceous.		2	
	4					
617.32			MH-Black, silt, micaceous.		3	Note: A piezometer was set at 12.0'. The screen was 2.5'. Gravel was placed from 12.0' to 4.0' Mudballs were placed from 4.0' to 2.5' and soil backfilled from 2.5' to 0.0'. There is a 2.1' stickup.
	6					
	8					
	10					
					4	
610.82	12		Bottom of Boring at 12.0'			
			Note: Soils field classified in accordance with the Unified Soil Classification System.			

A.4 Current Boring Logs - Clemson Upper Dam

Boring No.	Date Drilled	Station	Offset (feet)	Elevation (feet, NGVD)	Comments
CUD-601	10-22-01	3+05	163	641.6	
CUD-602	10-23-01	3+50		642.8	
CUD-603	10-24-01	5+15	118	642.7	
CUD-604	10-25-01	6+80	120	642.1	
CUD-605	10-30-01	9+10	165	640.6	
CUD-606	11-1-01	10+00	128	642.0	
CUD-607	11-1-01	12+00	121	642.3	
CUD-608	11-2-01	14+80	128	642.3	
CUD-609	11-2-01	17+20	166	640.1	
CUD-610	11-3-01	18+00	122	641.5	
CUD-611	11-4-01	19+65	117	643.7	
CUD-621A	12-4-01	6+15	120	642.4	
CUD-621B	12-5-01	6+05	123	642.5	Undisturbed Tubes
CUD-622A	12-2-01	9+13	162	640.7	
CUD-623A	12-3-01	12+30	120	642.2	
CUD-624A	12-1-01	17+97	120	641.7	
CUD-624B	12-5-01	17+92	121	641.8	Undisturbed Tubes
CUD-624C	12-6-01	17+95	120	641.8	Undisturbed Tubes

GEI Consultants, Inc.

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.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE 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							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-601

PAGE: 1 OF 2

DATE: 10/22/2001 / 10/23/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 641.60
NORTHING: 1040906.185 EASTING: 1442829.473
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 3+05 DOWNSTREAM OFFSET (FT): 163
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 33.2

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							0-20.4'. -EMBANKMENT FILL-
15	S1	5 8 12	18	10			S1 - SILTY SAND (SM); fine, micaceous sand; ~30-40% low plasticity fines; red/brown. -EMBANKMENT FILL-
	S2	6 12 20	18	12			S2 - SILTY SAND (SM); Similar to S1. -EMBANKMENT FILL-
	S3	6 12 9	18	8			S3 - Top 4" SILTY SAND (SM); Similar to S1. -EMBANKMENT FILL- S3 - Bottom 4" SILTY SAND (SM); fine sand, ~5% coarse sand; ~30-40% slight plasticity fines; black/brown, 1/4" laminations of red/brown. -EMBANKMENT FILL-
20	S4	6 12 10	18	11			~~S4 - Top 6" SANDY SILT (ML); low to medium plasticity fines; ~40% fine~~ sand; black/brown. -EMBANKMENT FILL-
	S5	4 7 6	18	5			~~Top of Drain Layer, 20.4 ft.~~ 20.4--21.5', -DRAIN LAYER- S4 - Bottom 5" SILTY SAND (SM); fine uniform sand; ~20-30% nonplastic fines; gray. -DRAIN LAYER-
	S6	3 4 8	18	10			Estimated Top of Alluvium, 21.5 ft. ~21.5-33.2', -ALLUVIUM- S5 - SANDY SILT (ML); low to medium plasticity fines; ~20-35% fine sand; lenses of clayey soil; wood; black/brown. -ALLUVIUM-
25	S7	3 4 5	18	7			S6 - SANDY LEAN CLAY (CL); medium to high plasticity, no dilatency fines; ~20-30% fine sand; red with lenses of gray sand. -ALLUVIUM- S7 - Top 4" SANDY SILT (ML); low plasticity fines, with organic material throughout; ~20% fine sand; black/brown. -ALLUVIUM-
	S8	2 2 3	18	11			S7 - Bottom 3" FAT CLAY (CH); homogeneous, medium plasticity fines; red/brown. -ALLUVIUM-
	S9	2 2 3	18	18			S8 - ELASTIC SILT (MH); medium plasticity fines; ~5% fine sand; organic material throughout; brown; Sv=0.3 tsf, Qp=0.5 tsf. -ALLUVIUM-
	S10	WOH WOH 2	18	6			
30	S11	WOH 2	18	2			

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-601

PAGE: 2 OF 2

DATE:10/22/2001 / 10/23/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		2					S9 - ELASTIC SILT (MH); Similar to S8; organics, wood; silty fines; ~5% sand; dark brown. -ALLUVIUM-
	S12	1 3 10	18	8			S10 - SANDY SILT (ML); medium plasticity; ~20% fine sand; organic material. -ALLUVIUM-
	S13	50/2"	2	2			~~S11 - SANDY SILT (ML); medium plasticity; gray/brown. -ALLUVIUM-~~
							S12 - SILTY SAND (SM); fine slightly micaceous sand; ~30-40% silt; gray. -ALLUVIUM-
35							S13 - SILTY SAND (SM); Similar to S12; bedrock in sampler tip. -ALLUVIUM-
							Refusal in Bedrock; Bottom of Borehole, 33.2 ft.
40							
45							
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-602

PAGE: 1 OF 2

DATE:10/23/2001 / 10/23/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.81
NORTHING: 1040968.638 EASTING: 1442837.487
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 3+50 DOWNSTREAM OFFSET (FT): 116
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 39.0

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 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							0-22.5', -EMBANKMENT FILL-
15	S1	7 8 9	18	9			S1 - SANDY SILT (ML); low t o medium plasticity fines; ~40-50% fine micaceous sand; alternating ~1/4" thick red silty zones; red/brown. -EMBANKMENT FILL-
	S2	4 5 8	18	11			S2 - SANDY SILT (ML); Similar to S1; oxidized lenses ~1/16" thick orange; red/brown. -EMBANKMENT FILL-
	S3	8 10 15	18	14			S3 - SILTY SAND (SM); fine micaceous sand; ~30-45% medium plasticity fines; orange/brown. -EMBANKMENT FILL-
20	S4	7 7 14	18	12			S4 - SANDY SILT (ML); medium plasticity fines; fine micaceous sand; weathered rock; black organic lenses ~1/4" thick; orange/brown. -EMBANKMENT FILL-
	S5	6 9 14	18	12			S5 - Top 10" SANDY SILT (ML); Similar to S4. -EMBANKMENT FILL-
							Estimated Top of Drain Layer, 22.5 ft.
	S6	10 11 10	18	8			22.5-23.6', -DRAIN LAYER-
	S7	6 4 4	18	1			S5 - Bottom 2" SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; gray. -DRAIN LAYER- S6 - Top 4" SILTY SAND (SM); Similar to Bot S5. -DRAIN LAYER-
25							Top of Alluvium, 23.6 ft.
	S8	2 3 5	18	4			23.6-39.0', -ALLUVIUM-
	S9	3 3 15	18	16			S6 - Bottom 4" SILTY SAND (SM); fine sand; ~30-40% low plasticity fines; organic debris; black/brown. -ALLUVIUM- S7 - SANDY SILT (ML); ~20-30% medium plasticity, no dilatency fines; red/brown. -ALLUVIUM-
	S10	12 14 16	18	8			S8 - LEAN CLAY WITH SAND (CL); medium to high plasticity fines; ~10-20% fine sand; red/brown. -ALLUVIUM-
30	S11	10 10	18	10			S9 - Top 12" LEAN CLAY WITH SAND (CL); Similar to S8; 1" thick sandy lense at ~27.4'. -ALLUVIUM-

GEI Consultants, Inc.	LOG OF DRILL HOLE	CUD-602
		PAGE: 2 OF 2
		DATE:10/23/2001 / 10/23/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		11					S9 - Bottom 4" NARROWLY GRADED SAND WITH SILT (SP-SM); fine sand; ~15% non to low plasticity fines; gray/brown. -ALLUVIUM-
	S12	6 8 8	18	6			S10 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to Bot S9. -ALLUVIUM-
	S13	8 8 8	18	7			S11 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to Bot S9. -ALLUVIUM-
35	S14	3 4 7	18	9			S12 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to Bot S9. -ALLUVIUM-
	S15	7 7 9	18	9			S13 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to Bot S9; minor black organic material. -ALLUVIUM-
	S16	6 18 18	18	9			S14 - Top 6" SANDY SILT (ML); low to medium plasticity fines; organic material; black. -ALLUVIUM-
							S14 - Bottom 3" NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S13. -ALLUVIUM-
							~~S15 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S13;~~ wood/organic material. -ALLUVIUM-
40							S16 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S15. -ALLUVIUM-
							Bottom of Borehole, 39.0'
45							
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-603

PAGE: 1 OF 2

DATE: 10/24/2001 / 10/24/2001

PROJECT NAME: Clemson Dam
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.69
NORTHING: 1041070.914 EASTING: 1442967.689
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 5+15 DOWNSTREAM OFFSET (FT): 118
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 49.2

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							0-21.5', -EMBANKMENT FILL-
15	S1	5 9 16	18	11			S1 - SANDY SILT (ML); low to medium plasticity fines; ~30-40% fine micaceous sand; red/brown. -EMBANKMENT FILL-
	S2	6 9 16	18	12			S2 - SANDY SILT (ML); Similar to S1; oxidized lenses throughout; orange/brown. -EMBANKMENT FILL-
	S3	8 10 14	18	11			S3 - SANDY SILT (ML); Similar to S1; orange/brown. -EMBANKMENT FILL-
20	S4	7 12 18	18	0			S4 - No Recovery.
	S5	5 18 24	18	12			S5 - Top 5" SANDY SILT (ML); Similar to S1; orange/brown. -EMBANKMENT FILL-
	S6	6 8 14	18	9			Top of Drain Layer, 21.5 ft. 21.5-23.3', -DRAIN LAYER-
	S7	3 4 6	18	6			S5 - Bottom 7" SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; gray/brown. -DRAIN LAYER-
25	S8	4 6 9	18	16			S6 - Top 5" SILTY SAND (SM); Similar to Bot S5. -DRAIN LAYER- Top of Alluvium, 23.3 ft. 23.3-48.0', -ALLUVIUM-
	S9	6 4 5	18	7			S6 - Bottom 4" FAT CLAY WITH SAND (CH); medium plasticity; ~15-25% fine micaceous sand; Sv=0.55 tsf, Qp=1.5 tsf. -ALLUVIUM-
	S10	2 3 3	18	18			S7 - FAT CLAY WITH SAND (CH); Similar to Bot S6. -ALLUVIUM-
30	S11	1 3	18	18			S8 - NARROWLY GRADED SAND WITH SILT (SP-SM); fine sand; ~10-15% low plasticity silt; wood debris; roots/organic material throughout. -ALLUVIUM-
							S9 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S8. -ALLUVIUM-

GEI Consultants, Inc.	LOG OF DRILL HOLE	CUD-603
		PAGE: 2 OF 2
		DATE:10/24/2001 / 10/24/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		4					
	S12	2 3 4	18	17			S10 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S8. -ALLUVIUM- S11 - SANDY SILT (ML); low plasticity, non dilatency fines; ~20-30% fine sand; brown. -ALLUVIUM- S12 - SANDY SILT (ML); low to medium plasticity fines; ~20-30% fine sand; red section ~1/2" within; minor organic material; one 1" piece rounded gravel; brown; clayey sections. -ALLUVIUM-
	S13	2 4 7	18	18			
35	S14	2 2 4	18	18			S13 - LEAN CLAY WITH SAND (CL); medium plasticity; ~15-25% fine sand; brown with tan spots; Sv=0.35 tsf, Qp=1.0 tsf. -ALLUVIUM- S14 - SILT (ML); low to medium plasticity fines; interbedded gray/brown silt with clayey particles. -ALLUVIUM-
	S15	2 2 2	18	18			S15 - Top 8" SILT WITH SAND (ML); Similar to S14; ~20% fine sand; brown. -ALLUVIUM- S15 - Bottom 10" SILT WITH SAND (ML); nonplastic fines; ~10-20% fine micaceous sand; gray. -ALLUVIUM-
	S16	2 2 5	18	18			
40	S17	7 12 13	18	13			S16 - SANDY SILT (ML); nonplastic silt; ~20-30% fine sand; minor organic material; gray/brown. -ALLUVIUM- S17 - Top 3" SANDY SILT (ML); Similar to S16. -ALLUVIUM- S17 - Middle 4" ORGANIC SOIL (OL); fibrous; black, earth smell. -ALLUVIUM- S17 - Bottom 6" SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; gray. -ALLUVIUM-
	S18	9 13 15	18	11			
	S19	9 11 14	18	11			S18 - SILTY SAND (SM); Similar to Bot S17. -ALLUVIUM- S19 - SILTY SAND (SM); Similar to Bot S17; one ~1/4" zone of black organic material. -ALLUVIUM-
	S20	5 10 12	18	12			
45	S21	10 11 15	18	8			S20 - NARROWLY GRADED SAND WITH SILT (SP-SM); mostly fine sand; ~10-15% nonplastic fines; gray. -ALLUVIUM- S21 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S20. -ALLUVIUM-
	S22	8 10 12	18	8			S22 - NARROWLY GRADED SAND WITH SILT (SP-SM); Similar to S20. -ALLUVIUM-
	S23	8 14 50/2"	18	14			Estimated Top of Sand & Gravel, 48.0 ft. ~~48.0-49.2', -SAND & GRAVEL-~~ ~~S23 - NARROWLY GRADED GRAVEL WITH SAND (GP-GM); fine gravel,~~ max size ~1/2"; ~30-40% sand; gray. -SAND & GRAVEL-
50							Bottom of Borehole, Estimated Top of Bedrock, 49.2 ft.

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-604

PAGE: 1 OF 2

DATE: 10/25/2001 / 10/25/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.14
NORTHING: 1041169.321 EASTING: 1443098.139
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 6+80 DOWNSTREAM OFFSET (FT): 120
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 44.7

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-~18.8', -EMBANKMENT FILL-
15	S1	8 11 15	18	6			S1 - SANDY SILT (ML); low to medium plasticity fines; ~20-30% fine micaceous sand; red/brown. -EMBANKMENT FILL-
	S2	7 8 13	18	14			S2 - SANDY SILT (ML); Similar to S1; oxidized orange zones ~1/8"; orange/brown. -EMBANKMENT FILL-
	S3	4 6 20	18	13			S3 - Top 7" SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
20	S4	10 12 16	18	9			Estimated Top of Drain Layer, 18.8 ft. ~18.8-~21.3', -DRAIN LAYER- S3 - Bottom 6" SILTY SAND (SM); fine sand; ~15-25% silt; gray. -DRAIN LAYER-
	S5	16 17 18	18	10			S4 - SILTY SAND (SM); Similar to Bot S3. -DRAIN LAYER- Estimated Top of Alluvium, 21.3 ft. S5 - Top 3" SILTY SAND (SM); Similar to Bot S3. -DRAIN LAYER- ~21.3-~42.0', -ALLUVIUM-
	S6	4 4 4	18	18			S5 - Bottom 7" SANDY SILT (ML); low plasticity fines; ~20-35% fine sand; brown/black. -ALLUVIUM-
25	S7	2 1 3	18	16			S6 - SANDY SILT (ML); low plasticity fines; organic material; 35% fine sand; black. -ALLUVIUM-
	S8	3 3 3	18	0			S7 - SANDY SILT (ML); Similar to S6. -ALLUVIUM-
	S9	1 1 2	18	18			S8 - SANDY SILT (ML); Second attempt classification, no recovery first attempt; Similar to S6. -ALLUVIUM-
	S10	1 1 1	18	18			S9 - SANDY SILT (ML); Similar to S6. -ALLUVIUM-
30	S11	WOH 2	18	18			S10 - SILT WITH SAND (ML); non to low plasticity fines; ~15-25% fine sand; brown/ black. -ALLUVIUM-
							S11 - SANDY SILT (ML); nonplastic fines; ~20-30% sand; brown. -ALLUVIUM-

GEI Consultants, Inc.	LOG OF DRILL HOLE	CUD-604
		PAGE: 2 OF 2
		DATE:10/25/2001 / 10/25/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		4					
	S12	2 2 6	18	18			S12 - Top 9" SANDY SILT (ML); Similar to S11. -ALLUVIUM- S12 - Bottom 9" LEAN CLAY WITH SAND (CL); low to medium plasticity; ~15-25% fine sand; black organic material; brown with ~1/16" thick gray zone; Sv=0.4 tsf. -ALLUVIUM-
	S13	2 3 4	18	18			S13 - LEAN CLAY WITH SAND (CL); Similar to Bot S12. -ALLUVIUM-
35	S14	2 4 6	18	18			S14 - SANDY SILT (ML); low plasticity fines; ~10-30% fine sand; gray/brown; transition to more sandy soil with depth. -ALLUVIUM-
	S15	3 3 10	18	15			S15 - Top 12" SANDY SILT (ML); Similar to S14. -ALLUVIUM- S15 - Bottom 3" SILTY SAND (SM); fine sand; ~10-25% nonplastic fines; gray. -ALLUVIUM-
	S16	5 10 14	18	9			S16 - SILTY SAND (SM); Similar to Bot S15; dark organic section 1/2" thick. -ALLUVIUM-
	S17	7 7 14	18	11			S17 - SILTY SAND (SM); fine sand; ~10-20% nonplastic fines; interbedded dark organic lenses ~1/16" thick; gray/white. -ALLUVIUM-
40	S18	9 17 26	18	8			S18 - SILTY SAND WITH GRAVEL (SM); ~10-20% nonplastic fines; interbedded organics; ~5-10% gravel, max size 1/2"; gray. -ALLUVIUM- Estimated Top of Sand & Gravel, 42.0 ft.
	S19	25 31 36	18	10			~42.0-~44.7', -SAND & GRAVEL- S19 - SILTY GRAVEL (GM); fine rounded to subrounded gravel, max size ~3/4"; ~20-30% nonplastic fines; gray. -SAND & GRAVEL-
	S20	30 30 40/2"	18	0			S20 - No Recovery; gravel piece in spoon tip. -SAND & GRAVEL-
45							Bottom of Borehole, Estimated Top of Bedrock, 44.7 ft.
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-605

PAGE: 1 OF 2

DATE: 10/30/2001 / 10/31/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 640.59
NORTHING: 1041277.116 EASTING: 1443307.106
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 9+10 DOWNSTREAM OFFSET (FT): 165
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman 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 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							??-41.5'. -ALLUVIUM-
20	S1	4 5 3	18	14			Note: Drain Layer assumed to be above 20.0' S1 - SANDY SILT (ML); Second attempt classification, no recovery first attempt; nonplastic fines; ~40-50% fine sand; black; minor organic debris. -ALLUVIUM-
							Note: No sample from 21.5-23.0', wash down to 22.0'.
	S2	2 1 1	18	4			S2 - SANDY SILT (ML); Similar to S1. -ALLUVIUM-
	S3	1 2 1	18	7			S3 - SANDY SILT (ML); Similar to S1. -ALLUVIUM-
25	S4	WOH 1 1	18	13			S4 - SANDY SILT (ML); Similar to S1. -ALLUVIUM-
	S5	WOH WOH WOH	18	8			S5 - SANDY SILT (ML); Similar to S1. -ALLUVIUM-
	S6	1 1 3	18	7			S6 - SANDY SILT (ML); Similar to S1. -ALLUVIUM-
30	S7	WOH 1 1	18	3			S7 - SANDY SILT (ML); Similar to S1. -ALLUVIUM-
	S8	2 1 4	18	14			S8 - SANDY SILT (ML); low to nonplastic silt; ~40-50% fine sand; brown. -ALLUVIUM-
	S9	1 1 1	18	5			S9 - SANDY SILT (ML); Similar to S8. -ALLUVIUM-
	S10	1 1 1	18	8			S10 - Top 5" SANDY SILT (ML); Similar to S8. -ALLUVIUM-
35							S10 - Bottom 3" SILTY SAND (SM); fine sand; ~20-30% nonplastic silt; gray/brown. -ALLUVIUM-
	S11	3	18	11			

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-605

PAGE: 2 OF 2

DATE:10/30/2001 / 10/31/2001

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		7 9					S11 - SILTY SAND (SM); Similar to Bot S10. -ALLUVIUM-
	S12	5 5 5	18	0			S12 - No Recovery.
	S13	6 8 13	18	9			S13 - SILTY SAND (SM); Similar to S11. -ALLUVIUM-
40	S14	7 12 15	18	8			S14 - SILTY SAND (SM); Similar to S11; ~15-25% nonplastic fines; ~15% gravel. -ALLUVIUM-
							Estimated Top of Sand & Gravel, 41.5 ft.
	S15	11 21 17	18	10			~41.5-46.0', -SAND & GRAVEL-
							S15 - SILTY SAND WITH GRAVEL (SM); fine sand; ~15-25% nonplastic fines; ~15% gravel. -SAND & GRAVEL-
	S16	10 19 40	18	11			S16 - SILTY GRAVEL WITH SAND (GM); rounded to subrounded gravel, max size 1-1/2"; ~20-30% fine to coarse sand; ~15-25% slightly plastic fines; orange/brown; blue weathered gravel. -SAND & GRAVEL-
45	S17	15 25 30	18	10			S17 - SILTY SAND (SM); fine to coarse sand; ~20-30% fines; appears to be weathered gravel or rock; white/orange and brown intermittent. -SAND & GRAVEL-
							Bottom of Borehole, 46.0 ft.
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-606

PAGE: 1 OF 2

DATE: 11/1/2001 / 11/1/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.05
NORTHING: 1041362.245 EASTING: 1443355.061
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 10+00 DOWNSTREAM OFFSET (FT): 128
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman 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 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							0-31.6', -EMBANKMENT FILL-
20	S1	9 17 23	18	9			S1 - SANDY SILT (ML); low to nonplastic silt; ~20-30% fine, micaceous sand; red/brown. -EMBANKMENT FILL-
	S2	10 11 22	18	10			S2 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S3	7 10 20	18	13			S3 - SANDY SILT (ML); Similar to S1; oxidized orange zones. -EMBANKMENT FILL-
25	S4	6 8 14	18	9			S4 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S5	5 10 14	18	7			S5 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S6	6 9 16	18	10			S6 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S7	6 8 13	18	10			S7 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
30	S8	9 19 41	18	11			S8 - Top 8" SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
							Estimated Top of Drain Layer, 31.6 ft.
	S9	19 31 48	18	10			31.6-34.2', -DRAIN LAYER- S8 - Bottom 3" SILTY SAND (SM); fine sand; ~30-40% nonplastic fines; ~5-10% fine gravel, max size ~3/4"; gray. -DRAIN LAYER-
	S10	21 22 32	18	6			S9 - SILTY SAND WITH GRAVEL (SM); fine sand; ~30-45% nonplastic fines; ~15% rounded to subrounded gravel, max size ~3/4"; black/gray. -DRAIN LAYER-
35	S11	27 47	17	13			S10 - Top 3" SILTY SAND (SM); Similar to Bot S8. -DRAIN LAYER-

GEI Consultants, Inc.	LOG OF DRILL HOLE	CUD-606
		PAGE: 2 OF 2
		DATE:11/1/2001 / 11/1/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		53/5"					Estimated Top of Alluvium, 34.2 ft.
	S12	19 15 13	18	9			34.2-41.0', -ALLUVIUM-
	S13	11 15 18	18	13			S10 - Bottom 3" SILTY SAND (SM); fine sand; ~20-30% low plasticity fines; black. -ALLUVIUM-
	S14	12 20 21	18	10			S11 - Top 3" SILTY SAND (SM); Similar to Bot S10. -ALLUVIUM-
40	S15	14 21 27	18	NA			S11 - Bottom 10" SILTY SAND WITH GRAVEL (SM); fine sand; ~10-30% nonplastic fines; ~5-15% rounded gravel; gray. -ALLUVIUM-
	S16	17 28 51	18	5			S12 - SILTY SAND (SM); fine sand; ~10-25% nonplastic fines; gray/brown. -ALLUVIUM-
							S13 - SANDY SILT (ML); nonplastic fines; ~20-25% fine sand; gray. -ALLUVIUM-
							S14 - SILTY SAND (SM); fine sand; ~15-25% nonplastic fines; ~5% gravel, max size ~3/4"; gray. -ALLUVIUM-
							Estimated Top of Sand & Gravel, 41.0 ft.
45							~41.0-44.0', -SAND & GRAVEL-
							S15 - SILTY SAND WITH GRAVEL (SM); fine sand; ~20-30% nonplastic fines; ~10-20% fine to coarse gravel; gray. -ALLUVIUM-
							S16 - SILTY GRAVEL WITH SAND (GM); fine to coarse, rounded to subrounded gravel; ~40-50% sand; ~10-20% nonplastic fines. -SAND & GRAVEL-
50							Bottom of Borehole, 44.0 ft.

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-607

PAGE: 1 OF 2

DATE:11/1/2001 / 11/1/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.30
NORTHING: 1041490.066 EASTING: 1443508.321
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 12+00 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 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							0-27.1', -EMBANKMENT FILL-
15	S1	6 11 18	18	14			S1 - SANDY SILT (ML); low plasticity fines; ~20-30% fines, micaceous sand; red/brown. -EMBANKMENT FILL-
	S2	7 10 18	18	15			S2 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S3	8 11 16	18	11			S3 - SANDY SILT (ML); Similar to S1; orange/brown. -EMBANKMENT FILL-
20	S4	6 9 20	18	14			S4 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S5	7 9 12	18	11			S5 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S6	8 11 12	18	12			S6 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S7	8 9 13	18	11			S7 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
25	S8	5 6 10	18	8			S8 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
							Estimated Top of Drain Layer, 27.1 ft.
	S9	9 13 14	18	11			S9 - Top 1" SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL- 27.1--30.0', -DRAIN LAYER- S9 - Bottom 10" SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; gray/brown. -DRAIN LAYER-
	S10	9 9 11	18	9			S10 - SILTY SAND (SM); Similar to Bot S9. -DRAIN LAYER-
30	S11	8 12	18	10			Estimated Top of Alluvium, 30.0 ft.

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-607

PAGE: 2 OF 2

DATE:11/1/2001 / 11/1/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		12					Note: Drain Layer and natural soil very similar.
	S12	6 6 10	18	5			~30.0-33.0', -ALLUVIUM-
							S11 - SILTY SAND (SM); fine sand; ~30-40% nonplastic fines; gray with black organic laminations throughout. -ALLUVIUM-
							S12 - SILTY SAND (SM); Similar to S11; ~1-3/8" piece of gravel in spoon tip. -ALLUVIUM-
35							Bottom of Borehole, 33.0 ft.
40							
45							
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-608

PAGE: 1 OF 1

DATE: 11/2/2001 / 11/2/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.30
NORTHING: 1041658.086 EASTING: 1443732.222
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 14+80 DOWNSTREAM OFFSET (FT): 128
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 27.0

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							0-21.8', -EMBANKMENT FILL-
15	S1	5 10 19	18	14			S1 - SANDY SILT (ML); low plasticity fines; ~30-40% fines, micaceous sand; red/brown. -EMBANKMENT FILL-
	S2	11 10 19	18	12			S2 - SANDY SILT (ML); Similar to S1; oxidized zones (orange) and weathered white zones. -EMBANKMENT FILL-
	S3	9 8 21	18	15			S3 - SANDY SILT (ML); Similar to S1; oxidized and weathered laminations. -EMBANKMENT FILL-
20	S4	8 15 20	18	12			S4 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S5	4 5 22	18	10			S5 - Top 7" SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
							Estimated Top of Drain Layer, 21.8 ft.
							21.8-~23.5', -DRAIN LAYER-
	S6	8 16 15	18	2			S5 - Bottom 3" SILTY SAND (SM); fine quartz sand; ~15-25% nonplastic fines; gray. -DRAIN LAYER-
	S7	7 8 7	18	8			S6 - SILTY SAND (SM); Similar to Bot S5. -DRAIN LAYER-
25							Estimated Top of Alluvium, 23.5 ft. Stratum change over 0.5 ft.
	S8	1 3 5	18	18			~23.5-27.0', -ALLUVIUM-
							S7 - SANDY SILT (ML); low plasticity fines; ~20-30% fine sand; organic material throughout; black. -ALLUVIUM-
							S8 - SANDY SILT (ML); low to medium plasticity; ~5-10% fine sand; black; organic material. -ALLUVIUM-
30							Bottom of Borehole, 27.0 ft.

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-609

PAGE: 1 OF 2

DATE: 11/2/2001 / 11/3/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 640.15
NORTHING: 1041776.02 EASTING: 1443944.256
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 17+20 DOWNSTREAM OFFSET (FT): 166
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 43.6

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 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-~20.7', -EMBANKMENT FILL-
20	S1	5 17 38	18	13			S1 - Top 6" SANDY SILT (ML); low plasticity fines; ~30% fine, micaceous sand; red/brown. -EMBANKMENT FILL-
	S2	5 7 9	18	2			Estimated Top of Drain Layer, 20.7 ft. ~20.7-~22.2', -DRAIN LAYER- S1 - Bottom 7" SILTY SAND (SM); fine quartz sand; ~20-30% nonplastic fines; gray. -DRAIN LAYER-
	S3	3 7 10	18	14			S2 - SILTY SAND (SM); Similar to Bot S1. -DRAIN LAYER-
25	S4	2 2 3	18	8			Estimated Top of Alluvium, 22.2 ft. Strata change over 0.8 ft. ~22.2-~41.0', -ALLUVIUM- S3 - Top 11" SANDY SILT (ML); low plasticity fines; ~30-40% fine sand; organic material within; black/brown. -ALLUVIUM-
	S5	WOH 1 2	18	18			S3 - Bottom 3" SILTY SAND (SM); fine quartz sand; ~15-25% nonplastic fines; gray/brown. -ALLUVIUM-
	S6	WOH 1 1	18	18			S4 - Top 2" SILTY SAND (SM); Similar to Bot S3. -ALLUVIUM-
30	S7 Top 12"	2 3 5	18	13			S4 - Bottom 6" SANDY SILT (ML); low plasticity; ~10-20% fine sand; black; organic material within; contaminated by drilling fluid. -ALLUVIUM-
	S8	3 3 7	18	8			S5 - SANDY SILT (ML); medium plasticity fines; ~5-10% fine sand; organic debris; black; homogeneous. -ALLUVIUM-
	S9	2 2 2	18	16			S6 - LEAN CLAY (CL); medium plasticity; gray; top 4" transitional from S5 sandy silt; Sv=0.20, 0.15 tsf. -ALLUVIUM-
	S10	2 3 2	18	0			S7 - Top 12" LEAN CLAY (CL); Similar to S6. -ALLUVIUM-
35	S11	4 4	18	5			S7 - Bottom 1" SILTY SAND (SM); non to low plasticity silt; ~15-25% fine, micaceous sand; gray. -ALLUVIUM-
							S8 - SILTY SAND (SM); fine sand; ~15-25% nonplastic silt; gray; micaceous. -ALLUVIUM-
							S9 - SILTY SAND (SM); Similar to S8. -ALLUVIUM-

GEI Consultants, Inc.	LOG OF DRILL HOLE	CUD-609
		PAGE: 2 OF 2
		DATE:11/2/2001 / 11/3/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		7					S10 - No Recovery; Attempted with 2" & 3" OD split spoons. S11 - SILTY SAND (SM); Similar to S8; with minor organic material. -ALLUVIUM-
	S12	3 3 4	18	4			S12 - SILTY SAND (SM); Similar to S8. -ALLUVIUM-
	S13	2 3 14	18	8			S13 - Top 5" SILTY SAND (SM); Similar to S8. -ALLUVIUM- S13 - Bottom 3" SILTY SAND (SM); fine quartz sand; ~20-30% nonplastic fines; gray. -ALLUVIUM-
40	S14	5 9 27	18	5			S14 - SILTY SAND (SM); Similar to Bot S13; oxidized lenses ~1/4" thick; orange. -ALLUVIUM-
	S15	16 29 38	18	8			Estimated Top of Sand & Gravel, 41.0 ft. ~41.0-~43.6', -SAND & GRAVEL- S15 - SILTY SAND WITH GRAVEL (SM); fine to coarse sand; ~15-25% nonplastic fines; ~15-25% round to subrounded gravel; orange/brown. -SAND & GRAVEL-
	S16	30 57 43/1"	18	11			S16 - SILTY GRAVEL WITH SAND (GM); fine to coarse gravel, max size 1-1/4"; ~15-20% nonplastic fines; ~15-25% fine to coarse sand; orange/brown. -SAND & GRAVEL-
45							Bottom of Borehole, Estimated Top of Bedrock, 43.6 ft.
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-610

PAGE: 1 OF 2

DATE:11/3/2001 / 11/3/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 641.55
NORTHING: 1041858.099 EASTING: 1443983.5
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 18+00 DOWNSTREAM OFFSET (FT): 122
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 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
							0-~22.0', -EMBANKMENT FILL-
15	S1	7 12 15	18	15			S1 - SANDY SILT (ML); low plasticity fines; ~30-40% fine micaceous sand; red/brown; oxidized zones. -EMBANKMENT FILL-
	S2	9 8 17	18	14			S2 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S3	8 12 24	18	16			S3 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
20	S4	8 12 19	18	13			S4 - SANDY SILT (ML); Similar to S1. -EMBANKMENT FILL-
	S5	5 25 45	18	13			S5 - Top 10" SANDY SILT (ML); Similar to S1; ~2" piece of wood. -EMBANKMENT FILL-
	S6	8 20 10	18	8			Estimated Top of Drain Layer, 22.0 ft. ~22.0-~24.0', -DRAIN LAYER- S5 - Bottom 3" SILTY SAND (SM); fine quartz sand; ~20-30% nonplastic fines; gray/brown. -DRAIN LAYER-
25	S7	10 17 12	18	11			S6 - SILTY SAND (SM); Similar to Bot S5. -DRAIN LAYER- Estimated Top of Alluvium, 24.0 ft. ~24.0-~41.7', -ALLUVIUM- S7 - SILT WITH SAND (ML); medium plasticity, slightly clayey fines; ~15-20% fine sand; organic material. -ALLUVIUM-
	S8	3 2 5	18	15			S8 - SILT WITH SAND (ML); Similar to S7. -ALLUVIUM-
	S9	2 2 2	18	14			S9 - Top 11" SILT (ML); medium to high plasticity fines; gray; Sv=0.2, 0.25 tsf. -ALLUVIUM-
	S10	1 1 5	18	16			S9 - Bottom 3" SANDY SILT (ML); medium to high plasticity; ~30-40% fine sand; organic material throughout; gray. -ALLUVIUM-
30	S11	WOH 3	18	0			

GEI Consultants, Inc.	LOG OF DRILL HOLE	CUD-610
		PAGE: 2 OF 2
		DATE:11/3/2001 / 11/3/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		5					S10 - Top 10" SILT (ML); low to medium plasticity fines; ~5-10% fine sand; gray with orange/brown sand. -ALLUVIUM-
	S12	3 3 6	18	13			S10 - Bottom 6" SILT (ML); medium to high plasticity; gray with orange oxidized spots; Sv=0.4, 0.35 tsf. -ALLUVIUM-
	S13	2 3 10	18	12			S11 - No Recovery; Attempted with 2" & 3" OD split spoons.
							S12 - SILT (ML); low to medium plasticity fines; ~5-10% fine sand; gray with orange/brown sand; Sv=0.3, 0.29 tsf. -ALLUVIUM-
35	S14	4 5 7	18	8			S13 - Top 6" SILT (ML); Similar to S12; with gray/brown. -ALLUVIUM-
							S13 - Bottom 6" SILTY SAND (SM); fine sand; ~30-40% nonplastic fines; gray/brown. -ALLUVIUM-
	S15	1 1 2	18	10			S14 - SILTY SAND (SM); Similar to Bot S13. -ALLUVIUM-
	S16	2 1 2	18	14			S15 - SILTY SAND (SM); fine, micaceous sand; ~20-30% slight plasticity fines; organic material; black/gray. -ALLUVIUM-
							S16 - SILTY SAND (SM); Similar to S15. -ALLUVIUM-
	S17	3 4 18	18	15			S17 - SILTY SAND (SM); fine, micaceous sand; ~30-40% nonplastic fines; gray. -ALLUVIUM-
40	S18	17 18 43	18	10			S18 - Top 8" SILTY SAND (SM); Similar to S17; ~1" piece of organic debris (root/tree). -ALLUVIUM-
							Estimated Top of Sand & Gravel, 41.7 ft.
	S19	17 19 36	18	8			~41.7'-45.0', -SAND & GRAVEL-
							S18 - Bottom 2" SILTY GRAVEL (GM); gravel broken when getting out of shoe of spoon; ~15-30% nonplastic fines; quartz rich. -SAND & GRAVEL-
	S20	17 30 43	18	7			S19 - SILTY GRAVEL WITH SAND (GM); fine to coarse, round to subangular gravel, max size ~1"; ~20-30% low plasticity fines; ~15-20% fine to coarse sand; orange oxidized color. -SAND & GRAVEL-
45							S20 - SILTY GRAVEL WITH SAND (GM); Similar to S19. -SAND & GRAVEL-
							Bottom of Borehole, 45.0 ft.
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-611

PAGE: 1 OF 2

DATE: 11/4/2001 / 11/5/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 643.70
NORTHING: 1041963.821 EASTING: 1444107.462
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 19+65 DOWNSTREAM OFFSET (FT): 117
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 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-~26.8', -EMBANKMENT FILL-
20	S1	5 4 7	18	15			S1 - SANDY SILT (ML); low plasticity fines; ~30-40% fine, micaceous sand; brown/red. -EMBANKMENT FILL-
	S2	4 4 6	18	4			S2 - SILTY GRAVEL (GM); coarse gravel, max size 1-1/4"; red/brown. -EMBANKMENT FILL-
	S3	5 4 7	18	4			S3 - SILTY SAND (SM); fine, micaceous sand; ~20-30% low plasticity fines; brown/orange. -EMBANKMENT FILL-
25	S4	4 6 12	18	15			S4 - SILTY SAND (SM); Similar to S3; clayey sections tan. -EMBANKMENT FILL-
	S5	5 7 12	18	13			S5 - Top 7" SILTY SAND (SM); Similar to S4. -EMBANKMENT FILL-
	S6	4 6 19	18	17			Estimated Top of Alluvium, 26.8 ft. ~26.8-~41.75', -ALLUVIUM- S5 - Bottom 6" SILT (ML); low to medium plasticity; tan with orange sandy oxidized spots; Sv=0.55, 0.55 tsf. -ALLUVIUM-
30	S7	5 9 10	18	12			S6 - SILT (ML); Similar to Bot S5; Sv=0.50, 0.45 tsf. -ALLUVIUM- S7 - Top 3" SILT (ML); Similar to Bot S5; Sv=0.4 tsf. -ALLUVIUM-
	S8	4 5 10	18	14			S7 - Bottom 9" SILTY SAND (SM); fine to very fine sand; ~30-40% medium plasticity fines; tan/brownish orange. ALLUVIUM-
	S9	5 6 10	18	18			S8 - SILT (ML); medium plasticity; homogeneous with ~1/16" orange/brown sandy layers; tan/gray; Sv=0.40 tsf. -ALLUVIUM-
	S10	4 4 6	18	13			S9 - Top 14" SILT WITH SAND (ML); Similar to S8; ~15-25% fine sand; Sv=0.50 tsf. -ALLUVIUM-
35	S11	3 3	18	18			S9 - Top 4" SANDY SILT (ML); medium plasticity fines; ~20-30% fine sand; gray/brown. -ALLUVIUM- S10 - Top 7" SANDY SILT (ML); medium plasticity fines; ~20-30% fine sand; tan. -ALLUVIUM-

GEI Consultants, Inc.	LOG OF DRILL HOLE	CUD-611
		PAGE: 2 OF 2
		DATE:11/4/2001 / 11/5/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		5					S10 - Bottom 5" SILT WITH SAND (ML); medium to high plasticity fines; ~10-20% fine sand; gray/black. -ALLUVIUM-
	S12	WOH 3 3	18	16			S11 - SILT WITH SAND (ML); medium to high plasticity; ~10-30% fine sand; organic material within; gray. -ALLUVIUM-
	S13	1 2 4	18	18			S12 - SILT WITH SAND (ML); Similar to S11. -ALLUVIUM-
	S14	8 18 23	18	13			S13 - SANDY SILT (ML); low to nonplastic silt; ~35-45% fine sand; gray. -ALLUVIUM-
40	S15	28 44 56/4"	16	9			S14 - Top 10" SILTY SAND (SM); fine sand; ~20-30% nonplastic fines; gray. -ALLUVIUM-
	S16	34 19 20	18	6			S14 - Bottom 3" SILTY SAND (SM); fine to coarse sand; ~15-30% nonplastic fines; ~5% rounded gravel; orange/brown. -ALLUVIUM-
	S17	17 19 30	18	NA			S15 - SILTY SAND (SM); Similar to Bot S14; highly weathered. -ALLUVIUM-
45							Estimated Top of Sand & Gravel, 41.75 ft.
							~41.75-~44.2', -SAND & GRAVEL-
							S16 - SILTY GRAVEL WITH SAND (GM); fine to coarse; rounded to subrounded gravel, max size 1"; ~20-30% nonplastic fines; ~20% fine to coarse sand; brown/orange weathered. -SAND & GRAVEL-
							Estimated Top of Bedrock, 44.2 ft.
							~44.2-~45.5', -BEDROCK-
							S17 - GRANITE GNIESS; weathered bedrock; orange, black, white. -BEDROCK-
50							Bottom of Borehole, ~45.5 ft.

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-621A

PAGE: 1 OF 1

DATE:12/4/2001 / 12/4/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.38
NORTHING: 1041131.151 EASTING: 1443048.66
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 6+15 DOWNSTREAM OFFSET (FT): 120
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 32.5

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 to 22.0' 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-
							Note: Rip rap/ boulder, ~5-7'.
	T1	PUSH	24	6			??-32.5', -ALLUVIUM-
							T1 - SANDY SILT (ML); Second attempt spoon classification, no recovery first tube attempt; low to nonplastic fines; ~30-40% fine sand; organic material within. -ALLUVIUM-
	T2	PUSH	24	22			T2 - SANDY ORGANIC SOIL (OL); medium plasticity; ~40-50% fine sand; organic odor; black. -ALLUVIUM-
25							
	U1	PUSH	20	20			U1 - SILT WITH SAND (ML); medium plasticity; ~5-10% fine sand; Sv=0.20, 0.20, 0.15 tsf. -ALLUVIUM-
30	U2	PUSH	24	0			U2 - No Recovery; poor seal.
							Bottom of Borehole, 32.5 ft.
35							
40							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-621B

PAGE: 1 OF 1

DATE:12/5/2001 / 12/5/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.54
NORTHING: 1041123.178 EASTING: 1443039.361
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 6+05 DOWNSTREAM OFFSET (FT): 123
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 31.75

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 to 30.0' 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
25							0.0-??', -EMBANKMENT FILL-
30	U1	PUSH	21	21			??-31.75', -ALLUVIUM-- U1 - SANDY SILT (ML); medium plasticity fines; ~45-55% gray clayey fines; tan/gray. -ALLUVIUM-
							Bottom of Borehole, 31.75 ft.
35							
40							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-622A

PAGE: 1 OF 1

DATE: 12/2/2001 / 12/2/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 640.67
NORTHING: 1041280 EASTING: 1443308.761
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 9+13 DOWNSTREAM OFFSET (FT): 162
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 31.0

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 6" paddle (fish tail).

DEPTH FT.	SAMPLE TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
							0.0-??', -EMBANKMENT FILL-
15	S1^	7 19 31 32	24	14	^ 3" OD Sampler 140 lb Hammer.		??-~15.8', -DRAIN LAYER-
	S2^	9 12 10 12	24	13			S1^ - Top 6" SILTY SAND (SM); fine, quartz sand; ~15-25% nonplastic fines; gray/brown. -DRAIN LAYER- Estimated Top of Alluvium, 15.8 ft. ~15.8-31.0', -ALLUVIUM- S1^ - Bottom 8" SILTY SAND (SM); fine sand; ~30-40% slightly plastic fines; brown/black. -ALLUVIUM-
20	T3	PUSH	24	0			S2^ - SILTY SAND (SM); Similar to Bot S1*. -ALLUVIUM- T3 - No Recovery.
	T4	PUSH	24	16			T4 - SILTY SAND (SM); fine sand; ~30% nonplastic silt; organic odor; black/gray. -ALLUVIUM-
	T5	PUSH	24	NA			T5 - SANDY ORGANIC SOIL (OL); low to medium plasticity fines; ~25-35% fine sand; black/gray; Sv=0.15, 0.20 tsf. -ALLUVIUM-
25	T6	PUSH	24	24			T6 - SILT WITH SAND (ML); low to medium plasticity fines; ~10-25% fine sand; increasing sand content with depth; gray/brown; Sv=0.20 tsf. -ALLUVIUM-
	T7	PUSH	24	19			T7 - SILTY SAND (SM); ~35-45% fine sand; nonplastic fines; gray/brown; Sv=0.20, 0.10 tsf. -ALLUVIUM-
	T8	PUSH	24	NA			T8 - SANDY SILT (ML); low plasticity fines; ~30-40% fine sand; composite sample; brown. -ALLUVIUM-
30							Bottom of Borehole, 31.0 ft.

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-623A

PAGE: 1 OF 2

DATE:12/3/2001 / 12/3/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 642.18
NORTHING: 1041506.1 EASTING: 1443530.43
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 12+30 DOWNSTREAM OFFSET (FT): 120
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman 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 26.0' with 7-3/4" 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	T1	PUSH	24	18			??-~44.0', -ALLUVIUM- T1 - SILTY SAND (SM); fine, micaceous sand; ~25-35% nonplastic fines; organic material within; brown; Sv=0.05 tsf. -ALLUVIUM-
	T2	PUSH	24	20			T2 - SILTY SAND (SM); Similar to T1. -ALLUVIUM-
30	T3	PUSH	24	16			T3 - SILTY SAND (SM); Similar to T1; ~20-30% nonplastic fines; tan. -ALLUVIUM-
	T4	PUSH	24	21			T4 - SILTY SAND (SM); Similar to T3. -ALLUVIUM-
	T5	PUSH	24	0			T5 - No Recovery.
35	T6	PUSH	24	19			T6 - SILTY SAND (SM); fine sand; ~15-25% nonplastic fines; ~1/16" thick black fibrous sections throughout; tan/brown. -ALLUVIUM-
	T7	PUSH	24	0			T7 - No Recovery.
40	S8*	16 7	24	19	* 3" OD Sampler 300 lb Hammer.		S8* - SILTY SAND (SM); fine sand ~15-20% nonplastic fines; minor black organic zones; tan/brown. -ALLUVIUM-

GEI Consultants, Inc.	LOG OF DRILL HOLE	CUD-623A
		PAGE: 2 OF 2
		DATE:12/3/2001 / 12/3/2001

DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	REMARKS	LOG	SOIL / BEDROCK DESCRIPTION
		11 11					
	S9*	4 8 10 19	24	19			S9* - SILTY SAND (SM); fine to medium sand; ~15% nonplastic fines; tan/gray. -ALLUVIUM-
							Estimated Top of Sand & Gravel, 44.0 ft.
	S10*	14 20 25 26	24	14			~44.0-46.0', -SAND & GRAVEL- S10* - SILTY GRAVEL WITH SAND (GM); fine to coarse, rounded to subrounded gravel, max size ~2-1/4"; ~20% nonplastic fines; ~15% fine to coarse sand; gray/tan. -ALLUVIUM-
45							Bottom of Borehole, 46.0 ft.
50							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-624A

PAGE: 1 OF 1

DATE:12/1/2001 / 12/1/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 641.72
NORTHING: 1041857.336 EASTING: 1443980.789
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 17+97 DOWNSTREAM OFFSET (FT): 120
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 24.0' 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
20							0.0-??', -EMBANKMENT FILL-
25	T1	PUSH	24	21			??-38.0', -ALLUVIUM- T1 - CLAYEY SAND (SC); fine sand; ~35-45% low to medium plasticity fines; brown/black; Sv=0.20, 0.25 tsf. -ALLUVIUM-
	T2	PUSH	24	23			T2 - Top Sample Bag SANDY SILT (ML); medium plasticity; ~30-40% fine sand; Sv=0.40, 0.45 tsf. -ALLUVIUM- T2 - Bottom Sample Bag ELASTIC SILT WITH SAND (MH); medium plasticity; ~10-20% sand; minor organic material; gray; Sv=0.3, 0.35, 0.3 tsf. -ALLUVIUM-
	T3	PUSH	24	22			T3 - Top Sample Bag SANDY LEAN CLAY (CL); medium plasticity; ~25% fine sand; gray; Sv=0.30, 0.25 tsf. -ALLUVIUM- T3 - Bottom Sample Bag SANDY LEAN CLAY (CL); medium plasticity; ~35-45% fine sand; Sv=0.2, 0.2 tsf. -ALLUVIUM-
30	T4	PUSH	24	19			T4 - Top Sample Bag SANDY LEAN CLAY (CL); Similar to Bot T3; tan/gray; Sv=0.20, 0.20 tsf. -ALLUVIUM- T4 - Bottom Sample Bag LEAN CLAY (CL); medium plasticity, high dry strength; gray with tan; Sv=0.4, 0.45 tsf. -ALLUVIUM-
	T5	PUSH	24	0			T5 - No Recovery.
	T6	PUSH	24	24			T6 - Top 8" SANDY SILT (ML); low to medium plasticity; ~40-50% fine sand; tan/brown; Sv=0.20 tsf. -ALLUVIUM- T6 - Bottom 16" SILTY SAND (SM); fine sand; ~45% nonplastic organic fines; organic odor; black/gray; Sv=0.05, 0.10 tsf. -ALLUVIUM-
35	T7	PUSH	24	24			T7 - SILTY SAND (SM); Second attempt classification, no recovery first attempt; Similar to Bot T6; except ~30% nonplastic organic fines. -ALLUVIUM-
							Bottom of Borehole, 38.0 ft.
40							

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-624B

PAGE: 1 OF 1

DATE:12/5/2001 / 12/5/2001

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 641.81
NORTHING: 1041855.533 EASTING: 1443977.701
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 17+92 DOWNSTREAM OFFSET (FT): 121
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 36.8

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 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	T1	PUSH	24	22			??-36.75', -ALLUVIUM- T1 - LEAN CLAY WITH SAND (CL); homogeneous, medium plasticity fines; ~15-25% fine sand; gray; Sv=0.30, 0.35 tsf. -ALLUVIUM-
	U1	PUSH	21	0			U1 - No Recovery.
30	U2	PUSH	21	21			U2 - SILT (ML); medium to high plasticity fines; 10-20% fine sand; gray/tan; Sv=0.25, 0.30 tsf. -ALLUVIUM-
	U3	PUSH	21	21			U3 - SIL (ML); medium to high plasticity fines; 10-20% fine sand; brown/gray. -ALLUVIUM-
35	U4	PUSH	21	6			U4 - SANDY SILT (ML); Did not keep sample. -ALLUVIUM-
40							Bottom of Borehole, 36.75 ft.

GEI Consultants, Inc.

LOG OF DRILL HOLE

CUD-624C

PAGE: 1 OF 1

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

PROJECT NAME: Clemson Dams Seismic Remediation
PROJECT NUMBER: 01282-Clemson
LOCATION: Clemson, SC Upper Dam - D/S Berm
GROUND SURFACE ELEVATION (FT): 641.81
NORTHING: 1041853.402 EASTING: 1443974.944
VERT. DATUM: NVGD HOR. DATUM: NAD83
STATION: 17+95 DOWNSTREAM OFFSET (FT): 120
DRILLED BY: U.S. Army Corp of Engineers
LOGGED BY: T. Gilman TOTAL DEPTH (FT): 33.75

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 to 26.0' 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-
25	T1	PUSH	24	23			??-33.75', -ALLUVIUM- T1 - SANDY SILT (ML); homogeneous, medium plasticity; ~40-50% fine sand; tan/gray; Sv=0.30, 0.35, 0.30 tsf. -ALLUVIUM-
	U1	PUSH	21	0			U1 - No Recovery; loss of piston.
30	U2	PUSH	21	21			U2 - SANDY SILT (ML); medium plasticity; gray/tan; Sv=0.35, 0.30 tsf. -ALLUVIUM-
35							Bottom of Borehole, 33.75 ft.
40							