



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-09
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724303.2 N, 458022.2 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 2-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 5/3/07 START : 5/1/2007 END : 5/3/2007 LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

WATER LEVELS : 4.0 (RDS) ON 9/9/07			START : 9/12/2007			END : 9/9/2007			LOGGERS : R. Biley, R. Coke, A. Erickson, W. Elliot		
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						
42.9	0.0	1.1	SS-1	1-1-2 (3)	Poorly Graded Sand With Organics (SP) 0.0-1.1' - dark gray to very light gray, (N3 to N8), moist, very loose, fine grained sands, trace nonplastic fines that are primarily organic, trace roots, decreasing with depth, silica sand		Wet at 3.0' below ground surface (SS-1 dry but SS-2 wet)				
	1.5										
5	5.0										
37.9		1.0	SS-2	3-1-2 (3)	Clayey Sand (SC) 5.0-6.0' - dark yellowish brown, (10YR 6/6), brownish black mottling, moist to wet, very loose, fine grained sand, 14% medium plastic fines, 5% concretions up to 1/2" in size, silica sand						
	6.5										
10	10.0										
32.9		0.9	SS-3	5-4-6 (10)	Silt (ML) 10.0-10.9' - grayish yellow, (5Y 8/4), wet, stiff, nonplastic, rapid dilatancy, mild to moderate HCl reaction, trace fine grained sand, trace concretions, carbonate derived						
	11.5										
15	15.0										
27.9		0.9	SS-4	11-2-2 (4)	Silt (ML) 15.0-15.9' - Same as 10.0-10.9' except trace brown-black mottling, soft, trace fine white grained sand, fine to coarse grained sand, carbonate derived						
	16.5										
20											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-09

SHEET 2 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724303.2 N, 458022.2 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 2-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/3/07

START : 5/1/2007

END : 5/3/2007

LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

WATER LEVELS : 4.0 TUBS ON 5/5/07				START : 5/7/2007		END : 5/9/2007		LOGGER : R. Birely, R. Cooke, A. Erickson, W. Elliott	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS		
			RECOVERY (ft)	#TYPE	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		
	6"-6"-6" (N)								
22.9	20.0	0.1	SS-5	50/3 (50/3")	Well Graded Gravel (GW) 20.0-20.1' - dusky yellowish brown, (10YR 2/2), fine to coarse grained gravel-sized concretions, dark yellowish orange staining, fine grained sands, also a single limestone fragment, silica sand		Driller's Remark: 4" HW casing advanced to 23.0' Driller's Remark: Circulation loss Last SPT of 5/1/07		
25	25.0								
17.9		1.2	SS-6	25-37-42 (79)	Silty Sand With Limestone Fragments (SM) 25.0-26.2' - grayish yellow, (5Y 8/4), wet, very dense, moderate HCl reaction, fine to coarse grained sand-sized, 41% nonplastic fines, 15% fine grained gravel-sized limestone fragments, trace white carbonate streaks, trace black with green very fine grained sand, all carbonate derived		SS-6 is first run of 5/2/07, 08:03 water level = +0.8'		
	26.5								
30	30.0								
12.9		1.3	SS-7	27-31-29 (60)	Silty Sand (SM) 30.0-31.3' - Same as 25.0-26.2' except 30-35% nonplastic fines and 10-15% fine sized limestone fragments				
	31.5								
35	35.0								
7.9		1.5	SS-8	29-40-19 (59)	Silty Sand With Limestone Fragments (SM) 35.0-36.5' - Same as 25.0-26.2' except 20% sized limestone fragments				
	36.5								
40									



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338884.FL

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B-09

SHEET 3 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724303.2 N, 458022.2 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 2-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/3/07

START : 5/1/2007

END : 5/3/2007

LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

WATER LEVELS : 4.0 (RDS) ON 9/9/07		START : 9/12/2007		END : 9/9/2007		LOGGER : K. Birely, R. Coke, A. Erickson, W. Elliott	
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		
2.9	40.0	1.5	SS-9	20-40-46 (86)	Sandy Silt (ML) 40.0-41.5' - grayish yellow, (5Y 8/4), moist to wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 33% fine to medium grained sand, all carbonate		
	41.5						
45	45.0						
-2.1		1.5	SS-10	16-22-36 (58)	Sandy Silt (ML) 45.0-46.5' - Same as 40.0-41.5'		
	46.5						
50	50.0						
-7.1	50.3	0.0	SS-11	50/4 (50/4")	No Recovery 50.0-50.3'		
55	55.0						
-12.1	55.4	0.1	SS-12	50/5 (50/5")	Limestone Fragments 55.0-55.1' - grayish yellow, (5Y 8/4), moderate HCl reaction, fine to coarse grained sand and fine sized limestone fragments		
60							Driller's Remark: Last 2.0' were harder drilling, light chatter



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-09
SHEET 4 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724303.2 N, 458022.2 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 2-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 5/3/07 START : 5/1/2007 END : 5/3/2007 LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

WATER LEVELS : 4.0 TDS ON 9/9/07			START : 9/1/2007			END : 9/9/2007			LOGGER : R. Birely, R. Cook, A. Erickson, W. Elliott		
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				
-17.1	60.0	0.1	SS-13	50/4 (50/4")	Limestone Fragments 60.0-60.1' - grayish yellow, (5Y 8/4), mild to moderate HCl reaction Begin Rock Coring at 61.0 ft bgs See the next sheet for the rock core log		Last SPT sample, switching to NQ coring Driller's Remark: 4" HW casing advanced to 60.0'				
65 -22.1											
70 -27.1											
75 -32.1											
80											



PROJECT NUMBER:

338884.FL

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B-09

SHEET 5 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724303.2 N, 458022.2 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

CORING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/3/07

START : 5/1/2007

END : 5/3/2007

LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

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.
61.0	R1-NQ 5 ft 66%	8	4	61.25, 61.55' - Bedding plane or mechanical break (2), horizontal, rough, undulating, open 1/16", shell casts on fracture surface		Limestone 61.0-64.4' - grayish yellow, (5Y 8/4), mild to strong HCl reaction, very weak (R1) (top most) to medium strong (R3) (lower 2/3 sample), voids (<1/16") over 25-30% of surface, moderately fossiliferous (casts, molds), medium gray (N5) staining over lower 2/3 sample, fossils up to 3/8" in size No Recovery 64.4-66.0'	NQ coring assembly, 60.0' 4" HW casing installed, tape measured total depth to 61.0' 14:00 Start coring, using 10.0' sections of NQ barrel
			6	61.7' - Fracture, 50 deg, rough, undulating, tight			
			3	61.95' - Fracture, 80 deg, rough, undulating, black staining in microfractures on surface			
			1	62.1, 62.25' - Bedding plane or mechanical break (2), horizontal, rough, undulating, 1/8" open			
			NR	62.5' - Fracture, 50 to 60 deg, rough, undulating, tight			
65 -22.1	R2-NQ 5 ft 100%	92		62.6' - Mechanical break or fracture, horizontal, rough, undulating, tight		Limestone 66.0-71.0' - grayish yellow, (5Y 8/4), strong HCl reaction, voids (<1/16") over 25-30% of surface, moderate to highly fossiliferous (casts, molds), extremely weak (R0) from 66.0-66.3', rest of sample medium strong rock (R3), grayish stains on rock surface	R1: 3 minutes
66.0			2	62.7' - Fracture, 50 to 60 deg, rough, undulating, tight			
			2	62.9' - Fracture, horizontal, rough, planar, tight			
			2	63.1' - Fracture or mechanical break, horizontal, rough, undulating, open to 3/4"			
			1	63.5, 63.75' - Fractures or mechanical break (2), horizontal, rough, undulating, dark grayish staining, open 1/16"			
70 -27.1	R3-NQ 5 ft 84%	75	2	64.0' - Fracture or mechanical break, 30 deg, rough, undulating, dark grayish staining on surface, tight		71.0-75.2' - stained medium gray, (N5), strong HCl reaction, very weak to weak (R1 to R2) 71.0-71.65' - voids (<5/8") over 5-10% of surface, hard medium dark gray (N4) mineralization and olive gray (5Y 4/1) soft plastic very fine grained infilling 71.65-75.2' - yellowish gray, (5Y 8/1), chalk-like texture, highly fossiliferous (shell fragments, casts, molds), most fossils <1/16" in size up to 3/8" casts 73.0-73.8' - moderate yellowish brown staining, (10YR 5/4), horizontally oriented medium dark gray (N4) 3/8" long fossils 74.3-75.2' - moderate yellowish brown (10yr 5/4) staining, horizontally oriented medium dark gray (N4) 3/8" long fossils No Recovery 75.2-76.0'	SC-1 collected at 68.75-69.65'
			0	66.1, 66.3' - Mechanical break or fractures (2), horizontal, rough, undulating, open up to 1/2"			
			0	67.15' - Fracture, 50 deg, rough, planar, dark staining over 80% of surface, tight			
			1	67.95' - Fracture, 10 to 20 deg, smooth, stepped, tight			
			NR	68.5' - Mechanical break, 10 to 20 deg, rough, undulating, mechanical break to get into box, tight			
75 -32.1	R4-NQ 5 ft 62%	43	0	68.75, 68.85' - Mechanical break or bedding plane (2), 10 to 20 deg, rough, undulating, open 1/16"		76.0-76.65' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, very weak (R1), voids (<1/16") over 5-10% of surface No Recovery 76.65-78.55'	Driller's Remark: Slight (20%) loss of circulation over first foot of run R3: 7 minutes
			1	69.65' - Mechanical break or bedding plane, horizontal, rough, undulating			
			NR	71.1' - Bedding plane or mechanical break, horizontal, rough, undulating, open up to 1/4"			
			2	71.65' - Bedding plane, horizontal, rough, undulating, open to 1/2" contact between 2 colors, infilled voids and soft plastic fines on surface above			
			NR	74.85' - Mechanical break or bedding plane, horizontal, rough, undulating, tight			
			1	76.2' - Mechanical break or fracture, horizontal, rough, planar, open 1/16"		76.0-76.65' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, very weak (R1), voids (<1/16") over 5-10% of surface No Recovery 76.65-78.55'	Driller's Remark: Loss of core interval from 76.65-78.5'
			3	76.4' - Fracture or mechanical break, 30 deg, rough, undulating			
			0	76.65' - Fracture, horizontal, rough, undulating			
80 -37.1				78.5' - Fracture, horizontal, rough, undulating			Driller's Remark: Loss of circulation at approximately 78' (100%)
				79.0, 79.25' - Fractures (2), horizontal, rough, undulating, top and base of crumbled rock fragments, tight			
81.0							SC-2 collected at 79.8-81.0' R4: 25 minutes



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338884.FL

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B-09

SHEET 6 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724303.2 N, 458022.2 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

CORING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, NQ tools, HW casing

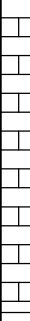
ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/3/07

START : 5/1/2007

END : 5/3/2007

LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

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		
85 -42.1	R5-NQ 5 ft 100%	86	1	79.8' - Bedding plane or mechanical break, horizontal, rough, planar, open <1/16"		Limestone 78.55-81.0' - medium yellow, (5Y 7/6), very fine grained, strong HCl reaction, weak to strong (R2 to R4), voids (<1/16") over 25-30% of surface, trace unfilled cavities, irregularly shaped, poorly fossiliferous (casts) 81.0-85.4' - yellowish gray, (5Y 8/1), white mottled, strong HCl reaction, very weak to weak (R1 to R2), highly fossiliferous (molds, casts) 1" long tubular molds 1/16" diameter, voids (<1/16") over 30-35% of surface, 83.3-84.0' very fine grained "chalk-like" textured layer, below 84.0' highly mottled in bioturbated pockets 85.4-86.0' - olive gray, (5Y 4/1), laminations 1/4" thick of a very fine grained soft fine material 86.0-91.0' - yellowish gray, (5Y 8/1), very fine grained, strong to moderate HCl reaction, weak (R2) 86.0-86.4' - light olive brown (5Y 5/6) bioturbated pockets with voids (<1/16") 86.4-86.7' - very fine grained "chalk-like" textured limestone bed 86.7-90.0' - very fine grained weak (R2) rock, voids or casts (<1/16") over 10-15% of surface, grades to highly fossiliferous medium grained textured limestone, 20-25% white fossil allochems in rock matrix with 30-35% medium gray grains 89.5' - organic clay lens, light olive brown (5Y 5/6) 90.0-91.0' - 30-40% yellowish gray (5Y 7/2) grains in matrix, organic (black) laminations with 3/8" sized grains (black in color) 91.0-95.9' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2) 91.0-93.2' - stained yellowish gray (5Y 7/2), highly fossiliferous (casts, molds up to 3/4"), voids/casts (<1/8) over 20-25% of surface, 10-15% fine to medium grained sized medium dark gray (N4) grains in rock matrix No Recovery 95.9-96.0 Limestone 96.0-101.0' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak (R1), chalk-like texture, highly fossiliferous (casts, spiral-shaped up to 5/8" and molds), voids or casts (<1/16") over 25-30% of surface, trace black grains (organics)	R5: 14 minutes	
			2	81.5' - Mechanical break, 50 to 60 deg, rough, undulating, tight 81.8' - Bedding plane or mechanical break, horizontal, rough, undulating, tight 82.8, 82.9, 83.05' - Bedding plane or mechanical break (3), 30 deg, rough, undulating, tight, fossil casts (up to 1 1/2" size) and molds (of tubular fossils) on surfaces				
			3	83.3' - Bedding plane or mechanical break, horizontal, rough, undulating, open up to 1"				
			0	83.5' - Mechanical break, mechanical break to get into box 83.7' - Bedding plane or mechanical break, horizontal, rough, undulating, slight darker discoloration/staining 84.2' - Mechanical break, 10 deg, rough, undulating, tight				
			1	85.4' - Bedding plane, 0 to 5 deg, rough, undulating, soft fine material infill 1/16" thick 86.2, 86.7' - Bedding plane or mechanical break (2), horizontal, rough, undulating, open 1/8"				
90 -47.1	R6-NQ 5 ft 100%	86	1	87.2' - Mechanical break or bedding plane, horizontal, smooth, planar 87.4' - Fracture, vertical, rough, undulating, black stains over 10-15% of surface 89.25' - Bedding plane, 70 deg, 3/4" thick soft fine infill (olive gray 5Y 3/2)		86.0-86.4' - light olive brown (5Y 5/6) bioturbated pockets with voids (<1/16") 86.4-86.7' - very fine grained "chalk-like" textured limestone bed 86.7-90.0' - very fine grained weak (R2) rock, voids or casts (<1/16") over 10-15% of surface, grades to highly fossiliferous medium grained textured limestone, 20-25% white fossil allochems in rock matrix with 30-35% medium gray grains 89.5' - organic clay lens, light olive brown (5Y 5/6) 90.0-91.0' - 30-40% yellowish gray (5Y 7/2) grains in matrix, organic (black) laminations with 3/8" sized grains (black in color) 91.0-95.9' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2) 91.0-93.2' - stained yellowish gray (5Y 7/2), highly fossiliferous (casts, molds up to 3/4"), voids/casts (<1/8) over 20-25% of surface, 10-15% fine to medium grained sized medium dark gray (N4) grains in rock matrix No Recovery 95.9-96.0 Limestone 96.0-101.0' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak (R1), chalk-like texture, highly fossiliferous (casts, spiral-shaped up to 5/8" and molds), voids or casts (<1/16") over 25-30% of surface, trace black grains (organics)	R6: 21 minutes	
			2	90.0' - Fracture, 70 deg, rough, undulating, light gray staining over 100% of surface, tight 90.45' - Fracture, 30 deg, rough, undulating, tight 91.1, 91.5' - Mechanical break or bedding plane (2), horizontal, rough, undulating, open 1/16"				
			0	91.9' - Mechanical break or bedding plane, horizontal, rough, undulating, open up to 1/2", fossils on surface of break 92.6, 93.65' - Mechanical break (2), horizontal, rough, undulating, tight 94.4' - Mechanical break or bedding plane, horizontal, rough, undulating, tight				
			1	95.25' - Mechanical break or bedding plane, horizontal, rough, planar, shell casts on fracture surface, open 1/16"				
			3	95.55' - Mechanical break or bedding plane, horizontal, rough, undulating, tight, fossil cast on surface 95.65' - Mechanical break or fracture, 30 deg, rough, undulating, open 3/8"-1/4"				
95 -52.1	R7-NQ 5 ft 98%	82	NR	96.3' - Fracture or mechanical break, 30 deg, rough, undulating, tight to open 3/4"		96.0-96.4' - light olive brown (5Y 5/6) bioturbated pockets with voids (<1/16") 96.4-96.7' - very fine grained "chalk-like" textured limestone bed 96.7-99.0' - very fine grained weak (R2) rock, voids or casts (<1/16") over 10-15% of surface, grades to highly fossiliferous medium grained textured limestone, 20-25% white fossil allochems in rock matrix with 30-35% medium gray grains 99.5' - organic clay lens, light olive brown (5Y 5/6) 100.0-101.0' - 30-40% yellowish gray (5Y 7/2) grains in matrix, organic (black) laminations with 3/8" sized grains (black in color) 101.0-105.9' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2) 101.0-103.2' - stained yellowish gray (5Y 7/2), highly fossiliferous (casts, molds up to 3/4"), voids/casts (<1/8) over 20-25% of surface, 10-15% fine to medium grained sized medium dark gray (N4) grains in rock matrix No Recovery 105.9-106.0 Limestone 106.0-111.0' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak (R1), chalk-like texture, highly fossiliferous (casts, spiral-shaped up to 5/8" and molds), voids or casts (<1/16") over 25-30% of surface, trace black grains (organics)	Driller's Remark: Depth to water 4.0' below ground surface Last run on 5/2/07 R7: 20 minutes First core run on 5/3/07 Water level 4.0' below ground surface at 07:49 SC-3 collected at 97.35-98.5'	
			0	98.2' - Fracture or mechanical break, horizontal, rough, undulating, gray staining				
			0	100.25' - Mechanical break, horizontal, rough, undulating, light gray staining, tight				
			1					
			2					
100 -57.1	R8-NQ 5 ft 100%	86	1			R8: 4 minutes		
		0						
		1						
		0						
		2						



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SHEET 7 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724303.2 N, 458022.2 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

CORING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/3/07

START : 5/1/2007

END : 5/3/2007

LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

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.
105 -62.1	R9-NQ 5 ft 96%	42	1	100.55' - Fracture, 50 deg, rough, undulating, tight		Limestone Continuing as 3/4" long x 1/8" wide grains, rock has a medium grained appearance due to medium dark gray (N4) and yellowish gray (5Y 7/2) grains in rock matrix, microforams throughout, trace elongated cavities 9/16"x1/16" rimmed with white (N9) mineral 98.1-101.0' - stained fine to medium grained yellowish gray (5Y 7/2) 101.0-105.8' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak (R1), very fine to medium grained, mixture of visible white (N9), yellowish gray (5Y 7/2) and medium gray (N5) grains, voids or casts (1/16") over 25-30% of surface, spheroidal to elongated in shape, rock has chalk-like feel, casts and molds up to 3/4" visible over upper 2.5' of sample, voids (<1/32"), white spheroidal grains predominant lower 2.5' of sample No Recovery 105.8-106.0' Limestone 106.0-111.0' - same as lower 2.5' of 101.0-105.8' except with areas of bioturbation horizontally oriented, bioturbated areas are yellowish gray (5Y 8/1) with voids (<1/16") over 40-45% of surface, trace cavities up to 3/4", elongate in shape and partially infilled like bioturbated areas, sample grades with depth to a yellowish gray (5Y 8/1) below 109.25' 111.0-116.0' - yellowish gray grading to light gray at 114.5', (5Y 8/1 to N7), very fine grained, strong HCl reaction, very weak (R1), medium to highly fossiliferous 114.5-116.0' - percentage of voids, fossil casts, and cavities increases with depth, voids (1/16" to 3/16") over 15-30% of surface, 5-10% cavities up to 9/16th rimmed with white (N4) mineral (possible mineral replacement in fossil casts), tubular and shell fossil casts up to 3/8" in size, color change also indicative of change from "chalk/powder" like feel to friable/gritty feel with depth, moderately to highly fossiliferous	Driller's Remark: Continued 90-95% loss of circulation
			2	101.3' - Mechanical break or fracture, horizontal, rough, undulating, gray staining over 100% of surface, tight			
			>10	101.65' - Fracture, 80 to 90 deg, rough, undulating, gray staining, tight			
			3	102.0' - Fracture, 10 to 15 deg, rough, undulating, 40% gray staining, tight			
			0	102.5' - Fracture, 80 deg, rough, undulating, >1' length, tight, casts/molds on surface			
			NR	104.15' - Fracture, 5 to 10 deg, rough, undulating, tight, casts/molds on surface			
110 -67.1	R10-NQ 5 ft 100%	100	0	104.3' - Fracture, 80 deg, rough, undulating, light gray staining on 70-80% of surface, tight			R9: 4 minutes
			0	104.7' - Fracture or mechanical break, 30 deg, rough, undulating, open up to 1"			
			1	108.45' - Mechanical break or fracture, horizontal, rough, undulating, brown staining over 80% of surface, tight			
			0	109.2' - Mechanical break, horizontal, rough, stepped, tight			
			0				
			1	110.85' - Mechanical break, 70 deg, rough, undulating, tight			
115 -72.1	R11-NQ 5 ft 100%	98	1	111.1' - Mechanical break or fracture, horizontal, rough, planar, open 1/16"			R10: 4 minutes
			1	112.4' - Fracture or mechanical break, 15 to 20 deg, rough, undulating, open 1/8"			
			0	113.55' - Mechanical break, 20 deg, rough, undulating, tight			
			0				
			0	115.45' - Mechanical break			
			1	116.1' - Fracture or mechanical break, horizontal, rough, planar			
120 -77.1	R12-NQ 5 ft 70%	68	1	117.45' - Fracture or mechanical break, 20 deg, rough, undulating, tight			SC-4 collected at 117.45-118.55'
			1	118.55' - Fracture, 30 deg, rough, planar, open 1/16"			
			1	119.1' - Fracture or mechanical break, horizontal, rough, undulating, tight, fossil casts on surface			
			NR				

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724303.2 N, 458022.2 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

CORING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/3/07

START : 5/1/2007

END : 5/3/2007

LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

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			
125 -82.1	R13-NQ 5 ft 98%	98	1	121.35' - Fracture, 70 deg, rough, undulating, tight		Limestone 116.0-119.5' - fine grained, strong HCl reaction, very weak to weak (R1 to R2), highly fossiliferous (microforams, molds/casts), grades in color from light gray (N7) from 116.0-118.0' to medium gray (N5) from 118.0-119.5', similar sequence to 111.0-116.0', becoming friable, voids and fossils increase in percentage with depth, 5-10% cavities with white (N9) and translucent mineral replacement, cavities are elongated 5/8"x3/8", translucent to clear crystal grains (calcite) (1/32"-1/16"), voids (<1/16") over 35-45% of surface No Recovery 119.5-121.0' Limestone 121.0-125.9' - yellowish gray to light gray, then to medium light gray at 125.0', (5Y 8/1 to N7 to N6), fine grained, strong HCl reaction, very weak (R1), voids/microforams casts (<1/16") over 30-35% of surface, highly fossiliferous (casts, molds, microforams), fossil casts of shells and spiral tubes up to 9/16", echinoderms with white (N9) mineral replacement 9/16" x 3/16" in size, similar to 101.0-105.8' 124.9-125.9' - possible calcite crystals No Recovery 125.9-126.0' Limestone 126.0-128.6' - medium gray to yellowish gray, (N5 to 5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), inverse sequence of 106.0-111.0', grades from friable/gritty to powder-like at 127.5', highly fossiliferous (casts up to 7/8", molds, microforams), 3-7% 3/4" echinoderms (rimmed cavities with white (N9) to translucent mineralization), bottom-most 1' has 3/8" thick horizontal bioturbated lenses No Recovery 128.6-131.0'	R13: 2 minutes		
			2	122.05, 122.1' - Bedding plane or mechanical break (2), 5 to 10 deg, rough, undulating, black speckling as stains on 25% of surface, tight					
			1	123.15, 123.4' - Mechanical break (2), mechanical break to get in to box					
			1	123.55' - Fracture, 60 to 70 deg, rough, undulating, tight					
			0	124.4, 124.65' - Mechanical break, horizontal, rough, undulating, broken by driller, tight					
130 -87.1	R14-NQ 5 ft 52%	22	NR	124.9' - Fracture, 80 deg, rough, undulating, black speckled staining over 60% of surface, tight				Limestone 121.0-125.9' - yellowish gray to light gray, then to medium light gray at 125.0', (5Y 8/1 to N7 to N6), fine grained, strong HCl reaction, very weak (R1), voids/microforams casts (<1/16") over 30-35% of surface, highly fossiliferous (casts, molds, microforams), fossil casts of shells and spiral tubes up to 9/16", echinoderms with white (N9) mineral replacement 9/16" x 3/16" in size, similar to 101.0-105.8' 124.9-125.9' - possible calcite crystals No Recovery 125.9-126.0' Limestone 126.0-128.6' - medium gray to yellowish gray, (N5 to 5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), inverse sequence of 106.0-111.0', grades from friable/gritty to powder-like at 127.5', highly fossiliferous (casts up to 7/8", molds, microforams), 3-7% 3/4" echinoderms (rimmed cavities with white (N9) to translucent mineralization), bottom-most 1' has 3/8" thick horizontal bioturbated lenses No Recovery 128.6-131.0'	R14: 3 minutes
			>10	125.05' - Mechanical break, <5 deg, rough, undulating, black stains, tight					
			1	126.15-126.45' - Fracture zone, subangular and subrounded limestone fragments 3/4"-1-1/8" in size					
			3	127.85' - Fracture or mechanical break, 60 to 70 deg, rough, undulating, tight to open 7/8"					
			NR	128.0' - Fracture or mechanical break, horizontal, rough, planar, tight					
135 -92.1	R15-NQ 5 ft 90%	80	3	128.5' - Fracture or mechanical break, horizontal, smooth, planar, tight				Limestone 121.0-125.9' - yellowish gray to light gray, then to medium light gray at 125.0', (5Y 8/1 to N7 to N6), fine grained, strong HCl reaction, very weak (R1), voids/microforams casts (<1/16") over 30-35% of surface, highly fossiliferous (casts, molds, microforams), fossil casts of shells and spiral tubes up to 9/16", echinoderms with white (N9) mineral replacement 9/16" x 3/16" in size, similar to 101.0-105.8' 124.9-125.9' - possible calcite crystals No Recovery 125.9-126.0' Limestone 126.0-128.6' - medium gray to yellowish gray, (N5 to 5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), inverse sequence of 106.0-111.0', grades from friable/gritty to powder-like at 127.5', highly fossiliferous (casts up to 7/8", molds, microforams), 3-7% 3/4" echinoderms (rimmed cavities with white (N9) to translucent mineralization), bottom-most 1' has 3/8" thick horizontal bioturbated lenses No Recovery 128.6-131.0'	CS-5 collected at 132.3-133.5'
			1	131.3, 131.4' - Mechanical break or fracture (2), horizontal, rough, undulating, open <1/8"					
			0	131.75' - Mechanical break or fault, horizontal, rough, planar, tight					
			2	132.3' - Fracture, 25 deg, rough, undulating, tight					
			0	133.5-133.75' - Mechanical break, 0 to 10 deg, rough, planar, mechanical break to get in to box, tight					
140 -97.1	R16-NQ 5 ft 50%	36	NR	134.55' - Fracture or mechanical break, 5 to 10 deg, rough, undulating, tight to open 1/16"		Limestone 121.0-125.9' - yellowish gray to light gray, then to medium light gray at 125.0', (5Y 8/1 to N7 to N6), fine grained, strong HCl reaction, very weak (R1), voids/microforams casts (<1/16") over 30-35% of surface, highly fossiliferous (casts, molds, microforams), fossil casts of shells and spiral tubes up to 9/16", echinoderms with white (N9) mineral replacement 9/16" x 3/16" in size, similar to 101.0-105.8' 124.9-125.9' - possible calcite crystals No Recovery 125.9-126.0' Limestone 126.0-128.6' - medium gray to yellowish gray, (N5 to 5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), inverse sequence of 106.0-111.0', grades from friable/gritty to powder-like at 127.5', highly fossiliferous (casts up to 7/8", molds, microforams), 3-7% 3/4" echinoderms (rimmed cavities with white (N9) to translucent mineralization), bottom-most 1' has 3/8" thick horizontal bioturbated lenses No Recovery 128.6-131.0'	R15: 3 minutes		
			NR	134.6' - Fracture or mechanical break, 0 to 5 deg, rough, planar, tight to open 1/16"					
			1	136.6' - Fracture or mechanical break, horizontal, rough, undulating, open up to 1"					
			2	137.3' - Bedding plane, horizontal, rough, undulating, open to 5/8"					
			2	137.4' - Mechanical break or fracture, 50 deg, rough, undulating, tight					
			NR	138.1, 138.2' - Fractures (2), rough, undulating, fracture intersecting 70° fractures with 6" lengths, tight		Limestone 121.0-125.9' - yellowish gray to light gray, then to medium light gray at 125.0', (5Y 8/1 to N7 to N6), fine grained, strong HCl reaction, very weak (R1), voids/microforams casts (<1/16") over 30-35% of surface, highly fossiliferous (casts, molds, microforams), fossil casts of shells and spiral tubes up to 9/16", echinoderms with white (N9) mineral replacement 9/16" x 3/16" in size, similar to 101.0-105.8' 124.9-125.9' - possible calcite crystals No Recovery 125.9-126.0' Limestone 126.0-128.6' - medium gray to yellowish gray, (N5 to 5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), inverse sequence of 106.0-111.0', grades from friable/gritty to powder-like at 127.5', highly fossiliferous (casts up to 7/8", molds, microforams), 3-7% 3/4" echinoderms (rimmed cavities with white (N9) to translucent mineralization), bottom-most 1' has 3/8" thick horizontal bioturbated lenses No Recovery 128.6-131.0'	R16: 6 minutes		

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724303.2 N, 458022.2 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

CORING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

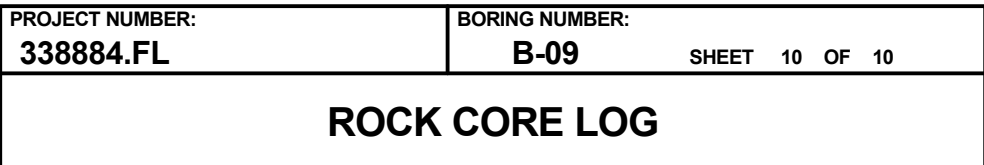
WATER LEVELS : 4.0 ft bgs on 5/3/07

START : 5/1/2007

END : 5/3/2007

LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

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ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

CORING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/3/07

START : 5/1/2007

END : 5/3/2007

LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

WATER LEVEL: 140.4 bgs on 5/3/07		START: 10/7/2007		END: 10/2/2007		LOGGERS: R. Bish, R. Cole, A. Erickson, W. Elmer	
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			
						Limestone 146.0-150.2' - yellowish gray, (5Y 7/2), strong HCl reaction, weak (R2) to medium strong (R3) rock, voids (<1/16") over 10-15% of surface, poorly fossiliferous (casts, molds, some echinoderms), medium grained intervals have barely visible distinct grain colors, yellowish gray (5Y 7/2) and light gray (N6), fine grained intervals are yellowish gray (5Y 8/1) in color and have voids (<1/16") over 20% of surface, trace infilled cavities up to 1/4" diameter 149.6-150.2' - horizontal bedding No Recovery 150.2-151.0' Bottom of Boring at 151.0 ft bgs on 5/3/2007	