



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-06
SHEET 1 OF 7	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722977.3 N, 456619.7 E (NAD83)
 ELEVATION : 41.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, AWJ rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 0.5 ft bgs on 11/13/07 START : 11/12/2007 END : 11/14/2007 LOGGER : P. De Sa'rego

WATER LEVELS : 0.510BS ON 11/15/07		START : 11/12/2007		END : 11/14/2007		LOGGERS : P. De Saegh	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION		
41.4	0.0	1.5	SS-1	3-4-6 (10)	Topsoil 0.0-0.2' - wood chips, no roots, silica sand		
	1.5				Poorly Graded Sand (SP) 0.2-1.5' - pale yellowish brown, (10YR 8/2), moist, loose, fine grained, no HCl reaction, silica sand, trace nonplastic fines, organic matter at 0.2-0.4'		
5	5.0						
36.4		1.1	SS-2	3-4-5 (9)	Poorly Graded Sand (SP) 5.0-6.1' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), wet, loose, fine grained, no HCl reaction, silica sand, trace nonplastic fines, trace roots		
	6.5						
10	10.0						
31.4		1.4	SS-3	4-4-5 (9)	Poorly Graded Sand (SP) 10.0-11.4' - yellowish gray, (5Y 8/1), wet, loose, fine grained, no HCl reaction, silica sand, trace nonplastic fines		
	11.5						
15	15.0						
26.4		1.3	SS-4	4-5-6 (11)	Sand Silt (ML) 15.0-16.3' - light gray, (N7), wet, stiff, nonplastic, no HCl reaction, 38% fine grained silica sand		
	16.5						
20							



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SHEET 2 OF 7	
SOIL BORING LOG	

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 ELEVATION : 41.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, AWJ rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 0.5 ft bgs on 11/13/07 START : 11/12/2007 END : 11/14/2007 LOGGER : P. De Sa'rego

WATER LEVELS : 0.5 RDS SPT 11/13/07		START : 11/12/2007		END : 11/14/2007		LOGGERS : P. De Saegh	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE		6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
21.4	20.0	1.3	SS-5	3-4-2 (6)	Sandy Fat Clay (CH) 20.0-20.5' - very light gray with very pale blue mottling, (N8 with 5B 8/2), wet, medium stiff, high plasticity, no dilatancy, no HCl reaction, 25-30% very fine to fine grained silica sand		Stop SPT for the day 11/12/07 at 17:00
	21.5				Silty Sand (SM) 20.5-21.3' - very light gray, (N9), wet, loose, fine grained, no HCl reaction, silica sand, 30% low plasticity fines		Resume SPT on 11/13/07 at 08:00
							Water level 0.5' below ground surface
25	25.0						
16.4		0.6	SS-6	0-0-0 (0)	Fat Clay (CH) 25.0-25.6' - pale brown, (5YR 5/2), wet, soft, medium to high plasticity, slow dilatancy, no HCl reaction, trace fine grained silica sand, final 0.05' of sample consists of compacted silica sand or fine grain sandstone		Weight of hammer drove SS-6 (25.0-25.6') through all 18" for SPT
	26.5						
30	30.0						
11.4		0.6	SS-7	31-50/4.5 (81/10.5")	Silt (ML) 30.0-30.6' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 7% fine to medium sand sized, all carbonate materials		
	30.9						
35	35.0						
6.4		0.7	SS-8	25-32-29 (61)	Silty Sand (SM) 35.0-35.7' - grayish orange, (10YR 7/4), wet, dense, fine to coarse grained, mild to moderate HCl reaction, 25% nonplastic fines, 5-10% fine gravel-size limestone fragments, all carbonate material		
	36.5						
	40.0						
	40.3	0.1	SS-9	50/3.5 (50/3.5")	Limestone Fragments 40.0-40.1' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, fragments up to 1/2"		End SPT soil sampling
40							
					Begin Rock Coring at 40.0 ft bgs See the next sheet for the rock core log		



PROJECT NUMBER:

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BORING NUMBER:

CT-06

SHEET 3 OF 7

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722977.3 N, 456619.7 E (NAD83)

ELEVATION : 41.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin

CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 11/13/07

START : 11/12/2007

END : 11/14/2007

LOGGER : P. De Sa'rego

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY		COMMENTS
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS		
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS				
1.4	40.0 R1-NQ 1.5 ft 40%	29	1	40.2' - Mechanical break 40.4-40.8' - Fracture, 80 deg, rough, undulating, open		Limestone 40.0-40.8' - grayish orange, (10YR 7/4), fine grained, moderate HCl reaction, weak (R2), voids (1/16") over 10% of core surface, trace casts to 1/4" No Recovery 40.8-46.5'	Begin coring from 40.0' at 10:30, 11/13/07 (depth of coring start adjusted to remove 0.5' of slough counted on the field log) R1: 8 minutes Driller's Remark: No resistance to drilling at 41.5-46.5', no circulation loss Driller's Remark: Stop to clean mud at 11:30, too much silt/fines R2: 3 minutes	
41.5			NR					
45 -3.6	R2-NQ 5 ft 0%	0	NR					
46.5			5	46.6' - Mechanical break 46.7-46.8' - Fracture, 45 deg, rough, undulating, open		Limestone 46.5-48.5' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), trace to 10% voids up to 1/16", trace cavities up to 3/4"x1-9/16", partly infilled with fossiliferous carbonate material No Recovery 48.5-56.5'	Driller's Remark: Soft at 47.0-48.5', 100% circulation lost at 47.0' R3: 16 minutes	
			4	47.1-47.2' - Fracture (3), horizontal, rough, undulating, loose fragments 1" in size, open				
	R3-NQ 5 ft 40%	13	NR	47.4' - Fracture, 30 deg, rough, planar, 1/4" open 47.7' - Fracture, horizontal, smooth, undulating, <1/16", open, related to cavity at 47.7'				
50 -8.6				47.9' - Fracture, horizontal, rough, undulating, open 47.9-48.1' - Fracture, 60 deg, rough, undulating, 1/8" relief				
51.5				48.4' - Fault, horizontal, smooth, planar to undulating, <1/8" relief				
55 -13.6	R4-NQ 5 ft 0%	0	NR			Limestone 56.5-57.4' - grayish orange, (10YR 7/4), fine to medium grained, mild HCl reaction, weak (R2), voids to 1/16" over 15% of core surface, trace fossil casts and cavities up to 3/8" at 56.5-56.8' No Recovery 57.4-61.5'	Driller's Remark: Soft throughout run R4, still no circulation R4: 4 minutes	
			3	56.65' - Fracture, horizontal, rough, undulating, 1/8" open 56.9' - Fracture, 10 deg, rough, undulating, 1/8" open				
	R5-NQ 5 ft 18%	0	NR	57.0' - Mechanical break 57.1-57.3' - Fracture, 60 deg, rough, undulating to planar, black staining over 80% of surface				
60								



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ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722977.3 N, 456619.7 E (NAD83)

ELEVATION : 41.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin

CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, NW casing ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 11/13/07 START : 11/12/2007 END : 11/14/2007 LOGGER : P. De Sa'rego

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
		R Q D (%)	FRACTURES PER FOOT		DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
					DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		
-18.6						R5: 10 minutes	
61.5			0		Silt With Sand (ML) 61.5-62.9' - grayish orange, (10YR 7/4), wet, hard, nonplastic, mild HCl reaction, 15% fine to very fine sand-sized particles, all carbonate material No Recovery 62.9-71.5'	No SPT taken	
	R6-NQ 5 ft 28%	0	0				
65 -23.6			NR				
66.5						R6: 8 minutes Stop for day 11/13/07 at 17:00 Resume coring on 11/14/07 at 8:00; depth is 66.5' Water level 4.0' below ground surface Casing advanced to 65.0' Driller's Remark: Circulation returned	
70 -28.6							
	R7-NQ 5 ft 0%	0	NR				
71.5						R7: 26 minutes Driller's Remark: Rock fragments lodged in core barrel, likely destroyed sample Driller's Remark: Soft at 71.5-74.5', increased resistance from 74.5-76.5'	
	R8-NQ 5 ft 80%		>10		Limestone 71.5-75.5' - grayish orange, (10YR 7/4), medium grained, mild HCl reaction, extremely weak (R0), no visible voids or cavities No Recovery 75.5-76.5'		
			2				
			2				
			0				
			NR				
75 -33.6							
76.5						R8: 10 minutes	
	R9-NQ 5 ft 62%		2		Limestone 76.5-78.2' - grayish orange, (10YR 7/4), fine to medium grained, mild HCl reaction, weak (R2), trace voids up to 1/16", trace cavities to 3/4"x3/8" 78.2-79.6' - grayish orange, (10YR 7/4), fine to medium grained, mild HCl reaction, extremely weak (R0), no visible voids or cavities No Recovery 79.6-81.5'	Driller's Remark: Circulation loss (100%) at 76.0' Driller's Remark: Medium resistance from 76.5-78.5' Driller's Remark: Hard at 78.5-81.8' Driller's Remark: Soft at 81.5-83.0' Driller's Remark: Hard at 83.0-84.5'	
			>10				
			2				
			0				
80							



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SHEET 5 OF 7

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722977.3 N, 456619.7 E (NAD83)

ELEVATION : 41.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin

CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

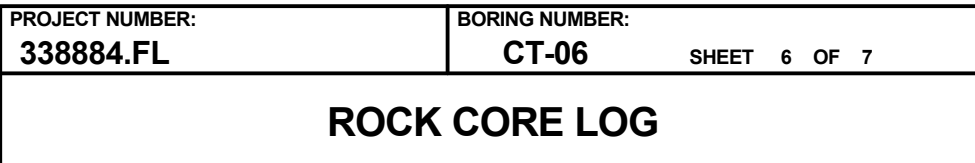
WATER LEVELS : 0.5 ft bgs on 11/13/07

START : 11/12/2007

END : 11/14/2007

LOGGER : P. De Sa'rego

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
-38.6			NR	78.9' - Fracture, horizontal, rough, undulating, tight			
				79.5' - Fracture, 20 deg, rough, undulating, 1/8" open			R9: 11 minutes
81.5			>10	81.5-82.1' - Fracture zone, fine to coarse sand-sized and fine to coarse gravel fragments		Limestone 81.5-83.1' - grayish orange, (10YR 7/4), fine grained, mild HCl reaction, weak (R2), trace voids to 1/16"	
			1	82.1-82.4' - Fracture, 70 deg, rough, undulating, opposing face fractured			
				82.4-82.5' - Fracture, 45 deg, rough, undulating, 1/4" open		No Recovery 83.1-86.5'	
	R10-NQ 5 ft 32%	8	NR	83.0' - Mechanical break			
85							Driller's Remark: Soft at 84.5-85.5'
-43.6							R10: 6 minutes
			>10	86.5-87.1' - Fracture zone, two dominant 60 deg fractures, at 86.5-86.7' and 86.7-87.0', rough and undulating surfaces, multiple fragments of fine gravel size		Limestone 86.5-90.2' - grayish orange, (10YR 7/4), fine grained, moderate HCl reaction, weak (R2), 10-15% coverage of voids up to 1/16", trace cavities up to 3/8"x-9/16", cavities increasing in frequency with depth	Driller's Remark: Hard at 85.5-86.5'
			1	88.05' - Fracture, horizontal, rough, undulating, opposite face at 60°; open			Driller's Remark: Medium drilling at 86.5-88.0'
	R11-NQ 5 ft 74%	32	>10	88.5-88.8' - Fracture zone, several medium gravel-sized fragments, terminates at 60 deg face			
			0	89.1-89.4' - Fracture zone, medium to coarse gravel-sized fragments		No Recovery 90.2-91.5'	
90			NR				R11: 15 minutes
-48.6							
			>10	91.5-91.9' - Fracture zone, medium to coarse gravel-sized fragments		Limestone 91.5-92.5' - grayish orange, (10YR 7/4), fine grained, moderate HCl reaction, weak (R2), 15% coverage of voids up to 1/16", trace cavities/fossil molds up to 1/4"x3/16"	
				92.2' - Fracture, horizontal, rough, undulating, 1/4" open		No Recovery 92.5-96.5'	
	R12-NQ 5 ft 20%	0	NR				
95							R12: 6 minutes
-53.6							
			>10	96.7-97.2' - Fracture zone, coarse gravel-sized fragments		Limestone 96.5-96.7' - Same as 91.5-92.5'	
			NR			96.7-97.2' - very pale orange, (10YR 8/2), fine grained, mild HCl reaction, medium strong (R3)	Driller's Remark: Rock fragments stuck in core barrel at 98.0'; removed barrel to clear, resumed coring 98.0-101.5'
			1	98.1' - Fracture, 10 deg, rough, undulating, open		No Recovery 97.2-97.9'	Core loss assumed to be 97.2-97.9'; lithologic description intervals adjusted accordingly
	R13-NQ 5 ft 86%	35	>10	98.6' - Fracture, horizontal, smooth, undulating, 1/4" open		Limestone 97.9-99.3' - Same as 96.7-97.2' except 2 large cavities (3-7/8"x3/8") at 98.9-99.2'	
100							



WATER LEVELS : 0.5 ft bgs on 11/13/07 START : 11/12/2007 END : 11/14/2007 LOGGER : P. De Sa'rego

DEPTH BELOW WATER LEVEL (ft) SURFACE AND ELEVATION (ft)		CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS				
			R Q D (%)	FRACTURES PER FOOT		DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.			
						DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS					
-58.6	101.5	R14-NQ 5 ft 80%	28	>10		Limestone 99.3-101.5' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak (R2), 15% coverage of voids to 1/16", trace casts/cavities to 3/8x1-3/16" 101.5-105.5' - pale yellowish brown, (10YR 6/2), fine grained, mild HCl reaction, weak (R2), trace to 10% coverage of voids up to 1/8", trace cavities up to 1/4x1/4", large (2-3/8x1-9/16") cavity at 101.8 to 102.0'	R13: 15 minutes				
1				99.7-99.9' - Fracture zone, gravel-sized fragments							
1				100.3' - Fracture, 30 deg, rough, undulating, tight							
>10	101.9' - Fracture, horizontal, rough, undulating, 1/8" open										
3	102.8-102.9' - Fracture zone, gravel-sized fragments										
>10	103.1' - 30 deg, rough, undulating, 1/8" open										
>10	103.1-103.4' - Fracture, vertical, rough, undulating, 1/8" open										
NR	103.4' - Fracture, horizontal, rough, undulating, 1/4" open										
NR	103.8' - Fracture, 40 deg, rough, undulating, 1/8" open										
NR	104.0' - Fracture, 40 deg, rough, undulating, 1/8" open										
105 -63.6	106.5	R15-NQ 5 ft 54%	17	>10		No Recovery 105.5-106.5' Limestone 106.5-109.2' - grayish orange, (10YR 7/4), fine grained, mild HCl reaction, weak (R2), 10% coverage of voids up to 3/16", trace cavities 3/8"x2-3/8" No Recovery 109.2-111.5' Limestone 111.5-112.6' - grayish orange, (10YR 7/4), fine grained, mild HCl reaction, weak (R2), 10% coverage of voids up to 1/16", single 1-9/16"x1-9/16" cavity at 111.9', deep spherical cavity (1-3/16" diameter) at 112.1' No Recovery 112.6-116.5'	R14: 9 minutes				
2				104.2' - Mechanical break							
>10				104.5' - Fracture, 10 deg, rough, undulating, 1/8" open							
NR	104.8-105.0' - Fracture zone, coarse gravel-sized fragments										
NR	105.1-105.3' - Fracture, 60 deg, rough, undulating, tight										
NR	106.5-107.4' - Fracture zone, gravel-sized fragments										
NR	107.5-107.6' - Fracture, 60 deg, rough, undulating, 1/8" open										
NR	108.4' - Fracture, horizontal, rough, undulating, open										
NR	108.7-109.2' - Fracture zone, gravel-sized fragments										
NR	110 -68.6	111.5	R16-NQ 5 ft 22%	15	>10			Limestone 111.6-111.7' - Fracture zone 112.1-112.2' - Fracture zone	R15: 5 minutes		
0	111.6-111.7' - Fracture zone										
NR	112.1-112.2' - Fracture zone										
NR	115 -73.6	116.5	R17-NQ 5 ft 64%	0	0	Well Graded Sand (SW) 116.5-117.5' - grayish orange, (10YR 7/4), wet, loose, fine to coarse grained, mild HCl reaction, trace nonplastic fines, all carbonate material Limestone 117.5-118.1' - grayish orange, (10YR 7/4), fine grained, mild HCl reaction, weak (R2), trace voids to 1/16"	R16: 3 minutes				
>10	116.5-117.5' - unconsolidated silts/sands										
>10	117.8' - Fracture, 80 deg, rough, undulating, tight										
>10	118.0-119.5' - Fracture zone or mechanical break										
1	120										

