

Appendix 2BB
GEOTECHNICAL BORING LOGS



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-01

SHEET 1 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723879.2 N, 457603.8 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 03/15/07

START : 3/14/2007

END : 3/21/2007

LOGGER : R. Bitely

WATER LEVELS : 2 HDS ON 03/10/07			START : 3/14/2007		END : 3/21/2007		LOGGERS : R. Wiley		
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			
41.6								"Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" Water at 6' below ground surface	
	3.5								
5	5.0	1.0	SS-1	5-4-3 (7)	Poorly Graded Sand With Silt (SP-SM) 3.5-4.5' - very pale orange to moderate yellowish brown, (10YR 8/2 to 10YR 5/4), wet, loose, very fine to fine grained, 10-15% fines, nonplastic, <10% root matter and organic material, trace concretions up to 1/4", very fine silica sand and silt in an iron matrix			Few dense lenses from 5.0-8.5', thin, relatively consistent drilling rate (moderately rapid)	
36.6									
	8.5								
	9.4	0.5	SS-2	9-50/5 (59/11")	Limestone Fragments 8.5-8.75' - very pale orange, (10YR 8/2), strong HCl reaction, gravel-sized, subrounded to angular, up to 1"x1-1/2" Silt (ML) 8.75-9.0' - grayish orange, (10YR 7/4), moist to wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 10-15% very fine to medium grained sand, all carbonate derived			Very hard from 9.0-12.5', possible limestone lenses, light chatter, extremely slow advancement rate	
10									
31.6									
	13.5							Relatively consistent from 12.5-28.5', moderately rapid drilling rate	
	15.0	0.8	SS-3	27-17-4 (21)	Silt With Limestone Fragments (ML) 13.5-14.3' - very pale orange, (10YR 8/2), wet, very stiff, nonplastic, mild to moderate HCl reaction, 10-15% very fine to fine grained sand, 3 limestone lenses (<1/2") at 13.5', 13.7' and 14.0', all carbonate derived				
15									
26.6									
	18.5								
	20.0	1.3	SS-4	40-54-50 (104)				SS-4 actual sample depth is 18.5-20.0'	
20									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-01

SHEET 2 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723879.2 N, 457603.8 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 03/15/07

START : 3/14/2007

END : 3/21/2007

LOGGER : R. Bitley

WATER LEVELS : 2.10 fgs on 03/10/07			START : 3/14/2007		END : 3/21/2007		LOGGER : R. Biley	
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	
21.6					Sandy Silt (ML) 18.5-19.75' - very pale orange, (10YR 8/2), moist, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 35-40% very fine to fine grained sand, all carbonate derived			
23.5								
25		1.5	SS-5	17-24-31 (55)	Sandy Silt With Limestone Fragments (ML) 23.5-25.0' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 20% fine to coarse gravel, limestone fragments are extremely weak rock (R0); similar to 18.5-19.75'			
16.6								
28.5								
29.3	0.8	SS-6	34-50/3.5 (84/9.5")		Silty Sand With Limestone Fragments (SM) 28.5-29.25' - Same as 23.5-25.0' except 72% fine to medium grained sand, interbedded with limestone lenses (<1/2") at 28.5-28.8' and intermittent throughout		Slow advancement rate from 28.5-33.5' with several dense lenses <0.5' thick, associated with light chatter	
30								
11.6								
33.5								
33.7	0.2	SS-7	50/2.5 (50/2.5")		Limestone Fragments 33.5-33.7' - grayish orange to dusky yellowish brown, (10YR 7/4 to 10YR 2/2), mild to moderate HCl reaction, gravel-sized limestone fragments up 1-1/2" diameter, sample includes 1/2" thick iron cemented lenses that have no HCl reaction			
35								
6.6								
38.5								
39.6	1.1	SS-8	28-35-50/1 (85/7")				Extremely dense from 39.0-46.0', slow drilling with light to heavy rig chatter	
40								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-01
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723879.2 N, 457603.8 E (NAD83)
 ELEVATION : 41.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2 ft bgs on 03/15/07 START : 3/14/2007 END : 3/21/2007 LOGGER : R. Bitley

WATER LEVELS : 2.10 BGS ON 03/19/07			START : 3/14/2007		END : 3/21/2007		LOGGER : R. Gray		
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			
21.6					Sandy Silt (ML) 18.5-19.75' - very pale orange, (10YR 8/2), moist, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 35-40% very fine to fine grained sand, all carbonate derived			Slow advancement rate from 28.5-33.5' with several dense lenses <0.5' thick, associated with light chatter	
23.5									
25	1.5	SS-5	17-24-31 (55)		Sandy Silt With Limestone Fragments (ML) 23.5-25.0' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 20% fine to coarse gravel, limestone fragments are extremely weak rock (R0); similar to 18.5-19.75'				
16.6									
28.5									
29.3	0.8	SS-6	34-50/3.5 (84/9.5")		Sandy Silt With Limestone Fragments (ML) 28.5-29.25' - Same as 23.5-25.0' except 40% fine to medium grained sand, interbedded with limestone lenses (<1/2") at 28.5-28.8' and intermittent throughout				
30									
11.6									
33.5									
33.7	0.2	SS-7	50/2.5 (50/2.5")		Limestone Fragments 33.5-33.7' - grayish orange to dusky yellowish brown, (10YR 7/4 to 10YR 2/2), mild to moderate HCl reaction, gravel-sized limestone fragments up 1-1/2" diameter, sample includes 1/2" thick iron cemented lenses that have no HCl reaction				
35									
6.6									
38.5									
39.6	1.1	SS-8	28-35-50/1 (85/7")						
40								Extremely dense from 39.0-46.0', slow drilling with light to heavy rig chatter	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-01

SHEET 3 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723879.2 N, 457603.8 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 03/15/07

START : 3/14/2007

END : 3/21/2007

LOGGER : R. Bitely

WATER LEVELS : 2 Hubs on 03/19/07			START : 3/14/2007			END : 3/21/2007			LOGGER : R. Blevy		
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				
1.6					Sandy Silt With Limestone Fragments (ML) 38.5-39.58' - olive gray to light olive gray, (5Y 3/2 to 5Y 5/2), wet, hard, low to medium plasticity, slow to rapid dilatancy, moderate to strong HCl reaction, 35% fine to coarse grain sand, trace organic content, limestone interbeds at 38.5-38.7' and intermittently throughout						
43.5											
43.8	0.3	SS-9	50/3 (50/3")		Limestone Fragments 43.5-43.75' - light olive gray, (5Y 6/1), mild HCl reaction, very fine to fine gravel, up to 3/4"x1/2"						
45											
-3.4											
					</						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-01

SHEET 4 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723879.2 N, 457603.8 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

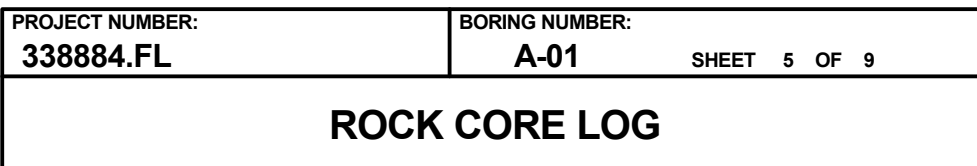
WATER LEVELS : 2 ft bgs on 03/15/07

START : 3/14/2007

END : 3/21/2007

LOGGER : R. Bitely

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.
49.0			0			Limestone 49.0-51.2' - dark yellowish brown, (10YR 4/2), fine grained, extremely weak to very weak (R0 to R1), voids (<3/16") over 70% of surface except from 49.65-50.2' where voids (<1/16") cover <20% of surface, fossiliferous, cavities <1/2"x1/4" over <15% of surface, trace organics	Switch to NQ rock coring tooling at 49.0', drive HW casing to 49', seat casing in <6" rock, flush casing with 3-7/8" tricone bit R1: 5 minutes
50 -8.4	R1-NQ 2.5 ft 88%	42	>10	49.55-49.65, 50.2-50.3' - Fracture zone (2), rough, undulating, with 1" openings			
			2	50.45' - Mechanical break or fracture, 40 deg, rough, undulating, open <3/4"			
			NR	50.75, 50.9' - Bedding plane or mechanical break (2), <10 deg, rough, undulating, open <1/2"			
51.5			0			No Recovery 51.2-51.5' Limestone 51.5-56.4' - moderate yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 60-80% of surface, few cavities <1-1/2"x1" concentrated at 53.8', fossiliferous	
			2	53.0' - Mechanical break or fracture, <10 deg, rough, stepped to undulating, tight			
			0	53.8' - Mechanical break or fracture, <10 deg, rough, undulating, tight at fracture with associated cavity			
55 -13.4	R2-NQ 5 ft 98%	82	2	54.4' - Mechanical break			
			2	55.0, 55.1' - Fractures, 35 deg, rough, undulating, tight			R2: 10 minutes
			3	56.0, 56.2' - Mechanical break or fractures, <10 deg, rough, undulating, open <1/2"			
			NR	56.5-56.8' - Fracture zone, rough, undulating, gravel-sized (<1-1/2"x1"), open		No Recovery 56.4-56.5' Limestone 56.5-60.4' - pale yellowish brown, (10YR 6/2), fine grained, very weak to medium strong (R1 to R3), voids (<3/16") over 85% of surface, fossiliferous, trace organics, extremely weak rock (R0) zones at 56.5-56.8', 58.7', 58.85', 59.5', 59.75-60.0'	Water level at 1' below ground surface at 17:30, end drilling on 03/14/07
			>10	57.0, 57.3, 57.5' - Fractures (3), 50-90 deg, smooth, undulating, intersecting fractures, tight			
			2				
			3	58.7, 58.85, 59.5' - Bedding plane or mechanical break (3), smooth, undulating, tight			
60 -18.4	R3-NQ 5 ft 78%	48	>10	58.95' - Mechanical break			
			NR	59.75-60.0' - Fracture zone, rough, undulating, gravel-sized fragments <1" diameter, open		No Recovery 60.4-61.5'	Water level at 2' below ground surface on 03/15/07 07:30
			NR	61.3' - Bedding plane or mechanical break, rough, undulating, broken along weak bedding planes, tight			R3: 16 minutes
			0			Limestone 61.5-66.45' - pale yellowish brown, (10YR 6/2), very fine to fine grained, weak to medium strong (R2 to R3), voids (<3/16") over 60-80% of surface at 61.5-61.9', 62.5-62.8', 63.5-65.1' and 65.4-66.3', organic material as <1/4" thick laminations at 63.0-65.2' over 20% of surface; very weak rock (R1) at 62.7-63.1', 65.0-65.5' and 66.3', bioturbated with some secondary infilling at 65.5-66.3'	
			1	63.15' - Bedding plane, horizontal, rough, undulating, tight			
			0	63.5, 63.7, 63.95, 64.0, 64.05, 64.4, 64.45, 65.2' - Mechanical break (8)			
65 -23.4	R4-NQ 5 ft 99%	98	0				
			0				
			1				
			NR			No Recovery 66.45-66.5'	R4: 8 minutes
			3	66.7, 67.5, 68.2, 68.5, 70.2, 70.3, 70.55' - Mechanical break or bedding plane (7), <10 deg, rough, undulating, <1/4" openings			
			2	67.3' - Fracture, 70 deg and vertical, rough, stepped to undulating, tight			
	R5-NQ						Driller's Remark: Slight fluid loss in zone



ORIENTATION : Vertical

LOGGER : R. Bitely

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-01

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723879.2 N, 457603.8 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, NW/HW casing









ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 03/15/07

START : 3/14/2007

END : 3/21/2007

LOGGER : R. Bitely

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				
90 -48.4	5 ft 98%	80	1	89.0' - Bedding plane, <10 deg, rough, undulating, open 1/4"		Limestone 83.0-84.5' - mild to moderate HCl reaction, mottled with zones of bioturbation having a secondary infill of a very fine, medium strong rock (R3) matrix, voids (<3/16") over 30% of surface, secondary infilling of bioturbated zone consisting of 20-30% of surface, trace fossil molds No Recovery 86.0-86.5'	R9: 11 minutes	
			0					
			2	90.95' - Bedding plane, horizontal, smooth, undulating, open <1/4"				
91.5	R10-NQ 5 ft 98%	82	NR	91.25' - Mechanical break or bedding plane, 15 deg, rough, undulating, tight		Limestone 86.5-87.05' - moderate yellowish brown to very light gray, (10YR 4/2 to N8), very fine to fine grained, extremely weak to very weak (R0 to R1), grayish blue mottling (5PB 5/2), voids (3/16") over 60-80% of surface from 84.5-86.0' and fossiliferous with trace organics 87.05-89.15' - Same as 86.5-87.05' except very light gray (N8) and grayish blue (5PB 5/2) mottling, voids (3/16") over 50-60% of surface, fossiliferous (microfossils) 89.15-90.7' - fine grained, very weak (R1), voids (<3/16") over 30-50% of surface, moderately fossiliferous 90.7-91.4' - Same as 86.5-87.05' except no mottling No Recovery 91.4-91.5'	R10: 16 minutes	
			1	91.6' - Bedding plane, horizontal, smooth, undulating, tight				
			0	92.9' - Mechanical break				
95 -53.4	R11-NQ 5 ft 100%	98	3	93.85-93.95' - Fracture zone, rough, undulating, 3 fractures, open <1-1/2"		Limestone 91.5-96.4' - moderate yellowish brown to yellowish gray, (10YR 5/4 to 5Y 7/2), very fine to fine grained, extremely weak to weak (R0 to R2) 91.55-91.85' - fine grained, very weak (R1), voids (<3/16") over 30-50% of surface, fossiliferous 91.85-94.6' - moderate HCl reaction, voids (<3/16") over 60-80% of surface, moderately fossiliferous (molds up to 1/2" x 1/4"), few cavities <1/2" diameter, trace organics 94.6-96.4' - strong HCl reaction, gradual transition to >30% voids up to 1/16", 1/4" diameter cavity with medium light gray (N6) clay infill No Recovery 96.4-96.5'	R11: 8 minutes	
			1	95.3' - Fracture, 75 deg, smooth, undulating, tight				
			4	95.85-95.9' - Clay seam, horizontal, smooth, undulating, 3/4" clay infilling, Fat Clay (CH), medium gray (N5), moist, soft, high plasticity				
96.5	R12-NQ 5 ft 96%	86	NR	96.05, 96.35' - Mechanical break or bedding plane (2), <10 deg, rough, undulating, tight		Limestone 96.5-101.5' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids (<3/16") over 70-80% of surface, moderately fossiliferous (molds <1/2"x1/4"), trace organics; 1/2" silt seam at 98.0', slow to fast dilatancy, low plasticity, carbonate material	R12: 3 minutes	
			1	96.85, 97.55' - Bedding plane, <10 deg, rough, undulating, tight				
			2	97.05, 99.0, 99.75, 101.05, 101.4' - Mechanical break (5)				
100 -58.4	R13-NQ		0	98.0' - smooth, undulating, <1/2" silt and/or clay sized infilling				
			0					
			0					
101.5			1	101.55, 102.65, 103.75' - Bedding plane or fractures (3), horizontal, smooth, undulating, tight				
			1					
			1	104.0, 104.85' - Mechanical break				
105 -63.4			0					
			>10	105.5-105.6' - Fracture zone, rough, undulating, gravel sized fragments, <1" diameter				
			NR					
106.5			0					
			1					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-01

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723879.2 N, 457603.8 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

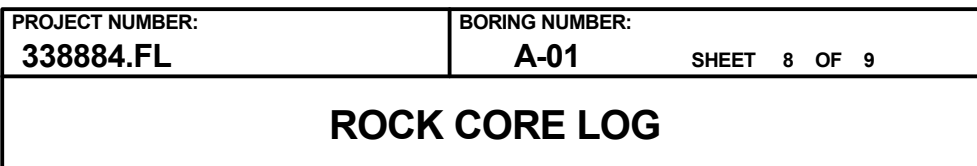
WATER LEVELS : 2 ft bgs on 03/15/07

START : 3/14/2007

END : 3/21/2007

LOGGER : R. Bitely

WATER LEVEL		DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY		COMMENTS
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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		
110 -68.4	5 ft 100%	70	4	108.65' - Fracture, 75 deg, smooth, undulating, tight		Limestone 101.5-106.3' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids (<1/16") over 50% of surface, few cavities up to 1/2"x1/4", poorly to moderately fossiliferous; 105.6-106.05' weak rock (R2) zone, voids (<3/16") over 70% of surface, moderately fossiliferous, moderate HCl reaction at 105.6-106.05'	R13: 10 minutes
	111.5	4	109.1, 109.15, 109.25' - Fractures (3), 90, 30, 50 deg, smooth to rough, undulating, intersecting fractures from 108.7-109.5'				
		3	109.65' - Fractures, 65 deg and 70 deg, rough, undulating, tight				
115 -73.4	R14-NQ 5 ft 100%	100	0	110' - Fracture, 75-85 deg, rough, undulating, tight, intersecting		No Recovery 106.3-106.5' Limestone 106.5-111.5' - moderate yellowish brown to yellowish gray, (10YR 5/4 to 5Y 7/2), very fine to fine grained, strong HCl reaction, very weak (R1), voids (<3/16") over 60-80% of surface, moderately to highly fossiliferous (molds <1/4" diameter) concentrated at 106.5-107.7' and 110.0-110.3', surface iron staining at 106.8', 107.8' and 109.5'	SC-3 collected at 114.2-115.2'
			0	110.5-110.65' - Fracture zone, 50 deg and 70 deg, rough, undulating, open <1-1/2"			
			0	113.35, 114.0, 114.2, 115.2, 116.25, 116.5' - Mechanical break (6)			
			0				
			0				
120 -78.4	R15-NQ 5 ft 97%	92	1	116.6' - Bedding plane, horizontal, smooth, undulating, tight		111.5-116.5' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, very weak (R1), 40% voids to <1/16", poorly to moderately fossiliferous (molds <1/16"), iron staining at 113.8', 114.6' and 115.7'	R14: 7 minutes
			0				
			0	118.85, 119.85' - Mechanical break (2)			
			0				
			2	120.5-120.6' - Fracture zone, 25 deg and horizontal, rough, undulating, intersecting, open <1"			
			NR				
125 -83.4	R16-NQ 5 ft 100%	84	1	121.9' - Bedding plane, horizontal, smooth, undulating, tight		116.5-119.0' except 80% voids up to 3/16", few cavities up to 1/2" diameter, highly fossiliferous (molds <1/2")	R15: 9 minutes
			0				
			0				
			0				
			>10	125.75-126.5' - Fracture zone, rough, undulating, gravel sized fragments <3"x1-1/2"			
			2				
	R17-NQ		1	127.25, 127.45, 127.7, 131.3' - Bedding plane, horizontal, smooth, undulating, tight		119.0-121.35' - Same as 119.0-121.35'	R16: 6 minutes
				128.7, 129.0' - Mechanical break (2)			



ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 03/15/07

START : 3/14/2007

END : 3/21/2007

LOGGER : R. Bitely

APPENDIX 2BB-10



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-01

SHEET 9 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723879.2 N, 457603.8 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 03/15/07

START : 3/14/2007

END : 3/21/2007

LOGGER : R. Bitely

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			
150 -108.4	5 ft 86%	80	1	148.95' - Bedding plane, horizontal, rough, undulating, open <1/4"		Limestone 146.5-150.8' - moderate yellowish brown to yellowish gray, (10YR 5/4 to 5Y 7/2), very fine to fine grained, mild to moderate HCl reaction, laminated bedding, 146.5-148.9' - weak to medium strong rock (R2-R3), voids (<3/16") over 30% of surface, voids increase to 80% from 148.3-148.9' 148.9-150.8' - very weak rock (R1), voids (up to 3/16") over 60% of surface, moderately fossiliferous (casts) concentrated at 148.9-150.0 No Recovery 150.8-151.5' Limestone 151.5-153.45' - Same as 148.9-150.8' except very weak (R1) Silty Sand (SM) 153.45-153.55' - wet, loose, silt has rapid dilatancy, 50% fine to medium grained sand, calcareous, 1/4" thick lense Limestone 153.55-156.5' - pale yellowish brown to yellowish gray, (10YR 6/2 to 5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, medium strong (R3), 50-70% voids up to 3/16", poorly to moderately fossiliferous, laminated bedding concentrated at 155.0-156.5', few cavities <1/2"x1/4", 1 large (3/4"x1/2") cavity at 156.4' 156.5-161.5' - pale yellowish brown, (10YR 6/2), very fine to fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), 60% voids up to 3/16", moderately fossiliferous (molds 3/4"x1/2" diameter), trace organics, trace secondary infill and silt-sized carbonate material at 158.35-158.5' and 160.5', medium strong rock (R3) lense at 158.7-159.7', laminated bedding at 156.5-156.9' and 160.5-160.9' Bottom of Boring at 161.5 ft bgs on 3/21/2007	R21: 13 minutes
			0				
			0				
			NR				
151.5			1	151.85' - Bedding plane, horizontal, rough, undulating, tight		Limestone 151.5-153.45' - Same as 148.9-150.8' except very weak (R1) Silty Sand (SM) 153.45-153.55' - wet, loose, silt has rapid dilatancy, 50% fine to medium grained sand, calcareous, 1/4" thick lense Limestone 153.55-156.5' - pale yellowish brown to yellowish gray, (10YR 6/2 to 5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, medium strong (R3), 50-70% voids up to 3/16", poorly to moderately fossiliferous, laminated bedding concentrated at 155.0-156.5', few cavities <1/2"x1/4", 1 large (3/4"x1/2") cavity at 156.4' 156.5-161.5' - pale yellowish brown, (10YR 6/2), very fine to fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), 60% voids up to 3/16", moderately fossiliferous (molds 3/4"x1/2" diameter), trace organics, trace secondary infill and silt-sized carbonate material at 158.35-158.5' and 160.5', medium strong rock (R3) lense at 158.7-159.7', laminated bedding at 156.5-156.9' and 160.5-160.9' Bottom of Boring at 161.5 ft bgs on 3/21/2007	SC-5 collected 151.85-152.8'
			1				
			0				
			0				
155 -113.4	R22-NQ 5 ft 100%	92	0	153.45-153.55' - Clay seam or bedding plane, horizontal, smooth, undulating, 5/8" silt and/or clay sized infilling, tight		Limestone 153.55-156.5' - pale yellowish brown to yellowish gray, (10YR 6/2 to 5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, medium strong (R3), 50-70% voids up to 3/16", poorly to moderately fossiliferous, laminated bedding concentrated at 155.0-156.5', few cavities <1/2"x1/4", 1 large (3/4"x1/2") cavity at 156.4' 156.5-161.5' - pale yellowish brown, (10YR 6/2), very fine to fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), 60% voids up to 3/16", moderately fossiliferous (molds 3/4"x1/2" diameter), trace organics, trace secondary infill and silt-sized carbonate material at 158.35-158.5' and 160.5', medium strong rock (R3) lense at 158.7-159.7', laminated bedding at 156.5-156.9' and 160.5-160.9' Bottom of Boring at 161.5 ft bgs on 3/21/2007	R22: 14 minutes
			0				
			2	155.65, 156.35' - Bedding plane (2), <10 deg, smooth, undulating, tight			
			3	156.7, 156.8, 156.9' - Bedding plane (3), <10 deg, smooth, undulating, tight			
			0			Limestone 153.55-156.5' - pale yellowish brown to yellowish gray, (10YR 6/2 to 5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, medium strong (R3), 50-70% voids up to 3/16", poorly to moderately fossiliferous, laminated bedding concentrated at 155.0-156.5', few cavities <1/2"x1/4", 1 large (3/4"x1/2") cavity at 156.4' 156.5-161.5' - pale yellowish brown, (10YR 6/2), very fine to fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), 60% voids up to 3/16", moderately fossiliferous (molds 3/4"x1/2" diameter), trace organics, trace secondary infill and silt-sized carbonate material at 158.35-158.5' and 160.5', medium strong rock (R3) lense at 158.7-159.7', laminated bedding at 156.5-156.9' and 160.5-160.9' Bottom of Boring at 161.5 ft bgs on 3/21/2007	
			0				
			0	158.35, 158.6, 159.7' - Mechanical break (3)			
			0				
160 -118.4	R23-NQ 5 ft 100%	92	0			Limestone 153.55-156.5' - pale yellowish brown to yellowish gray, (10YR 6/2 to 5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, medium strong (R3), 50-70% voids up to 3/16", poorly to moderately fossiliferous, laminated bedding concentrated at 155.0-156.5', few cavities <1/2"x1/4", 1 large (3/4"x1/2") cavity at 156.4' 156.5-161.5' - pale yellowish brown, (10YR 6/2), very fine to fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), 60% voids up to 3/16", moderately fossiliferous (molds 3/4"x1/2" diameter), trace organics, trace secondary infill and silt-sized carbonate material at 158.35-158.5' and 160.5', medium strong rock (R3) lense at 158.7-159.7', laminated bedding at 156.5-156.9' and 160.5-160.9' Bottom of Boring at 161.5 ft bgs on 3/21/2007	R23: 7 minutes
			0				
			1	160.65' - Bedding plane, <10 deg, smooth, undulating, tight			Water level at 5' below ground surface on 3/21/2007 at 18:30
161.5							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-02

SHEET 1 OF 13

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ and NWJ rods, 6 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 03/22/07

START : 3/22/2007

END : 4/5/2007

LOGGER : R. Bitely

WATER LEVELS : 1.51005 ON 03/22/07		START : 3/22/2007		END : 4/3/2007		LOGGERS : K. Birey	
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		
41.6	0.0	1.1	SS-1	2-2-4 (6)	Poorly Graded Sand With Organics (SP) 0.0-0.2' - grayish black, (N2), moist, loose, very fine to fine grained, no HCl reaction, sand is silica, trace nonplastic fines, 20% fine organics		"Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" Water level at 1.5' below ground surface SS-1 collected with hammer only, hammer stem is AWJ rod, NWJ used below SS-1 6" tri-cone roller bit used with mud rotary to open bore hole, rapid drilling from 0-10' below ground surface
	1.5				Poorly Graded Sand (SP) 0.2-1.1' - medium light gray, (N6), moist, loose, very fine to fine grained, sand is silica, trace nonplastic fines, 10% organics and roots		
5	5.0						
36.6		0.9	SS-2	3-4-7 (11)	Silty Sand (SM) 5.0-5.9' - light olive gray, (5Y 6/1), wet to moist, medium dense, slow dilatancy, no HCl reaction, fine sand, 22% low plasticity fines		
	6.5						
10	10.0						
31.6	10.3	0.3	SS-3	50/3 (50/3")	Silt With Sand (ML) 10.0-10.25' - dusky yellow, (5Y 6/4), wet, hard, low to medium plasticity, rapid dilatancy, mild to moderate HCl reaction, 25% sand sized grains, trace iron-rich concretions at 10.25', carbonate material with some silica grains (possibly slough)		Extremely slow drilling rate 10.0-14.5'
15	15.0						
26.6		1.3	SS-4	21-30-25 (55)	Silt (ML) 15.0-16.3' - moderate yellow, (5Y 7/6), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 14% fine to medium sand sized grains, carbonate derived		Rapid drilling 14.5-20'
	16.5						
20							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-02

SHEET 2 OF 13

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ and NWJ rods, 6 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 03/22/07

START : 3/22/2007

END : 4/5/2007

LOGGER : R. Bitely

WATER LEVELS : 1.510 DGS 0103/22/07							START : 3/2/2007		END : 4/3/2007		LOGGERS : R. Biley	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS				
			RECOVERY (ft)		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				
	#TYPE	6"-6"-6" (N)										
21.6	20.0	0.1	SS-5	50/2.5 (50/2.5")	Limestone Fragments 20.0-20.1' - grayish yellow, (5Y 8/4), mild HCl reaction, rock fragments to 1/2" with 60% coverage of voids to 1/16"			Slow drilling, trace light chatter 20-21'				
25	25.0							Rapid drilling with intermittent dense zones 21-35'				
16.6	25.4	0.4	SS-6	50/5 (50/5")	Silt With Interbedded Limestone Lenses (ML) 25.0-25.4' - dark yellowish orange, (10YR 6/6), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, limestone lenses <1/2" thick, voids <1/16" over 70% of limestone surface							
30	30.0											
11.6	31.3	1.0	SS-7	15-30-50/3 (80/9")	Silty Sand (SM) 30.0-31.0' - dark yellowish orange, (10YR 6/6), wet, very dense, fine to coarse grained, moderate HCl reaction, 49% nonplastic fines, 1" thick limestone lense at 30.4', few limestone lenses <1/4" thick interbedded throughout, carbonate derived							
35	35.0											
6.6	36.0	0.8	SS-8	15-50/2.5 (65/11.5")	Silty Sand (SM) 35.0-35.8' - Same as 30.0-31.0' except a few siltier lenses <1/2" thick, no limestone lenses							
40								Moderate to heavy chatter increasing with depth, moderate to slow drilling 35-40'				



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-02
SHEET 3 OF 13	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)
 ELEVATION : 41.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ and NWJ rods, 6 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.5 ft bgs on 03/22/07 START : 3/22/2007 END : 4/5/2007 LOGGER : R. Bitely

WATER LEVELS : 1.5 RDBS ON 03/22/07			START : 3/22/2007		END : 4/3/2007		LOGGERS : R. Greig	
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			
			40.0				0.1	SS-9
1.6							Drilling stops at 17:30 on 03/22/2007 Water/mud level 0.5' below ground surface at 07:30, 3/23/07 Continue drilling from 40' with mud rotary NWJ rod and 6" tri-cone bit at 08:00 on 03/23/2007 Extremely slow drilling, light to moderate chatter 40-44'	
45	45.0						44.0-45.0' Drill rate increases slightly 40-44'	
-3.4	46.5	1.3	SS-10	37-50-48 (98)	Sandy Silt (ML) 45.0-46.3' - light olive gray, (5Y 5/2), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 48% fine to coarse grained sand		Rapid drill rate 45-55'	
50	50.0							
-8.4	51.5	1.3	SS-11	12-24-30 (54)	Sandy Silt With Gravel (ML) 50.0-51.3' - moderate olive brown, (5Y 4/4), wet, hard, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 30% sand sized grains, 20% gravel sized grains, few extremely weak (R0) rock limestone lenses <1/2" thick, carbonate derived			
55	55.0							
-13.4	55.8	0.8	SS-12	50-50/3 (100/9")	Sandy Silt With Gravel And Limestone (ML) 55.0-55.5' - Same as 50.0-51.3' except moderate yellowish brown, (10YR 5/4), limestone fragments <1-1/2" x 1/2" thick Silt (ML) 55.5-55.8' - moderate yellowish brown, (10YR 5/4), wet, hard, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 10-15% very fine to fine sand sized grains, carbonate derived Begin Rock Coring at 56.5 ft bgs See the next sheet for the rock core log		HW casing set to 55', clean out casing with 3-7/8" tri-cone to 56' Rock coring begins at 56.5', no sampling from 56.0-56.5'	
60								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-02

SHEET 4 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 03/22/07

START : 3/22/2007

END : 4/5/2007

LOGGER : R. Bitely

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
56.5	R1-NQ 5 ft 86%	74	1	57.1' - Fracture, 30 deg, smooth, undulating, <1/4" open	Limestone 56.5-60.8' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, mild to moderate HCl reaction, very weak to medium strong (R1 to R3), voids (<3/16") over 70% of rock surface from 56.5-58.2', voids (<3/16") variable from trace to 50% of rock surface from 58.2-60.8', trace organics, moderately fossiliferous, few molds/casts <1/4", many molds/casts <3/16" 56.5-58.2; 58.9-60.5' - weak to medium strong (R2 to R3) 58.2-58.9; 60.5-60.8' - very weak (R1) No Recovery 60.8-61.5' Limestone 61.5-66.0' - moderate HCl reaction, extremely weak to medium strong (R0 to R3), trace organics throughout, organic lense at 62.9' <1-1/2" thick (laminated), voids (<3/16") over 70% of surface from 61.7-63.7', voids (<1/16") over 20% of surface from 63.7-66.0', moderately fossiliferous with molds <3/16", few cavities (1" x 1/2") 61.5-61.7; 62.9-63.7' - extremely weak to very weak (R0 to R1) 61.7-62.9; 64.2-66.0' - weak to medium strong (R2 to R3) No Recovery 66.0-66.5' Limestone 66.5-71.4' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, moderate HCl reaction, very weak to medium strong (R1 to R3), trace laminated bedding, trace organics, voids (<3/16") variable for 0-50% of rock surface, poorly fossiliferous 66.5-68.4, 70.0-71.5' - very weak (R1) 68.4-70.0' - weak to medium strong (R2 to R3) No Recovery 71.4-71.5' Limestone 71.5-72.3' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (<3/16") over 40-50% of rock surface, fossiliferous with molds <1/4", trace secondary infilling	R1: 13 minutes
60 -18.4			1			
			2	58.35, 58.5, 58.75' - Fractures (3), <10 deg, rough, undulating, <1/4" open 58.95' - Mechanical break		
			2	59.85' - Fracture (2), 60 deg and 30 deg, smooth, undulating, intersecting fractures		
			0			
61.5	R2-NQ 5 ft 90%	76	NR			R2: 11 minutes
			2	61.7' - Fracture, <10 deg, rough, undulating, <1/2" open 62.1' - Fracture, 15 deg, rough, undulating, <1" open		
			>10	62.6' - Fracture, 70 deg, smooth, undulating, tight		
			1	62.9' - Fracture, <10 deg, rough, undulating, <1-1/2" open 63.7' - Fracture, <10 deg, rough, undulating, <1" open		
65 -23.4			2	64.0, 64.5' - Mechanical break (2) 64.7' - Fracture, <10 deg, rough, undulating, tight		
	R3-NQ 5 ft 98%	98	0	65.35' - Fracture, <10 deg, smooth, undulating, tight		R3: 12 minutes
			0			
			0	67.8, 68.9, 70.8, 71.25' - Mechanical break (4)		
70 -28.4			0			
			0			
71.5	R4-NQ 5 ft 95%	84	NR			SC-1 collected at 72.9-74.0'
			0			
			0	72.85' - Fracture, 65 deg, rough, undulating, tight		
			1	74.0' - Mechanical break 74.35' - Fracture, 15 deg, smooth, undulating, tight		
75 -33.4			0			
			0		R4: 15 minutes	
76.5						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-02

SHEET 5 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 03/22/07

START : 3/22/2007

END : 4/5/2007

LOGGER : R. Bitely

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
80 -38.4	R5-NQ 5 ft 100%	60	NR		Silt (ML) 72.3-72.8' - moist, nonplastic, rapid dilatancy	R5: 11 minutes
			>10		Limestone 72.8-76.25' - Same as 71.5-72.3' except voids (<3/16") over up to 80% of surface	
			1		No Recovery 76.25-76.5' Limestone 76.5-77.0' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 50% of rock surface, trace black organics	
			2		Silt (ML) 77.0-77.3' - moderate olive brown, (5Y 4/4), moist, nonplastic, firm to hard, trace lignite	
			3		Limestone 77.3-78.15' - Same as 76.5-77.0'	
			1		Silt (ML) 78.15-78.25' - Same as 77.0-77.3'	
			0		Limestone 78.25-81.5' - Same as 76.5-77.0' except 1/4" clay lense at 78.8', medium dark gray (N4), plastic, with organics, calcareous, extremely weak to very weak (R0 to R1) from 78.25-79.95' with trace voids and laminated bedding at 78.8'	
			0		79.5-81.5' - weak to medium strong (R2 to R3), voids (<3/16") over 50-80% of surface, few cavities (1-1/2" x 1/2"), some cavities with secondary infilling	
			2		81.5-85.9' - very pale orange to moderate yellowish brown, (10YR 8/2 to 10YR 5/4), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (<3/16") covering 20-70% of surface at 81.5-83.5' and 83.8-84.9' increasing with depth, with secondary infilling, bioturbation accounts for 30% of surface area	
			NR		83.5-83.8' - extremely weak to very weak (R0 to R1), with elastic silt laminations and organics	
85 -43.4	R6-NQ 5 ft 88%	74	1		No Recovery 85.9-86.5' Limestone	R6: 24 minutes
			0			
			2			
			2			
			0			
			NR			
			>10			
			0			
			>10			
			2			
90 -48.4	R7-NQ 5 ft 75%	56	>10			R7: 15 minutes
			0			
			>10			
			2			
			NR			
			1			
			0			
			1			
			0			
			0			
95 -53.4	R8-NQ 5 ft 98%	95	1			R8: 11 minutes
			0			
			1			
			0			
			0			
			1			
			0			
			0			
			1			
			0			
96.5						Stop coring on 03/23/2007



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-02

SHEET 6 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 03/22/07

START : 3/22/2007

END : 4/5/2007

LOGGER : R. Bitely

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			
100 -58.4	R9-NQ 5 ft 100%	100	NR			Limestone 86.5-90.25' - moderate yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), very fine to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids (<3/16") over 50-80% of rock surface, highly fossiliferous with molds (1/4" diameter), trace organics, trace laminated bedding, few cavities (<1-1/2" x 1"), extremely weak (R0) to very weak (R1) from 86.5-86.56' No Recovery 90.25-91.5' Limestone 91.5-96.4' - yellowish gray to moderate yellowish brown, (5Y 8/1 to 10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 70% from 91.5-92.3' and 94.7-96.4', voids (<3/16") over 10-30% of surface from 92.3-94.7'; cavities <1-1/2" x 1/2" partially infilled with silt; clay lense from 94.0-94.05' (elastic silt to fat clay, CH-MH, grayish olive (10YR 4/2), calcareous); fossiliferous especially at 94.7-96.4' No Recovery 96.4-96.5' Limestone 96.5-101.5' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 50% of rock surface, trace laminated bedding, moderately to highly fossiliferous with molds <1/2", few cavities 1" x 1/2" 101.5-106.4' - Same as 96.5-101.5' except strong HCl reaction, trace organic lenses <1-1/2" x 1/4", few cavities <3/4" x 1/2" No Recovery 106.4-106.5' Limestone 106.5-111.45' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids (<3/16") over 50-70% of rock surface, trace laminated bedding, moderately fossiliferous with molds <1/4" in diameter No Recovery 111.45-111.5' Limestone 111.5-116.5' - Same as 106.5-111.45' except poorly to moderately fossiliferous, fossil casts/molds <1/2" x 1/4", laminated bedding over <30% of rock surface	Resume coring at 08:00 on 03/24/2007 Water level at 1' below ground surface R9: 6 minutes
			0	96.8, 98.75, 99.0, 99.2' - Mechanical break (4)			
			0				
			0				
			0				
105 -63.4	R10-NQ 5 ft 98%	98	0			No Recovery 90.25-91.5' Limestone 91.5-96.4' - yellowish gray to moderate yellowish brown, (5Y 8/1 to 10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 70% from 91.5-92.3' and 94.7-96.4', voids (<3/16") over 10-30% of surface from 92.3-94.7'; cavities <1-1/2" x 1/2" partially infilled with silt; clay lense from 94.0-94.05' (elastic silt to fat clay, CH-MH, grayish olive (10YR 4/2), calcareous); fossiliferous especially at 94.7-96.4' No Recovery 96.4-96.5' Limestone 96.5-101.5' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 50% of rock surface, trace laminated bedding, moderately to highly fossiliferous with molds <1/2", few cavities 1" x 1/2" 101.5-106.4' - Same as 96.5-101.5' except strong HCl reaction, trace organic lenses <1-1/2" x 1/4", few cavities <3/4" x 1/2" No Recovery 106.4-106.5' Limestone 106.5-111.45' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids (<3/16") over 50-70% of rock surface, trace laminated bedding, moderately fossiliferous with molds <1/4" in diameter No Recovery 111.45-111.5' Limestone 111.5-116.5' - Same as 106.5-111.45' except poorly to moderately fossiliferous, fossil casts/molds <1/2" x 1/4", laminated bedding over <30% of rock surface	R10: 11 minutes
			0	104.0, 106.35' - Mechanical break (2)			
			0				
			0				
			0				
110 -68.4	R11-NQ 5 ft 99%	42	NR	106.6' - Fracture (2), vertical and horizontal, rough, undulating, <1/2" open		No Recovery 96.4-96.5' Limestone 96.5-101.5' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 50% of rock surface, trace laminated bedding, moderately to highly fossiliferous with molds <1/2", few cavities 1" x 1/2" 101.5-106.4' - Same as 96.5-101.5' except strong HCl reaction, trace organic lenses <1-1/2" x 1/4", few cavities <3/4" x 1/2" No Recovery 106.4-106.5' Limestone 106.5-111.45' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids (<3/16") over 50-70% of rock surface, trace laminated bedding, moderately fossiliferous with molds <1/4" in diameter No Recovery 111.45-111.5' Limestone 111.5-116.5' - Same as 106.5-111.45' except poorly to moderately fossiliferous, fossil casts/molds <1/2" x 1/4", laminated bedding over <30% of rock surface	Driller's Remark: 30-40% loss of circulation at 108.5' R11: 5 minutes
			1	107.7, 108.0, 108.25' - Fractures (4), horizontal and 80-90 deg, rough, undulating, four intersecting fractures, tight			
			4	108.65, 108.8, 108.9, 109.05, 109.15' - Fractures (>5), horizontal and 80-90 deg, rough, undulating, intersecting fractures, tight			
			5	109.6, 109.7, 109.8, 109.95, 110.1, 110.3, 110.6, 110.7' - Fractures (>8), horizontal and 80-90 deg, rough, undulating, intersecting fractures, tight			
			4	111.1, 111.2-111.9' - Fracture zone (2), horizontal and 75-90 deg, rough, undulating, tight			
115 -73.4	R12-NQ 5 ft 100%	68	NR	112.45, 112.65, 112.7, 113.0' 113.1, 113.25' 113.6, 113.7, 113.8'5, 115.3' 115.65' - Bedding plane (17), <10 deg, rough, undulating, tight to 1/4" open		No Recovery 106.4-106.5' Limestone 106.5-111.45' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids (<3/16") over 50-70% of rock surface, trace laminated bedding, moderately fossiliferous with molds <1/4" in diameter No Recovery 111.45-111.5' Limestone 111.5-116.5' - Same as 106.5-111.45' except poorly to moderately fossiliferous, fossil casts/molds <1/2" x 1/4", laminated bedding over <30% of rock surface	SC-3 collected at 114.4-115.3' R12: 5 minutes
			>10	112.6, 112.7, 113.2, 113.3' - Fractures (4), 60-70 deg, rough, undulating, intersecting fractures, tight			
			7				
			1				
			1				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-02

SHEET 7 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 03/22/07

START : 3/22/2007

END : 4/5/2007

LOGGER : R. Bitely

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			
120 -78.4	R13-NQ 5 ft 94%	82	1	116.6' - Fracture, 60 deg, rough, undulating, tight		Limestone 116.5-121.2' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 30-70% of rock surface increasing with depth, moderate to highly fossiliferous increasing with depth, fossil molds/casts <1/2" in diameter, several cavities (<1-1/2" x 1/2"), trace secondary infilling and organics	R13: 5 minutes
			1	118.05' - Bedding plane, horizontal, rough, undulating, <1/4" open			
			0				
			2	120.0' - Fracture, 75 deg, rough, undulating, <1/4" open			
			>10				
125 -83.4	R14-NQ 5 ft 96%	82	NR	121.0-121.3' - Fracture zone, rough, undulating, <1-1/2" angular gravel sized rock fragments		No Recovery 121.2-121.5' Limestone 121.5-123.0' - yellowish gray to pale yellowish brown, (5Y 7/2 to 10YR 6/2), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 30-50% of rock surface, laminated bedding over 20% of surface from 123.0-125.0' with trace secondary infilling and poorly fossiliferous 123.0-125.0' - Same as 121.5-123.0' except granular texture up to medium grained, very fossiliferous, fossil casts/molds <1" x 1/2" 125.0-126.3' - Same as 121.5-123.0' No Recovery 126.3-126.5' Limestone 126.5-131.5' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), laminated bedding from 127.35-127.7', voids (<3/16") over 10-40% of rock surface especially from 126.5-127.35' and 130.35-131.5', poorly to moderately fossiliferous, few fossil molds/casts <1/2" x 1/4", trace secondary infilling, trace cavities <3/4" x 1/2"	Possible loss of circulation, 100% loss of circulation as R14 proceeded R14: 10 minutes
			1	121.8' - Fracture, horizontal, rough, undulating, <1/2" open			
			10	122.55, 122.65, 122.8, 122.9, 123.05' - Bedding plane (5), <10 deg, smooth, undulating, tight to 1/4" open			
			0	122.65, 122.95' - Fractures (2), 80 deg and vertical, rough, undulating, tight			
			0	123.85, 124.5, 124.7' - Mechanical break (3)			
130 -88.4	R15-NQ 5 ft 100%	100	1	125.65' - Bedding plane, horizontal, smooth, undulating, tight			SC-4 collected at 130.4-131.5' R15: 8 minutes
			NR				
			1	127.0' - Fracture, 60 deg, rough, undulating, tight			
			0	127.7' - Bedding plane, 15 deg, smooth, undulating, tight, possible mechanical break			
			0				
135 -93.4	R16-NQ 5 ft 100%	94	0	130.35' - Fracture, horizontal, rough, undulating, <1/4" open		131.5-136.5' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), limestone with voids (<3/16") over 50% of rock surface interbedded with limestone having laminated bedding with trace voids (<3/16"), moderate to highly fossiliferous zones, fossil molds <1/2" x 1/4", trace secondary infilling of cavities	R16: 22 minutes
			1	131.6' - Bedding plane, rough, undulating, <1/2" open, possible mechanical break			
			0				
			0	133.6, 134.0, 136.45' - Mechanical break (3)			
			1	135.15' - Fracture, 45 deg, rough, undulating, tight			
			2				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-02

SHEET 8 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

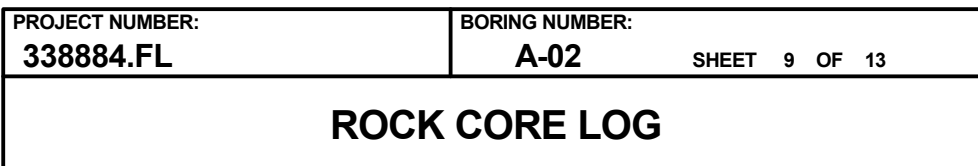
WATER LEVELS : 1.5 ft bgs on 03/22/07

START : 3/22/2007

END : 4/5/2007

LOGGER : R. Bitely

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.
140 -98.4	R17-NQ 5 ft 100%	90	0	135.95, 136.15' - Fracture (2), horizontal, smooth, undulating, to rough, tight		Limestone 136.5-141.5' - yellowish gray to moderate yellowish brown, (5Y 7/2 to 10YR 5/4), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), laminated bedding from 137.5-138.05' and 140.2-140.65', voids (<3/16") over 0-30% of rock surface from 136.5-137.5', 138.05-140.2', and 140.65-141.5'	R17: 9 minutes
			6	137.55, 137.6, 137.9, 137.95, 138.0, 138.05' - Bedding plane (6), <10 deg, smooth to rough, undulating, tight to 1/4" open			
			0	139.0, 140.55, 141.45' - Mechanical break (3)			
			0				
			0				
141.5			3	141.65' - Fracture, 40 deg, rough, undulating, tight		141.5-142.0' - yellowish gray to dark yellowish brown, (5Y 7/2 to 10YR 4/2), very fine to fine grained, mild to moderate HCl reaction, medium strong (R3), minor infilling with medium grained and weak to medium strong (R2 to R3) limestone, trace voids (<3/16") 142.0-145.2' - Same as 141.5-142.0' except voids (<3/16") over 10-30% of rock surface, many cavities (<2" x 1") up to 40% secondary infilling with medium grained limestone, highly fossiliferous with molds and casts <1/2", possibly bioturbated 145.2-145.8' - Same as 141.5-142.0' except laminated bedding, trace voids, poorly fossiliferous No Recovery 145.8-146.5' Limestone 146.5-151.5' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), trace laminated bedding, trace organics, voids (<3/16") over 10% of rock surface, moderately fossiliferous with molds/casts <1" x 1/2", cavities <1/2" diameter from 146.5-146.6' 151.5-151.9' - pale yellowish brown to dark yellowish brown, (10YR 6/2 to 10YR 4/2), fine to medium grained, mild HCl reaction, weak (R2), trace secondary infilling 151.9-154.1' - Same as 151.5-151.9' except very fine to fine grained, medium strong (R3), voids (<3/16") over 20% of rock surface, moderately to poorly fossiliferous,	Water level at 1' below ground surface at 14:30
			1	141.8' - Fracture, 50 deg, rough, undulating, tight			
			3	142.0' - Fracture, <10 deg, rough, undulating, <1/2" open			
			0	142.6' - Mechanical break			
			10	143.3' - Fracture, <10 deg, rough, undulating, <1/4" open			
			0	143.6' - Fracture, 40 deg, rough, undulating, tight			
			NR	144.1' - Fracture, <10 deg, rough, undulating, tight			
145 -103.4	R18-NQ 5 ft 86%	54		144.2-144.25, 144.85-144.9' - Fracture zone (2), <10 deg, rough, undulating, <1" open, subangular to angular rock fragments <1" in diameter		145.2-145.8' - Same as 141.5-142.0' except laminated bedding, trace voids, poorly fossiliferous No Recovery 145.8-146.5' Limestone 146.5-151.5' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), trace laminated bedding, trace organics, voids (<3/16") over 10% of rock surface, moderately fossiliferous with molds/casts <1" x 1/2", cavities <1/2" diameter from 146.5-146.6' 151.5-151.9' - pale yellowish brown to dark yellowish brown, (10YR 6/2 to 10YR 4/2), fine to medium grained, mild HCl reaction, weak (R2), trace secondary infilling 151.9-154.1' - Same as 151.5-151.9' except very fine to fine grained, medium strong (R3), voids (<3/16") over 20% of rock surface, moderately to poorly fossiliferous,	R18: 19 minutes
			0	145.2' - Fracture, 15 deg, rough, undulating, tight			
			1	145.4' - Bedding plane, horizontal, smooth, undulating, tight			
			0	147.85, 149.0' - Mechanical break (2)			
			0	148.05' - Bedding plane, horizontal, smooth, undulating, <1/4" open			
150 -108.4	R19-NQ 5 ft 100%	92		151.15' - Fracture, 60 deg, rough, undulating, possible mechanical break, 1/4" open		151.5-151.9' - pale yellowish brown to dark yellowish brown, (10YR 6/2 to 10YR 4/2), fine to medium grained, mild HCl reaction, weak (R2), trace secondary infilling 151.9-154.1' - Same as 151.5-151.9' except very fine to fine grained, medium strong (R3), voids (<3/16") over 20% of rock surface, moderately to poorly fossiliferous,	R19: 6 minutes
			1	151.9' - Bedding plane, horizontal, smooth, undulating, <1/4" open			
			0	152.0, 152.2, 152.4, 155.95' - Mechanical break (4)			
			1	154.0' - Fracture, 70 deg, rough, undulating, tight			
			6	154.65, 154.7, 154.8, 154.95, 155.05, 155.3' - Bedding plane (6), <10 deg, smooth to rough, undulating, tight to <1/4" open			
155 -113.4	R20-NQ 5 ft 97%	83				151.9-154.1' - Same as 151.5-151.9' except very fine to fine grained, medium strong (R3), voids (<3/16") over 20% of rock surface, moderately to poorly fossiliferous,	SC-5 collected at 152.4-153.25'
			0				
			0				
156.5							R20: 10 minutes



WATER LEVELS : 1.5 ft bgs on 03/22/07 START : 3/22/2007 END : 4/5/2007 LOGGER : R. Bitely

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-02	SHEET 10 OF 13
ROCK CORE LOG		

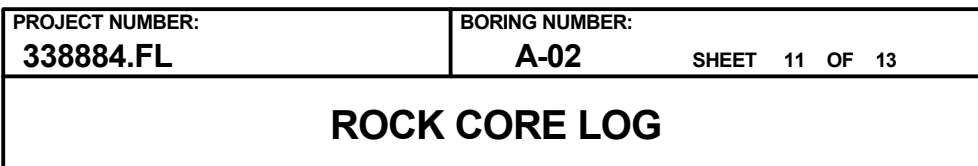
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)

ELEVATION : 41.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 03/22/07 START : 3/22/2007 END : 4/5/2007 LOGGER : R. Bitley

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			
180 -138.4	R25-NQ 5 ft 86%	16	NR	176.6, 179.2' - Mechanical break (2)		No Recovery 176.4-176.5' Limestone 176.5-180.8' - yellowish gray to moderate yellowish brown, (5Y 7/2 to 10YR 5/4), very fine to fine grained, strong HCl reaction, very weak to medium strong (R1 to R3), voids (<3/16") over 5-30% of rock surface, poorly to moderately fossiliferous with fossil molds <1/2" diameter, trace laminations, few cavities <3/4" x 1/4"; zones of very light gray (N8), very fine grained, non-fossiliferous strong rock (R4) at 178.15-178.3' and 178.75-179.35'	R25: 19 minutes
			3	176.8, 177.2, 177.5, 177.7, 178.1, 178.15, 178.3, 178.75, 179.05, 179.35, 179.55, 179.6, 179.65, 179.7, 179.85, 180.15, 180.2, 180.4, 180.45, 180.5, 180.6' - Bedding plane (21), <10 deg, smooth to rough, undulating to planar, tight to <1/4" open			
			5	178.45-178.44, 180.4-180.45, 180.5-180.6' - Fracture zone (3), smooth to rough, undulating, tight to 1/2" open			
			3				
			>10				
185 -143.4	R26-NQ 5 ft 90%	48	10			No Recovery 180.8-181.5' Limestone 181.5-184.8' - yellowish gray to pale yellowish brown, (5Y 7/2 to 10YR 6/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (<3/16") over 30-50% of rock surface, poorly fossiliferous with few fossil molds <1/2" x 1/4" 184.8-186.0' - Same as 181.5-184.8' except trace organics at 184.8', voids (<3/16") over 50% of rock surface, highly fossiliferous with molds 3/4" x 1/4", large cavity at 187.75' (2-1/2" x 1-1/2")	R26: 15 minutes
			NR	181.5-181.65' - Fracture zone, rough, undulating, gravel sized fragments <1" diameter			
			>10	181.7' - Fracture zone, 20 deg, rough, undulating, <1/4" open			
			4	182.7, 182.9, 183.1, 183.4, 183.55, 183.7, 183.75, 183.8, 183.95, 184.1, 184.35' - Bedding plane (11), <10 deg, smooth, undulating, tight to <1/4" open			
			>10	184.15' - Fractures, horizontal and vertical, rough, undulating, multiple intersecting fractures			
190 -148.4	R27-NQ 5 ft 96%	56	1	185.6' - Fracture, <10 deg, rough, undulating, <1/2" open		No Recovery 186.0-186.5' Limestone 186.5-189.5' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, medium strong (R3), interbedded and laminated fine and very fine grained limestone, undulating bedding planes, voids (<1/16") over <20% of rock surface, poorly fossiliferous with fossil molds <1/2" in diameter, several cavities 1-1/2" x 1/2" 189.5-191.3' - Same as 186.5-189.5' except extremely weak to weak (R0 to R2), voids (<3/16") over 50% of rock surface, poorly to moderately fossiliferous, several cavities <1/2"	R27: 10 minutes
			NR	186.6' - Fracture or mechanical break, rough, undulating, <1/2" open			
			2	187.4, 187.65, 187.95, 188.1, 188.3' - Bedding plane (5), <10 deg, smooth, undulating to planar, tight to 1/4" open			
			4				
			0				
195 -153.4	R28-NQ 5 ft 96%	56	>10	189.65, 189.85, 190.5, 190.9, 191.05' - Fractures or mechanical break (5), rough, undulating, <1/2" open			Stop coring at 18:00 on 04/03/2007
			NR	190.5, 190.6, 191.05, 191.3' - Fracture zone (4), rough, undulating, rock fragments up to 1" diameter and sand sized grains			
			2	191.65' - Fracture or mechanical break, <10 deg, rough, undulating, <1/4" open			
			>10	192.45' - Fracture or mechanical break, 20 deg, rough, undulating, <1/2" open			
			3	192.65' - Fracture or mechanical break, <10 deg, rough, undulating, tight			
196.5			2	192.9-193.1' - Fracture zone, rough, undulating, gravel sized fragments <2" diameter		No Recovery 191.3-191.5' Limestone	Water level at 1.0' below ground surface at 18:00, 04/03/2007 R28: 5 minutes
			2	193.35, 193.45, 193.65, 193.8, 194.2, 194.6' - Bedding plane or mechanical break (6), <10 deg, rough, undulating, tight to <1/4" open			
			>10	195.05' - Fracture or mechanical break, horizontal, rough, undulating, tight			



ORIENTATION : Vertical

LOGGER : R. Bitely

Rev. 4







PROJECT NUMBER: 338884.FL	BORING NUMBER: A-02	SHEET 12 OF 13
ROCK CORE LOG		

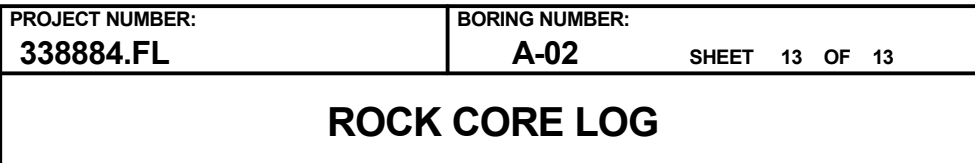
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723946.2 N, 457608.0 E (NAD83)

ELEVATION : 41.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 03/22/07 START : 3/22/2007 END : 4/5/2007 LOGGER : R. Bitely

WATER LEVELS : 1.51665 ON 05/22/07		START : 3/22/2007		END : 4/3/2007		LOGGER : K. Diney		
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				
220 -178.4	R33-NQ 5 ft 38%	0	>10	216.7, 216.9' - Bedding plane (2), <10 deg, smooth, undulating, to rough, tight to <1/4" open 216.9-218.2' - Fracture zone, rough, undulating, gravel sized fragments <2" diameter, stain on surface @ 217.6' (laminated organics)		Limestone 206.5-207.0' - yellowish gray, (5Y 8/1), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), with lenses of extremely weak (R0) rock, voids (<3/16") over 10-30% of rock surface, poorly to moderately fossiliferous with molds/casts <1/2" in diameter, friable 207.0-208.3' - moderate to strong HCl reaction, poorly consolidated silts to very weak (R1) rock, laminated bedding, trace voids in few bedding planes, fossils absent 208.3-209.7' - Same as 206.5-207.0' No Recovery 209.7-211.5'	Formation collapsing on core barrel at 216.5', advance NW casing to 209'	
			>10					
			NR					
			221.5					
225 -183.4	R34-NQ 5 ft 4%	0	>10	221.5-221.7' - Fracture zone or mechanical break, rough, undulating, angular gravel sized fragments <1-1/2" diameter		Limestone 211.5-213.2' - yellowish gray, (5Y 8/1), very fine to fine grained, moderate to strong HCl reaction, extremely weak to weak (R0 to R2), voids (<3/16") over <20% of rock surface, few cavities <1/2" diameter No Recovery 213.2-216.5'	Stop coring at 221.5 at 18:30 on 04/04/2007; water level at ground level Resume coring at 07:00 on 04/05/2007 Recovery loss for R34 due to core barrel blockage at 221.7'	
			>10					
			NR					
			226.5					
230 -188.4	R35-NQ 5 ft 36%	0	>10	226.6, 226.75, 226.9, 226.95, 227.05, 227.2, 227.5' - Fractures or mechanical break (7), <10 deg, rough, undulating, <1" open, gravel sized fragments <1/2" diameter 227.5-228.1' - Fracture zone, rough, undulating, angular gravel sized fragments <1" diameter		Limestone 216.5-218.4' - yellowish gray, (5Y 8/1), very fine to fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 20-40% of rock surface, moderately fossiliferous with molds/casts <1/2" diameter, trace organic laminations No Recovery 218.4-221.5'	R33: 14 minutes	
			>10					
			NR					
			231.5					
235 -193.4	R36-NQ 5 ft 40%	20	0	232.5' - Bedding plane, horizontal, smooth, undulating, <1/8" open 232.6' - Fracture, 60 deg, rough, undulating, tight 232.8-233.5' - Fracture zone, rough, undulating, gravel sized fragments <2" diameter		Limestone 221.5-221.7' - yellowish gray, (5Y 8/1), very fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), voids (<3/16") over 20-30% of rock surface, moderately fossiliferous, with molds/casts <1/2" diameter, few cavities <1/2" diameter No Recovery 221.7-226.5'	R34: 19 minutes	
			>10					
			NR					
			236.5					
						Limestone 226.5-228.3' - yellowish gray, (5Y 7/2), very fine to fine grained, mild to moderate HCl reaction, extremely weak to very weak (R0 to R1), voids (<3/16") over 10-30% of rock surface, poorly to moderately fossiliferous, few cavities <1/4" diameter, trace organics, medium strong (R3) rock from 227.4-227.5' No Recovery 228.3-231.5'	SC-7 collected at 231.5-232.5'	
							R35: 12 minutes	
							R36: 18 minutes	



ORIENTATION : Vertical

LOGGER : R. Bitely

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-03
SHEET 1 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)
 ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 6 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

WATER LEVELS : 1.51005 on 9/17/07			START : 9/10/2007		END : 9/12/2007		LOGGERS : R. Diney, C. Wallestad, N. Jarzyniecki	
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	
42.1								C. Wallestad and N. Jarzyniecki also logged portions of boring A-03
	3.5							
5	5.0	1.2	SS-1	3-4-6 (10)	Poorly Graded Sand With Silt (SP-SM) 3.5-4.7' - very pale orange and dark yellowish orange, (10YR 8/2 and 10YR 6/6), wet, loose, very fine to fine grained, silica sand, 6% nonplastic fines, trace root matter, trace iron cemented sand nodules <1/4" diameter			Moderate to light chatter, slow advancement at 5.0-8.5'
37.1								
	8.5							
10	10.0	0.9	SS-2	3-8-4 (12)	Silt (ML) 8.5-9.4' - pale yellowish orange, (10YR 8/6), wet, stiff, nonplastic to low plasticity, rapid dilatancy, mild to moderate HCl reaction, 5-10% fine to medium grained sand, all carbonate			
32.1								
								Very slow drilling at 11.5-13.5'
	13.5							
		0.0	SS-3	50/1 (50/1")	No Recovery 13.5-13.6'			Rapid advancement
15								
27.1								
	18.5							
	18.8	0.3	SS-4	50/4 (50/4")	Silt With Sand (ML) 18.5-18.8' - pale yellowish orange, (10YR 8/6), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 15-20% fine to medium grained sand, all carbonate			Very dense layer at 18.75', very slow advancement
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-03
SHEET 2 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)
 ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 6 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

WATER LEVELS : 1.51 ft bgs on 9/17/07			START : 9/10/2007		END : 9/12/2007		LOGGERS : R. Grely, C. Wailestad, N. Garzyniec	
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	
22.1								
								Moderate to rapid advancement at 22.5'
	23.5							
		1.5	SS-5	23-36-46 (82)	Silty Sand (SM) 23.5-25.0' - grayish orange, (10YR 7/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 46% nonplastic fines, approximately 5 interbedded extremely weak (R0) limestone lenses <1/2" thick			Sample SS-5 may be weak limestone
25	25.0							
17.1								
	28.5							
		1.5	SS-6	8-9-27 (36)	Silty Sand (SM) 28.5-30.0' - Same as 23.5-25.0' except dark yellowish orange, (10YR 6/6), dense, 1/2" lense of medium plastic silt at 28.6', approximately 5 interbedded limestone lenses up to 1/2" thick			Moderate drilling rate with variable thin, dense zones.
30	30.0							
12.1								
	33.5							
		0.5	SS-7	4-10-50/1.5 (60/7.5")	Silty Sand With Limestone (SM) 33.5-34.0' - Same as 28.5-30.0' except 50% of sample is limestone lenses to 1/2" thick			
35	34.6							
7.1								
	38.5							
		0.9	SS-8	22-50/5 (72/11")				
	39.4							
40								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-03
SHEET 3 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)
 ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 6 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

WATER LEVELS : 1.51005 on 9/17/07				START : 9/10/2007		END : 9/12/2007		LOGGERS : R. Birely, C. Wailestad, N. Garzyniec	
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		
2.1				Silty Sand With Limestone (SM) 38.5-39.4' - olive gray, (5Y 4/1), wet, very dense, fine to coarse grained, moderate HCl reaction, 30% nonplastic fines, with interbedded limestone lenses to 1" thick, all carbonate			Slow drilling with intermittent light chatter at 40.0-43.5'		
43.5									
43.6	0.1	SS-9	50/1 (50/1")	Limestone Fragments 43.5-43.6' - olive gray, (5Y 4/1), mild to moderate HCl reaction, coarse sand to fine gravel-sized fragments (<1/2" in diameter), trace fossils and voids <1/16" Begin Rock Coring at 43.5 ft bgs See the next sheet for the rock core log					
45 -2.9									
50 -7.9									
55 -12.9									
60									

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

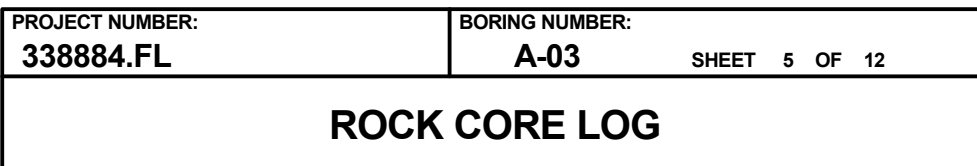
WATER LEVELS : 1.3 ft bgs on 3/11/07

START : 3/10/2007

END : 3/12/2007

LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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		
45 -2.9	43.5	R1-NQ 2.5 ft 90%	88	0	44.65' - Mechanical break	Limestone 43.5-45.9' - moderate yellowish brown, (10YR 5/4), fine grained, weak to extremely weak (R2 to R0), voids (<1/6") over 60-70% of rock surface, hardness decreases with depth, highly to poorly fossiliferous decreasing with depth, trace laminations No Recovery 45.9-46.0' Limestone 46.0-50.3' - moderate yellowish brown, (10YR 5/4), fine grained, very weak to extremely weak (R1 to R0), voids (<3/16") over 40-80% of rock surface increasing with depth, poorly fossiliferous, moderately to highly fossiliferous with fossil molds from 47.7-49.2'	HW casing installed to 43.5'; begin rock coring at 43.5'	
	0							
	1							
	50 -7.9	46.0	R2-NQ 5 ft 86%	77	NR	45.4' - Bedding plane or fracture, <10 deg, rough, undulating, <1/4" open 46.15, 46.25, 46.4' - Bedding plane or mechanical break, 0-<10 deg, smooth, undulating, <1/4" open 46.55, 47.2, 47.85' - Mechanical break 47.4-47.65' - Clay seam 48.5' - Mechanical break 49.25-49.45' - Clay seam 50.25' - Bedding plane or mechanical break, <10 deg, smooth, undulating, tight No Recovery 50.3-51.0'	R1: 5 minutes	
		3						
		1						
		0						
		1						
		1						
		NR						
55 -12.9	51.0	R3-NQ 5 ft 98%	84	0	52.3, 52.5' - Bedding plane or mechanical break, <10 deg, rough, undulating, <1/8" open 52.85' - Fracture or mechanical break, 50 deg, rough, undulating, tight 53.0' - Bedding plane or mechanical break, 35 deg, rough, undulating, tight 53.2' - Fracture or mechanical break, 20 deg, rough, undulating, tight 53.3' - Fracture or mechanical break, 50 deg, rough, undulating, tight 53.45, 53.6' - Mechanical break 54.25' - Fracture or mechanical break, 60 deg, rough, undulating, tight 55.4' - Fracture or mechanical break, <10 deg, rough, undulating, tight 55.7' - Bedding plane or mechanical break, <10 deg, rough, undulating, 1/8" infilling, sand infilling, open 56.55' - Fracture or mechanical break, 30 deg, rough, undulating, tight 57.25, 57.35, 57.5, 57.55, 58.0, 58.4' - Bedding plane or mechanical break, <10 deg, rough, undulating, <1/4" open 59.25' - Bedding plane or mechanical break, <10 deg, smooth, undulating, <1/4" open 59.95' - Bedding plane or mechanical break, horizontal, rough, undulating, <1/2" open 60.2, 60.45' - Bedding plane or mechanical break, <10 deg, rough to smooth, undulating, 1/4" open 61.8' - Fracture or mechanical break, 30 deg, rough, undulating, sandy or fragmented infilling, 1/2" to 1/4" open	R3: 8 minutes		
	4							
	2							
	2							
	2							
	2							
	NR							
	60 -17.9	56.0	R4-NQ 5 ft 90%	67	1	53.45, 53.6' - Mechanical break 54.25' - Fracture or mechanical break, 60 deg, rough, undulating, tight 55.4' - Fracture or mechanical break, <10 deg, rough, undulating, tight 55.7' - Bedding plane or mechanical break, <10 deg, rough, undulating, 1/8" infilling, sand infilling, open 56.55' - Fracture or mechanical break, 30 deg, rough, undulating, tight 57.25, 57.35, 57.5, 57.55, 58.0, 58.4' - Bedding plane or mechanical break, <10 deg, rough, undulating, <1/4" open 59.25' - Bedding plane or mechanical break, <10 deg, smooth, undulating, <1/4" open 59.95' - Bedding plane or mechanical break, horizontal, rough, undulating, <1/2" open 60.2, 60.45' - Bedding plane or mechanical break, <10 deg, rough to smooth, undulating, 1/4" open 61.8' - Fracture or mechanical break, 30 deg, rough, undulating, sandy or fragmented infilling, 1/2" to 1/4" open	R4: 10 minutes	
		5						
		1						
2								
2								
NR								
61.0		R5-NQ						1
1								



WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-03

SHEET 6 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07

START : 3/10/2007

END : 3/12/2007

LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

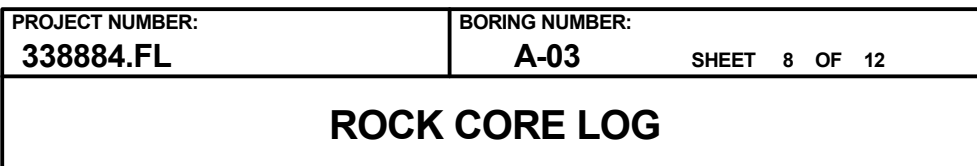
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
85 -42.9	5 ft 98%	84	2	83.6, 83.7' - Bedding plane, rough, undulating		Limestone 81.0-85.35' - yellowish gray to very light gray, (5Y 7/2 to N8), very fine to fine grained, weak to medium strong (R2 to R3), extremely weak at 83.6-83.7', laminated from 81.0-81.4', voids (<1/16") over 30% of rock surface, organics rare from 81.35-81.4', secondary infilling of very fine grained matrix from 81.4-83.6', fossiliferous with molds up to 1/2"x1/4" with some secondary infilling, cavities up to 3" with secondary infilling, voids (3/16") over 80-90%, organics, fossiliferous, and cavities up to 1-1/2", possible bioturbation at 81.4-83.6'	R9: 12 minutes
			0				
			>10				
	86.0		NR	85.55-85.9' - Fracture zone, rough, undulating to stepped			
			>10	86.0-86.3' - Fracture zone, rough, undulating to stepped, intersecting fractures			
			1	86.8-87.0' - Bedding plane, <10 deg, 1/2" clay infilling, 1/2" open			
			0	87.6' - Bedding plane, <10 deg, smooth, undulating, 1/4" open			
	R10-NQ 5 ft 86%	64	0	88.5' - Mechanical break		85.35-85.9' - Same as 81.0-85.35' except extremely weak to very weak (R0 to R1), molds up to 1"x1/4" with some secondary infilling, cavities up to 1-1/2"x1/2", trace organics	R10: 7 minutes
			>10				
			>10	89.7-90.3' - Fracture zone, rough, undulating, intersecting fractures			
			NR			No Recovery 85.9-86.0'	
			0			Limestone 86.0-87.0' - Same as 85.35-85.9' except fat clay (CH) to elastic silt (MH) seams at 86.8' and 87.5', secondary infilling of cavities at 86.65-86.8', cavities up to 1-1/2"x1/2"	End drilling for the day 3/10/07 at 91.0' Resume drilling on 3/11/07 at 91.0', water level is 1.3' below ground surface
			1	92.0, 94.3' - Mechanical break		87.0-87.65' - yellowish gray, (5Y 7/2), very fine to fine grained, extremely weak (R0), fossil molds up to 1/2"x1/4", cavities few, some secondary infilling	
	R11-NQ 5 ft 100%	76	0	92.8' - Bedding plane or mechanical break, <10 deg, smooth, undulating		87.65-90.3' - light olive gray to dark yellowish brown, (5Y 5/2 to 10YR 4/2), very fine to fine grained, very weak to medium strong (R1 to R3), voids (<3/16") over 60% of rock surface, cavities few (up to 1/2"), trace organics, possible bioturbation, very fossiliferous, molds and casts up to 1/4"x1/2"	R11: 24 minutes
			4	94.05, 94.5' - Bedding plane or mechanical break, <10 deg, rough, undulating			
			>10	94.65' - Fracture, smooth, undulating, 1/4" open			
			0	94.75' - Fracture, 50 deg, infilling, up to 1/2" open			
			0	95.1-96.0' - Fracture zone, intersecting fractures			SC-2 collected at 96.0-97.0'
			0			No Recovery 90.3-91.0'	
			0	97.05, 99.5, 96.0-96.2' - Mechanical break		Limestone 91.0-93.0' - dusky yellow, (5Y 6/4), very fine to fine grained, very weak to medium strong (R1 to R3), fossiliferous with casts up to 3/4"x1/2", voids (3/16") over 30% of rock surface, cavities up to 1/2"x1/4" over 15% of rock surface, yellowish gray (5Y 7/2) secondary infilling up to 2"x2" with trace voids (1/16"), trace organics	R12: 10 minutes
	R12-NQ 5 ft 100%	87	1	98.7' - Mechanical break, 50 deg, rough, stepped			
			1				
			5	99.9' - Bedding plane, <10 deg, smooth, undulating, up to 1/4" open			
			1	100.35, 100.4' - Fracture, <10 deg, rough, undulating, up to 1/4" open			
			1	100.55-101.0' - Fracture zone, 80-85 deg, rough, undulating, fracture interval separated by bedding plane fractures			
			1	100.7-100.9' - Fracture zone or bedding plane, rough, undulating			
			1	101.2, 103.3, 103.5, 103.6, 104.4' - Mechanical break			
	R13-NQ						



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-03	SHEET 7 OF 12
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)
ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler
CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

WATER LEVELS : 1.5 ft below surface of 3/1/07		START : 3/10/2007		END : 3/12/2007		LOGGER : K. Diney, C. Wainstead, N. Jarzyniec	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
		R Q D (%)	FRACTURES PER FOOT				DESCRIPTION
							DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS
105 -62.9	5 ft 100%	98	0		93.0-96.0' - yellowish gray, (5Y 7/2), weak to medium strong (R2 to R3), voids over <10% of rock surface increasing to 30% from 93.65-94.35', fossiliferous with molds/casts up to 1/2"x1/4", possibly bioturbated from 93.65-94.35'	R13: 8 minutes	
	106.0	1	104.95' - Bedding plane, rough, undulating		Limestone		
		0			96.0-101.0' - yellowish gray, (5Y 7/2), very fine to fine grained, very weak to medium strong (R1 to R3), voids (3/16") over 35% of rock surface decreasing to 15-20% at 99.8', fossiliferous with casts/molds up to 1/2"x1/4", organics visible in solution cavities at 98.4-98.6', secondary infilling with voids over <10% of surface and with trace fossils		
110 -67.9	R14-NQ 5 ft 100%	87	0	106.5, 108.3, 109.2' - Mechanical break	101.0-106.0' - yellowish gray, (5Y 7/2), very fine to fine grained, weak to very weak (R2 to R1), voids over 20-30% of rock surface, fossiliferous with casts up to 1"x1/2", fossils and voids increase from zone at 102-103.5', clay infilling over 5% of voids, secondary infilling of yellowish gray (5Y 8/1) limestone with <10% voids and fossils; sparsely fossiliferous from 101-102.5' with 15-25% voids on rock surface	SC-3 collected at 109.75-110.65' R14: 5 minutes	
			1	107.35' - Bedding plane, <15 deg, rough, undulating, 1/4" open	106.0-106.9' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), very fine to fine grained, very weak (R1), voids (1/16") over 20% of rock surface, fossiliferous with molds/casts up to 1"x1/2", laminar bedding planes		
			3	108.1, 108.6, 108.8' - Bedding plane, 10 deg, smooth to rough, undulating, tight to up to 1/8" open at 108.8'	106.9-111.0' - yellowish gray, (5Y 5/2), very fine to fine grained, very weak to weak (R1 to R2), voids (3/16") over 25-30% of rock surface, fossiliferous with fossils up to 1/4"x1/4", possible dissolution cavities up to 1/2"x1/2"		
			1	109.75' - Mechanical break, 10-15 deg, rough, undulating	111.0-119.0' - yellowish gray, (5Y 7/2), very fine to fine grained, very weak (R1), voids (<1/16") over 10-30% of rock surface, voids with secondary infilling over additional 25% of rock surface, secondary infilling is yellowish gray (5Y 8/1)		
			3	110.65, 110.85, 110.95' - Bedding plane, <10 deg, rough, undulating, up to 1/4" open	119.0-121.0' - yellowish gray, (5Y 7/2), very fine to fine grained, weak (R2), voids (3/16") over 30% of rock surface, highly fossiliferous, with fossils up to 1/2"x1/4", dissolution cavities up to 1/4" in diameter over 15% of rock surface		
			0	111.05' - Fracture zone, rough, undulating, intersecting fractures			
115 -72.9	R15-NQ 5 ft 100%	89	3	111.7, 112.1, 115.15-115.2, 115.85' - Mechanical break		R15: 9 minutes	
			6	113.1, 113.35, 113.45, 113.55, 113.7, 113.8, 114.1, 144.3, 144.35, 114.75, 114.85' - Fracture zone or bedding plane, <10 deg, smooth to rough, undulating, up to 1/8" open, healed fracture at 119.6'			
			5				
			1	115.5' - Bedding plane, <10 deg, smooth to rough, undulating, up to 1/8" open			
			3	116.1, 116.45, 116.55' - Bedding plane, <10 deg, smooth to rough, undulating, up to 1/4" open			
			0				
120 -77.9	R16-NQ 5 ft 100%	88	0	118.5, 118.45, 116.75, 119.8, 120.9' - Mechanical break		R16: 6 minutes	
			1	119.3' - Bedding plane, rough, undulating, ground rock infilling, up to 1/2" open			
			2	120.6' - Bedding plane, rough, undulating			
			1	120.95' - Fracture or mechanical break, rough, undulating, high angle fracture			
			2	121.35' - Bedding plane, 15 deg, rough, undulating, 1/2" open			
				122.0' - Bedding plane, rough, undulating to stepped, tight			
	R17-NQ						



WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

Rev. 4




PROJECT NUMBER: 338884.FL	BORING NUMBER: A-03	SHEET 9 OF 12
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

WATER LEVEL: 10.00 ft (3.05 m)		DATE: 03/11/2007		END: 03/12/2007		LOGGERS: T.R. BROWN, G. WALKER, R. GILYENCO		
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
145 -102.9	5 ft 91%	53	>10	143.0' - Bedding plane, <10 deg, smooth to rough, undulating, up to 1" open		Limestone 141.5-143.1' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), very fine to fine grained, very weak to weak (R1 to R2), voids over 20% of rock surface, cavities over 10% of rock surface up to 1-1/3"x3/4", most voids and cavities infilled with medium gray (N6) material, fossiliferous (as casts)	R21: 22 minutes	
		>10	143.3' - Bedding plane, <10 deg, some recrystallization on 20% of surface					
		>10	143.5-144.6; 145.05-145.55' - Fracture zone, intersecting fractures					
		NR						
150 -107.9	146.0							
	R22-NQ 5 ft 80%	71	4	146.1-146.15' - Fracture zone, open		143.1-145.55' - yellowish gray to very light gray, with light olive grey mottling, (5Y 7/2 to N8, with 5Y 5/2), very fine to fine grained, weak to medium strong (R2 to R3), voids over 15% of rock surface, dissolution cavities up to 1/2" in diameter, fossiliferous (as casts) No Recovery 145.55-146.0'	R22: 25 minutes	
			3	146.3' - Bedding plane, <10 deg, smooth to rough, undulating to planar, organic staining on fracture face, up to 1/2" open				
			2	146.9, 147.4' - Fracture, 50 deg				
			1	147.55' - Bedding plane, <10 deg, 1/4" open				
			NR	147.9' - Bedding plane, 10-15 deg, up to 1" open				
151.0								
155 -112.9	R23-NQ 5 ft 89%	71	4	151.05' - Fracture, 20 deg, up to 1/2" open		Limestone 146.0-147.2' - Same as 143.1-145.55' except laminar beds up to 4" thick, trace to 20% voids over rock surface, trace organics	R23: 12 minutes	
			1	151.65, 151.8, 151.9' - Bedding plane, <20 deg, up to 1/2" open				
			1	152.0' - Bedding plane, <5 deg, tight				
			6	153.8' - Mechanical break, 50 deg				
			>10	154.35-154.6' - Fracture zone or bedding plane, <10 deg, 1/2" open at 156.5				
	156.0		NR	155.4-155.55' - Fracture zone, intersecting fractures		No Recovery 150.0-151.0'		
160 -117.9	R24-NQ 5 ft 92%	66	>10	156.0-156.1' - Fracture zone, open		151.0-152.75' - dusky yellow to light gray, (5Y 6/4 to N7), very weak to weak (R1 to R2), voids (up to 1/16") over 40% of rock surface, dissolution cavities up to 1"x1/2", organic layer at 152.0' with very fine grained limestone layer with no voids (<1/4" thick)	R24: 8 minutes	
			1	156.35, 156.45' - Bedding plane, <10 deg, rough, undulating, up to 1/8" open				
			2	156.4' - Fracture, 85 deg, 1/8" open				
			6	157.6' - Bedding plane, <10 deg, rough, undulating, 1/4" open				
			0	158.5-158.8' - Fracture zone, 50 deg, rough, undulating, organic staining over 10-20%				
	NR	159.0-159.45' - Fracture zone, rough, undulating, intersecting fractures, up to 1/4" open						
161.0			159.55, 159.75' - Bedding plane, 10 deg, rough, undulating, 1/8" open		No Recovery 155.45-156.0'			
R25-NQ			1	160.5' - Fracture, 50 deg, rough, undulating, 1/8" open		156.0-156.45' - Same as 152.75-155.45' except very weak (R1), laminar organics (<3/4") thick, moderately fossiliferous with casts up to 1/4"x1"	End drilling for the day 03/11/2007, 18:30 at 161.0' Resume drilling on 03/12/2007, water level is 1.0' below ground surface	
	2	161.55' - Bedding plane, <5 deg, rough to smooth, undulating, up to 1/4" open						
		162.05' - Bedding plane, <5 deg, rough to smooth, undulating, up to 1/8" open						
				162.75, 163.75, 164.55' - Mechanical break, rough, undulating				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-03

SHEET 10 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07

START : 3/10/2007

END : 3/12/2007

LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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			
165 -122.9	5 ft 86%	85	1	164.95' - Bedding plane, smooth to rough, undulating, up to 1/2" open		Limestone 156.45-160.6' - very fine to fine grained, very weak to weak (R1 to R2), alternating laminar beds up to 8" thick defined by changes in voids, voids ranging from <10% up to 30% (up to 1/16"), dissolution cavities at 157.6', 158.45', 158.9', and 159.5' up to 1/2"x1/4" over 15% of rock surface, poorly to moderately fossiliferous No Recovery 160.6-161.0' Limestone 161.0-165.3' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), very fine to fine grained, voids (up to 3/16") over <10% of rock surface, fossil casts over <10% of rock surface, laminar bedding characterized by color change and % voids, trace organics, highly fossiliferous from 162.05-163' with increase in voids (up to 1/4") over 35% of rock surface, some secondary infilling of voids with yellowish gray (5Y 7/2) to gray (N7) limestone No Recovery 165.3-166.0' Limestone 166.0-168.7' - yellowish gray to moderate olive brown, (5Y 7/2 to 5Y 4/4), very fine to fine grained, weak to medium strong (R2 to R3), extremely weak (R0) to very weak rock (R1) at discontinuities, voids (<3/16") over 60-80% of rock surface, several cavities (>5) from 1/4"-1/8" on bedding laminations, poorly fossiliferous 168.7-170.25' - Same as 166.0-168.7' except mild to moderate HCl reaction, moderately to highly fossiliferous (casts/molds), trace bedding plane laminations, trace secondary infilling of fossil molds at 169.8-169.9' No Recovery 170.25-171.0' Limestone 171.0-175.85' - light olive gray to pale yellowish brown, (5Y 5/2 to 10YR 6/2), very fine to fine grained, extremely weak to weak (R0 to R2), weakest along bedding plane fractures, voids (<3/16") over 50-80% of rock surface, laminated bedding at 171.8', 172.9' and 174.8-175.05', several cavities (<1/2") over 20% of rock surface, poorly fossiliferous No Recovery 175.85-176.0'	R25: 19 minutes
			2				
			0				
			NR				
166.0	R26-NQ 5 ft 85%	38	3	166.6, 166.75, 166.8, 167.1, 167.2, 167.4, 167.55, 167.65, 167.7, 167.8, 167.95, 168.10, 168.15, 168.2, 168.35, 168.45, 168.50, 169.9, 170.0' - Bedding plane or mechanical break, <5 deg, smooth, undulating to planar, open up to 1/4"			SC-6 collected at 168.6-169.6'
			8				
			6				
			1				
170 -127.9	171.0		1				R26: 15 minutes
			NR				
			3				
			9				
175 -132.9	R27-NQ 5 ft 97%	34	3	171.55' - Bedding plane or mechanical break, horizontal, rough, undulating, tight 171.8' - Bedding plane, 20 deg, smooth, undulating, <1/8" open 171.95-172.25' - Fracture zone, <5 deg, rough to smooth, undulating, up to 1/4" open 172.4' - Fracture, 80 deg, rough to smooth, undulating, recrystallization on fracture surface 172.6' - Bedding plane, smooth to rough, undulating, silt-sized infilling, organic staining, up to 1/4" open 172.9, 172.95, 173.1, 173.5, 174.0, 174.35, 174.65' - Bedding plane or mechanical break, <5 deg, smooth, undulating 174.5' - Bedding plane or mechanical break, 35 deg, smooth, undulating 175.0, 175.25-175.35, 175.55, 175.65, 175.75' - Bedding plane or mechanical break, rough, undulating, <1/2" open, friable from 175.25-175.35' 176.95' - Bedding plane or mechanical break, 20 deg, smooth to rough, undulating 177.25, 177.3' - Bedding plane or mechanical break, 10 deg, smooth, undulating 178.7, 178.8' - Bedding plane, <10 deg, rough, undulating, up to 1/4" open 178.75' - Fracture, 60 deg and 65 deg 178.95' - Bedding plane, <10 deg, rough, undulating, up to 1" open 179.2-179.25' - Fracture zone, rough, undulating, 1/2" open 179.3' - Bedding plane, <5 deg, smooth to rough, planar 179.45' - Bedding plane or mechanical break, smooth to rough, 1/2" to 1/4" open			R27: 6 minutes
			4				
			5				
			NR				
176.0	R28-NQ 5 ft 91%	32	1				R28: 19 minutes
			5				
			7				
			>10				
180 -137.9	181.0		3				
			NR				
			2				
			3				
	R29-NQ						

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

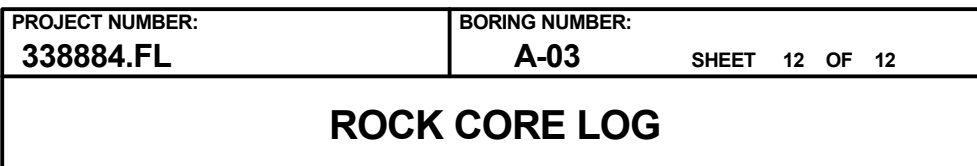
WATER LEVELS : 1.3 ft bgs on 3/11/07

START : 3/10/2007

END : 3/12/2007

LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

WATER LEVELS : 1.3 ft bgs on 9/7/07						START : 9/10/2007		END : 9/12/2007		LOGGERS : R. Birely, C. Walestad, N. Salzynecki	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES				SYMBOLIC LOG	LITHOLOGY	COMMENTS			
		R O 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			
185 -142.9	5 ft 88%	54	>5	179.5, 179.65, 179.8, 179.85, 179.95, 180.0, 180.1, 180.15' - Bedding plane, <10 deg, smooth to rough, undulating, up to 1/2" open 179.6-179.8' - Fracture zone, rough, undulating 181.3, 181.35' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/4" open 181.45-181.6' - Fracture zone, 0-55 deg, rough, undulating, intersecting fractures 182.75, 182.9, 183.0, 183.05, 183.35, 183.4, 183.45, 184.2, 184.3' - Bedding plane or mechanical break, smooth to rough, undulating, friable zones at 183.0-183.5' 186.75, 187.05' - Bedding plane or mechanical break, <10 deg, rough, undulating, <1/4" open 187.2, 187.35, 187.75, 187.9, 188.1, 188.45, 188.65, 188.75' - Bedding plane, <10 deg, rough to smooth, undulating, with some <1/4" open 189.25' - Fracture, 50 deg, smooth, undulating 189.65, 189.75, 190.4, 190.55, 190.75' - Bedding plane, <10 deg, rough to smooth, undulating, <1/8" open 191.1, 191.35, 191.7' - Fracture, <10 deg, rough, undulating 192.15' - Mechanical break 192.85, 193.0-193.1' - Fracture zone, rough, undulating, <1/2" open 193.45, 193.6' - Mechanical break 193.75, 193.95, 194.1' - Bedding plane or mechanical break, <10 deg, rough, undulating to stepped 194.55' - Mechanical break, 40 deg 194.75-194.9' - Fracture zone, rough, undulating 195.6-195.8' - Fracture, rough, undulating, 2" fragment missing over 180 degrees of core section 196.45' - Bedding plane, horizontal, rough, undulating, silt and/or clay sized infilling, 1/2" open 196.9-197.45' - Fracture zone, rough, undulating 198.55' - Bedding plane, horizontal, rough, undulating, 1/4" silt infilling 198.8, 198.85, 199.15' - Bedding plane, <10 deg, rough, undulating, <1/4" open 199.4-199.65; 199.95-200.1' - Fracture zone, rough, undulating to stepped 199.65-199.95' - Fracture zone, smooth to rough, undulating, high angle fracture planes intersecting bedding plane at 199.8', tight	Limestone 176.0-178.5' - pale yellowish brown to very light gray, (10YR 6/2 to N8), very fine to fine grained, weak to medium strong (R2 to R3), voids (<3/16") over 60-80% of rock surface, dissolution cavity at 179.3' (1-1/2"x1"), few fossil molds 178.5-178.7' - Same as 176.0-178.5' except medium strong (R3), voids (<1/16") over 0-30% of rock surface, trace mottling 178.7-179.0' - Same as 176.0-178.5' 179.0-179.5' - Same as 178.5-178.7' 179.5-180.55' - Same as 176.0-178.5' No Recovery 180.55-181.0' Limestone 181.0-185.4' - pale yellowish brown, (10YR 6/2), very fine to fine grained, very weak to medium strong (R1 to R3), with extremely weak (R0) and friable silty lens, voids (<3/16") over 60% of rock surface, few cavities (3/4"x1/4") poorly fossiliferous with few casts/molds, bioturbated, friable lens at 184.55-184.6' No Recovery 185.4-186.0' Limestone 186.0-191.0' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, weak to medium strong (R2 to R3), voids (<3/16") over 70-80% of rock surface, moderately to highly fossiliferous especially at 186.0-186.75' (molds/casts), laminated bedding over 50% of rock surface 191.0-193.0' - moderate yellowish brown to yellowish gray, (10YR 5/4 to 5Y 7/2), fine grained, very weak to weak (R1 to R2), voids (<3/16") over 80% of rock surface, dissolution cavities (<1-1/2" diameter), laminated over 30% of rock surface, highly fossiliferous 193.0-194.0' - Same as 191.0-193.0' except very weak (R1), voids (<1/16") over 40% of rock surface, few dissolution cavities (<1/2"x1/8") 194.0-195.95' - Same as 191.0-193.0' except voids (<3/16") over 30-80% of rock surface, fossils decreasing with depth, highly fossiliferous with casts/molds and 2" diameter dissolution cavities at 195.6-195.8' No Recovery 195.95-196.0'	R29: 15 minutes					
		186.0	NR					SC-7 collected at 186.0-186.75'			
		190 -147.9	R30-NQ 5 ft 100%			56	1				
						5	5				
3	4										
191.0	3			2							
195 -152.9	R31-NQ 5 ft 99%	62	3								
		3	3								
		1	NR								
		196.0	3	>10							
200 -157.9	R32-NQ 5 ft 84%	40	3								
		>10	>10								
		NR									
		201.0									



CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-04
SHEET 1 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724023.6 N, 457634.2 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0.1 ft bgs on 03/26/07 START : 3/25/2007 END : 3/27/2007 LOGGER : R. Bitely, C. Wallestad

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
41.3	0.0	1.0	SS-1	1-1-2 (3)	Poorly Graded Sand (SP) 0.0-1.0' - pale yellowish brown, (10YR 6/2), moist, very loose, very fine to fine grained, subrounded silica sand, trace nonplastic fines, 1" loamy organic layer at surface, brownish black (5YR 2/1), with 20% root mass/organics		"Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" Water table between 1.5' and 5' below ground surface, based on split spoon sample Rapid drilling rate
	1.5						
5	5.0						
36.3		1.3	SS-2	1-2-3 (5)	Silty Sand (SM) 5.0-5.7' - dusky yellow, (5Y 6/4), wet, loose, very fine grained, subrounded silica sand, 20-25% low plasticity fines Clay With Sand (CH) 5.7-6.3' - moderate olive brown, (5Y 4/4), moist, firm, high plasticity, no dilatancy, 20-25% very fine grained silica sand		
	6.5						
10	10.0						
31.3		1.3	SS-3	16-4-8 (12)	Fat Clay (CH) 10.0-10.2' - light olive gray, (5Y 5/2), wet, soft, medium to high plasticity, slow to no dilatancy, no HCl reaction, trace very fine grained silica sand Silt (ML) 10.2-10.7' - grayish yellow, (5Y 8/4), moist to wet, stiff, rapid to no dilatancy, moderate HCl reaction, fine to medium sand-sized lenses <1/2" thick at 10.2' contact, all carbonate Silt (ML) 10.7-11.3' - Same as 10.2-10.7' except wet (saturated)		Light chatter at 11 feet Moderate to slow drilling rate 11-20'
	11.5						
15	15.0						
26.3		1.0	SS-4	11-6-10 (16)	Sandy Silt (ML) 15.0-16.0' - grayish yellow, (5Y 8/4), moist, very stiff, nonplastic, rapid dilatancy, moderate HCl reaction, scattered lenses <1/4" thick of fine to coarse sand		
	16.5						
20							



PROJECT NUMBER: <div style="background-color: black; color: white; padding: 2px; font-weight: bold;">338884.FL</div>	BORING NUMBER: <div style="background-color: black; color: white; padding: 2px; font-weight: bold;">A-04</div>
SHEET 2 OF 9	
<div style="background-color: black; color: white; font-size: 1.2em; font-weight: bold; padding: 5px;">SOIL BORING LOG</div>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724023.6 N, 457634.2 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0.1 ft bgs on 03/26/07 START : 3/25/2007 END : 3/27/2007 LOGGER : R. Bitely, C. Wallestad

WATER LEVELS : 0.11035 ON 03/20/07							START : 3/23/2007		END : 3/27/2007		LOGGERS : T. Birely, C. Wailestad	
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				
21.3	20.0	1.0	SS-5	18-11-11 (22)	Silt And Limestone Lenses (ML) 20.0-21.0' - grayish yellow to grayish orange, (5Y 8/4 to 10YR 7/4), moist to wet, very stiff, nonplastic, rapid dilatancy, moderate to strong HCl reaction, all carbonate, 50% silt and 50% limestone lenses <2" thick, voids and fossil structures intact			Moderate to heavy chatter 25-37', moderate to slow drilling rate				
	21.5											
25	25.0											
16.3		1.5	SS-6	8-10-16 (26)	Silt And Limestone Lenses (ML) 25.0-26.5' - Same as 20.0-21.0' except yellowish gray, (5Y 7/2), 2" elastic silt or lean clay (CL) seam at 25.5'-25.65'; moderate plasticity with slow dilatancy							
	26.5											
30	30.0											
11.3	30.3	0.2	SS-7	50/3 (50/3")	Limestone Fragments And Silt And Sand 30.0-30.25' - Same as 25.0-26.5' except moderate HCl reaction, all carbonate, limestone fragments <1/2" thick							
35	35.0											
6.3		0.9	SS-8	20-50/5 (70/11")	Silt With Sand (ML) 35.0-35.9' - moderate yellowish brown to dusky yellowish brown, (10YR 5/4 to 10YR 2/2), wet, hard, low to medium plasticity, slow to rapid dilatancy, mild HCl reaction, 15% fine to coarse sand-sized carbonate particles			Moderate to heavy chatter from 37-39', extremely slow drilling (15 minutes / 2 feet)				
	35.9											



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-04
SHEET 3 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724023.6 N, 457634.2 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0.1 ft bgs on 03/26/07 START : 3/25/2007 END : 3/27/2007 LOGGER : R. Bitely, C. Wallestad

WATER LEVELS : 0.1 Hubs on 03/20/07			START : 3/23/2007			END : 3/27/2007			LOGGERS : R. Grely, C. Wailestad		
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						
1.3	40.0	0.1	SS-9	50/2 (50/2")	Limestone Fragments 40.0-40.1' - pale yellowish brown, (10YR 6/2), very dense, mild to moderate HCl reaction, very fine to fine grained, <10% voids <1/16" diameter		Moderate to heavy chatter from 40-55', moderate to rapid drilling rate				
45	45.0										
-3.7	46.4	1.4	SS-10	27-42-50/4.5 (92/10.5")	Silty Sand (SM) 45.0-46.4' - moderate yellowish brown, (10YR 5/4), moist to wet, very dense, very fine to coarse grained, mild to moderate HCl reaction, 30% nonplastic fines						
50	50.0										
-8.7	50.2	0.2	SS-11	50/2 (50/2")	Limestone Fragments 50.0-50.2' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, wafer-shaped fragments <1/2" thick						
55	55.0										
-13.7	55.3	0.1	SS-12	50/3 (50/3")	Limestone Fragments 55.0-55.1' - Same as 50.0-50.2' Begin Rock Coring at 55.0 ft bgs See the next sheet for the rock core log		End SPT at 55' below ground surface; switch to rock coring Set HW casing to 55' below ground surface at 17:00 Break for day at 17:00 Water level at 0' (ground surface)				
60											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-04

SHEET 4 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724023.6 N, 457634.2 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 03/26/07

START : 3/25/2007

END : 3/27/2007

LOGGER : R. Bitely, C. Wallestad

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			
-13.7	55.0	60	0	55.7' - Mechanical break		Limestone 55.0-55.9' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, moderate HCl reaction, extremely weak to weak (R0 to R2), strength decreasing with depth, voids <3/16" over 60% of surface, trace organic laminations No Recovery 55.9-56.5' Limestone 56.5-60.1' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, extremely weak (R0), to compacted non-indurated carbonate silts, <10% organics, voids <3/16" over 30% of surface, weakest material at 56.5-57.2' and 58.5-60.0' No Recovery 60.1-61.5' Limestone 61.5-66.25' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, mild to moderate HCl reaction, extremely weak to weak (R0 to R2), <10% laminated organics, voids <3/16" over 40-50% of surface, strongest rock zones 62.0-63.0' and 63.7-65.8', few cavities <1"x1/2"	Continue drilling at A-04 at 07:30 on 03/26/07 Begin rock coring at 55' Water level at 1 inch below ground surface at 07:30 R1: 2 minutes
	56.5		NR				
		48	4	56.9, 57.0, 57.4, 57.95, 58.05, 58.9, 59.55, 60.0' - Fractures (8), <10 deg, rough, undulating, along bedding planes, open <1/2" 57.4' - Fracture, 60 deg, rough, undulating, open <1/2" 58.5' - Fracture, 40 deg, rough, undulating, open <1/2" 59.15-59.55' - Fracture zone, rough, undulating, gravel-sized fragments <2" diameter			R2: 8 minutes
			3				
			>10				
			2				
			NR				
60		82	0	63.1' - Fracture or mechanical break, 35 deg, rough, undulating, tight 63.3, 61.75, 64.1' - Mechanical break (3)			R3: 18 minutes
			1				
			0				
			3				
			2				
-18.7		78	NR	64.55, 64.65' - Fractures or mechanical break (2), <10 deg, rough, undulating, open <1/2" 65.2' - Fracture or mechanical break, 35 deg, rough, undulating, open <1/2" 65.85, 66.05' - Fractures or mechanical break (2), <10 deg, rough, undulating, along bedding planes, open <1/2" 66.9, 67.9' - Fractures or mechanical break (2), <10 deg, rough, undulating, open <1/2"			R4: 8 minutes
			1				
			1				
			4				
			0				
65		53	0	68.75, 69.1' - Fractures (2), 70 to 90 deg, rough, undulating, tight 69.3' - Fracture or mechanical break, <10 deg, rough, undulating, tight 69.4, 70.05, 71.0' - Mechanical break (3)			Driller's Remark: Slight water loss <10% Driller's Remark: Strength decreasing abruptly from 74.8' to 75.4'
-23.7			0				
			3				
			4				
			NR				
		53	0	73.05, 73.15' - Fractures (2), horizontal, rough, undulating, open <1/2" 73.1' - Fracture, vertical, rough, undulating, intersects with 73.05' and 73.15', open 1/2" 74.25, 74.35' - Fractures (2), horizontal and 50 deg, rough, undulating, open <1/4"			
			3				
			4				
			NR				
			NR				
70		53	0	73.05, 73.15' - Fractures (2), horizontal, rough, undulating, open <1/2" 73.1' - Fracture, vertical, rough, undulating, intersects with 73.05' and 73.15', open 1/2" 74.25, 74.35' - Fractures (2), horizontal and 50 deg, rough, undulating, open <1/4"			
-28.7			3				
			4				
			NR				
			NR				
		53	0	73.05, 73.15' - Fractures (2), horizontal, rough, undulating, open <1/2" 73.1' - Fracture, vertical, rough, undulating, intersects with 73.05' and 73.15', open 1/2" 74.25, 74.35' - Fractures (2), horizontal and 50 deg, rough, undulating, open <1/4"			
			3				
			4				
			NR				
			NR				
75		53	0	73.05, 73.15' - Fractures (2), horizontal, rough, undulating, open <1/2" 73.1' - Fracture, vertical, rough, undulating, intersects with 73.05' and 73.15', open 1/2" 74.25, 74.35' - Fractures (2), horizontal and 50 deg, rough, undulating, open <1/4"			
			3				
			4				
			NR				
			NR				



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-04	SHEET 5 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724023.6 N, 457634.2 E (NAD83)

ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 03/26/07 START : 3/25/2007 END : 3/27/2007 LOGGER : R. Bitely, C. Wallestad

WATER LEVELS: G. HUBS ON 03/20/07		START: 3/23/2007		END: 3/27/2007		LOGGER: K. DiLery, C. Wainstat		
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				
-33.7			NR	74.5' - Fracture, horizontal, rough, undulating, along bedding plane, open <1/4"		No Recovery 74.6-76.5'	R5: 10 minutes	
76.5		2	76.7, 76.75' - Fractures (2), 40 deg and horizontal, smooth, planar, tight	Limestone 76.5-77.3' - very pale orange to dark yellowish orange, (10YR 8/2 to 10YR 6/6), very fine to fine grained, strong HCl reaction, extremely weak to medium strong (R0 to R3), strength increasing abruptly 77.3' to 77.4', non-indurated silt to extremely weak rock (R0) 76.5-77.3', trace voids <3/16", no fossils, trace laminated bedding		SC-1 collected at 76.75-77.6'		
	R6-NQ 5 ft 91%	76	3	77.65, 78.1, 78.2' - Fractures or mechanical break (3), <10 deg, smooth, undulating, along bedding planes, open <1/4" to tight		77.3-80.1' - Same as 76.0-77.3' except medium strong (R3), voids <3/16" over 30-50% of surface, trace fossil casts, trace secondary infill		
		2	78.7, 78.85' - Fractures (2), 80 deg and 50 deg, rough, undulating, open 1/4" to 1/2"	80.1-81.05' - Same as 77.3-80.1' except secondary infill with voids <3/16" over 30-50% of surface, poorly fossiliferous, heavily bioturbated with 50% of bioturbation with secondary infilling, cavities up to 1/2"x5"				
80		0						
-38.7		1	80.5' - Fracture or mechanical break, <10 deg, rough, undulating, tight			R6: 18 minutes		
81.5		NR						
		2	82.15, 82.45' - Mechanical break or fractures (2), <10 deg, rough, undulating, open <1/2"					
		>10						
	R7-NQ 5 ft 100%	86	0	83.5-83.9' - Fracture zone, rough, undulating, gravel-sized fragments <1-1/2" diameter		No Recovery 81.05-81.5' Limestone 81.5-82.0' - moderate yellowish brown to yellowish gray, (10YR 5/4 to 5Y 8/1), very fine to fine grained, strong HCl reaction, extremely weak to medium strong (R0 to R3), voids <3/16" over 30-60% of surface, heavily fossiliferous, fossil molds/casts <1"x1/4", cavities <1/2"x1/4", few cavities with secondary infill		
85		0				82.0-82.25' - Same as 81.5-82.0' except very weak (R1), laminated/variegated bedding 30% of zone	R7: 9 minutes	
-43.7		0				82.25-84.8' - Same as 81.5-82.0'		
86.5		0				84.8-85.25' - Same as 81.5-82.0' except non-indurated silts as secondary infill, very very weak (<R0)		
		1		87.35' - Fracture or mechanical break, 60-90 deg, rough, undulating, tight to open 1/8"		85.25-85.4' - Same as 81.5-82.0'	R8: 11 minutes	
	R8-NQ 5 ft 98%	84	4	87.65' - Fracture or mechanical break, 20 deg, rough, undulating, tight to open 1/8"		85.4-86.0' - Same as 81.5-82.0' except extremely weak (R0), trace voids		
		0	88.25, 88.4, 88.45' - Mechanical break or fractures (3), rough, undulating, open <1/2" at 88.25', others are tight					
90		0	88.9, 88.95, 89.35' - Mechanical break (3)					
-48.7		0						
91.5		NR				86.0-86.5' - Same as 81.5-82.0'	SC-2 collected at 95.65-96.45'	
		2	91.65' - Fracture, horizontal, smooth, planar, along bedding plane, tight					
		10	92.2' - Fracture, 70 deg, rough, undulating, tight					
		10	92.85-92.9' - Fracture zone, rough, planar					
	R9-NQ 5 ft 99%	50	10	93.6, 93.7, 93.8, 93.9, 94.05' - Fractures, 80 deg, rough, undulating, tight				
95								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-04

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724023.6 N, 457634.2 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 03/26/07

START : 3/25/2007

END : 3/27/2007

LOGGER : R. Bitely, C. Wallestad

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			
-73.7			0			Limestone 106.5-111.5' - yellowish gray, (5Y 7/2), very fine to fine grained, very weak to weak (R1 to R2), voids <3/16" over 20-50% of surface, moderately fossiliferous, fossil casts and molds <1/2" diameter, trace iron staining	SC-3 collected at 115.45-116.3' R13: 12 minutes
	116.5		0	115.45' - Mechanical break			
			0			Limestone 111.5-116.5' - yellowish gray, (5Y 8/1), very fine to fine grained, strong HCl reaction, weak (R2), voids <3/16" over <20% of surface, trace laminations, poorly fossiliferous, few fossil molds 1/2"x1/4"	
			0				
	R14-NQ 5 ft 100%	96	0	119.05' - Mechanical break			
120			0			116.5-120.7' - yellowish gray, (5Y 8/1), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), trace laminations, voids <3/16" over 10-50% of surface (highly variable across length), moderately to heavily fossiliferous with fossil casts and molds up to 1/4" diameter, especially 117.5-118.0' and 118.5-119.5', laminated bedding from 116.85-117.0'	R14: 17 minutes
-78.7			2	120.7, 120.9' - Mechanical break or bedding plane (2), horizontal, smooth, undulating, tight to open 1/2"			
	121.5		1	121.95, 122.0' - Fractures (2), 50 deg and 30 deg, rough, undulating, intersecting fractures, open 1"			
			0			120.7-121.5' - Same as 116.5-120.7' except extremely weak (R0) rock to non-indurated silt, laminated from 120.7-120.9'	
	R15-NQ 5 ft 100%	94	3	123.95, 124.0, 124.25' - Bedding plane (3), horizontal, smooth, planar to stepped, tight			
125			0			121.5-123.6' - yellowish gray to grayish orange, (5Y 8/1 to 10YR 7/4), very fine to fine grained, strong HCl reaction, weak (R2), voids to 3/16" over 50% of surface, decreasing with depth, fossil casts and molds to 1/2"x1/4" over 30% of surface.	R15: 12 minutes
-83.7			0			123.6-126.55' - Same as 121.5-123.6' except voids to 3/16" over 20-40% of surface, trace fossil molds and casts to 1/4" diameter, possibly bioturbated 123.6-126.55'	
	126.5		1	127.2, 130.45, 131.0, 131.05, 131.35' - Fractures (5), <10 deg, smooth, planar to undulating, along bedding planes, tight to open 1/4"		126.55-131.45' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids to 3/16" over 10-20% of surface except 130.15-130.85' voids to 3/16" over 60% of surface, poorly to moderately fossiliferous except 130.15-130.85' highly fossiliferous, with casts and molds to 1/2"x1/4", trace infill material	
			0				
	R16-NQ 5 ft 99%	89	0	130.1' - Mechanical break			R16: 11 minutes
130			0				
-88.7			4				
	131.5		NR	131.55, 133.9' - Fractures (2), horizontal, smooth, planar, along bedding planes, tight			SC-4 collected at 133.9-134.7'
			1			No Recovery 131.45-131.5'	
			0				
	R17-NQ 5 ft 99%	98	1				
135							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-04

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724023.6 N, 457634.2 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 03/26/07

START : 3/25/2007

END : 3/27/2007

LOGGER : R. Bitely, C. Wallestad

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.
-93.7			2	134.7, 135.1' - Bedding plane or mechanical break (2), 10-20 deg, smooth, undulating, trace organics, tight		Limestone 131.5-136.45' - pale yellowish brown to yellowish gray, (10YR 6/2 to 5Y 8/1), very fine to fine grained, strong HCl reaction, extremely weak to weak (R0 to R2), voids to 1/16" covering 10-30% of surface, decreasing with depth, except voids to 3/16" over 60-70% of surface from 131.6-133.05', trace fossils, except highly fossiliferous 131.6-133.05', with casts and molds to 3/4"x1/2", trace infill in fossil casts	R17: 8 minutes
	136.5		0				
		NR	1	136.65, 140.2, 140.65' - Fractures or mechanical break (3), rough, undulating, along bedding planes, open <1/2"			
			0				
	R18-NQ 5 ft 98%	86	0			No Recovery 136.45-136.5'	R18: 10 minutes
140			1			Limestone 136.5-141.4' - yellowish gray, (5Y 8/1), very fine to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids to 3/16" over 5-30% of surface, decreasing with depth, poorly to moderately fossiliferous, fossil casts and molds to 3/4"x1/4", secondary infill extremely weak rock (R0) and void <3/16" over 30-40% in infill, several bioturbation or dissolution cavities with secondary infilling up to 2" x 1"	DR: 100% circulation loss at 141.5' below ground surface
-98.7			>10	140.65, 140.95' - Fracture zone, rough, undulating, fragments <1-1/2" diameter			Stop drilling at 17:30 on 03/26/07 at 141.5' below ground surface
	141.5		NR				Water level at 1.8' below ground surface at 17:30
			1				
			10	142.45, 142.55' - Fracture zone, rough, undulating, fragments <1/2" diameter, angular, open <1"			
	R19-NQ 5 ft 97%	75	2	142.9, 143.1, 143.25, 143.35, 143.55' - Fractures (5), <10 deg, rough, undulating, tight to open <1" at 143.25-143.35', with angular rock fragments <1" diameter		No Recovery 141.4-141.5'	Continue rock coring 03/27/07 at 08:00
145			1	143.8' - Fracture, horizontal, smooth, undulating, along bedding plane, tight		Limestone 141.5-143.6' - light olive gray to moderate yellowish brown, (5Y 5/2 to 10YR 5/4), very fine to fine grained, weak to medium strong (R2 to R3), voids <3/16" over 20-30% of surface moderately fossiliferous, fossil molds <1/2" diameter, many cavities <1-1/2"x1/2" comprising 20% of surface, several (<50% of cavities) with secondary infill, trace organic laminations	Water level at 1.3' below ground surface
-103.7			1	144.0, 144.5' - Mechanical break (2)			No circulation
			1	144.9' - Fracture, <10 deg, smooth, undulating, tight			
	146.5		NR				
			1	145.95' - Fracture, <10 deg, smooth, undulating, along bedding plane, tight to open <1/4"			
			0	146.6' - Fracture, horizontal, rough, undulating, along bedding plane, open <1/4"			
	R20-NQ 5 ft 100%	98	0			143.6-146.35' - Same as 141.5-143.6' except moderate HCl reaction, voids <3/16" over <5%-30% variable, trace laminated bedding especially 143.8-144.0' and 145.9-146.0', poorly fossiliferous	
150			1	149.55' - Fracture, horizontal, smooth, undulating, along bedding plane, open <1/4"		No Recovery 146.35-146.5'	R20: 8 minutes
-108.7			0			Limestone 146.5-149.6' - grayish orange to moderate yellowish brown, (10YR 7/4 to 10YR 5/4), very fine to fine grained, weak to medium strong (R2 to R3), strength increasing with depth, except very weak rock (R1) at 149.35-149.6', voids <3/16" over <20% of surface, poorly fossiliferous, trace cavities with secondary infill <1"x1/2"	
	151.5		1				
			3	152.1, 153.0, 153.15, 153.25, 153.35, 153.7' - Fractures or mechanical break (6), along bedding planes, smooth to rough, undulating, tight			SC-5 collected at 152.1-152.9'
			1	152.9' - Mechanical break			
	R21-NQ 5 ft 100%	90		153.9, 154.15, 154.4' - Mechanical break (3)			
155				154.0' - Mechanical break			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-04

SHEET 9 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724023.6 N, 457634.2 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

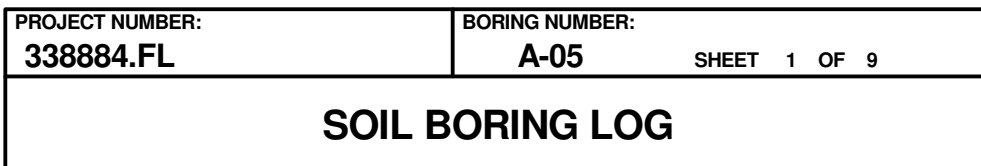
WATER LEVELS : 0.1 ft bgs on 03/26/07

START : 3/25/2007

END : 3/27/2007

LOGGER : R. Bitely, C. Wallestad

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.
-113.7			0	154.95, 156.3' - Mechanical break		Limestone 149.6-151.5' - Same as 146.5-149.6' except moderate HCl reaction, voids <3/16" over <10-20% of surface, variable, poorly fossiliferous, trace laminations, trace cavities <1/4" diameter	R21: 22 minutes
	156.5		0			151.5-153.0' - yellowish gray to moderate yellowish brown, (5Y 7/2 to 10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, medium strong (R3), voids <3/16" over <20% of surface, poorly fossiliferous, trace dissolution cavities <1/2"x1/4", trace laminations	
			1	156.55' - Fracture or mechanical break, horizontal, rough, undulating, open <1/4"		153.0-153.7' - Same as 151.5-153.0' except very weak (R1), highly laminated, cavities < 1"x1/4" over 30-40% of surface, trace organics	
			0			153.7-154.9' - Same as 151.5-153.0'	
	R22-NQ 5 ft 98%	96	0	158.65, 160.9' - Mechanical break (2) 158.85, 158.95, 159.10, 160.1' - Mechanical break (4)		154.9-156.5' - Same as 151.3-153.0' except very weak rock (R1) at 154.9-155.4', voids <3/16" over <20% of surface, moderately fossiliferous, trace cavities 1-1/2"x1/2" with secondary infill	R22: 9 minutes
160 -118.7			0			156.5-161.4' - yellowish gray to moderate yellowish brown, (5Y 7/2 to 10YR 5/4), very fine to fine grained, strong HCl reaction, weak (R2), voids <3/16" over <5%-30% of surface, voids over 30% occur at 156.3-157.3' and 160.1-160.9', extremely weak to very weak bedding planes <1/2" thick at 158.65' and 160.9', poorly to moderately fossiliferous, fossil molds and casts <1/2"x1/4", trace laminations, trace secondary infill of cavities <2"x1"	10:30 03/27/07: Reach total depth at 161.5' with criteria at 80% recovery and 70% RQD
	161.5		NR			No Recovery 161.4-161.5' Bottom of Boring at 161.5 ft bgs on 3/27/2007	



LOGGER : T. Valentine, R. Bitely, J. Schaeffer

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-05
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723975.3 N, 457680.2 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 2-3/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 3/06/07 START : 2/26/2007 END : 3/1/2007 LOGGER : T. Valentine, R. Bitely, J. Schaeffer

WATER LEVELS : 3.51 TUBS ON 9/30/07							START : 2/20/2007		END : 9/17/2007		LOGGERS : R. Valentine, R. Biley, J. Schaeffer	
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				
22.0												



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-05
SHEET 3 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723975.3 N, 457680.2 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 2-3/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 3/06/07 START : 2/26/2007 END : 3/1/2007 LOGGER : T. Valentine, R. Bitely, J. Schaeffer

WATER LEVELS : 3.51 bgs on 9/30/07			START : 2/20/2007		END : 3/17/2007		LOGGERS : R. Valentine, R. Biley, J. Schaeffer	
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	
2.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-05

SHEET 4 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723975.3 N, 457680.2 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

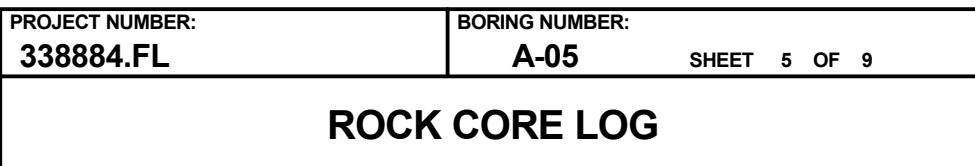
WATER LEVELS : 3.5 ft bgs on 3/06/07

START : 2/26/2007

END : 3/1/2007

LOGGER : T. Valentine, R. Bitely, J. Schaeffer

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			
60 -18.0	58.0	54	3	58.05' - Mechanical break, vertical, rough, stepped		Limestone 58.0-59.7' - light olive gray, (5Y 5/2), very fine to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16" on 50% of surface, cavities up to 1/2", microfossils with few macrofossils, 1" low to moderate plasticity silt at 59.5-59.6' No Recovery 59.7-60.0' Limestone 60.0-60.8' - Same as 58.0-59.7 except medium strong to very strong (R3 to R5), trace organic laminations, seams up to 1/16" thick, voids <3/16" over 60% of surface, few cavities up to 1x1/4" No Recovery 60.8-61.5' Limestone 61.5-65.25' - Same as 60.0-61.5' except moderate yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), extremely weak (R0), voids up to 1/12" on 30% of surface, large cavities up to 3" with silt infill No Recovery 65.25-66.5' Limestone 66.5-67.3' - Same as 61.5- 66.5' except very weak to medium strong (R1 to R3), voids <1/16" over 10% of surface, trace cavity infill 67.3-68.1' - Same as 66.5-67.3' except weak to medium strong (R2 to R3), voids up to 3/16" over 50% of surface, cavities up to 1/2" 68.1-68.45' - Same as 67.3-68.1' except very weak (R1), friable surface, no voids or cavities 68.45-71.4' - Same as 68.1-68.45' except dense, strong HCl reaction, medium strong (R3), voids up to 1/16" over 20% of surface, trace organics, microfossils No Recovery 71.4-71.5' Limestone 71.5-72.4' - Same as 68.45-71.4' except pale yellowish brown to yellowish gray, (10YR 6/2 to 5Y 7/2), very weak to weak (R1 to R2), voids <3/16" over 60% of surface 72.4-72.65' - Same as 71.5-72.4' except extremely weak to weak (R0 to R2), few cavities 1/4 x 1/8" 72.65-75.1' - Same as 72.4-72.65' except medium strong (R3), voids up to 3/16" over 50%, cavities up to 1/2x1/4" over 40%, sharp contact at 75.1'	Driller's Remark: hard, switch to 3 7/8" rock core bit to depth R1: 2 minutes Even, continuous boring R2: 2 minutes Short run to adjust tooling for 5' continuous run length SC-1 collected at 62.0-62.8' R3: 9 minutes SC-2 collected at 68.45-69.45' R4: 13 minutes R5: 11 minutes
	R1-NQ 2 ft 80%		2	58.1' - Mechanical break, 10 deg, rough, stepped			
	60.0		NR	58.3' - Mechanical break, 60 deg, rough, undulating			
	61.5	31	>10	59.05' - Bedding plane or mechanical break, rough, undulating			
			NR	59.45' - Fracture, 70 deg, smooth, undulating			
	65 -23.0	55	1	60.0-60.4' - Fracture zone or mechanical break, multiple intersecting fractures, various angles, bedding plane fractures at 60.2', 60.25', and 60.4, rough to smooth, undulating to stepped, tight			
			1	61.7' - Mechanical break			
			3	62' - Bedding plane, horizontal, smooth, undulating			
			6	62.8' - Bedding plane, 40 deg, rough, stepped			
			NR	63.1' - Mechanical break			
			NR	63.35' - Mechanical break, 40 deg, rough, stepped			
70 -28.0	66.5	77	4	63.7' - Mechanical break, 60 to 90 deg, smooth, undulating			
			3	63.8' - Mechanical break, 50 deg, smooth, undulating, intersecting 67.7' mechanical break			
			0	64.05' - Mechanical break, horizontal, rough, undulating			
			1	64.65-64.75' - Mechanical break (4), rough, undulating, multiple intersections and angles, ground rock			
			1	64.75' - Fracture, 60 deg, smooth, undulating			
			NR	65.05' - Bedding plane, 40 deg, smooth, undulating			
	71.5	55	1	67.05, 67.15, 67.30, 67.65' - Mechanical break (4), <10 deg, rough, stepped to undulating			
			1	68.15, 68.45' - Bedding plane, horizontal, smooth, undulating			
			2	68.3' - Mechanical break			
			3	69.7, 70.1' - Mechanical break			
75 -33.0	76.5	55	1	70.4' - Fracture, 60 deg, smooth, undulating			
			2	71.05' - Fracture or mechanical break, 10 to 50 deg, rough, stepped to undulating			
			3	71.2' - Fracture, vertical, rough, stepped to undulating			
			1	72.15' - Bedding plane, horizontal, smooth, undulating			
			>10	72.4' - Mechanical break or bedding plane, horizontal, smooth, undulating, <1/2" open			
			NR	72.65' - Bedding plane, horizontal, smooth, undulating			
			>10	72.8' - Fracture, 70 deg, rough, undulating			
			>10	73.8' - Fracture, horizontal, rough, undulating			
			>10	74.5, 74.75, 74.85' - Mechanical break			
			>10	75.1' - Fracture, 20 deg, smooth, undulating			
			>10	75.15, 75.25' - Mechanical break, horizontal, rough, undulating, 1/2" open			
			>10	75.55' - Fracture, 50 deg, rough, undulating			
			>10				



ORIENTATION : Vertical

LOGGER : T. Valentine, R. Bitely, J. Schaeffer

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-05

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723975.3 N, 457680.2 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/06/07

START : 2/26/2007

END : 3/1/2007

LOGGER : T. Valentine, R. Bitely, J. Schaeffer

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			
100 -58.0	R10-NQ 5 ft 40%	8	>10	97.15' - Fracture or mechanical break, horizontal, rough, stepped 97.15-98.3' - Fracture zone, rough, stepped, gravel up to 2" diameter, intersecting angles		Limestone 88.8-88.9' - Same as 87.9-91.0' except strong HCl reaction, mottled infilling with cavities, possible bioturbation, fossils prevalent No Recovery 91.0-91.5' Limestone 91.5-92.25' - very light gray and yellowish gray, (N8 and 5Y 8/1), strong HCl reaction, extremely weak to medium strong (R0 to R3), voids up to 1/4" over 30% of surface, cavities up to 1/2", infill and bioturbation Calcareous Fat Clay (CH) 92.25-92.60' - yellowish gray, (5Y 8/1), moist, stiff to hard, high plasticity, strong HCl reaction, carbonate derived Limestone 92.6-95.8' - Same as 91.5-92.25' No Recovery 95.8-96.5' 95.8-96.5' Limestone 96.5-98.5' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak (R0), friable, voids up to 1/4" over 30% of surface, few cavities with infill up to 1/4"x1/8", fossiliferous, trace organics No Recovery 98.5-101.5' Limestone 101.5-104.8' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids up to 3/16" over 50-70% of surface, cavities up to 1/2" over 30% of surface, fossiliferous with infilled cavities and fossil molds, trace organics 104.8-105.05' - Same as 101.5-104.8' except laminated bedding Limestone 105.05-106.5' - Same as 101.5-104.8 106.5-110.5' - Same as 104.8-105.05' except voids <1/4" over <20% of surface, many fossil casts and cavities up to 1/2" diameter No Recovery 110.5-111.5' Limestone 111.5-116.5' - Same as 106.5-111.5' except few cavities 3/4"x1/4" Limestone 116.5-118.7' - Same as 111.5-116.5' except secondary infill in a few fossil molds	R10: 5 minutes SC-4 collected at 101.5-102.4'
105 -63.0	R11-NQ 5 ft 100%	69	1	102.45' - Fracture, 30 deg, rough, undulating			
			1	102.8' - Fracture, 30 deg, rough, undulating			
			2	103.3' - Mechanical break			
			4	104.5, 104.35, 104.7, 105.1' - Bedding plane, <10 deg, rough, undulating			
			0	105.2, 105.35' - Bedding plane, <10 deg, rough, undulating			
			0	105.7' - Mechanical break			
110 -68.0	R12-NQ 5 ft 80%	53	>10	106.65-107.25' - Fracture zone, rough, undulating, intersecting fractures at various angles, gravel up to 1-1/2" diameter			
			0	107.5' - Bedding plane, horizontal, rough, undulating			
			1	108.1' - Mechanical break			
			5	108.95' - Fracture or bedding plane, horizontal, rough, undulating			
			NR	109.85, 110.25, 110.35, 110.4' - Bedding plane, horizontal, rough, undulating, tight to <1/2" open			
115 -73.0	R13-NQ 5 ft 100%	30	2	111.6' - horizontal, smooth, undulating, 1/6" open, loose			
			6	111.9' - horizontal, smooth, undulating, 1/12" open, loose			
			2	112.55' - Bedding plane, horizontal, smooth, undulating			
			2	112.9' - Mechanical break			
			3	113.1' - Fracture, 40 deg, smooth, undulating			
			3	113.3, 113.4, 113.5' - Fractures, 20 to 65 deg, smooth, undulating			
			3	113.85' - Fracture, 40 deg, smooth, undulating			
			7	114.05' - Bedding plane, horizontal, smooth, undulating			
			>10	115.2' - Fractures, 0 to 80 deg, smooth, undulating			
				115.4, 115.5' - Fractures, 35 deg and vertical, smooth, undulating			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-05	SHEET 7 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723975.3 N, 457680.2 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/06/07 START : 2/26/2007 END : 3/1/2007 LOGGER : T. Valentine, R. Bitely, J. Schaeffer

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
120 -78.0	R14-NQ 5 ft 44%	12	>10		No Recovery 118.7-121.5'	R14: 4 minutes
			1			
			NR			
125 -83.0	R15-NQ 5 ft 100%	76	0		Limestone 121.5-123.65' - Same as 116.5-121.5' except grading into weak rock with depth (R2)	SC-5 collected at 121.5- 122.6'
			3			
			0			
			3			
			6			
			2			
			0			
			0			
			0			
			NR			
130 -88.0	R16-NQ 5 ft 98%	82	5		Limestone 126.5-131.4' - very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (< 3/16") variable 0-30% of surface, (especially at 127.05-128.5' and 129.6-131.4'), cavities (<1/4") over 20% of surface from 129.6-131.4', fossiliferous (molds/casts), secondary infill in molds 127.05-128.5' - Same as 125.45-126.5' except many fossil molds and casts with few secondary infill of molds 128.5-129.6' - Same as 121.5-123.65 129.6-131.4' - Same as 128.5-129.6 except many fossil molds and casts with few secondary infill of molds No Recovery 131.4-131.5' Fat Calcareous Clay (CH) 131.5-131.55' - yellowish gray, (5Y 7/2), moist to wet, soft, high plasticity Limestone 131.55-132.6' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), voids <1/4" over 20-70% of surface, variable, cavities <1/4" diameter over 20% of surface, variable, fossil molds throughout with some infilling	R15: 5 minutes
			>10			
			1			
			1			
			5			
			7			
135 -93.0	R17-NQ 5 ft 100%	54	1			R16: 7 minutes
			1			
			5			
			7			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-05

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723975.3 N, 457680.2 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/06/07

START : 2/26/2007

END : 3/1/2007

LOGGER : T. Valentine, R. Bitely, J. Schaeffer

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			
140 -98.0	R18-NQ 5 ft 100%	58	2	135.4' - Fracture, 30 to 50 deg, smooth, undulating		132.6-133.0' - Same as	R18: 7 minutes
			0	135.55, 135.6, 135.80, 136.3, 136.5' - Fractures, <10 deg, smooth, undulating		131.55-132.6' except light olive brown, (5Y 5/2), very fine to fine grained, weak to medium strong (R2 to R3), few fossils, voids <1/4" over 5% of surface, fossil molds <1/8"	
			5	137.4, 137.6' - Bedding plane, 0 to 10 deg, smooth, undulating		133.0-136.5' - Same as	
			5	138.4' - Fracture, 15 deg, rough, undulating		131.55-132.6'	
145 -103.0	R19-NQ 5 ft 86%	42	1	139.65, 139.75, 140.0, 140.3, 140.35, 140.9, 141.1, 141.15, 141.3, 141.45, 141.5' - Bedding plane, horizontal and <10 deg, undulating, rough to smooth		Limestone	R19: 24 minutes
			1	141.65' - Bedding plane, <10 deg, smooth, undulating		136.5-137.1' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), variable 0-30% 15-20% of surface, cavities (<1/2"), variable	
			4	142.6' - Mechanical break		15-20% of surface, fossiliferous, trace molds and laminated bedding, rare secondary infill of cavities	
			>10	143.35' - Fracture or mechanical break, 20 deg, rough, stepped		137.1-137.25' - Same as	
150 -108.0	R20-NQ 5 ft 98%	90	5	143.65' - Fracture, horizontal, rough, undulating		136.5-137.1' except pale yellowish brown to moderate yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), medium strong (R3)	R20: 10 minutes
			NR	144.05' - Fracture, horizontal, rough, undulating		137.25-139.75' - Same as	
			1	144.3-145.05' - Fracture zone, rough, intersecting fractures at various angles, <1" gravel, angular, stepped to undulating, partial recovery		139.75-140.0' - Same as	
			0	145.25' - Bedding plane, horizontal, rough, undulating		137.1-137.25'	
155 -113.0	R21-NQ 5 ft 94%	80	2	145.45' - Fracture, vertical, smooth, undulating		140.0-141.5' - Same as 136.5-137.1'	R21: 11 minutes
			2	145.55, 145.65, 146.15' - Bedding plane, horizontal, smooth, undulating		Limestone	
			1	145.8, 146.05, 146.35' - Fractures (3), vertical, smooth, undulating		141.5-145.5' - dark yellowish brown to pale yellowish brown, (10YR 4/2 to 10YR 6/2), very fine to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), with extremely weak (R0) zone at 141.6-141.65', voids (<3/16") over 10-50% of surface, cavities and fossil molds (up to 1" diameter) over 40% of surface, about 50% of cavities have secondary infill, very fossiliferous (molds)	
			NR	147.45' - Bedding plane, horizontal, smooth, undulating		145.5-145.8' - pale yellowish brown, (10YR 6/2), very fine grained, strong HCl reaction, medium strong (R3), laminated bedding, voids (<3/16") over 0-20% of surface	
			0	148.35' - Mechanical break		No Recovery 145.8-146.5'	SC-6 collected at 146.5-147.4'
			6	149.15, 149.25, 149.75, 150.0, 150.75, 151.4' - Bedding plane, horizontal and <10 deg, smooth, undulating		Limestone	
			2	152.75, 153.2, 153.35' - Mechanical break		146.5-151.4' - pale yellowish brown, (10YR 6/2), very fine to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids (<3/16") over 0-20% of surface (voids <1/4" over 80% of surface from 150.7-151.05'), few cavities	
			0	155.55, 155.65' - Mechanical break		<3/4"x1/2", few cavities with infill, fossiliferous	
			NR	156.6' - Bedding plane, horizontal, smooth, undulating		150.7-151.4' - Same as 146.5-150.7' except voids <1/4" over 80% of surface	SC-7 collected at 156.55-157.55'
			1	157.6' - Mechanical break		No Recovery 151.4-151.5'	



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-05
SHEET 9 OF 9	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723975.3 N, 457680.2 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 3/06/07 START : 2/26/2007 END : 3/1/2007 LOGGER : T. Valentine, R. Bitely, J. Schaeffer

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
160 -118.0	R22-NQ 5 ft 96%	8	157.75, 157.8, 157.9, 158.0' - Bedding plane, horizontal, smooth, undulating		Limestone 151.5-154.95' - Same as 150.7-151.05' except yellowish gray to dark yellowish brown, (5Y 7/2 to 10YR 4/2), weak to medium strong (R2 to R3) 151.60-151.65' - Same as 151.5-154.95' except voids <1/4" over 60% of surface 151.65-153.2' - Same as 151.60-151.65' except no voids, few cavities <1/4" diameter 153.2-154.2' - Same as 151.65-153.2' except voids <1/8" over 30-60% of surface 154.2-154.92' - Same as 153.2-154.2' except highly laminated with organics, voids <1/4" over <10-20% of surface Limestone 154.95-156.2' - Same as 154.2-154.92' except very weak to weak (R1 to R2), voids <1/8" over <10-20% of surface No Recovery 156.2-156.5' Limestone 156.5-157.95' - Same as 154.95-156.5' except pale yellowish brown to very light gray, very fine grained, voids < 1/4" over 20-40% of surface 157.95-158.6' - Same as 156.5-157.95' except pale yellowish brown to very light gray, (10YR 6/2 to N8), very fine grained, medium strong (R3), <10% voids over surface, few cavities <1/4"x1-1/2" with infill 158.6-161.3' - Same as 157.95-158.6' except yellowish gray, (5Y 7/2), very fine to fine grained, weak (R2), voids <1/4" over 40-70% of surface, cavities up to 1"x1/2" over 30% of surface No Recovery 161.3-161.5' Bottom of Boring at 161.5 ft bgs on 3/1/2007	R22: 12 minutes
		71	158.1' - Fracture, vertical, smooth, undulating			
		6	158.15, 158.25, 158.3' - Bedding plane or mechanical break, 0 to 90 deg, smooth, undulating			
		0	158.6, 158.65, 158.75, 158.9, 159.15' - Bedding plane, horizontal, smooth, undulating			
		0	160.1, 160.65, 161.05' - Mechanical break			
161.5		NR				



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-06
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723934.5 N, 457719.1 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/09/07 START : 3/6/2007 END : 3/9/2007 LOGGER : R. Bitely, L. Prochaska

WATER LEVELS : 1.01 RDS ON 03/09/07			START : 3/3/2007			END : 3/3/2007			LOGGERS : T. Birely, E. Prochaska		
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				
42.5											
	3.5										
5	5.0	1.3	SS-1	4-4-4 (8)	Poorly Graded Sand With Silt (SP-SM) 3.5-4.1' - dark yellowish orange, (10YR 6/6), wet, loose, very fine to fine grained, 10-15% nonplastic fines, trace organics, trace coarse sand-sized iron cemented sand concretions, sand is silica						
37.5					Clayey Sand (SC) 4.1-4.8' - pale yellowish brown, (10YR 6/2), moist, loose, very fine to fine grained, 40% medium to high plastic fines, trace organics, sand is silica						
	8.5										
10	10.0	1.0	SS-2	5-5-6 (11)	Silt (ML) 8.5-9.5' - dark yellowish orange, (10YR 6/6), wet, stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 10% very fine grained sand, 5% medium to coarse grained sand, all carbonate						
32.5											
	13.5										
	14.5	0.8	SS-3	38-50/5.5 (88/5.5")	Silt With Sand (ML) 13.5-14.25' - grayish orange, (10YR 7/4), moist to wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 10-15% very fine sand-sized, 5% medium sand-sized, trace fine gravel-sized, all carbonate						
15											
27.5											
	18.5										
	18.7	0.2	SS-4	50/2 (50/2")	Limestone Fragments 18.5-18.7' - grayish orange, (10YR 7/4), mild HCl reaction, fragments to 3/8"						
20											
								Driller's Remark: Hard layer 18.0-21.0'			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-06
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723934.5 N, 457719.1 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/09/07 START : 3/6/2007 END : 3/9/2007 LOGGER : R. Bitely, L. Prochaska

WATER LEVELS : 1.01005 on 03/09/07			START : 3/3/2007		END : 3/3/2007		LOGGERS : R. Grely, E. Prochaska	
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	
22.5								
	23.5							
25	25.0	1.1	SS-5	10-13-24 (37)	Silty Sand (SM) 23.5-24.6' - grayish orange, (10YR 7/4), wet, dense, rapid dilatancy, moderate HCl reaction, fine to coarse sand, 47% nonplastic fines, 3/4" thick limestone lense at 24.4-24.5', all carbonate			Driller's Remark: Very hard layer 25.5-27.0'
17.5								
	28.5							
	29.9	1.4	SS-6	31-50-50/5 (100/11")	Silt With Sand (ML) 28.5-29.9' - dark yellowish orange, (10YR 6/6), moist to wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 30% fine to medium sand-sized (amount varies in lenses), all carbonate			Driller's Remark: Very hard layer 30.0-35.0'
30								
12.5								
	33.5							
	33.8	0.3	SS-7	50/3.5 (50/3.5")	Limestone Fragments 33.5-33.8' - grayish orange, (10YR 7/4), mild HCl reaction, gravel-sized fragments (1/16"-1"), 75% coverage of <1/16" voids on fragment surfaces			Driller's Remark: Hard layers 38.0-38.5' and 38.5-42.0'
35								
7.5								
	38.5							
	38.8	0.3	SS-8	50/3 (50/3")				
40								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-06
SHEET 3 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723934.5 N, 457719.1 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/09/07 START : 3/6/2007 END : 3/9/2007 LOGGER : R. Bitely, L. Prochaska

WATER LEVELS : 1.01 bgs on 03/09/07			START : 3/6/2007		END : 3/9/2007		LOGGERS : R. Birely, E. Prochaska	
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	
2.5					Limestone Fragments 38.5-38.8' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, fine to coarse gravel-sized fragments up to 2" diameter, 70-80% coverage of <1/16" voids on fragment surfaces		Dense drilling 40.0-43.0', light chatter variable	
	43.5							
	43.8	0.3	SS-9	50/3.5 (50/3.5")	Limestone Fragments 43.5-43.8' - pale yellowish brown, (10YR 6/2), mild HCl reaction, coarse sand-sized to fine gravel-sized fragments (1/16"-1"), 2" silt lense (ML) at bottom of sample			
45								
-2.5								
	48.5							
		1.3	SS-10	49-15-20 (35)	Limestone Fragments 48.5-49.0' - Same as 43.4-43.8' except fragments 1/2"-2"			
50	50.0				Sandy Silt (ML) 49.0-49.8' - dark yellowish brown, (10YR 4/2), moist to wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 35-40% fine to coarse sand-sized, gravel-sized limestone lense at 49.6-49.8', all carbonate			
50								
-7.5								
	53.5							
	53.9	0.4	SS-11	50/5 (50/5")	Limestone Fragments 53.5-53.9' - light olive gray, (5Y 5/2), moderate HCl reaction, sand and gravel-sized			
55								
-12.5								Dense drilling 56.0-57.0', light chattering
	58.5							
	58.6	0.1	SS-12	50/1 (50/1")	Limestone Fragments 58.5-58.6' - light olive gray, (5Y 5/2), mild to moderate HCl reaction, only a single 2" fragment Begin Rock Coring at 58.5 ft bgs See the next sheet for the rock core log		Stop drilling at 18:30 on 3/6/07, set HW casing to 40'	
60								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-06

SHEET 4 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723934.5 N, 457719.1 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/09/07

START : 3/6/2007

END : 3/9/2007

LOGGER : R. Bitely, L. Prochaska

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.
60 -17.5	R1-NQ 3 ft 97%	68	2	58.7, 59.4' - Mechanical break (2)		Limestone 58.5-61.4' - pale yellowish brown, (10YR 6/2), very fine to fine grained, strong HCl reaction, medium strong (R3) at 58.5-59.0' grading to very weak (R1) at 59.0-61.4', 80% coverage of <1/16" voids on surface from 58.5-59.0', trace voids and few cavities <1/4" diameter from 59.0-61.4'	3/7/07 advanced HW casing to 58.5'
			4	58.85, 59.1, 59.5' - Bedding plane (3), 40 deg, smooth, undulating			
			3	60.25' - Bedding plane or fracture, horizontal, smooth, undulating, intersecting high angle fracture			
			NR	60.3' - Fracture, 75 deg, smooth, undulating			
65 -22.5	R2-NQ 5 ft 92%	62	0	60.8, 61.0' - Bedding plane (2), horizontal, smooth, undulating		No Recovery 61.4-61.5' Limestone 61.5-66.1' - pale yellowish brown, (10YR 6/2), very fine to fine grained, moderate to strong HCl reaction, very weak to medium strong (R1 to R3), 60% coverage of <1/16" voids on surface from 64.75-65.25', trace voids and few cavities up to 3/4"x1/12" 61.5-64.75' and 65.25-66.5', trace organics in laminations	R1: 3 minutes
			>10	60.9' - Fracture, 80 deg, smooth, undulating, tight			
			2	62.55, 62.65' - Bedding plane (2), horizontal, smooth, undulating			
			2	62.65-62.8' - Fracture zone, rough, undulating, >10 fractures at various angles			
			10	63.1, 63.2, 63.6' - Fractures or mechanical break (3), smooth to rough, undulating, low angle			
			NR	64.1, 65.0' - Bedding plane or mechanical break (2), smooth to rough			
70 -27.5	R3-NQ 5 ft 76%	40	>10	64.45-65.95' - Fracture zone, rough, undulating, 5+ fractures at intersecting angles		No Recovery 66.1-66.5' Limestone 66.5-70.3' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), fine grained, moderate to strong HCl reaction, very weak to medium strong (R1 to R3), hardness increasing with depth, 60% coverage of <1/16" voids on surface, no cavities 68.15-70.3', 67.7-67.8' silt lense, carbonate, low plasticity	R2: 10 minutes
			>10	65.75' - Bedding plane, smooth, undulating			
			2	65.75' - Fracture, 40 deg, smooth, undulating			
			0	66.5-67.8' - Fracture zone, rough, undulating to stepped, intersecting fractures at various angles			
			NR	68.05, 68.15' - Bedding plane or mechanical break (2), <10 deg, rough to smooth, undulating			
			NR	69.25, 69.4' - Bedding plane, <10 deg, smooth, undulating			
75 -32.5	R4-NQ 5 ft 76%	68	1	69.75, 71.85, 72.5, 74.9' - Mechanical break (4)		No Recovery 70.3-71.5' Limestone 71.5-75.3' - pale yellowish brown to very light gray, (10YR 6/2 to N8), very fine to fine grained, moderate HCl reaction, medium strong (R3) at 71.5-75.15', very weak to extremely weak (R1 to R0) at 75.15-75.3', 25-75% coverage of <1/16" voids on surface, many cavities <1/4" diameter with few cavities <1/2" (fossil molds), fossiliferous	R3: 8 minutes
			1	72.1, 72.6' - Bedding plane (2), <10 deg, smooth, undulating			
			1	74.05' - Fracture, 20 deg, smooth, undulating			
			3	74.5, 74.65' - Bedding plane (2), <10 deg, smooth, undulating			
			NR	75.15' - Fracture, 20 deg, rough, undulating			
			NR	76.5-76.6' - Fracture zone, rough, undulating to stepped, trace silt infill			
			>10	76.7' - Mechanical break or bedding plane, <10 deg, rough, undulating		No Recovery 75.3-76.5' Limestone 76.5-76.9' - pale yellowish brown, (10YR 6/2), very fine to fine grained, strong HCl reaction, very weak (R1), 20% coverage of <1/16" voids on surface	R4: 16 minutes
			NA	76.9, 78.25' - Clay seam (2), clay contact			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-06

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723934.5 N, 457719.1 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/09/07

START : 3/6/2007

END : 3/9/2007

LOGGER : R. Bitely, L. Prochaska

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			
80 -37.5	R5-NQ 5 ft 86%	20	0	78.4' - Mechanical break or bedding plane, <10 deg, smooth, undulating		Fat Clay (CH) 76.9-78.25' - very pale orange, (10YR 8/2), moist, medium stiff to stiff, low dilatancy, moderate to high plasticity, 30% silt	Laminated organics varve-like deposition at 79.4-79.5'
			4	78.55' - Mechanical break or fracture, 50-70 deg, smooth, undulating			
			0	78.75, 79.2, 79.3' - Bedding plane (3), <10 deg, smooth, undulating			
			NR				
85 -42.5	R6-NQ 5 ft 86%	54	>10	81.6' - Fracture or mechanical break, <10 deg, rough, undulating		Limestone 78.25-80.8' - very light gray to dark yellowish brown, (N8 to 10YR 4/2), very fine to fine grained, weak to medium strong (R2 to R3), 40% coverage of <1/16" voids on surface varying/decreasing with depth, laminated organics 79.4-79.5'	R5: 10 minutes
			2	81.8-82.0' - Fracture zone, rough, undulating, multiple intersecting fractures at various angles			
			0	82.25, 83.2, 83.4, 84.6' - Mechanical break or fractures (4), rough, stepped to undulating, variable angularities			
			2				
90 -47.5	R7-NQ 5 ft 76%	58	NR	85.3' - Mechanical break or fracture, 0-50 deg, rough, stepped		No Recovery 80.8-81.5' Limestone 81.5-82.75' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, weak to medium strong (R2 to R3), 70% coverage of <1/16" voids on surface, 20% coverage of <1/2" cavities on surface, several cavities <1/2" with secondary infill, all acid reactive	R6: 16 minutes
			>10	85.55-85.8' - Fracture zone, rough, undulating, multiple (<4) fractures, various angles			
			>10	87.2' - Fracture, 35 deg, rough, undulating			
			0	87.35-87.8' - Fracture zone, rough, undulating to stepped, multiple fractures at various angles			
95 -52.5	R8-NQ 5 ft 90%	58	10	87.95, 88.9, 89.3' - Mechanical break (3)		No Recovery 85.8-86.5' Limestone 86.5-90.3' - pale yellowish brown to dark yellowish brown, (10YR 6/2 to 10YR 4/2), very fine to fine grained, mild to moderate HCl reaction, very weak to medium strong (R1 to R3), 60% coverage of <1/16" voids on surface, many cavities <1"x1/4" over 20-30% of surface, fossiliferous, mottled coloration, weak to moderate HCL reaction, trace organics	R7: 23 minutes
			NR	89.0' - Mechanical break or bedding plane, 40 deg, rough, undulating			
			>10	89.2-89.3' - Fracture zone, rough, undulating to stepped, intersecting fractures at various angles			
			2	91.6' - Fracture, vertical, rough, undulating			
			1	91.65' - Mechanical break or fracture, 15 deg, rough, stepped to undulating		No Recovery 90.3-91.5' Limestone 91.5-92.2' - dark yellowish brown to pale yellowish brown, (10YR 4/2 to 10YR 6/1), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids <3/16" over 80% of core surface, few cavities (<1/4") over 20% of surface	SC-2 collected at 95.05-95.85'
			2	91.85' - Fracture, vertical, rough, undulating			
			NR	92.05-92.2' - Fracture zone, rough, undulating to stepped, multiple fractures at various angles			
			1	92.95' - Mechanical break or fracture, 25-70 deg, rough, undulating, variable fracture angle			
			>10	93.3' - Bedding plane, horizontal, smooth, undulating		except weak to medium strong (R2 to R3), fossiliferous, voids <3/16" over 60% of core surface, decreasing with depth, cavities up to 2-1/2"x1" with extremely weak (R0) limestone or silt infill	R8: 29 minutes
			1	94.1' - Bedding plane, smooth, planar			
			NR	94.25-94.35' - Clay seam, soil horizon			
			>10	94.7' - Fracture, 35 deg, rough, stepped			
			1	95.0' - Mechanical break, 70 deg, rough, undulating			96.5-96.85' hammer test for calibration (50/4")
			>10	95.05' - Clay seam, soil horizon, clay contact <1/4", potential fracture infill, open 1/4"			
				95.85' - Mechanical break or fracture, 15 deg, rough, stepped			Top 4" of core lost to hammer test for calibration, measurements of core depths start from 96.85'



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-06	SHEET 6 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723934.5 N, 457719.1 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/09/07

START : 3/6/2007

END : 3/9/2007

LOGGER : R. Bitely, L. Prochaska

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			
100 -57.5	R9-NQ 5 ft 82%	60	0	97.5, 99.6' - Mechanical break (2) 97.95' - Fracture, 60 deg, rough, undulating 98.0-98.6' - Fracture zone, rough, stepped, multiple (>20) intersecting fractures at various angles, gravel sized fragments <3"		Limestone 93.0-94.1' - Same as 91.5-92.2' except weak to medium strong (R2 to R3), trace voids <3/16" and cavities 94.1-95.1' - Same as 91.5-92.2' except very weak to weak (R1 to R2), trace voids <3/16" and cavities 95.1-96.0' - Same as 91.5-92.2' except very weak to medium strong (R1 to R3), voids <3/16" over 60-80% of core surface, few cavities (<1/2"x1/4"), horizon of greenish black (5GY 2/1) fat clay (moist, soft to medium stiff, highly plastic, mild HCl reaction) at 94.25-94.35'	R9: 7 minutes
			1	100.2' - Mechanical break			
			NR				
105 -62.5	R10-NQ 5 ft 99%	97	0	101.95, 103.3, 103.6, 105.0' - Mechanical break (4)		No Recovery 96.0-96.85' Limestone 96.85-100.6' - pale yellowish brown, (10YR 6/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), 60% coverage of <3/16" voids on surface, 20% coverage of <3/4"x1/2" cavities on surface, fossiliferous	R10: 13 minutes
			0				
			0				
			NR			No Recovery 100.6-101.5' Limestone 101.5-106.45' - pale yellowish brown, (10YR 6/2), very fine to fine grained, extremely weak to very weak (R0 to R1), 60% coverage of <3/16" voids on surface, few cavities <1/2" diameter, fossiliferous with fossil molds, trace organics	
			2	106.85' - Fracture, 30 deg, rough, stepped		No Recovery 106.45-106.5' Limestone 106.5-111.2' - pale yellowish brown, (10YR 6/2), very fine to fine grained, extremely weak to weak (R0 to R2), 30-70% coverage of <3/16" voids on surface variable and decreasing with depth, cavities up to 1/2" to 1/4", fossiliferous, fossil molds and casts	
			1	107.4' - Fracture or mechanical break, 70 deg, smooth, stepped, open		No Recovery 111.2-111.5' Limestone 111.5-116.4' - pale yellowish brown, (10YR 6/2), very fine to fine grained, extremely weak to weak (R0 to R2), 40-70% coverage of <1/16" voids on surface variable, fossiliferous with fossil molds and casts <1/4" diameter	
110 -67.5	R11-NQ 5 ft 94%	60	2	108.5' - Bedding plane, horizontal, smooth, undulating, 1/2" open			R11: 16 minutes
			3	108.7' - Fracture or mechanical break, 60 deg, smooth, stepped			
			0	109.0' - Bedding plane, horizontal, smooth, undulating			
			NR	110.15, 110.25' - Bedding plane (2), <10 deg, rough, stepped			
			1	110.4' - Bedding plane, <10 deg, smooth, undulating			
			1	110.85' - Mechanical break			
			1	112.35, 112.6' - Bedding plane (2), <10 deg, rough, undulating			
115 -72.5	R12-NQ 5 ft 98%	92	2	114.0' - Fracture, 40 deg, smooth, undulating			
			1	114.35, 115.45' - Bedding plane (2), smooth, planar			
			0				SC-3 collected at 115.45- 116.2'
			NR	116.2' - Mechanical break		No Recovery 116.4-116.5'	R12: 14 minutes
			1				
			1	117.3' - Fracture, 70 deg, smooth, planar 117.55' - Fracture or mechanical break, 30 deg, rough, stepped			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-06

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723934.5 N, 457719.1 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/09/07

START : 3/6/2007

END : 3/9/2007

LOGGER : R. Bitely, L. Prochaska

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.
120 -77.5	R13-NQ 5 ft 98%	92	1	119.45, 119.7' - Fracture or mechanical break (2), 50 deg and 80 deg, rough, undulating		Limestone 116.5-117.5' - yellowish gray, (5Y 7/2), very fine to fine grained, very weak to weak (R1 to R2), 30-50% coverage of <1/16" voids on surface, 1 cavity 1/2" diameter, fossiliferous (molds), trace organics 117.5-121.4' - Same as 116.5-117.5' except 50-70% coverage of <3/16" voids on surface, 20% coverage of 1/4" to 1" cavities on surface, highly fossiliferous (molds) No Recovery 121.4-121.5' Limestone 121.5-125.4' - very pale orange, (10YR 8/2), very fine to fine grained, strong HCl reaction, weak to very weak (R2 to R1), 50-70% coverage of <3/16" voids on surface, 10% coverage of 3/16" to 1/2" cavities on surface, highly fossiliferous (molds) 125.4-126.0' - Same as 121.5-125.4' except thinly (1/16") laminated with pale yellowish brown, (10YR 6/2), very fine to fine grained, weak to medium strong (R2 to R3), organics, mild HCl reaction except for laminations No Recovery 126.0-126.5' Limestone 126.5-131.5' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to weak (R0 to R2), friable, 20% coverage of <1/16" voids on surface, highly fossiliferous (casts and molds)	R13: 9 minutes
			2	119.6' - Fracture or mechanical break, 60 deg, rough, planar			
			1	120.95' - Fracture or mechanical break, <10 deg, rough, stepped			
			NR	121.6, 121.65' - Bedding plane (2), <10 deg, smooth, stepped			
125 -82.5	R14-NQ 5 ft 90%	70	4	122.0' - Mechanical break or fracture, <10 deg, rough, stepped		121.5-125.4' - very pale orange, (10YR 8/2), very fine to fine grained, strong HCl reaction, weak to very weak (R2 to R1), 50-70% coverage of <3/16" voids on surface, 10% coverage of 3/16" to 1/2" cavities on surface, highly fossiliferous (molds) 125.4-126.0' - Same as 121.5-125.4' except thinly (1/16") laminated with pale yellowish brown, (10YR 6/2), very fine to fine grained, weak to medium strong (R2 to R3), organics, mild HCl reaction except for laminations No Recovery 126.0-126.5' Limestone 126.5-131.5' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to weak (R0 to R2), friable, 20% coverage of <1/16" voids on surface, highly fossiliferous (casts and molds)	R14: 8 minutes
			1	122.5' - Bedding plane, horizontal, smooth, undulating			
			0	122.65' - Mechanical break or fracture, 50 deg, rough, undulating			
			2	123.65, 123.9' - Fracture or mechanical break (2), 45 deg and 80 deg, rough, undulating			
130 -87.5	R15-NQ 5 ft 100%	42	NR	125.7' - Bedding plane, horizontal, smooth, planar		121.5-125.4' - very pale orange, (10YR 8/2), very fine to fine grained, weak to medium strong (R2 to R3), organics, mild HCl reaction except for laminations No Recovery 126.0-126.5' Limestone 126.5-131.5' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to weak (R0 to R2), friable, 20% coverage of <1/16" voids on surface, highly fossiliferous (casts and molds)	Sample can be crushed between fingers to silt size material (calcareous)
			>10	125.9' - Bedding plane, horizontal, smooth, undulating			
			3	126.5-126.83' - Fracture zone, smooth, undulating, multiple intersecting fractures, fragments up to 2" diameter			
			>10	126.85' - Bedding plane, horizontal, smooth, undulating			
135 -92.5	R16-NQ 5 ft 100%	84	>10	127.15' - Bedding plane or mechanical break, rough, undulating		126.5-131.5' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to weak (R0 to R2), friable, 20% coverage of <1/16" voids on surface, highly fossiliferous (casts and molds)	R15: 5 minutes
			>10	127.7, 127.8, 128.0' - Bedding plane (3), <10 deg, smooth, undulating			
			>10	128.15' - Bedding plane or mechanical break, horizontal, rough, undulating			
			>10	128.5, 128.75, 128.9, 129.0' - Bedding plane (4), horizontal, rough, undulating			
136.5	R16-NQ 5 ft 100%	84	5	129.15-129.35' - Fracture zone, rough, stepped		131.5-134.7' - very pale orange, (10YR 8/2), very fine to fine grained, extremely weak to very weak (R0 to R1), trace organics, fossiliferous (casts and molds), 60-90% coverage of <3/16" voids on surface, interbedded laminated bedding up to 1" thick with trace voids and fossils	SC-4 collected at 134.0-134.85'
			3	129.55-129.65' - Fracture zone, rough, stepped			
			0	130.2, 130.8' - Bedding plane (2), rough, undulating			
			2	131.0-131.5' - Fracture zone, rough, stepped to undulating			
137.5	R16-NQ 5 ft 100%	84	0	131.6' - Bedding plane or mechanical break, rough, undulating, 1/2" open		131.5-134.7' - very pale orange, (10YR 8/2), very fine to fine grained, extremely weak to very weak (R0 to R1), trace organics, fossiliferous (casts and molds), 60-90% coverage of <3/16" voids on surface, interbedded laminated bedding up to 1" thick with trace voids and fossils	R16: 7 minutes
			2	132.2' - Bedding plane or mechanical break, smooth, planar			
			2	132.4' - Fracture or mechanical break, <10 deg, rough, stepped			
			0	132.5, 132.55' - Bedding plane (2), horizontal, smooth, undulating			
138.5	R16-NQ 5 ft 100%	84	0	133.2, 133.55' - Bedding plane (2), <10 deg, rough, undulating		134.7-136.5' - Same as 131.5-134.7' except strong HCl reaction, 20-40% coverage of <1/16" voids on surface, trace fossil molds or casts, interbedded with highly fossiliferous lenses up to 1" thick	
			0	134.85, 135.1' - Bedding plane (2), <10 deg, smooth, undulating			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-06	SHEET 8 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723934.5 N, 457719.1 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/09/07

START : 3/6/2007

END : 3/9/2007

LOGGER : R. Bitely, L. Prochaska

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			
140 -97.5	R17-NQ 5 ft 100%	100	0	135.9, 135.95' - Fracture or mechanical break (2), 60 deg, rough, undulating, intersecting		Limestone 136.5-141.5' - very pale orange, (10YR 8/2), very fine to fine grained, extremely weak to weak (R0 to R2), <1/16" voids, highly fossiliferous (molds), interbedded with horizontal laminations up to 1 1/2" thick which are yellowish gray (5Y 7/6) and exhibit no fossils and few voids <1/16", large fossil cast 1" in diameter at 141.1'	R17: 11 minutes
			1	139.65' - Bedding plane or mechanical break, smooth, undulating			
			1	141.1' - Mechanical break, rough, undulating			
	141.5		1	142.2' - Fracture or mechanical break, 20 deg, rough, stepped, 1/2" open			
145 -102.5	R18-NQ 5 ft 88%	68	2	143.8' - Mechanical break		141.5-144.95' - yellowish gray to very pale orange, (5Y 7/2 to 10YR 8/2), very fine grained, medium strong (R3), 40-50% coverage of voids on surface, solution cavities up to 1 1/2" with secondary infill of fine grained limestone with voids over 80-90% of surface, all fossiliferous with multiple casts in matrix and secondary infill, organic staining occurring on fresh surface at 144.1-144.95'	SC-5 collected at 142.5-143.75'
			>10	144.1, 144.3' - Mechanical break or fracture (2), <10 deg, rough, undulating to stepped, 1/4" open			
			0	144.6, 144.7, 144.9' - Mechanical break or fracture (3), horizontal, rough, undulating, organic staining			
			NR	144.9-144.95' - Fracture zone, smooth to rough, undulating to stepped, organic staining			
			3	145.6' - Mechanical break			
			>10	146.9' - Mechanical break or bedding plane, <10 deg, smooth, undulating, 1/4" open			
150 -107.5	R19-NQ 5 ft 98%	60	1	147.0' - Mechanical break		No Recovery 145.9-146.5' Limestone 146.5-151.4' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 3/2), fine grained, very weak to medium strong (R1 to R3), 50-80% coverage of <1/16" voids on surface, moderately fossiliferous, trace laminations, trace mottling/potential secondary infilling on cavities <1 1/2"	R18: 38 minutes
			0	147.2, 147.45, 147.65, 147.7, 147.8, 147.9, 148.15, 148.2, 148.3, 148.35, 148.5' - Mechanical break or bedding plane (11), <10 deg, smooth to rough, undulating			
			1	149.05' - Fracture, 40 deg, rough, undulating			
			NR	151.2' - Clay seam, horizontal, 1/4" open, 1/4" clay infill			
			0	152.45' - Mechanical break			
			1	153.3' - Fracture or mechanical break, horizontal, smooth, undulating, 1/4" open			
155 -112.5	R20-NQ 5 ft 95%	73	5	153.8' - Fracture or mechanical break, horizontal, smooth, undulating		No Recovery 151.4-151.5' Limestone 151.5-153.8' - pale yellowish brown, (10YR 6/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), 30-60% coverage of <3/16" voids on surface variable, fossiliferous, fossil molds and casts up to 1/2" to 1/4"	R19: 8 minutes Stop drilling at 18:00 on 3/8/07 Resume drilling at 08:15 on 3/9/07 Driller's Remark: Depth to water before drilling at 1' below ground surface
			>10	153.95-154.65' - Mechanical break			
			0	154.1, 154.15, 154.2, 154.3, 154.35' - Bedding plane (5), <10 deg, smooth, undulating, <1/4" open			
			NR	154.65' - Fracture or mechanical break, <10 deg, rough, undulating			
			2	155.3-155.4' - Fracture zone, <10 deg, rough, stepped to undulating			
			4	156.1' - Mechanical break			
	156.5		NR	156.65' - Bedding plane or mechanical break, horizontal, smooth, undulating, 1/4" open		153.8-155.4' - pale yellowish brown to dark yellowish brown, (10YR 6/2 to 10YR 4/2), very fine to fine grained, extremely weak to weak (R0 to R2), poorly laminated bedding, highly fossiliferous, fossil molds and casts <1/4", organics on laminar partings, 60% coverage of <3/16" voids on surface, 20% coverage of <3/4" cavities on surface, 1" carbonate derived silt lens at 155.3-155.4'	R20: 27 minutes



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-06
SHEET 9 OF 9	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723934.5 N, 457719.1 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/09/07 START : 3/6/2007 END : 3/9/2007 LOGGER : R. Bitely, L. Prochaska

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			
160 -117.5	R21-NQ 5 ft 99%	76	5	157.05' - Fracture or mechanical break, 30 deg, rough, stepped, 1/2" open, silt size infill		155.4-156.25' - Same as	SC-6 collected at 160.45-161.45' R21: 27 minutes
			1	158.0' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/4" open		151.5-153.8'	
			0	158.25, 158.35, 158.45' - Fractures or mechanical break (3), horizontal, smooth to rough, undulating, 1/4" open		No Recovery 156.25-156.5' Limestone	
161.5				158.6' - Bedding plane, rough, undulating, 1/4" open		156.5-157.8' - yellowish gray to pale yellowish brown, (5Y 7/2 to 10YR 6/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), 40-70% coverage of <3/16" voids on surface, fossiliferous with molds and casts	
				158.8, 158.83, 158.85, 158.9' - Bedding plane or mechanical break (4), smooth to rough, undulating, 1/4" open		157.8-159.0' - yellowish gray, (5Y 7/2), very fine grained, mild HCl reaction, medium strong (R3), interbedded, 10-30% coverage of <1/16" voids on surface, few fossils	
				159.45' - Fracture, 60 deg, rough, undulating, 1/4" open		159.0-161.4' - Same as 156.5-157.8'	
				160.45' - Mechanical break		No Recovery 161.4-161.5'	
						Bottom of Boring at 161.5 ft bgs on 3/9/2007	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-07

SHEET 1 OF 14

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

WATER LEVELS : 2.9 (BGS 01/03/07)			START : 2/29/2007		END : 3/9/2007		LOGGERS : J. Schaeffer, R. Gomez	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE	6"-6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY				
42.3	0.0	1.0	SS-1	1-2-2-1 (4)	Topsoil 0.0-0.1' - wood debris	NR=No Recovery		
	2.0				Poorly Graded Sand (SP) 0.1-1.0' - pale yellowish brown, (10YR 6/2), moist, very loose, no HCl reaction, very fine to fine grained silica sand to <1/16", trace nonplastic fines, trace organics			
		1.4	SS-2	3-3-4-5 (7)	2.0-2.4' - Same as 0.1-1.0' except color darkens with depth			
	4.0				Poorly Graded Sand With Silt (SP-SM) 2.4-3.4' - dark yellowish orange, (10YR 6/6), moist, loose, very fine to fine grained, nonplastic, no HCl reaction, 5-10% nonplastic fines, trace fine organics and roots, mottled, sand is silica			
5	5.4	1.0	SS-3	2-2-50/5 (52/11")	Silty Sand (SM) 4.0-4.4' - moderate yellowish brown, (10YR 5/4), moist, loose, very fine to fine grained, low plasticity, no HCl reaction, 30% low plastic fines, trace organics, sand is silica			
37.3	6.0				Clayey Sand (SC) 4.4-4.7' - pale green, (10G 6/2), moist, loose, no HCl reaction, 20-25% medium to high plastic fines, trace organics at contact with next material			
	6.4	0.4	SS-4	50/5 (50/5")	Silt With Sand (ML) 4.7-5.0' - yellowish gray, (5Y 8/1), moist, hard, nonplastic, very rapid dilatancy, moderate HCl reaction, 15-20% sand-sized, very fine to fine and scattered coarse-sized, all carbonate			
	8.0				Silt (ML) 6.0-6.4' - yellowish gray, (5Y 8/1), wet, hard, nonplastic, very rapid dilatancy, moderate HCl reaction, some yellowish staining, 5-10% very fine to fine sand-sized, trace coarse sand-sized, all carbonate			
10	10.0	0.8	SS-5	45-3-2-1 (5)	Sandy Silt And Limestone Fragments (ML) 8.0-8.5' - Same as 6.0-6.4' except some yellowish staining, 30-35% coarse sand to fine limestone fragments sized carbonate material, has the appearance of beds, may be extremely weak limestone			
32.3	12.0	1.9	SS-6	2-1-2-4 (3)	Silt (ML) 8.5-8.8' - Same as 6.0-6.4'			
	13.5	1.5	SS-7	4-5-50/6 (55/12")	10.0-10.6' - Same as 6.0-6.4' except soft, 5-10% very fine sand sized, all carbonate			
	14.0				Silt With Sand (ML) 10.6-11.9' - Same as 10.0-10.6' except 10-15% fine to medium sand sized, trace fine gravel sized carbonate material, trace limestone lenses <1/2" thick			
15	14.2	0.0	SS-8	50/2 (50/2")	12.0-13.5' - yellowish gray, (5Y 8/1), wet, soft, nonplastic, very rapid dilatancy, sand-sized content varies, trace scattered fine gravel-sized, 1/6" thick lenses of limestone from 13.4-13.6', moderate HCl reaction in fines, mild to moderate HCl reaction in larger particles, all carbonate			
27.3	16.0				No Recovery 14.0-14.2'			
	18.0	1.1	SS-9	14-14-3-2 (17)				
		1.7	SS-10	2-3-6-3 (9)				
20								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-07

SHEET 2 OF 14

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

WATER LEVEL: 23.0 RDS ON 3/30/07		DATE: 2/26/07		EQUIP: G. SCHUBERT, R. SCHUBERT			
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE		6"-6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		
22.3	20.0	1.6	SS-11	1-2-27-50 (29)	Silt (ML) 16.0-17.1' - yellowish gray, (5Y 8/1), wet, very stiff, nonplastic, very rapid dilatancy, moderate HCl reaction, 5-10% fine to coarse grained sand, all carbonate	Driller's Remark: 22.0-23.6' hard, becomes soft at 23.6'	
22.0	22.2	0.2	SS-12	50/2 (50/2")	Sandy Silt (ML) 18.0-19.7' - Same as 16.0-17.1' except 40% sand sized trace gravel sized to 1", voids 1/16" and fossil molds visible on larger particles, all carbonate		
	24.0				Silty Sand (SM) 20.0-21.6' - grayish orange, (10YR 7/4), wet, medium dense, fine to coarse grained, moderate HCl reaction, 30% nonplastic fines, 20% fine gravel-sized in lenses <1/4" thick, all carbonate		
25	25.2	1.1	SS-13	9-26-50/2 (76/8")	22.0-22.2' - Same as 20.0-21.6' except silt and fine to coarse gravel sized limestone pieces	Driller's Remark: Lost circulation at 24.0'	
17.3	26.9	0.1	SS-14	50/1 (50/1")	Silty Sand With Limestone Fragments (SM) 24.0-25.1' - grayish orange, (10YR 7/4), wet, very dense, fine to coarse grained, moderate to strong HCl reaction, 35% nonplastic fines, 15% fine gravel-sized to 1", trace white limestone fragments		
	28.0				Silt (ML) 26.0-26.1' - white to yellowish gray, (N9 to 5Y 8/1), silt and a 1" iron nodule, silt may be slough		
	28.9	0.6	SS-15	6-50/5 (56/11")	Sandy Silt With Limestone Fragments (ML) 28.0-28.6' - pale yellowish brown, (10YR 6/2), wet, very dense, fine to coarse grained, moderate to strong HCl reaction, 16% nonplastic fines, limestone fragments to 2"	Still have no circulation; install 4" HW casing; heavy chatter at 15.0-20.0' Finish drilling at 16:00 on 4/25/07 Resume drilling 2/26/07 at 8:00	
30	30.0						
12.3	32.0	1.3	SS-16	3-7-13-6 (20)	Limestone Fragments 30.0-30.1' - pale yellowish brown, (10YR 6/2), mild to moderate HCl reaction, coarse gravel-sized pieces, surface covered in 1/16" voids, some fossil molds, very weak limestone		
	34.0	2.0	SS-17	2-3-3-4 (6)	Silty Sand (SM) 30.1-31.3' - dark yellowish orange, (10YR 6/6), wet, medium dense, fine to coarse grained, moderate HCl reaction, 35% nonplastic fines, all carbonate		
	34.6	0.4	SS-18	45-50/1 (95/7")	Silty Sand With Limestone (SM) 32.0-32.8' - Same as 30.1-31.3' except mild HCl reaction, intact limestone fragments to 1" in silt and sand sized matrix		
35	36.0	0.0	SS-19	50/0 (50/0")	Sandy Silt (ML) 32.8-33.5' - dark yellowish orange, (10YR 6/6), wet, very soft, moderate HCl reaction, 30-35% sand-sized fragments, very friable, trace medium sand-sized white particles, trace black streaks		
7.3	38.9	0.1	SS-20	50/1 (50/1")	Silty Sand With Limestone (SM) 33.5-33.7' - Same as 32.0-32.8'	Shut down at 10:11 2/26/07 due to hydraulic leak on autohammer	
					Silty Sand (SM) 33.7-34.0' - yellowish gray, (5Y 8/1), wet, medium dense, mild HCl reaction, intact limestone fragments to 1" in silt and sand-sized matrix, fragments have many fossil molds/casts, all carbonate		
					Sandy Silt (ML) 34.0-34.2' - Same as 32.8-33.5' except medium stiff		
					Silty Sand (SM) 34.2-34.4' - Same as 32.0-32.8'	Resume drilling 2/27/07 12:00 Driller's Remark: 38.0-40.0' hard, but no chatter	
					No Recovery 36.0'		
40							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-07

SHEET 3 OF 14

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

WATER LEVELS : 2.3 TO 60.0		START : 2/23/2007		END : 3/2/2007		LOGGERS : J. J. Schaefer, R. Gomez	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE	6"-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		
2.3	40.0	1.9	SS-21	6-8-33-50/5 (41)	Limestone Fragments 38.0-38.1' - dark yellowish brown, (10YR 4/2), moderate HCl reaction, fragments <1/8" thick and wafer shaped, abundant fossil casts/molds Silty Sand (SM) 40.0-41.9' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), wet, dense, fine to coarse grained, moderate to strong HCl reaction, 30-40% silt-sized, limestone fragments in thin bedded appearance at 41.6-41.9', sand-sized very friable and can crush with fingers, all carbonate Sandy Silt (ML) 42.0-43.0' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), stiff, low plasticity, no dilatancy, strong HCl reaction, trace black streaks, 30% fine sand-sized Silty Sand With Limestone Fragments (SM) 43.0-43.3' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), dense, moderate to strong HCl reaction, trace black streaks, predominately sand-sized material with 30% silt-sized, limestone fragments in last 0.3' with bedded appearance, carbonate materials Sandy Silt (ML) 44.0-45.4' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), moist to wet, hard, nonplastic, low to rapid dilatancy, strong HCl reaction, 40% fine sand, 1/2" limestone lens at 44.2' Silty Sand (SM) 46.0-46.3' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), wet, very dense, fine to coarse grained, strong HCl reaction, 40% medium plastic silt, last 0.1' has gravel-sized limestone fragment Limestone Fragments 48.0-48.1' - strong HCl reaction, 80% coverage of voids 1/16" or less on surface of fragments Sandy Silt (ML) 50.0-51.5' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), moist to wet, hard, fine to coarse grained, moderate HCl reaction, 55% nonplastic fines, 3/4" to 1/2" limestone lenses Silty Sand (SM) 52.0-52.9' - Same as 50.0-51.5' except 40-50% low plastic fines, 1/2" poorly indurated limestone lens at 52.3' No Recovery 54.0-54.1' Limestone Fragments 56.0-56.1' - dark yellowish brown, (10YR 4/2), moderate HCl reaction, fragments to 1", 60% coverage of 1/16" voids on surface, black streaks Limestone Fragments 58.0-58.1' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, 60% coverage of 1/16" voids on surface, fossil molds/casts, black streaks, very weak		Driller's Remark: Chatter starting at 43.0'
41.8							
43.4	1.3	SS-22	21-38-50/5 (88/11")				
44.0							
45 -2.7	1.4	SS-23	14-15-17-24 (32)				
46.0							
46.3	0.3	SS-24	50/4 (50/4")				
48.9							
	0.1	SS-25	50/1 (50/1")				
50 -7.7							
	1.5	SS-26	46-31-49-41 (80)				
52.0							
	0.9	SS-27	4-14-50/4 (64/10")				
53.3							
54.9							
	0.0	SS-28	50/1 (50/1")				
55 -12.7							
	0.1	SS-29	50/1 (50/1")				
56.9							
							Driller's Remark: Very hard 56.0-57.0', softer at 57.0'
58.0							
	0.8	SS-30	25-50/6 (75/12")				
59.0							Driller's Remark: Very hard 59.0-60.0'
60							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-07	SHEET 4 OF 14
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

WATER LEVELS : 2.51 bgs on 03/07/07		START : 2/29/2007		END : 3/9/2007		LOGGERS : J. Schaefer, R. Gomez	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE	6"-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		
-17.7	60.0	0.9	SS-31	5-50/6 (55/12")	Silty Sand (SM) 58.1-58.8' - moderate yellowish brown, (10YR 5/4), wet, very dense, fine to coarse grained, moderate HCl reaction, black streaks, 35-40% low plastic fines, carbonate		Driller's Remark: Gets softer at 67.0'
	61.0				Silt With Sand (ML) 60.0-60.9' - moderate yellowish brown, (10YR 5/4), wet, low to medium plasticity, rapid dilatancy, strong HCl reaction, hard, 15-20% fine sand-sized carbonate particles, trace black streaks, trace coarse sand-sized limestone fragments		
	62.0	0.0	SS-32	50/1 (50/1")	No Recovery 62.0-62.1'		
	64.0						
65	64.8	0.8	SS-33	44-50/3 (94/9")	Silty Sand (SM) 64.0-64.8' - Same as 58.1-58.5' except 50% silt sized carbonate material, 2 limestone lenses 1" thick, last 0.2' is coarse sand size limestone fragments, no black streaks		
-22.7	66.0						
		0.0	SS-34	50/0 (50/0")	Limestone Fragments 66.0' - moderate yellowish brown, (10YR 5/4), hard, very fine grained, mild to moderate HCl reaction, voids (1/16") over <5% of surface, few fragments recovered, fragments are 1/4" size		
	68.0						
	68.7	0.7	SS-35	17-50/2 (67/8")	Silty Sand (SM) 68.0-68.4' - Same as 64.0-64.8' except 2 limestone pieces to 1/2" in size, 80% coverage of voids 1/16" on surface		
					Silt With Sand (ML) 68.4-68.7' - grayish orange, (10YR 7/4), moist, hard, low plasticity, rapid dilatancy, moderate HCl reaction, 20% sand-sized, carbonate materials		
70	70.0				Silt With Sand (ML) 70.0-70.2' - Same as 68.4-68.7' except 25% sand-sized		Driller's Remark: Some chatter 70.0-71.0', softer at 71.0' faster drilling
-27.7	70.3	0.2	SS-36	50/4 (50/4")			
							Driller's Remark: Hard at 71.5'
	72.0						
		0.7	SS-37	14-9-50/5 (59/11")	Sandy Silt With Limestone Fragments (ML) 72.0-72.7' - moderate yellowish brown, (10YR 5/4), wet, hard, mild to moderate HCl reaction, 68% fines, 2" lense of limestone, scattered pieces to 3/8", 80% coverage of voids 1/16" on surface		
	73.4						
	74.0						
75		1.8	SS-38	2-3-7-50/4 (10)	Lean Clay (CL) 74.0-74.9' - pale yellowish brown, (10YR 6/2), moist, low to medium plasticity, no dilatancy, strong HCl reaction, stiff, 10-15% fine to medium sand-sized particles, trace black spots to 1/16", carbonate material		Driller's Remark: Very hard at 75.0'
-32.7	75.8						Driller's Remark: Finish drilling at 18:10 on 2/27/07, will switch to rock coring at 76.0'
		0.0	SS-39	50/0 (50/0")	Sandy Silt (ML) 74.9-75.8' - yellowish gray, (5Y 8/1), moist to wet, stiff, low plasticity, slow to rapid dilatancy, strong HCl reaction, 20-30% sand-sized material, carbonate		
					Limestone Fragments 75.9-76.0' - dark yellowish brown, (10YR 7/2), moderate HCl reaction, some with voids 1/16", others without voids		
					Begin Rock Coring at 76.0 ft bgs See the next sheet for the rock core log		
80							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-07

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

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			
76.0	R1-HQ 5 ft 100%	73	4	76.2-76.3' - Mechanical break, multiple		Limestone 76.0-81.0' - pale yellowish brown to very pale orange, (10YR 6/2 to 10YR 8/2), strong HCl reaction, no noticeable fossils, no solution cavities from 76.0-79.0', 16% coverage of solution cavities 3/8" or less in diameter at 79.0-81.0', 1-2 perfect elongate spherical solution cavities, limestone is fine grained at 76.0-76.9' and 79.2-81.0' (very pale orange), limestone becomes silty from 77.2-77.9'	Install HW casing to 76.0' Not able to retrieve inner core last interval due to catcher not grasping inner core barrel Begin rock coring at 76.0' After pulling core barrel, used A rods to flush hole with water to extract slough R1: 12 minutes SC-1 collected at 80.0-81.0'
			3	76.7' - Fracture, smooth, undulating, <3/4" silt infilling or silt seams			
			1	77.2' - Fracture, horizontal, smooth, planar, <1-3/16", thick clayey silt			
			1	77.4' - Fracture, horizontal, smooth, planar, <3/16" fines			
			1	77.9' - Fracture, horizontal, smooth, planar, <3/8" silt			
80 -37.7	R2-HQ 5 ft 100%	92	1	78.2' - Fracture, 1-2 deg, rough, stepped, <3/4" friable fines		81.0-81.3' - very pale orange, (10YR 8/2), strong HCl reaction, fine grained limestone, no fossils, no solution cavities 81.3-86.0' - pale yellowish brown, (10YR 6/2), moderate to strong HCl reaction, 20-30% microfossils, 50-70% silty matrix, 60-70% coverage of solution cavities 1/16" or less, 81.5-81.6' zone laminated dusky brown (5YR 2/2) organics 86.0-88.0' - moderate yellowish brown, (10YR 5/4), 30-50% fossil shells, molds and casts, 50-60% coverage of 3/8" or less solution cavities, 87.6' infilling of fat clay (CH) bluish gray (5B 9/1) to light bluish gray (5B 7/1), high plasticity and very moist 88.0-88.4' - pinkish gray, (5YR 8/1), dry, dense, strong HCl reaction, extremely weak to very weak (R0 to R1) 88.4-90.6' - pinkish gray, (5YR 8/1), dry, dense, strong HCl reaction, very weak (R1) 90.6-91.0' - pinkish gray, (5YR 8/1), strong HCl reaction, 70-90% silty matrix, no fossils observed 91.0-94.0' - Same as 90.6-91.0' except weak to medium strong (R2 to R3), noticeable fossil (shell fragments, casts), 10-20% coverage of voids 1/8" or less 94.0-96.0' - moderate yellowish brown, (10YR 5/4), 30-50% fossil shells, molds and casts, 50-60% coverage of solution cavities up to 3/8"	R2: 8 minutes SC-2 collected at 83.7-84.7' SC-3 collected at 89.6-90.6' R3: 11 minutes SC-4 collected at 91.7-92.6' R4: 12 minutes Driller's Remark: 95.0-96.0' soft
			1	79.2' - Fracture, rough, stepped, <3/16" fines			
			1	80.3' - Fracture, 30-40 deg, rough, stepped, <3/16" fines			
81.0			1	81.6' - Fracture, 1 deg, smooth, undulating, <5% fines, laminated organics			
			2	82.3' - Fracture, 20-25 deg, rough, stepped, 20-30% mix of fines and sand sized grains			
	R3-HQ 5 ft 100%	93	1	82.9, 83.5' - Fracture (2), horizontal and 5-10 deg, rough, stepped, 20-30% mix of fines and sand sized grains			
85 -42.7			1	84.8' - Fracture, rough, undulating, 20-30% mix of fines and sand size grains			
			0				
			1	86.4' - Fracture, 30 deg, sand to gravel size limestone grains			
			1	87.6' - Fracture, 25 deg, rough, stepped, <3/4" fractured carbonate grains and up to 1-3/16" void filled with fat clay (CH)			
90 -47.7	R4-HQ 5 ft 100%	70	1	88.4' - Fracture, horizontal, smooth, undulating, <3/8" silty infilling			
			0				
			1	90.6' - Bedding plane, horizontal, smooth, undulating			
			2	92.5' - Fracture, horizontal, smooth, planar			
			<7	92.8' - Fracture, horizontal, rough, undulating, infilled with 3/4" of medium plasticity clay/silt			
			0	93.3-93.7' - Fracture zone, rough, undulating, multiple fractures, low to high angle			
95 -52.7			0				
			1				
96.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-07	SHEET 6 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

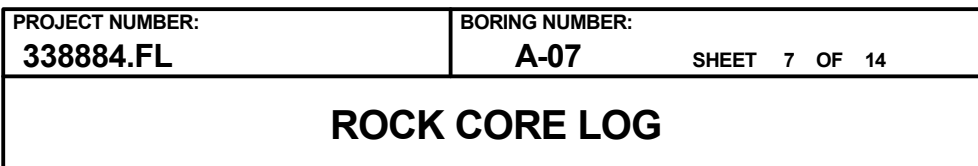
WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

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				
100 -57.7	R5-HQ 5 ft 40%	0	>10	95.4' - Fracture, planar, <2" thick, clays and silts 96.0-98.0' - Fracture zone, 0-90 deg, fractured material, most likely mechanical breaks		Limestone 96.0-97.0' - pinkish gray, (5YR 8/1), strong HCl reaction, 70-90% silty matrix, non fossiliferous No Recovery 97.0-100.0'	Driller's Remark: Sand lense 97.0-100.0'; core loss assumed to be from that interval No recovery in core barrel but residual material appears to be very fine to fine grained sand, poorly graded, white to light brown in color Driller's Remark: Advance HW casing past sand lense to 101.0' R5: 13 minutes Insert and set surface casing to 101.0' Stop drilling at 17:30 2/28/07 Resume drilling at 15:52 3/6/07 SC-5 collected at 102.4-103.4'		
			NR						
			>10						
	105 -62.7	R6-HQ 5 ft 86%	86	1	101.6' - Mechanical break, horizontal, rough, stepped, 3/4" of relief, open		100.0-101.0' - medium yellowish brown, (10YR 5/4), strong HCl reaction, very weak (R1), 30-50% fossils shells, molds and casts, 50-60% solution cavities 101.0-105.3' - Same as 100.0-101.0' except solution cavities up to 3/4" in length (fossil molds)	Driller's Remark: Advance HW casing past sand lense to 101.0' R5: 13 minutes Insert and set surface casing to 101.0' Stop drilling at 17:30 2/28/07 Resume drilling at 15:52 3/6/07 SC-5 collected at 102.4-103.4'	
				0					
				0					
				0					
				0					
				NR					
	110 -67.7	R7-HQ 5 ft 100%	100	0	105.3' - Mechanical break		No Recovery 105.3-106.0'	R6: 8 minutes	
1									
0									
0									
0									
0									
115 -72.7		R8-HQ 5 ft 100%	100	0	107.5' - Mechanical break, 2-6 deg, rough, planar		106.0-111.0' - very pale orange, (10YR 8/2), strong HCl reaction, weak to medium strong (R2 to R3), 20-40% coverage of solution cavities up to 3/16", no apparent bedding, silty matrix when reduced with rock hammer, 10-20% fossil evidence	SC-6 collected at 107.9-108.9' Driller's Remark: Softer drilling 109.0-111.0' R7: 14 minutes	
	0								
	0								
	0								
	0								
			0			111.0-116.0' - Same as 106.0-111.0' except Very weak to weak (R1 to R2) at 114.0-116.0'	Very weak to weak interval identified as 109.0-111.0' on field log, it is assumed that 114.0-116.0' was intended		
			0				SC-7 collected at 113.7-114.6'		
			0				R8: 7 minutes		



ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

APPENDIX 2BB-70



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-07

SHEET 8 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

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			
140 -97.7	R13-HQ 5 ft 82%	62	0			Limestone 134.4-135.5' - pale yellowish brown, (10YR 6/2), very fine grained, strong HCl reaction, laminar bedding, 5-6 3/8" in diameter solution cavities following silty laminae, <10% coverage of voids 1/16" or less on surface 135.5-137.5' - grayish orange pink, (10R 8/2), weak to medium strong (R2 to R3), fine grained with some medium to coarse sand-sized particles, sporadic 1/16" pyrite grains, 10-15% coverage of 1/16" or less voids Silt (ML) 137.5-137.8' - pale brown, laminar bedding Limestone 137.8-139.5' - pale orange, (10YR 8/2), weak to medium strong (R2 to R3), 10-25% voids coverage of 1/16" or less, 10-20% fossils, 3/4" solution cavity with fat clay infilling at 139.5' 139.5-140.1' - grayish orange, (10YR 7/4), fine grained, weak to medium strong (R2 to R3), 10-20% fossil casts No Recovery 140.1-141.0' Limestone 141.0-144.0' - pale brown, (5YR 5/2), very weak to weak (R1 to R2), 20-30% coverage of 3/4" voids on surface, intact fossil casts and molds, no broken fossil shells, becomes more fossiliferous towards base (143.5-144.0') and increases in sand-sized grains, dense limestone but density decreases 143.2-144.0' as granularity increases 144.0-145.5' - pale yellowish brown, (10YR 6/2), very fine to fine grained, no visible fossils, laminar to thin bedded, 5-10% coverage of voids 1/16" or less 145.5-146.0' - pale brown, (5YR 5/2), strong HCl reaction, weak (R2), 10-30% sand-sized grain matrix 146.0-146.7' - very pale orange to grayish orange, (10YR 5/2 to 10YR 7/4), medium to coarse grained, weak to medium strong (R2 to R3), fossils up to 3/8", sand to gravel-sized grains 146.7-147.0' - fine grained, strong HCl reaction, weak (R2), silty laminae, silty matrix, no fossils, 15% coverage of voids 1/16" or less	SC-12 collected at 137.8-138.7' Driller's Remark: Circulation lost at 139.5' R13: 13 minutes
			2	137.5, 137.8' - Fractures (2), horizontal, smooth, planar, silty infilling <1/16"			
			0				
			0				
			NR				
145 -102.7	R14-HQ 5 ft 100%	52	1	141.8' - Fracture, 12-15 deg, rough, undulating, open up to 1/4", minor silt sized particle infilling		Driller's Remark: Continuous circulation loss even while adding water to mud tub R14: 11 minutes	
			3	142.2, 142.3, 142.7' - Fractures (3), 5-10 deg, rough, planar, apparent orientation of fractures with solution cavities			
			>10	142.8-143.8' - Fracture zone, variable orientation, fragments range from 1/2" to 2 1/2"			
			2	143.9' - Bedding plane, horizontal, smooth, planar			
			>10	144.2, 144.6' - Bedding plane (2), horizontal, smooth, planar			
150 -107.7	R15-HQ 5 ft 100%	98	0	144.6-146.0' - Fracture zone, fragments range from 1/2" to 3"x1" or larger		SC-13 collected at 146.0-147.05' R15: 9 minutes	
			0	147.6, 155.7' - Mechanical break (2), load tests and machine breaks			
			0				
			3	149.5, 149.6' - Bedding plane (2), 5-8 deg, rough, planar, <1/16" thick silty infilling on bedding plane partings			
			0	149.75' - Fracture, 80 deg, smooth, planar, tight			
155 -112.7	R16-HQ 5 ft 100%	100	0			SC-14 collected at 151.0-152.1' R16: 14 minutes	
			2	152.1, 152.5' - Fractures (2), horizontal, rough, planar, <3/8" thick unconsolidated silt			
			1	153.1' - Bedding plane, planar, undulating			
			0				
			1	155.2' - Fracture, rough, stepped, <1/16" silty infill			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-07	SHEET 9 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07 START : 2/25/2007 END : 3/8/2007 LOGGER : J. Schaeffer, R. Gomez

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			
160 -117.7	R17-HQ 5 ft 100%	100	0			Limestone 147.0-149.7' - grayish orange to very pale orange, (10YR 7/4 to 10YR 5/2), mottled and variegated, fine to medium grained, strong HCl reaction, 10-20% 1/16" or less voids, sporadic echinoderms 3/8" to 9/16" 149.7-151.0' - fine grained, weak to medium strong (R2 to R3), 5-10% fossil casts, 5-10% coverage of 1/8" or less voids 151.0-151.8' - Same as 149.7-151.0' except very fine to fine grained 151.8-152.4' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, very weak to weak (R1 to R2), 10-20% coverage of voids 1/16" or less, silty matrix 152.4-153.1' - brown, (10YR 5/4), alternating silt and sand-sized carbonate layers at less than 1/8" thick, 5-10% coverage of 1/8" or less solution cavities, fossil molds at base, undulant to broadly undulant, thin to laminar bedding, unit exhibits slow but moderate HCl reaction, strong HCl reaction in very fine grained layers, exhibits differential compaction in very fine grained layers, dissolved fossils at/near center of bedding features 153.1-155.0' - Same as 149.7-151.0' except very fine to medium grained 155.0-156.6' - moderate orange pink to pale yellowish brown, (5YR 8/4 to 10YR 6/2), very weak to weak (R1 to R2), voids 3/8" or less, 10-20% fossils (30% at 155.3') 156.6-161.0' - very pale orange, (10YR 8/2), strong HCl reaction, very weak to weak (R1 to R2), 30-50% coverage of voids 1/8" or less, 1-3% coverage of 3/8" or less solution cavities at base (161.0'), 15-20% silty matrix 161.0-165.3' - Same as 156.6-161.0' except very thin laminar bedding planes from 163.6-164.9', brown laminae increase in frequency from 164.4-164.9' 165.3-165.6' - fine to medium grained, moderate HCl reaction, very fine to fine grained laminae 165.6-166.0' - medium gray, (N5), medium to coarse grained, strong HCl reaction, weak to medium strong (R2 to R3), no visible fossils, no solution cavities	SC-15 collected at 157.5-158.4'
			1	157.5, 160.4' - Fractures (2), 0-5 deg, smooth, undulating			
			0				
			0				
			1				
165 -122.7	R18-HQ 5 ft 100%	86	0			SC-16 collected at 162.5-163.4'	R17: 9 minutes
			0				
			0				
			1				
			3	164.7' - Fracture, horizontal, smooth, planar, minor silt infilling 165.3' - Fracture, horizontal, stepped, 1/8" relief, lithology contact, silt and sandy infill, <3/8" thick			
170 -127.7	R19-HQ 5 ft 100%	90	6	165.6, 165.8' - Fractures (2), horizontal, rough, planar, very fine to fine sandy infill, <3/8" thick		A variety of rock, mainly limestone and shell fragments up to 1/4" x 1.3" in random distribution but sub parallel in deposition, the long axes are aligned with apparent flow, the high energy (relatively) deposition is from 167.2-168.25', where the bedding becomes laminar to thin with very fine to fine grained laminae R19: 12 minutes SC-17 collected at 170.15-171.0' SC-18 collected at 172.7-174.0'	Driller's remark: Feels gritty like sand
			0	166.1-166.4' - Bedding plane, 0-5 deg, rough, planar			
			1				
			0	168.9' - Bedding plane, horizontal, smooth, stepped, consolidated silt/clay laminae, <3/16" thick			
			1	170.15' - Bedding plane, horizontal, rough, stepped, <3/16" thick			
175 -132.7	R20-HQ 5 ft 100%	68	2	171.2, 171.9' - Mechanical break or bedding plane (2), 0-3 deg, planar, rough to smooth			
			4	172.1' - Fracture, horizontal, smooth, undulating, silty infill <1/8" thick			
			0	172.2' - Fracture, horizontal, smooth, planar 172.5, 172.8' - Fractures (2), 10-15 deg, rough, planar			
			2	174.1' - Fracture, 5 deg, rough, stepped 174.6' - Fracture, 12 deg, rough, planar			
			6	175.1' - Fracture, 1-2 deg, rough, planar, <1/8" thick silty infill			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-07	SHEET 10 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

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			
180 -137.7	R21-HQ 5 ft 100%	53	5	175.4-175.5' - Bedding plane, 0-3 deg, smooth, planar, 1/4" to 1/2" wafers		Limestone 166.0-167.5' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, sandy and silty sized matrix, fossil casts at base, 10-20% voids 3/16" or less, iron oxide stains and grains of pyrite	SC-19 collected at 178.95-180.0'
			2	176.1-176.3' - Bedding plane, 0-3 deg, rough, planar, recrystallized carbonate on plane		167.5-168.5' - grayish orange, (10YR 7/4), strong HCl reaction, 20-40% fossils, 20-40% coverage of solution cavities 3/8" or less, 20-30% coverage of voids 1/16" or less	
			2	176.8' - Fracture, horizontal, rough, stepped, enlarged solution cavity fractures at depositional contact		168.5-169.8' - alternating very pale orange and pale yellowish brown, (10YR 8/2 to 10YR 6/2), thinly laminated bedding	
			1	177.45' - Fracture, horizontal, smooth, planar		169.8-171.0' - strong HCl reaction, very weak to weak (R1 to R2), no laminae, no visible fossils, 40-50% coverage of voids 1/16" or less	
			3	177.95, 178.3, 178.5' - Fractures (3), horizontal, rough, planar, lithology contact, <1/16" thick very fine sandy infill		171.0-172.2' - grayish orange, (10YR 7/4), moderate HCl reaction, 1 solution cavity up to 3/8" wide and 1 3/16" long across surface, increase in silts below 172.0', becoming dark yellowish orange, voids 5/16" or less	
181.0			4	180.1, 180.4, 180.6' - Fractures (3), horizontal, rough, planar, <1/8" thick carbonate recrystallization infilling		172.2-172.5' - grayish orange, (10YR 7/4), very fine to fine grained, carbonate derived silt-sized particles	SC-20 collected at 181.8-182.95'
			0	181.1' - Fracture, horizontal, smooth, planar		172.5-175.0' - Same as 171.0-172.2'	
			4	181.5, 181.7, 181.7' - Fractures (3), horizontal, planar, smooth to rough, trace infilling		175.0-175.5' - Same as 171.0-172.2' except fine grained, mild HCl reaction, laminated	
			2	183.2' - Fracture, horizontal, rough, planar, trace silty infilling		175.5-176.0' - pale yellowish brown, (10YR 6/2), strong HCl reaction, weak to medium strong (R2 to R3), <2% coverage of voids 1/16" or less, no visible fossils	
			4	183.5, 185.3, 185.4, 185.7, 185.8, 185.9' - Bedding plane (6), 5 deg		176.0-176.9' - fine grained, strong HCl reaction, weak to medium strong (R2 to R3), silty matrix with very fine sand (<10%), very fine to medium sand-sized lense, void filling with mica mineral, 10-15% coverage of tubular solution cavities on surface	
185 -142.7	R22-HQ 5 ft 100%	45	5	184.2, 184.5' - Fractures (2), horizontal, rough, undulating		176.9-177.6' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), <10% noticeable fossils, <10% coverage of voids 1/16" or less	SC-21 collected at 188.6-189.8'
			1	186.1-186.3' - Fracture zone, horizontal, smooth, planar		177.6-181.0' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, very weak to weak (R1 to R2), silty matrix, 5-10% coverage of 3/8" or less solution cavities	
			1	186.6' - Fracture, horizontal, rough, planar, lithology contact		181.0-183.5' - Same as 177.6-181.0' except dark brown silty organic laminae (1-3/16" thick)	
			2	186.9' - Fracture, 10 deg, rough, undulating			
			1	187.8' - Fracture, 8 deg, rough, undulating, silty infilling from formation matrix			
			3	188.3, 188.7, 189.9' - Fractures (3), horizontal, rough, planar, trace silty infilling			
190 -147.7	R23-HQ 5 ft 100%	66	>10	190.5, 190.7, 190.9' - Fractures (3), 5-40 deg, trace silty infilling			Numerous rock fragments indicate possible cavity filling debris from at least 195.5-196.0' but probably 193.4-196.0'
			>10	191.0-192.4' - Bedding plane, 0-10 deg, smooth, planar to undulating, numerous partings, irregular			
			>10	192.4-195.05' - Fracture zone, 0-90 deg, rough, multiple fracture zones, irregular, may exhibit recrystallization on the surface			
			>10				
			>10				
195 -152.7	R24-HQ 5 ft 100%	13	4	195.05, 195.2' - Fractures (2), horizontal and 7 deg, smooth, planar			R24: 6 minutes
196.0							



PROJECT NUMBER:
338884.FL

BORING NUMBER:
A-07

SHEET 11 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

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			
200 -157.7	R25-HQ 5 ft 70%	10	5	195.6, 195.8' - Fractures (2), horizontal and 15 deg, rough, undulating		Limestone 183.5-185.0' - very pale orange, (10YR 8/2), strong HCl reaction, very weak to weak (R1 to R2), 40-50% fossil shells, casts and molds up to 1"x 9/16", 20-40% coverage of voids 1/16" or less 185.0-186.0' - very fine to medium grained, very strong HCl reaction, 15-20% coverage of voids 1/16" or less 186.0-191.0' - pale yellowish brown, (10YR 6/2), mild to moderate HCl reaction, very weak to weak (R1 to R2), 10-30% fossil casts and molds, 5-10% coverage of solution cavities 3/8" or less, 30-50% coverage of voids 1/16" or less, 189.0-190.0 alternating dark brown and pale yellow brown laminae 191.0-192.4' - pale yellowish brown, (10YR 6/2), very fine to medium grained, moderate to strong HCl reaction, laminar to thin bedded, 10-20% coverage of solution cavities 3/8" or less 192.4-193.4' - very pale orange, (10YR 8/2), strong HCl reaction, very weak to weak (R1 to R2), 20-30% coverage of voids 1/16" or less, 20-40% fossil casts and molds 193.4-196.0' - pale yellowish brown, (10YR 6/2), very fine to coarse grained, strong HCl reaction, slightly mottled, light to moderately dense rock, 10-15% coverage of voids 1/16" or less, abundant fossils, indistinct bedding, multiple lithologic fragments 196.0-198.0' - grayish orange, (10YR 7/4), medium to coarse grained, moderate HCl reaction, very weak (R1), 30-40% fossils, 10-20% coverage of solution cavities 3/8" or less 198.0-198.5' - alternating grayish orange and light brown, (10YR 7/4 to 5YR 5/6), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), medium to coarse grained at alternating laminae 198.5-199.5' - strong HCl reaction, extremely weak (R0), large amount of non carbonate silt to clay-sized particles, 10% coverage of voids 1/16" or less, pyrite grains on and define laminar silt beds No Recovery 199.5-201.0'	R25: 9 minutes
			4	196.0-196.3' - Fracture zone, random orientations, fragments 1/4" to 3/4"			
			5	196.6' - Fracture, 30-50 deg, rough, planar			
			>10	197.3, 197.4' - Fractures (2), horizontal, rough, planar, solution cavity fractures			
			NR	198.05, 198.1, 198.4, 198.5' - Fractures (4), 0-7 deg, smooth, planar			
				198.6' - Fracture, horizontal, smooth, planar, lithology contact			
				199.0-199.5' - Fracture zone, orientations are random, rock fragments range from 1/8"x1/2" to 2"x1"x1 1/2"			
205 -162.7	R26-HQ 5 ft 80%	36	>10	201.0-201.5' - Fracture zone, random orientation			Widely disseminated oxidized pyrite grains The unit appears as random clast orientations in variably hard matrix, it is either fluvial or infill of an undetermined void, it exhibits very low density and apparent strength R26: 7 minutes
			5	201.5-202.1' - Fracture zone, 25-90 deg, rough, non separated fracture, indistinctly extends into underlying unit			
			5	201.5' - Fracture, 10 deg, rough, planar			
			>10	202.1' - Fracture, horizontal, rough, stepped, lithology contact			
			NR	202.7-203.0' - Fracture zone, multiple fracture orientation			
				203.1-203.3' - Fracture zone, multiple fractures broken along fragment edges			
				203.7' - Fracture, 2 deg, rough, planar			
210 -167.7	R27-HQ 5 ft 50%	10	4	206.2, 206.3, 201.7, 206.9' - Fractures (4), 0-10 deg, smooth, planar			
			>10	207.0-208.5' - Fracture zone, 75-80 deg, multiple fractures 207.5-208.0, fragments up to 2 1/2"x1 to 1/4"x1/2"			
			>10				
215 -172.7	R28-HQ 5 ft 40%	0	NR	211.0-213.0' - Fracture zone, no distinguishable orientation			R27: 11 minutes Stop drilling 17:28 3/7/07 Water level 2.5' below ground surface Resume drilling 08:50 3/8/07 R28: 23 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-07

SHEET 12 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
220 -177.7	R29-HQ 5 ft 34%	0	216.0-216.4' - Fracture zone, multiple fractures, fragments range from 1/4" to 1"x1"x1"		Limestone 201.0-202.1' - grayish orange, (10YR 7/4), strong HCl reaction, weak to medium strong (R2 to R3), carbonate derived silt-sized grains 202.1-205.0' - pale yellowish brown, (10YR 6/2), mild to moderate HCl reaction, extremely weak to very weak (R0 to R1), 10-20% sand-sized matrix, 5-15% fossils, 30-40% coverage of voids 3/16" or less No Recovery 205.0-206.0 Limestone 206.0-207.0' - grayish orange, (10YR 7/4), strong HCl reaction, very weak (R1), thin to laminar bedding, very low density, no visible fossils, 5-15% coverage of voids 1/16" or less, no solution cavities 207.0-208.5' - dark yellowish orange to grayish orange, (10YR 6/6 to 10YR 7/4), moderate to strong HCl reaction, 10-20% coverage of voids 1/8" or less, slightly friable, worm burrows in very fine grained limestone 207.2-208.0' No Recovery 208.5-211.0' Limestone 211.0-213.0' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), very fine to fine grained, very weak to weak (R1 to R2), 30-40% fossil shell fragments, casts, and molds, 20-40% coverage of voids 1/6" or less, 5-10% coverage of solution cavities 3/8" or less, low to moderate density No Recovery 213.0-216.0' Limestone 216.0-216.4' - pale yellowish brown and grayish orange, (10YR 6/2, 10YR 7/4), fine grained, strong HCl reaction, pale yellowish brown material is weak to medium strong (R2 to R3), non fossiliferous, grayish orange material is very weak to weak (R1 to R2) with 30-40% fossils No Recovery 216.4-219.7' Limestone 219.7-221.0' - grayish orange, (10YR 7/4), strong HCl reaction, very weak to weak (R1 to R2), 40-50% fossils, 20% coverage of voids 3/8" or less, trace organics, abundant fossil casts and molds, low to moderately dense, 15% coverage of 1/16" or less voids	Driller's Remark: Soft and rapid drilling at 216.5-220.0' Assume loss of recovery is 216.4-219.7' based on driller's report of soft and rapid drilling at 216.5-220.0' R29: 8 minutes
225 -182.7	R30-HQ 5 ft 30%	0	221.0-222.5' - Fracture zone, 2-3 of the fractures are smooth and planar bedding plane partings		206.0-207.0' - grayish orange, (10YR 7/4), strong HCl reaction, very weak (R1), thin to laminar bedding, very low density, no visible fossils, 5-15% coverage of voids 1/16" or less, no solution cavities 207.0-208.5' - dark yellowish orange to grayish orange, (10YR 6/6 to 10YR 7/4), moderate to strong HCl reaction, 10-20% coverage of voids 1/8" or less, slightly friable, worm burrows in very fine grained limestone 207.2-208.0' No Recovery 208.5-211.0' Limestone 211.0-213.0' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), very fine to fine grained, very weak to weak (R1 to R2), 30-40% fossil shell fragments, casts, and molds, 20-40% coverage of voids 1/6" or less, 5-10% coverage of solution cavities 3/8" or less, low to moderate density No Recovery 213.0-216.0' Limestone 216.0-216.4' - pale yellowish brown and grayish orange, (10YR 6/2, 10YR 7/4), fine grained, strong HCl reaction, pale yellowish brown material is weak to medium strong (R2 to R3), non fossiliferous, grayish orange material is very weak to weak (R1 to R2) with 30-40% fossils No Recovery 216.4-219.7' Limestone 219.7-221.0' - grayish orange, (10YR 7/4), strong HCl reaction, very weak to weak (R1 to R2), 40-50% fossils, 20% coverage of voids 3/8" or less, trace organics, abundant fossil casts and molds, low to moderately dense, 15% coverage of 1/16" or less voids	Driller's Remark: Drilling action intermittently becomes hard and soft The final 0.5' recovered is an agglomeration, appears to have 60-80 deg planar features that may indicate subsidence infill R30: 4 minutes
230 -187.7	R31-HQ 5 ft 30%	0	226.0-227.5' - Fracture zone, multiple fractures, no visible orientations		211.0-213.0' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), very fine to fine grained, very weak to weak (R1 to R2), 30-40% fossil shell fragments, casts, and molds, 20-40% coverage of voids 1/6" or less, 5-10% coverage of solution cavities 3/8" or less, low to moderate density No Recovery 213.0-216.0' Limestone 216.0-216.4' - pale yellowish brown and grayish orange, (10YR 6/2, 10YR 7/4), fine grained, strong HCl reaction, pale yellowish brown material is weak to medium strong (R2 to R3), non fossiliferous, grayish orange material is very weak to weak (R1 to R2) with 30-40% fossils No Recovery 216.4-219.7' Limestone 219.7-221.0' - grayish orange, (10YR 7/4), strong HCl reaction, very weak to weak (R1 to R2), 40-50% fossils, 20% coverage of voids 3/8" or less, trace organics, abundant fossil casts and molds, low to moderately dense, 15% coverage of 1/16" or less voids	R31: 5 minutes
235 -192.7	R32-HQ 5 ft 12%	0	231.0-231.6' - Fracture zone, random orientations, fragments range from 1/4" to 1"x3/4"		216.0-216.4' - pale yellowish brown and grayish orange, (10YR 6/2, 10YR 7/4), fine grained, strong HCl reaction, pale yellowish brown material is weak to medium strong (R2 to R3), non fossiliferous, grayish orange material is very weak to weak (R1 to R2) with 30-40% fossils No Recovery 216.4-219.7' Limestone 219.7-221.0' - grayish orange, (10YR 7/4), strong HCl reaction, very weak to weak (R1 to R2), 40-50% fossils, 20% coverage of voids 3/8" or less, trace organics, abundant fossil casts and molds, low to moderately dense, 15% coverage of 1/16" or less voids	Discuss drilling to 265.0', conclusion continue drilling to 265.0' even though very low recovery and 0% RQD for the last 5 runs (25') in hopes that borehole stays open R32: 8 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-07

SHEET 13 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724100.8 N, 457649.4 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

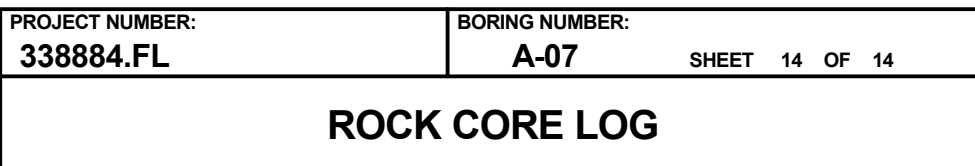
WATER LEVELS : 2.5 ft bgs on 03/07/07

START : 2/25/2007

END : 3/8/2007

LOGGER : J. Schaeffer, R. Gomez

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.
240 -197.7	R33-HQ 5 ft 40%	22	>10	236.0-236.1' - Fracture zone, 3/4" fragments		Limestone 221.0-222.5' - grayish orange, (10YR 7/4), strong HCl reaction, very weak (R1), 10-20% fossils, 10-20% coverage of voids 1/16" or less on surface, thin to laminar bedded, silt-sized particles	R33: 4 minutes
			5	236.4' - Fracture, horizontal, rough, planar		No Recovery 222.5-226.0' Limestone 226.0-227.5' - very pale orange, (10YR 8/2), very fine to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), no visible fossils, voids, or solution cavities	
			NR	236.5' - Fracture, 60 deg, rough, planar		No Recovery 227.5-231.0' Limestone 231.0-231.6' - pale yellowish brown, (10YR 6/2), 20-40% fossils, 30-40% coverage of voids 1/16" or less	
241.0				237.2, 237.3, 237.5, 237.6, 237.85' - Bedding plane (5), 0-5 deg, rough		No Recovery 231.6-236.0' Limestone 236.0-238.0' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), very fine to medium grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), low to moderate density, 15% of rock is medium grained, thin to laminar bedding with organics along bedding partings, bedding ranges from horizontal to 10 degrees, 5-15% coverage of voids 1/16" or less	R34: 5 minutes
245 -202.7	R34-HQ 5 ft 22%	0	>10	241.0-242.1' - Fracture zone, fragments range from 3/8" to plates 1/4"x3/8" thick and 1 1/2"x1 1/2"		No Recovery 238.0-241.0' Limestone 241.0-242.1' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), strong HCl reaction, very weak to weak (R1 to R2), 10-20% coverage of voids 1/8" or less, very fine to medium grained (medium grains constitute 30% of the unit), the unit exhibits no bedding until 241.7' then thin (up to 1/4") to laminar beds that are thumbnail soft	
			NR			No Recovery 242.1-246.0' Limestone 246.0-247.5' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), very fine to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), fossiliferous, 5-10% coverage of voids 1/16" or less	R35: 8 minutes
246.0				246.0-247.0' - Fracture zone		No Recovery 247.5-251.0' Limestone	
			4	247.05, 247.2, 247.35, 247.4' - Bedding plane (4), 0-7 deg			
250 -207.7	R35-HQ 5 ft 30%	0	>10				
			NR				
251.0							
255 -212.7	R36-HQ 5 ft 48%	13	>10	251.25, 251.6' - Bedding plane (2)			
			>10	251.6-252.3' - Fracture zone, fragments from 1/4" to 1"x1" to 1/4"x3/8" (bedding planes), fragments are generally small			
			2	252.45, 252.6, 252.8, 252.95, 253.2, 253.4' - Fractures (6), 0-7 deg, smooth, planar, fractures or partings along bedding planes			
			NR				R36: 7 minutes
256.0							



ORIENTATION : Vertical

LOGGER : J. Schaeffer, R. Gomez

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-08	SHEET 1 OF 15
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07 START : 3/12/2007 END : 3/21/2007 LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

WATER LEVELS : 3-41005-0103/22/07			START : 3/12/2007		END : 3/21/2007		LOGGERS : G. Wallestad, R. Gomez, R. McCune, L. Puchalska	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE	6"-6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY				
42.1 								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-08	SHEET 2 OF 15
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07

START : 3/12/2007

END : 3/21/2007

LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

WATER LEVELS : 3.4' (DGS ON 03/22/07)		START : 3/12/2007		END : 3/21/2007		LOGGERS : G. Wallestad, H. Gomez, H. McCumb, E. Puchner	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE		6"-6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		
22.1	20.0	1.5	SS-11	10-15-17-16 (32)	Silty Sand (SM) 20.0-21.5' - Same as 18.0-19.9' except dense		Sample SS-14 is similar to SS-12 and above, but darker in color
	22.0	1.6	SS-12	17-19-49-50/1 (68)	Silty Sand (SM) 22.0-23.6' - Same as 18.0-19.9' except very dense		
	23.6						
	24.0						
	24.4	0.4	SS-13	50/5 (50/5")	Silty Gravel With Sand (GM) 24.0-24.4' - Same as 22.0-23.1' except mild HCl reaction, 60% of sample is several wafer shaped limestone fragments to 1/4" thick		
25	26.0	1.6	SS-14	10-11-7-11 (18)	Silty Sand (SM) 26.0-27.6' - dark yellowish orange, (10YR 6/6), wet, medium dense, fine to medium grained, mild to moderate HCl reaction, 35% nonplastic fines, trace of coarse sand to fine gravel-size, trace white sand-sized particles, all carbonate		
17.1	28.0	0.7	SS-15	8-11-10-50/5 (21)	Silty Sand And Limestone (SM) 28.0-28.7' - Same as 26.0-27.6' except a few 1/4" wafer shaped limestone fragments		
	30.0						
30	30.3	0.0	SS-16	50/4 (50/4")	Limestone Fragments 30.0' - a few coarse sand-size limestone fragments recovered		
12.1	32.0	1.5	SS-17	23-36-27-28 (63)	Silty Sand With Gravel (SM) 32.0-33.5' - dark yellowish orange, (10YR 6/6), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 15-20% fine gravel-size, 20-25% nonplastic fines, all carbonate		
	34.0	0.6	SS-18	28-50/5 (78/11")	Silty Sand With Gravel (SM) 34.0-34.6' - Same as 32.0-33.5' except several coarse gravel-size limestone fragments		
35	34.9						
7.1	36.9	0.0	SS-19	50/1 (50/1")	No Recovery 36.0'		
	38.9	0.0	SS-20	50/0.5 (50/0.5")	Limestone Fragments 38.0-38.04' - light olive gray, (5Y 5/2), mild HCl reaction, fragments to 1/2" size, fragments are stronger than previously		
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-08	SHEET 3 OF 15
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit

ORIENTATION : Vertical

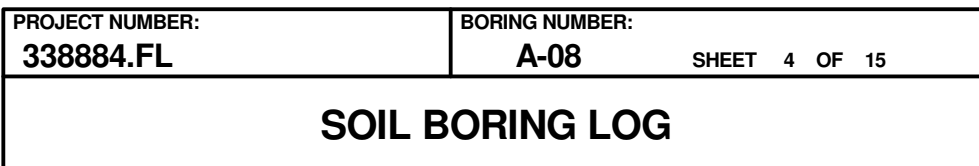
WATER LEVELS : 3.4 ft bgs on 03/22/07

START : 3/12/2007

END : 3/21/2007

LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

WATER LEVELS : 3.41 fms on 3/22/07		START : 3/12/2007		END : 3/21/2007		LOGGERS : G. Waitestad, R. Gomez, R. McCumb, L. Puchalska	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE		6"-6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		
2.1	40.0	1.3	SS-21	24-24-50/3 (74/9")	Silty Sand (SM) 40.0-41.3' - light olive brown to moderate olive brown, (5Y 5/2 to 5Y 4/4), wet, very dense, fine to coarse grained, mild HCl reaction, 30% nonplastic fines, 5-10% fine gravel-size, all carbonate		
	41.3						
	42.0						
	42.5	0.5	SS-22	50/6 (50/6")	Silty Sand (SM) 42.0-42.5' - Same as 40.0-41.3' except 30% size limestone pieces		
	44.0	0.1	SS-23	50/3 (50/3")	Silty Sand (SM) 44.0-44.1' - Same as 42.0-42.5'		
	44.3						
	46.0						
45 -2.9	46.2	0.1	SS-24	50/2 (50/2")	Limestone Fragments 46.0-46.05' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, 2 wafer shaped limestone pieces, 1/8"-1/4" thick, voids up to 1/16" over 30% of surface		
	48.0	0.3	SS-25	50/5 (50/5")	Silty Sand (SM) 48.0-48.3' - Same as 42.0-42.5' except more limestone fragments		
	48.4						
	50.0						
50 -7.9	50.0	0.0	SS-26	50/1 (50/1")	Limestone Fragments 50.0' - recovered one 1/4" limestone fragment		
	52.0	1.7	SS-27	14-25-24-16 (49)	Silty Sand (SM) 52.0-53.7' - Same as 48.0-48.3'		Sample SS-27 and similar samples may be extremely weak limestone
	54.0						
	54.3						
	54.3	0.2	SS-28	50/4 (50/4")	Silty Sand (SM) 54.0-54.2' - Same as 52.0-53.7'		
55 -12.9	56.0	0.0	SS-29	50/1 (50/1")	Limestone Fragments 56.0' - a few limestone fragments to 3/8"		Stopped drilling for the day 3/12/07 at 17:50, at 56' Surface collapse 3/13/07 at 07:45, driller rebuilding surface with dirt; will insert HW casing HW casing set to 14' at 09:40 Resume drilling at 10:15 on 3/13/07
	58.0						
	58.6						
	58.6	0.4	SS-30	24-50/1 (74/7")	Silty Sand With Gravel (SM) 58.0-58.4' - Same as 52.0-53.7' except moderate yellowish brown, (10YR 5/4), wet, hard, nonplastic, very rapid dilatancy, mild HCl reaction, 20-25% fine to coarse sand-size, 30% fine gravel-size, all carbonate		
60							



LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-08	SHEET 5 OF 15
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07 START : 3/12/2007 END : 3/21/2007 LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

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.
66.0	R1-HQ 5 ft 92%	65	<10	66.0-66.2' - Fracture zone		Limestone 66.0-70.6' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, mild HCl reaction, very weak to weak (R1 to R2), <1/16" voids on 15-20% of surface	Geophysical testing performed prior to rock coring, depth tagged at 65.5'
			3	66.3' - Fracture, horizontal, smooth, planar, open			
			1	66.8-67.0' - Fracture, 50-55 deg, rough, planar, tight			
			3	67.2' - Mechanical break			
			0	67.3-67.9' - Fracture, 10-50 deg, rough, planar, tight			
70 -27.9	R2-HQ 5 ft 96%	73	NR	68.2' - Fracture, 10 deg, rough, planar, open		No Recovery 70.6-71.0' Limestone 71.0-75.2' - Same as 66.0-70.6' except 5-10% solution cavities up to 3/8" at 72.6-75.2', weak to medium strong (R2 to R3) at 74.0-75.0'	SC-1 collected at 69.4-70.5' R1: 8 minutes
			0	68.4-68.55' - Mechanical break, 30 deg, smooth, planar, open <1/16"			
			2	68.95-69.0' - Fracture, 30 deg, smooth, planar, silt and/or clay sized infilling, <3/16" thick, open			
			3	69.4, 69.5' - Fractures (2), horizontal, smooth, planar, silt infilling, open			
			0	70.5' - Fracture, horizontal, smooth, undulating, open			
75 -32.9	R3-HQ 5 ft 64%	23	NR	71.4' - Fracture, 20 deg, rough, undulating, trace red laminated staining, open		75.2-75.8' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, extremely weak to very weak (R0 to R1), trace voids to 1/8", trace casts/ cavities up to 3/8"x9/16" No Recovery 75.8-76.0' Limestone 76.0-78.9' - light gray to very pale orange, (N7 to 10YR 7/2), very fine to fine grained, moderate HCl reaction, weak (R2), trace voids to 1/16", trace casts/cavities to 3/4"x3/8" Clay (CL) 78.9-79.2' - grayish brown, (5YR 3/2), mild HCl reaction, organic, laminated No Recovery 79.2-81.0'	SC-2 collected at 71.4-72.85' R2: 7 minutes
			3	72.35' - Fracture, horizontal, rough, planar			
			7	72.75, 72.9' - Fractures (2), 30 deg, rough, planar, tight			
			NR	73.0' - Fracture, horizontal, rough, stepped, trace silt and/or clay infilling			
			NR	73.3-73.6' - Fracture, 80 deg, rough, undulating, tight			
80 -37.9	R4-HQ 5 ft 100%	88	1	73.6' - Fracture, horizontal, rough, undulating, tight		Limestone 81.0-83.3' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), 15% voids <1/16", 5-10% solution cavities up to 3/8", 10-15% fine sand with limestone, weak (R2), same color, 20-25% voids 83.3-83.6' - transition zone as rock from 81.0-83.3' grades into material at 83.6-86.4'	SC-3 collected at 76.9-77.8' R3: 8 minutes
			1	73.6-74.25' - Fracture, 60 deg, rough, undulating, tight			
			3	75.3, 75.5' - Fractures (2), horizontal, rough, stepped, <3/16" silt infilling, open 1/8"			
			1	75.5-75.8' - Fracture, 75 deg, rough, undulating, tight			
			0	76.0-76.05' - Clay seam, dark organic rich clay			
85 -42.9				76.05-76.6' - Fracture zone			
				76.8-76.9' - Mechanical break or fracture, 15 deg, rough, undulating, open			
				77.7' - Fractures, multiple vertical fractures			
				77.8-78.2' - Fracture, 75 deg, smooth, undulating, tight			
				77.8-78.2' - Fracture, rough, planar, orthogonal to above, tight			
				78.2-78.9' - Fracture, vertical, rough, undulating, trace black powdery staining, tight			
				78.9-79.2' - Bedding plane, horizontal, smooth, undulating, 1/4"-1/2" thick, open 1/8"			
				81.7' - Fracture, 15 deg, rough, planar, <1/16" thick silt or/and clay sized infilling, 1/4" open			
				82.4' - Fracture, 15 deg, rough, undulating, open			
				83.3, 83.6, 84.3' - Fractures (3), horizontal, rough, planar, silt and/or clay sized infilling, open			
				83.6-83.7' - Fracture zone			
				84.8' - Mechanical break			
86.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-08

SHEET 6 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07

START : 3/12/2007

END : 3/21/2007

LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

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			
90 -47.9	R5-HQ 5 ft 100%	71	0	86.2' - Fracture, 10 deg, rough, undulating, open		Limestone 83.6-86.4' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, weak (R2), 20-25% coverage of voids up to 1/16", 25% casts/ cavities up to 3-1/8"x1-9/16" at 83.6-84.8', trace casts/cavities (up to 3/4"x3/8") throughout, single large (2-3/4"x3/4") cavity at 86.0' 86.4-91.0' - moderate yellowish brown, (10YR 5/4), fine grained, strong HCl reaction, very weak to weak (R1 to R2), fossil casts and molds, 3/16" voids on 15% of surface, 10% solution cavities up to 3-1/8"x3/4" 91.0-92.9' - moderate yellowish brown mottled very pale orange, (10YR 5/4 mottled 10YR 6/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), 10-20% voids <1/8", 5-10% solution cavities up to 1-3/16"- 1-9/16", partially to completely infilled with white to yellowish gray (5Y 5/1) carbonate, extremely weak (R0) material 92.9-96.0' - yellowish gray to very pale orange, (5Y 8/1 to 10YR 8/2), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), 5% voids, 2-5% solution cavities 96.0-101.0' - very pale orange to yellowish gray, (10YR 8/2 to 5Y 7/2), fine grained, strong HCl reaction, very weak (R1), 10-15% voids up to 1/16", trace casts/cavities up to 3/8" diameter, 10% irregular black laminae/inclusions at 96.5-97.5' Poorly Graded Sand (SP) 101.0-101.4' - grayish orange, (10YR 7/4), very fine to fine grained, strong HCl reaction, 80% carbonate, 20% silicate Limestone 101.4-106.0' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), trace voids up to 1/16", no visible casts/cavities	SC-5 collected at 88.6-89.5'
			4	87.35' - Fracture, horizontal, smooth, undulating, 1/4" hard infill, tight			
			2	87.6' - Fracture, horizontal, smooth, undulating, silt and/or clay sized infilling, 1" thick infilling, tight			
			1	87.75' - Fracture, horizontal, smooth, undulating, 1/2" silt infill, tight to 1/2" open			
			1	88.0' - Fracture, horizontal, smooth, undulating, silt and/or clay sized infilling, tight, 1/2" silt infill, 1/4" open			
95 -52.9	R6-HQ 5 ft 100%	93	0	88.35' - Fracture, horizontal, smooth, stepped, tight			R5: 7 minutes
			1	88.6' - Fracture, horizontal, smooth, undulating, 1/8"-1/2" open			
			3	89.8' - Mechanical break			
			2	90.5' - Fracture, 2-4 deg, smooth, undulating, tight			
			2	92.6' - Fracture, 5-7 deg, rough, planar, <3/8" thick infilling, carbonate silt, open			
	R7-HQ 5 ft 100%	58	3	93.0' - Fracture or mechanical break, horizontal, rough, undulating, white infilling 1/16" thick, tight			SC-6 collected at 94.0-94.9'
			1	93.2, 93.6' - Mechanical break (2)			
			2	94.0, 94.9' - Fractures (2), horizontal, rough, undulating, open			
			2	95.2' - Fracture, horizontal, smooth, planar, dark brown clay infilling 3/4" thick			
			2	95.9-96.0' - Fracture or mechanical break, 30 deg, rough, planar, tight			
100 -57.9	R8-HQ 5 ft 100%	46	2	96.25-96.35' - Fracture, 45 deg, rough, planar, open			R6: 15 minutes
			3	96.95' - Fracture, horizontal, smooth, planar, fractured along contact			
			1	97.05' - Fracture, horizontal, rough, planar, tight			
			2	97.4, 97.6, 98.9' - Fractures (3), 0-5 deg, rough, undulating, up to 1/8" open			
			2	99.3' - Mechanical break			
	NA	NA	2	99.6' - Fracture, 0-30 deg, rough, undulating, tight			SC-7 collected at 98.15-98.9'
			1	100.0' - Mechanical break			
			1	100.5-101.05' - Fracture, 70 deg, rough, undulating, open 1/8"-1/4"			
			3	101.4' - Fracture, 30 deg, rough, undulating, sand/rock contact			
			3	102.25' - Fracture, horizontal, rough, planar, tight			
105 -62.9	R8-HQ 5 ft 100%	46	2	102.8' - Fracture, 10 deg, rough, undulating, open			R7: 6 minutes
			2	102.85-103.05' - Fracture, 60 deg, rough, undulating			
			>10	103.95' - Fracture, 20-25 deg, rough, planar, open			
			>10	103.95-104.2' - Fractures (3), rough, undulating, open			
			>10	104.5' - Mechanical break			
	R8-HQ 5 ft 100%	46	2	104.5' - Mechanical break			SC-8 collected at 103.05-103.95'
			2	104.5' - Mechanical break			
			2	104.5' - Mechanical break			
			2	104.5' - Mechanical break			
			2	104.5' - Mechanical break			
	R8-HQ 5 ft 100%	46	2	104.5' - Mechanical break			R8: 10 minutes
			2	104.5' - Mechanical break			
			2	104.5' - Mechanical break			
			2	104.5' - Mechanical break			
			2	104.5' - Mechanical break			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-08	SHEET 7 OF 15
ROCK CORE LOG		

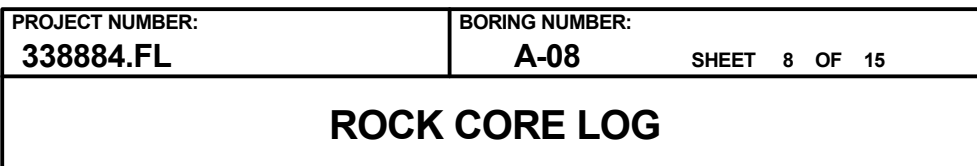
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07 START : 3/12/2007 END : 3/21/2007 LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

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			
110 -67.9	R9-HQ 5 ft 100%	66	3	104.65-105.0' - Fracture zone 105.3-105.45' - Fracture, 45 deg, rough, undulating, open		Limestone 106.0-111.0' - very pale orange to yellowish gray, (10YR 8/2 to 5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), 20% voids up to 1/16" on surface, casts/cavities up to 1-9/16" on 10% of surface	SC-9 collected at 110.0- 111.0'
			3	105.45-106.0' - Fracture zone 106.0-106.1' - Fracture, vertical, rough, undulating, 1/4" open			
			2	106.1, 106.3' - Fractures (2), vertical, smooth, planar, open			
			3	107.3, 107.5' - Fractures (2), horizontal, smooth, planar, <3/16" open			
			0	107.9, 108.25-108.3' - Fractures (3), 30 deg, smooth, undulating, tight			
111.0			0	109.0' - Fracture, horizontal, rough, undulating, open		111.0-116.0' - very pale orange to yellowish gray, (10YR 8/2 to 5Y 7/2), fine grained, strong HCl reaction, very weak (R1), trace voids to 1/16", trace cavities to 3/8" diameter at 113.6'	R9: 6 minutes
			2	109.45' - Fracture, horizontal, smooth, undulating, 1/8" open			
			0	109.6' - Fracture, 10 deg, rough, stepped, 1/8" open			
			3	109.7' - Fracture, 10 deg, rough, undulating, open			
			1	110.0' - Fracture, horizontal, rough, undulating			
115 -72.9	R10-HQ 5 ft 100%	90	1	111.3' - Mechanical break, horizontal 111.65-111.85' - Fracture, 45 deg, rough, planar, tight		116.0-121.0' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), fine to medium grained, strong HCl reaction, very weak (R1), voids (1/16") on 10% of surface, 15-20% casts/cavities, single cavity (2"x1-3/16") at 114.5', poorly fossiliferous	SC-10 collected at 113.65- 114.55'
			1	113.2' - Fracture, horizontal, rough, stepped, 1/8" open			
			1	113.4' - Mechanical break 113.65, 114.55' - Fractures (2), horizontal, rough, undulating			
			4	115.5' - Fracture, horizontal, smooth, undulating, open			
			7	116.1, 116.25' - Mechanical break (2) 116.25-116.8' - Fractures (2), 75 deg, rough, undulating, 10% black stain, open			
120 -77.9	R11-HQ 5 ft 100%	33	3	116.8' - Fracture, 30 deg, rough, undulating, open		121.0-122.65' - Same as 116.0-121.0' except trace cavities up to 9/16"x3/16"	SC-11 collected at 120.2- 121.0'
			4	117.1-117.2' - Fracture, 52 deg, rough, planar, 1/8" open			
			1	117.35' - Fracture, horizontal, rough, planar 117.65-117.9' - Fracture, rough, planar, 1/8" open			
			1	117.9-118.2' - Fracture zone 118.8, 119.5, 119.3' - Fractures (3), 10 deg, smooth, undulating, tight			
			5	118.9' - Fracture, 20 deg, rough, undulating, tight			
125 -82.9	R12-HQ 5 ft 100%	34	3	119.3, 119.5' - Fractures (2), <5 deg, rough, stepped, open		122.65-126.0' - very pale orange, (10YR 8/2), fine grained, strong HCl reaction, very weak (R1), trace voids to 1/16", 25-30% casts up to 3/8"x3/4" at 122.65-123.7', highly fossiliferous	SC-12 collected at 123.7- 124.5'
			2	119.7-119.8' - Fracture, 30 deg, rough, undulating, open			
			2	119.9-120.0' - Mechanical break 120.2' - Mechanical break			
			2	121.15, 121.2' - Fractures (2), horizontal, smooth, planar, open 1/4" to tight			
			>10	121.15-121.4' - Fracture, 60 deg, rough, undulating, 30% black staining			
126.0				121.7' - Bedding plane, horizontal, smooth, planar, <1/8" open 121.95' - Fracture or bedding plane, horizontal, smooth, planar, <1/8" open			R11: No runtime recorded
							R12: 5 minutes



ORIENTATION : Vertical

LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

Rev. 4

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing


ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07

START : 3/12/2007

END : 3/21/2007

LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

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					
150 -107.9	R17-HQ 5 ft 100%	90	2	144.3-145.2' - Fracture zone, rough to smooth, various orientations, open to tight, limestone rock fragments		Limestone 145.0-146.0' - dark yellowish brown, (10YR 4/2), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), laminated bedding alternating between pale yellowish brown (10YR 6/2) and dark yellowish brown (10YR 6/6), incipient hairline fractures throughout length of interval 146.0-151.0' - mottled yellowish gray to grayish orange, (5Y 7/2 to 10YR 7/4), fine to very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), thinly laminated to massive bedded, rare solution cavities, 5-10% voids up to 1/16", rare macro fossils 151.0-153.3' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to medium strong (R1 to R3), voids (1/16") over 3-5% of surface, trace cavities, trace fossil casts becoming thinly laminated with depth, some mottling 153.3-153.8' - Same as 151.0-153.5' except with cavities and voids on 20-25% of surface, few thin laminae 153.8-156.0' - mottled yellowish gray to yellowish gray, (5Y 7/2 to 5Y 8/1), fine grained, strong HCl reaction, very weak to weak (R1 to R2), thinly laminated, numerous bedding plane separations in upper 1/3 of interval, becoming chalk-like with depth, fossils rare to absent 156.0-161.0' - very pale orange to grayish orange, (10YR 7/4 to 10YR 8/2), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), 10-15% fossil shells/casts decreasing with depth, voids (1/16") over 1-3% of surface, rare cavities, occasionally thinly laminated, chalk-like texture at 158.4-158.8' 161.0-165.7' - Same as 156.0-161.0' except voids up to 30-40% on upper 1' of interval, voids becoming less dense with depth, massive bedding with thin laminae near base	SC-14 collected at 146.8-147.9'		
			0	145.2' - Bedding plane, horizontal, smooth, open			R17: 5 minutes		
			1	145.4' - Fracture, <5 deg, smooth, undulating, tight, black crystalline-like grains over 10-15% of surface					
			0	146.1' - Fracture, <5 deg, rough, stepped to undulating, open					
			1	146.35' - Fracture, 10 deg and vertical, rough, planar, tight					
	155 -112.9	R18-HQ 5 ft 100%	80	1			148.3' - Fracture or mechanical break, horizontal, rough, undulating		R18: 8 minutes
				2			150.6' - Fracture, horizontal, rough, planar, tight		
				>10			151.0-152.3' - Fracture, vertical, rough, undulating, tight, tiny black crystalline-like grains		SC-15 collected at 155.05-156.0'
				>10			152.74' - Fracture, <10 deg, rough, stepped, black tiny crystals over 2% of surface, open		
				1			153.3, 153.6' - Fractures (2), <10-40 deg, rough, planar to stepped, open		
R19-HQ 5 ft 100%		100	0	153.7-154.1' - Fracture zone, stepped to planar, horizontal to slightly inclined, bedding laminae, open					
			1	153.7-154.1' - Fracture zone, stepped to planar, horizontal to slightly inclined, bedding laminae, open					
			2	154.25' - Fracture, 20 deg, smooth, undulating, tight					
			0	154.64' - Fracture, horizontal, rough, stepped, tight					
			0	155.05' - Fracture, horizontal, rough, planar, open, silty infilling		SC-16 collected at 158.4-150.3'			
160 -117.9	R20-HQ 5 ft 100%	68	0	157.8' - Fracture, 5 deg, smooth, planar, tight					
			2	158.4, 158.8' - Fractures (2), 2 deg, rough, stepped, tight					
			0						
			0			R19: 7 minutes			
			5						
	R20-HQ 5 ft 94%	68	3	161.7-162.0' - Fracture zone, horizontal and vertical, smooth, planar to undulating, open		SC-17 collected at 163.85-164.9'			
			0	162.0-162.5' - Fracture, 80 deg and vertical, rough, planar to undulating, open					
			0	162.55-163.0' - Fracture, 70 deg, rough, undulating, open					
			1						
			3	164.9' - Fracture, horizontal, smooth, planar, 3/16" thick silt and/or clay sized infilling, open		R20: 8 minutes			
166.0		NR			No Recovery 165.7-166.0'				



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-08	SHEET 10 OF 15
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07 START : 3/12/2007 END : 3/21/2007 LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

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			
170 -127.9	R21-HQ 5 ft 100%	52	3	165.4, 165.72, 165.78' - Bedding plane (3), horizontal, smooth to undulating, rough to loose		Limestone 166.0-166.8' - very pale orange, (10YR 8/2), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), up to 3/8" solution cavities on 3-4% of surface, up to 1/16" voids on 15-20% of surface 166.8-169.2' - moderate yellowish brown, (10YR 5/4), fine grained, mild to moderate HCl reaction, very weak (R1), 15-20% voids, 1-2% solution cavities up to 3/8", gradational contact with interval below 169.2-171.0' - Same as 166.0-166.8'	SC-18 collected at 168.3-169.65'
			>10	166.2, 166.8, 166.9' - Fractures (3), horizontal, smooth, planar, fractured along laminated bedding, open			
			2	167.0-168.0' - Fracture zone, horizontal, smooth, planar, fractured along laminated bedding, open			
			1	168.1, 168.4, 169.95' - Fractures (3), 1-2 deg, smooth to rough, trace of silt			
			2				
171.0				170.65' - Fracture, 5-10 deg, rough, undulating, trace silt, open		171.0-173.6' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, strong (R4), voids over 15-20% of surface, up to 3/4"x3/8" cavities	R21: 7 minutes End of shift; stop drilling 3/15/07 at 10:00 Bottom of hole tagged at 171' Resume drilling 3/20/07 at 12:22 R. McComb begins logging hole
			1	170.8' - Fracture, 1-2 deg, rough, stepped, open			
			4	171.25, 171.4, 171.8' - Fracture zone (3), 70 deg, rough, planar, cobble size fragments			
			3	172.75' - Fracture, 20 deg, rough, undulating, open			
			1	173.05, 173.7' - Fractures (2), horizontal, rough, planar to stepped, open			
175 -132.9	R22-HQ 5 ft 100%	66	3	173.55' - Fracture, <5 deg, smooth, undulating, brown silty clay over 60% of surface		173.6-173.9' - Same as 171.0-173.6 except no voids, no cavities, finely laminated 173.9-177.75' - Same as 171.0-173.6'	SC-19 collected at 171.45-172.75'
			1	174.0-174.3' - Fracture, 70 deg, planar to undulating, tight			
			3	174.3' - Fracture, horizontal, smooth, planar, open			
			5	174.6' - Fracture, 70 deg, rough, planar, tight			
			3	174.73' - Fracture, horizontal, smooth, planar, tight			
180 -137.9	R23-HQ 5 ft 100%	52	3	175.85' - Fracture, <5 deg, smooth, undulating, clay infilling, silty clay infilling		177.75-178.1' - moderate olive brown, (5Y 4/4), fine grained, no to mild HCl reaction, extremely weak (R0), 1/16" voids over 10-15% of surface, 3/8"- 1-3/16" cavities, friable 178.1-179.45' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, weak (R2), up to 1/16" voids over 10-15% of surface, 10-15% 3/8" to 1-3/16" cavities 179.45-180.4' - pale yellowish brown, (10YR 6/2), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids over 1-2% of surface 180.4-184.80' - dusky yellow, (5Y 6/4), fine to very fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), voids over 10-15% of surface and increasing to 30-40% of surface below 183.5', thinly laminated at 182.2-182.4', trace voids from 184.65-184.8'	SC-20 collected at 178.65-179.45'
			1	176.3' - Fracture, <5 deg, rough, undulating			
			3	176.6-176.85' - Fracture zone, horizontal, smooth, planar, open			
			5	177.03' - Fracture, horizontal, smooth, planar, open			
			3	177.45, 177.6' - Fractures (2), horizontal, smooth, planar, open			
181.0				178.4' - Fracture, <5 deg, rough, stepped, 3/8"-3/4" open			R23: 4 minutes
			3	179.0' - Fracture, <5 deg, smooth, stepped, brown silty clay infilling, 3/4"-1-3/16" open			
			5	179.25-179.43' - Fracture zone, <10 deg, smooth, stepped, zone of soft friable rock fragments, inclined to horizontal, clay over 10-15%			
			3	179.85' - Fracture, <5 deg, smooth, stepped			
			2	180.0-180.3, 180.55-181.6' - Fractures (2), horizontal, smooth, planar			
185 -142.9	R24-HQ 5 ft 100%	66	3	181.5' - Fracture, 70 deg, smooth, planar, tight			SC-21 collected at 184.8-185.7'
			2	181.8, 181.95' - Fractures (2), horizontal, smooth, planar, open			
			1	182.1' - Fracture, <5 deg, smooth, stepped, open			
186.0							R24: 5 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-08

SHEET 11 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07

START : 3/12/2007

END : 3/21/2007

LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

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			
190 -147.9	R25-HQ 5 ft 100%	56	7	182.5' - Fracture, horizontal, rough, planar, open		Limestone 184.8-186.5' - pale yellowish brown, (10YR 6/2), very fine to fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), fossil cavities up to 1-1/2"x1" over 60% of surface, voids up to 3/16" over 40% of surface	SC-22 collected at 187.0-188.5'
			4	182.7-183.02' - Fracture zone, horizontal, smooth, planar, open			
			1	183.3' - Fracture, horizontal, smooth, planar, open to tight			
			4	184.55' - Fracture, <5 deg, rough, undulating, rock fragments with dark brown clay filling			
			1	184.7' - Fracture, horizontal, rough, planar, open			
			1	185.5-185.7' - Fracture zone, <5 deg, rough, undulating, 1-3/16"-2" open			
195 -152.9	R26-HQ 5 ft 100%	36	1	186.2, 186.35, 186.45' - Fractures (3), 0-<5 deg, rough, open to tight		186.5-187.7' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), 5-10% voids over surface, trace cavities, trace fossil molds, up to 40-50% voids at 186.7-186.8' and 186.9-187.05'	R25: 9 minutes
			3	186.64' - Fracture, horizontal, smooth, planar, open			
			3	186.78, 186.93, 187.0, 187.35, 187.6, 187.65, 187.7' - Fractures (7), 0 - <5 deg, rough, planar, open, vertical fracture at 187.35-187.6', tight			
			6	187.8' - Fracture, 70 deg, smooth, planar, tight			
			>10	189.05' - Fracture, <5 deg, rough, planar, light brown sandy clay infilling, open			
			1	189.6, 189.7' - Fractures (2), horizontal, smooth, planar, open			
200 -157.9	R27-HQ 5 ft 100%	50	2	189.9' - Fracture, <5 deg, rough, stepped to undulating		187.73-187.93' - light olive gray, (5Y 6/1), fine grained, thinly laminated	SC-23 collected at 191.0-191.9'
			10	190.6' - Fracture, horizontal, rough, stepped to undulating, black organics over 90% of surface			
			10	191.0' - Fracture, horizontal, smooth, planar, black coating over 100% of surface			
			2	191.6-191.9' - Fracture, 80 deg, rough, planar, open			
			2	191.9' - Fracture, <5 deg, rough, open, with stains			
			10	192.3, 192.4, 192.7' - Fractures (3), <5 deg, rough, undulating to stepped, open			
205 -162.9	R28-HQ 5 ft 100%	54	3	193.25' - Fracture, <10 deg, smooth, planar to stepped, open		190.2-190.6' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), voids over 50-60% of surface, cavities up to 3/4"x3/8" and up to 1-3/16" deep, voids becoming less common with depth	R26: 6 minutes
			1	193.25-195.6' - Fracture zone, with low to high angle fractures, rock fragments			
			4	196.1' - Fracture, <5 deg, rough, stepped, open			
			2	196.5' - Fracture, horizontal, rough, stepped, open			
			3	198.5' - Fracture, horizontal, rough, stepped, open			
			2	198.9' - Fracture, <5 deg, rough, stepped, open			
206.0			3	199.3-201.0' - Fracture zone, horizontal, smooth, open, becoming stepped and rough with depth		193.5-196.0' - grayish yellow, (5Y 8/4), fine to very fine grained, mild to moderate HCl reaction, very weak (R1), voids over 20-30% of surface, 3-5% cavities, trace fossils, trace black organics	SC-24 collected at 197.5-198.5'
			1	201.35' - Fracture, horizontal, rough, stepped, open			
			4	201.95' - Fracture, horizontal, smooth, planar, open			
			2	202.25' - Fracture, horizontal, rough, planar, open			
			2	202.35-202.5' - Fractures (2), horizontal, rough to smooth, stepped, open			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-08

SHEET 12 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07

START : 3/12/2007

END : 3/21/2007

LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

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	
210 -167.9	R29-HQ 5 ft 76%	25	>10	203.9' - Fracture, horizontal, rough, undulating, open		201.0-203.0' - Same as 199.3-201.0' except with void/ cavity zone from 201.3-201.6' covering 20-30% of surface, very thin dark laminae at 201.8'	R29: No runtime recorded
			3	204.1, 204.25, 204.4, 204.5' - Fractures (4), horizontal, rough, stepped, open		Limestone 203.0-207.65' - dusky yellow to moderate yellow, (5Y 6/4 to 5Y 7/6), fine to medium grained, mild to moderate HCl reaction, very weak to extremely weak (R1 to R0), voids over 100% of surface except rare cavities from 205.1' to 205.5', some cavities are 3/8" to 3/4" deep	
			2	205.5' - Fracture, horizontal, rough, planar, open		207.65-208.8' - yellowish gray, (5Y 7/2), very fine grained, mild HCl reaction, very weak (R1), voids/cavities rare to absent	
			>10	205.8' - Fracture, <5 deg, rough, stepped, open		208.8-209.2' - fine grained, mild HCl reaction, extremely weak (R0)	
			NR	206.0-207.0' - Fracture zone, horizontal and vertical, rough, abundant horizontal to vertical fractures, open		209.2-209.8' - light gray, (N7), fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), only small gravel sized fragments, voids/cavities over 15-20% of surface up to 3/4" - 1-3/16" length, 3/16" deep	
215 -172.9	R30-HQ 5 ft 26%	0	>10	207.3, 207.75, 207.65' - Fractures (3), horizontal, rough, planar		No Recovery 209.8-211.0' Limestone 211.0-212.3' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, very weak (R1), voids/cavities over 30-40% of surface	R30: 6 minutes
			>10	208.25, 208.7' - Fractures (2), horizontal, smooth, planar, open		No Recovery 212.3-216.0' Limestone 216.0-218.45' - yellowish gray, (5Y 7/2), fine to medium grained, mild to moderate HCl reaction, extremely weak (R0), voids/cavities over 20-30% of surface, trace fossils casts interbedded with soft friable limestone at 217.0-218.0'	
			NR	208.7-209.8' - Fracture zone		No Recovery 218.45-221.0'	R31: 7 minutes
220 -177.9	R31-HQ 5 ft 49%	13	>10	211.0-212.3' - Fracture zone		Limestone 221.0-222.7' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, very weak (R1), friable along thin laminae, voids/cavities over 10-30% of surface, trace fossils (casts/molds)	
			>10	216.0-218.45' - Fracture zone		222.7-223.5' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, extremely weak to very weak (R0 to R1), voids on 1-3% of surface or absent	
			NR	218.45' - Fracture, horizontal, rough, planar, open		No Recovery 223.5-226.0'	R32: 4 minutes
225 -182.9	R32-HQ 5 ft 50%	8	>10	221.0-223.5' - Fracture zone			
			>10	221.7' - Fracture, horizontal, rough, stepped, open			
			NR	222.1' - Fracture, fractured gravel sized limestone			
226.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-08	SHEET 13 OF 15
ROCK CORE LOG		

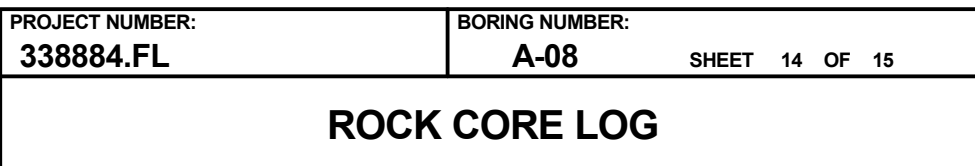
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724017.2 N, 457734.1 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 3.4 ft bgs on 03/22/07 START : 3/12/2007 END : 3/21/2007 LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
230 -187.9	R33-HQ 5 ft 40%	9	>10 226.0-228.0' - Fracture zone, with some discernible fracture planes >10 226.3' - Fracture, <5 deg, rough, stepped, open 226.75, 226.95' - Fractures (2), horizontal, smooth, undulating, open 226.95' - Fracture, zone of rock fragments 227.35' - Fracture, horizontal, smooth, planar, open 227.5, 227.60' - Fractures (2), horizontal, rough, planar, open 227.52' - Fracture, zone of rock fragments 227.9' - Fracture, horizontal, smooth, planar, open		Limestone 226.0-228.0' - pale greenish yellow, (10Y 8/2), fine to very fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), voids over 10-15% of surface, voids absent from 227.35-227.50' No Recovery 228.0-231.0'	Stop drilling for the day 3/20/07 Resume drilling at 08:40 on 3/21/07 R33: 5 minutes
235 -192.9	R34-HQ 5 ft 40%	20	3 231.2' - Fracture, <5 deg, rough, undulating, open 3 231.9' - Fracture, horizontal, rough, stepped, open 232.0' - Fracture, 40 deg, rough, undulating, open 232.4' - Fracture, <5 deg, rough, undulating, tight 232.65' - Fracture, 25 deg, rough, undulating, tight 232.8' - Fracture, <5 deg, rough, undulating, open 1-3/16"-1-9/16"		Limestone 231.0-233.0' - yellowish gray to pale greenish yellow, (5Y 7/2 to 10Y 8/2), fine grained, mild HCl reaction, very weak to extremely weak (R1 to R0), voids over 90% of rock No Recovery 233.0-236.0'	R34: 5 minutes
240 -197.9	R35-HQ 5 ft 32%	0	>10 236.0-237.6' - Fracture zone, no bedding/fracture plane apparent, gravel sized limestone fragments up to 1-2" length >10		Limestone 236.0-237.6' - Same as 231.0-233.0' No Recovery 237.6-241.0'	R35: 6 minutes
245 -202.9	R36-HQ 5 ft 32%	0	>10 241.0-242.6' - Fracture zone, gravel sized rock fragments, fracture plane uncertain NR		Limestone 241.0-242.6' - yellowish gray, (5Y 7/2), fine to very fine grained, mild HCl reaction, extremely weak to very weak (R0 to R1), voids over 40% of rock, trace clay, trace fossil casts No Recovery 242.6-246.0'	R36: 8 minutes



ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

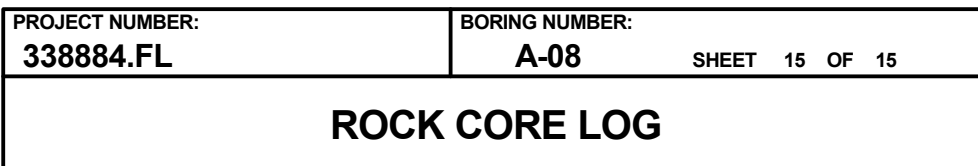
WATER LEVELS : 3.4 ft bgs on 03/22/07

START : 3/12/2007

END : 3/21/2007

LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

APPENDIX 2BB-91



LOGGER : C. Wallestad, R. Gomez, R. McComb, L. Prochaska

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-09
SHEET 1 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724113.8 N, 457731.4 E (NAD83)
 ELEVATION : 41.9 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 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/13/07 START : 3/13/2007 END : 3/22/2007 LOGGER : T. Stewart

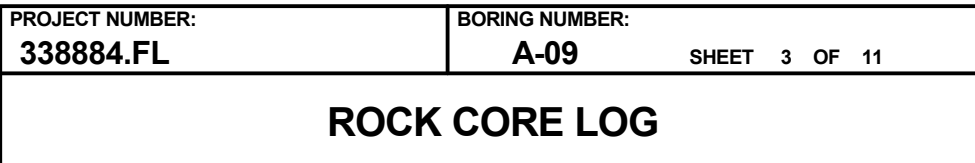
WATER LEVELS : 2.0 RODS ON 3/13/07			START : 3/13/2007		END : 3/22/2007		LOGGERS : T. Stewart	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
	RECOVERY (ft)	#TYPE		6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY			
41.9							Cathead Operator - Matthew Griffin 14:17 Water level at about 2' below ground surface SS-1 (5.0-6.5') totally saturated (wet)	
5	5.0							
36.9								
	6.5	0.5	SS-1	12-8-12 (20)	Sand With Clay And Gravel (SP-SC) 5.0-5.5' - light olive gray, (5Y 6/1), wet, medium dense, fine to medium grained, no HCl reaction, silica sand, 9% medium plastic fines, 20% fine to coarse gravel		Driller's Remarks: Drill time: 4 minutes (6.5-10.0')	
10	10.0							
31.9								
	11.5	0.7	SS-2	4-3-5 (8)	Silt (ML) 10.0-10.7' - grayish orange, (10YR 7/4), wet, medium stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 5-10% very fine sand, trace fine sand-sized white particles, trace very fine brilliant green (5G 6/6) sand-sized particles		Driller's Remarks: Hard drilling at 13', continued circulation loss	
15	15.0							
26.9	15.4	0.1	SS-3	50/5 (50/5")	Limestone Fragments 15.0-15.1' - grayish orange, (10YR 7/4), mild to moderate HCl reaction, friable with hand, 1/4-1/2" sized discs; remainder are yellowish gray (5Y 5/1) angular fragments to 1/2", mild to moderate HCl reaction		Driller's Remarks: Drill time: 4 minutes (10.0-15.0') 14:37 Driller's Remarks: Will insert 15' of 3" NW casing to seal off hole Driller's Remarks: Now using a 4.5" tricone roller drill bit with NW rod to open up the hole for 10' of 6" diameter casing 15:45 Driller's Remarks: Hole is crooked with 19' NWJ in ground; Adding 10' of 6" surface casing to straighten hole 17:17 End of drilling for the day on 3/13/07 with 20' of 6" in place	
	18.5							
		1.5	SS-4	47-36-46 (82)				
20	20.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-09
SHEET 2 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724113.8 N, 457731.4 E (NAD83)
 ELEVATION : 41.9 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 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/13/07 START : 3/13/2007 END : 3/22/2007 LOGGER : T. Stewart

WATER LEVELS : 2.0 TUBS ON 3/13/07		START : 3/13/2007		END : 3/22/2007		LOGGERS : T. Stewart	
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				
21.9					Sandy Silt With Gravel (ML) 18.5-20.0' - very pale orange, (10YR 8/2), wet, hard, nonplastic, moderate HCl reaction, 30% fine to coarse sand, 15% limestone in disc-shaped gravel size pieces, all carbonate, trace fine to medium sand-sized white particles, trace brilliant green (5G 6/6) particles		3/14/07; bottom of hole at 18.5' Will start sampling interval at 18.5' to 20.0' to avoid complicated footage counts No adapter available to reset drill rig run stroke 08:00 3/14/07 Water level is 1.8' below ground surface 09:22 03/14/07 start SPT at 18.5-20.0'
23.5							Driller's Remarks: Drill time: 20 minutes (20.0-23.5')
25	1.2	SS-5	40-35-37 (72)		Silty Sand (SM) 23.5-24.7' - dusky yellow, (5Y 6/4), wet, very dense, very fine to medium grained, moderate to strong HCl reaction, 30-35% nonplastic fines, trace white particles as laminae and fine to medium particles, trace fine to medium grained sized brilliant green particles (5G 6/6); 23.75-24.0' limestone fragment, all carbonates		09:57- Clean out mud tub from accumulated sandy cuttings, current borehole construction has 20' of 6" diameter casing, driller using N-rod (NWJ) to advance 4-1/2" tricone roller drill bit
16.9							
28.5							Driller's Remarks: Drill time: 19 minutes (25.0-28.5')
29.4	0.8	SS-6	36-50/4.5 (86/10.5")		Silty Sand With Gravel (SM) 28.5-29.3' - dusky yellow, (5Y 6/4), wet, very dense, very fine to medium grained, moderate to strong HCl reaction, 20-30% nonplastic fines, 10-15% gravel-sized, poorly fossiliferous (casts) limestone fragments; trace fine black particles		
30							
11.9							
33.5							Driller's Remarks: Drill time: 6 minutes (30.0-33.5')
33.9	0.4	SS-7	50/5 (50/5")		Silty Sand With Gravel (SM) 33.5-33.9' - dusky yellow to light olive brown, (5Y 6/4 to 5Y 5/6), wet, very fine to coarse grained, moderate to strong HCl reaction, 20% nonplastic fines, 25% fine gravel, moderately fossiliferous (molds, casts, fragments), trace black inclusions, all carbonate		
35							12:48 Start run from 35.0-38.5' - heavy chatter, 5-6 minutes to drill 1/2'
6.9							13:16 Driller's Remarks: Maintaining circulation 14:04 End run from 35.0-38.5' (76 minutes)
38.5							
38.7	0.2	SS-8	50/2 (50/2")		Limestone Fragments 38.5-38.7' - light olive gray, (5Y 5/2), moderate HCl reaction, coarse sand to fine gravel-sized fragments, poorly fossiliferous (casts), 15-20% fine black organic particles Begin Rock Coring at 38.5 ft bgs See the next sheet for the rock core log		14:24 Driller's Remarks: Switch to rock coring, end of soil sampling at SS-8; approximately 38.5' below ground surface
40							



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

WATER LEVELS : 2.0 ft bgs on 3/13/07 START : 3/13/2007 END : 3/22/2007 LOGGER : T. Stewart

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-09	SHEET 4 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724113.8 N, 457731.4 E (NAD83)

ELEVATION : 41.9 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/HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/13/07 START : 3/13/2007 END : 3/22/2007 LOGGER : T. Stewart

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.
60 -18.1	R5-NQ 5 ft 82%	60	3	57.2' - Bedding plane, horizontal, rough, undulating, base of weakly indurated material		Limestone 56.5-57.95' - light olive gray, (5Y 5/2), strong HCl reaction, extremely weak to weak (R0 to R2), tiny voids up to 3/16"x3/16" covering 30-40% of surface, poorly fossiliferous (cast, molds) contains several inches of rock that can be indented with thumb, sharp bedding plane at 57.95'	3/15/07 09:03 Water Level = 1.15' below ground surface 09:15 Start R5-NQ
			1	57.85' - Fracture, horizontal, rough, undulating, open 1/4-1/2"			Driller's Remarks: Maintained full circulation R5: 12 minutes
61.5			NR	57.95' - Bedding plane, horizontal, smooth, planar, open 1/4"			
			NR	58.65, 59.0, 59.2' - Mechanical break (3)			
			NR	59.65' - Fracture, 45 deg, smooth, undulating, tight		57.95-60.6' - light olive gray, (5Y 5/2), strong HCl reaction, weak to medium strong (R2 to R3), tiny (<1/16") voids over 10-15% of surface, trace cavities with secondary mineral infill up to 3/4"x1/2" elliptical shape, entire section mottled, trace black fine to medium particles	Start R6 at 10:04 Driller's Remarks: Probably loss of core at beginning of run
			3	62.75' - Fracture, horizontal, smooth, undulating, base of weakly indurated section, tight			
65 -23.1	R6-NQ 5 ft 78%	52	4	62.85' - Bedding plane or mechanical break, horizontal, rough, planar		No Recovery 60.6-62.6'	
			1	63.4' - Bedding plane or mechanical break, <10 deg, rough, planar		Limestone 62.6-63.5' - light olive gray, (5Y 5/2), fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), crumbles under thumb pressure, silt with organic laminations	R6: 6 minutes
			1	63.8' - Bedding plane or mechanical break, horizontal, rough, undulating, black staining, tight to open 1/4"			
66.5			3	64.0' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/4-1/2"			
			2	64.4' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
			1	64.55' - Bedding plane or mechanical break, horizontal, rough, planar, tight			
70 -28.1	R7-NQ 5 ft 80%	72	1	65.1' - Mechanical break			Start run R7-NQ at 10:26
			0	65.4' - Bedding plane, horizontal, rough, planar, tight			
			NR	65.95' - Fracture, 15 deg, rough, undulating, open 1/4"			
			NR	66.6' - Mechanical break			
			NR	66.95' - Fracture, 25 deg, rough, undulating, tight			
			NR	67.7, 67.95' - Fractures or mechanical break (2), horizontal, rough, planar, open 1/4-1/2"			R7: 13 minutes Last core run on 3/15/07 20' of 6" diameter casing 40' of 3" diameter NW casing Bottom hole depth at 71.6'
			2	69.0' - Bedding plane, horizontal, smooth, planar, 1/4" fine infill			13:20 3/20/07 Measured water level at 0.2' below ground surface; bottom of hole at 71.5'
			>10	69.5, 70.1' - Mechanical break (2)			Driller's Remarks: Soft drilling from 72.5-75.0'
			NR	72.1' - Fracture or mechanical break, 50 deg, smooth, undulating, tight			
			NR	72.4' - Fracture, 90-80 deg, rough, undulating, gray staining, tight			
75 -33.1	R8-NQ 5 ft 66%	38	NR	72.75' - Mechanical break or fracture, 70 deg, rough, undulating, open 1/4-3/4"			
			2	74.7' - Bedding plane, <10 deg, bottom of core loss zone			13:45 Start run R8-NQ; 100% circulation loss over core run End run at approximately 14:10
			1	74.85' - Bedding plane or mechanical break, smooth, planar, tight			Driller's Remarks: Running in 3rd gear, will mix a denser mud for next run
			3	76.2' - Fracture, 70 deg, slickensided, undulating, black staining, tight			R8: 22 minutes 14:25 Start run
			>10	76.55, 76.7' - Bedding plane or mechanical break, horizontal, slickensided, planar, open 1/4-1/8"			
			>10	76.85' - Fracture, 70 deg, rough, undulating, tight			



PROJECT NUMBER:
338884.FL

BORING NUMBER:
A-09

SHEET 5 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724113.8 N, 457731.4 E (NAD83)

ELEVATION : 41.9 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/HW casing


ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/13/07

START : 3/13/2007

END : 3/22/2007

LOGGER : T. Stewart

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				
80 -38.1	R9-NQ 5 ft 94%	63	1	78.0' - Bedding plane, horizontal, sharp contact also showing mottling of rock		Limestone 71.5-73.0' - yellowish gray to light olive brown, (5Y 2/2 to 5Y 5/6), strong HCl reaction, very weak to medium strong (R1 to R3), elongated voids up to 3/16"x1/16" over 25-30% of surface, very irregular shaped cavities up to 3/4"x1-1/4" filled with carbonate silt bearing medium to coarse grained, gray inclusions or infill, poorly fossiliferous (molds) No Recovery 73.0-74.7' 74.7-76.5' - Same as 71.5-73.0' except very weak (R1) rock and yellowish gray (5Y 7/2) from 74.7-74.85', more dense and more fossiliferous from 74.85-76.5' Limestone 76.5-81.2' - moderate yellowish brown to dusky yellow, (10YR 5/4 to 5Y 6/4), moderate to strong HCl reaction, medium strong (R3), mottled very pale orange (10YR 8/2) and medium gray (N5) over 78.2-78.7', tiny (1/16"x1/16") voids on 25-35% of surface, irregular shaped cavities 15-20% with secondary mineral infill, poorly fossiliferous (molds), trace organics as 1/2" long horizontally aligned inclusions, 10-15 deg bedding plane at 78.0', wavy carbonate silt and organic laminae at 80.0', gray staining from 80.4-81.2' No Recovery 81.2-81.5' Limestone 81.5-86.1' - moderate yellowish brown, (10YR 5/4), fine to medium grained, strong HCl reaction, medium strong (R3), voids up to 3/16"x3/16" over 35-45% of surface, elliptical 1/2"x1/2" shaped cavities, moderately fossiliferous (casts), subangular to subrounded inclusions of yellowish gray (5Y 8/1) carbonate silt clasts from 1/8"-2"x2" No Recovery 86.1-86.5' Limestone 86.5-88.3' - medium olive brown, (5Y 4/4), strong HCl reaction, very weak to medium strong (R1 to R3), voids up to 1/16" over 35-40% of surface; carbonate silts (yellowish gray) at 87.0'; at 87.8' medium olive brown, moderately fossiliferous (casts), black medium grained inclusions No Recovery 88.3-91.0' Limestone 91.0-91.5' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, medium strong (R3), trace voids, trace black wavy laminations (>1/16")	R9: 16 minutes 14:42 End run Driller's Remarks: Soft near bottom of run at 81', will advance 3" NW casing to 80' due to continued circulation loss Assumed core loss from end of run SC 1 collected at 81.6-82.45' Driller's Remarks: Continued circulation loss during 3" NW casing advancement, soft at 81.5-84' R10: 9 minutes 09:12 Start R11-NQ Core loss assumed from 88.1 to 90.8' (2.7 ft core loss) R11: 14 minutes Driller's Remarks: Very hard drilling at 91.0', driller pulled out of hole because he thought the core barrel was not spinning; another core run will be made to get the remaining 1/2 foot The 6" core run will be R12-NQ R12: 3 minutes Start R13 at 09:52 R13: 14 minutes	
	1		78.2-75.5' - Fracture zone, irregular shaped cavities infilled with medium coarse grained infill, infill of medium gray (N5)					
	>10		79.05' - Bedding plane, horizontal, rough, undulating, open up to 3/4"					
	NR		80.35' - Bedding plane or mechanical break, rough, undulating, tight, open up to 1/8"					
	85 -43.1	81.5	>10	80.8-81.2' - Fracture zone, 1-1/4"-1/4" limestone fragments				
		R10-NQ 5 ft 92%	67	1				81.5-82.2' - Fracture zone
				0				82.7' - Fracture, 50 deg, rough, undulating, tight, brownish black staining
				1				
				1				85.3-85.6' - Fracture zone
		86.5	NR					
90 -48.1		R11-NQ 4.5 ft 40%	0	>10	86.8-87.4' - Fracture zone, yellowish gray carbonate silts and up to 1-1/2" subrounded limestone fragments			
				>10				
				NR				
				NR				
	91.0							
	91.5	R12-NQ 0.5 ft 100%	100	1	91.2' - Fracture, vertical, smooth, undulating, black staining, tight (runs from 90.8-91.5')			
	R13-NQ 5 ft 100%	0	2	92.1' - Fracture, horizontal, smooth, stepped, tight				
			3	92.35' - Bedding plane, horizontal, smooth, undulating, 1/2" thick organic infill				
			3	92.55' - Fracture, 80 deg, rough, undulating, tight				
			3	92.85' - Fracture, 70-80 deg, rough, undulating, tight				
2			93.0' - Fracture, 70-80 deg, rough, undulating, tight					
1			93.2' - Bedding plane or mechanical break, horizontal, rough, undulating					
1			93.4, 93.5, 93.6' - Fractures (3), horizontal, rough, undulating, tight					
1			93.5' - Fracture, 60-75 deg, rough, undulating					
95 -53.1	96.5		1	93.75' - Bedding plane, horizontal, smooth, planar, <1/8" organic infill				
			1	94.5' - Bedding plane or mechanical break, horizontal, rough, undulating, tight				



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-09	SHEET 6 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724113.8 N, 457731.4 E (NAD83)

ELEVATION : 41.9 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/HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/13/07 START : 3/13/2007 END : 3/22/2007 LOGGER : T. Stewart

WATER LEVELS : 2.0 RGS ON 3/13/07		START : 3/13/2007		END : 3/22/2007		LOGGER : T. Stewart	
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			
100 -58.1	R14-NQ 5 ft 100%	100	0	95.1' - Fracture, 40-50 deg, rough, undulating, tight		91.5-93.75' - Same as 90.8-91.5' except organic interval 1/2" thick at 92.4' gradational change from 93.45' to 93.75' 93.75-96.5' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, medium strong (R3), tiny (1/16"x1/16") voids over 35-40% of surface, up to 25% organic laminations concentrated from 93.8-94.7', highly fossiliferous (shells/casts) up to 1-1/2" fragments, up to 5% medium grained gray (N5) particles 96.5-101.5' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak (R1), highly fossiliferous (molds, casts, fragments), trace organics (soft) up to 1-1/2" square fragments, apparent bedding, fossil fragments up to 1/2", few whole spherical fossils, rock has a chalk like appearance 101.5-106.5' - Same as 96.5-101.5' except densely bedded 106.5-111.5' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak (R1), tiny spherical voids up to 1/16"x1/16" over up to 15% of surface, poorly fossiliferous (casts), trace cavities up to 1/4"x1/4", medium grained white and gray particles up to 35% in matrix 111.5-116.4' - Same as 106.5-111.5' except at 114.6-116.4' elongated cavities rimmed with a secondary mineralization infill of the same color as the matrix, medium to coarse grained medium gray (N5) inclusions over 30-40% of surface, wavy bedding 1/4" thick near base (about 116.2') No Recovery 116.4-116.5'	R14: 8 minutes Continued circulation loss SC-2 collected at 100.55-101.5'
			1	95.5' - Fracture, 40-50 deg, rough, undulating, tight			
			1	97.85' - Fracture, 45-55 deg, rough, undulating, tight			
	101.5		1	98.9' - Fracture, 55-65 deg, rough, undulating, tight			
			2	100.55' - Fracture or mechanical break, rough, undulating, tight			
			1	101.7' - Fracture, 40-50 deg, rough, undulating, tight			
	R15-NQ 5 ft 100%	53	1	102.1' - Fracture, 40-50 deg, rough, undulating, tight			
			1	104.35' - Fracture, 40-50 deg, rough, undulating, tight			
			>10	104.8' - Fracture or mechanical break, horizontal, rough, undulating, tight 105.4-106.5' - Fracture zone			
	105 -63.1	R16-NQ 5 ft 100%	93	1			
1				107.75' - Fracture, 70-80 deg, rough, undulating, tight			
0							
111.5			0				
			1				
			0				
R17-NQ 5 ft 98%		97	0	111.4' - Fracture or mechanical break, 40-50 deg, rough, undulating, tight			
			0				
			0				
116.5			2	114.75' - Fracture or mechanical break, 50-60 deg, rough, undulating, open 1/8-1/4"			
	0		115.0' - Bedding plane or mechanical break, horizontal, slickensided, undulating, open 1/4"				
	NR						
		3	116.65' - Fracture or mechanical break, rough, undulating, open 1/8-1/4"				
		2	117.45' - Fracture or mechanical break, 20-30 deg, rough, undulating, open 1/4"				



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-09	SHEET 7 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724113.8 N, 457731.4 E (NAD83)

ELEVATION : 41.9 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/HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/13/07 START : 3/13/2007 END : 3/22/2007 LOGGER : T. Stewart

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			
120 -78.1	R18-NQ 5 ft 100%	82	3	118.55' - Fracture, <10 deg, rough, undulating, tight		Limestone 116.5-121.5' - very pale orange (10YR 8/2) from 116.5-119.8' and yellowish gray (5Y 8/1) from 119.8-121.5', fine to medium grained, strong HCl reaction, weak (R2), very fine well rounded grains, moderately to highly fossiliferous (casts, molds), gray staining from 116.5-117.0', trace elliptical cavities (1/2"x1/8") rimmed with opaque secondary mineralization in center, coarse appearance of rock due to micro fossils, rock has a "chalk like" feel 121.5-126.3' - yellowish gray, (5Y 8/1), fine grained, strong HCl reaction, weak (R2), tiny voids (<1/16") up to 20% of surface, trace elliptical cavities rimmed with white secondary mineralization, poorly fossiliferous (casts, few molds), trace organics as very fine discontinuous laminations (<1/16"), 5-15% fine to medium grained, medium gray (N5) particles No Recovery 126.3-126.5' Limestone 126.5-131.3' - yellowish gray (5Y 7/2) from 126.5-129.7' and yellowish gray (5Y 8/1) from 129.7-131.25', strong HCl reaction, weak (R2), moderately to highly fossiliferous (casts, molds, microforams), black staining on rock surface, 15-20% fine grained medium gray (N5) particles, very thinly bedded from 128.5-129.5'	SC 4 collected at 117.5-118.6'
			3	119.0' - Mechanical break 119.2' - Fracture or mechanical break, horizontal, rough, planar, tight 119.35' - Bedding plane or mechanical break, horizontal, rough, planar, open 1/8-1/4"			
			3	121.05, 121.2' - Bedding plane or mechanical break (2), horizontal, rough, undulating, open 1/4-1/8"			
125 -83.1	R19-NQ 5 ft 96%	43	1	121.45' - Fracture, 40-50 deg, black staining, tight		121.6' - Fracture or mechanical break, rough, planar, tight 122.2' - Fracture, 30 deg, rough, planar, brownish black staining, open 1/8" 122.5' - Fracture or bedding plane, 20 deg, open 1/8-1/4" 122.55, 123.5' - Fracture (2), horizontal, rough, planar, tight 123.9' - Fracture, horizontal, rough, undulating, open 1/8" 124.2' - Bedding plane or mechanical break, horizontal, smooth, planar, open 1/8" 124.55, 124.65' - Bedding plane or mechanical break (2), horizontal, smooth, undulating, open 1/8" 125.25' - Bedding plane or mechanical break, horizontal, smooth, planar, open 1/8" 125.55' - Bedding plane or mechanical break, horizontal, smooth, undulating, open 1/8-1/4" 125.8, 125.95' - Bedding plane or mechanical break (2), horizontal, rough, undulating, open 1/8-1/4" 126.65' - Mechanical break or bedding plane, horizontal, smooth, planar, tight 127.2' - Bedding plane, <10 deg, rough, undulating, tight 127.45' - Bedding plane or mechanical break, horizontal, rough, undulating, brown staining, open 1/2" 127.95' - Fracture, <10 deg, rough, undulating, open 1/4" 128.15' - Mechanical break or fracture, horizontal, smooth, planar, tight 128.8' - Bedding plane, horizontal, rough, planar, tight 129.1, 129.13' - Bedding plane (2), horizontal, rough, planar, tight 129.65' - Bedding plane, horizontal, rough, planar, open 1/4" 129.8' - Bedding plane, horizontal, rough, undulating, open 1/2-3/4" 130.15' - Bedding plane, horizontal, rough, planar, open 1/2-3/4"	R18: 5 minutes
			1	121.6' - Fracture or mechanical break, rough, planar, tight			
			3	122.2' - Fracture, 30 deg, rough, planar, brownish black staining, open 1/8"			
130 -88.1	R20-NQ 5 ft 96%	53	3	122.5' - Fracture or bedding plane, 20 deg, open 1/8-1/4"		131.3-131.5' - fine to medium grained, strong HCl reaction, very weak (R1), bedding up to 1/2" thick, 20% fine grained medium gray inclusions 134.1-136.5' - fine to medium grained, strong HCl reaction, very weak (R1), moderately fossiliferous (molds, casts), disconformity at 134.25'; 136.3-136.5' beds dipping at 7 deg, trace voids with calcite infill up to 1/6"x1/16" (white infill color), rock color is alternating, laminated to thinly bedded yellowish gray (5Y 7/2) to light olive gray (5Y 5/2) from 131.5-134.25', then yellowish gray (5Y 7/2) to the end of core run	R19: 7 minutes
			1	122.55, 123.5' - Fracture (2), horizontal, rough, planar, tight			
			3	123.9' - Fracture, horizontal, rough, undulating, open 1/8"			
135 -93.1	R21-NQ 5 ft 100%	63	NR	124.2' - Bedding plane or mechanical break, horizontal, smooth, planar, open 1/8"		136.3-136.5' - beds dipping at 7 deg, trace voids with calcite infill up to 1/6"x1/16" (white infill color), rock color is alternating, laminated to thinly bedded yellowish gray (5Y 7/2) to light olive gray (5Y 5/2) from 131.5-134.25', then yellowish gray (5Y 7/2) to the end of core run	100% loss of circulation continues
			3	124.55, 124.65' - Bedding plane or mechanical break (2), horizontal, smooth, undulating, open 1/8"			
			2	125.25' - Bedding plane or mechanical break, horizontal, smooth, planar, open 1/8"			
			2	125.55' - Bedding plane or mechanical break, horizontal, smooth, undulating, open 1/8-1/4"		136.3-136.5' - beds dipping at 7 deg, trace voids with calcite infill up to 1/6"x1/16" (white infill color), rock color is alternating, laminated to thinly bedded yellowish gray (5Y 7/2) to light olive gray (5Y 5/2) from 131.5-134.25', then yellowish gray (5Y 7/2) to the end of core run	R20: 8 minutes
			>10	125.8, 125.95' - Bedding plane or mechanical break (2), horizontal, rough, undulating, open 1/8-1/4"			
			2	126.65' - Mechanical break or bedding plane, horizontal, smooth, planar, tight			
			NR	127.2' - Bedding plane, <10 deg, rough, undulating, tight		136.3-136.5' - beds dipping at 7 deg, trace voids with calcite infill up to 1/6"x1/16" (white infill color), rock color is alternating, laminated to thinly bedded yellowish gray (5Y 7/2) to light olive gray (5Y 5/2) from 131.5-134.25', then yellowish gray (5Y 7/2) to the end of core run	Start R21 at 14:42 SC-5 collected at 135.70-136.50'
			5	127.45' - Bedding plane or mechanical break, horizontal, rough, undulating, brown staining, open 1/2"			
			5	127.95' - Fracture, <10 deg, rough, undulating, open 1/4"			
			4	128.15' - Mechanical break or fracture, horizontal, smooth, planar, tight		136.3-136.5' - beds dipping at 7 deg, trace voids with calcite infill up to 1/6"x1/16" (white infill color), rock color is alternating, laminated to thinly bedded yellowish gray (5Y 7/2) to light olive gray (5Y 5/2) from 131.5-134.25', then yellowish gray (5Y 7/2) to the end of core run	R21: 10 minutes
			0	128.8' - Bedding plane, horizontal, rough, planar, tight			
			0	129.1, 129.13' - Bedding plane (2), horizontal, rough, planar, tight			
			0	129.65' - Bedding plane, horizontal, rough, planar, open 1/4"		136.3-136.5' - beds dipping at 7 deg, trace voids with calcite infill up to 1/6"x1/16" (white infill color), rock color is alternating, laminated to thinly bedded yellowish gray (5Y 7/2) to light olive gray (5Y 5/2) from 131.5-134.25', then yellowish gray (5Y 7/2) to the end of core run	Continued circulation loss
			0	129.8' - Bedding plane, horizontal, rough, undulating, open 1/2-3/4"			
			0	130.15' - Bedding plane, horizontal, rough, planar, open 1/2-3/4"			
			3	130.15-130.4' - Fracture zone, up to 1/2" core fragments, brownish black staining on fracture surface		136.3-136.5' - beds dipping at 7 deg, trace voids with calcite infill up to 1/6"x1/16" (white infill color), rock color is alternating, laminated to thinly bedded yellowish gray (5Y 7/2) to light olive gray (5Y 5/2) from 131.5-134.25', then yellowish gray (5Y 7/2) to the end of core run	
			>10	130.75, 130.9' - Bedding plane or mechanical break, rough, undulating, open 1/4-3/8"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-09

SHEET 8 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724113.8 N, 457731.4 E (NAD83)

ELEVATION : 41.9 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/HW casing





ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/13/07

START : 3/13/2007

END : 3/22/2007

LOGGER : T. Stewart

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					
140 -98.1	R22-NQ 5 ft 90%	57	>10	131.55' - Bedding plane, horizontal, smooth, undulating, tight		Limestone 136.5-138.3' - dusky yellow, (5Y 6/4), fine grained, strong HCl reaction, tiny voids up to 1/16" (spheroidal) over 10% of surface, cavities up to 1/2"x1" elongated and infilled with white minerals and medium gray secondary minerals, up to 15% medium grained, medium gray particles, dipping wavy laminations near 138.0'	R22: 12 minutes		
			4	131.75, 131.8' - Bedding plane or mechanical break, horizontal, smooth, planar, tight				138.3-139.6' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, strong (R4), moderately fossiliferous (casts, molds), trace tiny voids, reflective very fine grains inside cavities and on broken surfaces, fossils up to 3/4"	
			1	132.15, 132.25, 132.55, 133.1' - Bedding plane or mechanical break (4), horizontal, rough, smooth, planar, tight				139.6-141.0' - light olive gray, (5Y 5/2), strong HCl reaction, strong (R4), short (about 3/8") discontinuous vertical stress fractures, orange staining, irregular shaped cavities up to 1-1/2"	
			NR	133.3-133.4' - Fracture zone				No Recovery 141.0-141.5' Limestone	
145 -103.1	R23-NQ 5 ft 92%	82	>10	133.45, 133.65, 133.75, 134.0, 134.1' - Bedding plane or mechanical break (5), horizontal, rough to smooth, planar, tight		141.5-144.0' - very light gray, (N8), mild to strong HCl reaction, weak to medium strong (R2 to R3), thinly bedded to laminated, voids up to 1/16" diameter over 10% of surface, with very weak (R1) zones that are fractured, trace cavities up to 1/2" diameter, organic content in very weak zones of rock 143.96-144.0', organic odor	R23: 9 minutes Circulation loss (100%) has continues About 75-100% water loss during run, 1/4 bag, quick gel in bentonite added to mud Powdery, "chalk like" feel over upper interval, translucent secondary mineralization in center, coarse appearance of rock due to microfossils		
			0	136.6, 136.7' - Bedding plane or mechanical break, horizontal, rough, planar, tight				144.0-146.1' - yellowish gray, (5Y 8/1), strong HCl reaction, chalk like/powdery feel, horizontally bedded, white and yellowish gray matrix, texture gradually changes from medium to fine grained downward with depth	
			2	137.2' - Fracture, horizontal, rough, planar, open 1/4"				No Recovery 146.1-146.5' Limestone	
			0	137.65' - Fracture, horizontal, rough, undulating, open 1/8"				146.5-148.6' - yellowish gray, (5Y 1/2), mottled in Hue 5Y colors, thinly bedded	
			0	138.3-138.85' - Fracture zone, 1"-1-1/2" subrounded fragments				148.6-150.9' - light olive gray, (5Y 5/2), very fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), powdery/"chalk like" feel over upper interval, dense limestone mottled with gray stains over lower interval, elongated cavity 2" long at 150.0', no infill	
			NR	139.4' - Fracture or mechanical break, horizontal, rough, undulating, tight, (R5)				No Recovery 150.9-151.5'	
			2	139.6' - Fracture, horizontal, rough, undulating, open 1/2-3/4", orange staining					
			2	140.0' - Fracture, horizontal, rough, undulating, black staining, open 1/8"					
			0	140.3' - Fracture or mechanical break, horizontal, rough, planar, open 1/8"					
			>10	140.4' - Fracture, 20-30 deg, rough, undulating, open 1/4-1/2"					
			>10	140.9' - Fracture, horizontal, rough, undulating, open 1/2-1"					
			NR	141.5-141.65' - Fracture zone, subangular fragments up to 3/4"					
150 -108.1	R24-NQ 5 ft 88%	68	>10	141.85' - Bedding plane or mechanical break, horizontal		146.5-148.6' - yellowish gray, (5Y 1/2), mottled in Hue 5Y colors, thinly bedded	Start at 16:05 added more quick gel. Circulation loss (mud was mixed as above)		
			>10	143.85' - Bedding plane or mechanical break, horizontal, rough, planar, open 1/4"					
			NR	143.95' - Fracture, 60-70 deg, rough, undulating, black staining, open					
			2	146.65, 146.8, 148.4, 148.35' - Bedding plane or mechanical break (4), horizontal, rough, planar, tight					
			3	149' - Mechanical break					
			1	150.1' - Fracture, 80 deg, rough, undulating, tight					
			1	150.25' - Mechanical break or fracture, horizontal, open 1/4"					
			NR	150.45-150.9' - Fracture zone, 1-1/2" fragments					
			1	151.55, 151.65' - Bedding plane (2), horizontal, rough, undulating, tight, organics on fracture surfaces					
			NR	152.75, 152.85' - Fracture (2), horizontal, rough, undulating, open 1/8-1/4"					
155 -113.1	R25-NQ 5 ft 80%	73	1	152.85' - Fracture, horizontal, rough, undulating, open 1/4"		148.6-150.9' - light olive gray, (5Y 5/2), very fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), powdery/"chalk like" feel over upper interval, dense limestone mottled with gray stains over lower interval, elongated cavity 2" long at 150.0', no infill	R25: 7 minutes		
			NR	154.1' - Bedding plane or mechanical break					
			1	155.05' - Bedding plane, 7 deg, smooth, planar, open 1/4"					
			1	156.8' - Bedding plane, horizontal					



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-09	SHEET 9 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724113.8 N, 457731.4 E (NAD83)

ELEVATION : 41.9 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/HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/13/07 START : 3/13/2007 END : 3/22/2007 LOGGER : T. Stewart

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			
160 -118.1	R26-NQ 5 ft 28%	10	NR	157.8' - Fracture, 70-80 deg, rough, undulating, black staining, tight			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-09

SHEET 10 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724113.8 N, 457731.4 E (NAD83)

ELEVATION : 41.9 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/HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/13/07

START : 3/13/2007

END : 3/22/2007

LOGGER : T. Stewart

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.
180 -138.1	5 ft 84%	40	>10	173.60, 173.65, 173.8' - Bedding plane (3), <10 deg, rough, undulating, organic infill, open 1/8"		Limestone 176.0-180.2' - light olive gray, (5Y 5/2), moderate to strong HCl reaction, weak to medium strong (R2 to R3), trace cavities up to 3/8" elongated, tiny voids up to 1/16" over 10-15% of surface, trace organics as wavy laminations <1/16" thick from 179.0-180.2'	R30: 9 minutes
			5	174.12' - Bedding plane, <10 deg, rough, planar, open 1/16-1/8"			
			NR	174.22, 174.5, 174.9, 174.97, 175.2' - Bedding plane (5), horizontal, rough, undulating, open 1/2"			
			5	175.75, 175.8' - Bedding plane (2), horizontal, rough, planar, open 1/8"			
			4	177.0' - Fracture or mechanical break, horizontal, rough, undulating, brownish black staining, open 1/4"		No Recovery 180.2-181.0' Limestone	
			3	178.2' - Bedding plane or mechanical break, horizontal, rough, planar, top of fractured zone		181.0-185.9' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, weak to medium strong (R2 to R3), medium to lightly fossiliferous (molds, casts), tiny voids up to 1/8"x1/8" over 25-35% of surface, trace cavities with medium gray (N5) secondary mineral infill, fossils up to 1/4", wavy laminated bedding 1/16" thick at 187.3', yellowish gray matrix mottling at 183.0'	R31: 10 minutes
			5	178.7' - Bedding plane or mechanical break, <10 deg, rough, planar, organic infill 1/16"			
			4	179.0, 179.2' - Bedding plane (2), 8-10 deg, rough, planar, organic infill 1/16"			
			NR	179.45, 179.55' - Bedding plane (2), 8-10 deg, rough, planar, open 1/16-1/8"		No Recovery 185.9-186.0' Limestone	
			>10	179.75' - Bedding plane or mechanical break, 5-10 deg, rough, undulating, open 1/4", bedding contact brown, more organic layered unit underneath		186.0-190.3' - dusky yellow to light olive brown, (5Y 6/4 to 5Y 5/6), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/16"x1/8" over 30-50% of surface, poorly fossiliferous (molds), 10-15% organics as short (3/8") discontinuous to laminated at 189.8', silt above yellowish gray (5Y 7/2), fossiliferous (molds, casts)	R32: 8 minutes
			>10	181.25' - Bedding plane, 5-10 deg, rough, undulating, organic infill 1/16"			
			>10	181.65, 181.75' - Bedding plane (2), horizontal, rough, undulating, tight			
			>10	181.85' - Fracture or mechanical break, 80-90 deg, rough, undulating, tight			
			>10	181.95' - Fracture or mechanical break, 40-50 deg, rough, undulating, tight			
			NR	182.2' - Fracture, 75-85 deg, rough, undulating, tight		No Recovery 190.3-191.0' Limestone	
			>10	182.4' - Fracture or mechanical break, horizontal, rough, undulating, open 1/2-3/4"		191.0-192.3' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, weak (R2), voids are micro forams and micro form molds up to 1/8"-1/4" over 20-25% of surface	Appearance is "chalk like"
			>10	182.75' - Fracture, horizontal, rough, undulating, tight to open 1/4"		192.3-192.8' - light olive gray, (5Y 5/6), fine grained, mild to moderate HCl reaction, very weak (R1), sharp change from 192.3-192.4'	
			>10	182.9' - Fracture or mechanical break, 10-20 deg, rough, planar, tight		No Recovery 192.8-196.0' Limestone	
			NR	183.25' - Fracture or mechanical break, 10-15 deg, rough, planar, open 1/16"		196.0-198.85' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, medium strong (R3), trace voids, up to 10% very fine to fine black particles in matrix	R33: 4 minutes
			NR	183.8, 183.9' - Fracture or mechanical break (2), 5-10 deg, rough, undulating, 183.8' open 1/8", 183.9' open 1/16", black staining			
			>10	184.1' - Bedding plane, horizontal, rough, undulating, tight			
			>10	184.4' - Bedding plane, 5-10 deg, smooth, undulating, open 1/8"			
			>10	184.55' - Bedding plane or mechanical break, 5-10 deg, rough, undulating, tight			
			>10	184.8, 184.81' - Bedding plane or mechanical break (2), 0-5 deg, smooth, undulating, tight			
			>10	184.9' - Bedding plane or mechanical break, 5-10 deg, rough, planar, tight			
			>10	185.2' - Bedding plane or mechanical break, 20-30 deg, rough, undulating, open 1/4-1/8"			
			>10	185.3' - Bedding plane or mechanical break, 60-70 deg, rough, undulating, tight			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-10
SHEET 1 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)
 ELEVATION : 42.2 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, 2-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

WATER LEVELS : 1.01 RDS 01/03/10/07			START : 2/23/2007		END : 3/11/2007		LOGGERS : G. LeBlanc, T. Stewart, C. Wailestad	
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	
42.2								C. Sump and T. Stewart also logged part of boring A-10
5	5.0							
37.2		0.8	SS-1	3-36-50/2 (86/8")	Poorly Graded Sand With Silt (SP-SM) 5.0-5.5' - dusky yellow, (5Y 6/4), moist, very dense, very fine to fine grained, no HCl reaction, 10% nonplastic fines			Driller's Remark: Hard 5-13.5'
	6.5				Limestone Fragments 5.5-5.8' - very light gray, (N8), moist, very fine grained, mild HCl reaction, some orange staining			
10	10.0							
32.2		1.4	SS-2	8-18-50/5 (68/11")	Silt (ML) 10.0-11.4' - grayish yellow, (5Y 8/4), wet, very dense, very fine grained, nonplastic, very rapid dilatancy, moderate to strong HCl reaction, 10-15% sand material, slightly indurated 1" layers throughout			
	11.4							
15	15.0							Driller's Remark: Softened at 13.5-15'
27.2		1.5	SS-3	18-29-35 (64)	Silt With Sand And Limestone Fragments (ML) 15.0-16.5' - grayish yellow, (5Y 8/4), wet, fine to coarse grained, nonplastic, very rapid dilatancy, moderate HCl reaction, 20-25% fine to coarse sand-sized, 10% fine gravel-sized carbonate material			
	16.5							
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-10
SHEET 2 OF 12	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)
 ELEVATION : 42.2 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, 2-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

WATER LEVELS : 1.0 TUBS ON 03/10/07			START : 2/29/2007			END : 3/11/2007			LOGGERS : G. LeBlanc, T. Stewart, G. Wailesad		
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					
22.2	20.0	0.2	SS-4	18-29-50/5 (79/11")	Silt With Sand (ML) 20.0-20.2' - Same as 15.0-16.5' except except one 1/2" gravel-sized carbonate fragment.						
	21.5										
				</							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-10
SHEET 3 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)
 ELEVATION : 42.2 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, 2-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

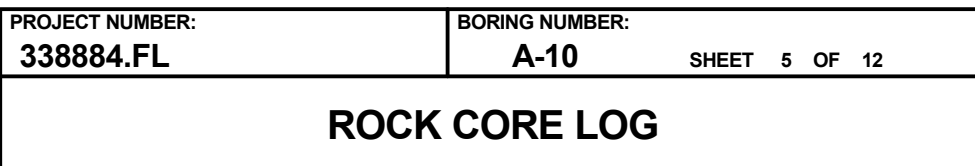
WATER LEVELS : 1.010 DGS 0103 10/07							START : 2/23/2007		END : 3/11/2007		LOGGERS : G. LeBlanc, T. Stewart, C. Wailestad	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS				
			RECOVERY (ft)	#TYPE	6"-6"-6" (N)	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				
2.2	40.0	1.3	SS-8	31-47-45 (92)	40.0-41.3' - moderate yellowish brown, (10YR 5/4), moist to wet, hard, mild to moderate HCl reaction, 49% sand and gravel, 10-15% fines, carbonate materials							
	41.5											
45	45.0											
-2.8	45.8	0.8	SS-9	40-50/3 (90/9")	45.0-45.75' - Same as 40.0-41.3' except trace gravel-sized rock fragments							
50	50.0											
-7.8	50.4	0.1	SS-10	50/4.5 (50/4.5")	50.0-50.1' - pale yellowish brown, (10YR 6/2), mild to moderate HCl reaction, silty sand (SM) cuttings, silty sand is same as 45.0-45.75', fossiliferous							
55	55.0											
-12.8	55.3	0.1	SS-11	50/3 (50/3")	55.0-55.1' - Same as 50.0-50.1'							
60												



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-10
SHEET 4 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)
 ELEVATION : 42.2 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, 2-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

WATER LEVELS : 1.01 RDS ON 03/10/07			START : 2/29/2007			END : 3/11/2007			LOGGERS : C. LeBlanc, T. Stewart, C. Wailestad		
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					
-17.8	60.0	0.1	SS-12	50/1 (50/1")	Limestone Fragments 60.0-60.1' - light olive gray, (5Y 5/2), mild to moderate HCl reaction			61.5-62.0' Heavy chatter, drill time increases, cuttings show weak limestone fragments, light olive gray, (5Y 5/2), finish soil drilling at 62', switch to rock coring, see rock core log			
	62.0										
	62.1	0.0	SS-13	50/1 (50/1")	Limestone Fragments 62.0-62.1' - light olive gray, (5Y 5/2), moderate HCl reaction, weak (R2) Begin Rock Coring at 62.0 ft bgs See the next sheet for the rock core log						
65 -22.8											
70 -27.8											
75 -32.8											
80											



WATER LEVELS : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-10

SHEET 6 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)

ELEVATION : 42.2 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

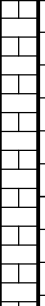



ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/10/07

START : 2/25/2007

END : 3/11/2007

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

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 -42.8	R5-NQ 5 ft 60%	58	2	81.1-81.3' - Clay seam, poorly to moderately indurated laminated silt (ML)		Sand (SW) 77.0-77.5' - strong HCl reaction, well graded fine sand sized carbonate derived grains, loose, friable, 10-15% fine clear crystals, (secondary calcite), possible fine silica grains (<5%)	SC-2 collected at 85.06-86.06' R5: 4 minutes	
			1	81.3' - Fracture, horizontal, rough, undulating		Limestone 77.5-81.1' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, medium strong (R3), few larger voids irregular shaped up to 3/4" in size with dark olive gray staining.		
			3	82.2' - Fracture, rough, stepped 82.6' - Fracture, rough, stepped, fine sand sized particles on surface 83.7' - Fracture, horizontal, rough, undulating				
			NR	84.0' - Fracture, 45 deg, rough, undulating to planar, tight, dark black/gray fine grained coating 84.6' - Fracture, horizontal, rough, undulating 84.7' - Fracture, 45 deg, rough, planar, some fine grained pyrite coating				
90 -47.8	R6-NQ 5 ft 82%	60	2	87.0' - Mechanical break, horizontal, rough, undulating		Limestone 81.1-81.4' - consolidated carbonate silt	R6: run time not recorded	
			1	87.7-88.2' - Fracture zone, discontinuity with weak limestone interbedded		Limestone 81.4-81.7' - Same as 77.5-81.1' No Recovery 81.7-82.0' Limestone 82.0-85.0' - grayish orange, (10YR 7/4), moderate to strong HCl reaction, weak (R2), color changes with depth to yellowish gray (5Y 7/2), 15-25% voids (1/8") over surface, 1-2% larger voids/cavities (fossil molds) up to 3/8" length, iron staining, few fossil molds infilled with very pale orange (10YR 8/2) soft material No Recovery 85.0-87.0' Limestone 87.0-87.7' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, medium strong (R3), fossiliferous molds and casts 1/16"-3/16" over 5-20% of surface, larger cavities up to 3/4" (fossil molds) 87.7-88.2' - white to yellowish gray, (N9 to 5Y 8/1), strong HCl reaction, very weak (R1), fossiliferous (molds & casts) 88.2-89.6' - pale yellowish brown, (10YR 6/2), moderate to strong HCl reaction, 15-20% voids (1/16"-1/8"), 2% larger voids/cavities, laminated black organic infilling at 89.4' 89.6-91.1' - pale yellow gray, (5Y 8/1), strong HCl reaction, weak to medium strong (R2 to R3), silt sized material (inclusions) and thin layers (1"-2") No Recovery 91.1-92.0'		
			4	88.8' - Fracture, 10 deg, rough, undulating, iron staining 89.3, 89.5' - Fractures (2), rough, black to dark brown staining, irregular fractures associated with larger voids/solution cavities				
			1	89.6' - Fracture, horizontal, contact with silty material				
			NR	89.8' - Fracture, 30-45 deg, rough, multiple tight healed fractures 90.3' - Mechanical break, horizontal 91.0' - Fracture, rough, break associated with large cavity				
			2	92.0' - Mechanical break, horizontal, planar 92.2' - Fracture, 45 deg, rough, planar 92.21' - Fracture, horizontal, black coating on fracture edge, (pyrite-organics)				
95 -52.8	R7-NQ 5 ft 80%	48	NA	92.8, 93.2, 93.8' - Fractures (3), horizontal, rough, stepped, loose, silty sand material on faces		R7: run time not recorded		
			>10	94.5' - Fracture, horizontal, smooth, undulating, parting along fine lamination, dark brown color, friable zone				
			NR	95.1' - Fracture, 60 deg, planar, loose sand material, fine grained pyrite on surface 95.1-96.0' - Fracture zone, limestone fragments				
			2	97.1' - Fracture or mechanical break, 60 deg, rough, undulating				
100 -57.8	R8-NQ 5 ft 60%	22	2	97.6' - Fracture or mechanical break, horizontal, rough, planar		R8: run time not recorded		
			3	98.3' - Fracture, 45 deg, rough, undulating, irregular 98.6' - Mechanical break, rough, undulating, near vertical				
			NR	99.2' - Fracture, 60 deg, planar 99.4' - Fracture, 15 deg, rough, undulating				
			NR	99.8' - Fracture, 50-60 deg, rough, planar				
102.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-10

SHEET 7 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)

ELEVATION : 42.2 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

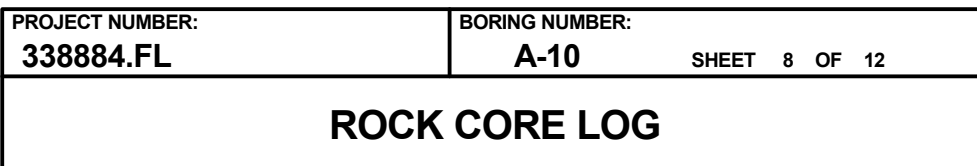
WATER LEVELS : 1.0 ft bgs on 03/10/07

START : 2/25/2007

END : 3/11/2007

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

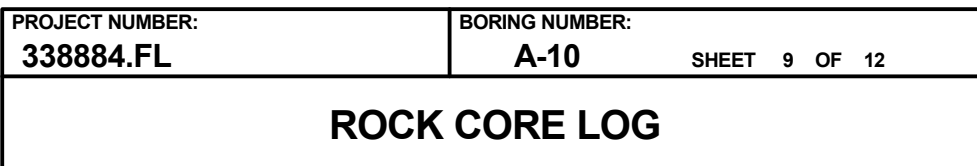
WATER LEVEL - 108.85 ft on 10/1/07		DISCONTINUITIES			SYMBOLIC LOG		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION			ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE 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						
105 -62.8	R9-NQ 5 ft 65%	38	>10	102.1, 102.7' - Fractures or mechanical break (2), horizontal, rough, undulating			Limestone 92.0-93.2' - yellowish gray, (5Y 8/1), strong HCl reaction, weak (R2), black organic/pyrite mottling and castings on fracture/void surfaces, voids (1/16") over 10-15% of surface, fossiliferous (molds/casts)	R9: 4 minutes		
			>10	102.3' - Fracture, 60-70 deg, smooth, thin coating of loose silt sized material on fracture surface						
			0	102.7-103.3' - Fracture zone, limestone fragments						
			0							
107.0			NR							
110 -67.8	R10-NQ 5 ft 100%	54	1	107.1' - Fracture, 45-60 deg			Limestone 95.2-96.0' - yellow gray, (5Y 8/1), strong HCl reaction, weak (R2), pyrite on surfaces No Recovery 96.0-97.0' Limestone 97.0-100.0' - yellowish gray, (5Y 8/1), strong HCl reaction, weak (R2), 10-15% voids (1/16-1/8") over surface, fossil molds/casts, cavities and molds up to 3/8" over 1-2% of surface. No Recovery 100.0-102.0' Limestone 102.0-105.25' - yellowish gray, (5Y 8/1), strong HCl reaction, weak (R2), percent voids vary from 5-15%, large fossil molds/cavities up to 3/8" (mollusks) No Recovery 105.25-107.0' Limestone 107.0-114.6' - yellowish gray, (5Y 8/1), fine grained, strong HCl reaction, weak (R2), small voids (1/16"-1/8") over <5% of surface, very few larger (>3/16") cavities/fossil molds on surface chalky appearance and texture 114.6-116.8' - yellowish gray, (5Y 8/1), strong HCl reaction, weak (R2), highly fossiliferous(molds and casts) up to 30-40%, somewhat friable No Recovery 116.8-117.0' Sand (SP) 117.0-117.3' - strong HCl reaction, well sorted carbonate sand, 5% fine clear subhedral calcite crystals, possible trace silica grains, possibly slough	SC-3 collected at 107.3-108.35'		
			1	108.5' - Fracture, 60 deg, rough, undulating, <1% fine black trace secondary pyrite crystals on surface						
			2	109.4' - Fracture or mechanical break, horizontal						
			2	109.5' - Fracture, 45 deg, rough, stepped, trace very fine black pyrite crystals						
			6	110.8' - Fracture or mechanical break, horizontal, rough						
			112.0			1			110.9, 111.0, 111.2, 111.5, 111.6, 111.8, 112.0' - Fractures (7), horizontal, rough, planar to undulating, open, fine "chalky" material on surface	
115 -72.8	R11-NQ 5 ft 96%	86	3	112.0' - Fracture or mechanical break, horizontal, smooth, planar						
			1	113.7' - Fracture, horizontal, iron oxide staining						
			1	113.71-113.8' - Mechanical break or fracture zone, horizontal, (drill pin)						
			2	114.4, 115.2, 115.7, 116.1, 116.3, 116.8' - Fractures or mechanical break (6), horizontal, undulating						
117.0			NR				R11: 5 minutes			
120 -77.8	R12-NQ 5 ft 100%	70	5	117.0-117.3' - Fracture zone, loose carbonate fine sand						
			3	117.3, 117.5, 117.9' - Fractures (3), horizontal, rough, undulating, fine carbonate sand on surface						
			3	118.5' - Fracture, 45 deg, rough, undulating to planar						
			3	118.8, 118.7, 119.1, 120.1' - Bedding plane (4), horizontal, smooth to rough, planar						
			3	120.1, 120.6, 121.1' - Fractures or mechanical break (3), 0-10 deg, rough, undulating						
			122.0			>10	121.1-122.0' - Fracture zone, irregular fracture surfaces, limestone fragments			R12: run time not recorded



ORIENTATION : Vertical

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

Rev. 4



ORIENTATION : Vertical

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-10

SHEET 10 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)

ELEVATION : 42.2 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 : 1.0 ft bgs on 03/10/07

START : 2/25/2007

END : 3/11/2007

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

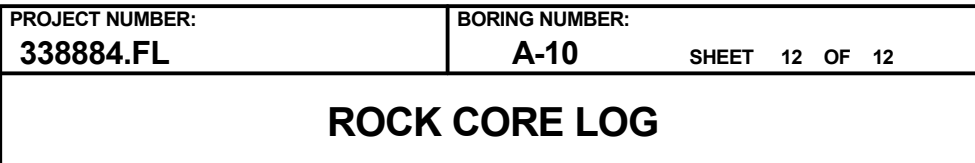
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS		
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.		
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS					
165 -122.8	R21-NQ 5 ft 88%	18	9	159.1' - Bedding plane or mechanical break, horizontal, smooth, planar, open 1/4"-1/2"		Limestone 152.0-156.3' - very pale orange, (10YR 8/2), strong HCl reaction, weak (R2), voids to 1/8" covering 25-30% of surface, moderately fossiliferous, (mold and casts) 5-10% white inclusions up to 1-1/4" (irregular shape), fine brownish black laminations (<1/16") at 153.48-153.63', contains vertical fracture across interval, up to 20% fine black particles No Recovery 156.3-157.0' Limestone 157.0-161.6' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), trace voids up to 1/8" elliptical, poorly fossiliferous (few molds,casts), 3/8"x3/16", bedding plane laminations <1/16" from 160.2-161.6' No Recovery 161.6-162.0' Limestone 162.0-166.4' - yellowish gray to moderate olive brown, (5Y 7/2 to 5Y 5/4), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/16" over 40% of surface, 163.0-163.09' interval has voids to 3/16" covering 90% of surface, moderately fossiliferous from 163.0-163.9' (some molds), 2"x1/4" inclusions up to 5%, from 163.0-163.1', irregular shaped inclusions, medium gray in color. No Recovery 166.4-167.0' Limestone 167.0-171.2' - moderate olive brown, (5Y 4/4), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/8" over 15-20% of surface, cavities (1/4"x1") from 168.05-168.04' poorly fossiliferous (trace molds), horizontal wavy laminations (<1/16") at 170.5 No Recovery 171.2-172.0' Limestone 172.0-176.2' - yellowish gray to moderate olive brown, (5Y 7/2 to 5Y 4/4), strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/8"x3/16" over 10-15% of surface, cavities up to 1"x1/2" over 5% of surface, poorly fossiliferous (few casts), mottling of slightly darker hue up to 20% No Recovery 176.2-177.0'	R21: 19 minutes		
			2	159.3, 159.4' - Mechanical break (2)					
			6	160.05-161.3' - Fracture zone or mechanical break, horizontal, smooth, planar					
			>10	162.27, 162.3, 162.4, 162.6, 162.7, 162.75, 162.82, 162.9, 162.98' - Bedding plane or mechanical break (9), smooth, planar, tight to open 1/8"					
			NR	163.9' - Bedding plane, horizontal, smooth, undulating, open 1/8"-1/4", dark staining					
170 -127.8	R22-NQ 5 ft 84%	31	NR	163.98' - Bedding plane or mechanical break, <10 deg, rough, undulating, black staining					SC-6 collected at 168.4-169.3'
			2	164.1, 169.25, 164.4, 164.5, 164.85, 164.95' - Bedding plane or mechanical break (6), horizontal, smooth, planar to undulating, tight to open 1/8"-1/4"					
			3	166.0' - Mechanical break					
			3	166.1' - Bedding plane or mechanical break, horizontal, smooth, planar, tight to open 1/8"					
			4	166.25-166.3' - Fracture (2), 80 deg, rough, undulating, tight, reddish brown staining					
175 -132.8	R23-NQ 5 ft 84%	35	NR	167.05' - Mechanical break or bedding plane, horizontal, smooth, planar, tight					R22: 23 minutes
			0	167.75-167.9' - Fracture zone					
			NR	168.1' - Bedding plane or mechanical break, horizontal, smooth, planar, open 1/8"-1/4"					
			3	168.2' - Bedding plane or mechanical break, <10 deg, rough, undulating, tight to open 1/4"-3/4"					
			6	168.4' - Bedding plane, smooth, undulating, open 1/4"					
180 -137.8	R24-NQ 5 ft 78%	40	6	169.3' - Bedding plane, horizontal, smooth, undulating, open 1/8"-1/4"					R23: 22 minutes
			6	169.55-169.7' - Fracture zone					
			4	169.8' - Bedding plane, horizontal, smooth, undulating, 1/8"-1/4" open					
			6	170.1' - Bedding plane or mechanical break, <10 deg, smooth, undulating, 1/8"-1/4" open					
			1	170.3-170.5' - Fracture zone					
182.0			NR	170.7-170.8' - Bedding plane (2), <10 deg, tight, dark staining					R24: 20 minutes
			NR	172.05' - Bedding plane, horizontal, smooth, undulating, crystal traces on surface, open 1/4"					
			6	172.15' - Bedding plane, horizontal, smooth, planar, open 1/8"-1/4"					
			0	172.3-172.55' - Fracture zone					
			2	173.2' - Bedding plane, horizontal, smooth, undulating, crystals on surface of fracture, open 1/8"					
			>10	173.3' - Bedding plane, <10 deg, smooth, undulating, crystals covering 30% of surface, open 1/4"to 1/2"					
			NR	173.45, 173.75, 173.87, 173.9, 174.0, 174.03,' - Bedding plane (6), horizontal, smooth, planar, crystals covering surface, tight to open 1/8"					
				174.1' - Bedding plane, horizontal, smooth, undulating, crystals, open 1/8"-1/4"					
				174.2-174.35' - Fracture zone, 3/4" fragments					



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-10	SHEET 11 OF 12
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)
ELEVATION : 42.2 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 : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

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			
185 -142.8	R25-NQ 5 ft 92%	40	4	175.45, 175.6, 175.8, 175.85, 175.95, 175.98, 176.05' - Bedding plane (7), horizontal, smooth, undulating, crystals on surface, tight to open 1/4"		Limestone 177.0-177.95' - yellowish gray to moderate olive brown, (5Y 7/2 to 5Y 4/4), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/8" covering 15-20% of surface, wavy dark brown laminations at 177.8' to sharp contact (bedding plane) at 117.95', 25 degree bedding plane	Driller's Remark: 183.0-184.5' was hard drilling, had to increase pump pressure
			4	177.0-177.05' - Fracture zone			
			6	177.25, 177.5, 177.55' - Bedding plane (3), horizontal, smooth, undulating, crystals on surface, tight to 1/8"			
			3	177.65' - Bedding plane, <10 deg, smooth, undulating, open 1/4"-1/2"			
			1	177.8' - Bedding plane, horizontal, smooth, planar, tight to open 3/4"			
187.0			NR	179.0' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/2"-1"			R25: 28 minutes
				179.85' - Fracture or mechanical break, horizontal, rough, undulating, tight to open 1/2"			
			3	180.05-180.15' - Fracture zone, up to 1" fragments			
			3	180.2-180.3' - Bedding plane (2), horizontal, smooth, planar, tight to open 1/8"			SC-7 rejected due to size requirements, total of six (6) special cores taken from boring A-10/A-10R
	R26-NQ 5 ft 96%	31	3	180.25' - Fracture or mechanical break, vertical, smooth, undulating, tight			
190 -147.8			2	180.45' - Bedding plane, <10 deg, rough, undulating, open 1/4"-3/4"			
			4	180.6, 180.8' - Bedding plane (2), <10 deg, rough, undulating, open 1/4"-1/2"			R26: 11 minutes
			NR	182.15, 182.5, 182.6, 182.85' - Bedding plane (4), horizontal, smooth, undulating, tight to open 1/8"			Driller's Remark: Circulation regained
				183.25-183.35' - Fracture zone, rock fragments up to 1"			
			>10	183.7, 183.77, 183.9' - Bedding plane (3), horizontal, smooth, planar, open 1/4"-1/2"			
			>10	184.10-184.20' - Fracture zone, rock fragments up to 1-1/2" fractures			
	R27-NQ 5 ft 44%	12	0	184.4' - Bedding plane, horizontal, smooth, planar, open 1/8"-1/4"			
195 -152.8			NR	184.45' - Bedding plane, <10 deg, smooth, undulating, open 1/8"			
				184.65' - Bedding plane, horizontal, smooth, planar, open 1/8"-1/4", dark staining			
				184.9-185.05' - Fracture zone, rock fragments up to 2"			R27: 12 minutes
			0	185.2' - Bedding plane or mechanical break, <10 deg, smooth, undulating, open 1/8"-1/4"			
				185.6' - Fracture or mechanical break, 20 deg, rough, undulating, tight			
				185.61' - Fracture or mechanical break, 70 deg, rough, undulating, tight			
				187.3-187.5' - Fracture zone, rock fragments to 1-1/2"x1-1/5"			
	R28-NQ 5.5 ft 0%	0	NR	187.55, 187.8, 187.9, 188.05' - Bedding plane (4), <10 deg, smooth, undulating, 188.05' has black stains, open 1/4"			
200 -157.8				188.8, 188.95' - Fractures or mechanical break (2), 40 deg, rough, undulating, tight			
				189.25' - Bedding plane or mechanical break, <10 deg, rough, undulating, tight			
				189.35' - Bedding plane, <10 deg, smooth, planar, tight			



LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 1 OF 15

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8 tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

WATER LEVELS : 1.0 ft bgs on 4/22/07		START : 4/21/2007		END : 3/3/2007		LOGGER : J. Stewart, R. McComb, A. Dornila	
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		
42.5	0.0	1.3	SS-1	2-2-2 (4)	Topsoil 0.0-0.3' - grayish black, (N2), moist, roots up to 3/8" diameter, organics Poorly Graded Sand With Silt (SP-SM) 0.3-0.9' - pale yellowish brown, (10YR 6/2), moist, very loose, very fine to fine grained, silica sand, rounded grains, 5% nonplastic fines, trace of very fine sand-sized black particles 0.9-1.25' - moderate yellowish brown, (10YR 5/4), moist, very loose, very fine to fine grained, silica sand, 15% nonplastic fines, trace very fine grained particles of a dark yellowish orange and very fine grained black particles		5' sections of NW rod, 24" split spoon (SS), 50 lb bags of Quik Gel brand bentonite 10:36 1/4 bag bentonite added to full mud vat using 3-7/8" tricone roller bit
5	1.5						
37.5	5.0						
	6.5	1.0	SS-2	6-6-4 (10)	Clayey Sand (SC) 5.0-6.0' - pale blue green, (5BG 7/2), wet, loose, 16% medium plastic fines, silica sand, trace very fine sand-sized black particles, brownish black staining around roots, trace of coarse sand-sized yellowish gray (5Y 8/1) particles, trace 1/8" rootlets, brownish black staining around rootlets		
10	10.0						Driller's Remark: 8.5' below ground surface change in drilling
32.5	10.3	0.3	SS-3	50/3 (50/3")	Lean Clay With Silt (CL-ML) 10.0-10.25' - Same as 5.0-6.0' except hard, no organics		9.5' stiffened up (harder drilling)
15	15.0						Driller's Remark: 12.5' started losing water
27.5	15.3	0.1	SS-4	50/4 (50/4")	Limestone Fragments 15.0-15.3' - grayish to dusky yellow, (5Y 8/4 to 5Y 7/4), mild to moderate HCl reaction, 20-30% voids <1/8" in size, spherical to elongated in shape, trace brilliant green very fine grained particles, voids are possible microfossils		Hard at 14.0', approximately 40-50% circulation loss, add 1/2 bag bentonite then added another 1/8 bag to mud vat
20							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 2 OF 15

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8 tri-cone bit


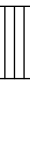


ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

WATER LEVELS : 1.010 bgs on 4/22/07			START : 4/21/2007			END : 3/3/2007			LOGGER : T. Stewart, R. McComb, A. Dornila		
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						
22.5	20.4	0.3	SS-5	50/5 (50/5")	Silty Sand With Gravel (SM) 20.0-20.25' - grayish to dusky yellow, (5Y 8/4 to 5Y 6/4), wet, very dense, fine to coarse grained, moderate HCl reaction, 20% nonplastic fines, 15-20% fine gravel-sized to 3/4", all carbonate		Driller's Remark: Hard at 22.5' then very soft drilling from 23.0-25.0'				
25	25.0										
17.5	26.5	1.1	SS-6	35-34-20 (54)	Silt With Sand (ML) 25.0-26.1' - dusky yellow, (5Y 6/4), trace white mottling, moist to wet, dense, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 15% very fine sand-sized, 5-10% fine to medium sand-sized, trace fine sand-sized brilliant green particles, all carbonate						
30	30.0										
12.5	31.5	1.2	SS-7	40-30-34 (64)	Silt With Sand (ML) 30.0-31.15' - Same as 25.00-26.1' except lenses of very fine grain sized limestone		Driller's Remark: Hard at 27.0'				
35	35.9						Driller's Remark: Soft again at 29.0'				
7.5	35.9	0.1	SS-8	50/1 (50/1")	Limestone Fragments 35.0-35.05' - light olive gray to moderate olive brown, (5Y 5/2 to 5Y 4/4), coarse grained, mild HCl reaction, very poor recovery Begin Rock Coring at 35.5 ft bgs See the next sheet for the rock core log		Driller's Remark: Hard at 33.5'				
40							Driller's Remark: Last foot of run 34.0-35.0' is drilling at 2.5 minutes per inch with 400 psi pressure applied Driller's Remark: Approximately 20 minutes to drill 34.0-35.0' Driller's Remark: Will switch over to NQ coring assembly				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 3 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

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			
35.5 							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 4 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

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	
60 -17.5	R5-NQ 5 ft 100%	87	2	55.5' - Bedding plane or mechanical break, horizontal, rough, planar, tight		Limestone 55.5-60.5' - light olive gray to moderate olive brown, (5Y 5/2 to 5Y 4/4), mild to moderate HCl reaction, very weak (R1), 1/16" spheroidal voids up to 30% of surface, moderately fossiliferous (cast up to 3/8"), trace black particles (possibly organics)	Approximately 1.0' below ground surface water level, core run ended at 8:07, first core run on 4/22/07 T. Stewart/A. Bonilla are the loggers.
			1	56.35, 57.15, 57.6, 58.3, 59.25' - Bedding plane or mechanical break (5), horizontal, rough, undulating, tight to 1" open			
			2				
			1				
			0				
65 -22.5	R6-NQ 5 ft 100%	100	1	61.1, 62.0, 63.45' - Mechanical break or bedding plane (3), horizontal, rough, undulating, tight		60.5-65.5' - light olive gray to moderate olive brown, (5Y 5/2 to 5Y 4/4), mild to moderate HCl reaction, very weak (R1), voids (<1/16") 20-25% of surface, poorly fossiliferous (casts up to 1/16" elongated), trace black particles, 10%-15% organics as medium grain particles and laminations under 1/16" thick horizontally aligned, medium strong rock (R3), stress joints over 61.0-62.0' vertically oriented	R5: 6 minutes SC-1 collected at 61.1-62'
			1				
			1	62.4, 62.7, 63.0, 65.1, 65.4' - Mechanical break (5), tight			
			0				
			0				
70 -27.5	R7-NQ 5 ft 96%	93	0			Limestone 65.5-70.3' - light olive gray to moderate olive brown, (5Y 5/2 to 5Y 4/4), mild HCl reaction, medium strong (R3), 1/8" voids on 15-20% of surface, some voids filled with hard, medium gray (N5) mineralization, poorly fossiliferous (casts up to 1/8" elongated)	T. Stewart is the logger.
			2	66.7' - Fracture, 40 deg, rough, undulating, tight			
			1	67.35' - Mechanical break or bedding plane, horizontal, rough, undulating, open up to 1/2"			
			1	68.3' - Fracture, vertical, rough, undulating, tight			
			1	68.65' - Fracture, 55-60 deg, rough, undulating, tight			
			1	69.4' - Mechanical break, horizontal, rough, undulating, tight			
			NR	70.05' - Fracture, 50-60 deg, rough, undulating, tight			
75 -32.5	R8-NQ 5 ft 72%	40	5	70.6, 70.7, 70.8, 70.85, 71.5' - Mechanical break or bedding plane, horizontal, rough, undulating, tight 10 1/8" open		No Recovery 70.3-70.5' Limestone 70.5-74.1' - light olive gray mottled with olive gray, (5Y 5/2 with 5Y 3/2), mild to moderate HCl reaction, strong (R4), extremely weak rock at top of sample, 1/16" voids on 10-15% of surface, poorly fossiliferous, casts up to 1/2"	R7: 10 minutes 73.5' Got soft, hard again at 75.0'
			2	71.2' - Fracture, 50 deg, rough, undulating, tight			
			2	71.7' - Fracture, 30-40 deg, rough, undulating, carbonate silt infill over 100% surface 1/16" thick			
			1	72.1' - Fracture or mechanical break, horizontal, up to 3/8" open			
			NR	72.8' - Fracture or mechanical break, horizontal, rough, undulating, open 1/4"			
			NR	73.1' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/4"			
						No Recovery 74.1-75.5'	R8: 12 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 5 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

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.
80 -37.5	R9-NQ 5 ft 80%	62	>10	73.9' - Fracture, 70-80 deg, rough, undulating, tight		Limestone 75.5-79.5' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), black mottling, strong HCl reaction, strong (R4), 1/8" spheroidal voids on 10-15% of surface, poorly fossiliferous (casts up to 5/16"), trace cavities up to 1" elongate and horizontally aligned, no infill in voids or cavities, black 1/16" horizontal laminations, vertical stress joints near 79', fractures with secondary black mineralization infill near 77.2'	T. Stewart/A. Bonilla are the loggers
			1	75.5-75.85' - Fracture zone, rock fragments 3/4", sub-angular, some granular mineralization on surface			
			3	77.1' - Fracture, 15-20 deg, rough, undulating, tight, black stains on 90% of surface			
			2	77.6, 77.7, 77.9' - Fracture, horizontal, rough, undulating, open up to 1/4"			SC-2 collected at 78.5-79.5'
			NR	78.4-78.5' - Fracture zone, rough, undulating, 1/16"-1/32" thick infill of very soft carbonate fines		No Recovery 79.5-80.5'	R9: 15 minutes
85 -42.5	R10-NQ 5 ft 100%	82	2	80.85' - Bedding plane or fracture, 0-5 deg, rough, undulating, brownish black stains over 100% surface, open 1/4"		Limestone 80.5-85.5' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), mild HCl reaction, medium strong (R3), weathered, spheroidal 1/8" voids up to 30% of surface, poorly fossiliferous (casts up to 1/2"), some secondary mineral infill (yellowish gray 5Y 8/1 in color), trace coarse grained sized black particles (organics)	Driller's Remark: Will set 3" NW casing from 45.5-75.5' below ground surface Start R-10 at 11:36, observed 50-60% core loss
			4	81.35, 81.55, 81.65, 81.8' - Bedding plane or mechanical break, horizontal, rough, planar, open up to 1/8"			
			2	82.0, 82.95' - Bedding plane or mechanical break (2), horizontal, rough, undulating, tight to 1/4" open			
			0	82.8' - Bedding plane or mechanical break, horizontal, rough, undulating, organic layers <1/16" thick, apparent weathering			R10: 8 minutes
			1	83.2' - Mechanical break, tight			Add 1/4 bag bentonite to mud vat
			0	84.4' - Fracture, 80-90 deg, rough, undulating, tight			
			0	85.45, 85.6' - Fracture (2), 50-60 deg, rough, undulating		85.5-90.5' - light olive gray, (5Y 5/2), moderate HCl reaction, medium strong (R3), spheroidal 1/8" voids up to 15-20% of surface, moderately fossiliferous (mostly casts of echinoderma up to 5/8", white whole fossils and fragments up to 3/4" in size over bottom 89.5-90.5', 3-7% medium to coarse grained black fragments (organics) also as 3/8" long discontinuous laminations less than 3/8" thick, also spiral and conical shaped casts up to 3/16"	
90 -47.5	R11-NQ 5 ft 100%	85	3	87.6' - Bedding plane, horizontal, rough, undulating, brownish black infill 1/16" thick over 85% of surface			R11: 6 minutes
			0	87.75' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/16"-1/8"			SC-3 collected at 89.5-90.5'
			0	88.0, 88.15' - Fracture (2), horizontal, rough, undulating, 1/8"-1" open			14:12 Mix 1/8 bag mud to vat
			0	88.95, 89.5' - Mechanical break (2), tight			
95 -52.5	R12-NQ 5 ft 100%	87	0	91.65' - Bedding plane or mechanical break, rough, undulating, tight		90.5-95.5' - yellowish gray with yellowish gray bedding, (5Y 8/1 with 5Y 7/2), silt-sized black particles, 1/16" voids on 20-25% of surface, highly fossiliferous toward bottom 1/3 of sample (casts and whole fossils) microforams and fossil fragments range from medium to coarse sand-sized particles, oval shaped fossils approximately 1/8", spiral shaped fossils	
			1	92.55' - Mechanical break, 3-5 deg, rough, undulating, tight			
			1	93.0' - Bedding plane, horizontal, smooth, planar, tight, possibly organic layer			
			3	93.6' - Fracture, 10-20 deg, rough, undulating, 1/8" open			
			>10	93.85, 94.3' - Fracture, 50-60 deg, rough, undulating, tight			R12: 15 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 6 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

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.
100 -57.5	R13-NQ 5 ft 100%	43	3	94.45' - Fracture, 80-90 deg, rough, undulating, tight		Limestone 95.5-100.5' - yellowish gray (5Y 7/2), strong HCl reaction, very weak rock (R1), highly fossiliferous (casts, molds up to 1/2", microforams), trace organics as coarse particles and 3/4" long/1/16" wide laminations, trace cavities rimmed with secondary mineralization, elongated 3/16"x1/16", 25% medium dark gray (N4) particles in rock matrix	T. Stewart is the logger.
			>10	94.8-95.2' - Fracture zone			
			>10	95.55, 95.7, 96.75' - Bedding plane or mechanical break, horizontal, rough, undulating			
			2	97.5-98.2' - Fracture zone, vertical			
			0	98.55' - Fracture, 5-10 deg, rough, undulating, tight			
			0	98.65, 98.8' - Mechanical break (2), tight		100.5-105.2' - yellowish gray (5Y 7/2), same sequence as R-13; spiral casts/molds (1/2"-5/8" size) in upper half (100.5-103.0'); less casts/molds in lower half, trace light olive gray (5Y 5/2) mottling at 104.0' in lower half (103.0-105.2'), upper half of R-14 not friable as is R-13	R13: 6 minutes
			0	99.0' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/8" open			
			0				
			2	102.0, 102.35' - Mechanical break or bedding plane (2), 3-5 deg, rough, undulating, open up to 1/8"			Driller's Remark: Will set 3" NW casing (25' more)
			1	102.6' - Bedding plane or mechanical break, horizontal, rough, undulating			Last core run on 4/22/07
105 -62.5	R14-NQ 5 ft 94%	82	0			No Recovery 105.2-105.5' Limestone 105.5-110.4' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, 1/16" spheroidal voids on 20-30% of surface, moderate to highly fossiliferous (casts, molds up to 1-1/2" long), majority of voids over first 2.5', rest of sample is 5-10% voids, trace irregular shaped casts up to 1/2" over first 2.5', no cavities below 107.9'; 15-20% medium grained medium dark gray particles in rock matrix, microforams up to 1/32", oval and spherical shaped molds/casts and very fine to fine grained (shell fragments) angular white particles	R14: 8 minutes
			NR	105.5-106.1' - Fracture zone, fragments up to 2"			
			2	106.85' - Fracture, 60-70 deg, rough, undulating, tight			
			1	106.95' - Fracture, 20-30 deg, rough, undulating, tight			
			2	107.9, 109.05, 109.15' - Mechanical break or bedding plane (3), horizontal, rough, planar to undulating, open to 1/16"			
110 -67.5	R15-NQ 5 ft 98%	82	0			No Recovery 110.4-110.5' Limestone 110.5-115.5' - Same as 105.5-110.4' except 1/16" spheroidal voids on 5-15% of surface, trace cavities up to 5/8" elongated - rimmed with yellowish gray (5Y 8/1) secondary mineralization, some cavities horizontally aligned in a 1/2" bed at 114.0'	R15: 10 minutes
			NR				
			0				
			2	112.15, 112.3' - Mechanical break or bedding plane (2), horizontal, rough, undulating, tight			
			1	113.0' - Mechanical break, tight			
			0	113.25' - Mechanical break or bedding plane, horizontal, rough, planar, open to 1/16"			
115 -72.5	R16-NQ 5 ft 100%	97	0				R16: 10 minutes
			0				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 7 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

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.
120 -77.5	R17-NQ 5 ft 100%	40	0			Limestone 115.5-120.5' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak to extremely weak (R1 to R0), very fossiliferous (casts, molds, microforams), trace cavities with medium dark gray infill up to 1-1/4", 25-35% medium to coarse grained medium dark gray particles in rock matrix, gray mottling in matrix at 119.0'	SC-4 collected at 115.5-116.55' R17: 9 minutes
			>10	116.55, 116.7' - Bedding plane or mechanical break, horizontal, rough, undulating, tight to open 1/4"			
			>10	116.55-117.3' - Fracture zone			
			7	118.15-118.45' - Fracture zone 118.5, 118.65, 118.8, 188.95, 119.2' - Bedding plane or mechanical break (5), horizontal, rough, undulating, tight to open 1/4"			
			2	119.45' - Fractures (2), horizontal and vertical, rough, undulating, perpendicular, tight			
125 -82.5	R18-NQ 5 ft 90%	70	NR	119.6, 119.8' - Bedding plane or mechanical break (2), 0-5 deg, rough, planar, tight		No Recovery 120.5-121.0' Carbonate Silt With Silica Sand (ML) 121.0-121.2' - grayish yellow, (5Y 7/2), wet, strong HCl reaction, 15-25% very fine to fine grained, clear, subrounded, silica sands, 3-7% very fine to fine grained dark yellowish orange (10YR 6/6) and light brown (5YR 5/6) particles Limestone 121.2-125.5' - yellowish gray, (5Y 7/2), strong HCl reaction, very fossiliferous (microforams, fossil casts and molds), thinly bedded near 123.5-124.0' with olive gray staining, organic odor from crumbled rock, friable from 121.2' to 123.0', trace cavities up to 3/4" some with white mineralization as 50% infill (rimmed), medium dark gray medium to coarse grained on 25-35% of rock matrix 125.5-130.5' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), voids (<1/16") over 15-20% (mostly over top 3'), 1/16"x3/16" elongated trace cavities horizontally aligned, cavities in lower 2' have white secondary mineralization rimming the outside of the void/cavity, medium dark gray particles up to 10% of rock matrix, trace medium gray cavities up to 3/4" and to trace medium grained black particles/organics throughout entire run; R-19 is highly fossiliferous (microforams and casts/molds)	9:25 Add 1/4 bag bentonite after emptying mud vat and refilling R18: 13 minutes
			1	121.2' - Bedding plane, horizontal, cohesive silt infill on surface, 1/4" thick			
			1	121.8, 122.8' - Mechanical break (2), tight			
			1	123.2' - Bedding plane or mechanical break, horizontal, rough, undulating, open 3/8"			
			6	123.6, 123.63, 123.65, 123.7, 123.75, 123.8, 124.0, 124.02' - Bedding plane or mechanical break (8), horizontal, rough, planar, tight, dark surfaces, possibly bedding plane of dark material			
130 -87.5	R19-NQ 5 ft 100%	77	1				R19: 10 minutes
			2	126.4, 127.05' - Bedding plane or mechanical break (2), horizontal, rough, undulating, tight to 1/4" open			
			5	127.5-127.65' - Fracture zone, rock fragments			
			1	128.0-128.15' - Fracture zone, angular rock fragments, 1/2"-5/8"			
			>10	128.25, 128.35, 129.0' - Fracture (3), horizontal and vertical, rough, undulating, open up to 3/4", cavity infilled with gray material at 129'			
135 -92.5	R20-NQ 5 ft 98%	65		129.35' - Bedding plane, 10-15 deg, open 3/4"			R20: 11 minutes
			6	130.0-130.5' - Fracture zone, vertical			
			4	130.55' - Mechanical break or bedding plane, horizontal, smooth, undulating, open 1/8"			
			1	131.0' - Mechanical break or bedding plane, horizontal, rough, undulating			
			5	131.3, 131.35, 131.4, 131.5, 131.6, 131.65, 131.7, 131.8' - Bedding plane or mechanical break (8), horizontal, rough, undulating, open 1/8"			
			2	132.1, 133.0' - Mechanical break (2), tight 132.55' - Bedding plane or mechanical break, horizontal, rough, planar 133.0' - Mechanical break, tight			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 8 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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





ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

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				
140 -97.5	R21-NQ 5 ft 94%	72	NR	133.6' - Bedding plane, 0-5 deg, rough, undulating, tight		Limestone 130.5-133.65' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), grades from a very lightly fossiliferous (microforams, molds) to a thinly bedded and laminated very fine grained limestone. 130.5-133.65': echinoid and microform rich, trace elongated cavities rimmed with white hard mineralization 3/8"x1/8", up to 25% medium grained medium dark gray (N4) particles in matrix; very fine grained wavy thinly bedded discontinuity at 133.65' 133.65-135.4' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), thinly bedded to laminated and alternating beds, wavy thinly bedded discontinuity at 135.2' (load structures) interval, microforams, medium dark gray (N4) particles as above No Recovery 135.4-135.5' Limestone 135.5-139.2' - yellowish gray to yellowish gray, (5Y 7/2 to 5Y 8/1), very fine grained, strong HCl reaction, medium dark gray (N4) particles on 15-20% of surface, trace olive gray (5Y 3/2) laminations and wavy bedded discontinuities at 137.5' 139.2-140.2' - strong HCl reaction, strong (R4), white with yellowish gray (5Y 8/1) cavity infilling, 1-1/2" irregularly shaped cavities, poorly fossiliferous (casts-spiral shaped up to 3/4" length), trace medium grained black particles (organics) No Recovery 140.2-140.5' Limestone 140.5-143.1' - Same as 139.2-140.2' except mottled light gray (N7) over 40% of run, trace organics as wavy laminations 3/16", 1/16" spheroidal voids infilled 10-15% 143.1-145.5' - yellowish gray, (5Y 7/2), strong HCl reaction, strong (R4), bedded, up to 1/8" voids up to 25% of surface (may be microforams as casts), trace casts of echinoderm fragments, wavy laminations 145.5-149.0' - yellowish gray, (5Y 7/2), strong HCl reaction, medium grained texture, 5-10% elongated cavities (up to 3/4"x1/8") horizontally aligned and infilled with hard medium to light gray (N6) mineral, trace voids 1/8"x1/16" rimmed with white mineral	SC-5 collected at 138-138.85' R21: 10 minutes Driller's Remark: 139.5' Started losing water rapidly			
			1	134.1, 134.35, 134.45, 134.5, 134.8' - Bedding plane (5), horizontal, rough, planar, open 1/16"						
			1	134.6' - Bedding plane, 0-5 deg, rough, undulating, open to 1/16"						
			1	135.75' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/2"						
			1	137.1' - Fracture, 70 deg, rough, undulating, tight						
			>10	138.0' - Bedding plane or mechanical break, horizontal, rough, planar, tight						
	145 -102.5	R22-NQ 5 ft 100%	80	NR				138.85' - Mechanical break		SC-6 collected at 143.1-143.9' Driller's Remark: 50-75% circulation loss R22: 8 minutes
				>10				139.2' - Bedding plane or mechanical break, horizontal, rough, planar, top of fractured zone, 2" open		
				2				139.5' - Fracture, vertical, rough, undulating		
				2				139.65-139.9' - Fracture zone, subrounded 1/2"- 1-1/8" fragments, black stains over 80% of surface		
1				139.95' - Fracture, 70-80 deg, rough, undulating, black stains over 25% of surface, tight						
1				140.15-141.25' - Fracture zone, brownish black staining on fragments, possibly weathered						
R23-NQ 5 ft 100%		100	1	142.1' - Bedding plane, 10 deg, smooth, undulating, organic layer, 1/16"		R23: 8 minutes				
			0	142.4-142.5' - Fracture zone, brownish black stains over 40% surface						
			0	143.1' - Bedding plane, horizontal, rough, undulating, brownish black stains over 80% surface, 1/16" open						
			2	143.9' - Bedding plane, 0-5 deg, rough, stepped, tight						
R24-NQ 5 ft 96%	38	1	145.2' - Bedding plane or mechanical break, 0-9 deg, rough, undulating, 1/4"				R24: 7 minutes			
		1	146.4' - Bedding plane or mechanical break, horizontal, rough, undulating, tight							
		4	148.0, 148.35, 148.5' - Mechanical break, tight							
		1	148.9' - Bedding plane, horizontal, 3/8" infill							
		4	149.0' - Bedding plane, 0-10 deg, rough, undulating, tight to 1/4" open							
		5	150.0' - Fracture, 60 deg, rough, undulating, tight							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 9 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
160 -117.5	R25-NQ 5 ft 64%	0	NR		Limestone 149.0-150.5' - light olive gray, (5Y 5/2), strong HCl reaction, medium strong to strong (R3 to R4), 1/16" voids on 5-10% of surface, trace cavities up to 3/16"x3/16" with grayish yellow (5Y 8/1) infill, poorly fossiliferous (casts up to 3/8") 150.5-153.6' - light olive gray, (5Y 5/2), mild to moderate HCl reaction, weak to medium strong (R2 to R3), dusky yellowish brown (10YR 2/2) wavy laminations, trace of medium grained organics in laminations 153.6-155.3' - light olive gray, (5Y 5/2), strong HCl reaction, medium strong to very weak (R3 to R1), very fossiliferous (microforams), very similar to 145.5-149.0', medium to coarse grained plate-like angular fragments, yellowish gray (5Y 8/1) in color No Recovery 155.3-157.3' Poorly Graded Silica Sand (SP) 157.3-159.9' - loose, fine grained, mild to moderate HCl reaction, clear, subrounded sands with trace carbonate fines, matrix of fines are very pale orange (10YR 8/2), trace light brown (5Y 5/6) and black particles (sum of fines is up to 5%), this sand grades to siltier with depth	T. Stewart/R. McComb are the loggers. Driller's Remark: Will add 3" NW casing to seal off sand Driller's Remark: 100% circulation loss On the field log the interval that was not recovered (155.5-157.3') appears to be from the top of the core R25: 14 minutes
165 -122.5	R26-NQ 5 ft 93%	57	2 0 2 5 4 3 NR		159.9' - Bedding plane, 0-10 deg, rough, planar, contact with silica sand above 160.1' - Bedding plane, 10 deg 161.6, 162.4, 162.57' - Fracture (3), horizontal, rough, undulating, tight 162.75, 162.95, 163.0, 163.35, 164.25, 164.3, 164.5, 164.6, 164.73, 164.92' - Fracture (10), horizontal, smooth, planar, open 163.65' - Fracture, horizontal, rough, stepped, open 164.3-164.5' - Fracture, vertical, stepped, open	SC-7 collected at 160.5-161.6' 9:49, 5/1/07 Water level 4.5' below ground surface 7:50, 5/8/07 Water level approximately 3' below ground surface Offset approximately 10' to west of A-11 and drill A-11R, lost bit in A-11; tried fishing for bit on 5/6/07 to no avail; offset A-11 on 5/7/07, drilled 4-7/8" borehole to 160'; set NW casing at 160.5' R26: 5 minutes
170 -127.5	R27-NQ 5 ft 100%	75	2 3 1 2 2		165.77' - Fracture, horizontal, rough, planar, tight 165.98' - Fracture, horizontal, rough, undulating, open 166.8' - Fracture, <5 deg, rough, stepped, open 166.95, 167.7' - Fracture (2), <5 deg, smooth, undulating, tight 168.4, 169.51' - Fracture (2), 10 deg and 10-20 deg, smooth, planar, tight 168.58' - Fracture, horizontal, rough, undulating, open 1/16", silty clayey lining over 80%-90% of surface 169.8' - Fracture, horizontal, rough, undulating	R27: 8 minutes
175 -132.5	R28-NQ 5 ft 98%	54	4 1 3 4 3		170.05' - Fracture, horizontal, rough, undulating, open 170.7' - Fracture, horizontal, smooth, undulating, tight, <1/16" brown clay lining over surface 170.95' - Fracture, horizontal, smooth, planar, open, <1/16" silty coating over 100% of surface 171.17' - Fracture, smooth, planar, open 171.5' - Fracture, 40 deg, rough, stepped, tight 172.2' - Fracture, 60 deg, rough, undulating, tight, length is from 172.0-172.9'	R28: 7 minutes



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-11	SHEET 10 OF 15
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis

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

WATER LEVELS : 1.0 ft bgs on 4/22/07 START : 4/21/2007 END : 5/9/2007 LOGGER : T. Stewart, R. McComb, A. Bonilla

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			
180 -137.5	R29-NQ 5 ft 94%	51	NR	173.15' - Fracture, horizontal, smooth, undulating, open		No Recovery 165.15-165.5' Limestone 165.5-166.1' - moderate olive brown, (5Y 4/4), strong HCl reaction, laminated, voids up to 3/8" to 3/4" covering 50-60% of surface, some cavity infilling with gray limestone (nodules/intraclasts), trace fossil molds and casts 166.1-166.8' - yellowish gray to very light gray, (5Y 7/2 to N8), very fine grained, strong HCl reaction, 1/16" voids on 5-10% of surface, cavities (>5) 3/8"x3/16", fossil casts/molds common 166.8-170.5' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to very fine grained, moderate to strong HCl reaction, becoming stronger with depth (up to R2), voids up to 1/16" on 15-25% of surface with some zones of very fine grained limestone with 0% voids, cavities rare, laminated from 167.6-167.8' (very weak rock [R1]), some brownish gray to light gray mottling especially from 168.7-169.3' 170.5-175.1' - dusky yellow to yellowish gray, (5Y 6/4 to 5Y 7/2), moderate to strong HCl reaction, voids up to 1/16" over 10-15% of surface, 3/8"x3/16" cavities, trace fossil molds/casts, laminated at 171.0', fine grained with occasional thin beds of very fine grained limestone with few voids especially near base of interval 175.1-175.4' - dusky yellow, (5Y 6/4), strong HCl reaction, laminated with black organic laminae, minimum voids and cavities covering 50-60% of surface No Recovery 175.4-175.5' Limestone 175.5-180.2' - variegated dusky yellow to light olive brown, (5Y 6/4 to 5Y 5/6), fine grained, moderate to strong HCl reaction, very weak (R1), light gray mottling (N8), fine grained limestone especially from 176.8-177.8', voids (1/16") common in fine grained material up to 15-20% of surface, some cavities up to 3/8"-3/4"x3/8" deep, voids 1-3% in very fine grained material, some cavity infilling, laminated very weak rock from 177.9-180.2' with black carbonaceous material No Recovery 180.2-180.5'	R29: 6 minutes
			2	173.7' - Fracture, <5 deg, smooth, stepped, tight			
			1	174.08, 174.2, 174.35, 164.55' - Fracture (4), horizontal, smooth, planar, tight (open at 174.35)			
			10	174.7' - Fracture, horizontal, smooth, planar, open, <1/16" thick brown clay over 100% of surface			
			>10	175.1' - Fracture, <5 deg, rough, stepped, open			
			>10	175.6' - Fracture, <5 deg, smooth, stepped, open, dark brown to black stain over 95%-100% surface			
			NR	176.1' - Fracture, horizontal, rough, stepped, open			
			1	177.1' - Fracture, horizontal, smooth, planar, tight			
			3	177.6, 177.7, 177.82' - Fracture (3), horizontal and <10 deg, smooth, planar, tight			
			2	177.9' - Fracture, 0-40 deg, smooth, stepped, open, dark brown/black stain over 40%			
185 -142.5	R30-NQ 5 ft 100%	46	4	178.1-178.4' - Fracture zone, 0-60 deg, rough, undulating, open			R30: 9 minutes
			4	178.55' - Fracture, <5 deg, smooth, undulating, open			
			3	179.17' - Fracture, horizontal, rough, stepped, open			
			3	179.25-181.2' - Fracture zone, rough to smooth, planar to undulating, open to tight			
			4	180.8' - Fracture, <5 deg, rough, stepped, open			
			7	181.8, 181.87' - Fracture (2), horizontal, smooth, planar, open			
			0	182.0' - Fracture, 0-90 deg, smooth, undulating, tight			
			1	182.6' - Fracture, <5 deg, rough, undulating, open			
			1	182.95' - Fracture, 40 deg, rough, undulating to stepped, tight			
			5	183.65, 184.4, 186.4' - Fracture (3), horizontal, rough, undulating, open			
190 -147.5	R31-NQ 5 ft 99%	62	5	183.8' - Fracture, 0-<5 deg, smooth, planar to stepped, open			R31: 8 minutes
			NR	184.17' - Fracture, horizontal, smooth, planar, tight			
			4	184.93, 185.2' - Fracture, rough, undulating, tight			
			3	185.25' - Fracture, 40-50 deg, rough, undulating, tight			
			2	185.95, 186.0' - Fracture, horizontal, smooth, open			
			2	186-186.4' - Fracture, vertical, rough, undulating, tight			
			4	186.4' - Fracture, horizontal, rough, undulating, open			
			>10	186.6, 186.7' - Fracture, <5 deg, rough, undulating, open			
			NR	186.95' - Fracture, <5 deg, rough, stepped, open			
			NR				
195 -152.5	R32-NQ 5 ft 90%	40	4			No Recovery 180.2-180.5'	R32: 6 minutes
			3				
			2				
			4				
			>10				
			NR				
			NR				
			NR				
			NR				
			NR				




PROJECT NUMBER: 338884.FL	BORING NUMBER: A-11	SHEET 11 OF 15
ROCK CORE LOG		

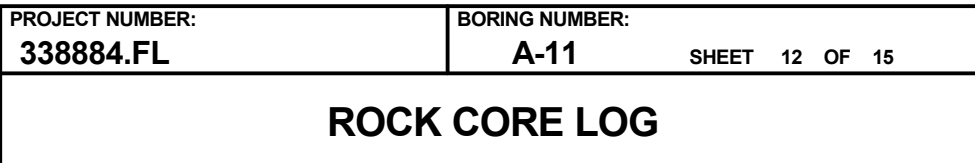
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis

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

WATER LEVELS : 1.0 ft bgs on 4/22/07 START : 4/21/2007 END : 5/9/2007 LOGGER : T. Stewart, R. McComb, A. Bonilla

WATER LEVELS : 1.0' LOSS ON 7/22/07		START : 4/21/2007		END : 3/31/2007		LOGGER : T. Stewart, R. McCulloch, A. Buhla		
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES				SYMBOLIC LOG	LITHOLOGY	COMMENTS
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION				
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS				
200 -157.5	R33-NQ 5 ft 100%	54	2	187.05-187.2' - Fracture zone, horizontal, rough to smooth, planar, open		Limestone 180.5-180.9' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids/cavities absent to <1%, fossils absent 180.9-181.6' - variegated light olive brown with thin very dark gray/black carbonaceous/organic laminae, very weak rock (R1), <1/16" voids over 10-15% of surface, cavities absent 181.6-183.8' - dusky yellow to yellowish gray, (5Y 6/4 to 5Y 7/2), moderate HCl reaction, voids covering 50-60% up to cavity size ranging from 3/4" to 1-3/16"x1/8" to 3/4", fossil voids and casts common with some clasts/nodules/cavity infilling 183.8-185.5' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), variegated very light gray (N8), predominantly very fine grained with some fine grained thin beds and laminae, voids on 20-30% of surface, voids on 1-2% of surface in very fine grained materials 185.5-187.8' - yellowish gray with very light gray mottling, (5Y 7/2 with N8), moderate to strong HCl reaction, fine to very fine grained nodules, voids and cavities up to 3/8"-3/4"x3/16"-3/8" over 50-60% of surface, voids in very fine grained intervals on 3-5% of surface, fossil voids/casts common, abundant cavities 70-80% from 187.2-187.75' 187.8-188.93' - yellowish gray, (5Y 7/2), black and dark gray mottled, very fine grained, moderate to strong HCl reaction, laminated (black carbonaceous /organic laminae), voids over 5-10% of surface 188.93-190.45' - Same as 185.50-187.8' except thinly bedded very fine to fine grained No Recovery 190.45-190.5' Limestone 190.5-195.0' - yellowish gray, (5Y 7/2), very fine grained, mild to moderate HCl reaction, chalk-like grained, voids and cavities up to 3/4"x3/16" covering 5-15% of surface, laminated in upper 0.5', variegated browns and grays (few fossils voids/casts), becoming more common with depth, becoming coarse grained with depth No Recovery 195.0-195.5'	Driller's Remark: 197' 50% loss of circulation	
			2	187.8, 188.0, 188.51' - Mechanical break				
			3	188.51' - Fracture, <5 deg, rough, undulating to stepped, open, black carbonaceous material over 40% in upper surface				
			>10	189.55' - Fracture, <5 deg, rough, stepped, open				
			6	189.65, 190.65, 190.8, 190.97' - Fracture (4), horizontal, smooth, planar, open				
	R34-NQ 5 ft 60%	0	>10	189.96' - Fracture, <5 deg, rough, undulating, tight				
			>10	190.05' - Fracture, horizontal, smooth, planar, open, black carbonaceous material on 30% of surface				
			>10	190.15' - Fracture, <5 deg and 30 deg, rough, undulating, open				
			>10	191.15' - Fracture, horizontal, smooth, planar, tight				
			NR	191.95, 192.65, 194.05' - Fracture (3), 30 deg and 40 deg, rough, undulating, open				
205 -162.5	R35-NQ 5 ft 30%	0	>10	192.3, 192.4' - Fracture (2), <5 deg, rough, undulating, open				
			>10	193.4' - Fracture, 20 deg, rough, undulating, open				
			NR	193.55' - Fracture, 70-80 deg, rough, stepped, open				
			>10	194.55-194.85' - Fracture zone, gravel				
			>10	194.85, 195.5' - Fracture (2), horizontal, rough, undulating, open and tight				
	R36-NQ 5 ft 64%	9	>10	196.25' - Fracture, 50 deg, rough, undulating, open				
			>10	197.3' - Fracture, <5 deg, rough, stepped, tight				
			NR	197.43, 197.65' - Fracture (2), horizontal and <5 deg, smooth, undulating, tight				
			NR	197.8' - Fracture, horizontal, smooth, planar, tight				
			NR	198.25' - Fracture, <5 deg, smooth, undulating to planar, open				
210 -167.5	R35-NQ 5 ft 30%	0	>10	198.5-199.60' - Fracture zone, 0-90 deg, rough, undulating to stepped, open				
			>10	199.68' - Fracture, 40 deg, rough, undulating, open				
			NR	200.07' - Fracture, smooth, stepped to planar, tight				
			>10	200.17-200.3' - Fracture zone, <5-90 deg, rough, stepped, tight				
			>10	202.5-203.5' - Fracture zone, 0-90 deg, rough to smooth, planar to undulating, tight to open				
	R36-NQ 5 ft 64%	9	3	205.5-206.7' - Fracture zone, 0-<5 deg, rough to smooth, planar to undulating, tight to open				
			10	206.7-207.0' - Fractures, 60-80 deg, rough to smooth, planar to undulating, tight				
			NR	210.52-210.8' - Fracture zone, various fracture angles, rock fragments				
			NR	210.8' - Fracture, 0-50 deg, rough, undulating, open				
			NR	211.15-211.4' - Fracture zone, rough to smooth, undulating to planar, gravel-sized fragments, open				
215 -172.5	R36-NQ 5 ft 64%	9	>10	210.8' - Fracture, 0-50 deg, rough, undulating, open				
			>10	211.15-211.4' - Fracture zone, rough to smooth, undulating to planar, gravel-sized fragments, open				
			NR					
			NR					
			NR					
	R36-NQ 5 ft 64%	9	>10					
			3					
			10					
			NR					
			NR					



ORIENTATION : Vertical

LOGGER : T. Stewart, R. McComb, A. Bonilla

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 13 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

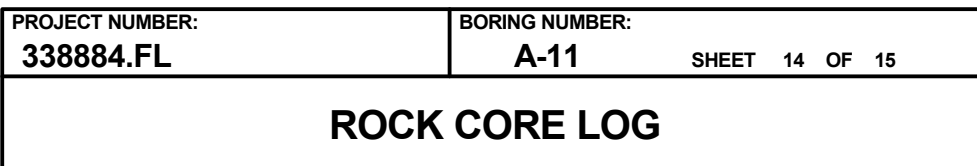
WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

WATER LEVEL: 10.1855 ON 4/22/07		CORING: 4/27/2007		END: 5/3/2007		COOPER: T. Stewart, R. McCune, R. Dornig	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
		R Q D (%)	FRACTURES PER FOOT				DESCRIPTION
							DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS
240 -197.5	R41-NQ 5 ft 0%	0	NR	250.5-250.9' - Fracture zone, gravel-sized rock fragments	212.0-212.7' - yellowish gray, (5Y 7/2), fine grained, friable, becoming coarser grained with depth, voids/cavities up to 3/8"-3/4"x1-3/8"-3/4", voids over 30-40% of surface, very weak rock (R1) Limestone 212.7-213.7' - very similar to 210.5-211.4', fine to very fine grained, fossil molds/casts common, becoming very fine grained at bottom 0.1' with little to no voids, no fossils, approaching medium strong (R3) No Recovery 213.7-215.5' Limestone 215.5-217.0' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, very fine grained (chalk-like), becoming laminated with depth (black to dark gray carbonaceous/organic laminae), voids and cavities were common from 216.6-217.0', voids over 0-1% above grading to 5-10% with depth, cavities few, 3/8"x3/16", with fossil molds/casts becoming more common with depth, microfractures (healed) abundant in upper 0.6' 217.0-218.1' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, voids and cavities common (up to several centimeters), fossiliferous (molds/casts) and worm burrows (unfilled-open), gastropods, forams No Recovery 218.1-220.5' Limestone 220.5-221.25' - yellowish gray to very light gray, (5Y 7/2 to N8), moderate HCl reaction, 1/16" voids on 10-15% of surface, cavities (up to several centimeters), fossiliferous (casts/molds) becoming less common with depth, "chalk-like" texture No Recovery 221.25-225.5' Limestone 225.5-228.0' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, extremely weak (R0), becoming more friable with depth, rock strength decreases with depth, voids/cavities over 30-40% of surface, fossiliferous casts/molds, occasionally laminated No Recovery 228.0-230.5'	R41: 2 minutes	
245 -202.5	R42-NQ 5 ft 0%	0	NR		R42: 2 minutes		
250 -207.5	R43-NQ 5 ft 0%	0	NR		No special cores have been pulled since SC-8 because RQDs <0.8' (for a continuous length)		
255 -212.5	R44-NQ 5 ft 8%	0	NR		R43: 3 minutes		
						R44: 5 minutes	



ORIENTATION : Vertical

LOGGER : T. Stewart, R. McComb, A. Bonilla

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-11

SHEET 15 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.7 N, 457813.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

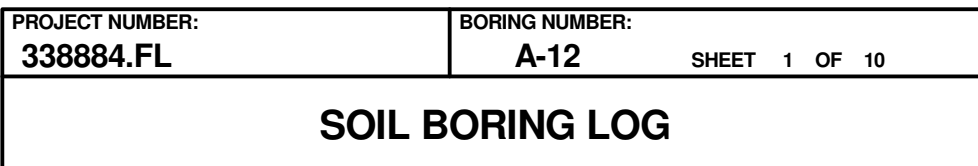
WATER LEVELS : 1.0 ft bgs on 4/22/07

START : 4/21/2007

END : 5/9/2007

LOGGER : T. Stewart, R. McComb, A. Bonilla

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.
280 -237.5	R49-NQ 5 ft 26%	0	>10 0	273.18-273.6' - Fracture zone, variable fracture orientations, limestone gravel 273.6' - Fracture, horizontal, smooth, undulating, tight 273.8' - Fracture, <5 deg, rough, stepped 273.8-274.0' - Fracture zone, various fracture angles, rock fragments 275.5-275.95' - Fracture zone, variable fracture orientation, rock fragments 275.95' - Fracture, <5 deg, rough, stepped, open 276.3' - Fracture, <5 deg, rough, undulating, open 276.3-276.8' - Fracture zone, smooth to rough, planar to undulating, variable fracture orientation, rock fragments 280.5' - Fracture, <5 deg, rough, stepped, open		Limestone 271.9-274.0' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, becoming stronger at 273.6-273.8' (R2) and returning to very weak rock below 273.8', very fine grained (chalky), voids covering 5-10% of surface, laminated in upper 0.5-0.7', trace cavities (3/8"x3/8"), trace fossil molds/casts, gravelly and blue with some black carbonaceous/organic material No Recovery 274.0-275.5' Limestone 275.5-276.8' - yellowish gray to very light gray, (5Y 7/2 to N8), fine to very fine grained, mild to strong HCl reaction, light gray thin bed at 276.55', voids and cavities common up to 3/8"-3/4"x3/16"-3/8", voids and cavities on 40-50% of surface, rock (except for N8 limestone where voids are absent), fossil casts/molds, strong HCl reaction for very fine grained N8 rock No Recovery 276.8-280.5' Limestone 280.5-282.75' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, voids and cavities common over 60-70% rock with occasional intraclastic limestone rock fragments (darker gray) with cavity infilling, cavities 3/8"-3/4" to 3/16"-3/8", fossiliferous (molds and casts) 282.75-283.7' - variegated pale blue to yellowish gray, (5PB 7/2 to 5Y 7/2), fine to medium grained, mild to moderate HCl reaction, becoming laminated with depth, fossil casts/molds common in upper 0.3' (gastropods), voids and cavities present (up to several centimeters) No Recovery 283.7-285.5' Bottom of Boring at 285.5 ft bgs on 5/9/2007	R49: 4 minutes
285 -242.5	R50-NQ 5 ft 64%	0	>10 3 1 NR	280.5-281.8' - Fracture zone, numerous fractures, some vertical 282.2' - Fracture, <5-40 deg, rough, stepped, open 282.75-283.15' - Fracture zone, 10 deg, rough, planar, tight 282.75' - Fracture, <5 deg, rough, undulating, open 283.15' - Fracture, <5-90 deg, rough, stepped, open 283.33' - Fracture, 20 deg, rough, stepped, tight			R50: 3 minutes
							Total Depth is 285.5', no special cores since SC-8, no lengths >0.8'



DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8 tri-cone bit

WATER LEVELS : 5.3 ft bgs on 05/03/07 START : 5/2/2007 END : 5/4/2007 LOGGER : W. Elliott, R. McComb

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-12
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724065.3 N, 457848.9 E (NAD83)
 ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.3 ft bgs on 05/03/07 START : 5/2/2007 END : 5/4/2007 LOGGER : W. Elliott, R. McComb

WATER LEVELS : 3.5 ft bgs on 03/03/07			START : 3/2/2007			END : 3/4/2007			LOGGER : W. Elliott, R. McGinnis		
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						
22.1	20.0	1.0	SS-5	24-21-22 (43)	Silty Sand With Limestone (SM) 20.0-21.0' - grayish orange, (10YR 7/4), wet, dense, fine to coarse grained, moderate HCl reaction, 24% nonplastic fines, 30% fine to coarse gravel sized (up to 1"), fragments are very porous and fossiliferous, all carbonate						
	21.5										
25	25.0										
17.1	25.9	0.7	SS-6	12-50/4.5 (62/10.5")	Silty Sand (SM) 25.0-25.7' - Same as 20.0-21.0' except 25-30% nonplastic fines, 25% fine gravel sized			Driller's Remark: Soft at 28.5'			
30	30.0										
12.1	31.5	1.0	SS-7	20-11-15 (26)	Silty Sand With Gravel (SM) 30.0-31.0' - Same as 20.0-21.0' except dark yellowish orange, medium dense			Driller's Remark: Harder at 32.5'			
35	35.0							Driller's Remark: Switch to NQ at 35'			
7.1	35.1	0.0	SS-8	50/1 (50/1")	No Recovery 35.0-35.1' Begin Rock Coring at 35.0 ft bgs See the next sheet for the rock core log						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-12

SHEET 3 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724065.3 N, 457848.9 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.3 ft bgs on 05/03/07

START : 5/2/2007

END : 5/4/2007

LOGGER : W. Elliott, R. McComb

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.
7.1	35.0	50	2	35.4' - Fracture, <5 deg, rough, stepped, open		Limestone 35.0-39.9' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, very weak (R1), becoming extremely weak (R0) and friable at 38.9-39.3', fossiliferous (molds and casts) with voids covering 50-60%, cavities >5 up to 3/8"-3/4"x3/16", mottled, less voids through extremely weak rock zone	HW casing set at 35'
			3	35.6' - Fracture, 0-40 deg, rough, stepped, tight			
			0	36.05' - Fracture, 40-70 deg, rough, stepped, approximately 0.3-0.4' long, open to tight			
			1	36.2' - Fracture, 40-70 deg, rough, stepped, approximately 0.3-0.4' long, open to tight			
			3	36.8' - Fracture, 30 deg, rough, undulating, tight			
		8	NR	38.2' - Fracture, 70 deg, rough, undulating, tight		No Recovery 39.9-40.0' Limestone 40.0-43.2' - Same as 35.0-39.9' except with interbeds of very weak to extremely weak (R1 to R0) rock at 40.5-41.3'	R1: 6 minutes
40	40.0		0	39.05, 39.25, 39.5' - Fractures (3), <5-90 deg, rough, stepped, tight to open			
2.1			2	41.65' - Fracture, 60 deg, rough, stepped, open			
			>10	41.9' - Fracture, 40-60 deg, rough, stepped, open			
			NR	42.3-42.9' - Fracture zone, <5-90 deg, rough, stepped to undulating, open			
		47	>2	45.0-45.3' - Fracture zone, <5-90 deg, rough, stepped, open		Limestone 45.0-48.4' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, very weak (R1), fossiliferous (casts/molds), voids typically up to 1/16" over 40-50%, cavities (>5) up to 1-3/16"-1-9/16"x3/8" (fossil casts), cavities more common from 45.0-46.0'	Driller's Remark: Very soft drilling at 43.5' R2: 3 minutes
45	45.0		1	45.65' - Fracture, horizontal, rough, undulating, tight			
-2.9			3	46.3' - Fracture, horizontal, rough, undulating, open			
			NR	47.7' - Fracture, 10 deg, rough, planar, tight			
			NR	47.8' - Fracture, 60 deg, rough, planar, tight			
		68	10	47.9' - Fracture, <5 deg, rough, undulating, open		No Recovery 43.2-45.0'	R3: 3 minutes
			1	48.0' - Fracture, 40 deg, rough, planar, open			
			2	48.2' - Fracture, <5 deg, rough, undulating, open			
			1	48.25' - Fracture, 80-90 deg, rough, undulating, tight			
			NR	50.4-51.1' - Fracture zone, 0-90 deg, rough, undulating to stepped, open to tight			
50	50.0	68	2	51.9' - Fracture, 20-30 deg, rough, undulating, tight		Limestone 50.0-54.2' - Same as 45.0-48.4' except becoming mottled with brownish gray patches of irregularly distributed finer grained limestone	SC-1 collected at 52.75-53.75'
-7.9			1	52.1' - Fracture, rough, undulating, tight			
			2	52.7' - Fracture, 30 deg, rough, stepped to undulating, tight, very soft on either side of fracture			
			1	53.7' - Fracture, 40 deg, rough, stepped, open			
			NR				
55	55.0					No Recovery 54.2-55.0'	R4: 4 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-12

SHEET 4 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724065.3 N, 457848.9 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.3 ft bgs on 05/03/07

START : 5/2/2007

END : 5/4/2007

LOGGER : W. Elliott, R. McComb

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.
-12.9	R5-NQ 5 ft 96%	64	10	55.0-55.6' - Fracture zone, 0-90 deg, rough, undulating to stepped, open to tight		Limestone 55.0-59.8' - Same as 50.0-54.2' except with very fine grained yellowish gray limestone at 55.7-55.9' (irregular), generally weak (R2) and free of voids and cavities compared with adjacent rock, very weak (R1) with thin friable zone of extremely weak rock (R0), adjacent to some fracture traces	R5: 6 minutes
			10	56.0-56.5' - Fracture zone, 0-90 deg, rough, undulating to stepped, open, very soft brown "clayey" infilling at 56.4-56.5'			
			2	57.45' - Fracture, 50 deg, rough, stepped, tight, black organics over 10-15% of surface			
			1	57.65' - Fracture, 10 deg, rough, stepped, open, black organics over 5% surface			
			2	59.3' - Fracture, horizontal, rough, undulating, tight			
60 -17.9	R6-NQ 5 ft 96%	20	NR	59.8' - Fracture, 0-90 deg, rough, stepped, fine grained sandy carbonate covering 100% of surfaces		No Recovery 59.8-60.0' Limestone 60.0-61.5' - Same as 55.0-59.8'	SC-2 collected at 63.1-64.1'
			0				
			1	61.55' - Fracture, 0-50 deg, rough, stepped, open			
			10	62.0-62.9' - Fracture zone, 0-90 deg, rough, stepped, open to tight, soft clay at 62.1' and 62.3' lining fracture trace			
			0				
65 -22.9	R7-NQ 5 ft 100%	50	0			62.3-64.0' - moderate yellowish brown, (10YR 5/4), fine to very fine grained, weak to medium strong (R2 to R3), voids up to 1/16" over 5-10%, few cavities up to 3/16"x3/16", trace fossil molds/casts. 64.0-64.8' - Same as 62.3-64.0' except very weak (R1), thinly laminated at 64.2' (possible organics), trace fine grained stronger rock No Recovery 64.8-65.0' Limestone 65.0-69.35' - moderate yellowish brown, (10YR 5/4), fine to very fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids (generally 1/16" or less) over 10-30%, more dense at 65.0-66.0' and 68.5-69.35', cavities more abundant in same two intervals up to 3/4"-1-3/16"x3/8", some mottling, possible void with cavity infilling at 68.5-69.35', very weak (R1) zone at approximately 66.0' 69.35-70.0' - moderate yellowish brown, (10YR 5/4), very fine grained, moderate HCl reaction, weak (R2), thinly laminated, with trace very fine grain limestone rock nodules up to 1/8" voids become more common with depth from <1% up to 10-15%	R6: 7 minutes
			NR				
			1	65.75' - Fracture, smooth, planar, tight, horizontal			
			10	66.2-67.1' - Fracture zone, 80 deg, smooth, undulating, dominated by fracture trace inclined approximately 80 deg from 66.2-68.1', with horizontal fracture at 66.2'			
			10	67.3-68.1' - Fracture zone, 80-90 deg, rough, undulating, tight to open			
	R8-NQ 5 ft 98%	78	3	68.55' - Fracture, horizontal, rough, undulating, open		77: 5 minutes	Driller's Remark: 80% loss of circulation water at 75'
			3	68.6' - Fracture, 50 deg, rough, stepped, open			
70 -27.9			2	69.35' - Fracture, 40 deg, rough, undulating, tight			
			1	69.65' - Fracture, horizontal, rough, stepped, open			
			2	69.8-70.0' - Fracture, 0-90 deg, rough, stepped, open			
			2	70.2' - Fracture, 0-90 deg, smooth, stepped, open			
			1	70.65' - Fracture, 70 deg, rough, undulating, tight			
			1	71.85' - Fracture, 10 deg, smooth, undulating, tight		R8: 13 minutes	
			2	72.15' - Fracture, 40 deg, rough, stepped, open			
75	75.0						



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-12	SHEET 5 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724065.3 N, 457848.9 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis

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

WATER LEVELS : 5.3 ft bgs on 05/03/07 START : 5/2/2007 END : 5/4/2007 LOGGER : W. Elliott, R. McComb

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-32.9	R9-NQ 5 ft 70%	26	NR		70.0-72.6' - moderate yellowish brown, (10YR 5/4), very fine grained, weak (R2) with some medium strong (R3) zones, voids up to 1/16" over 15-20% of core surface, decreasing with depth, rock becoming thinly laminated and weaker with depth, punctuated with light gray/yellowish gray very fine grained, irregular-shaped nodules/clasts, voids generally lacking in lighter gray, very fine grained nodules/clasts 72.6-74.9' - Same as 70.0-72.6' except with thick (6") beds of yellowish gray, very fine grained limestone, weak to medium strong (R2 to R3), thinly laminated with organics, in matrix of void/cavity characterized limestone No Recovery 74.9-76.5' Silt (ML) 76.5-77.1' - moderate yellowish brown, (10YR 5/4), wet, soft, rapid dilatancy, mild HCl reaction Limestone 77.1-78.4' - pale yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), very fine grained, strong HCl reaction, medium strong to weak (R3 to R2), voids up to 1/16" over 10-15% decreasing with depth, cavities typically 3/8 to 3/4"x1/16" (fossil casts/molds), becoming lighter in color and containing less voids with depth 78.4-79.5' - fine to very fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids up to 1/16", cavities 1-3/16"-1-9/16"x3/8", clay laminae at 78.3-78.4' (brown, soft) 79.5-80.0' - very light gray to bluish white, (N8 to 5B 9/1), very light gray mottling, very fine grained, medium strong (R3), voids (up to 1/16" or less) over 3-5%, several cavities up to 3/16"x3/16", several vertical to subhorizontal hairline fractures 80.0-81.5' - Same as 79.5-80.0' except becoming darker (brownish) with depth, cavities common at 80.4' 81.5-83.6' - moderate yellowish brown, (10YR 5/4), fine to very fine grained, moderate HCl reaction, very weak (R1), voids up to 1/16" over 30-40% surface, cavities up to 1-3/16"-1-9/16"x2", fossiliferous (molds/casts), extremely weak (R0) rock from 82.35-82.65' No Recovery 83.6-85.0'	Driller's Remark: Soft drilling from 75-77' SC-3 collected at 77.1-78.4' Driller's Remark: Advanced NW casing to 80', regained circulation R9: 8 minutes Driller's Remark: Very hard from 80' to approximately 81' Driller's Remark: Hard again at 84' R10: 10 minutes R11: 7 minutes R12: 10 minutes
			NR			
			NA			
			1			
			2			
			1			
80	R10-NQ 5 ft 72%	48	3			
-37.9			3			
			2			
			1			
			NR			
			NR			
85	R11-NQ 5 ft 100%	76	0			
-42.9			2			
			2			
			2			
			2			
			0			
90	R12-NQ 5 ft 99%	74	1			
-47.9			3			
			2			
			2			
			2			
			2			
95						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-12

SHEET 6 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724065.3 N, 457848.9 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.3 ft bgs on 05/03/07

START : 5/2/2007

END : 5/4/2007

LOGGER : W. Elliott, R. McComb

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			
-52.9	R13-NQ 5 ft 98%	72	NR	93.65' - Fracture, <5 deg, smooth, undulating to stepped, tight		Limestone 85.0-88.35' - Same as 81.5-83.6' except black organic laminae at 88.0' and traces of black organic laminae from 87.0-88.0' 88.35-89.45' - variegated very pale orange and very pale blue, (10YR 8/2 and 5B 8/2), strong HCl reaction, very weak (R1), possibly cavity fill with brownish limestone; fossil casts/molds, voids over 15-20%, few cavities 3/8"x3/16", three 2"x3/16" black coated cavities (possible worm burrows) 89.45-90.0' - Same as 85.0-88.35' except fossiliferous, molds/casts and original material 90.0-91.15' - moderate yellow brown, (10YR 5/4), fine to very fine grained, strong HCl reaction, very weak (R1), voids up to 1/16" over 40-50%, cavities generally 3/16"x1/16", fossil casts/molds with whitish fossil layer at 90.8', thin discontinuous black organic laminae 91.15-94.95' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, very weak (R1), voids 1/16" or less over 1-5% (up to 10-15% at 92.0-92.5'), thinly laminated at 93.8' No Recovery 94.95-95.0' Limestone 95.0-95.7' - Same as 91.15-94.95' 95.7-95.9' - organic zone, thinly laminated, black peat, soft, platy 95.9-99.9' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), voids over 40-50%, cavities up to 3/4"-1-3/16"x3/8"-3/4" with thin (1/16"x3/8") black worm tubes, some cavity fill at 97.8-98.0', fossiliferous (casts/molds) No Recovery 99.9-100.0' Limestone 100.0-105.0' - Same as 95.9-99.9' 105.0-110.0' - yellowish gray, (5Y 7/2), fine to very fine grained, strong HCl reaction, very weak (R1), voids covering 10-15% in upper half of core, becoming less common with depth; cavities more common in upper half also, typically 3/8"x3/16" becoming absent with depth, some molds/casts in upper half, absent below. No Recovery 110.0-112.75'	SC-4 collected at 98.15-99.05'
			1	94.05' - Fracture, horizontal, smooth, undulating, tight, black organic coating			
			2	94.55' - Fracture, 80 deg, smooth, undulating, tight			
			0	95.7' - Fracture, horizontal, smooth, planar, open			
			1	96.2' - Fracture, vertical, smooth, undulating, tight			
			1	96.75' - Fracture, <5 deg, rough, stepped, open			
100	R14-NQ 5 ft 100%	54	NR	98.15' - Fracture, 60 deg, rough, undulating, tight		89.45-90.0' - Same as 85.0-88.35' except fossiliferous, molds/casts and original material 90.0-91.15' - moderate yellow brown, (10YR 5/4), fine to very fine grained, strong HCl reaction, very weak (R1), voids up to 1/16" over 40-50%, cavities generally 3/16"x1/16", fossil casts/molds with whitish fossil layer at 90.8', thin discontinuous black organic laminae 91.15-94.95' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, very weak (R1), voids 1/16" or less over 1-5% (up to 10-15% at 92.0-92.5'), thinly laminated at 93.8' No Recovery 94.95-95.0' Limestone 95.0-95.7' - Same as 91.15-94.95' 95.7-95.9' - organic zone, thinly laminated, black peat, soft, platy 95.9-99.9' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), voids over 40-50%, cavities up to 3/4"-1-3/16"x3/8"-3/4" with thin (1/16"x3/8") black worm tubes, some cavity fill at 97.8-98.0', fossiliferous (casts/molds) No Recovery 99.9-100.0' Limestone 100.0-105.0' - Same as 95.9-99.9' 105.0-110.0' - yellowish gray, (5Y 7/2), fine to very fine grained, strong HCl reaction, very weak (R1), voids covering 10-15% in upper half of core, becoming less common with depth; cavities more common in upper half also, typically 3/8"x3/16" becoming absent with depth, some molds/casts in upper half, absent below. No Recovery 110.0-112.75'	R13: 6 minutes
-57.9			>10	99.05' - Fracture, 60 deg, rough, undulating, tight			
			>10	100.0-102.0' - Fracture zone, undulating, stepped, horizontal to inclined, open to tight			
			1	102.8' - Fracture, <5 deg, rough, undulating, tight, clayey			
			0				
			1				
105	R15-NQ 5 ft 100%	40	2	104.9' - Fracture, <5 deg, rough, undulating, tight, clayey		100.0-105.0' - Same as 95.9-99.9' 105.0-110.0' - yellowish gray, (5Y 7/2), fine to very fine grained, strong HCl reaction, very weak (R1), voids covering 10-15% in upper half of core, becoming less common with depth; cavities more common in upper half also, typically 3/8"x3/16" becoming absent with depth, some molds/casts in upper half, absent below. No Recovery 110.0-112.75'	End at 13:05 on 5/3/07 depth to water 5'3" Start on 5/4/07 depth to water 5'3"
-62.9			10	105.9' - Fracture, 70 deg, rough, planar, open			
			>10	105.9-107.9' - Fracture zone, 0-90 deg, rough, undulating to stepped, open, dominated by vertical fracture that propagates to 108.9'			
			2	105.95' - Fracture, 0-90 deg, rough, undulating, open			
			>10	108.15' - Fracture, horizontal, rough, stepped, open			
			>10	108.4' - Fracture, horizontal, rough, undulating, open			
110	R16-NQ 5 ft 45%	45	NR	109.25' - Fracture, 0-90 deg, rough, stepped, tight		100.0-105.0' - Same as 95.9-99.9' 105.0-110.0' - yellowish gray, (5Y 7/2), fine to very fine grained, strong HCl reaction, very weak (R1), voids covering 10-15% in upper half of core, becoming less common with depth; cavities more common in upper half also, typically 3/8"x3/16" becoming absent with depth, some molds/casts in upper half, absent below. No Recovery 110.0-112.75'	R15: 7 minutes
-67.9			0	109.35-110.0' - Fracture zone, 0-90 deg, rough, stepped, undulating, varying orientations from vertical to horizontal			
			0	112.75-115.0' - Fracture, horizontal, there are vertical fracture planes when rock has separated in thin (1/16") slices			
115							Driller's Remark: Upper 2.75' was lost (soft-no recovery) R16: 7 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-12

SHEET 7 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724065.3 N, 457848.9 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.3 ft bgs on 05/03/07

START : 5/2/2007

END : 5/4/2007

LOGGER : W. Elliott, R. McComb

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.
-72.9	R17-NQ 5 ft 100%	60	3	115.0' - Fracture, 0-40 deg, rough, stepped, tight		Limestone 112.75-115.0' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, very weak (R1), voids <1%, 4-5 cavities at approximately 114.2' generally 3/8"x3/8", fossils absent 115.0-119.35' - Same as 112.75-115.0' except fossiliferous zone at 118.5', casts/molds possibly original material	Fossiliferous zone at 118.7'
			2	115.6' - Fracture, 0-20 deg, rough, stepped, tight			
			>10	115.7' - Fracture, horizontal, rough, planar to stepped, open			
			0	116.02' - Fracture, horizontal, smooth, planar, tight			
			>10	116.65' - Fracture, 0-70 deg, rough, stepped, tight			
120	R18-NQ 5 ft 97%	95	1	117.0-117.45' - Fracture zone, 0-90 deg, rough, stepped to undulating, tight to open		119.35-120.0' - Same as 115.0-119.35' except except coarser grained (gravelly to sandy), voids and cavities more common than 115.0-119.35' 120.0-121.3' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), voids up to 1/16" covering approximately 15-20%, few cavities 3/8"x3/8", some mottling and some nodules of very fine grained limestone with no voids/cavities 121.3-122.7' - Same as 120.0-121.3' except voids and cavities more common, covering 60-70% of surface, fossils (casts/molds) common 122.7-124.85' - Same as 120.0-121.3'	R17: 9 minutes
-77.9			0	117.72' - Fracture, horizontal, smooth, planar, tight			
			0	119.3-120.0' - Fracture zone, various orientations, up to gravel sized limestone fragments			
			0	120.15' - Fracture, 10 deg, rough, undulating, open			
			0				
125	R19-NQ 5 ft 100%	70	NR			No Recovery 124.85-125.0' Limestone 125.0-128.5' - Same as 122.7-124.85' except fine to very fine grained, voids over 1-3%, cavities rare, some cavity infilling/nodules, sharp undulatory contact between different color limestone at 125.5' (possible stylolite) 128.5-129.0' - Same as 125.0-128.5' except some thin laminae, voids becoming more common, transitional with 129.0-130.0' 129.0-130.0' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), somewhat friable, cavities cover 70-80%, fossil molds/casts, cavity infillings/nodules 130.0-130.6' - yellowish gray, (5Y 7/2), fine to very fine grained, strong HCl reaction, very weak (R1), voids over 1-3% of surface, cavities 1/16"x1/16", thinly laminated, fossils (molds/casts) rare and interlaminated between very fine grained limestone	SC-5 collected at 123.27-124.3' R18: 6 minutes
-82.9			1	125.45' - Fracture, horizontal, smooth, planar, tight			
			0				
			0				
			>10	128.0-129.0' - Fracture zone, <5-90 deg, rough, undulating to stepped, open to tight			
130	R20-NQ 5 ft 96%	88	10	129.0' - Fracture, 60 deg, rough, undulating, open, gravel-filled			R19: 7 minutes
-87.9			0	129.5-129.9' - Fracture zone, 60-90 deg, multiple fractures			
			0	130.1' - Fracture, horizontal, smooth, planar, open			
			2				
			3	133.15, 133.85' - Fractures (2), horizontal, smooth, planar, tight			
135	135.0						R20: 7 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-12

SHEET 8 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724065.3 N, 457848.9 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.3 ft bgs on 05/03/07

START : 5/2/2007

END : 5/4/2007

LOGGER : W. Elliott, R. McComb

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			
-92.9	R21-NQ 5 ft 98%	86	NR	134.47', 134.62' - Fractures (2), horizontal, smooth, planar, open		130.6-132.65' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), voids and cavities common covering 50-60% of surface, some fossil molds/casts, some cavity infilling/nodules, some very fine grained thin laminae 132.65-134.8' - Same as 130.0-130.6' except thinly laminated, very weak (R1), yellowish brown and light olive gray mottling associated with laminae, becoming darker with depth, some cavities and voids up to approximately 5-10% coverage No Recovery 134.8-135.0' Limestone 135.0-135.25' - light olive gray, (5Y 7/2), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), thinly laminated, voids <1% (1/16" or less), 1 cavity 1-9/16"x9/32" (approximately 3/8" deep) 135.25-137.7' - yellowish gray grading to moderate yellowish brown, (5Y 7/2 to 10YR 5/4), fine grained, very weak (R1), thinly laminated from 135.25-135.5' and from 137.3-137.7' (sharp contact with underlying rock), voids up to 1/16" over 15-20%, few cavities generally 3/16"x3/16", trace fossil molds/casts 137.7-139.2' - Same as 135.25-137.7' except yellowish gray, (5Y 7/2), voids <3-5%, few cavities generally 3/8"x3/16", fossil hash accumulation at 139.0-139.2', some mottling, possible cavity infilling/nodules 139.2-139.9' - yellowish gray, (5Y 7/2), very fine grained, very weak (R1), cleaves very easily due to large cavities (worm burrows), voids over 1-3% (<1/16") cavities up to 2"-2-3/8"x3/8"-3/4" (extending completely through core), fossil molds/casts (gastropods) No Recovery 139.9-140.0' Limestone 140.0-142.5' - Same as 139.2-139.9' except becoming grayish yellow at 140.0' and grading to yellowish gray/light olive gray (5Y 7/2 to 5Y 5/2) with depth, sharp boundary between grayish-yellow and yellowish grey at 140.6', cavities becoming more frequent/dense with small voids (1/16") covering 10-15% of limestone, perhaps becoming somewhat coarser grained in depth	R21: 8 minutes
			1	134.72' - Fracture, horizontal, rough to smooth, stepped, open			
			2	135.25' - Fracture, 10 deg, smooth, planar, tight			
			0	136.5' - Fracture, <5 deg, rough, stepped, open			
			0	136.8' - Fracture, <5 deg, rough, undulating, open			
140	R22-NQ 5 ft 87%	76	2	139.2' - Fracture, <5 deg, rough, undulating, open			Driller's Remark: 80% loss of circulation at 140'
-97.9			NR	139.3' - Fracture, <5 deg, rough, undulating, open, gravel between fracture planes			
			0				
			1	141.7' - Fracture, <5 deg, rough, undulating, open, dark brown organic stains			
			5	142.03' - Fracture, horizontal, rough, undulating, open with black organic coating over 100%			
	R23-NQ 5 ft 100%	97	0	142.15' - Fracture, horizontal, rough, undulating, open, dark brown coating over 100%			SC-6 collected at 142.88- 144.13'
			1	142.4' - Fracture, horizontal, rough, undulating, open with black organic coating over 100%			
145			NR				
-102.9			3	142.5' - Fracture, <5 deg, rough to smooth, undulating, open, no coatings			
			1	142.85' - Fracture, 10 deg, smooth, undulating, tight			
	R24-NQ 5 ft 95%	70	0	144.12' - Fracture, horizontal, rough, stepped, tight			R22: 10 minutes
			0	145.1' - Fracture, horizontal, rough, undulating, open			
			1	145.8' - Fracture, 50-60 deg, rough, planar, open			
			0	145.9' - Fracture, 50-60 deg, rough, planar, open			
			0	146.4' - Fracture, horizontal, rough, undulating, open			
150			0	148.7' - Fracture, <5 deg, rough to smooth, undulating			R23: 6 minutes
-107.9			0	150.55' - Fracture, horizontal, smooth, planar, tight			
			3	150.58' - Fracture, horizontal, smooth, planar, tight			
			0	150.83' - Fracture, horizontal, rough, stepped, open			
			0				
			1				R24: 6 minutes
155							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-12

SHEET 9 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724065.3 N, 457848.9 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.3 ft bgs on 05/03/07

START : 5/2/2007

END : 5/4/2007

LOGGER : W. Elliott, R. McComb

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			
-112.9	R25-NQ 5 ft 100%	76	NR	154.67' - Fracture, <5 deg, rough, undulating, open		142.5-144.35' - yellowish gray mottled with dusky yellow, (5Y 7/2 and 5Y 6/4), fine to very fine grained, distinct boundaries between fine and very fine grained, voids more common in fine grained material covering 20-30%, 1-3% voids in very fine grained material occurring in irregular-shaped nodules, thinly laminated near top of interval, trace fossil molds/casts No Recovery 144.35-145.0' Limestone 145.0-148.7' - yellowish gray to dusky yellow and light olive brown, (5Y 7/2 to 5Y 6/4 and 5Y 5/2), fine grained, strong HCl reaction, weak (R2), voids (<1/16") over 95-100% surface, becoming fossiliferous with depth, casts/molds with some cavities near base of interval 148.7-149.7' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 5/6), moderate to mild HCl reaction, very weak (R1), thinly laminated at 148.9' and with very fine grained beds at 149.0' (yellowish gray) 149.7-150.0' - Same as 148.7-149.7' except very fine grained, few voids 150.0-151.0' - yellowish gray mottled with dusky yellow, (5Y 7/2 and 5Y 6/4), very fine grained, strong HCl reaction, weak (R2), voids <1/16" over 1-3%, few cavities 3/4"-1-3/16"x3/8" 151.0-151.85' - Same as 150.0-151.0' except becoming thinly laminated with light olive brown (5Y 5/6) bands, voids over 10-15% surface area 151.85-152.5' - light olive brown, yellowish gray and light gray, (5Y 5/6, 5Y 5/2 and N5), fine to very fine grained, very weak (R1), thinly laminated, voids and cavities covering 40-50% surface (more so in fine grained, darker colored material), some fossil hash 152.5-154.75' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, very weak (R1), coarse grained at 154.5-154.75', voids covering 10-15% with cavities up to 3/8"x2" over 10%, grades to fossil hash below 153.8' with fossils (molds/casts) common below 154.5' where rock becomes friable No Recovery 154.75-155.0'	SC-7 collected at 156.68-157.65' R25: 6 minutes
			2	155.25' - Fracture, horizontal, rough to smooth, undulating, open			
			1	155.85' - Fracture, horizontal, rough, planar, tight			
			1	156.7' - Fracture, horizontal, rough, planar, tight			
			4	157.65' - Fracture, <5 deg, rough, undulating, open			
	160.0			158.45-158.65' - Fracture zone, 70 deg, rough, undulating to stepped, open to tight			
			1	159.87' - Fracture, horizontal, rough, undulating, tight			
160							
-117.9							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-12	SHEET 10 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724065.3 N, 457848.9 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis

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

WATER LEVELS : 5.3 ft bgs on 05/03/07 START : 5/2/2007 END : 5/4/2007 LOGGER : W. Elliott, R. McComb

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 155.0-155.25' - light olive gray mottled with yellowish gray, (5Y 5/2 and 5Y 7/2), strong HCl reaction, very weak (R1), thinly laminated with organic material, voids over 20-30%, soft and friable from 155.0-155.1' 155.25-155.9' - light olive brown, (5Y 5/6), very fine to fine grained, strong HCl reaction, very weak (R1), voids (<1/16") covering 60-70% surface, trace fossil molds/casts 155.9-156.65' - yellowish gray, (5Y 7/2), fine to very fine grained, moderate to strong HCl reaction, very light gray (N8) interbeds, thinly laminated, especially from 156.5-156.65', voids (<1/16") covering 50-60%, voids <10% in gray very fine grained limestone 156.65-160.0' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), becoming more coarse grained and more fossiliferous (molds/casts) with depth, voids increase from 1-2% coverage to 60-70% with depth, possible void/cavity infilling from 158.0-160.0' (possible nodules/intraclasts) Bottom of Boring at 160.0 ft bgs on 5/4/2007	



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-13
SHEET 1 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)
 ELEVATION : 40.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 5/6/07 START : 5/6/2007 END : 5/23/2007 LOGGER : C. Sump, P. De Sa'rego

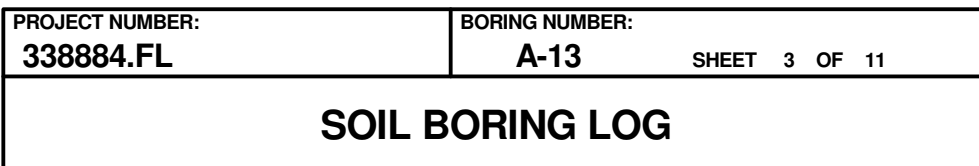
WATER LEVELS : 2.0' RGS ON 9/9/07		START : 9/23/2007		END : 9/23/2007		LOGGERS : G. Jamp, P. De Saeghe	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
			RECOVERY (ft)				
	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY				
40.6	0.0	1.1	SS-1	0-1-2 (3)	Poorly Graded Sand With Organics (SP) 0-0.5' - moist, very loose, very fine to fine grained, 30-40% organics and roots, sand is silica Poorly Graded Sand (SP) 0.5-1.1' - light gray, (N7), moist, very loose, very fine to fine grained, trace nonplastic fines, organics decreasing with depth, sand is silica		Borehole located in staked wetlands area--drill rig and equipment staged on swamp mats, surface conditions are dry
	1.5						Water table 2.0' below ground surface
	5.0						
35.6		1.3	SS-2	1-1-2 (3)	Silty Sand (SM) 5.0-6.25' - grayish brown, (5YR 3/2), wet, very loose, very fine to fine grained, 20-25% nonplastic fines, fines appear to be organic material, slight sulfur odor, trace medium to coarse sand-sized grains, iron cemented silica sand concretions		
	6.5						
	10.0						
30.6		1.1	SS-3	2-3-7 (10)	Clayey Sand (SC) 10.0-10.2' - dark gray, (N3), wet, loose, fine to medium grained, carbonate material, white limestone fragments incorporated (slough) Well Graded Sand With Silt (SW-SM) 10.2-11.1' - yellowish gray, (5Y 8/1), wet, loose, fine to coarse grained, strong HCl reaction, 10-15% nonplastic fines, material appears to be predominantly fossil fragments		SS-3A 10.0-10.2' SS-3B 10.2-11.1'
	11.5						Drilling's Remark: Approximately 10% loss of circulation (limestone zones)
	15.0						
25.6		1.0	SS-4	0-1-2 (3)	Well Graded Sand With Silt (SW-SM) 15.0-15.4' - Same as 10.2-11.1' except pale yellowish brown, (10YR 6/2), silty fines (slough) Silty Sand (SM) 15.4-16.0' - very light gray, (N8), wet, very loose, very fine to fine grained, sand is predominantly silica, 20% fine to medium grained carbonate sand, 20-25% nonplastic fines, scattered pockets of very pale green (10G 8/2) medium plasticity clay, moderate HCl reaction in carbonate materials		SS-4 15.4-16.0'
	16.5						Driller' Remark: Drilling rate slowing down at 18.5'
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-13
SHEET 2 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)
 ELEVATION : 40.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 5/6/07 START : 5/6/2007 END : 5/23/2007 LOGGER : C. Sump, P. De Sa'rego

WATER LEVELS : 2.0 TDS ON 5/6/07			START : 5/6/2007		END : 5/23/2007		LOGGERS : G. Sump, 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	
20.6	20.0	0.2	SS-5	50/2.5 (50/2.5")	Sandy Silt With Limestone (ML) 20.0-20.2' - very pale orange, (10YR 8/2), moist, hard, nonplastic, very rapid dilatancy, moderate to strong HCl reaction, 35% fine to coarse sand-sized, 10% fine gravel-sized, all carbonate materials			
25	25.0							
15.6	25.8	0.8	SS-6	39-50/3.5 (89/9.5")	Silty Sand (SM) 25.0-25.8' - pale yellowish orange, (10YR 8/2), moist to wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 25-30% nonplastic fines, trace fine gravel-sized, all carbonate		Stop drilling for 5/6/07 due to thunderstorm/lightning hazard	
							Resume drilling 5/7/07, water level approximately 2.0' below ground surface	
							Install surface casing (4") to approximately 28.5'	
30	30.0							
10.6	30.3	0.3	SS-7	50/3.5 (50/3.5")	Silty Sand (SM) 30.0-30.3' - Same as 25.0-25.8'			



LOGGER : C. Sump, P. De Sa'rego

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-13

SHEET 4 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)

ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, NQ tools, HW casing




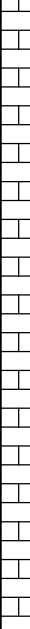
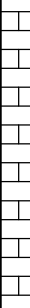
ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 5/6/07

START : 5/6/2007

END : 5/23/2007

LOGGER : C. Sump, 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					
-4.4	45.0	0	1	45.3' - Fracture or mechanical break, 50 deg, rough, undulating to mostly planar 45.9-47.9' - Fracture zone, friable, disaggregated material, numerous "breaks" handling material (unconsolidated)		Limestone 45.0-45.9' - pale yellowish brown, (10YR 6/2), moderate HCl reaction, medium strong (R3), 10-20% coverage of 1/6" to 1/8" small voids on surface, larger lenticular shaped cavities (up to 1/2" long 1/6"-3/16" high), exhibit preferred horizontal orientation 45.9-47.9' - Same as 45.0-45.9' except very weak (R1) and disaggregated, easily broken by hand into silty sand material No Recovery 47.9-50.0'	Switch to rock coring (45.0') R1: 4 minutes		
	0								
	0								
	NR								
50	50.0	13	NA	50.0-53.3' - unconsolidated silty, sandy, gravel material		Silty Sand With Limestone Fragments (SM) 50.0-53.3' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, 20-25% fines, 35-40% sand, 35-40% gravel-sized fragments of friable limestone with fragments 1/4"- >1" size			
-9.4									
		2	53.3-54.4' - Fracture zone, rough, irregular, non planar		Limestone 53.3-54.4' - pale yellowish brown, (10YR 6/2), moderate HCl reaction, medium strong (R3), 10-20% coverage of 1/16"-1/8" voids on surface, few larger cavities/fossil molds (<1%) up to 3/4" No Recovery 54.4-55.0'	R2: 7 minutes			
		1	54.1' - Fracture, 10 deg, rough, planar, tight				Limestone 55.0-56.8' - yellowish brown, (10YR 5/4), very fine grained, mild to moderate HCl reaction, weak (R2), 20-25% coverage of 1/16"-1/8" small voids on surface, very fine dark black laminations (<1/16") 1/2"-1" spacing 56.8-59.8' - Same as 55.0-56.8' except weak (R2), finer grained (silt sized particles), reduced small void density (<10%) and pronounced fine black laminations (lignite, organics) throughout interval and concentrated in zones up to 1/2" thick No Recovery 59.8-60.0'		
55	55.0	NR						Limestone 60.0-63.8' - Same as 56.8-59.8' except weak to medium strong (R2 to R3), decreasing density of fine black layering, variable density of small voids (5-15% surface area), weak unconsolidated zone at 63.5' of silt and sand with gravel No Recovery 63.8-65.0'	
-14.4		47	1	55.4' - Fracture or mechanical break, rough, undulating, nonplanar 56.4, 56.8' - Fractures (2), 15 deg, rough, planar 57.0' - Bedding plane, 10 deg, rough, planar to stepped 57.7' - Mechanical break, rough, nonplanar 57.95, 58.3' - Bedding plane (2), 5 deg, smooth, planar, (organic layer) 58.6' - Bedding plane, 5 deg, smooth, 0.5" thick zone 58.8' - Bedding plane, smooth, planar 59.1' - Fracture or mechanical break, horizontal, rough, undulating 59.4' - Fracture, 10 deg, rough, planar to undulating 60.5, 60.7, 61.4, 61.7' - Fractures or mechanical break (4), horizontal, rough, undulating to planar 62.1, 62.3, 62.5' - Fractures (3), <10 deg, rough, undulating to semi planar 63.4' - Fracture, rough, undulating 63.5' - Fracture, 45 deg, rough, undulating		Limestone 55.0-56.8' - yellowish brown, (10YR 5/4), very fine grained, mild to moderate HCl reaction, weak (R2), 20-25% coverage of 1/16"-1/8" small voids on surface, very fine dark black laminations (<1/16") 1/2"-1" spacing 56.8-59.8' - Same as 55.0-56.8' except weak (R2), finer grained (silt sized particles), reduced small void density (<10%) and pronounced fine black laminations (lignite, organics) throughout interval and concentrated in zones up to 1/2" thick No Recovery 59.8-60.0'	Horizontal partings associated with black laminations (soft) laminae are sinuous and exhibit more pinch and swell patterns and are often slightly inclined to core diameter R3: 6 minutes		
			2						Limestone 60.0-63.8' - Same as 56.8-59.8' except weak to medium strong (R2 to R3), decreasing density of fine black layering, variable density of small voids (5-15% surface area), weak unconsolidated zone at 63.5' of silt and sand with gravel No Recovery 63.8-65.0'
			3						
			3						Limestone 60.0-63.8' - Same as 56.8-59.8' except weak to medium strong (R2 to R3), decreasing density of fine black layering, variable density of small voids (5-15% surface area), weak unconsolidated zone at 63.5' of silt and sand with gravel No Recovery 63.8-65.0'
		2		Limestone 60.0-63.8' - Same as 56.8-59.8' except weak to medium strong (R2 to R3), decreasing density of fine black layering, variable density of small voids (5-15% surface area), weak unconsolidated zone at 63.5' of silt and sand with gravel No Recovery 63.8-65.0'					
		NR			Limestone 60.0-63.8' - Same as 56.8-59.8' except weak to medium strong (R2 to R3), decreasing density of fine black layering, variable density of small voids (5-15% surface area), weak unconsolidated zone at 63.5' of silt and sand with gravel No Recovery 63.8-65.0'				
60	60.0	40	2	59.4' - Fracture, 10 deg, rough, planar to undulating 60.5, 60.7, 61.4, 61.7' - Fractures or mechanical break (4), horizontal, rough, undulating to planar 62.1, 62.3, 62.5' - Fractures (3), <10 deg, rough, undulating to semi planar 63.4' - Fracture, rough, undulating 63.5' - Fracture, 45 deg, rough, undulating			Limestone 55.0-56.8' - yellowish brown, (10YR 5/4), very fine grained, mild to moderate HCl reaction, weak (R2), 20-25% coverage of 1/16"-1/8" small voids on surface, very fine dark black laminations (<1/16") 1/2"-1" spacing 56.8-59.8' - Same as 55.0-56.8' except weak (R2), finer grained (silt sized particles), reduced small void density (<10%) and pronounced fine black laminations (lignite, organics) throughout interval and concentrated in zones up to 1/2" thick No Recovery 59.8-60.0'	R4: 6 minutes	
-19.4			3						Limestone 60.0-63.8' - Same as 56.8-59.8' except weak to medium strong (R2 to R3), decreasing density of fine black layering, variable density of small voids (5-15% surface area), weak unconsolidated zone at 63.5' of silt and sand with gravel No Recovery 63.8-65.0'
			3						
			2						Limestone 60.0-63.8' - Same as 56.8-59.8' except weak to medium strong (R2 to R3), decreasing density of fine black layering, variable density of small voids (5-15% surface area), weak unconsolidated zone at 63.5' of silt and sand with gravel No Recovery 63.8-65.0'
		NR		Limestone 60.0-63.8' - Same as 56.8-59.8' except weak to medium strong (R2 to R3), decreasing density of fine black layering, variable density of small voids (5-15% surface area), weak unconsolidated zone at 63.5' of silt and sand with gravel No Recovery 63.8-65.0'					
65	65.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-13

SHEET 5 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)

ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 5/6/07

START : 5/6/2007

END : 5/23/2007

LOGGER : C. Sump, P. De Sa'rego

WATER LEVEL: 20.00 ggs		DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY		COMMENTS
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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		
-24.4	R5-NQ 5 ft 36%	10	NA	65.4, 65.5, 65.6, 65.7' - Mechanical break (4), horizontal, rough, undulating to planar, fine sand/silt material on fracture surface		Silty Sand (SM) 65.0-65.8' - moderate yellowish brown, (10YR 5/4), with gravel-sized limestone fragments 1/2"-2" size (disaggregated by drilling) Limestone 65.8-66.8' - moderate yellowish brown, (10YR 5/4), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), 15-20% coverage of 1/16" to 1/8" small voids on surface, 1-2% coverage of larger cavities/fossil molds up to 1/4" diameter, fine silt infilling in many voids/molds No Recovery 66.8-70.0' Limestone 70.0-74.9' - moderate yellowish brown, (10YR 5/4), fine grained, mild to moderate HCl reaction, medium strong (R3), fossiliferous, with 4"-6" thick poorly fossiliferous, fine grained intervals, low to medium density, up to 17-20% coverage of small (1/16"-1/8") voids and larger (up to 3/4") cavities/fossil molds, lenticular inclusions of soft black organic material up to 1-1/2"x1/4" thick at 73.2-73.8', few fine (1/16"-3/16") organic inclusions No Recovery 74.9-75.0' Limestone 75.0-80.0' - Same as 70.0-74.9' except mild HCl reaction, weak (R2), 5-15% coverage of small (1/16"-1/8") voids, loose sand-sized limestone particles on fracture surfaces 80.0-84.0' - Same as 75.0-80.0' except mild HCl reaction, weak to medium strong (R2 to R3), with friable, extremely weak (R0), partially unconsolidated zones at 80.4-80.7', 81.4-81.6', and 82.0-82.5' 	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-13

SHEET 6 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)

ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 5/6/07

START : 5/6/2007

END : 5/23/2007

LOGGER : C. Sump, 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.
-44.4	R9-NQ 5 ft 98%	47	1	85.6' - Fracture, 45 deg, rough, planar		Limestone 85.0-89.9' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, medium strong (R3), fossiliferous (molds/casts), surface coverage of voids 20%, with very weak to weak (R1 to R2) zones of limestone disaggregated into carbonate sands or silt from 86.0-86.6' and 87.2-88.1'	1/2" thick "greasy" organic layer at 85.2
			>10	86.0-88.0' - Fracture zone, 0-30 deg, limestone fragments 1/4" to 2", larger fragments exhibit semi planar surfaces			
			>10				
			2	88.2, 88.8, 89.3, 89.5' - Fractures or mechanical break (4), horizontal, rough, undulating			
			3	89.4' - Fracture, 45 deg, rough, planar			
90	R10-NQ 5 ft 84%	58	NR			No Recovery 89.9-90.0' Limestone 90.0-94.2' - Same as 85.0-89.9' except highly fossiliferous zone with greater density of small voids from 90.8-91.1' (fragments <1"), finer grained with decreased density of small voids, weak to medium strong (R2 to R3) below 91.1'	R9: 7 minutes Small flazer structure on fragment material, bioturbation SC-2 collected at 91.75-92.5'
-49.4			>10	90.3' - Fracture, 70 deg, rough, planar			
			>10	90.7' - Fracture, horizontal, rough, undulating to planar, black organics on surface (or fine laminae controlling break)			
			1	90.7-91.2' - Fracture zone			
			2	93.0' - Fracture, horizontal, rough, undulating, open			
	R11-NQ 5 ft 96%	62	0	93.5' - Fracture, 25 deg, rough, undulating, 1/16" open		No Recovery 94.2-95.0'	R10: 12 minutes
			NR	93.9' - Mechanical break, horizontal			
95			2	95.2' - Fracture, 5 deg, planar			
-54.4			1	95.7' - Fracture, 60 deg, rough, planar			
			2	96.8' - Mechanical break, rough, undulating		Limestone 95.0-98.0' - yellowish gray, (5Y 4/2), variable density of small voids (1/16"-1/8") across interval ranging from sparse up to >20% in discrete zones, typically 5%, few larger cavities/fossil molds 1/4" or larger, dark brown/black (organic) inclusions (1/16"-1/8") and as thin (1/16") fine stringers 98.0-98.7' - fine grained, strong to very strong (R4 to R5), dense 98.7-99.8' - Same as 95.0-98.0' except mild to moderate HCl reaction, weak to medium strong (R2 to R3) No Recovery 99.8-100.0' Limestone 100.0-104.5' - Same as 95.0-98.0' except medium strong (R3), increasing density of small voids and larger (up to 1/2") cavities/fossil molds (10-20%), irregular zones of dark gray (N6) (redox boundary), few fossil molds/casts infilled with soft clayey carbonate material	SC-3 collected at 95.6-96.8' R11: 11 minutes
	R12-NQ 5 ft 90%	33	>10	97.3, 97.35' - Fractures (2), 60 deg, rough, planar			
			>10	97.9' - Fracture, horizontal, rough, nonplanar, brownish black coating on surface (soft)			
			>10	98.0-98.7' - Fracture zone, rock fragments, conchoidal fracture faces, undulating, near vertical break, few 45-60 deg fractures on fragments			
100			NR	98.9, 99.2, 99.8' - Fractures (3), horizontal, rough, undulating			
-59.4			>10	100.0-101.0' - Fracture zone, vertical, rough, planar to undulating, 3/4"-1" angular rock fragments with large (4"-5") long partial core pieces		No Recovery 104.5-105.0'	R12: 6 minutes
			1	101.3' - Fracture, 70 deg, rough, planar			
			>10	102.0-102.7' - Fracture zone, limestone fragments			
			>10	102.8' - Fracture, 45 deg, rough, undulating			
			>10	103.3' - Fracture or mechanical break, horizontal, rough, undulating			
			>10	103.3-104.5' - Fracture zone, horizontal, rough, planar to undulating, partings with 1-2" spacing			
105			NR				



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-13	SHEET 7 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)

ELEVATION : 40.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 5/6/07 START : 5/6/2007 END : 5/23/2007 LOGGER : C. Sump, 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.
-64.4	R13-NQ 5 ft 82%	40	>10	105.2-105.8' - Fracture zone, limestone fragments (1/2"-1-1/2")		Limestone 105.0-107.5' - grayish orange to light olive gray, (10YR 7/4 to 5Y 5/2), mild to moderate HCl reaction, weak (R2), <5% coverage of small (1/16"-1/8") voids on surface, moderately friable	R13: 10 minutes
			>10	106.7' - Fracture, 45 deg, rough, undulating			
			0	106.8-107.1' - Fracture zone, weak friable material, 1/2"-2" fragments, dark brown/black staining (possibly pyrite) on few fragment/fracture surfaces		107.5-109.1' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), mild HCl reaction, medium strong (R3), small voids (1/16"-1/8") and larger cavities/fossils/molds (up to 1/2" max dimension) 5-10% coverage on surface, few fossil casts, partial fine recrystallization	
			>10	108.7-109.1' - Fracture zone, rough, undulating			
			NR				
110	R14-NQ 5 ft 78%	57	2	110.1' - Fracture or mechanical break, horizontal, rough, planar		No Recovery 109.1-110.0' Limestone	R14: 9 minutes
-69.4				110.7' - Fracture, rough, undulating		110.0-113.9' - Same as 107.5-109.1' except medium strong to strong (R3 to R4), fewer cavities/fossil molds >1/4"	
			2	111.3' - Fracture, rough, undulating, fine limestone fragments			
			2	111.6' - Fracture, rough, undulating to partially stepped			
			1	112.0' - Fracture, 70 deg, rough, undulating, with thin spalls, black staining/coating on surface (pyrite) somewhat radiated surface		No Recovery 113.9-115.0'	
			NR	112.6, 113.7' - Fractures (2), 45 deg, rough, planar			
115	R15-NQ 5 ft 90%	37	>10	115.0-116.0' - Fracture zone, 1"-3" rock fragments, larger fragments exhibit 30 deg orientation, planar surfaces		Limestone 115.0-119.5' - intermingled zones of pale yellowish orange and light olive gray, (10YR 8/6 and 5Y 5/2), moderate HCl reaction, medium strong (R3), 5-10% coverage of small (1/6"-1/8") voids on surface, partial recrystallization	R15: 10 minutes
-74.4			3	116.1, 116.2' - Fractures or mechanical break (2), horizontal, rough, undulating			
			1	116.5' - Fracture, 75 deg, rough, undulating to planar			
			1	117.0' - Mechanical break, horizontal, rough, undulating			
			1	118.0' - Fracture, 45 deg, rough, planar			
			1	118.5' - Fracture or mechanical break, 15 deg, rough, planar			
			1	119.1' - Fracture or mechanical break, rough, undulating		No Recovery 119.5-120.0'	
			NR				
120	R16-NQ 5 ft 80%	55	1	120.6' - Fracture, 15 deg, rough, planar		Limestone 120.0-124.0' - Same as 115.0-119.5' except mild HCl reaction, strong (R4), larger cavities (1/4"-1/2") present in discrete zones of variable spacing, most prominent in fragmented zones (123.0-123.4'), blackish brown staining on some fracture/fragment surfaces, minor recrystallization, color becoming darker with depth light olive gray (5Y 5/2) to medium olive brown (5Y 4/4)	R16: 11 minutes
-79.4			4	121.0' - Mechanical break, rough, undulating			
				121.1-121.3' - Fracture zone			
			>10	121.3' - Mechanical break, rough, undulating			
				122.1' - Mechanical break, horizontal, rough, undulating			
			1	122.9-123.3' - Fracture zone, limestone fragments (1/2"-1-1/2"), dark brown staining on surfaces		No Recovery 124.0-125.0'	
			NR	123.3, 124.0' - Fractures or mechanical break (2), horizontal, rough, undulating and planar			
125	125.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-13

SHEET 8 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)

ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 5/6/07

START : 5/6/2007

END : 5/23/2007

LOGGER : C. Sump, 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.
-84.4	R17-NQ 5 ft 78%	43	4	125.35, 123.55' - Mechanical break (2), horizontal, rough, undulating		Limestone 125.0-128.9' - yellowish orange to pale yellowish brown, (10YR 8/6 to 10YR 6/2), mild HCl reaction, medium strong to strong (R3 to R4), 10-20% coverage of 1/16"-1/8" small voids on surface, larger oval shaped (fossil molds) cavities (1/4"-1/2") occur variably throughout depth but <5% surface area, very fine grained dense interbeds at 125.75-125.9' and 126.0-126.3' yellowish gray (5Y 7/2), laminated, with <5% small (1/16"-1/8") voids No Recovery 128.9-130.0'	Fresh fracture faces indicate possible partial recrystallization R17: 9 minutes
			1	125.7' - Fracture, vertical, rough, undulating, healed fracture, tight			
			>10	125.75, 125.9' - Bedding plane (2), horizontal, planar			
			1	126.0' - Fracture, horizontal, rough, undulating			
			NR	126.2' - Bedding plane, horizontal, smooth 127.3-127.7' - Fracture zone, irregular limestone fragments, undulating surfaces 128.6' - Fracture or mechanical break, horizontal, rough, undulating			
130 -89.4	R18-NQ 5 ft 42%	0	>10	130.0-132.1' - Fracture zone, rough, undulating surfaces on most fragments, few horizontal, planar, thin (1/4") bedding plane partings 130.0-130.5', 1/2"-1-1/2" fragments with 2"-4" full diameter core pieces between zones		Limestone 130.0-130.5' - grayish orange to yellowish gray, (10YR 7/4 to 5Y 7/2), moderate HCl reaction, medium strong (R3), thin (3/4") zones of dark gray fine laminations, thin (<25) bedding plane partings 130.5-132.1' - grayish yellow, (5Y 8/4), weak (R2), 15-20% coverage of 1/6"-1/8" small voids, larger (1/4"-3/4") cavities/fossil molds, friable No Recovery 132.1-135.0'	Driller's Remark: 100% loss of circulation at 132.0' below ground surface, soft drilling, possible void R18: 4 minutes
			>10				
			NR				
135 -94.4	R19-NQ 5 ft 74%	27	>10	135.0-135.2' - Bedding plane, horizontal, smooth, multiple 1/4"-1/2" thick partings		Limestone 135.0-135.2' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), mild HCl reaction, finely laminated, bedding plane partings (1/4") 135.2-138.7' - grayish orange to yellowish orange, (10YR 7/4 to 10YR 8/6), mild HCl reaction, medium strong (R3), small voids (1/16"-1/8") exhibit variable density across interval (<5% up to 20+%) partings/breaks concentrate along zones with higher percentage of voids, sparse large cavities (1/4"-1/2") <5% (fossil molds) No Recovery 138.7-140.0'	Fine black staining on few fractures (pyrite) SC-4 collected at 135.7-136.6' R19: 10 minutes
			1	135.7' - Fracture, horizontal, rough, planar			
			>10	136.7' - Mechanical break, rough, undulating 136.9-138.2' - Fracture zone, irregular, undulating surfaces, possible vertical fracture, fine black staining on few fragments			
			1	138.2' - Mechanical break, 60 deg, rough, planar			
			NR				
140 -99.4	R20-NQ 5 ft 60%	13	1	140.9' - Fracture, 40 deg, smooth, planar		Limestone 140.0-140.5' - pale yellowish orange, (10YR 8/6), very weak to weak (R1 to R2), 5-7% coverage of 1/16"-1/8" small voids and larger cavities/fossil molds (up to 1/4"), some infilling of cavities with soft white carbonate material	Exhibits "punk" texture on fresh surfaces R20: 13 minutes
			2	141.1' - Fracture or mechanical break, vertical, rough, undulating			
			3	141.4-142.2' - Fracture zone, limestone fragments <1"			
			NR	142.5' - Fracture or bedding plane, horizontal, smooth			
				142.8' - Fracture, vertical, rough, undulating, healed, tight 143.0' - Fracture, rough, undulating, black coating (possibly pyrite) on surface			
145	145.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-13

SHEET 9 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)

ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 5/6/07

START : 5/6/2007

END : 5/23/2007

LOGGER : C. Sump, 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.
-104.4	R21-NQ 5 ft 80%	17	>10	145.0-145.4' - Fracture zone, rock fragments 1/2" thick		140.5-143.0' - very pale yellowish gray, (5Y 7/2), moderate HCl reaction, medium strong to strong (R3 to R4), small zones (<1") of dark gray, fossil molds up to 3/4", numerous small voids (5%-20% surface area) becoming denser, hard below 142.0', black coating on some fracture faces (pyrite) No Recovery 143.0-145.0' Limestone 145.0-146.8' - yellowish gray, (5Y 7/2), mild HCl reaction, medium strong to strong (R3 to R4), small voids (1/16"-1/8") and larger cavities/fossil molds up to 1/2" variable across interval from trace to >10%, thin (1") fine grained beds show indications of very fine laminations 146.8-147.2' - medium olive brown, fragmented (1/4"-3/4" size), friable, coarse carbonate sand 147.2-147.7' - medium olive brown, weak (R2) 147.7-149.0' - Same as 145.0-146.8' except light olive gray, (5Y 5/2) No Recovery 149.0-150.0' Limestone 150.0-152.8' - Same as 145.0-146.8' except light olive gray, (5Y 5/2), mild HCl reaction, medium strong (R3) 152.8-153.9' - mottled grayish yellow and light olive gray, (5Y 8/4 and 5Y 5/2), medium strong (R3), thin (1"-2") dark yellowish brown (10YR 4/2) fine wavy laminations, dark laminations slightly inclined (5-10 deg) 153.9-155.0' - Same as 150.0-152.8' except strong (R4), denser, fewer voids 155.0-156.3' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), strong (R4), mottled appearance, <5-10% coverage of 1/16"-1/8" small voids and larger cavities/fossil molds up to 1/2" increasing with depth, dense 156.3-158.4' - Same as 155.0-156.4' except increasing percentage of small voids uniformly distributed, color darkening to medium olive brown (5Y 4/4), very fine laminated dense interbed at 157.6-158.1' No Recovery 158.4-160.0' Limestone 160.0-162.5' - light olive gray to olive gray, (5Y 5/2 to 5Y 3/2), medium strong (R3), dense, few small voids or cavities/fossil molds (<5%) No Recovery 162.5-165.0'	Disaggregate carbonate sand 146.8-147.2'
			4	145.75' - Fracture, 10 deg, rough, planar			
			>10	146.3' - Fracture or mechanical break, rough, undulating			
			3	146.4' - Bedding plane, horizontal, rough, discontinuity with fine grained limestone			
			NR	146.6' - Fracture, >80 deg, rough, undulating, healed			
150	R22-NQ 5 ft 100%	15	2	146.8' - Bedding plane, discontinuity with yellowish brown, weak, loose, carbonate sand zone		Weak along laminae, dark laminations may be biofeature (algae) R22: 15 minutes	R21: 15 minutes
-109.4			>10	147.5-147.8' - Fracture zone, vertical, limestone fragments 1-1/2"-3"			
			6	147.8, 148.0' - Bedding plane (2), horizontal, smooth			
			>10	148.6' - Mechanical break, horizontal, rough, undulating			
			>10	148.9, 149.0' - Fractures (2), 45 deg, rough, planar			
155	R23-NQ 5 ft 68%	25	2	150.8' - Fracture or mechanical break, horizontal, rough, planar		R23: 11 minutes	R22: 15 minutes
-114.4			3	150.9' - Fracture, >80 deg, rough, undulating			
			>10	151.0-152.0' - Fracture zone, mostly rough, undulating horizontal fractures, few 45 deg rough, planar fractures, limestone fragments 3/4"-2-1/2" in length			
			>10	152.0, 152.1, 152.3, 152.5, 152.7, 152.9' - Fractures (6), horizontal, rough, undulating			
			NR	153.0-154.0' - Fracture zone, horizontal, rough, undulating, partings controlled by bedding lamination			
160	R24-NQ 5 ft 50%	0	>10	154.0-155.0' - Fracture zone, 20-45 deg, rough, undulating		The rig CME 55 (S/N 252345) was changed to CME 75 (S/N 252437) at depth 162 feet below ground surface R24: 10 minutes Core barrel stuck at 162.3'	R23: 11 minutes
-119.4			1	155.3' - Fracture, 15 deg, rough, planar			
			0	155.4, 155.6' - Fractures (2), 10-15 deg, rough, undulating			
			NR	156.5' - Fracture, horizontal, rough, planar			
			NR	156.6' - Fracture, rough, undulating			
165				156.8' - Fracture, horizontal, rough, planar			
				157.2' - Bedding plane, 4-5 deg, break on fine grained layer			
				157.2-158.4' - Fracture zone, horizontal, planar, rock fragments 3/4"-2" in length			
				161.3' - Fracture, 75 deg, undulating, slightly radial, 6" long			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-13	SHEET 10 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)

ELEVATION : 40.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 5/6/07 START : 5/6/2007 END : 5/23/2007 LOGGER : C. Sump, P. De Sa'rego

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-124.4	R25-NQ 5 ft 76%	0	>10	165.0-166.1' - Fracture zone	Limestone 165.0-167.4' - medium dark gray, (N5), fine grained, mild HCl reaction, strong (R4), 10-15% coverage of small (<1/8") voids, 10% coverage of 1"-1-3/8" fossil molds/cavities, trace carbonate infill of cavities, light olive gray (5Y 6/1) coloration of fractured surfaces 167.4-168.8' - medium dark gray to yellowish gray, (N5 to 5Y 5/2), fine grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), trace to 10% coverage of 1/16" voids increasing with depth, visible casts/cavities No Recovery 168.8-170.0' Limestone 170.0-170.2' - Same as 165.0-167.4' 170.2-171.1' - Same as 165.0-167.4' except no visible casts/cavities 171.1-172.1' - Same as 165.0-167.4' 172.1-174.5' - Same as 167.4-168.4' except size of large casts/cavities up to 1-3/16"x3/4" over 30% of rock at 173.5-174.5'	5/9/07, 14:00 hrs - Rig changed to one with a cathead to allow pull-back hammering 16:00 hrs - Only 10' of rods removed, decide to overdrill with HQ tools 16:20 hrs - Start installing HQ 19:00 hrs - HQ tools will not go through 4" bit, HQ tools pulled and resumed back hammering Driller's Remark: Core barrel retrieved, hole currently cased from 0-60' with HW casing Driller's Remark: extending HW casing to 90' Driller's Remark: HW casing installed to 90', NQ rod and tri-cone bit equipped to reach sampling depth of 165' P. De Sa'rego begins logging R25: 28 minutes Driller's Remark: Chatter approximately 145' Driller's Remark: Chatter approximately 150'-155' Driller's Remark: Chatter at approximately 160' R26: 24 minutes Driller's Remark: Chatter Driller's Remark: Chatter
			>10	166.35' - Fracture, <10 deg, rough, undulating, 1/8"-3/16" relief		
			8	166.35-165.55' - Fracture zone, vertical, rough, planar, <1/16" gray carbonate infill		
			>10	166.6' - Fracture, horizontal, smooth, planar		
			NR	166.8, 166.9, 167.0, 167.2' - Fractures (4), <10 deg, smooth, undulating		
170	R26-NQ 5 ft 90%	7	8	167.4, 167.8, 167.9' - Bedding plane (3), horizontal, smooth, planar	No Recovery 174.5-175.0' Limestone 175.0-176.0' - pale yellowish brown to dark gray, (10YR 8/2 to N3), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), trace voids up to 1/16" in size, 10-15% coverage of 1-3/16"x3/8" casts/cavities, with infill/recrystallization of yellowish brown, fine to medium grained carbonate 176.0-177.9' - pale yellowish brown, (10YR 8/2), fine to medium grained, mild to moderate HCl reaction, medium strong (R3), 10-15% coverage of <3/16" voids No Recovery 177.9-180.0' Limestone 180.0-184.5' - Same as 176.0-177.9' except 40-50% casts/cavities at 180.75-181.1' and 183.7-183.9' (up to 1-3/16"x9/16"), and highly fossiliferous with 50% voids up to 1-3/16" at 183.1-184.1' and thin (1/16"-3/16") dark laminae from 181.4-182.4'	R27: 58 minutes Driller's Remark: Chatter Driller's Remark: Chatter
-129.4			>10	167.7' - Mechanical break		
			8	167.9-168.8' - Fracture zone		
			>10	170.0-170.2' - Fracture zone		
			6	170.2-170.8' - Fracture, 60 deg, smooth, undulating		
			>10	170.8' - Mechanical break		
			1	170.95-171.25' - Fracture zone		
175	R27-NQ 5 ft 58%	8	>10	171.4, 171.6, 172.05, 172.2, 173.1, 173.45, 173.8, 174.2' - Fractures (8), <10 deg, rough, undulating	R27: 58 minutes Driller's Remark: Chatter Driller's Remark: Chatter	R27: 58 minutes Driller's Remark: Chatter Driller's Remark: Chatter
-134.4			2	172.4-172.6' - Fracture zone		
			NR	172.8-173.0' - Fracture zone		
			>10	175.0-176.1' - Fracture zone		
			NR	176.35, 176.45, 176.7, 176.75, 176.8' - Fractures (5), horizontal, smooth, planar to undulating		
180	R28-NQ 5 ft 90%	20	6	176.45-176.7' - Fracture zone	R28: 46 minutes Driller's Remark: Chatter Driller's Remark: Chatter	R28: 46 minutes Driller's Remark: Chatter Driller's Remark: Chatter
-139.4			>10	176.8-177.0' - Fracture zone		
			>10	177.4' - Fracture, horizontal, rough, planar to undulating		
			1	177.75' - Fracture, 60 deg, rough, undulating		
			NR	177.76' - Mechanical break		
			>10	180.75-180.9' - Fracture zone, possibly due to cavities in rock		
185	R28-NQ 5 ft 90%	NR	6	181.2' - Fracture, horizontal, smooth to rough, undulating, 1/4"-3/8" relief	No Recovery 184.5-185.0'	
			>10	181.5, 181.55' - Fractures (2), 25 deg, smooth, planar, along laminae of darker material		
			>10	181.75, 181.80' - Fractures (2), <10 deg, rough, undulating, 1/4"-3/8" relief		
	R28-NQ 5 ft 90%	NR	1	182.0-182.2' - Fracture zone		
			NR	182.4' - Bedding plane, smooth, planar, 1/8" relief		
				182.5-182.9' - Fracture zone		



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-13
SHEET 11 OF 11	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722927.1 N, 457933.5 E (NAD83)
 ELEVATION : 40.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 CORING METHOD AND EQUIPMENT : CME 55 S/N 252345; CME 75 S/N 252437, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 5/6/07 START : 5/6/2007 END : 5/23/2007 LOGGER : C. Sump, 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.
-144.4	R29-NQ 5 ft 86%	22	>10	183.2-183.9' - Fracture zone		Limestone 185.0-187.6' - pale yellowish brown, fine to medium grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), 10% coverage of <3/16" voids, trace casts/cavities up to 9/16"x3/8" with partial carbonate recrystallization on surfaces 187.6-189.3' - Same as 185.0-187.6' except 15-35% voids up to 1/8" increasing with depth, with trace casts/cavities up to 9/16"x1" No Recovery 189.3-190.0'	R29: 37 minutes
			>10	184.1' - Bedding plane, horizontal, rough, planar			
			3	185.2-185.9' - Fracture zone			
				186.0' - Mechanical break			
				186.3' - Fracture, horizontal, rough, undulating, 3/8" relief, <1/16" carbonate infill			
	R30-NQ 5 ft 72%	8		186.4' - Mechanical break		Limestone 190.0-193.6' - Same as 175.0-176.0' except 10-15% voids up to 3/16" and black laminations from 190.5-192.3', increased (50% by volume) carbonate infill of cavities and casts No Recovery 193.6-195.0'	R30: 51 minutes
				186.7-186.95' - Fracture zone			
				187.5' - Fracture, <5 deg, smooth, undulating			
				187.8' - Fracture, <5 deg, rough, undulating, <1/8" relief			
				187.95' - Fracture, horizontal, rough, undulating, <3/16" relief			
	R31-NQ 5 ft 36%	16		188.2-188.4' - Fracture zone		Limestone 195.0-196.1' - yellowish gray, (5Y 7/2), fine to medium grained, mild HCl reaction, strong (R4), 40-50% lenses of medium dark gray (4N), 5% coverage of small (1/16") voids on surface, trace casts/cavities up to 3/8"x3/8" 196.1-196.8' - Same as 175.0-176.0' except 5-10% casts/cavities up to 9/16"x1-3/16" No Recovery 196.8-200.0'	Driller's Remark: 100% fluid loss at 196' R31: 15 minutes
				188.55, 188.9, 189.0, 189.1, 189.15' - Fractures (5), horizontal, smooth, planar to undulating, 1/16" relief			
				190.0-190.55' - Fracture zone			
				190.9-191.1' - Fracture zone			
				191.3' - Fracture, 15 deg, smooth to rough, undulating			
				191.5-191.6' - Fracture zone		Bottom of Boring at 200.0 ft bgs on 5/23/2007	
				191.8-192.1' - Fracture zone			
				192.3' - Fracture, 30 deg, rough, undulating			
				192.4-192.6' - Fracture zone, 60 deg, smooth to rough, undulating, gray staining over <10% of fracture surface			
				192.95' - Fracture, 30 deg, smooth to rough, undulating, gray staining over 75% surface			
				193.15-193.3' - Fracture zone			
				193.15-193.3' - Fracture zone			
				195.0-195.4' - Fracture zone			
				195.7-196.0' - Fracture zone			
				196.3-196.8' - Fracture zone or mechanical break, 40 deg, rough, undulating, pale yellowish brown recrystallization (carbonate, fine to medium grained) on 100% of surface, 3/16"-3/8" relief			
200							
-159.4							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14
SHEET 1 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722999.7 N, 457929.8 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205; Dietrich D-50 S/N 240, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.7 ft bgs on 03/20/07 START : 3/14/2007 END : 4/9/2007 LOGGER : C. Wallestad

WATER LEVELS : 1.7 RODS ON 03/20/07							START : 3/14/2007		END : 4/9/2007		LOGGERS : G. Wallstead	
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						
42.4								16:35 - Began drilling				
	3.5											
5	5.0	1.5	SS-1	2-2-1 (3)	Silty Sand (SM) 3.5-5.0' - dark yellowish orange to light brown, (10YR 6/6 to 5YR 5/6), wet, very loose, fine grained, no HCl reaction, 20-25% nonplastic fines, trace medium to coarse grained sand-sized iron-cemented concretions			6" slough removed for photo				
37.4												
	8.5											
10	10.0	1.2	SS-2	3-4-5 (9)	Clayey Sand (SC) 8.5-9.7' - very light gray, (N8), wet, loose, fine grained, no HCl reaction, 30% medium plastic fines, trace organics (roots), trace green mineral							
32.4												
	13.5											
15	15.0	1.3	SS-3	1-3-5 (8)	Clayey Sand (SC) 13.5-14.0' - medium light gray, (N6), wet, loose, no HCl reaction, fine silica sand with 3 distinct CH layers at 13.5-13.55', 13.7-13.75', and 13.8-14.0'; CH is greenish gray (5G 6/1) to greenish black (5GY 2/1), highly plastic Silt (ML) 14.0-14.8' - grayish orange, (10YR 7/4), wet, medium stiff, nonplastic, rapid dilatancy, strong HCl reaction, carbonate material							
27.4												
	18.5											
20	20.0	1.3	SS-4	2-4-2 (6)	Clayey Sand (SC) 18.5-18.6' - very light gray, (N8), wet, loose, fine grained, no HCl reaction, 30% medium to high plasticity fines, silica sand			17:30 - Stopped drilling for the day at 20'				



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14
SHEET 2 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722999.7 N, 457929.8 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205; Dietrich D-50 S/N 240, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.7 ft bgs on 03/20/07 START : 3/14/2007 END : 4/9/2007 LOGGER : C. Wallestad

WATER LEVELS : 1.7 TUBS ON 03/20/07		START : 3/14/2007		END : 3/3/2007		LOGGERS : G. Wallstead	
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		
22.4					Poorly Graded Sand (SP) 18.6-19.4' - very light gray, (N8), wet, loose, fine grained, <5% fines, no HCl reaction, silica sand Clayey Sand (SC) 19.4-19.8' - very light gray, (N8), wet, loose, fine grained, 30% fines, medium to high plasticity, no HCl reaction, silica sand		Began drilling on 3/15/07 at 08:25
	23.5						
25		1.2	SS-5	5-7-8 (15)	Clayey Sand (SC) 23.5-24.6' - medium light gray, (N6), wet, medium dense, fine grained, no HCl reaction, 22% medium plastic fines, trace very fine sand-sized black minerals, CH lenses at 23.55-23.6', 24.2-24.25' and 24.55-24.6'		Driller's Remark: Shallow rock ledge or bedrock
17.4	25.0				Silt (ML) 24.6-24.7' - grayish orange, (10YR 7/4), wet, stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 10% fine sand, all carbonate material		
	28.5						
30		1.1	SS-6	5-8-29 (37)	Silt With Sand (ML) 28.5-29.6' - grayish orange, (10YR 7/4), wet, hard, low plasticity, slow to rapid dilatancy, 15% fine sand, 5-10% medium to coarse sand, lenses of coarse sand at 28.6' and 29.4-29.6', 1" limestone fragment near bottom of sample; Sandy Fat Clay (CH) lenses at 28.65' and 29.0'		Driller's Remark: Lost circulation at 36.5' at 10:07 36.5-38.5' Intermittent medium chattering 37.0-38.5' Hard/slow drilling
12.4	30.0						
	33.8						
		0.1	SS-7	50/1.5 (50/1.5")	Sandy Silt (ML) 33.5-33.6' - dark yellowish orange, (10YR 6/6), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 40-45% fine to coarse grained sand, all carbonate material		
35							12:25 Set 6" diameter casing to 8.5' and 20' HW casing 14:30 - End drilling on 3/15/07
7.4	38.5						
	38.8	0.0	SS-8	50/3 (50/3")	Limestone Fragments 38.50-38.55' - light olive gray, (5Y 6/1), mild HCl reaction, fragments up to 1/2", voids up to 1/16" over 15-20% of surface		
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14	SHEET 3 OF 12
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722999.7 N, 457929.8 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205; Dietrich D-50 S/N 240, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 1.7 ft bgs on 03/20/07 START : 3/14/2007 END : 4/9/2007 LOGGER : C. Wallestad

WATER LEVELS : 1.7' Rods on 3/20/07				START : 3/14/2007		END : 4/9/2007		LOGGERS : G. Wainestad	
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					
2.4								Water level at 1.7' at 12:30 on 3/20/07 Driller's Remark: Set HW casing from 20-38' at 15:00 Driller's Remark: Begin drilling from 38.5' with AWJ rod and 2-7/8" tricone bit (new bit) at 15:20	
	42.5								
	42.8	0.2	SS-9	50/3 (50/3")	Silt With Limestone (ML) 42.5-42.65' - light olive gray, (5Y 5/2), wet, low plasticity, mild to moderate HCl reaction, medium to coarse sand-sized and fine gravel-sized limestone, voids up to 1/16" in diameter covering 15-25% of surface, no visible casts or molds			SS-9 collected from 42.5' to 44.0'	
45									
-2.6								Driller's Remark: Tagged hole at 52.5', 1' short of presumed depth on 3/21/07 at 08:40; Assuming change in bit on morning of 3/20/07 reconciles loss of 1' in measured depth	
	47.5								
	47.9	0.3	SS-10	50/4.5 (50/4.5")	Sandy Silt (ML) 47.5-47.75' - pale yellowish brown, (10YR 6/2), wet, hard, nonplastic to low plasticity, rapid dilatancy, mild to moderate HCl reaction, 30-35% fine to coarse sand, all carbonate material			SS-10 collected from 47.5-49.0'. 16:45 Stopped drilling at 53.5' for the day on 3/20/07	
50									
-7.6								Driller's Remark: Reamed borehole from 38.5' to 52.5' with 3-7/8" tricone bit on 3/21/07 At 08:50; hole tagged at 52.5'	
	53.5								
	54.8	1.3	SS-11	33-50-50/4 (100/10")	Sandy Silt (ML) 53.5-54.8' - moderate yellowish brown, (10YR 5/4), wet, hard, low plasticity, slow to rapid dilatancy, mild HCl reaction, 30% fine to medium grained sand, 3/16" thick grayish black (N2) organic lens at 53.75', other irregular organic lenses and stringers throughout sample				
55									
-12.6									
	58.5								
	59.4	0.9	SS-12	26-50/5 (76/11")					
60									



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14
SHEET 4 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722999.7 N, 457929.8 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205; Dietrich D-50 S/N 240, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 1.7 ft bgs on 03/20/07 START : 3/14/2007 END : 4/9/2007 LOGGER : C. Wallestad

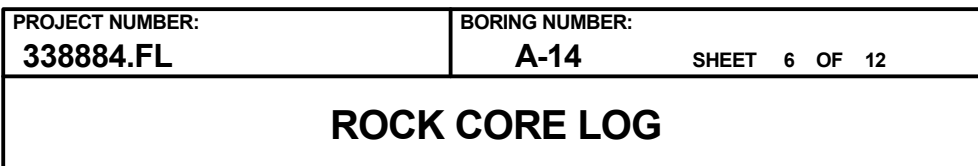
WATER LEVELS : 1.7 TUBS ON 03/20/07			START : 3/14/2007		END : 4/9/2007		LOGGERS : G. Waitestad	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
	RECOVERY (ft)			SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY				
	#TYPE	6"-6"-6" (N)						
-17.6					Silt (ML) 58.5-59.4' - moderate yellowish brown, (10YR 5/4), wet, hard, low plasticity, rapid dilatancy, mild to moderate HCl reaction, 10-15% very fine to fine grained sand, trace black particles, carbonate material			
63.5								
63.9	0.4	SS-13	50/5 (50/5")		Silt With Sand (ML) 63.5-63.9' - Same as 58.5-59.4' except dark yellowish orange, (10YR 6/6), up to 20% fine to medium sand			
65								
-22.6							Driller's Remark: 66.5-67' hard layer, light chatter	
68.5								
69.3	0.7	SS-14	25-50/4 (75/10")		Silty Sand With Limestone Lenses (SM) 68.5-69.15' - moderate yellowish brown, (10YR 5/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 25% low plasticity fines, around 50% of sample is limestone lenses up to 1" in size, voids up to 1/16" in size over 5-10% of surface, all carbonate material		Driller's Remark: Slow drilling and moderate chattering, hard rock	
70								
-27.6								
73.5								
73.8	0.0	SS-15	50/1 (50/1")		Limestone Fragments 73.5-73.55' - Fragments up to 1/2" in size, with Silty Sand (SM) as in 68.5-69.15'		Driller's Remark: Advance HW casing from 38.0' to 73.5'	
75								
-32.6								
78.5								
78.9	0.0	SS-16	50/5 (50/5")		Limestone Fragments 78.50-78.55' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, up to 1/2" in size, voids up to 1/16" over 50-70% of surface, no visible fossils or cavities			
80								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14
SHEET 5 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722999.7 N, 457929.8 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205; Dietrich D-50 S/N 240, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.7 ft bgs on 03/20/07 START : 3/14/2007 END : 4/9/2007 LOGGER : C. Wallestad

WATER LEVELS : 1.7 TUBS ON 03/20/07		START : 3/14/2007		END : 4/9/2007		LOGGERS : G. Wainestad	
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
-37.6							Driller's Remark: 81.5-82.5' soft rock Driller's Remark: 82.5-83.5' hard, heavy chattering
	83.5						Driller's Remark: Stopped drilling at 83.5' at 18:10 Driller's Remark: Start SPT with AWJ rod on 3/22/07 at 08:10
85							
-42.6	84.4	0.0	SS-17	37-50/5 (87/11")	Silty Sand With Limestone (SM) 83.5-83.55' - moderate yellowish brown, (10YR 5/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 29% low plasticity fines, 50% of sample is gravel-sized limestone fragments up to 1/2" in size, voids up to 1/16" over 40-60% of surface, all carbonate material		
	88.5						Driller's Remark: 87.5-88.0' heavy chatter, hard rock
	88.8	0.0	SS-18	50/3 (50/3")	Limestone Fragments 88.50-88.55' - pale yellowish brown, (10YR 6/2), moderate HCl reaction, very poor recovery, fragments up to 1/2", voids up to 1/16" over 15-25% of surface, moderately fossiliferous, no visible cavities		
90							
-47.6							Driller's Remark: 90.0-93.5' moderate chatter, slow drilling, hard rock
	93.5						
	93.8	0.1	SS-19	50/3 (50/3")	Sandy Silt With Limestone (ML) 93.5-93.6' - grayish olive, (10YR 4/2), wet, hard, very dense, low plasticity, moderate HCl reaction, 30% fine to medium grained sand, pale yellowish brown (10YR 6/2) limestone lenses up to 1/4" thick		
95							
-52.6							
	98.5						
	98.9	0.3	SS-20	50/5 (50/5")	Limestone 98.5-98.8' - pale yellowish brown, (10YR 6/2), moderate HCl reaction, limestone fragments up to 1/2"x3/4"		
					Begin Rock Coring at 98.4 ft bgs See the next sheet for the rock core log		
100							



ORIENTATION : Vertical

LOGGER : C. Wallestad

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14	SHEET 7 OF 12
ROCK CORE LOG		

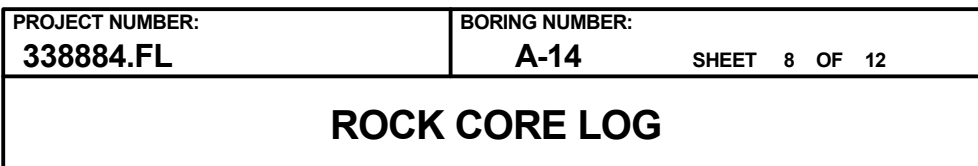
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722999.7 N, 457929.8 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205; Dietrich D-50 S/N 240, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.7 ft bgs on 03/20/07 START : 3/14/2007 END : 4/9/2007 LOGGER : C. Wallestad

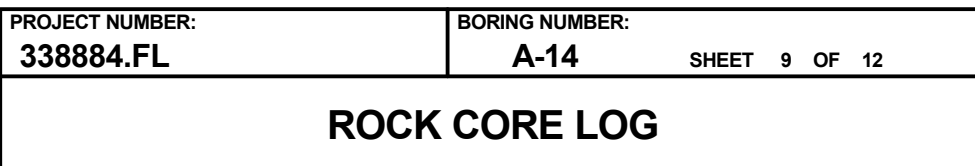
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
120 -77.6	R5-NQ 5 ft 72%	20	NR	111.6-111.7' - Fractures or mechanical break (2), 5 deg and 70 deg, rough, undulating, tight		No Recovery 118.2-118.4' Limestone 118.4-122.0' - Same as 108.9-112.8' except voids up to 1/16" over 15-25% of surface	Start drilling on 3/24/07 at 08:05
			>10	111.8-111.9' - Fractures (2), 10 deg and 70 deg, smooth, undulating, tight			Still no circulation Driller's Remark: 121.4-121.6' small void
			>10	112.8-113.4' - Fracture zone (2), 1"x1-1/2" fragments			
			4	114.2-114.4' - Fracture zone (2), 1"x1-1/2" fragments			
			NR	114.5-114.6' - Fractures (2), 30 deg, smooth, undulating, intersecting, tight to open 1/4"			
125 -82.6	R6-NQ 5 ft 50%	16	9	114.65-114.8' - Bedding plane or mechanical break (2), horizontal, smooth, undulating, tight to open 1/4"		No Recovery 122.0-123.4' Limestone 123.4-125.9' - Same as 108.9-112.8' except voids up to 1/16" over 15-40% of surface increasing with depth, trace fossil casts up to 1/16"x1/4"	R5: 9 minutes
			4	115.9' - Fracture, same as 114.65', tight			
			1	117.3' - Fracture, 45 deg, smooth, undulating to stepped, tight			
			NR	117.8' - Fracture or mechanical break, 10 deg, smooth, undulating to stepped, tight to open 1/4"			Driller's Remark: Void at 124.7-125.8'
			NR	118.6,-118.7' - Bedding plane or mechanical break (2), horizontal, smooth to undulating, stepped, tight to open 1/8"			
130 -87.6	R7-NQ 5 ft 56%	9	NR	118.7-119.6' - Fracture zone (2), up to 1-3/4"x2" sized fragments, many fractures at 0 deg, a few at 70-80 deg		No Recovery 125.9-128.4' Limestone 128.4-131.2' - pale yellowish brown, (10YR 6/2), fine to medium grained, mild to moderate HCl reaction, medium strong (R3), voids up to 3/16" over 10-20% of surface, trace fossil casts up to 1/4" diameter	R6: 12 minutes
			7	119.7' - Fracture, 80 deg, smooth, undulating, tight			
			7	120.3' - Fracture, 40 deg and 45 deg, smooth, undulating, tight			
			>10	120.8' - Fracture, 80 deg, rough, undulating, tight			Water level at 1.9' below ground surface on 3/26/07 at 08:00 Water level 1.9' below ground surface on 3/27/07 at 08:08 Driller's Remark: No circulation during run Driller's Remark: Light chatter from 128.4-132.4' Driller's Remark: no chatter, faster drilling from 132.4-132.9' R7: 12 minutes
			NR	120.9' - Mechanical break			
135 -92.6	R8-NQ 5 ft 28%	0	>10	121.0-121.5' - Fracture zone (2), breaks at 80-90 deg, many discontinuities up to 1-3/4"x1-3/4" fragments		No Recovery 131.2-133.4' Limestone 133.4-134.25' - light olive gray, (5Y 5/2), very fine to fine grained, mild to moderate HCl reaction, medium strong (R3), voids (1/16") over <10% of surface, trace fossil casts up to 1/2"x1/4"	Driller's Remark: Very soft from 133.4-135.4', harder from 135.4-137.4', soft from 137.4-138.4'
			>10	121.5' - Bedding plane, horizontal, smooth, undulating, open			
			NR	121.8-121.9' - same as 121.5' except tight			
			NR	121.85' - Fracture, 80 deg, rough, undulating, open			
			NR	123.4-123.7' - Fracture zone (2), three rock fragments			
138.4			>10	123.9, 124.2, 124.45' - Fracture or mechanical break (3), horizontal and 10 deg, rough, undulating, open		134.25-134.65' - dusky yellow, (5Y 6/4), medium to coarse grained, moderate HCl reaction, medium strong (R3), voids (3/16") over 15-30% of surface, 5-10% fossil casts up to 3/6"x1/2"	R8: 8 minutes
			>10	124.7-124.75' - Bedding plane or mechanical break (2), horizontal, smooth, planar to undulating, tight to 1/4" open			
			NR	125.0' - Bedding plane or mechanical break, horizontal, smooth, planar to undulating, open			
			NR	125.4' - Fracture, 60 deg, planar to stepped, open 1/4"-1/2"			
			NR	128.5' - Fracture, 40 deg, rough, undulating, open			
				128.8' - Fracture, 70 deg, rough, undulating, tight to open 1/5"			
				128.85' - Fracture, 30 deg, rough, undulating, tight to open 1/8"			



ORIENTATION : Vertical

LOGGER : C. Wallestad

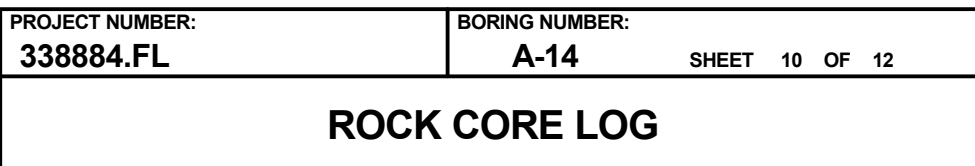
Rev. 4



ORIENTATION : Vertical

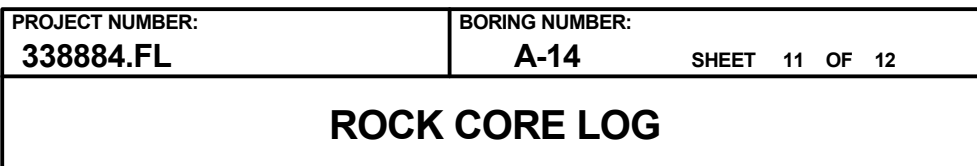
LOGGER : C. Wallestad

Rev. 4



LOGGER : C. Wallestad

Rev. 4



ORIENTATION : Vertical

LOGGER : C. Wallestad

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14	SHEET 12 OF 12
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722999.7 N, 457929.8 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205; Dietrich D-50 S/N 240, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.7 ft bgs on 03/20/07 START : 3/14/2007 END : 4/9/2007 LOGGER : C. Wallestad

WATER LEVEL: 1.1' R BGS ON 06/20/07		DATE: 10/14/2007		END : 10/20/2007		BOILER : G. Walstead	
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		
220 -177.6	R25-NQ 5 ft 0%	0	NR			Limestone 218.25-218.4' - pale yellowish brown, (10YR 6/2), fine to medium grained, moderate HCl reaction, medium strong (R3), trace voids up to 1/16" over 5-10% of surface No Recovery 218.4-223.4'	R24: 12 minutes Driller's Remark: Circulation almost returned, hard coming up casing; harder rock at bottom of run R25: 18 minutes
223.4						Bottom of Boring at 223.4 ft bgs on 4/9/2007	Driller's Remark: Switched to split spoon to attempt to recover a sample Stop coring for day on 4/6/07 at 13:45 Water level at 2.4' below ground surface on 4/7/07 at 07:50 End of boring at 223.4'. Driller's Remark: Hole terminated short of 250.0' total depth due to borehole collapse from 174.0-223.0' and ground collapse around the surface casing and under the drill rig



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14A
SHEET 1 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.6 N, 457934.5 E (NAD83)
 ELEVATION : 42.2 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, 2-15/16 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.6 ft bgs on 6/13/07 START : 6/12/2007 END : 6/13/2007 LOGGER : D. Whitaker

WATER LEVELS : 3.61 RDS ON 9/15/07			START : 9/12/2007			END : 9/13/2007			LOGGERS : D. Whitaker		
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				
42.2	0.0	1.3	SS-1	2-2-3 (5)	Silty Sand With Organics (SM) 0.0-0.55' - brownish black, (5YR 2/1), moist, loose, bark and root matter present, sand is light gray (N7), fine grained, silica, 22% fines		11:30 - Start sampling using AWJ rods, 2"x2" split spoon, drilling with 2-15/16" tri-cone bit				
	1.5				Poorly Graded Sand (SP) 0.55-1.3' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), moist to wet, loose, very fine to fine grained, trace non-plastic fines, 10% roots and organics		Wet at 1'				
5											
37.2	5.0										
		1.1	SS-2	1-1-0 (1)	Poorly Graded Sand (SP) 5.0-6.1' - yellowish gray, (5Y 7/2), wet, very loose, very fine to fine grained, medium plasticity, 4% nonplastic fines, sand is silica						
	6.5										
10											
32.2	10.0										
		0.3	SS-3	0-0-1 (1)	Clayey Sand (SC) 10.0-10.25' - light bluish gray, (5B 7/1), wet, very loose, no HCl reaction, 33% high plasticity fines, fine to coarse sand and fine gravel-sized limestone fragments that are yellowish gray (5Y 7/2) with strong HCl reaction						
	11.5						Driller's Remark: Slight loss of circulation at 12'				
15											
27.2	15.0						14:40 - 15' of HW casing installed				
	15.4	0.3	SS-4	50/5 (50/5")	Silt (ML) 15.0-15.33' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 3% fine sand, trace organics, all carbonate material		15:00 - Add bentonite chips around surface casing and borehole to prevent caving				
20											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-14A

SHEET 2 OF 6

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.6 N, 457934.5 E (NAD83)

ELEVATION : 42.2 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, 2-15/16 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 3.6 ft bgs on 6/13/07

START : 6/12/2007

END : 6/13/2007

LOGGER : D. Whitaker

WATER LEVELS : 3.61 bgs on 9/13/07			START : 9/12/2007			END : 9/13/2007			LOGGER : D. Whitaker		
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						
22.2	20.0	1.0	SS-5	10-16-13 (29)	Silt With Sand (ML) 20.0-21.0' - grayish orange, (10YR 7/4), wet, very stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 25% very fine to medium grained sand, coarse sand to fine gravel-sized lenses at 20.0-20.5', all carbonate material						
	21.5										
25	25.0										
17.2	25.4	0.4	SS-6	50/4.5 (50/4.5")	Silt With Sand (ML) 25.0-25.4' - grayish orange to dark yellowish orange, (10YR 7/4 to 10YR 6/6), moist, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 15% fine sand sized, all carbonate material						
30	30.0										
12.2		0.6	SS-7	14-5-9 (14)	Sandy Silt (ML) 30.0-30.6' - grayish orange to dark yellowish orange, (10YR 7/4 to 10YR 6/6), wet, stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 40% fine to coarse sand sized, 10% fine gravel-sized grains, all carbonate						
	31.5										
35	35.0							16:10 - Recover SS-8, decide to start rock coring; add 20' HW casing to 34' (1' stickup)			
7.2	35.3	0.3	SS-8	50/3.5 (50/3.5")	Silt And Limestone Fragments (ML) 35.0-35.3' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), wet, moderate to strong HCl reaction, 60% of sample is silt (similar to SS-7), 40% of sample is limestone fragments up to 1/4", all carbonate material Begin Rock Coring at 36.0 ft bgs See the next sheet for the rock core log			SS-8 may be slough/cuttings Borehole drilled from 35.3-36.0' without sampling to set stroke			
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-14A

SHEET 3 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.6 N, 457934.5 E (NAD83)

ELEVATION : 42.2 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 : 3.6 ft bgs on 6/13/07

START : 6/12/2007

END : 6/13/2007

LOGGER : D. Whitaker

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.
36.0	R1-NQ 5 ft 100%	91	1	36.7' - Mechanical break or bedding plane, 10 deg, rough, undulating, tight to 1/4" open		Limestone 36.0-41.0' - light olive gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), 25% voids up to 1/16" increasing to 40% at 37.5', many oblong cavities (3/16" to 9/16") with trace recrystallization on inner surfaces, trace infill	Water level at 3.6' below ground surface on 6/13/07 at 07:30 Begin rock coring at 36' below ground surface 07:55 on 6/13/07 SC-1 collected at 36.7- 37.85' R1: 11 minutes
			1				
			2	37.9' - Mechanical break or bedding plane, 10 deg, smooth to rough, undulating, tight			
			0	38.55, 38.9' - Mechanical break or fractures (2), 25 deg and 45 deg, rough, undulating, tight			
40 2.2			0				
41.0	R2-NQ 5 ft 96%	84	0			41.0-43.8' - Same as 36.0-41.0' except very weak (R1) at 42.6-43.8' 43.8-45.8' - light olive gray, (5Y 7/2), fine to medium grained, extremely weak (R0), 60% voids up to 1/16" with some silt-sized infill and minor recrystallization, few black 1/16" diameter fossils, thin laminations of organic material from 45.65-45.8' No Recovery 45.8-46.0' Limestone 46.0-47.3' - moderate yellowish brown, (10YR 5/4), fine to medium grained, strong HCl reaction, very weak (R1), up to 1/16" voids over 40% of surface, trace black fragments at 46.1', some silt-sized infill, some recrystallization in void space, many (>5) black organic fragments up to 3/16" diameter 47.3-50.0' - Same as 46.0-47.3' except extremely weak (R0), with trace black fragments at 48.8' No Recovery 50.0-51.0' Limestone 51.0-53.35' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, extremely weak (R0), 5-15% voids <1/16" on surface, trace 1/32" to 1/16" black laminations, many 1/16" black organic particles No Recovery 53.35-56.0'	R2: 6 minutes
			2				
			1	42.6, 42.9, 43.7, 43.9, 44.7, 44.95, 45.3, 45.6' - Mechanical break (8), 5-15 deg, smooth to rough, undulating, tight			
45 -2.8			2				
			0				
46.0	R3-NQ 5 ft 80%	53	NR				Additional mechanical breaks created when placing core into box, due to rock conditions R3: 5 minutes
			2	46.1, 46.5, 47.6, 47.8, 48.8, 49.15, 49.6, 49.9' - Bedding plane or mechanical break (8), <15 deg, smooth, undulating, tight to 1/4" open			
			2				
			2				
			3				
50 -7.8	R4-NQ 5 ft 47%	0	NR				R4: 2 minutes
			5	51.15, 51.4' - Fractures or mechanical break (2), 30 deg, smooth, planar to undulating, tight to 1/2" open			
			>10	51.75, 51.82' - Bedding plane (2), <10 deg, smooth, undulating			
			2	51.75-51.82' - Fracture, 85 deg, smooth, planar, extends between 2 bedding plane fractures			
			NR	52.0-52.3' - Fracture zone 53.0, 53.15' - Bedding plane or mechanical break (2), 5 deg, rough, undulating			
55 -12.8							
56.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14A	SHEET 4 OF 6
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.6 N, 457934.5 E (NAD83)

ELEVATION : 42.2 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 : 3.6 ft bgs on 6/13/07

START : 6/12/2007

END : 6/13/2007

LOGGER : D. Whitaker

WATER LEVELS : 3.01 bbs on 07/13/07							START : 07/12/07		END : 07/13/07		LOGGER : D. Whitaker	
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								
60 -17.8	R5-NQ 5 ft 0%	0	NR				No Recovery 56.0-61.0'		Driller's Remark: All sand/silt-sized particles fell out/washed out of core barrel during retrieval			
	61.0								Driller's Remark: Fragments/pieces of rock could be felt at 59.0' R5: 2 minutes			
	R6-NQ 5 ft 31%	0	NR	61.0-61.2' - Fracture zone, 2 subrounded gravel sized fragments			Limestone 61.0-62.55' - dusky yellow, (5Y 6/4), fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), 40% surface voids up to 1/16", trace very thin (<1/32") black laminations at 61.25-61.3', oblong black material up to 1-3/16" x 1/16", spherical black material at 3/8" diameter, many cavities up to 3/8"x 3/16" No Recovery 62.55-66.0'		R6: 2 minutes			
				61.4' - Bedding plane or mechanical break, horizontal, smooth, undulating, tight								
				61.65' - Bedding plane, horizontal, rough, planar, black staining on surface, <1/2" open								
				61.9' - Bedding plane or mechanical break, <10 deg, rough, undulating, tight								
	65 -22.8	R7-NQ 5 ft 75%	14	NR	62.05' - Fracture or mechanical break, 25 deg, smooth, undulating, tight		Limestone 66.0-69.75' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, weak (R2), 30% surface voids <1/16" diameter many cavities up to 3/8"x3/16", minor recrystallization, trace black laminations up to 3/16" thick, trace black organic material up to 5/16" diameter moderately fossiliferous (molds, casts) No Recovery 69.75-71.0'		09:50 Driller's Remark: Hole started caving due to loose interval at 56.0-61.0', installed HW casing from 35.0-60.0' 11:20 Casing installed, borehole flushed R7: 5 minutes			
					62.35' - Fracture or mechanical break, 10 deg, smooth, undulating, tight to 1" open							
					66.1' - Bedding plane, horizontal, rough, stepped, up to 1" open							
					67.05-67.55' - Fracture zone							
70 -27.8	R8-NQ 5 ft 62%	22	NR	67.7, 69.1' - Fracture (2), 75 deg, rough, undulating to stepped, tight to <1/2" open		Limestone 71.0-72.15' - Same as 66.0-69.75' except very weak (R1), 40% surface voids <1/16" 72.15-74.1' - Same as 66.0-69.75' except extremely weak (R0), 5% surface voids <1/16" No Recovery 74.1-76.0'		R8: 4 minutes				
				67.9, 68.05' - Bedding plane or mechanical break (2), <10 deg, smooth, undulating								
				68.25, 68.45, 68.6' - Bedding plane or mechanical break (3), <15 deg								
				68.7' - Fracture, 45 deg, rough, stepped, tight								
				69.34-69.5' - Fracture zone								
				71.8' - Bedding plane, 10 deg, rough, stepped								
75 -32.8				72.1' - Bedding plane, horizontal, rough, stepped								
				72.6, 72.9, 73.65, 73.9' - Mechanical break or bedding plane (4), <15 deg, smooth, planar to undulating, tight								
				73.2' - Fracture, 40 deg, tight								
76.0												



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-14A

SHEET 5 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.6 N, 457934.5 E (NAD83)

ELEVATION : 42.2 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 : 3.6 ft bgs on 6/13/07

START : 6/12/2007

END : 6/13/2007

LOGGER : D. Whitaker

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			
80 -37.8	R9-NQ 5 ft 80%	0	1	76.55' - Mechanical break		Limestone 76.0-80.0' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), 50% surface voids <1/16", many (5+) cavities, few large cavities up to 1-3/16"x5/16", minor silt-sized infill, minor recrystallization, trace black fossil casts, poorly fossiliferous, zone from 77.95-78.75' is weak rock (R2), 5% surface coverage of voids <1/16" with minor recrystallization No Recovery 80.0-81.0'	Driller's Remark: Slight mud loss at 80.0' R9: 5 minutes
			2	76.9-77.05, 77.25-77.43' - Fracture zone, sand to gravel-sized limestone fragments			
			>10	78.05' - Bedding plane, 5 deg, rough, stepped, up to 1/4" open			
			1	78.15' - Bedding plane, horizontal, rough, stepped, up to 3/4" open			
			NR	78.25-78.5, 78.7-78.8' - Fracture zone 79.65' - Mechanical break, <15 deg, rough, stepped			
85 -42.8	R10-NQ 5 ft 84%	34	>10	81.1' - Fracture, horizontal, smooth, planar, black organic infill or staining		Limestone 81.0-81.4' - very pale orange, (10YR 8/2), fine grained, very weak (R1), laminated bedding, 3/4" black organic layer at 81.0' 81.4-82.9' - pale olive, (10Y 6/2), weak to medium strong (R2 to R3), 20-25% coverage of surface voids up to 1/16", fossiliferous 82.9-83.6' - grayish orange, (10YR 7/4), fine grained, moderate to strong HCl reaction, very weak (R1) 83.6-85.2' - yellowish gray, (5Y 7/2), medium strong (R3), 20-25% voids up to 1/16" over surface, 1-2% fossil molds up to 5/16" No Recovery 85.2-86.0'	R10: 5 minutes
			3	81.3-81.75' - Fracture zone, angular rock fragments			
			>10	81.7' - Fractures (2), 60 deg and 45 deg, smooth, stepped, intersecting, tight			
			0	81.85' - Fracture, vertical, rough, undulating, 1/8" open			
			NR	82.5, 82.65, 83.4, 83.55' - Fracture (4), 50 deg, rough, undulating to stepped, tight to 1/4" open 83.0-83.2, 83.76-83.95' - Fracture zone 84.1' - Fracture, 45 deg, rough, stepped			
90 -47.8	R11-NQ 5 ft 60%	40	3	86.4-86.6' - Fracture zone, bound by 45 deg fractures, rough, undulating		Limestone 86.0-89.0' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, medium strong (R3), 15-20% surface coverage of voids up to 1/8", <2% surface coverage of cavities/molds up to 3/8" (1"x2" cavity at 88.9'), sparse soft white infilling in some of the larger molds No Recovery 89.0-91.0'	SC-2 collected at 87.3-88.35' R11: 9 minutes
			1	87.1' - Fracture, 75 deg, smooth, undulating			
			1	87.3' - Bedding plane, horizontal, rough, undulating, bedding plan splits into 45 deg fractures above and below			
			NR	88.4' - Mechanical break, smooth, stepped, tight			
95 -52.8	R12-NQ 5 ft 82%	7	3	91.1, 91.4' - Bedding plane (2), <10 deg, smooth, undulating		Limestone 91.0-91.7' - Same as 86.0-89.0' 91.7-95.1' - moderate yellowish brown, (10YR 5/4), fine to medium grained, strong HCl reaction, extremely weak (R0), 5-10% surface coverage of voids <1/16", trace black oblong material up to 3/8"x1/16", minor recrystallization No Recovery 95.1-96.0'	Driller's Remark: Slight mud loss at 92.0', lost circulation completely at 93.0' R12: 7 minutes
			2	91.5' - Fracture, 45 deg, smooth, undulating			
			>10	91.88, 92.2, 92.6' - Bedding plane or mechanical break (3), <5 deg, rough, undulating to stepped, tight except 1/4" open at 92.2'			
			2	92.9' - Mechanical break, horizontal, smooth, undulating, tight			
			NR	93.0-93.33' - Fracture zone 93.33' - Fracture, 60 deg, rough, stepped 93.5' - Fracture, 45 deg, smooth, stepped, black staining, tight 93.8, 93.95, 94.2' - Fractures (3), 45-60 deg, rough, planar to stepped			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-14A
SHEET 6 OF 6	
ROCK CORE LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.6 N, 457934.5 E (NAD83)

ELEVATION : 42.2 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 : 3.6 ft bgs on 6/13/07 START : 6/12/2007 END : 6/13/2007 LOGGER : D. Whitaker

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.
100 -57.8	R13-NQ 5 ft 86%	18	5	94.5, 94.8, 95.0' - Bedding plane (3), <10 deg, rough, undulating, black staining at 94.5', tight to 1/4" open		Limestone 96.0-97.8' - light olive gray grading to yellowish gray, (5Y 5/2 to 5Y 7/2), fossiliferous (molds/casts), voids up to 1/16" over 10-15% of surface, 1-2% coverage of molds/casts up to 3/8" diameter	R13: 7 minutes
			>10	96.1' - Bedding plane, horizontal, smooth, undulating		97.8-100.3' - yellowish gray, (5Y 5/2), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), 15-30% surface coverage of voids up to 1/8", few large cavities up to 3/8", fossiliferous (molds)	
			>10	96.4' - Fracture, 55 deg, smooth, undulating, tight		No Recovery 100.3-101.0'	
			6	96.7-96.95' - Fracture zone		Limestone 101.0-103.9' - Same as 97.8-100.3'	R14: 9 minutes
			1	97.5' - Fracture or mechanical break, 40 deg, rough, undulating, tight			
			NR	97.85, 98.3' - Bedding plane (2), horizontal, rough, undulating, tight			
105 -62.8	R14-NQ 5 ft 58%	16	1	98.0' - Fracture, 80 deg, smooth to rough, undulating, with fragments along length from 97.55-98.5'		No Recovery 103.9-106.0'	R15: 10 minutes
			>10	98.5, 98.7' - Fracture (2), 50 deg, smooth, stepped, V-shaped fractures			
			>10	98.8, 99.2, 99.4' - Bedding plane or mechanical break (3), horizontal			
			NR	99.4-99.5' - Fracture zone		Limestone 106.0-110.5' - pale yellowish brown, (10YR 6/2), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), 25% voids <1/16" on surface, 5+ cavities up to 3/4"x1/4", faint horizontal white and black bands throughout core	16:00 - Reached total depth of 111.0'
			>10	99.5' - Bedding plane, horizontal, rough, planar			
			>10	99.7, 100.0' - Bedding plane or mechanical break (2), <10 deg, smooth to rough, undulating, tight to 1" open			
110 -67.8	R15-NQ 5 ft 90%	37	1	101.75' - Fracture, 40 deg, smooth to rough, stepped, up to 3/4" open		No Recovery 110.5-111.0'	Water level is 1.7' below ground surface on 6/14/07 at 08:00 before grouting and with casing still in hole
			1	101.9-102.45' - Fracture zone			
			1	102.7' - Fracture, rough, undulating, conchoidal fracture plane, 1/4" open			
			NR	102.9, 103.1' - Fractures (2), 50 deg, smooth, stepped		Bottom of Boring at 111.0 ft bgs on 6/13/2007	
			>10	103.25-103.9' - Fracture zone			
			>10	103.55' - Fracture, 45 deg, smooth, planar			
			1	106.0-106.7' - Fracture zone			
			1	106.8, 107.2' - Fractures (2), 70 deg, rough, stepped, tight to 1/8" open			
			1	107.05, 107.3' - Bedding plane (2), horizontal, rough, undulating			
			1	107.4-107.9' - Fracture zone			
			1	107.9, 108.2' - Fractures (2), 60 deg, rough, undulating to stepped, up to 3/4" open			
			NR	109.2' - Mechanical break, 65 deg			
			NR	110.2' - Bedding plane or mechanical break, horizontal, smooth, undulating, tight to 1/2" open			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-15
SHEET 1 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722937.2 N, 457994.3 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: F. Harrington, M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/11/2007 END : 2/20/2007 LOGGER : A. Teal, R. Gomez

WATER LEVELS : 4.41 ft bgs on 3/09/07			START : 2/11/2007		END : 2/20/2007		LOGGERS : A. Teal, H. Gomez	
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			
42.5							Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)"	
							Water levels not recorded during drilling	
	4.5							
5								
37.5		1.5	SS-1	3-3-4 (7)	Poorly Graded Sand (SP) 4.5-6.0' - grayish orange pink, (5YR 7/2), wet, loose, very fine to fine grained, no HCl reaction, 20% fine organics, trace nonplastic fines, trace fine rounded gravel, silica sand			
	6.0							
	9.5							
10								
32.5		1.0	SS-2	6-6-8 (14)	Poorly Graded Sand (SP) 9.5-10.5' - pinkish gray, (5YR 8/1), wet, medium dense, very fine to fine grained, no HCl reaction, trace nonplastic fines, trace black minerals, silica sand			
	11.0							
	14.5							
15								
27.5		0.9	SS-3	3-3-2 (5)	Poorly Graded Sand (SP) 14.5-15.4' - Same as 9.5-10.5' except loose			
	16.0							
	19.5							
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-15
SHEET 2 OF 11	
SOIL BORING LOG	

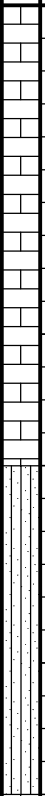
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722937.2 N, 457994.3 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: F. Harrington, M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/11/2007 END : 2/20/2007 LOGGER : A. Teal, R. Gomez

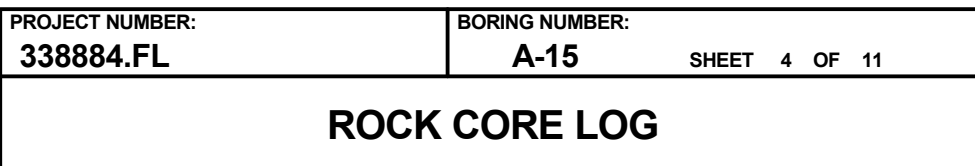
WATER LEVELS : 4.41 ft bgs on 3/6/07			START : 2/11/2007		END : 2/20/2007		LOGGERS : A. Teal, R. Gomez		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION			
22.5		1.1	SS-4	1-1-0 (1)	Poorly Graded Sand (SP) 19.5-20.35' - Same as 14.5-15.4'			Weight of hammer drove last 6"	
21.0					Sandy Lean Clay (CL) 20.35-20.6' - light olive gray, (5Y 5/2), moist, very soft, low to medium plasticity, slow dilatancy, no HCl reaction, 35-40% very fine to fine silica sand				
24.5									
25									
17.5		1.5	SS-5	2-1-1 (2)	Clayey Sand (SC) 24.5-26.0' - very pale orange, (10YR 8/2), moist, very loose, very fine to fine grained, no HCl reaction, 27% fines, fat clay interbeds 1/8"-5/8" thick at 24.6', 24.8', 25.2', 25.5', 25.85' and 25.95' (olive gray [5Y 4/1], moist, very soft, high plasticity, no dilatancy)				
26.0									
29.5									
30									
12.5		1.2	SS-6	18-19-13 (32)	Silt With Sand (ML) 29.5-30.7' - grayish orange, (10YR 7/4), moist, hard, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, 19% fine to medium sand sized, carbonate				
31.0									
34.5									
35									
7.5		1.1	SS-7	21-42-50/4 (92/10")	Silt With Sand (ML) 34.5-35.6' - dark yellowish orange, (10YR 6/6), moist, hard, mild to moderate HCl reaction, 10-25% very fine to medium sand-sized (varies in sample), laminated beds of white at 35.1' and 35.3-35.6', all carbonate				
35.8									
39.5									
39.6	0.0	SS-8	50/1.5 (50/1.5")		Limestone Fragments 39.5' - olive gray, (5Y 3/2), voids over 80-90% of surface, mild HCl reaction on unscratched surface, moderate HCl reaction when scratched			Switch to rock coring at 40'	
40									
					Begin Rock Coring at 40.0 ft bgs See the next sheet for the rock core log				



PROJECT NUMBER: <div style="font-size: 1.2em; font-weight: bold;">338884.FL</div>	BORING NUMBER: <div style="font-size: 1.2em; font-weight: bold;">A-15</div>
SHEET 3 OF 11	
<div style="font-size: 1.5em; font-weight: bold;">ROCK CORE LOG</div>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722937.2 N, 457994.3 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: F. Harrington, M. Griffin
 CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, NW casing ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/11/2007 END : 2/20/2007 LOGGER : A. Teal, R. Gomez

WATER LEVELS: 4.4 ft (Rds on 3/30/07)		START: 2/11/2007		END: 2/20/2007		LOGGER: A. Teal, R. Gomez		
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				
2.5	40.0	70	3	40.0-40.2' - Fracture zone		Limestone 40.0-41.9' - light olive gray, (5Y 5/2), moderate to strong HCl reaction, medium strong to strong (R3 to R4), fossiliferous (casts) voids 60-70% coverage, few cavities up to 1/16" No Recovery 41.9-42.0' Limestone 42.0-47.0' - Same as 40.0-41.9' except many cavities up to 1/4", voids (1/16") up to 60% coverage, very weak (R1) below 46.0'	Begin rock coring at 40' Core run times were not recorded at the time of drilling	
	R1-NQ 2 ft 95%		0	40.35' - Fracture, vertical, rough, planar, tight 40.5' - Fracture, 10 deg, rough, undulating, open				
	42.0	NR						
		0						
		4	43.3-43.4' - Fracture zone, rock fragments, coarse sand (1/16") to gravel (1") size					
		6	44.1' - Fracture, 5 deg, rough, undulating, open					
45			44.25, 44.4' - Fracture (2), 88 deg and vertical, rough, planar, tight					
-2.5		5	44.5, 44.6' - Fractures (2), 10 deg, rough, undulating, <1" relief					
		2	44.85, 45.35' - Fractures (2), 40 deg, rough, planar, tight					
	47.0		45.55-45.7' - Fracture zone, rock fragments from fine gravel (3/16") to coarse gravel (1"x2") size					
		0	45.9' - Fracture, 50 deg, rough, undulating, open	Sandy Silt (SM) 47.0-50.1' - light olive gray, (5Y 5/2), wet, 20-25% very fine to coarse grained sand, trace gravel-sized limestone fragments, thin (1/16-1/8") organic layers throughout (30% coverage), section compacted at 49.0-50.0' with no cementation No Recovery 50.1-52.0'	Loggers: A. Teal/ C. Dougherty			
			NA			46.6' - Mechanical break		
						46.9' - Fracture zone, 10 deg, smooth, undulating, 1-1/4" relief		
						47.0-50.1' - Fracture zone, sandy silt, mostly loose indurated material, fractures very easily, some fractures may be mechanical		
50		NR						
-7.5								
	52.0		>10			52.0-57.0' - Fractures or mechanical break, mostly mechanical breaks due to soft material, partially lithified compacted fragments from silt to coarse sand, up to 1" sections		
			>10					
		20	2			54.0' - Fracture, horizontal, rough, undulating, 3/8" relief		
						54.4' - Fracture, 3/16" open		
			>10					
55			0					
-12.5			NR					
	57.0		4	57.25' - Fracture, 15 deg, smooth, undulating, <1" open				
			0	57.5, 60.8' - Fractures (2), 20 deg, rough, undulating, open				
		80		57.8' - Fracture, 10 deg, smooth, planar, tight, lignite lamination 3/8" thick				
			1	57.95' - Fracture, 60 deg, rough, undulating to planar, tight				
60								



ORIENTATION : Vertical

LOGGER : A. Teal, R. Gomez

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-15

SHEET 5 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722937.2 N, 457994.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 4.41 ft bgs on 3/06/07

START : 2/11/2007

END : 2/20/2007

LOGGER : A. Teal, R. Gomez

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			
-37.5			0	79.8, 78.3, 80.4' - Mechanical break (3)		Limestone 79.4-80.9' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 80% of surface, few larger (up to 3/16") voids, moderately fossiliferous	Many of the fragments at 82.0-82.5' show tooling marks from drilling; fragmentation could be result of drilling
			NR			No Recovery 80.9-82.0' Limestone 82.0-86.7' - dusky yellow, (5Y 6/4), fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over 80% of surface, moderately fossiliferous, zones at 83.7-84.0' and 86.3-86.7' have few voids, black organic laminations (20%), and color closer to yellowish gray 5Y 7/2	
82.0			>10	82.0-82.5' - Fracture zone, limestone fragments, coarse sand cobble-sized			
			2	82.65' - Fracture, 60 deg, smooth, undulating, open			
			>10	83.35' - Fracture, 25 deg, rough, undulating, open			
			1	83.7, 84.0, 84.1, 84.15' - Bedding plane (4), organic beds, black, thin laminations			
			2	84.4-85.3' - Fracture zone, limestone fragments from silt to cobble-sized			
			NR	85.75' - Fracture, 25 deg, rough, undulating, tight			
			3	86.0, 86.2' - Fractures (2), 30 deg, rough, undulating, 2-1/2" relief at 86.0', open at 86.2'			
			2	87.1, 87.15' - Fractures (2), 5 deg and 10 deg, smooth, undulating, open			
			3	87.45-87.75' - Fracture zone, limestone fragments, gravel to cobble-sized			
			1	88.0, 89.0' - Fractures (2), 20 deg and 10 deg, rough, undulating, open			
			NR	88.45' - Fracture, 70 deg, smooth, planar, tight			
			NR	89.2, 90.4' - Fractures (2), 40 deg and 20 deg, rough, undulating, open at 89.2', 2-1/2" relief at 90.4'			
			NR	89.45' - Fracture, 70 deg, rough, planar, open			
			NR	89.8, 90.0' - Mechanical break (2)			
			3	92.2' - Fracture, 75 deg, smooth, planar, open			
			3	92.75, 92.95' - Fractures (2), 20 deg, smooth, undulating, tight			
			3	93.0' - Fracture, vertical, smooth, planar, tight			
			0	93.2, 93.4' - Fractures (2), 20 deg, smooth, undulating, open at 93.2', tight at 93.4'			
			4	93.7' - Mechanical break			
			NR	94.0' - Fracture, 70 deg, rough, planar, open			
			NR	94.2, 94.35' - Fractures (2), 15 deg, rough, undulating, open			
			2	97.3' - Fracture, 20 deg, rough, undulating, <1" relief			
			2	97.95-98.3' - Fracture zone, 60 deg, smooth, planar, tight/multiple fractures			
			2	98.6' - Fracture, horizontal, rough, undulating, open			
			2	99.3' - Fracture, 10 deg, rough, undulating, 2-1/2" relief			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-15

SHEET 6 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722937.2 N, 457994.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 4.41 ft bgs on 3/06/07

START : 2/11/2007

END : 2/20/2007

LOGGER : A. Teal, R. Gomez

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.
-57.5			1	99.9' - Fracture, 50 deg, rough, planar, tight		Limestone 97.5-98.3' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), few voids 98.3-102.0' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, medium strong (R3), voids (<1/16") over 85% of surface, few larger (up to 3/8") voids, few organic laminations, moderately fossiliferous 102.0-106.6' - Same as 98.3-102.0' except area of intermixed material (yellowish gray 5Y 7/2, with few voids) from 102.3-103.3', larger voids (up to 3/8") and fossil molds/casts more common, zone from 104.0-104.5' appears more moderate olive brown (5Y 4/4) in color	Bioturbation zones are highly HCl reactive, matrix has slow to moderate HCl reaction
			1	100' - Fracture, 75 deg, rough, planar, tight			
				100.5' - Fracture, 45 deg, rough, undulating, open			
102.0			3	101.6' - Fracture, 70 deg, rough, undulating, 1-1/4" relief			
			3	101.65' - Fracture, 25 deg, rough, undulating, tight			
			3	102.25, 102.7' - Fractures (2), 30 deg and 10 deg, rough, undulating, open			
			2	102.4' - Fracture, 70 deg, smooth, planar, tight			
105	R14-NQ 5 ft 92%	51	1	103.2' - Fracture, 5 deg, smooth, undulating, tight			
-62.5			1	103.5' - Fracture, 40 deg, rough, undulating, 3-1/2" relief			
			1	103.8' - Fracture, 40 deg, smooth, planar, tight			
			NR	104.2' - Fracture, 25 deg, smooth, undulating, open		No Recovery 106.6-107.0' Limestone 107.0-111.8' - dusky yellow, (5Y 6/4), fine grained, moderate to strong HCl reaction, weak (R2), voids (<1/16") over 80% of surface, larger (up to 3/8") voids and fossil molds/casts cover up to 5% of surface, moderately fossiliferous, particularly at 107.8-109.5'	SC-3 collected at 105.75-106.6'
			1	104.2-104.7' - Fracture zone, cobble-sized rock fragments			
			2	105.75' - Fracture, 60 deg, rough, stepped, 3-1/2" relief			
			2	106.6' - Fracture, 15 deg, rough, undulating, open			
			2	107.7, 109.4' - Fracture (2), 25 deg, rough, undulating, 2-1/2" relief for 107.7', open for 109.4'			
110	R15-NQ 5 ft 96%	86	1	108.0, 108.5' - Fractures (2), 35 deg, rough, undulating, tight for 108.0', open for 108.5'			
-67.5			2	109.7' - Fracture, 20 deg, rough, undulating, open			
			NR	109.85' - Mechanical break			
			NR	110.35, 111.35' - Fractures (2), 40 deg and 5 deg, rough, undulating, tight for 110.35', open for 111.35'			
			2	111.6' - Fracture, 15 deg, smooth, undulating, open			
			5	112.0-112.5' - Fracture zone, limestone fragments, gravel to cobble-sized		No Recovery 111.8-112.0' Limestone 112.0-117.0' - Same as 107.0-111.8' except medium strong (R3)	SC-4 collected at 110.35-111.35'
			3	112.8, 113.2' - Fractures (2), 70 deg, smooth, planar, open			
115	R16-NQ 5 ft 100%	44	6	113.2, 113.5' - Fractures (2), 10 deg and 15 deg, rough, undulating, open			
-72.5			0	113.7, 113.85' - Fractures (2), 20 deg, rough, undulating, open			
			0	114.0' - Fracture, 30 deg, rough, undulating, tight			
			4	114.1' - Fracture, 40 deg, smooth, undulating, tight			
			1	114.9, 115.0' - Fractures (2), 50 deg, smooth, planar, tight			
			3	115.2, 115.6' - Fracture (2), 60 deg, smooth, planar, tight			
				115.45' - Fracture, 25 deg, smooth, undulating, tight			
120	R17-NQ 5 ft 94%	62		115.7' - Fracture, 30 deg, smooth, undulating, open			
						117.0-118.7' - Same as 112.0-117.0'	SC-5 collected at 117.7-118.7'



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-15	SHEET 7 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722937.2 N, 457994.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: F. Harrington, M. Griffin

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

WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/11/2007 END : 2/20/2007 LOGGER : A. Teal, R. Gomez

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.
-77.5			3	115.75' - Fracture, 5 deg, rough, undulating, open		Limestone 118.7-120.7' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 60% of surface, few larger (up to 3/16") voids, gradual color change to dusky yellow (5Y 6/4) at bottom foot of interval	Inner sample barrel not locked in while coring runs R18 and R19 and no core was recovered in sample barrel; after pulling outer core barrel 2.3' of core was found in outer barrel; recovered core is assumed to come from 122.0-124.3' at top of R18
			1	117.25, 117.30, 119.1' - Fractures (3), 25 deg, smooth, undulating, tight for 117.25' and 117.30', open for 119.1'			
	122.0		NR	117.6, 119.3' - Fractures (2), 5 deg, smooth, undulating, tight for 117.6', open for 119.3'			
			>10	117.7, 118.7' - Fractures (2), 45 deg, smooth, planar, tight			
			>10	119.25' - Fracture, 20 deg, smooth, undulating, tight			
125	R18-NQ 5 ft 46%	9	>10	120.1' - Fracture, 15 deg, smooth, undulating, open		120.7-121.7' - mottled dusky yellow and yellowish gray, (5Y 6/4 and 5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), voids (<1/16") over 80% of surface of yellow-colored areas and 30% in gray areas	Core from R20 stuck in outer core barrel, driller had to pull outer barrel (137.0') out of hole; 3.6' of core recovered; scratches, scores, and tool marks on many pieces of core from drilling; many fractures in R20 could be drilling induced
-82.5			NR	120.8, 120.9' - Fractures (2), 30 deg and 45 deg, smooth, planar, tight		No Recovery 121.7-122.0'	
				121.2' - Fracture, 25 deg, smooth, undulating, open		Limestone Fragments 122.0-124.3' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, moderate to strong HCl reaction, medium strong to strong (R3 to R4), voids (<1/16") over 30-60% of surface, a 5" section core has no voids, with laminated alternating colors, strong (R4), fine grained, strong HCl reaction	
				122.0-124.3' - Fracture zone or mechanical break, fragmented		No Recovery 124.3-132.0'	
130	R19-NQ 5 ft 0%	0	NR				Core from R20 stuck in outer core barrel, driller had to pull outer barrel (137.0') out of hole; 3.6' of core recovered; scratches, scores, and tool marks on many pieces of core from drilling; many fractures in R20 could be drilling induced
-87.5							
135	R20-NQ 5 ft 72%	19	3	132.0-132.2' - Fracture zone, gravel-sized limestone fragments		Limestone 132.0-133.4' - light olive gray grading to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), voids (<1/16") over 30% of surface, larger (up to 3/8") voids and fossils molds/casts over 5% of surface, laminated coloration and few voids from	Core from R20 stuck in outer core barrel, driller had to pull outer barrel (137.0') out of hole; 3.6' of core recovered; scratches, scores, and tool marks on many pieces of core from drilling; many fractures in R20 could be drilling induced
-92.5			5	132.85' - Fracture, 5 deg, smooth, planar, open		132.7-133.2'	
			4	133.0, 133.3' - Fractures (2), 40 deg and 5 deg, smooth, planar, open for 133.0', very tight for 133.3'		133.4-135.0' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 80% of surface, larger (up to 3/8"x3/4") voids and fossil molds over 10% of surface	
			4	133.05, 133.35' - Fractures (2), 5 deg, smooth, planar, very tight		135.0-135.6' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), voids (1/16") over 5% of surface, laminated coloration, some laminations of organic material	
			NR	133.5, 134.55' - Fractures (2), 5 deg and 15 deg, rough, undulating, open		No Recovery 135.6-137.0'	
				134.0, 134.25' - Fractures (2), horizontal, rough, undulating, open			
				134.7' - Fracture, 10 deg, smooth, undulating, open			
			4	135.0' - Fracture, 5 deg, rough, undulating, open			
			2	135.0-135.2' - Fracture zone, limestone fragments, gravel to cobble-sized			
			4	135.3' - Fracture, horizontal, smooth, planar, very tight			
140	R21-NQ 5 ft 84%	50					




PROJECT NUMBER: 338884.FL	BORING NUMBER: A-15	SHEET 8 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722937.2 N, 457994.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: F. Harrington, M. Griffin

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

WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/11/2007 END : 2/20/2007 LOGGER : A. Teal, R. Gomez

WATER LEVELS: 4.4 ft bgs on 3/30/07		START: 2/11/2007		END: 2/20/2007		LOGGERS: A. Teal, R. Gomez		
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
-97.5			1	135.5' - Fracture, 5 deg, smooth, undulating, open		Limestone 137.0-137.6' - Same as 135.0-136.6' except light colored (dusky yellow (5Y 6/4)) laminations have increasing amount of voids	SC-6 collected at 143.0-144.0'	
		2	137.3' - Fracture, vertical, rough, planar, tight	137.6-141.2' - dusky yellow, (5Y 6/4), fine grained, moderate to strong HCl reaction, medium strong (R3), voids (<1/16") over 75% of surface decreasing to 40% below 139.5', moderately fossiliferous, molds up to 3/16"x9/16", few black organic laminations at 138.5-139.8', few inclusions (3/16"x3/4") of grey limestone material at 138.0' and 139.9'				
	142.0	NR	137.6' - Fracture, horizontal, smooth, undulating, open	No Recovery 141.2-142.0' Limestone 142.0-144.0' - mottled medium light gray and yellowish gray, (N6, 5Y 7/2), fine grained, moderate HCl reaction, yellowish gray is in bands around cavities, few voids (<1/16"), several larger (up to 3/8") voids and fossil molds				
		>10	137.8, 138.15' - Fractures (2), 5 deg, rough, undulating, tight	144.0-145.5' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), voids (<1/16") 30% coverage, larger voids (up to 3/4") 15%, organic material on irregular bedding plane and fracture surfaces, moderately to very fossiliferous, gradational contact with material below				
		>10	137.9, 138.6' - Fractures (2), 15 deg and 70 deg, rough, undulating, tight for 137.9', open with gray staining at 138.6'	145.5-146.7' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), few voids (1/16"), no larger voids, organic lamination				
		>10	139.0, 139.55' - Fractures (2), 70 deg and 15 deg, rough, undulating, open, gray staining	No Recovery 146.7-147.0' Limestone 147.0-151.4' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, medium strong (R3), voids (<1/16") over 30% of surface, more abundant in zone from 147.3-148.8' and 150.0-151.0', fossiliferous in same zones, black staining is on uneven and irregularly laminated bedding at 148.1-148.8', clasts (up to 3/8"x1-3/16") of yellowish gray (5Y 7/2) limestone without voids appear imbedded in the core from 147.0-148.0', coloration on bedding ranging from light olive gray (5Y 5/2) to dusky yellow (5Y 6/4)				
		>10	139.2' - Fracture, 50 deg, rough, planar, open, gray staining	No Recovery 151.4-152.0'				
		3	139.9, 141.1' - Fractures (2), 5 deg, smooth, undulating, tight					
		2	140.45, 141.25' - Fractures (2), 30 deg and 20 deg, rough, undulating, open					
		NR	142.0-143.0, 144.0-145.1' - Fracture zone or mechanical break (2), sections crushed, limestone fragments from gravel to cobble-sized					
		3	145.2' - Fracture, 60 deg, rough, undulating, open					
		2	145.3, 145.5' - Fractures (2), 15 deg, rough, undulating, open, moderate yellowish brown (10Y 5/4) to dusky brown (5Y 2/2) staining					
		4	145.9' - Mechanical break					
		6	146.6, 146.9' - Fractures (2), horizontal and 50 deg, smooth, planar, tight					
		2	147.30, 147.6' - Fractures (2), 60 deg, smooth, planar, tight					
		NR	147.35' - Fracture, 20 deg, smooth, undulating, open					
		1	148.22' - Fracture, 5 deg, smooth, planar, tight, moderate yellowish brown (10Y 5/4) to dusky brown (5Y 2/2) staining					
		0	148.4' - Fracture, 15 deg, rough, undulating, open, partial coverage up to 20% of moderate yellowish brown (10Y 5/4) to dusky brown (5Y 2/2) staining					
		2	149' - Fracture, 70 deg, rough, planar, open					
		2	149.3' - Fracture, 20 deg, rough, undulating, open					
		1	149.4, 149.6' - Fractures (2), 75 deg, rough, planar, tight					
		2	150' - Fracture, 60 deg, rough, planar, tight					
		1	150.1' - Fracture, 60 deg, slickensided, planar, very tight, light to dark brown staining (possibly hematite)					
		3	150.6' - Fracture, 50 deg, smooth, undulating, open					
		1	150.65, 150.8' - Fractures (2), 30 deg and 10 deg, smooth, undulating, tight					
		2	150.9' - Fracture, 40 deg, smooth, undulating, tight					
		50	151.3, 151.5' - Fractures (2), 5 deg and 35 deg, smooth, undulating, open					
		2	152.0-152.9' - Fracture zone, limestone fragments, gravel to cobble-sized					
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PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-15

SHEET 9 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722937.2 N, 457994.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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


ORIENTATION : Vertical

WATER LEVELS : 4.41 ft bgs on 3/06/07

START : 2/11/2007

END : 2/20/2007

LOGGER : A. Teal, R. Gomez

WATER LEVELS: 4.41 ft bgs on 3/30/07		START: 2/17/2007		END: 2/20/2007		LOGGERS: A. Teal, R. Gomez		
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
-117.5			1	152.9' - Fracture, 5 deg, smooth, undulating, open		Limestone 152.0-155.7' - Same as 147.0-151.4' except fewer (now 10%) voids (<1/16") covering surface, thin bedding from 153.5-155.0', uneven and irregular laminations from 155.2-155.7'		
	162.0		3	154.4' - Fracture, 45 deg, rough, planar, tight 154.9, 156.7, 156.9' - Mechanical break (3) 155.2' - Fracture, 10 deg, smooth, undulating, open		155.7-157.0' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), few (<5%) voids or fossil molds/casts, thin bedding (1/4") from 155.7-157.0', olive gray (5Y 3/2) coloration along healed fracture at 156.8-157.0'		
			1	155.7' - Fracture, horizontal, smooth, planar, tight		157.0-157.4' - Same as 155.7-157.0'		
			5	156.5' - Fracture, 30 deg, rough, undulating, open		157.4-158.8' - fragments of light olive gray (35%) and yellowish gray (15%) in a dusky yellow matrix (50%), (5Y 5/2 and 5Y 7/2 in 5Y 6/4), fine grained, moderate HCl reaction, medium strong (R3), voids (<1/16") over 50% of matrix area but only 10% of other areas, larger (up to 3/16"x3/8") voids and fossil casts/molds over 5% of area overall		
	R26-NQ 5 ft 84%	32	3	157.2' - Fracture, 75 deg, rough, planar, open 157.4' - Fracture, 20 deg, rough, undulating, open		158.8-160.0' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, strong (R4), voids (<1/16") over 5% of surface, mainly in thin (1/2") zones, thinly bedded, few fossil casts		
165			4	157.8, 158.4' - Fractures (2), 25 deg and 10 deg, rough, undulating, tight for 157.8', open for 158.4'		160.0-162.0' - mottled light olive gray and dusky yellow, (5Y 5/2 and 5Y 6/4), fine grained, moderate to mild HCl reaction, medium strong to strong (R3 to R4), voids (1/16") cover 70% of surface, few large voids, fragments of other limestone material imbedded in dusky yellow matrix below 161.0'		
-122.5			2	158.4-159.0' - Fracture zone, limestone fragments, gravel to cobble-sized		162.0-166.2' - moderate olive brown grading to light olive gray by 165.0', (5Y 4/4 to 5Y 5/2), fine grained, moderate to mild HCl reaction, strong (R4), voids (1/16") only 5% from surface area except zones from 163.0-163.3' and 165.4-166.0', few larger voids (up to 3/16") below 165.4', uneven and disturbed bedding below 165.6'		
			NR	159.5- 159.7' - Fracture zone, limestone fragments, gravel to cobble-sized		No Recovery 166.2-167.0'		
			0	159.5' - Fracture, 5 deg, smooth, planar, tight		Limestone		
			0	159.9, 160.4' - Fractures (2), 40 deg, smooth, undulating, tight		167.0-167.9' - Same as 162.0-166.2' except presence of breccia (1" fragments) at 167.3-167.9'		
			2	161.0' - Fracture, 15 deg, smooth, undulating, open		167.9-169.0' - dusky yellow, (5Y 6/4), mild to moderate HCl reaction, medium strong (R3), voids (<1/16") over 80% of surface		
			2	161.2' - Fracture, 85 deg, smooth, planar, tight				
			0	161.3' - Fracture, 20 deg, smooth, undulating, open				
170	R27-NQ 5 ft 100%	62	2	161.3-162.0' - Fracture, limestone fragments, gravel to cobble-sized				
-127.5			0	162.4, 163.15' - Fractures (2), 10 deg and 25 deg, rough, undulating, open				
			6	163.0' - Fracture, 20 deg, smooth, planar, tight				
			>10	163.15-164.2' - Fracture zone, limestone fragments, gravel to cobble-sized				
			>10	164.0' - Fracture, 60 deg, rough, undulating, tight				
			4	165.0, 165.05' - Fractures (2), 15 deg and 5 deg, smooth, undulating, open				
175	R28-NQ 5 ft 100%	30	>10	165.3' - Fracture, 80 deg, rough, planar, open				
-132.5			3	165.5' - Fracture, 35 deg, rough, undulating, open				
			>10	165.5-166.0' - Fracture zone, limestone fragments, gravel to cobble-sized				
			3	167.0-168.8' - Fracture zone, limestone fragments, gravel to cobble-sized				
			>10	169.2' - Fracture, 5 deg, smooth, planar, tight				
			3	169.4' - Fracture, 30 deg, rough, undulating, tight				
			>10	170.2, 170.4' - Fractures (2), 10 deg, smooth, undulating, tight				
			>10	172.25' - Fracture, 40 deg, rough, planar, tight				
			3	172.3, 172.8' - Fractures (2), 5 deg, rough, undulating, tight				
			0	172.55' - Fracture, 15 deg, rough, stepped, open				
180	R29-NQ 5 ft 100%	0	3	172.75' - Fractures, 10 deg, rough, undulating, tight				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-15

SHEET 10 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722937.2 N, 457994.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

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

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

ORIENTATION : Vertical

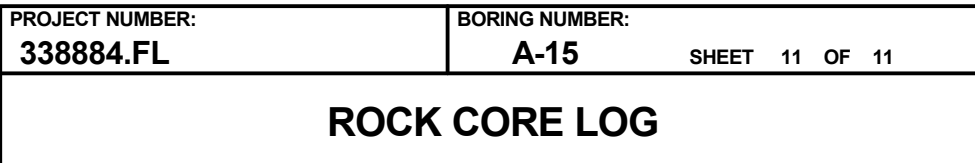
WATER LEVELS : 4.41 ft bgs on 3/06/07

START : 2/11/2007

END : 2/20/2007

LOGGER : A. Teal, R. Gomez

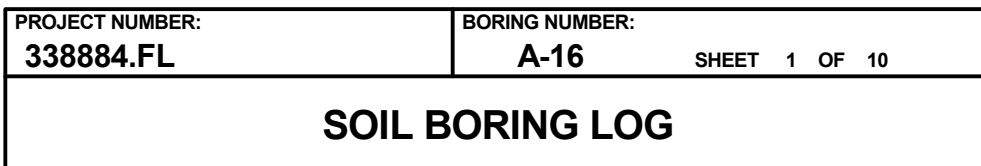
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, 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.
-137.5			1	172.95' - Fracture, 40 deg, rough, stepped, tight		Limestone 169.0-169.4' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, strong (R4), few voids or cavities	
			0	173.2' - Fracture, 40 deg, rough, planar, tight		169.4-172.0' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, medium strong (R3), voids (<1/16") over 20% of surface (up to 50% from 169.4-170.0'), laminated bedding below 171.0' at an angle of 5-10 degrees	R30: 10 minutes
182.0			>10	173.4' - Fracture, 50 deg, rough, undulating, open		172.0-177.0' - Same as 169.4-172.0' except more voids (up to 50% coverage) from 173.5-174.5' and presence of cavities (up to 3/16"x3/4") below 175.0', laminated bedding 174.8-175.3'	
			>10	173.45, 174.5' - Fractures (2), 5 deg and 20 deg, smooth, undulating, open		177.0-178.0' - Same as 172.0-177.0'	
			>10	173.6, 173.75' - Fractures (2), 10 deg, smooth, undulating, tight		178.0-178.6' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak (R2), voids (<1/16") over 40% of surface	
			>10	174.5-175.0' - Fracture zone, limestone fragments, gravel to cobble-sized		178.6-182.0' - dusky yellow to light olive gray, (5Y 6/4 to 5Y 5/2), fine grained, moderate HCl reaction, medium strong (R3), voids (1/16") over 50% of surface area below 180.0', breccia and dark stained laminated bedding below 180.5', some larger (3/16"x3/4") cavities below 180.5'	SC-7 collected at 185.0-186.0'
185	R30-NQ 5 ft 90%	27	>10	175.2' - Fracture, 10 deg, smooth, undulating, tight		182.0-186.5' - light olive gray with laminations (uneven and irregular) of yellowish gray, (5Y 5/2 with 5Y 7/2), moderate HCl reaction, strong (R4), few areas of voids, few fossil molds, apparent breccia zones at 182.8-184.0' and 186.0-186.3', color of core mainly yellowish gray below 186.0'	
-142.5			0	175.25, 175.4' - Fractures (2), 75 deg and 15 deg, rough, undulating, open		No Recovery 186.5-187.0'	
			1	175.8' - Fracture, 80 deg, rough, planar, open to tight		Limestone 187.0-189.0' - mottled yellowish gray and light olive gray, (5Y 7/2 and 5Y 5/2), fine grained, mild to moderate HCl reaction, strong (R4), mottling resolves into laminated bedding by 188.0', few voids or fossil molds	
			NR	176.5' - Mechanical break		189.0-192.0' - dusky yellow with thin beds (1/2" thick) of pale olive, (5Y 6/2 with 10Y 6/2), fine grained, moderate to strong HCl reaction, medium strong (R3), voids (<1/16") over 70% of the dusky yellow areas, larger voids (up to 3/8") also present, pale olive areas have few voids, fewer voids overall below 191.0', possible breccia from 189.4-190.0'	
			NR	176.75' - Fracture, 30 deg, rough, planar, tight			
			1	177.0-182.0' - Fracture, no piece longer than 5", most fractures could be from drilling, others appear to be in place			
			3	179.1' - Fracture, 70 deg, rough, planar, open			
			3	179.3, 179.5' - Fractures (2), 20 deg and 10 deg, rough, undulating, open			
			3	180.2' - Fracture, 20 deg, rough, planar, open			
190	R31-NQ 5 ft 100%	38	3	182.0-185.0' - Fracture zone or mechanical break, no piece longer than 5", most fractures could be from drilling, others appear to be in place			
-147.5			3	182.3, 182.5' - Fractures (2), 70 deg and 25 deg, rough, undulating, open for 182.3', tight for 182.5'			
			1	182.8' - Fracture, 30 deg, smooth, undulating, tight, dusky brown to dusky yellow infilling 100%			
			0	182.9' - Fracture, 15 deg, smooth, undulating, tight			
			2	186.35' - Fracture, 10 deg, smooth, planar, tight to open up to 1/16"			
			>10	187.4' - Fracture, 20 deg, smooth, undulating, open			
			>10	187.4-188.15' - Fracture zone, limestone fragments, gravel to cobble-sized			
195	R32-NQ 5 ft 70%	20	>10	188.25' - Fracture, 5 deg, smooth, undulating, open			
-152.5			NR	188.35' - Fracture, 85 deg, smooth, planar, tight			
			NR	188.5' - Fracture, 5 deg, smooth, undulating, tight			
			4	189.0, 189.2' - Fractures (2), 25 deg and 40 deg, rough, undulating, open for 189.0', tight for 189.2'			
			>10	189.4' - Fracture, 20 deg, smooth, undulating, open			
			0	189.4-190.0' - Fracture zone, limestone fragments, gravel to cobble-sized			
			0	190.35, 190.8' - Fractures (2), 25 deg, rough, undulating, tight for 190.35', open for 190.8'			
200	R33-NQ 5 ft 48%	0					



ORIENTATION : Vertical

LOGGER : A. Teal, R. Gomez

Rev. 4



LOGGER : A. Teal

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-16
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723075.9 N, 457958.1 E (NAD83)
 ELEVATION : 42.7 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, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.5 ft bgs on 4/5/07 START : 4/5/2007 END : 4/8/2007 LOGGER : A. Teal

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	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
22.7	20.0	0.1	SS-5	50/3.5 (50/3.5")	Limestone Fragments 20.0-20.1' - dark yellowish orange, (10YR 6/6), weak rock (R2), voids to 1/16", limestone fragments to 1/8"-1/2" Begin Rock Coring at 21.0 ft bgs See the next sheet for the rock core log		21.0': End soil sampling switch to rock coring
25							
17.7							
30							
12.7							
35							
7.7							
40							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-16

SHEET 3 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723075.9 N, 457958.1 E (NAD83)

ELEVATION : 42.7 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 : 2.5 ft bgs on 4/5/07

START : 4/5/2007

END : 4/8/2007

LOGGER : A. Teal

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.
21.0	R1-NQ 5 ft 44%	0	>10	21.0-21.7' - Fracture zone, limestone fragments from gravel to cobble-sized		Limestone 21.0-23.2' - grayish orange, (10YR 7/4), medium grained, strong HCl reaction, extremely weak to very weak (R0 to R1), highly fossiliferous (molds/casts), voids (<1/16") over 70-75% of surface No Recovery 23.2-26.0'	Fossils including echinoids, gastropods and brachiopods R1: 2 minutes
			>10	21.7-22.7' - Fracture zone			
			0	22.9' - Fracture, 45 deg, rough, planar, open			
25 17.7			NR				
26.0	R2-NQ 5 ft 80%	25	>10	26.0-26.9' - Fracture zone, limestone fragments from gravel to cobble-sized		Limestone 26.0-30.0' - Same as 21.0-23.2' except dusky yellow, (5Y 6/4) No Recovery 30.0-31.0'	R2: 2 minutes
			>10	27.3-28.8' - Fracture zone, fragments up to 1-1/2"			
30 12.7			4	29.4-29.7' - Fracture or mechanical break (4), horizontal and 15 deg, rough, undulating, open			
			NR				
31.0	R3-NQ 5 ft 70%	50	>10	31.0-32.5' - Fracture zone, limestone fragments from gravel to cobble-sized		Limestone 31.0-34.5' - moderate yellow and light olive gray, (5Y 7/6 and 5Y 5/2), light olive gray mottling from 32.6-33.4', fine grained, strong HCl reaction, weak to medium strong (R2 to R3), predominately weak rock, medium strong from 32.3-33.8', voids (<1/16") over 80% of surface, fossiliferous No Recovery 34.5-36.0'	11:06 Stopped drilling to remix mud Driller's Remark: Lost circulation at 34.0-35.0' R3: 5 minutes
			>10	32.5' - Fracture, 40 deg, rough, stepped, open			
35 7.7			2	33.75' - Fracture, 25 deg, rough, undulating, open			
			0				
	R4-NQ 5 ft 84%	47	NR			Limestone 36.0-40.2' - Same as 31.0-34.5' except light olive gray, (5Y 5/2), color transition from above run complete by 37.0', voids <1/16" and abundant larger cavities to 3/16" yielding a rough surface No Recovery 40.2-41.0'	R4: 4 minutes
			>10	36.0-37.2' - Fracture zone, limestone fragments from gravel to cobble-sized			
40 2.7			1	37.25' - Mechanical break 37.55' - 25 deg, smooth, undulating, very tight			
			>10	38.3-38.75' - Fracture zone, limestone fragments from gravel to cobble-sized 38.9' - 75 deg, rough, planar, very tight			
			0				
			>10	40.0-40.7' - Fracture zone, limestone fragments from gravel to cobble-sized			
41.0			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-16

SHEET 4 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723075.9 N, 457958.1 E (NAD83)

ELEVATION : 42.7 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 : 2.5 ft bgs on 4/5/07

START : 4/5/2007

END : 4/8/2007

LOGGER : A. Teal

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
45 -2.3	R5-NQ 5 ft 22%	0	>10 NR		Limestone 41.0-42.1' - moderate olive brown, (5Y 4/4), fine grained, strong HCl reaction, extremely weak (R0), friable No Recovery 42.1-46.0'	R5: 2 minutes
46.0						
50 -7.3	R6-NQ 5 ft 100%	70	>10 1 0 0		Limestone 46.0-51.0' - Same as 41.0-42.1' except very weak (R1), voids <1/16" and cavities to 3/16" yielding rough appearance, trace black organic material 49.0-50.5'	SC-1 collected 46.4-47.45'
51.0						R6: 2 minutes
55 -12.3	R7-NQ 5 ft 50%	18	0 NA		51.0-51.9' - light olive gray, (5Y 5/2), fine grained, moderate to strong HCl reaction, weak (R2), voids <1/16" over 35% of surface, cavities to 3/16" over <5% of surface, fossiliferous Silt (ML) 51.9-53.5' - light olive gray, (5Y 5/2), strong HCl reaction, carbonate material No Recovery 53.5-56.0'	R7: 2 minutes
56.0						
60 -17.3	R8-NQ 5 ft 78%	10	NA 3 NR		Silt (ML) 56.0-58.7' - Same as 51.9-53.5'	
61.0					Limestone 58.7-59.9' - moderate olive brown, (5Y 4/4), fine grained, moderate HCl reaction, weak (R2), voids <1/16" over 15% of surface, trace cavities to 9/16"x3/4" on surface No Recovery 59.9-61.0'	R8: 3 minutes

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723075.9 N, 457958.1 E (NAD83)

ELEVATION : 42.7 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 : 2.5 ft bgs on 4/5/07

START : 4/5/2007

END : 4/8/2007

LOGGER : A. Teal

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				
65 -22.3	R9-NQ 5 ft 96%	43	NA			Silt (ML) 61.0-63.0' - Same as 51.9-53.5' except trace organics 61.0-61.3', carbonate material		
66.0			1	63.0' - 60 deg, rough, planar, tight 63.4, 64.3' - Mechanical break (2)		Limestone 63.0-65.8' - moderate olive brown, (5Y 4/4), fine grained, moderate HCl reaction, very weak (R1), voids <1/16" over 15% of surface, trace cavities to 9/16"x3/4" on surface	SC-2 collected at 63.4-64.3'	
			0	64.4-65.2' - Mechanical break (>10)				
			2	65.3' - Fracture, 15 deg, smooth, undulating, open				R9: 3 minutes
			NR	65.7' - Fracture, 40 deg, rough, undulating, open				
			1	66.4' - Fracture, 10 deg, rough, undulating, open		No Recovery 65.8-66.0' Limestone 66.0-70.4' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids <1/16" on 25% of surface increasing from 68.8', extremely weak (R0) zone from 67.2-67.5', 3/4"x1-3/16" cavity at 70.2', very fossiliferous below 68.5', solution cavity at 68.5-69.0'		
			2	67' - Fracture, 10 deg, smooth, undulating, tight				
			3	67.8' - Fracture, 65 deg, rough, planar, tight 68.1, 68.3' - Fracture (2), 20 deg, rough, undulating, open				
			3	69.5, 69.8' - 40 deg, rough, undulating, open				
			1	70.1' - Fracture, 20 deg, rough, undulating, open				
			NR			No Recovery 70.4-71.0'		R10: 3 minutes
			2	71.25' - 10 deg, rough, undulating, open 71.5' - 85 deg, rough, planar, tight		Limestone 71.0-73.3' - Same as 66.0-70.4' except moderate olive brown, (5Y 4/4)		
			>10	72.0' - Mechanical break, strong to very strong (R4-R5) 72.25' - Fracture, 20 deg, rough, undulating, open				
			5	73.2' - Fracture zone, limestone fragments from gravel to cobble-sized				
			0	73.4, 73.5, 73.7' - Mechanical break 73.95' - 25 deg, smooth, undulating, tight				
			>10	74.5' - Mechanical break, medium strong (R3) 75' - 10 deg, smooth, undulating, tight				
			NR	75.4-75.9' - Fracture zone, limestone fragments from gravel to cobble-sized				
			0					
			>10	76.75' - Mechanical break 77.0-77.35' - Fracture zone, limestone fragments from gravel to cobble-sized				
			>10			No Recovery 75.9-76.0' Limestone 76.0-77.2' - Same as 74.4-75.5' 77.2-79.0' - light olive brown, (5Y 5/6), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over 40% of surface, cavities up to 3/4"x1-9/16" over 15% of surface, fossiliferous, trace organics		
			NR	78.75' - 10 deg, rough, undulating, tight 78.9-79.0' - Fracture zone, limestone fragments from gravel to cobble-sized				
						No Recovery 79.0-81.0'		R12: 2 minutes



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-16	SHEET 6 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723075.9 N, 457958.1 E (NAD83)

ELEVATION : 42.7 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 : 2.5 ft bgs on 4/5/07

START : 4/5/2007

END : 4/8/2007

LOGGER : A. Teal

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			
85 -42.3	R13-NQ 5 ft 50%	27	>10	81.1' - 5 deg, smooth, undulating, 1/16" clay infilling, dark brown clay infilling		Limestone 81.0-83.5' - dusky yellow grading to yellowish gray, (5Y 6/4 grading to 5Y 7/2), fine grained, moderate to mild HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over 25% of surface, cavities up to 3/16"x3/8" over <5% of surface No Recovery 83.5-86.0'	4/6/07 08:04 Water level at 5.4' below ground surface
			>10	81.6-82.6' - Fracture zone, limestone fragments from gravel to cobble-sized			
			1	83.05' - 15 deg, smooth, undulating, open			
			NR				R13: 5 minutes
86.0							
90 -47.3	R14-NQ 5 ft 90%	37	>10	86.0-86.95' - Fracture zone, limestone fragments from gravel to cobble-sized		Limestone 86.0-89.5' - dusky yellow, (5Y 6/4), fine grained, moderate to strong HCl reaction, medium strong (R3), voids <1/16" over 35% of surface, cavities to 3/4"x3/4" and fossil molds on 15% of surface, very fossiliferous transitioning to moderately fossiliferous at 88.0'	R14: 6 minutes
			4	87.3' - 45 deg, rough, planar, tight			
			10	87.55' - 10 deg, rough, undulating			
			>10	87.85' - 50 deg, rough, planar, tight			R15: 6 minutes
			0	88.2, 88.5' - 60 deg, rough, planar, tight			
			NR	88.7' - 20 deg, rough, undulating			
91.0				89.1-89.4' - Fracture zone, limestone fragments from gravel to cobble-sized		89.5-90.5' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), voids <1/16" on 5-10% of surface, trace cavities to 3/16", moderately fossiliferous (molds) No Recovery 90.5-91.0' Limestone 91.0-93.0' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids <1/16" on 30% of surface, cavities to 3/8"x3/4" No Recovery 93.0-96.0'	
			>10	89.5' - 30 deg, smooth, undulating, open			
			NR	89.6' - rough, undulating, tight			
95 -52.3	R15-NQ 5 ft 40%	0	>10	91.0-92.6' - Fracture zone, limestone fragments from gravel to cobble-sized			R16: 7 minutes
			>10				
			NR	92.8' - 25 deg, smooth, undulating, tight			
96.0							
100 -57.3	R16-NQ 5 ft 100%	65	3	96.25, 96.6, 96.7' - 30 deg, smooth, planar, very tight		Limestone 96.0-97.9' - Same as 91.0-93.0' except inclusion fragments (to 1-3/16") of yellowish gray	
			>10	97.2-97.25' - 45 deg, rough, planar, high angle fracture zone, very tight			
			>10	97.9-98.6' - Fracture zone, limestone fragments from gravel to cobble-sized			
			4	98.8' - 60 deg, rough, planar, tight		97.9-101.0' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, weak (R2), voids <1/16" on 5% of surface, trace fossil molds to 3/16"	
			1	98.95' - 25 deg, rough, undulating, open			
				99.05, 99.3' - 5 deg, rough, undulating, tight			
				99.2' - 15 deg, rough, undulating, tight			
				99.9' - 10 deg, rough, undulating, tight			
				100.2' - 60 deg, smooth, planar, tight			
101.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-16

SHEET 7 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723075.9 N, 457958.1 E (NAD83)

ELEVATION : 42.7 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

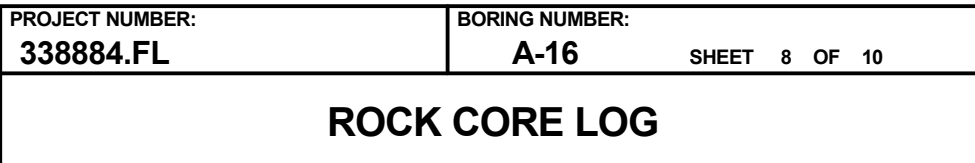
WATER LEVELS : 2.5 ft bgs on 4/5/07

START : 4/5/2007

END : 4/8/2007

LOGGER : A. Teal

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 -62.3	R17-NQ 5 ft 94%	62	>10			Limestone 101.0-103.1' - Same as 97.9-101.0'	SC-3 collected at 101.0-102.0'
			2	102.0-102.2' - Fracture zone, limestone fragments from gravel to cobble-sized			
			NA	102.65' - 10 deg, rough, undulating, open		Silt (ML) 103.1-104.2' - moderate olive brown, (5Y 4/4), soft, strong HCl reaction, trace organics	
			0	102.9' - 60 deg, rough, planar, open		Limestone 104.2-105.7' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, weak to medium strong (R2 to R3), voids <1/16" on 30% of surface, trace fossil molds	
			1	105.4' - 60 deg, rough, planar, tight		No Recovery 105.7-106.0'	
110 -67.3	R18-NQ 5 ft 80%	58	NR	106.0-106.2' - Fracture zone, limestone fragments from gravel to cobble-sized		Limestone 106.0-110.0' - Same as 104.2-105.7' except color grades to mottled dusky yellow and light olive gray (5Y 6/4 and 5Y 6/1) by 107.0' then transitions to only dusky yellow by 109.0'	R17: 6 minutes
			6	106.6' - 30 deg, rough, undulating, open			
			9	107.1-107.8' - 85 deg and vertical, planar, high angle fracture zone, multiple planar features open to moderately tight			
			3	108.5-110.0' - vertical, rough, planar, 15-20% charcoal gray to black, same as 107.1-107.8'			
			6				
115 -72.3	R19-NQ 5 ft 82%	33	NR			No Recovery 110.0-111.0'	R18: 5 minutes
			>10	111.0-111.2' - Fracture zone, limestone fragments from gravel to cobble-sized		Limestone 111.0-115.1' - dusky yellow grading to light olive gray by 112.4' grading to pale olive by 114.5', (5Y 6/4 to 5Y 5/2 to 10Y 6/2), fine grained, moderate HCl reaction, medium strong (R3), voids <1/16" on 35% of surface	
			3	112.35' - 60 deg, smooth, planar, tight			
			10	112.9' - 10 deg, rough, undulating, tight			
			7	114.55-114.7' - Fracture zone, limestone fragments from gravel to cobble-sized		No Recovery 115.1-116.0'	
120 -77.3	R20-NQ 5 ft 86%	52	NR	114.9' - 20 deg, smooth, undulating, open		Limestone 116.0-120.3' - Same as 114.5-115.1'	SC-4 collected at 113.8-114.5'
			>10	116.0-116.3' - Fracture zone, rough, undulating, fragments 1/2"-1-1/2"			
			2	116.5, 117.0' - 20 deg, rough, undulating, open			
			1	117.35' - 10 deg, rough, undulating, tight			
			1	118' - horizontal, smooth, undulating, open			
			1	118.25' - horizontal, smooth, undulating, black, open to 1/16"			R19: 4 minutes
			1	118.25-118.5' - Mechanical break, limestone fragments from gravel to cobble-sized			
			1	119.3-119.8; 120.0-120.3' - 70 deg, rough, undulating, black, open to 1/16"		No Recovery 120.3-121.0'	
			NR				R20: 6 minutes



ELEVATION : 42.7 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 : 2.5 ft bgs on 4/5/07

START : 4/5/2007

END : 4/8/2007

LOGGER : A. Teal

APPENDIX 2BB-188



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-16	SHEET 9 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723075.9 N, 457958.1 E (NAD83)

ELEVATION : 42.7 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 : 2.5 ft bgs on 4/5/07

START : 4/5/2007

END : 4/8/2007

LOGGER : A. Teal

WATER LEVELS : 2.0 ft bgs on 4/3/07		START : 4/3/2007		END : 4/7/2007		LOGGER : A. Year				
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						
145 -102.3	R25-NQ 5 ft 56%	0	10	141.2' - 10 deg, smooth, undulating, open 141.35' - 15 deg, smooth, undulating, open 141.5' - 30 deg, smooth, undulating, open 141.75' - 20 deg, smooth, undulating, open 141.76-142.4' - Fracture zone, black, irregular fragments to 1-1/2" 142.6-143.7' - Fracture (6), 20 deg and 30 deg, rough, undulating, open		Limestone 141.0-141.8' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, weak (R2), voids <1/16" on 30% of surface, cavities and fossil molds up to 3/16" on 5% of surface 141.8-142.6' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), voids <1/16" on 5% of surface 142.6-143.8' - light olive gray, (5Y 5/2 with 5Y 7/2), 10% yellowish gray mottling, fine grained, strong HCl reaction, strong (R4), voids <1/16" on 25% of surface, trace cavities and fossil (molds) to 9/16" No Recovery 143.8-146.0' Limestone 146.0-147.5' - yellowish gray, (5Y 7/2 and 5Y 5/2), light olive gray mottling, fine grained, mild HCl reaction, strong (R4), trace voids <1/16", cavities 1/16"x1/16" and fossil molds No Recovery 147.5-151.0'	R25: 5 minutes			
			>10							
			6							
			NR							
	146.0	>10	146.0-147.3' - Fracture zone, dark, limestone fragments from gravel to cobble-sized					No Recovery 143.8-146.0' Limestone 146.0-147.5' - yellowish gray, (5Y 7/2 and 5Y 5/2), light olive gray mottling, fine grained, mild HCl reaction, strong (R4), trace voids <1/16", cavities 1/16"x1/16" and fossil molds No Recovery 147.5-151.0'	Set casing to 150.0' due to cave-in on last run; stop coring at 151.0' for the day 4/7/07	
	>10									
	NR									
	150 -107.3	151.0								>10
	NR									
	48	5	152' - 25 deg, smooth, undulating, open 152.3' - Mechanical break 152.45-153.2' - Fracture zone, rough, undulating, dark, staining on vertical fracture							
155 -112.3	R27-NQ 5 ft 90%	>10	153.7-154.2' - Fracture zone, fragments 1/16"-1/2" 154.4, 154.7, 155.05' - Mechanical break							
155 -112.3	R27-NQ 5 ft 90%	48	>10		Limestone 151.0-155.5' - yellowish gray, (5Y 7/2 with 5Y 5/2), light olive gray mottling from 152.5-153.8', mild to moderate HCl reaction, medium strong (R3), laminar bedding below 153.5'	R27: 10 minutes				
			4							
			NR							
			156.0							
	R28-NQ 5 ft 60%	47	>10				155.25' - 15 deg, smooth, planar, open, solution cavity 155.3' - 10 deg, smooth, planar, tight 155.4' - 15 deg, smooth, planar, tight 156.0-156.4' - Fracture zone, rough, undulating, small fragments 1/16"- 1-1/2" 157.65' - Mechanical break 157.9' - 20 deg, smooth, undulating, open 158.7-158.9' - Fracture zone	No Recovery 155.5-156.0' Limestone 156.0-159.0' - yellowish gray transitions to dusky yellow below 158.0', (5Y 7/2 to 5Y 6/4), fine grained, mild HCl reaction, medium strong (R3), laminated bedding, voids <1/16" on 5% of surface, cavities and fossil molds to 3/16" on <5% of surface (predominantly on lighter colored laminations), increased voids and fossil abundance below 158.0' No Recovery 159.0-161.0'	R28: 9 minutes	
			1							
>10										
NR										
160 -117.3	161.0									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-16

SHEET 10 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723075.9 N, 457958.1 E (NAD83)

ELEVATION : 42.7 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 : 2.5 ft bgs on 4/5/07

START : 4/5/2007

END : 4/8/2007

LOGGER : A. Teal

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.
165 -122.3	R29-NQ 5 ft 86%	37	1	161.65' - Mechanical break		Limestone 161.0-162.9' - dusky yellow with moderate olive brown from	R29: 4 minutes
			6	161.8' - Fracture or mechanical break, horizontal, smooth, planar, open		161.8-162.7', (5Y 6/4 with 5Y 4/4), fine grained, mild HCl reaction, medium strong (R3), thin bedding, voids <1/16" on 50% of surface, cavities up to 3/8"x3/4" and fossil molds on <5% of surface, evenly distributed thin (1/2"-1") bedding	
			>10	162.1' - 20 deg, rough, undulating, open, solution cavity		162.9-165.3' - yellowish gray with zone of dusky yellow and light olive from 164.6-165.3', (5Y 7/2 with 5Y 6/4 and 5Y 5/2), fine grained, mild HCl reaction, medium strong (R3), laminar bedding from 164.2-164.6', trace voids <1/16"	
			>10	162.25' - Fracture or mechanical break, horizontal, smooth, planar, open		No Recovery 165.3-166.0'	
			1	162.35' - Mechanical break		Limestone 166.0-170.5' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, medium strong (R3), laminar bedding from 167.8-169.4', voids <1/16" on 20% of surface from 166.0-168.0', <5% below 168.0', cavities 3/8"x3/8" and fossil molds on 5% of surface from 166.4-168.0'	
166.0			NR	162.7' - 20 deg, rough, undulating, open			SC-7 collected at 167.95-168.75'
			1	162.9-163.5' - Fracture zone			
			NR	163.5-164.2' - Fracture zone, 45 deg and 75 deg			
			1	164.2-164.6' - Fracture zone			
			2	164.9, 164.95, 165.05' - 10 deg, smooth, planar, tight			
			2	166.35, 167.7' - 40 deg, rough, planar, tight			R30: 6 minutes
			1	167.8' - 55 deg, rough, planar, tight			
			>10	167.95' - Mechanical break			
			2	168.75-169.2' - Fracture zone, dark, staining on vertical fractures			
			1	169.7' - Mechanical break			
170 -127.3	R30-NQ 5 ft 90%	77	1	169.9' - 30 deg, smooth, undulating, tight			SC-8 collected at 173.9-175.0'
			NR	170.4' - horizontal, smooth, planar, open			
			2	171.45' - 5 deg, smooth, planar, tight			
			5	171.5' - 5 deg, smooth, planar, open			
			>10	172.2' - 5 deg, smooth, undulating, open			
			0	172.4' - 85 deg, rough, planar, tight			R31: 6 minutes
			>10	172.55-173.9' - Fracture zone, 45 deg and 75 deg, smooth, planar, black staining, tight			
			4	175.1, 175.2, 175.35' - 10 deg, smooth, undulating, open, brownish staining at 175.2'			
175 -132.3	R31-NQ 5 ft 100%	73					15:07 End boring at 176.0', met recovery and RQD requirements
176.0							
						Bottom of Boring at 176.0 ft bgs on 4/8/2007	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-17

SHEET 1 OF 14

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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, 3-7/8 tri-cone bit

ORIENTATION : Vertical

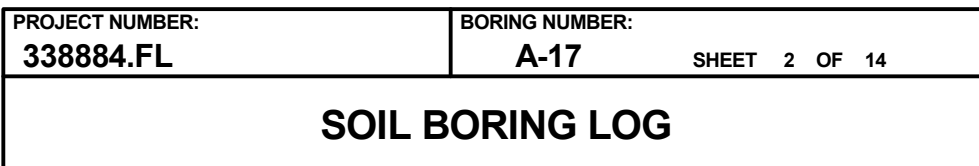
WATER LEVELS : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

WATER LEVEL: 2.5' below ground surface		DATE: 4/9/2007		END: 4/10/2007		EQUIP: A. Galt, N. Galt, M. Galt			
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			
42.3	0.0	1.2	SS-1	1-3-6 (9)	Poorly Graded Sand With Organics (SP) 0.0-1.2' - brownish black to pale brown, (5YR 2/1 to 5YR 5/2), moist, loose, very fine to fine grained, no HCl reaction, up to 30% fine organics and roots, silica sand			4/9/07, 17:20 no water encountered	
	1.5								
	5	5.0							04/10/07 08:01: Begin drilling for the day
37.3		1.2	SS-2	1-1-1 (2)	Silty Sand (SM) 5.0-5.9' - moderate yellowish brown, (10YR 5/4), wet, very loose, very fine to fine grained, no HCl reaction, 13% low plastic fines, silica sand Lean Clay With Sand (CL) 5.9-6.2' - greenish gray to dark yellowish orange to pale purple, (5G 6/1 to 10YR 6/6 to 5P 6/2), wet, very soft, medium to high plasticity, no dilatancy, no HCl reaction, 20-25% very fine to fine grained silica sand			Water level: 2.5' below ground surface, 08:01 on 4/10/07	
	6.5								
	10	10.0							
32.3		1.0	SS-3	5-10-5 (15)	Silty Limestone Fragments With Sand 10.0-11.5' - white to yellowish gray, (N9, 5Y 9/1), wet, medium dense, strong HCl reaction, fine to coarse gravel, 20% low plastic fines, grained predominantly fine to medium sand, all carbonate			Driller's Remark: Slight mud loss at 12.0' below ground surface	
	11.0								
	15	15.0							
27.3		1.3	SS-4	34-39-42 (81)	Silt (ML) 15.0-16.3' - grayish yellow, (5Y 8/4), moist to wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 8% very fine to medium sand, trace organics, trace black minerals, all carbonate			08:39 set casing to 20.0'	
	16.5								
	20								



LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-17

SHEET 3 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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 : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

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			
21.0	NQ-1 0.8 ft 75%	0	NA			Silt (ML) 20.3-20.85' - Same as 15.0-16.3' except strong HCl reaction No Recovery 20.85-21.0'	
25 17.3	R2-NQ 5 ft 62%	0	NR			Limestone 21.0-24.1' - grayish orange, (10YR 7/4), medium to fine grained, mild HCl reaction, extremely weak to very weak (R0 to R1), voids <1/16" on 90-95% of surface, trace rounded to subrounded white casts, at 22.55' sandy clay lens, greenish gray, 0.1' thick, 22.56-22.9' trace linear white bedding, moderately to very fossiliferous No Recovery 24.1-26.0'	Casing advanced to 25.0'
26.0							
30 12.3	R3-NQ 5 ft 90%	0	1	26.0-27.0' - Fracture zone or mechanical break, 0-70 deg, rough, undulating, open to 3/16"		Limestone 26.0-29.4' - grayish orange, (10YR 7/4), fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), voids <1/16" on 25% of surface, zones of silt	
			>10	27.0-29.4' - Fracture zone, silt and rock fragments to 1-1/2"		27.0'-29.4', 6" thick	
			>10			29.4-30.5' - grayish orange, (10YR 7/4), fine grained, moderate HCl reaction, medium strong (R3), few voids <1/16"	
			>10	29.4-30.5' - Fracture zone, sand to cobble-sized limestone fragments		No Recovery 30.5-31.0'	
			NR			Limestone 31.0-34.2' - grayish orange with olive gray mottling over 60-70% of surface, (10YR 7/4, 5Y 4/1), very fine to fine grained, mild HCl reaction, weak (R2), predominately olive gray by 34.0', grayish orange material becoming associated with casts/molds, moderately fossiliferous, voids vary from 10-15% up to 50% in matrix No Recovery 34.2-36.0'	
35 7.3	R4-NQ 5 ft 64%	18	>10	31.9-34.2' - Fracture zone, 0-65 deg, rough, undulating, lighter coloration (grayish orange) up to 1/8" wide along 65 deg fracture at 33.0-33.3'			
			>10				
			0				
			NR				
36.0							
			>10	36.0-36.5' - Fracture zone, 0-70 deg, rough, undulating, grayish orange coloration on most surfaces, rock fragments to 2"		Limestone 36.0-38.0' - olive gray, (5Y 4/1), fine grained, moderate HCl reaction, voids <1/16" on 20% of surface, very fossiliferous, few cavities to 3/16" (molds)	
			1	36.5-36.7' - Fracture, 65 deg, rough, undulating, tight		38.0-38.8' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, extremely weak (R0), friable, trace organics No Recovery 38.8-41.0'	
			>10	37.6' - Fracture, 60 deg, rough, planar, tight			
				38.0-38.8' - Fracture zone, smooth, planar to undulating, fragments <1"			
40 2.3	R5-NQ 5 ft 56%	27					
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-17

SHEET 4 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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

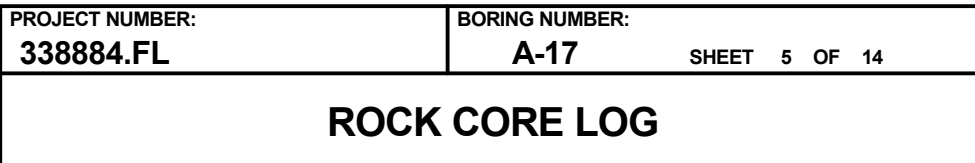
WATER LEVELS : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

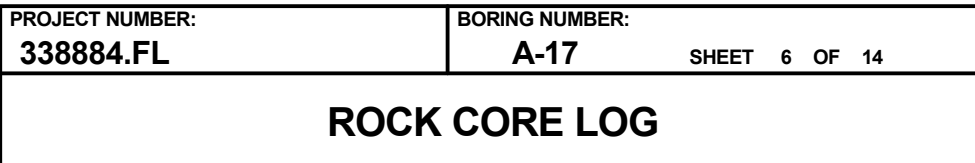
LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

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.
41.0	R6-NQ 5 ft 68%	0	>10	41.0-44.4' - Fracture zone, 20-30 deg, rough to smooth, undulating, fragments predominately 1/2" up to 2"		Limestone 41.0-42.3' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, very weak (R1), voids <1/16" on 50% of surface, moderately fossiliferous, trace organics 42.3-44.4' - Same as 41.0-43.0' except extremely weak (R0), 42.3-42.5' seam of sandy lean clay No Recovery 44.4-46.0'	
			>10				
			>10				
			>10				
45 -2.7			NR				
46.0	R7-NQ 5 ft 68%	0	5	46.0-47.7' - Fractures (8), 20 deg, rough, undulating, to smooth and undulating, face angles parallel, open to 1/16" 47.9' - Fracture, horizontal, smooth, undulating, open to 3/16" 48.2, 48.4, 48.6' - Fracture (3), 0-20 deg, rough, undulating 48.6-49.4' - Fracture zone, rough, undulating, rock fragments to 1"		Limestone 46.0-48.2' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, extremely weak (R0), friable, trace organics 48.2-48.6' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, very weak (R1), voids <1/16" on 40-50% of surface, laminations of organic material <1/16" 48.6-49.4' - Same as 46.0-48.2' No Recovery 49.4-51.0'	
			4				
			>10				
			>10				
50 -7.7			NR				
51.0	R8-NQ 5 ft 90%	35	>10	51.3' - Fracture, 20 deg, smooth, undulating, open to 3/16" 51.4-52.0' - Fracture zone, 0-90 deg, rough, undulating, to smooth and undulating, fragments <3/16"-1-1/2" 52.1, 53.4, 53.6, 54.0, 54.9' - Mechanical break (5) 52.2, 52.3, 52.5, 52.8' - Fracture (4), 20 deg, rough, undulating, to smooth and planar, fractures non-parallel, open to 1/8" 53.1' - Fracture, 40 deg, smooth, undulating, open to 1/16" 54.3, 54.5' - Fractures or mechanical break (2), 10-20 deg, smooth, undulating, open to 3/16" 55.4' - Fracture, 20 deg, rough, planar, open to 1/16" 56.1' - Fracture, horizontal, smooth, undulating, open to 1/16" 56.3, 56.5' - Fractures (2), 20-40 deg, smooth, undulating, open to 3/16" 57.2' - Fracture, 0-20 deg, 20 deg on upper surface, 0 deg on lower surface, open 57.5-58.1' - Fracture zone, 0-65 deg, smooth, undulating, trace silt and/or clay sized infilling, black staining on 65 deg fracture faces, fragments from 1/2"-2"		Limestone 51.0-52.5' - Same as 46.0-48.2' except laminations of organic material <1/16" from 51.0'-51.5' 52.5-55.5' - Same as 48.2-48.6' except few voids <1/16", organics more abundant No Recovery 55.5-56.0' Limestone 56.0-57.5' - Same as 52.5-55.5' 57.5-60.2' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, strong (R4), laminated bedding, voids <1/16" on 0-30% of surface, voids concentrated in zone from 58.4'-59.4', cavities to 3/4"x3/8" (fossil molds), trace organics, some laminated bedding inclined 10 deg	56.0-76.0' re-logged by C. Dougherty Casing advanced to 60.0'
			4				
			1				
			2				
55 -12.7			1				
56.0	R9-NQ 5 ft 84%	38	NR				
			3				
			>10				
			2				
60 -17.7			>10				
			>10				



LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

Rev. 4



LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-17

SHEET 7 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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 : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

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.
101.0				101.0-101.35' - Fracture zone, to 90 deg, fragments 3/8"-2-1/2"		Limestone 101.0-106.0' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, medium strong (R3), voids <1/16" on 15% of surface, trace cavities to 3/8" predominately fossil molds and casts, very fossiliferous	Water level at 1.9' below ground surface SC-4 collected at 102.15- 103.5'
	R18-NQ 5 ft 100%		>10	102.15' - Fracture, 60 deg, rough, planar to undulating, tight			
			1	103.5' - Fracture, 50 deg, smooth, undulating to planar, tight			
			1	104.0, 105.4' - Fractures (2), 15 deg, rough, undulating, tight			
			1				
105 -62.7			2			106.0-111.0' - Same as 101.0-106.0' except olive gray mottling (5Y 4/1), at 107.0' laminated bedding from 109.6-110.2' inclined 40 deg	SC-5 collected at 107.25- 108.5'
	R19-NQ 5 ft 100%		3	105.6' - Fracture, 70 deg, smooth, planar, tight			
			2	106.1-106.4' - Fracture, 60 deg, rough, undulating, tight to open to 1/16"			
			1	106.4-106.7' - Fracture, apparent healed fractures			
			1	106.5' - Fracture, 40 deg, rough, undulating, tight			
110 -67.7			>10	106.8' - Fracture, horizontal, rough, undulating, tight		111.0-116.0' - Same as 101.0-106' except trace organics from 113.6-114.3', cavities to 3/8"x1-3/16" from 113.6-114.3'	SC-6 collected at 111.0- 112.1'
	R20-NQ 5 ft 100%		3	107.0, 107.25, 108.5' - Fractures (3), 60 deg, smooth, planar, tight			
			0	109.0-109.3' - Fracture zone, 0-80 deg, rough, undulating, fragments 3/16"-2"			
			1	109.8' - Fracture, 60 deg, rough, undulating, open to 1/16", organic material on faces			
			0	110.15' - Fracture, 45 deg, smooth, undulating			
115 -72.7			0	110.25' - Fracture, 50 deg, rough, undulating, open to 1/16"		116.0-119.5' - Same as 101.0-106.0'	
	R21-NQ 5 ft 70%		1	110.65' - Fracture, 60 deg, rough, undulating, open to 1/8"			
			0	112.1' - Fracture, 75 deg, rough, undulating, tight			
			0	113.6, 114.45' - Mechanical break (2)			
			0				
120 -77.7			0			No Recovery 119.5-121.0'	
	R21-NQ 5 ft 70%		1	117.6' - Fracture, 25 deg, smooth, undulating, charcoal gray staining on 30%, tight			
			7	118.0-118.2' - Fracture zone, 0-50 deg, rough, planar, open to 1/16"			
			>10	118.2' - Fracture, 50 deg, rough, planar, tight 118.65' - Fracture, 30 deg, smooth, undulating, tight			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-17	SHEET 8 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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 : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

WATER LEVELS : 2.31 ft bgs on 4/10/07				START : 4/9/2007		END : 4/10/2007		LOGGER : A. Year, N. Jajszyniec, W. Paulose				
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 -82.7	121.0		NR	118.9' - Fracture, 10 deg, smooth, undulating, loose 119.05' - Fracture, 25 deg, smooth, undulating, loose 119.2' - Fracture, 15 deg, smooth, undulating, loose 119.3-119.5' - Fracture zone, rough, undulating, to smooth and planar, fragments 3/8"-1" 121.0-122.2' - Fracture zone, 0-90 deg, rough, undulating, fragments <3/16"-2" 121.3-121.9' - Fracture, vertical, rough, undulating, dark gray staining, open to 1/16"			Limestone 121.0-122.1' - grayish orange, (10YR 7/4), fine grained, moderate HCl reaction, medium strong (R3), voids <1/16" on 40% of surface, trace cavities to 3/8" diameter predominately fossil casts/molds No Recovery 122.1-126.0'					
	R22-NQ 5 ft 22%	12	>10	0								
		NR	>10									
			>10									
			130 -87.7	R23-NQ 5 ft 86%	18				4	2	2	
	NR	>10										
		>10										
		R24-NQ 5 ft 50%			25				0			
	NR			>10								
				>10								
135 -92.7				R24-NQ 5 ft 50%	25	0				No Recovery 133.5-136.0'		
	NR	>10										
		>10										
		R25-NQ 5 ft 60%			38	0						
	NR		>10									
			>10									
			140 -97.7	R25-NQ 5 ft 60%	38	0						
	NR	>10										
		>10										
		NR			>10							
>10												
>10												
>10												



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-17

SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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 : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

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.
141.0							
			>10	141.25-142.7' - Fracture zone, up to 75 deg, rough to smooth, undulating, dark staining, fragments <3/8"-3"		Limestone 141.0-144.6' - Same as 136.0-139.0' except mainly light olive gray, (5Y 5/2), very fossiliferous below 142.0', molds to 3/16"x3/8" on 5% of surface	
			>10				
	R26-NQ 5 ft 72%	38	1	143.25' - Fracture, 45 deg, rough, planar, tight			
			0				
145 -102.7			NR			No Recovery 144.6-146.0'	
146.0							
			1	146.7' - Fracture, horizontal, rough, undulating, open		Limestone 146.0-150.6' - Same as 136.0-139.0' except several healed fractures at 147.0-148.0', inclined 55 deg	
			1	147.2' - Fracture, 55 deg, rough, undulating, tight			
	R27-NQ 5 ft 92%	77	4	148.3-148.5' - Fractures (4), 30-70 deg, rough, undulating, 3 fragments to 1-1/2", tight to 1/16" open			
			4	149.45' - Fracture, 30 deg, rough, undulating, tight			
150 -107.7			1	149.75, 149.8, 149.9' - Fractures (3), 20 deg, rough, undulating, loose			
			NR	150.6' - Fracture, 70 deg, rough, planar, tight		No Recovery 150.6-151.0'	
			1	151.85' - Fracture, 75 deg, rough, planar, tight		Limestone 151.0-155.0' - Same as 136.0-139.0' except cavities from 3/16" diameter to 3/4"x1-3/16" on 15-20% of surface from 153.5-154.5' and 151.9-152.3', trace organics from 152.0-152.3'	
			2	152.2' - Fracture, 25 deg, rough, undulating, loose, organics on lower faces			
	R28-NQ 5 ft 80%	63	1	152.3' - Fracture, 25 deg, rough, undulating, tight to open to 3/8"			
			>10	153.2, 153.5' - Mechanical break (2) 153.8' - Fracture, 15 deg, rough, undulating, loose			
155 -112.7			NR	154.5-155.0' - Fracture zone, 0-75 deg, rough, undulating, fragments 3/8"-1"		No Recovery 155.0-156.0'	
156.0							
			>10	156.0-156.5, 157.0-157.35' - Fracture zone (2), 0-60 deg, rough, undulating, brown staining on some fracture planes, fragments to 1-1/2"		Limestone 156.0-160.7' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), trace voids <1/16" except from 158.5-160.5' where voids present over 25% of surface, cavities to 9/16" diameter throughout core and associated with healed fractures	
			>10				
	R29-NQ 5 ft 94%	60	3	158.8' - Fracture, 80 deg, rough, undulating, tight			
			>10	158.95-159.5' - Fracture zone, 20-80 deg, rough, undulating, fragments to 3"			
160 -117.7							

SC-7 collected at 148.5-149.45'



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-17

SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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 : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

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.
161.0			1	160.5' - Fracture, 30 deg, rough, undulating, tight at center, open to 3/8"		No Recovery 160.7-161.0' Limestone 161.0-162.4' - moderate yellowish brown, (10YR 5/4), fine grained, mild to moderate HCl reaction, medium strong (R3), laminated bedding at 161.0-161.5', trace organics at 162.0', voids <1/16" on 15% of surface grouped along bedding, trace cavities to 3/4" diameter 162.4-165.2' - light olive gray with moderate yellowish brown, (5Y 5/2 with 10YR 5/4), fine grained, mild HCl reaction, medium strong (R3), some cavities up to 1-9/16" oriented along healed fractures	
			NR				
			1	161.9' - Fracture, 20 deg, rough, undulating, loose			
			>10	162.0' - Fracture, 35 deg, rough, undulating, loose			
	R30-NQ 5 ft 84%	67	3	162.4-162.7' - Fracture zone, rough, undulating, brown staining on some surfaces, fragments 3/16"-1-1/2"			
			3	163.0, 163.9' - Fractures (2), 45 deg, closed, healed			
165 -122.7			0	163.6' - Fracture, 60 deg, rough, planar, open			
			NR	164.7' - Fracture, 25 deg, rough, undulating, loose			
166.0			2	164.7-164.9' - Fracture zone, rough, undulating, small fragments			
			3	166.3, 166.4' - Fractures (2), 20 deg, smooth, planar, tight			
	R32-NQ 5 ft 96%	57	8	167.55' - Fracture, 85 deg, smooth, planar, tight		No Recovery 165.2-166.0' Limestone 166.0-170.8' - moderate yellowish brown and light olive gray, (10YR 5/4 and 5Y 5/2), fine grained, mild HCl reaction, medium strong (R3), laminated bedding at 166.0-166.8' and 169.7-170.1' inclined 30-35 deg with voids <1/16" on 25% of surface, trace cavities to 3/16"x1-3/4"	
			1	167.7' - Fracture, 20 deg, smooth, undulating, tight			
170 -127.7			2	167.85' - Fracture, 80 deg, smooth, planar, tight			
			NR	168.05' - Fracture, 40 deg, smooth, undulating, tight			
			0	168.15' - Fracture, 25 deg, smooth, undulating, tight			Casing advanced to 110.0' end rock coring 4/12/07
			3	168.4-168.6' - Fracture zone, same as 29.4-30.5'			
			2	168.85' - Fracture, 25 deg, rough, undulating, loose			Q4/17/07 13:10 resume coring R31 Not recorded in field 13:35 casing advanced to 115.0'
	R33-NQ 5 ft 94%	88	1	169.65, 170.1' - Fractures (2), 35 deg, rough, undulating, loose			Corehole reamed from 115-171' begin coring at 171.0'
175 -132.7			0	170.6' - Fracture, 50 deg, rough, undulating, loose			
			NR	172.25' - Fracture, 45 deg, rough, flat, angular, dissolution break with healed 45 deg fractures			R33: 10 minutes
			10	172.35, 172.8' - Fractures (2), 2-5 deg, rough		No Recovery 170.8-171.0' Limestone 171.0-175.7' - pale olive to light olive, (10Y 6/2 to 5Y5/2), mild to moderate HCl reaction, medium strong (R3), cavities to 1.2"x2.4"x3.6", fossiliferous (casts/molds) up to 10-15% of surface	
			10	173.25' - Mechanical break, 35 deg, smooth			
			NR	174.0' - Fracture, 5-10 deg			
	R34-NQ 5 ft 98%	43	3	176.3, 176.5, 176.8, 178.1, 178.25, 178.3, 178.55, 178.9-179' - Fractures (8), these fractures are related to breccia clast separations and high angle fractures that were partially healed			M. Faurote begins logging at 176.0'
			0				Heavy chatter at 176.0-177.0'
			10	179-179.2, 179.3, 179.45, 179.8, 180.1, 180.15' - Mechanical break (6)			
180 -137.7			10				R34: 8 minutes
			NR				
			10				
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-17

SHEET 11 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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 : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
181.0		2			178.9-180.9' - pale olive, (10Y 6/2), very fine grained, mild HCl reaction, medium strong to strong (R3 to R4), 15% voids due to fossil (casts/molds), cavities to 1" long by 1/4"x1/2"	
		NR			No Recovery 180.9-181.0'	
		2	181.25' - Fracture, 7 deg, smooth, planar, minor iron oxide staining		Limestone	
		>10	181.95' - Fracture, 45 deg, rough, angular, solution expanded		181.0-184.25' - Same as 178.9-181.0'	R35: 9 minutes
	R35-NQ 5 ft 84%	59	182.55' - Fracture zone, fragments to 1"x1-1/2"			SC-8 collected at 183.25- 184.2'
		1	183.25' - Fracture, 45 deg, planar to slightly undulating, with some carbonate recrystallization			
185 -142.7		1			184.25-185.2' - light brown to medium brown, (5YR 5/6 to 5YR 4/4), fine grained, strong HCl reaction, medium strong (R3), containing very fine to fine grained clasts with <10% fossil void space	
		0	184.8' - Fracture, rough, undulating, with carbonate recrystallization on fracture surface, break is at the base of a clast in breccia		No Recovery 185.2-186.0'	
		NR			Limestone	
186.0		>10	186.0-187.0' - Fracture zone, moderate to heavy iron oxide, multiple fracture orientations		186.0-186.9' - medium brown to dark brown, (5YR 4/4 to 5YR 3/4), heavily iron-oxide stained	
		1	187.25' - Fracture or mechanical break, very angular surface		186.9-187.6' - pale olive, (10Y 6/2), very fine grained, moderate HCl reaction	
	R36-NQ 5 ft 32%	0			No Recovery 187.6-191.0'	R36: 18 minutes
190 -147.7		NR				
191.0		>10	191.0-192.0' - Fracture zone, multiple fractures, random orientations, fragments to 1"		Limestone Fragments	
					191.0-192.0' - multiple rock fragments	
					No Recovery 192.0-196.0'	
	R37-NQ 5 ft 20%	0				R37: 11 minutes
195 -152.7		NR				
196.0		2	196.3' - Fracture, 20 deg, rough, undulating			
		3	196.95' - Fracture, 40 deg, rough, undulating, <5% recrystallization on surface			
		2	197.3' - Fracture, 30 deg, rough, minor recrystallization			
	R38-NQ 5 ft 86%	67	197.65-197.75' - Fracture zone, fragments <1", recrystallization on surfaces, fragments may be from cavity break down			
		1	198.5-198.8' - Fracture zone or bedding plane, 1-3 deg, smooth, planar, minor recrystallization, fragments <1"			
200 -157.7		0				R38: 4 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-17

SHEET 12 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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 : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

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			
201.0			NR	199.05' - Fracture, 1-5 deg, rough, undulating		Limestone 196.0-198.4' - dusky yellow with moderate brown and dusky brown, (5Y 6/4 with 5YR 6/4 and 5YR 2/2), very fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), infill along bedding or subsidence planes inclined 65-80 deg, organic material as discontinuous, lenticular to planar accumulations, 196.9-198.4' cavities to 1"x1/2" on 35% of surface, trace recrystallized infill of cavities, trace healed fractures	N. Jarzyniecki begins logging at 201.0'
	R39-NQ 5 ft 76%	54	>10	201.1-201.2' - Fracture zone, intersecting fractures, open <1/4"			
			4	201.85' - Mechanical break, 10 deg			
			0	202.15, 202.65' - Fractures (2), rough, undulating, open to 1/2"			
			2	202.3, 204.65' - Bedding plane, 40 deg, rough, undulating, open to 1/2"			
205 -162.7			NR	202.95' - Bedding plane, 10 deg, smooth to rough, undulating, open to 1/4"			SC-9 collected at 203.5-204.4'
				204.1' - Mechanical break			204.0-205.0' hard drilling
				204.8' - Fracture, 70-80 deg, smooth, undulating, open, organic staining			
206.0			>10	206-206.4, 209.05-209.9' - Fracture zone (2), organic staining, intersecting fractures, open <1/4"			
	R40-NQ 5 ft 78%	37	2	206.6' - Bedding plane, 30 deg, smooth, undulating, tight			Chatter throughout
			1	207.55' - Bedding plane, <5 deg, smooth, undulating			
			>10	207.8' - Fracture, 40-45 deg, rough, stepped, open to 1/2"			
210 -167.7			NR	208.8' - Fracture, 65 deg, rough, undulating, organic staining, open			
				211.0-211.5' - Fracture zone, rough, undulating, some organic staining, open to 1/4"			Chatter throughout R41
			0	212.6' - Mechanical break			
	R41-NQ 5 ft 60%	45	3	213.4, 213.5' - Bedding plane (2), <10 deg, smooth, undulating, open to 1/4"			
215 -172.7			NR	213.9' - Bedding plane, 10 deg, rough, undulating, organic staining, open to 1/4"			
				216.0-216.5' - Bedding plane (2), <10 deg, smooth, undulating, open to 1/4"			
			1	216.45, 218.6, 218.85, 219.35, 219.45, 219.6, 219.7, 220.75' - Bedding plane (7), 5-10 deg, rough, undulating, open to 1/4"			
			0	217.4' - Bedding plane, 25 deg, rough, undulating, open to 1/4"			
	R42-NQ 5 ft 98%	73	3	218.9' - Bedding plane, rough to smooth, planar, organic staining, open to 1/4"			
220 -177.7			5				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-17

SHEET 13 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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 : 2.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/18/2007

LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

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.
221.0	R43-NQ 5 ft 86%	48	1	220.3' - Mechanical break		213.5-214.0' - dusky yellow with pale olive, (5Y 6/4 with 10YR 6/2), weak to medium strong (R2 to R3), voids <1/16" on up to 50% of surface, fossiliferous	10:50 chatter at 223.0-224.0'
			NR			No Recovery 214.0-216.0' Limestone	
			1	221.35' - Fracture, 45 deg, rough, undulating, open to 1/8"		216.0-220.9' - Same as 211.0-213.1' except dusky yellow, (5Y 6/4), medium strong (R3), voids to 1/8" on up to 70% of surface, highly fossiliferous (casts) decreasing with depth, clasts 1/2"-3" diameter, laminated organics from	
			>10	221.9, 223.4' - Mechanical break 222.35-222.5, 222.8-222.9, 224.0-225.3' - Fracture zone (3), rough, undulating, organic staining, open to <1/8"		219.0-219.65'	
			1	222.7' - Fracture, 85 deg, smooth, undulating, organic staining, open to 1/2"		No Recovery 220.9-221.0' Limestone	
			>10	223.65' - Bedding plane, <5 deg, smooth, planar, open to 1/8"		221.0-222.35' - dusky yellow with yellowish gray infill, (5Y 6/4 with 5Y 7/2), fine grained, voids <1/16" 15-50% of surface, very fossiliferous (casts/ molds)	
225 -182.7	R44-NQ 5 ft 64%	48	>10	225.3' - Fracture zone, rough, undulating, organic staining, intersecting fractures, open to <1/8"		222.35-223.7' - dusky yellow, very pale orange and pale olive, (5Y 6/4, 10YR 8/2 and 10Y 6/2), trace voids <1/16", poorly fossiliferous	SC-10 collected at 227.9-228.8'
			NR			223.7-225.3' - Same as 216.0-220.9' except weak to medium strong (R2 to R3)	
			2	226.55' - Bedding plane or mechanical break, 30 deg, rough, undulating to stepped		No Recovery 225.3-226.0' Limestone	
			3	226.95' - Bedding plane, 15 deg, smooth, undulating, open to 1/4"		226.0-229.2' - Same as 216.0-220.9'	
			>10	227.4' - Bedding plane, 15 deg, rough, undulating, open to 1/4"		No Recovery 229.2-231.0' Limestone	
			>10	227.8' - Bedding plane, 15 deg, rough, undulating, tight		231.0-232.1' - Same as 216.0-220.9' except medium strong (R3), laminations from 231.8'-231.9'	
230 -187.7	R45-NQ 5 ft 46%	10	NR	227.9' - Bedding plane, 15 deg, rough, undulating, open to 1/2"		232.1-233.3' - pale olive, (10Y 6/2), fine grained, very weak to weak (R1 to R2), voids <1/16" on 50% of surface, very fossiliferous	
				228.8' - Fracture zone, intersecting fractures, open to 1/4"		No Recovery 233.3-236.0'	
			>10	231.0-231.3, 232.1-232.4, 232.75-233.3' - Fracture zone (3), rough, undulating, intersecting fractures, open to 1/4"			
			>10	231.5' - Bedding plane, 10 deg, smooth, undulating, open to 1/4"			
			>10	231.55, 231.66' - Fractures (2), 60 deg, smooth, undulating, open to 1/4"			
			NR	231.75' - Mechanical break 232.5' - Fracture, 60 deg, smooth, undulating, open to 1/4"			
235 -192.7	R46-NQ 5 ft 38%	0				Limestone	
			>10	236.35-237.9' - Fracture zone, some organic staining, intersecting fractures, open to 1/4"		236.0-237.9' - Same as 232.1-233.3' except pale olive to dusky yellow and light gray, (10Y 6/2 to 5Y 6/4, and N7), very weak to medium strong (R1 to R3), trace organics and voids <1/16", poorly fossiliferous, light gray laminations at 236.75-237.1' and	
			>10			237.8-237.85'	
						No Recovery 237.9-241.0'	
			NR				
240 -197.7							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-17	SHEET 14 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723025.7 N, 458007.3 E (NAD83)

ELEVATION : 42.3 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 : 2.5 ft bgs on 4/10/07 START : 4/9/2007 END : 4/18/2007 LOGGER : A. Teal, N. Jarzyniecki, M. Faurote

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.
241.0							
			>10	241.0-241.65, 244.4-244.75' - Fracture zone (2), open to 1/4", intersecting fractures		Limestone 241.0-241.65' - Same as 236.0-237.9' except no laminations 241.65-243.6' - Same as 216.0-220.9'	
			1	241.9' 243.9' - Bedding plane or mechanical break (2), 10 deg, rough, undulating, tight			
			5	242.4' - Fracture, 60 deg, rough, undulating, tight			
				243.1' - Bedding plane or mechanical break, 10 deg, rough, undulating, open to 1/4"			
				243.4, 243.6' - Bedding plane (2), 10-15 deg, rough, undulating, open to 1/4"			
				243.8' - Bedding plane or mechanical break, 30 deg, rough, undulating, tight			
245 -202.7	R47-NQ 5 ft 80%	53	>10			243.6-245.0' - pale olive, (10Y 6/2), very fine grained, weak (R2), poorly fossiliferous	
			NR			No Recovery 245.0-246.0'	
246.0							
			>10	246.0-246.4, 246.5-246.7, 247.6-247.7' - Fracture zone (3), intersecting fractures, open to 1/8"		Limestone 246.0-247.7' - Same as 243.6-245.0'	
			10				
						No Recovery 247.7-251.0'	
250 -207.7	R48-NQ 5 ft 34%	13					
			NR				
251.0							
						Bottom of Boring at 251.0 ft bgs on 4/18/2007	



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-18
SHEET 1 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/25/07 START : 2/24/2007 END : 3/8/2007 LOGGER : R. Gomez, C. LeBlanc

WATER LEVELS : 2.0 TUBES ON 9/23/07			START : 2/24/2007		END : 3/3/2007		LOGGERS : R. Gomez, C. LeBlanc		
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			
42.3								Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08) Soil relogged by J. Schaffer Rock relogged by C. Dougherty Water levels in boring not recorded	
	3.5								
5		0.4	SS-1	2-2-1 (3)	Silty Sand (SM) 3.5-3.9' - grayish orange, (10YR 7/4), wet, very loose, no HCl reaction, fine silica sand, 25% nonplastic fines				
37.3	5.0								
	8.5								
10		0.9	SS-2	2-2-3 (5)	Clayey Sand (SC) 8.5-9.4' - light bluish gray, (5B 7/1), wet, loose, no HCl reaction, fine silica sand, 40% medium plastic fines				
32.3	10.0								
	13.5								
15		1.1	SS-3	3-3-5 (8)	Clayey Sand (SC) 13.5-14.1' - Same as 8.5-9.4'				
27.3	15.0				Poorly Graded Sand (SP) 14.1-14.6' - white to very light gray, (N9 to N8), wet, loose, no HCl reaction, fine silica sand, trace nonplastic fines, trace black minerals				
	18.5								
		0.0	SS-4	0-0-0 (0)	No Recovery 18.5-20.0'				
20	20.0								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-18
SHEET 2 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/25/07 START : 2/24/2007 END : 3/8/2007 LOGGER : R. Gomez, C. LeBlanc

WATER LEVELS : 2.01 TDS ON 9/29/07			START : 2/24/2007			END : 9/9/2007			LOGGERS : R. Gomez, C. LeBlanc		
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				
22.3											
	23.5										
25		1.5	SS-5	0-0-0 (0)	Fat Clay (CH) 23.5-24.2' - light to medium light gray, (N7 to N6), wet, very soft, high plasticity, no dilatancy, no HCl reaction						
17.3	25.0				Sandy Lean Clay (CL) 24.2-25.0' - very light to light gray, (N8 to N7), wet, very soft, medium plasticity, no to slow dilatancy, no HCl reaction, 41% fine silica sand						
	28.5										
	28.9	0.4	SS-6	50/5 (50/5")	Silt With Sand (ML) 28.5-28.9' - grayish orange, (10YR 7/4), moist to wet, hard, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, 20% fine to medium sand, trace organics in laminar lenses, all carbonate						
30											
12.3							Change from 3-1/2" drag bit to 3-3/8" tricone roller bit at 30.0'				
	33.5										
		1.5	SS-7	17-29-65 (94)	Sandy Silt (ML) 33.5-35.0' - Same as 28.5-29.0' except moderate yellowish brown, (10YR 5/4), moist, rapid dilatancy, 25-30% fine to medium sand, all carbonate						
35	35.0										
7.3											
	38.5										
	38.7	0.2	SS-8	50/2.5 (50/2.5")	Limestone Fragments 38.5-38.7' - moderate to strong HCl reaction, coarse sand to fine gravel, fine grained, <1/16" voids		Grinding at 38.0'				
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-18
SHEET 3 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/25/07 START : 2/24/2007 END : 3/8/2007 LOGGER : R. Gomez, C. LeBlanc

WATER LEVELS : 2.0 TUBS ON 9/23/07			START : 2/24/2007			END : 3/3/2007			LOGGERS : T. Gomez, C. LeBlanc		
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				
2.3							Moderate grinding				
	43.5						Driller's Remark: Clay, softer				
45	45.0	0.6	SS-9	7-9-61 (70)	Silt With Sand (ML) 43.5-44.1' - medium dark gray, (N4), moist to wet, hard, nonplastic to low plasticity, rapid dilatancy, moderate HCl reaction, 25% fine to medium silica sand, trace organics, all carbonate, organics in SS-9 appear to be grass		Set HW casing to 30.0'				
-2.7											
	48.5										
50	50.0	1.3	SS-10	14-38-43 (81)	Silt With Sand (ML) 48.5-49.0' - Same as 43.5-44.1' Sandy Silt (ML) 49.0-49.8' - dark yellowish brown, (10YR 4/2), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 43% fine to coarse sand, 3/8" thick clayey seams, all carbonate						
-7.7											
	53.5										
	53.9	0.4	SS-11	50/5 (50/5")	Sandy Silt (ML) 53.5-53.85' - Same as 48.5-49.8' except trace organics		Trip out 3" casing				
55											
-12.7											
	58.5										
	58.8	0.2	SS-12	50/4 (50/4")							
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-18
SHEET 4 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/25/07 START : 2/24/2007 END : 3/8/2007 LOGGER : R. Gomez, C. LeBlanc

WATER LEVELS : 2.0 TUBS ON 3/23/07			START : 2/24/2007		END : 3/3/2007		LOGGERS : R. Gomez, C. LeBlanc	
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			
-17.7					Silt With Sand (ML) 58.5-58.7' - moderate yellowish brown, (10YR 5/4), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 15% fine to medium sand, 10% organics in laminar beds		Circulation loss at 60.0'	
	63.5							
	63.8	0.3	SS-13	50/4 (50/4")	Silt With Sand (ML) 63.5-63.8' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), moist, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 24% fine to medium sand, all carbonate			
65 -22.7							Driller's Remark: Hard drilling at 65.5'	
	68.5							
	68.8	0.2	SS-14	50/3 (50/3")	Silt (ML) 68.5-68.65' - Same as 63.5-63.8' except 10-15% coarse sand to fine gravel-sized limestone in lenticular shapes			
70 -27.7								
	73.5							
	73.7	0.0	SS-15	50/2 (50/2")	No Recovery 73.5-73.7'			
75 -32.7								
	78.5							
		1.2	SS-16	53-50-39 (89)				
80	80.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-18
SHEET 5 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/25/07 START : 2/24/2007 END : 3/8/2007 LOGGER : R. Gomez, C. LeBlanc

WATER LEVELS : 2.0 TUBES ON 9/23/07			START : 2/24/2007		END : 3/3/2007		LOGGERS : R. Gomez, C. LeBlanc	
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	
-37.7					Silty Sand With Gravel (SM) 78.5-79.7' - moderate yellowish brown, (10YR 5/4), wet, very dense, mild to moderate HCl reaction, fine to coarse carbonate sand, 20% nonplastic fines, 35-40% fine to coarse gravel-sized limestone			
83.5								
85								
-42.7								
85.0	1.3	SS-17	15-11-34 (45)		Silty Sand With Gravel (SM) 83.5-84.8' - Same as 78.5-79.7' except black organics in laminar beds from 84.6-84.8'			
88.5								
89.3	0.6	SS-18	22-52/4 (74/10")		Silty Sand With Gravel (SM) 88.5-89.1' - Same as 83.5-84.8'		HW casing set to 30.0', set NW casing to 55.0'	
90					Begin Rock Coring at 88.5 ft bgs See the next sheet for the rock core log			
-47.7								
95								
-52.7								
100								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-18	SHEET 6 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler

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

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/25/07

START : 2/24/2007

END : 3/8/2007

LOGGER : R. Gomez, C. LeBlanc

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			
90 -47.7	88.5 R0-NQ 2.5 ft 60%	47	1	88.7' - Fracture, horizontal, rough, undulating		Limestone 88.5-90.0' - dusky yellow, (5Y 6/4), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), 80% coverage of 1/16" voids on surface, few larger 3/16" voids near lower end of run, moderately fossiliferous (casts), lignite disk 1/8" thick, silty matrix when grains broken down No Recovery 90.0-91.0' Limestone 91.0-96.0' - Same as 88.7-89.0' except more abundant cavities (up to 9/16") from 93.5-94.5', cavities appear to be fossil molds, some small (1/16"x1/8") fragments of dark organic material from 94.5-96.0'	Core run R0-NQ advanced 88.5-91.0' to set 5-foot stroke for remainder of borehole SC-1 collected at 89.1-89.8' R0: 4 minutes 2/25/08 08:00 Begin inserting NQ rods
			1	89.8' - Fracture, horizontal, rough, undulating, break is along plan of 1-3/16" clam shell fossil			
			NR				
			1	91.7' - Fracture, 25 deg, rough, undulating, 3/16" open, semi-tight			
			1	92.8' - Fracture, horizontal, smooth, undulating, open		Limestone 96.0-97.3' - yellowish gray with pale olive (20%), (5Y 7/2 with 10 6/2), fine grained, moderate to strong HCl reaction, weak (R2), 50-60% coverage of 1/16" voids on surface, areas with voids mix irregularly with areas without voids, moderately fossiliferous, few voids >1/16" No Recovery 97.3-101.0'	Driller's Remark: Loss of circulation between 94.0-96.0' R1: 14 minutes
			0	94.0' - Fractures, 30-50 deg, multiple fractures			
			>10				
			2	95.4' - Fractures (2), 45 deg, almost perpendicular, one is smooth and undulating with some dark staining, other is rough and undulating with no staining			
95 -52.7			>10	96.0-97.3' - Fractures, 0-90 deg, rough, undulating, slightly weathered, 3/16" relief, open		Limestone 101.0-102.0' - Same as 96.0-97.3' except up to 20% voids, 6-7 gastropod casts up to 3/16" 102.0-102.3' - dusky yellow, (5Y 6/4), fine grained, moderate to strong HCl reaction, weak (R2), 85% coverage of 1/16" voids on surface 102.3-102.8' - light olive gray, (5Y 5/2), fine grained, moderate to strong HCl reaction, 30% coverage of 1/16" voids on surface No Recovery 102.8-106.0'	R2: 7 minutes
			>10				
			0				
			NR				
100 -57.7			>10	101.0-102.8' - Fractures, 0-45 deg, rough, undulating, up to 3/16" relief, open, one 2" fragment shows coring marks in two different directions (at 101.9'), fracture at 102.1' is moderately tight and 30% rough and undulating		Limestone 106.3-107.0' - Fractures, 0-60 deg, rough, undulating, fragments range from 3/16" to 1-1/2", open 107.0-107.4' - Fracture, vertical, rough, undulating, tight	Driller's Remark: Low recovery possibly from losing inner core from broken pieces during drilling actions Drilling head appears loose during coring causing an eccentric advancement, breaking up rock R3: 11 minutes
			>10				
			17				
			NR				
105 -62.7			>10				
			5				

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler

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






ORIENTATION : Vertical

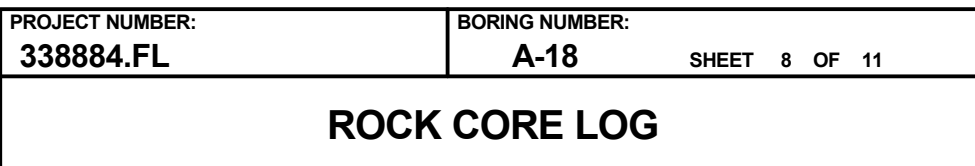
WATER LEVELS : 2.0 ft bqs on 3/25/07

START : 2/24/2007

END : 3/8/2007

LOGGER : R. Gomez, C. LeBlanc

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							
110 -67.7	5 ft 100%	35	2	107.4, 107.7, 107.8, 107.10' - Fractures (4), 0-20 deg, rough, undulating, open		Limestone 106.0-111.0' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, weak (R2), 90% coverage of 1/16" voids on surface, <5% coverage of 3/16" fossil molds on surface, particularly in top half of section, some very small fragments of organic material below 110.0' 111.0-116.0' - Same as 106.0-111.0' except mild to moderate HCl reaction, moderately fossiliferous from 112.0-114.0', 1/16" voids-molds	R4: 10 minutes						
		2	108.3' - Fracture, 10 deg, rough, undulating, open up to 3/16"										
	111.0	2	108.8' - Fracture, 60 deg, rough, undulating, tight										
115 -72.7	R5-NQ 5 ft 100%	75	1	109.2' - Fracture, 45 deg, rough, undulating, open up to 1/16"					Limestone 116.0-118.0' - Same as 111.0-116.0' 118.0-121.0' - light olive gray, (5Y 5/2), fine grained, moderate to strong HCl reaction, weak (R2), fine grain, 50-60% coverage of 1/16" voids on surface, few larger voids <1/16", voids are fossil casts	SC-2 collected at 111.55-112.35'			
			3	109.7' - Fracture, 10 deg, rough, undulating, open									
			2	110.6' - Fracture, 65 deg, rough, undulating, tight									
			0	110.8' - Fracture, 10 deg, rough, undulating, open to 1/16"									
			2	111.2' - Fracture, 45 deg, smooth, undulating, dark staining on 60%									
			0	112.5, 112.7, 112.8' - Fractures (3), 0-45 deg, rough, undulating, open									
			2	113.2, 113.9' - Fractures (2), horizontal, rough, undulating, 3/16" relief, open									
120 -77.7	R6-NQ 5 ft 100%	68	2	113.8' - Mechanical break								Limestone 121.0-121.9' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, <30% coverage of <1/16" voids on surface, poorly fossiliferous 121.9-122.5' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), 85% coverage of <1/16" voids on surface, remainder is larger 3/8" cavities, moderately fossiliferous, grades into below 122.5-123.0' - light olive gray, (5Y 5/2), fine grained, mild to moderate HCl reaction, weak (R2), 90% coverage of 1/16" voids on surface, moderately fossiliferous No Recovery 123.0-126.0'	R5: Run time not recorded
			1	115.2' - Fracture, horizontal, rough, undulating, open									
			4	115.7' - Mechanical break, rounded ends									
			1	116.4' - Fracture, 60 deg, rough, undulating, tight to 1/16" open									
			3	116.9' - Fracture, 5 deg, smooth, undulating, open									
			1	117.8' - Fracture or mechanical break, 5 deg, rough, undulating, tight to open 1/16"									
			1	118.1, 118.9' - Fractures (2), horizontal, smooth, undulating, dark staining, open									
125 -82.7	R7-NQ 5 ft 40%	18	1	118.3, 118.5' - Fractures or mechanical break (2), 10 deg and 20 deg, rough, undulating, tight		SC-3 collected at 121.0-121.9' From 122.0-125.0' coring increased with loss of circulation, possibly a void or unconsolidated sands Lack of recovery may have occurred from 122.0-125.0' based upon a drop in the drilling head that stopped at 125.0' followed by hard drilling Core barrel having trouble pulling out of casing Inner/outer core barrels lodged in borehole R7: Run time not recorded							
			>10	119.7' - Fracture or mechanical break, 10 deg, rough, undulating, tight to open 1/16"									
			NR	120.1-120.4' - Fractures, 0-45 deg, dark staining at 120.4', open									
			4	121.9' - Fracture, horizontal, rough, undulating, rounded surface, open									
			1	122.0-122.4' - Fractures, 0-90 deg, rough, undulating, open									
	R8-NQ		>10	122.7' - Fracture or mechanical break, 20 deg, rough, undulating, open to 1/16"									
			4	126.3-126.5' - Fractures, 0-45 deg, open, fragments up to 1-1/2"									
			1	126.6' - Fracture, horizontal, rough, undulating, relief 3/16" open									



WATER LEVELS : 2.0 ft bgs on 3/25/07 START : 2/24/2007 END : 3/8/2007 LOGGER : R. Gomez, C. LeBlanc

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-18

SHEET 9 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler

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

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/25/07

START : 2/24/2007

END : 3/8/2007

LOGGER : R. Gomez, C. LeBlanc

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		
150 -107.7		5 ft 66%	18	3			141.8-142.5' - yellowish gray, (5Y 7/2), moderate HCl reaction, weak (R2), 80% coverage of 1/16" voids on surface, fossil molds (3/16") from 141.8-142.1', layer without voids from 142.3-142.5' No Recovery 142.5-146.0' Limestone 146.0-146.9' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, weak (R2), 75% coverage of <1/16" voids on surface, larger voids (up to 9/16") over 10% of surface 146.9-149.3' - light olive gray, (5Y 5/2), mild to moderate HCl reaction, medium strong (R3), <5% coverage of 1/16" voids on surface, most being below 148.5', few larger <3/16" voids (fossil molds) below 148.5' No Recovery 149.3-151.0' Limestone 151.0-155.1' - dusky yellow to light olive gray, (5Y 6/4 to 5Y 5/2), fine grained, moderate HCl reaction, weak (R2), 90% coverage of 1/16" voids on surface to 154.2', then only over 40% of surface, cavities (fossil molds) up to 3/8" up to 5% of surface throughout interval No Recovery 155.1-156.0' Limestone 156.0-158.1' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), 60% coverage of 1/16" voids on surface, most are present from 156.5-157.0' and 157.4-158.1' 158.1-158.9' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak (R2), laminated with dusky yellow 5Y 6/4, laminations are irregular and uneven, <1/16" voids present along laminations 158.9-160.5' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak (R2), <1/16" voids, few fossil molds (up to 3/16") No Recovery 160.5-161.0' Limestone 161.0-162.0' - Same as 158.9-160.5' except 20% coverage of <1/16" voids on surface, larger voids (3/16"), fossil molds also visible 162.0-163.3' - dusky yellow, (5Y 6/4), fine grained, moderate to strong HCl reaction, weak (R2), 95% coverage of <1/16" voids on surface, cavities (up to 3/16") on remaining 5% No Recovery 163.3-166.0'	R12: 13 minutes
			0					
			NR					
155 -112.7		R13-NQ 5 ft 82%	71	1			R13: 12 minutes	
				2				
				1				
				2				
				0				
				NR				
160 -117.7		R14-NQ 5 ft 90%	50	2			R14: 14 minutes	
				>10				
				4				
				3				
				1				
				NR				
165 -122.7		R15-NQ 5 ft 46%	28	0			R15: 5 minutes	
				4				
				4				
				NR				
				3				
				>10				
		R16-NQ						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-18

SHEET 10 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler

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

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/25/07

START : 2/24/2007

END : 3/8/2007

LOGGER : R. Gomez, C. LeBlanc

WATER LEVEL: 26.0 R EGS ON 02/07		DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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					
170 -127.7	5 ft 62%	23	2	167.0-167.6' - Fracture zone, 0-90 deg, black staining on vertical faces, fragments from 3/16" to 3-1/2", faces match poorly			Limestone 166.0-169.1' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, medium strong (R3), 10% coverage of 1/16" voids on surface, few larger (up to 3/16") voids and fossil molds, except from about 166.9-167.4', zone from 167.5-167.9' has no voids but is laminated with darker zone from 167.7-167.9', brass colored to dark colored staining on broken surface across darker zone No Recovery 169.1-171.0' Limestone 171.0-172.0' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, medium strong (R3), some <3/16" fossil molds 172.0-173.5' - yellowish gray, (5Y 7/2), moderate HCl reaction, weak to medium strong (R2 to R3), 50% coverage of 1/16" voids on surface, larger (up to 3/8") voids up to 5%, moderately fossiliferous 173.5-175.4' - Same as 171.0-172.0' No Recovery 175.4-176.0' Limestone 176.0-180.7' - Same as 172.0-173.5' except fewer large voids and fossil molds, poorly fossiliferous	R16: 18 minutes	
			0	167.9' - Fracture zone, horizontal, rough, undulating, open to 3/16"					
	171.0	NR	168.3' - Fracture, horizontal, rough, undulating, open						
			3	168.5' - Fracture, horizontal, rough, undulating on upper face, smooth and planar on lower, open, some 3/8" fragments					
	175 -132.7	R17-NQ 5 ft 88%	34	3	169.0' - Mechanical break				
				2	171.1, 171.2' - Fractures (2), horizontal, smooth, planar, open up to 3/16"				
				5	172.0' - Fracture or mechanical break, 45 deg, rough, undulating				
				1	172.3-172.7' - Mechanical break or fractures, 0-65 deg, open to 3/16"				
				NR	173.4, 173.6' - Fractures (2), horizontal, smooth, planar, open to 3/16"				
				3	174.1, 174.2, 174.3' - Fractures (3), 0-5 deg, smooth, planar, open up to 3/16"				
180 -137.7	R18-NQ 5 ft 94%	46	8	174.6' - Fracture or mechanical break, horizontal, rough, undulating, open up to 1/16"					
			2	174.8, 175.1' - Fractures (2), horizontal, rough, undulating on upper face and planar on lower face					
			5	176.4, 176.6' - Fractures (2), horizontal, rough, undulating, open to 3/16"					
			2	176.7' - Fracture, horizontal, smooth, planar, open to 1/16"					
			NR	177.1, 177.15, 177.2, 177.4, 177.7, 177.75, 177.8, 177.9' - Fractures (8), horizontal, smooth, planar to slightly undulating, open 1/16" to 3/16"					
			>10	178.3' - Fracture, horizontal, rough, undulating, open, fragments up to 1/2"					
	181.0	NR	178.9-179.4' - Fractures (4), 0-45 deg, rough, undulating, open, fragments up to 1"						
			0	179.8, 179.9' - Fractures (2), horizontal, rough, undulating, open to 3/16"					
			>10	180.3' - Fracture, horizontal, smooth, planar to stepped, open to 3/16"					
			NR	180.4' - Fracture, horizontal, rough, undulating, open, rounded faces					
185 -142.7	R19-NQ 5 ft 54%	18	181.0-182.0' - Fracture zone, 0-90 deg, rough, undulating, some slight dark staining at 181.6'						
			182.0-183.0' - Mechanical break						
			183.0-183.7' - Fracture zone, 0-90 deg, rough, undulating, fragments up to 1-1/2"						
			186.0-186.4' - Fractures, horizontal, multiple 1" fragments, open						
			187.8' - Fracture, horizontal, smooth, planar, open to 1/16"						
			3						
	186.0	NR							
			1						
			37						
</									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-18

SHEET 11 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722986.9 N, 458047.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: R. Woodard, P. Buchler

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

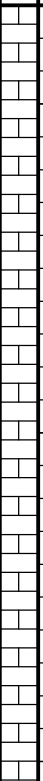
ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/25/07

START : 2/24/2007

END : 3/8/2007

LOGGER : R. Gomez, C. LeBlanc

DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS		
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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				
190 -147.7	69%	190.5	>10	188.2-189.1' - Fracture zone, rough, undulating, fragments up to 2"		186.5-189.1' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), 40% coverage of <1/16" voids on surface to 187.3', over 90% of surface with larger (up to 3/16") below 187.3', moderately fossiliferous No Recovery 189.1-190.5' Limestone 190.5-194.3' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, weak (R2), 40% coverage of <1/16" voids on surface in zone from 191.3-192.8' and 193.5-194.3', moderately fossiliferous in same zone, color grades to dusky yellow (5Y 6/4) by 193.0', dark thin (1/16") irregular laminations visible at 192.5-192.7' No Recovery 194.3-195.5'	R20: 14 minutes R21: 52 minutes On 3/7/07 all day was spent addressing/fixing borehole cave-in issues, casing was set to 175.0' drilled with tricone bit to 190.5'	
			>10					
	NR							
	3							
	3							
	>10							
	>10							
	NR							
	195 -152.7	R21-NQ 5 ft 76%	17					5
	2							
	200 -157.7	R22-NQ 5 ft 80%	20					>10
								>10
NR								
200.5						Bottom of Boring at 200.5 ft bgs on 3/8/2007	R22: 17 minutes	



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-18A
SHEET 1 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.2 N, 458049.3 E (NAD83)
 ELEVATION : 42.1 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, 2-15/16 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/25/07 START : 6/14/2007 END : 6/15/2007 LOGGER : D. Whitaker

WATER LEVELS 7/26/18 BGS ON 7/26/18			START DATE 7/24/2007			END DATE 7/19/2007			ECCOENR B. Whitaker		
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				
42.1							06/14/07 Drill 10.0' pilot hole, install 10.0' of SW (6") casing Blind drill to 25.0'				
							Water level obtained from boring A-18				
5											
37.1											
		</									



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-18A
SHEET 2 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.2 N, 458049.3 E (NAD83)
 ELEVATION : 42.1 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, 2-15/16 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/25/07 START : 6/14/2007 END : 6/15/2007 LOGGER : D. Whitaker

WATER LEVELS : 2.0 (bgs) 01/02/07			START : 01/14/2007			END : 01/03/2007			LOGGERS : D. Whitaker		
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				
22.1											
25	25.0										
17.1		1.3	SS-1	20-24-23 (47)	Fat Clay With Sand (CH) 25.0-25.05' - light bluish gray, (5B 7/1), wet, very stiff, high plasticity, no dilatancy, no HCl reaction, 15% very fine to fine silica sand, (slough)						
	26.5				Silty Sand (SM) 25.05-26.35' - yellowish gray, (5Y 8/1), wet, dense, fine to coarse grained sand-sized, moderate HCl reaction, 24% nonplastic fines, all carbonate			06/15/07 Install 5' more of SW casing Begin split spoon sampling at 25.0' 09:00 Pull out split spoon 25.0-26.5'			
30	30.0										
12.1		0.5	SS-2	50/5.5 (50/5.5")	Silty Sand (SM) 30.0-30.5' - Same as 25.05-26.35' except grayish orange, (10YR 7/4) Begin Rock Coring at 30.5 ft bgs See the next sheet for the rock core log			09:15 Pull out 30.0-31.5' interval SPT; decide to start rock coring			
35											
7.1											
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-18A

SHEET 3 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.2 N, 458049.3 E (NAD83)

ELEVATION : 42.1 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, SW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/25/07

START : 6/14/2007

END : 6/15/2007

LOGGER : D. Whitaker

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.
30.5						No Recovery 30.5-35.5'	09:55 Begin rock coring
35	R1-NQ 5 ft 0%	0	NR				Driller's Remark: Sand layer that washed out (30.5-35.5') - felt resistance during drilling
35.5							R1: 4 minutes
36.2'			2	36.2' - Fracture (2), 60 deg and 70 deg, rough, undulating, open (1/8"), intersecting		Limestone 35.5-39.5' - pale olive, (10Y 6/2), very fine to fine grained, moderate to strong HCl reaction, very weak (R1), 15% surface voids (<1/16")	
37.12-37.45'			>10	37.12-37.45' - Fracture zone		35.5-38.5', 40% surface voids from 38.5-38.5', many cavities up to 3/16"x9/16", many fossil molds with minor silt infill, sporadic black (organic) material up to 3/16", trace (few) fossil casts	SC-1 collected at 37.45-38.55'
38.55-38.75'	R2-NQ 5 ft 80%	60	0	38.55-38.75' - Fracture zone		No Recovery 39.5-40.5'	R2: 8 minutes
38.95'			>10	38.95' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
40.5			NR				
41.65'			0	41.65' - Bedding plane or mechanical break, 5 deg, rough, undulating, open (1/8")		Limestone 40.5-42.9' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, weak (R2), extremely weak rock (R0) from 42.2-42.9', 40.5-42.2' 40% small surface voids (<1/16"), many small cavities up to 3/16" in diameter, few fossil molds and casts, moderately fossiliferous, 42.2-42.9' 5% surface voids and 1/16" infill into void space, few fossil molds	Core run times not recorded beyond run R2-NQ
42.1-42.53'			>10	42.1-42.53' - Fracture zone			
42.67'	R3-NQ 5 ft 48%	31	2	42.67' - Fracture, horizontal, rough, stepped, open (1/2"), intersecting		No Recovery 42.9-45.5'	
45			NR				
45.5							
46.4, 45.9, 46.95, 47.5, 48.3, 48.5, 49.1, 49.45, 50.15'			2	46.4, 45.9, 46.95, 47.5, 48.3, 48.5, 49.1, 49.45, 50.15' - Mechanical break, <5 deg, rough, planar, silt infilling, tight		Limestone 45.5-50.4' - yellowish gray, (5Y 7/2), strong HCl reaction, extremely weak (R0), 25-40% surface voids (<1/16") variable over core, void infill, many cavities up to 3/16"x3/8", many black (organic) oblong and spherical fossils up to 3/16" in diameter, horizontal black laminations from 47.4-47.8' varying in size up to 3/16" thick, fine grained with local medium grained accumulations	
50			2				
50.15'			2				
50.5	R4-NQ 5 ft 98%	63	2				
			3				
			1				
50.5							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-18A

SHEET 4 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.2 N, 458049.3 E (NAD83)

ELEVATION : 42.1 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, SW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/25/07

START : 6/14/2007

END : 6/15/2007

LOGGER : D. Whitaker

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.
55 -12.9	R5-NQ 5 ft 96%	73	NR			No Recovery 50.4-50.5' Limestone 50.5-55.3' - pale yellowish brown, (10YR 4/2), moderate HCl reaction, extremely weak (R0), small surface voids (<1/16") 15-25% variable over core length, many cavities up to 9/16"x3/16", trace black elongate shaped material (organics) up to 9/16"x1/16", trace black lineations from 51.65-51.85', fine grained with local medium grained accumulations	
			0				
			2	51.5, 53.8' - Mechanical break, 60 deg, tight 51.85' - Mechanical break, 50 deg, tight			
			3	52.85, 53.85, 53.95, 54.5' - Mechanical break, horizontal, tight			
			3				
55.5 -17.9	R6-NQ 5 ft 100%	82	1			No Recovery 55.3-55.5' Limestone 55.5-60.5' - Same as 50.5-55.3' except 5-15% surface voids (<1/16"), many black lineations throughout, few cavities up to 1/8" diameter	
			NR				
			3	55.75, 55.9, 56.15, 56.63, 57.02, 57.4, 57.9, 58.4, 59.08' - Mechanical break, <10 deg, rough, planar, tight			
			3				
			3	57.6' - Mechanical break, 50 deg, rough, planar, tight			
60 -22.9	R7-NQ 5 ft 100%	88	1			Limestone 60.5-61.1' - pale yellowish brown, (10YR 4/2), moderate HCl reaction, weak (R2), hard, moderate density, fossiliferous, small voids and fossil molds (1/16"-1/8") over 10-15% of surface Limestone 61.1-65.5' - pale yellowish brown, (10YR 4/2), moderate HCl reaction, extremely weak to weak (R0 to R2), hard, localized zones of small voids (1/16"-1/8") up to 15% of surface, very sparse black organic inclusions Limestone 65.5-70.5' - moderate yellowish brown, (10YR 5/4), moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), some of the rock from 68.0-70.5' poorly fossiliferous, up to 3/16" thick, sparse very thin (<1/16" thick) lineations, few cavities up to 1/16"x1/8", few black blebs up to 3/16" diameter, mostly fine grained	
			0				
			3	61.0' - Bedding plane or mechanical break, horizontal, rough, undulating, tight 61.1' - Mechanical break, 40 deg, rough, undulating, tight 61.5, 61.9, 62.46, 63.05, 64.0, 64.6, 65.23' - Mechanical break, <10 deg, rough, planar to undulating, tight			
			2				
			2				
65 -27.9	R8-NQ 5 ft 100%	86	1				SC-2 collected at 69.12-70.23'
			3	66.5' - Fracture (2), 50 deg, rough, stepped, tight, intersecting 66.9, 67.13, 67.8, 69.13, 70.2' - Bedding plane or mechanical break, <5 deg, rough, planar to undulating, tight to open (up to 1/4")			
			1				
			1				
			2				
70 -27.9	70.5						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-18A

SHEET 5 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.2 N, 458049.3 E (NAD83)

ELEVATION : 42.1 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, SW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/25/07

START : 6/14/2007

END : 6/15/2007

LOGGER : D. Whitaker

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.
75 -32.9	R9-NQ 5 ft 85%	52	2	70.25' - Fracture, 70 deg, rough, planar		Limestone 70.5-74.75' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, weak (R2), 25% surface voids (<1/16") from 70.5-73.0', 50% surface voids (<1/16") from 73.0-74.75', many cavities up to 3/8", very fossiliferous, many molds, casts, trace black (organics) lineations	11:40 20.0' More HW casing put in to 50.0'
			2	71.1, 72.15, 72.25' - Fracture, 50 deg, smooth, undulating, open (up to 1/4")			
			3	71.2' - Bedding plane, horizontal, rough, planar, black staining, open (1/8")			
			6	72.6' - Fracture (2), 60 deg and 5 deg, rough, undulating, tight, intersecting			
			>10	73.03' - Mechanical break or bedding plane, rough, planar, tight to open (1/16")			
			NR	73.9, 74.0, 74.15, 74.3, 74.5, 74.6' - Bedding plane, <10 deg, rough, undulating to stepped, open (up to 3/4")			
				74.6-74.75' - Fracture zone		No Recovery 74.75-75.5'	
80 -37.9	R10-NQ 5 ft 67%	33	2	75.5-75.6' - part of core is fractured		Limestone 75.5-78.85' - Same as 70.5-74.75' except extremely weak (R0), black organic material up to 1"x1/8"	
			>10	75.9, 76.6' - Fracture (2), 50 deg, rough, planar, open (up to 3/4")			
			5	76.95-77.3' - Fracture zone			
			NR	78.05, 78.2, 78.3' - Bedding plane or mechanical break, horizontal, smooth, undulating, tight to open (1/16")		No Recovery 78.85-80.5'	
				78.45' - 20 deg and 70 deg, rough, undulating, tight to open (1/8"), intersecting			
85 -42.9	R11-NQ 5 ft 8%	0	>10	80.5-80.9' - Fracture zone		Limestone 80.5-80.9' - Same as 75.5-78.85' except pale olive, (10Y 6/2) No Recovery 80.9-85.5'	
			NR				
90 -47.9	R12-NQ 5 ft 52%	43	1	85.5-88.1' - Mechanical break or bedding plane, 30 deg, rough, undulating, tight		Limestone 85.5-88.1' - light olive gray to dusky yellow, (5Y 5/2 to 5Y 6/4), strong HCl reaction, weak (R2), 87.7-88.1' extremely weak rock (R0), 40-50% surface voids (<1/16") many cavities up to 3/8"x3/16", highly fossiliferous, many (>5) molds, few casts, minor recrystallization No Recovery 88.1-90.5'	SC-3 collected at 86.9-87.72'
			1	86.9' - Mechanical break or bedding plane, horizontal, rough, undulating, tight			
			>10	87.72-88.1' - Fracture zone			
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-18A

SHEET 6 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722992.2 N, 458049.3 E (NAD83)

ELEVATION : 42.1 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, SW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/25/07

START : 6/14/2007

END : 6/15/2007

LOGGER : D. Whitaker

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.
95 -52.9	R13-NQ 5 ft 90%	57	>10	90.78' - Mechanical break or bedding plane, horizontal, rough, stepped, tight		Limestone 90.5-95.0' - Same as 85.5-88.1' except very fossiliferous with many cavities up to 1-3/4"x1-3/16", minor silt infill, secondary carbonate crystals within cavities and voids space present, minor black staining in some cavities	
			>10	91.3-92.4' - Fracture, 85 deg, rough, undulating, fragments along fracture plane			
			4	91.3, 91.8' - Bedding plane or mechanical break, 35 deg, rough, stepped, tight			
			2	91.9' - Fracture, smooth, stepped, missing part of fracture			
			0	92.6, 92.7, 93.4, 94.25' - Bedding plane, <25 deg, rough, stepped, fragments in fractures, open (up to 1")			
			NR	93.8' - Bedding plane or mechanical break, 30 deg, rough, undulating, tight		No Recovery 95.0-95.5' Limestone 95.5-97.35' - Same as 85.5-88.1' except 15-25% surface voids (<1/16")	
			1	95.95' - Bedding plane or mechanical break, 10 deg, smooth, undulating, tight			
			1	96.6' - Bedding plane, smooth, undulating, open (3/4-2"), fragments in fracture, also 50 degree fracture smooth, undulating, black staining			
	R14-NQ 5 ft 37%	32	NR			No Recovery 97.35-100.5'	
100 -57.9						Bottom of Boring at 100.5 ft bgs on 6/15/2007	6/15/07 15:30, Total depth of boring 100.5'



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-19	SHEET 1 OF 14
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/26/2007

LOGGER : R. McComb

WATER LEVELS : 2.0' TO 0.5' ON 3/20/07		START : 3/20/2007		END : 3/20/2007		LOGGERS : T. MCCOMB			
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					
43.1	0.0				Poorly Graded Sand With Silt And Gravel (SP-SM) 0.0-0.5' - grayish yellow, (5Y 8/4), dry, loose, fine to coarse grained sand and gravel, 11% fines, limestone road base		Water level at 2.0' below ground surface		
	1.5	SS-1	3-3-3-3 (6)		Poorly Graded Sand (SP) 0.5-1.5' - dusky brown to pale yellowish brown, (5YR 2/2 to 10YR 6/2), moist, loose, fine grained, trace nonplastic fines, up to 25% organics, wood fragments 0.5-0.8'				
	2.0								
	4.0	SS-2	2-4-4-6 (8)		Silty Sand (SM) 2.0-2.5' - grayish brown, (5YR 5/2), wet, loose, fine grained, 20% nonplastic fines, fines may be organics				
5									
38.1	6.0	SS-3	3-3-4-4 (7)		Poorly Graded Sand With Silt (SP-SM) 2.5-3.2' - grayish orange, (10YR 5/6), wet, loose, fine grained, 5-10% nonplastic fines				
	8.0	SS-4	2-2-1-0 (3)		Silty Sand (SM) 4.0-5.4' - light gray, (N8), wet, loose, fine grained, 20-25% low plastic fines, trace fine sand-sized black minerals				
	10.0	SS-5	2-3-7-12 (10)		Silty Sand (SM) 6.0-7.2' - light gray to medium gray, (N7 to N6), wet, very loose, fine grained, 20% low plastic fines				
10									
33.1	12.0	SS-6	3-47-11-9 (58)		Lean Clay With Sand (CL) 7.2-7.6' - medium gray to dark gray, (N4 to N3), wet, soft, low to medium plasticity, slow dilatancy, 15% fine grained sand, 5% wood and organics				
	14.0	SS-7	6-12-8-10 (20)		Fat Clay With Sand (CH) 8.0-8.4' - medium gray to dark gray, (N4 to N3), wet, stiff, high plasticity, no dilatancy, 15-20% fine grained sand, 5% wood fragments				
	16.0				Silt With Sand (ML) 8.4-8.9' - grayish orange, (10YR 7/4), wet, stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 18% fine grained sand				
	18.0	SS-8	3-8-9-8 (17)		Silty Gravel With Sand (GM) 10.0-10.9' - grayish orange, (10YR 7/4), moist, very dense, moderate to strong HCl reaction, fine to coarse gravel-sized up to 2", 25% fine to coarse grained sand, 15-20% low plastic fines				
15					Silt With Sand (ML) 12.0-12.9' - grayish orange, (10YR 7/4), moist to wet, very stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 5-10% fine grained sand, 5% medium to coarse grained sand				
28.1	20.0	SS-9	9-13-18-30 (31)		Limestone And Silt (ML) 14.0-14.7' - moderate olive brown, (5Y 4/4), moderate HCl reaction, coarse sand to coarse gravel-sized, angular to subrounded limestone fragments, with silt that is grayish yellow (5Y 8/4), wet, very stiff, 10-15% fine grained sand, moderate to strong HCl reaction				
	22.0	SS-10	12-18-25-13 (43)		Silt (ML) 16.0-17.3' - yellowish gray, (5Y 7/2), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 6% fine grained sand				
	24.0				Limestone Fragments 18.0-18.2' - moderate to dark yellowish orange, (10YR 5/4 to 10YR 6/6), strong HCl reaction, fine to coarse gravel-sized, angular fragments up to 2"				
20					Silt (ML) 18.2-19.4' - Same as 16.0-17.3'				



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-19
SHEET 2 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/23/07 START : 3/23/2007 END : 3/26/2007 LOGGER : R. McComb

WATER LEVELS : 2.0 TUBS ON 9/23/07		START : 9/23/2007		LOGGERS : T. MCCOMB		END : 9/26/2007		LOGGERS : T. MCCOMB	
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	
23.1	20.0		1.4	SS-11	12-19-17-17 (36)	Silt (ML) 20.0-21.4' - Same as 16.0-17.3' except 10-15% fine grained sand, trace medium to coarse grained sand			
	22.0								
		1.7		SS-12	38-43-38-44 (81)	Sandy Silt (ML) 22.0-22.5' - grayish orange, (10YR 7/4), moist, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 33% very fine to coarse grained sand			
	24.0					Silt (ML) 22.5-23.7' - Same as 22.0-22.5' except 10-15% fine grained sand			
25		1.4		SS-13	37-27-20-31 (47)	Silt (ML) 24.0-25.4' - Same as 22.5-23.7'			
18.1	26.0								
		1.4		SS-14	21-18-16-11 (34)	Sandy Silt (ML) 26.0-27.4' - Same as 22.0-22.5'			
	28.0								
		1.7		SS-15	4-3-2-17 (5)	Sandy Silt (ML) 28.0-29.7' - yellowish gray, (5Y 7/2), moist to wet, medium stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 32% fine to coarse grained sand			
30	30.0								
13.1		1.4		SS-16	10-20-21-50/3 (41)	Sandy Silt To Silt (ML) 30.0-31.4' - yellowish gray, (5Y 7/2), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 25-30% fine to coarse grained sand, decreasing to 10-15% fine grained sand at 30.0-30.3', thin laminae, white calcareous stringers <1/16" thick, oriented horizontal to 30 deg			
	31.8								
	32.0								
	32.4	0.3		SS-17	50/5 (50/5")	Sandy Silt With Limestone (ML) 32.0-32.3' - dark yellowish orange, (10YR 6/6), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 25-30% very fine to coarse grained sand, 20% disc-shaped limestone fragments up to 1/10" thick			
	34.0								
	34.4	0.4		SS-18	50/5 (50/5")	Limestone And Sandy Silt (GM) 34.0-34.4' - Same as 32.0-32.3' except low plasticity, mild to moderate HCl reaction, 75% fine to coarse grained sand and fine to coarse gravel-sized; 25% silt			
35									
8.1	36.0								
	36.1	0.1		SS-19	50/1 (50/1")	Limestone Fragments 36.0-36.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, 3 coarse gravel-sized pieces recovered Begin Rock Coring at 36.0 ft bgs See the next sheet for the rock core log		SPT discontinued at 36.0' Surface casing set to 36.0'	
40									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-19

SHEET 3 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/26/2007

LOGGER : R. McComb

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.
36.0	R1-HQ 5 ft 20%	0	>10	36.0-37.0' - Fracture zone, rough, undulating, rounded limestone fragments, some surface staining		Limestone 36.0-36.5' - yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2) 36.5-37.0' - pale yellowish brown, (10YR 6/2), fine to very fine grained, mild HCl reaction, extremely weak (R0), friable, voids over 80-90% of surface No Recovery 37.0-41.0'	Driller's Remark: Soft at 40.0-41.0' R1: 7 minutes
40 3.1			NR				
41.0	R2-HQ 5 ft 78%	35	4	41.1' - Fracture, horizontal, smooth, planar, open 3/8"		Limestone 41.0-43.5' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, extremely weak (R0), thin bedding, very friable, thinly laminated from 41.3-41.55'	R2: 2 minutes
			2	41.35' - Fracture, <5 deg, smooth, undulating, open 3/4"			
			3	41.6-41.9' - Fracture zone, 0 to <5 deg, rough, stepped			
			3	42.3' - Fracture, <5 deg, smooth, undulating, open 3/4"			
45 -1.9			NR	42.7' - Fracture, horizontal, rough, planar, open 3/4"-1-3/16"		43.5-44.9' - yellowish gray, (5Y 7/2), fine grained, no to mild HCl reaction, weak to extremely weak (R2 to R0), trace organics, voids over 40-50% of surface becoming larger with depth, trace organic material No Recovery 44.9-46.0'	
46.0	R3-HQ 5 ft 88%	20	4	43.0, 43.9' - Fractures (2), horizontal, rough, undulating, open 3/16" at 43.0', open 3/8" at 43.9'		Limestone 46.0-50.4' - yellowish gray, (5Y 7/2), fine grained, no to mild HCl reaction, extremely weak (R0), trace organics, voids over 10-15% of surface	R3: No runtime recorded
			3	44.4, 44.6' - Fractures (2), horizontal, rough, undulating, open 3/16"-3/8"			
			3	44.7' - Fracture, <5 to 40 deg, rough, undulating			
			2	46.2' - Fracture, horizontal, smooth, planar, open 1/16"			
			3	46.4' - Fracture, horizontal, rough, undulating, open 3/16"			
50 -6.9			NR	46.6' - Fracture, horizontal, smooth, planar, tight		No Recovery 50.4-51.0'	
51.0	R4-HQ 5 ft 46%	0	>10	46.9, 47.15' - Fractures (2), horizontal, rough, undulating, open 1/16"-3/16"		Limestone 51.0-53.3' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), voids on 15-25% of surface, cavity up to 3/8" length at 52.3'	R4: 4 minutes
			>10	47.30' - Fracture, <5 deg, rough, undulating, tight			
			>10	47.85' - Fracture, horizontal, smooth, undulating, open <1/16"		No Recovery 53.3-56.0'	
				48.03, 48.55' - Fractures (2), horizontal, smooth, planar, tight			
				49.60' - Fracture, <5 deg, smooth, stepped, tight			
				50.0' - Fracture, <5 to 30 deg, rough, stepped, open 3/8"			
				50.2' - Fracture, rough, planar to undulating, open 3/8"			
55 -11.9			NR	50.4' - Fracture, horizontal, smooth, planar, open			
56.0				51.0-51.7' - Fracture zone 51.7' - Fracture, 80 deg, rough, undulating, 0.4' long, open			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-19	SHEET 4 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07 START : 3/23/2007 END : 3/26/2007 LOGGER : R. McComb

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
60 -16.9	R5-HQ 5 ft 98%	87	1 52.9' - Fracture zone, <5 to 90 deg, rough, undulating		Limestone 56.0-60.9' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), voids variable from 1-2% to 20-25% of surface	SC-1 collected at 58.0- 59.3'
			1 56.6' - Fracture zone, 80 to 90 deg, rough, undulating			
			0 58.0' - Fracture, 30 deg, smooth, planar, open			
			2 59.3' - Fracture, horizontal, smooth, planar, open			
			1 59.9' - Fracture, horizontal, smooth, planar, open <1/16"			
65 -21.9	R6-HQ 5 ft 100%	90	60.5' - Fracture, horizontal, smooth, stepped, open 3/8"		No Recovery 60.9-61.0' Limestone 61.0-66.0' - Same as 56.0-60.9' except cavities vary from 15-20% decreasing with depth, trace organics as thin discontinuous laminae	R5: 4 minutes
			NR 61.3, 61.75' - Fractures (2), horizontal, smooth, planar, open 3/16"			
			3 62.8' - Fracture, horizontal, smooth, planar, tight			
			2 63.0' - Fracture, horizontal, smooth, stepped, tight			
			1 64.4' - Fracture, 50 deg, smooth, stepped, open			
			1 65.5' - Fracture, horizontal, smooth, undulating, open			
			2 66.1' - Fracture, horizontal, smooth, planar, open			
			3 66.8' - Fracture, <5 deg, smooth, stepped, open			
			1 67.03' - Fracture, <5 deg, smooth, undulating, tight			
			2 67.35' - Fracture, horizontal, smooth, planar, open			
70 -26.9	R7-HQ 5 ft 97%	65	0 67.9' - Fracture, 0 to 50 deg, rough, stepped, open		68.5-70.85' - yellowish gray, (5Y 7/2), very fine to fine grained, no to moderate HCl reaction, very weak to weak (R1 to R2), some strong hydrochloric acid reaction in some cavities, voids over 20-25% of surface, trace cavities to 3/8"x3/16"	SC-3 collected at 69.7- 70.85' R7: No runtime recorded
			2 68.45' - Fracture, 70 deg, smooth, planar, tight			
			0 69.6, 69.7' - Fracture (2), 0 to 50 deg, rough, undulating, open			
			NR 71.0			
			2 71.25' - Fracture, horizontal, smooth, undulating, tight to open 3/16"			
			0 71.8' - Fracture, horizontal, smooth, stepped, tight, organic black covering 15-20% of surface			
			1 73.55' - Fracture, horizontal, smooth, planar, open			
			1 74.8' - Fracture, horizontal, smooth, undulating, tight			
75 -31.9	R8-HQ 5 ft 100%	88	2 74.8' - Fracture, horizontal, smooth, undulating, tight		No Recovery 70.85-71.0' Limestone 71.0-71.3' - Same as 68.5-70.85' 71.3-73.5' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), very fine to fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), laminated in zones with black organic material, fossil plant impression along fracture and bedding planes, voids <5%, trace cavities 73.5-76.0' - Same as 68.5-70.85'	SC-4 collected at 74.9- 75.7' R8: 9 minutes
			2 76.0			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-19

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/26/2007

LOGGER : R. McComb

WATER LEVEL: 20.000	
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PROJECT NUMBER: 338884.FL	BORING NUMBER: A-19
SHEET 6 OF 14	
ROCK CORE LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07 START : 3/23/2007 END : 3/26/2007 LOGGER : R. McComb

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.
100 -56.9	R13-HQ 5 ft 96%	70	3	96.4' - Fracture, 0 to 90 deg, rough, undulating, open		Limestone 94.5-96.0' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, very weak to medium strong (R1 to R3), voids over less than 10% of surface, trace organics 96.0-97.2' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), laminated, voids over 25-30% of surface, cavities over 10-15% of surface, near base of interval, possible bioturbation at 96.5' 97.2-99.1' - yellowish gray, (5Y 7/2), very fine grained, weak to medium strong (R2 to R3), thinly laminated with thin (<1") softer zone where voids are more prevalent, voids generally <5% of surface, rare cavities, rare fossils 99.1-100.8' - yellowish gray, (5Y 7/2), very fine grained, moderate to mild HCl reaction, very weak to weak (R1 to R2), fossiliferous (casts/molds), increasing with depth, voids over 20-25% of surface, cavities increasing with depth No Recovery 100.8-101.0' Limestone 101.0-103.5' - Same as 99.1-100.8' except fine grained, mild HCl reaction 103.5-105.3' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), some fossils (molds/casts), voids over 25-30% of surface, cavities (up to 1/16"-1/8") over 5% No Recovery 105.3-106.0' Limestone 106.0-114.7' - Same as 103.5-105.3'	SC-9 collected at 99.35-100.35' R13: 9 minutes
			1	96.7' - Fracture, horizontal, smooth, planar 96.8' - Fracture, continuation of 96.4'			
			2	97.8' - Fracture, 30 deg, smooth, planar 98.1' - Fracture, horizontal, smooth, planar, tight			
			1	98.85' - Fracture, horizontal, rough, undulating, tight			
			2	99.35, 100.35' - Fractures (2), horizontal, rough, undulating, open, silty infilling covering 2-3%			
			NR	100.65' - Fracture, horizontal, rough, undulating, open			
105 -61.9	R14-HQ 5 ft 86%	36	0			SC-10 collected at 101.0-102.35'	R14: No runtime recorded
			2	102.35' - Fracture, 30 deg, rough, undulating, open			
			1	102.5' - Fracture, 60 deg, rough, planar, tight 103.0' - Fracture, <5 deg, rough, stepped, open			
			>10				
			>10				
			NR				
110 -66.9	R15-HQ 5 ft 100%	64	3	106.1' - Fracture, horizontal, rough, undulating, open		SC-11 collected at 108.35-109.8'	R15: No runtime recorded
			3	106.6, 106.95' - Fractures (2), <5 deg, rough, stepped, open			
			2	107.1' - Fracture, 70 deg, rough, planar, open 107.4' - Fracture, horizontal, rough, undulating, open			
			1	107.6' - Fracture, 70 deg, rough, undulating, tight 108.2, 108.5, 109.0, 110.1' - Fractures (4), <5 deg, rough, undulating, open			
			2	110.45' - Fracture, 60 deg, rough, planar, tight			
			2	111.7, 111.9' - Fractures (2), 80 deg, rough, undulating, tight fracture, extends to 112.3'			
115 -71.9	R16-HQ 5 ft 100%	78	2	112.3' - Fracture, <5 deg, rough, undulating, open		SC-12 collected at 113.5-114.7'	R16: No runtime recorded
			0	112.45' - Fracture, 60 deg, rough, undulating, tight			
			1				
			2	114.65' - Fracture, <5 deg, smooth, undulating, open			
				115.02' - Fracture, 30 deg, rough, undulating, open			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-19

SHEET 7 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/26/2007

LOGGER : R. McComb

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.
120 -76.9	R17-HQ 5 ft 50%	17	2	115.55' - Fracture, <5 deg, rough, undulating, open		Limestone 114.7-115.7' - yellowish gray, (5Y 7/2), fine to medium grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), 1/16" voids over 10-15% of surface, some cavities up to 3/8"-3/4" irregular shaped, irregular distribution, fossil casts/molds rare to absent 115.7-116.0' - Same as 103.5-105.3' except very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), <5% voids on surface 116.0-117.5' - Same as 103.5-105.3' except possible voids No Recovery 117.5-120.0'	SC-13 collected at 116.4-117.2'
			>10	116.2, 116.4' - Fractures (2), horizontal, rough, undulating, open			Driller's Remark: Possible void from 117.5-120.0'
			NR	117.2-117.5' - Fracture zone, 0 to <5 deg, smooth to rough, planar to stepped, open			Lost circulation at 118.0'
			>10				R17: 5 minutes
125 -81.9	R18-HQ 5 ft 100%	63	2	121.2' - Fracture, horizontal, rough, stepped, open		Limestone 120.0-121.0' - Same as 103.5-105.3' except light olive brown, 15-20% cavities up to 3/8" 121.0-123.1' - Same as 103.5-105.3' except light olive gray to grayish olive, (5Y 5/2 to 10Y 4/2), fossiliferous zone (cavities) at 122.8' 123.1-124.9' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), thinly laminated with <5% voids (up to 10-15%) 124.9-130.15' - light olive gray, (5Y 5/2), fine grained, moderate to mild HCl reaction, weak (R2)	
			1	121.4' - Fracture, stepped			
			1	122.75' - Fracture, 75 deg, rough, stepped, tight			SC-14 collected at 123.10-124.4'
			2	123.10' - Fracture, 40 deg, rough, undulating, tight			R18: 10 minutes
			1	124.4, 124.92' - Fractures (2), horizontal, smooth, planar, tight		No Recovery 130.15-130.75'	
			1	125.45' - Fracture, <5 deg, rough, undulating, tight			
			0	126.9' - Fracture, 60 deg, rough, undulating, tight			
			1	128.5' - Fracture, horizontal, rough, stepped, open			Driller's Remark: Softer at 130.0' and below SC-15 collected at 128.6-130.15'
130 -86.9	R19-HQ 5 ft 88%	82	0			Limestone 130.75-131.8' - Same as 124.9-130.15' 131.8-133.35' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), no to mild HCl reaction, very weak to weak (R1 to R2), voids on 20-25% of surface, <10% cavities, trace fossils 133.35-133.5' - yellowish gray, (5Y 7/2), strong HCl reaction, weak to medium strong (R2 to R3), <2% voids, trace cavities 133.5-133.85' - Same as 133.35-133.5' except very weak (R1), laminated bedding	R19: 8 minutes Driller's Remark: Lost core from 130.15-130.75'
			NR				
			1	130.9' - Fracture, horizontal, smooth, undulating, open			
			3	131.15' - Fracture, vertical, rough, planar, tight			
			10	131.5' - Fracture, <5 deg, rough, undulating, open			
			6	131.7' - Fracture, 40 deg, rough, undulating, tight			
			1	132.0-133.0' - Fracture zone			
			1	133.15, 133.18, 133.22, 133.40, 133.70, 133.80' - Fracture zone, <5 deg, rough, planar			SC-16 collected at 133.75-134.84'
135 -91.9	R20-HQ 5 ft 100%	28	10	135.22, 135.52, 135.6' - Fractures (3), horizontal, smooth, planar, tight to open			R20: 6 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-19

SHEET 8 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/26/2007

LOGGER : R. McComb

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
140 -96.9	R21-HQ 5 ft 64%	40	0		Limestone 133.85-135.25' - Same as 133.35-133.5'	SC-17 collected at 136.0- 137.3'
			3		135.25-137.3' - Same as 131.85-133.35'	
			NR		137.3-137.9' - yellowish gray, (5Y 7/2), fine to very fine grained, mild HCl reaction, very weak to weak (R1 to R2), voids over 15-20% of surface, trace cavities up to 1-3/16", thinly laminated	
			1		No Recovery 137.9-139.7' Limestone 139.7-141.0' - light gray to very light gray, (N7 to N6), very fine grained, weak (R2), 2-3% voids over surface, cavities over 5-10%, voids and cavities more common with depth, cavities up to 1/16"-1/8"	
145 -101.9	R22-HQ 5 ft 100%	72	4		141.0-142.05' - Same as 139.7-141.0' except voids up to 10-15% of surface cavities up to 3/16", cavities interconnected	R21: 6 minutes
			1		142.05-142.5' - yellowish gray to light gray, (5Y 5/2 to N7), strong HCl reaction, weak to medium strong (R2 to R3)	
			>10		142.5-142.6' - moderate olive brown, fine to very fine grained, extremely weak (R0)	
			2		142.6-143.5' - Same as 142.05-142.5'	
150 -106.9	R23-HQ 5 ft 100%	70	1		143.5-144.65' - yellowish gray, (5Y 5/2), strong HCl reaction, weak (R2), voids over 15% of surface	SC-18 collected at 144.15- 145.05'
			1		144.65-145.05' - yellowish gray, (5Y 5/2), very fine to fine grained, mild to moderate HCl reaction, voids rare to absent	
			1		145.05-145.4' - light olive gray, (5Y 5/2), moderate to strong HCl reaction, weak (R2), voids over 30-40% of surface, cavities over 5-10% of surface, angular to round limestone clasts of very fine grained limestone	
			2		145.4-148.1' - light olive gray, (5Y 5/2), mild to moderate HCl reaction, very weak (R1), voids on 5-15% of surface	
155 -111.9	R24-HQ 5 ft 100%	82	2		148.1-151.0' - Same as 145.4-148.1' except weak (R2), trace cavities up to 3/8", voids over 15-25% of surface	R22: 10 minutes
			0		151.0-153.35' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), mild to moderate HCl reaction, medium strong to weak (R3 to R2), voids over 5-15% of surface	
			2		153.35-154.7' - fine grained, no to mild HCl reaction, very weak (R1), thinly laminated below 154.0'	
			3			
156.0			0			SC-19 collected at 146.0- 147.3'
			0			



PROJECT NUMBER:

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BORING NUMBER:

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SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing





ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/26/2007

LOGGER : R. McComb

WATER LEVEL: 20.855 ft (6/26/07)		DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		SYMBOLIC LOG	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					
160 -116.9	R25-HQ 5 ft 100%	74	0				154.7-156.0' - Same as 151.0-153.35'		
			1	157.15' - Fracture, 20 deg, smooth, planar, tight, open <1/16", brown clay infilling <1/16" over 10%			156.0-158.03' - moderate olive brown, (5Y 4/4), fine grained, very weak to weak (R1 to R2), voids on 15-20% of surface with interlaminar zones of finer grained limestone with <5% voids, rare cavities		
			>10	158.02-159.0' - Fracture zone, horizontal, rough to smooth, planar to undulating, open to tight			158.03-158.5' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, weak (R2), <3% voids, thinly laminated		
			2	159.4' - Fracture, horizontal, smooth, planar, tight			158.5-159.4' - yellowish gray, (5Y 7/2), strong HCl reaction, medium strong (R3), <1% voids, thinly laminated	SC-21 collected at 159.5-160.3'	
			2	160.3' - Fracture, horizontal, rough, planar, open			159.4-161.65' - light olive gray to light olive brown, (5Y 5/2 to 5Y 5/6), fine grained, very weak to weak (R1 to R2), voids on 25-30% of surface, 3/8" voids up to 3-5%, very thinly laminated	R25: 7 minutes	
165 -121.9	R26-HQ 5 ft 100%	8	5	160.4' - Fracture, horizontal, rough, undulating, tight			161.2, 161.25' - Fractures (2), 30 deg, rough, stepped, open		
			3	161.55' - Fracture, 40 deg, rough, stepped, open			161.65' - Fracture, <5 deg, rough, undulating, open		
			>10	161.65' - Fracture, <5 deg, rough, undulating, open			161.9' - Fracture, horizontal, smooth, planar, open		
			>10	162.6' - Fracture, horizontal, rough, undulating, open			162.6' - Fracture, horizontal, rough, undulating, open		
			4	162.75' - Fracture zone, 30 to 90 deg, rough, stepped, tight			162.75' - Fracture zone, 30 to 90 deg, rough, stepped, tight	R26: 6 minutes	
170 -126.9	R27-HQ 5 ft 100%	64	>10	162.9' - Fracture, <5 deg, rough, stepped, open			162.2-162.72' - Same as 159.4-161.65'		
			1	162.9-163.5' - Fracture zone, <5 to 90 deg, rough, undulating to stepped, open			162.72-166.0' - yellowish gray, (5Y 5/2), fine grained, moderate to strong HCl reaction, weak (R2), voids over 5-10% of surface		
			1	163.5-165.1' - Fracture zone, horizontal, smooth to rough, planar, open			166.0-166.95' - dusky yellow to light olive brown, (5Y 6/4 to 5Y 5/6), fine grained, moderate HCl reaction, very weak (R1), thin laminae of extremely weak rock (R0), voids over 5-10% of surface	SC-22 collected at 168.7-169.7'	
			3	165.1' - Fracture, 0 to 50 deg, smooth, planar, open			166.95-168.5' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), fine to very fine grained, laminated with very fine grained limestone with <1% voids, rest of rock up to 15-20% voids, rare cavities	R27: 8 minutes	
			10	165.3' - Fracture, 30 deg, smooth, stepped, tight			168.5-169.9' - yellowish gray, (5Y 7/2), fine grained, very weak to weak (R1 to R2), voids over 5-10% of surface		
175 -131.9	R28-HQ 5 ft 100%	74	2	165.5, 165.8' - Fractures (2), 0 to 90 deg, rough, stepped, open			169.9-171.0' - yellowish gray, (5Y 7/2), fine grained, weak (R2), voids over 15-25% of surface, 1/8"-3/16" cavities over 5% of surface		
			2	166.0-167.0' - Fracture zone, 0 to 40 deg, smooth to rough					
			2	167.15' - Fracture, 50 deg, rough, planar, tight					
			5	167.85' - Mechanical break				R28: 8 minutes	
			1	168.70' - Fracture, horizontal, rough, undulating, tight					
				169.7' - Fracture, horizontal, rough, undulating, open					
				169.7-170.1' - Fracture zone, 0 to 90 deg, rough, undulating, tight					
				170.1' - Fracture, <5 deg, rough, undulating, open					
				170.65' - Fracture, 5 deg, rough, undulating, tight					
				171.55' - Fracture, horizontal, rough, stepped, tight					
				171.85' - Fracture, 60 deg, rough, undulating, tight					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-19

SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

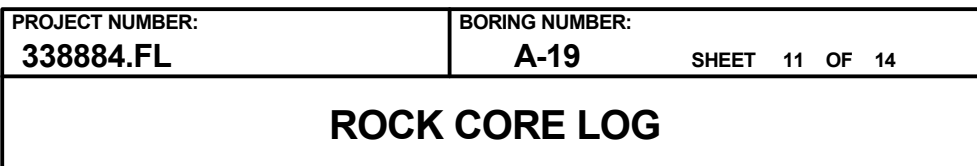
WATER LEVELS : 2.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/26/2007

LOGGER : R. McComb

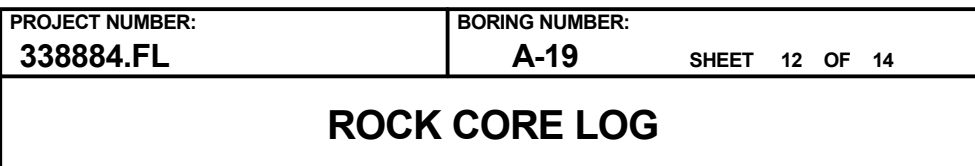
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, 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.
180 -136.9	R29-HQ 5 ft 72%	28	10	172.20' - Fracture, 50 deg, rough, undulating, tight		171.0-177.4' - yellowish gray to pale olive, (5Y 7/2 to 10Y 6/2), fine grained, moderate to strong HCl reaction, weak (R2), generally <3-5% voids, voids up to 10-15% of surface from 174.0-174.7', rare cavities up to 3/4" to 1-3/16"	End drilling on 3/24/07 at 176.0' at 17:00 hrs Water level at 2.0' below ground surface Begin coring at 176.0' on 3/25/07, continuing to have lost circulation
			7	172.70' - Fracture, horizontal, smooth, planar, infilling, tight, brown silty infilling over 5%			
			2	173.1' - Fracture, horizontal, rough, undulating, tight			
			>10	173.3' - Fracture, <5 deg, rough, undulating, open			
			NR	174.05' - Fracture, horizontal, rough, undulating, black stain over 5%			
181.0				174.45' - Fracture, 10 deg, rough, planar, tight			
				174.7' - Fracture, <5 deg, rough, stepped, open			R29: 8 minutes
				174.82' - Fracture, 10 deg, smooth, planar, dark brown clay over 80%, open			
			2	174.87' - Fracture, 10 deg, smooth, planar, dark brown clay over 80%, open			
			>10	175.4-176.0' - Fracture, vertical, rough, undulating to stepped, tight			Driller's Remark: Soft at 183.0-184.0'
				176.3-176.8" - Fracture, 0 to 90 deg, rough, undulating to stepped, open			
			>10	177.15, 177.25, 177.3' - Fractures (3), 20 deg, smooth, planar, open			
			4	177.5' - Fracture, <5 deg, rough, undulating, tight			
185 -141.9	R30-HQ 5 ft 96%	14	2	177.6' - Fracture, <5 deg, smooth, undulating, open			
			NR	177.75, 177.85' - Fractures (2), 20 deg, rough, planar, open			R30: 8 minutes
				178.3' - Fracture, 30 deg, rough, undulating, tight			
			3	178.85' - Fracture, 60 deg, rough, undulating, open			
			2	181.7' - Fracture, <5 deg, rough, stepped, tight			SC-23 collected at 187.3-188.6'
			3	181.8' - Fracture, vertical, smooth, undulating, tight			
			3	181.95' - Fracture, <5 deg, rough, stepped, tight			
				182.5-182.75' - Fracture zone, rough to smooth, various fracture plane orientations			
			1	182.5' - Fracture, <5 deg, rough, undulating, open			
190 -146.9	R31-HQ 5 ft 100%	68		182.75' - Fracture, <5 deg, rough, undulating, open			R31: 7 minutes
			3	183.0' - Fracture, <5 deg, rough, undulating, open			
			1	183.2' - Fracture, 30 deg, rough, undulating, open			SC-24 collected at 191.55-192.55'
			4	183.45-183.65' - Fracture zone			
			>10	183.65-185.7' - Fracture, vertical, undulating to planar, tight			
				184.2' - Fracture, horizontal, rough, planar to stepped			
			>10	184.3' - Fracture, 50 deg, rough, stepped, open			
195 -151.9	R32-HQ 5 ft 100%	40		184.6, 185.1' - Fracture (2), 0 to 90 deg, rough, undulating			R32: 9 minutes
			>10	186.0-186.9' - Fracture, vertical, rough, stepped, tight			



ORIENTATION : Vertical

LOGGER : R. McComb

Rev. 4



ORIENTATION : Vertical

LOGGER : R. McComb

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-19

SHEET 13 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/26/2007

LOGGER : R. McComb

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.
240 -196.9	R41-HQ 5 ft 30%	0	>10 >10 NR	232.4-232.8' - Fracture, vertical, rough, undulating, tight 233.0-233.6' - Fracture zone, various orientations 233.7' - Fracture, 0 to 90 deg, smooth, planar, open 234.2' - Fracture, horizontal, rough, undulating, open 236.0-236.75' - Fracture zone, 0 to <5 deg, rough, stepped to undulating, open, distinct fracture planes at 236.12', 236.4', 236.75' 237.0-237.5' - Fracture zone, gravel-sized rock fragments		Limestone 226.0-228.8' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, very weak (R1), voids over 5-10% of surface, concentrated to 20-30% of surface in thin (1") beds, trace organics, cavities up to 3/4"-1-3/16" present at 226.0-226.7' No Recovery 228.8-231.0' Limestone 231.0-231.8' - light olive brown, (5Y 5/6), fine grained, very weak (R1), voids over 15-20% of surface Limestone 231.8-233.5' - yellowish gray, (5Y 7/2), very fine grained, very weak (R1), gravel-sized limestone fragments, trace voids 233.5-234.2' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to mild HCl reaction, very weak (R1), trace to 10% voids increasing with depth, some organic staining at 234.1' No Recovery 234.2-236.0' Limestone 236.0-236.75' - yellowish gray, (5Y 7/2), fine grained, no to mild HCl reaction, very weak (R1), sandy texture with inclined fracture traces 236.75-237.5' - Same as 233.5-234.2' No Recovery 237.5-241.0' Limestone 241.0-243.0' - yellowish gray, (5Y 7/2), very fine to fine grained, no to mild HCl reaction, limestone fragments, voids and cavities present on some surfaces No Recovery 243.0-246.0' Limestone 246.0-248.3' - fine to very fine grained, mild HCl reaction, extremely weak to weak (R0 to R2), voids over 30-40% of surface to 247.8', 0-5% of surface on 247.8-248.3' No Recovery 248.3-251.0' No Recovery 251.0-256.0'	R41: 8 minutes
245 -201.9	R42-HQ 5 ft 40%	0	>10 >10 NR	241.0-243.0' - Fracture, 0-90 deg, rough, planar, open			R42: 9 minutes
250 -206.9	R43-HQ 5 ft 46%	0	>10 10 3 NR	246.0-247.0' - Fracture zone 247.1' - Fracture, horizontal, smooth, planar, open 247.4' - Fracture, 80 deg, rough, stepped, open 247.6' - Fracture, horizontal, rough, undulating to stepped, open 248.05, 248.25, 248.35' - Fracture (3), horizontal, rough, undulating, open			R43: 9 minutes
255 -211.9	R44-HQ 5 ft 0%	0	NR				R44: 6 minutes



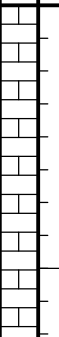
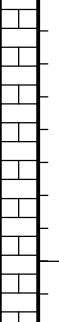
PROJECT NUMBER: 338884.FL	BORING NUMBER: A-19
SHEET 14 OF 14	
ROCK CORE LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723149.9 N, 457976.4 E (NAD83)

ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/23/07 START : 3/23/2007 END : 3/26/2007 LOGGER : R. McComb

WATER LEVEL: 20 RGS ON 3/26/07		START: 3/26/2007		END: 3/26/2007		LOGGER: R. MOORE	
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		
260 -216.9	R45-HQ 5 ft 20%	0	>10		Limestone 256.0-257.0' - yellowish gray, (5Y 7/2), fine grained, no to mild HCl reaction, extremely weak to very weak (R0 to R1), poorly fossiliferous, some organic staining No Recovery 257.0-261.0'	R45: 13 minutes	
		NR					
265 -221.9	R46-HQ 5 ft 10%	0	>10		Limestone 261.0-261.5' - Same as 256.0-257.0' No Recovery 261.5-266.0'	R46: 9 minutes	
		NR					
					Bottom of Boring at 266.0 ft bgs on 3/26/2007		



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-20	SHEET 1 OF 14
SOIL BORING LOG		

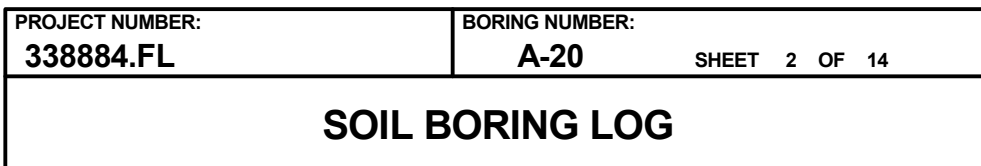
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 wing bit ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/24/2007 END : 5/1/2007 LOGGER : C. Dougherty, R. McComb

WATER LEVELS : 1.01 ft bgs on 1/4/07			START : 4/24/2007		END : 5/17/2007		LOGGER : G. Dougherty, R. McCord		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
	RECOVERY (ft)	#TYPE	6"-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			
42.3 									



LOGGER : C. Dougherty, R. McComb

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-20

SHEET 3 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

WATER LEVEL - 10.1 RGS SH 14.01		DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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					
7.3	35.0	77	1	35.4' - Fracture, horizontal, rough, undulating				Limestone 35.0-39.7' - light olive gray, (5Y 5/2), moderate to strong HCl reaction, medium strong (R3), small voids (1/16") over 20% of surface, few cavities up to 3/8", moderately fossiliferous	Rock coring begins at 35' below ground surface, continuing after soil boring from surface to 34' Water level at 07:35 hrs on 4/25/07
	1		36.2' - Fracture, 20 deg, rough, undulating, thin (1/16") infill of carbonate derived silt						
	R1-HQ 5 ft 94%		3	37.2' - Mechanical break, horizontal, rough, undulating, open up to 3/4"					
			0	37.5' - Fracture, 50 deg, rough, undulating, black staining on faces, open 1/4-1/2", fossil cast on surface					
			0	37.85' - Fracture, 10 deg, rough, undulating, fossil casts on surface, tight					
40 2.3	40.0		NR					No Recovery 39.7-40.0'	R1: 9 minutes
	R2-HQ 5 ft 64%	0	NA					Silt (ML) 40.0-43.2' - dusky yellow, (5Y 6/4), wet, high dilatancy, fine sand up to 15%, very weakly indurated 40.8-41.2'	
			NR					No Recovery 43.2-45.0'	R2: 5 minutes
45 -2.7	45.0	22	4	45.1, 45.2, 45.4' - Fractures or mechanical break (3), horizontal, rough, undulating, open 1/4" to 1/2"				Limestone 45.0-49.2' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, extremely weak (R0), trace organics from 48.0-49.0'	Layers up to few inches thick of apparently non indurated material at 48.0-48.9'
	4		45.9' - Mechanical break						
	R3-HQ 5 ft 84%		3	46.15' - Mechanical break					
				46.4' - Fracture, 15 deg, rough, undulating, 1/16" of carbonate derived silt infilling					
				46.6' - Fracture, horizontal, rough, undulating, 1/16" of carbonate derived silt infilling					
				46.7' - Mechanical break					
		1	47.2' - Mechanical break						
		0	47.7' - Mechanical break						
		NR	47.95' - Mechanical break						
				48.4' - Mechanical break					
50 -7.7	50.0	22	2	50.5' - Fracture, 10-70 deg, rough, undulating, multiple fragments up to 1", 1/2-3" open				No Recovery 49.2-50.0'	R3: 4 minutes
	R4-HQ 5 ft 34%		0	50.95' - Fracture, horizontal, rough, undulating, open up to 1"				Limestone 50.0-51.7' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, very weak (R1), trace organics, small voids (1/16") over 20% of surface, few larger (3/16"x3/8") cavities (molds/casts) No Recovery 51.7-55.0'	
			NR						R4: 7 minutes
55	55.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-20

SHEET 4 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

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					
-12.7	R5-HQ 5 ft 94%	60	1	55.8' - Mechanical break		Limestone 55.0-57.7' - Same as 50.0-51.7'	SC-1 collected at 55.0-55.8'		
1			56.5' - Mechanical break, for special core	57.7-59.4' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), small (1/16") voids over about 30% of surface, few larger (up to 3/16") voids and fossil molds					
3			57.5, 57.7' - Fractures (2), horizontal, rough, undulating, organic material on faces, open up to 1/2"						
3			57.7-58.0' - Fracture, vertical, rough, undulating, tight						
>10			58.3' - Mechanical break						
60	60.0	NR		58.8-59.5' - Fracture, vertical, rough, undulating, tight		Silty Sand (SM) 59.4-59.7' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, carbonate derived	R5: 5 minutes		
-17.7	3	58.8-59.3' - Fracture, 75 deg, rough, undulating, open to 1/4"	No Recovery 59.7-60.0'						
	1	60.1' - Fracture, horizontal, smooth, undulating, open to 1/4"		Limestone 60.0-60.5' - Same as 55.0-57.7' except no organics		SC-2 collected at 60.9-61.95'			
	1	60.35' - Mechanical break		60.5-62.0' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), small (1/16") voids over up to 15% of surface					
	2	60.9' - Fracture, 45 deg, rough, undulating, tight		62.0-62.8' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, extremely weak (R0)					
65	65.0	NR		62.8-63.4' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, medium strong (R3), small (<1/16") voids over about 10% of surface	R6: 5 minutes				
-22.7	R7-HQ 5 ft 90%	58	>10	63.0, 63.6' - Fractures (2), horizontal, rough, undulating, open up to 1/2"			63.4-63.9' - Same as 62.0-62.8'	SC-3 collected at 68.1-69.4'	
			3	65.3-65.7' - Fracture zone, fragments up to 2"			Sand With Silt (SP-SM) 63.9-64.2' - yellowish gray, (5Y 7/2), fine grained, carbonate derived		
			1	65.7-66.15' - Mechanical break, vertical, rough, undulating, tight			No Recovery 64.2-65.0'		
			1	66.15' - Mechanical break, 15 deg, rough, undulating, open up to 1/2"	Limestone 65.0-66.9' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, medium strong (R3), small (<1/16") voids cover about 25% of surface, few larger voids or cavities except in zones from 65.7-65.9' and 66.7-66.9' (about 10% coverage, voids up to 1/16" diameter), moderately fossiliferous, trace organics				
			1	66.5-66.95' - Mechanical break, 25 deg, rough, undulating	66.9-67.4' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, extremely weak (R0), trace organics				
		0		66.95' - Fracture, smooth, undulating, open up to 1/2"		67.4-69.5' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, very fossiliferous, voids (fossil molds) up to 3/8" over about 30% of core surface	R7: 8 minutes		
	NR		67.4' - Fracture, horizontal, rough, undulating, open up to 1/2"	No Recovery 69.5-70.0'					
70	70.0			68.1' - Mechanical break					
-27.7	R8-HQ 5 ft 100%	92	0	71.9' - Mechanical break					R8: 7 minutes
			1						
			1	72.5' - Mechanical break, horizontal, smooth, undulating, along bedding plane, tight, organic material on faces					
			1	73.2' - Fracture, horizontal, smooth, undulating, coating of carbonate derived silt on faces					
			1						
75	75.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-20

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

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.
-32.7	R9-HQ 5 ft 84%	48	2	74.6' - Fracture, horizontal, smooth, undulating, coating of carbonate derived silt on faces		Limestone 70.0-72.5' - yellowish gray with some light olive gray mottling, (5Y 7/2 with 5Y 5/2), fine grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), small (<1/16") voids cover about 20% of surface, but not uniformly, few larger (3/16") voids, trace organics 72.5-75.0' - moderate yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, very weak (R1), trace organics, voids up to 3/8" x 1-3/16" at 72.6 and 74.0', trace clasts (3/16") of gray limestone. Slightly harder zones from 73.6-74.2' and 74.7-75.0', with small (<1/16") voids covering about 25% of surface 75.0-78.2' - dusky yellow to moderate yellowish brown, (5Y 6/4 to 10YR 5/4), fine grained, weak to very weak (R2 to R1), small (<1/16") voids cover about 35% of core surface, few larger (3/16") voids 78.2-79.2' - light olive gray, (5Y 5/2), moderate HCl reaction, extremely weak (R0), mixed with carbonate derived fine sand and silt No Recovery 79.2-80.0' Limestone 80.0-82.8' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), small (<1/16") voids cover about 50% of core surface. 82.8-84.5' - moderate olive brown, (5Y 4/4), moderate HCl reaction, weak (R2), fine grained, small (<1/16") voids cover about 25% of core surface, few larger (3/16") voids, trace organics No Recovery 84.5-85.0' Limestone 85.0-90.0' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, medium strong (R3), very fossiliferous, trace organics, small (<1/16") voids cover about 25% of surface, larger (3/8") cavities cover 30% of surface from 85.5 to 86.4 but <5% elsewhere, most larger voids are fossil molds 90.0-93.1' - Same as 85.0-90.0' except weak to medium strong (R2 to R3), moderately fossiliferous, few larger cavities, zone of light olive gray (5Y 7/2) from 91.3-91.75 No Recovery 93.1-95.0'	R9: 8 minutes
			2	75.0-75.3' - Fracture zone, multiple fragments, possible mechanical break			
			1	75.3-75.5' - Fracture, 70 deg, rough, undulating, possible mechanical break			
				76.3-76.5' - Fracture zone, multiple fragments			
			>10	76.9' - Fracture, horizontal, rough, undulating, tight			
	R10-HQ 5 ft 90%	43	>10	77.4-77.8' - Fracture, 65 deg, rough, undulating, coating of carbonate derived silt		SC-4 collected at 80.7-81.8'	R10: 6 minutes
80			NR	78.2-79.2' - Fracture zone			
-37.7			>10	80.0-80.7' - Fracture zone, multiple fragments, up to 1-1/2"			
			>10	81.8-82.7' - Fracture zone (2), multiple fragments, up to 2"			
			1	82.9-83.4' - Fracture, vertical, tight			
	R11-HQ 5 ft 100%	70	0			SC-5 collected at 87.8-89.1'	R11: 8 minutes
			0				
85			NR				
-42.7			3	85.5' - Fracture, horizontal, rough, undulating, coating of carbonate derived silt			
			0	85.7' - Fracture, 45 deg, rough, undulating, open up to 1/2"			
	R12-HQ 5 ft 62%	10	1	86.0' - Fracture, horizontal, rough, undulating, open up to 1/2"		R12: 7 minutes	
			0	87.4' - Mechanical break			
				87.8' - Mechanical break			
			>10	89.1-90.0' - Fracture zone, multiple fragments up to 3"			
90			>10	90.3-91.3' - Fracture zone, multiple fragments up to 2", most are 1/2-3/4", some fragments with organic material and coating of brown silt and fine sand			
-47.7			>10	91.75-93.1' - Fracture zone			
			NR				
95							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-20

SHEET 6 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

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.
-52.7	R13-HQ 5 ft 98%	58	>10	95-95.9' - Fracture zone		Limestone 95.0-95.5' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, medium strong (R3), includes small (<3/16") clasts of yellowish gray (5Y 7/2) material, small (<1/16") voids cover 10% of surface 95.5-99.5' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), small (1/16"), voids over <5% of surface, concentrated in 1" wide zones, fossil casts and molds moderately abundant, laminated bedding from 97.7-99.5' 99.5-99.9' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), laminated bedding, few small (<1/16") voids No Recovery 99.9-100.0' Limestone 100.0-100.9' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, very weak (R1), trace organics 100.9-104.7' - light olive gray, (5Y 5/2), fine grained, medium strong (R3), small (1/16") voids over 30% of surface, larger cavities (3/16" to 1-3/16") over <5%, moderately fossiliferous, a cavity about 1-3/16"x2" is present at about 103.3' No Recovery 104.7-105.0' Limestone 105.0-110.0' - Same as 100.9-104.7' except larger cavity (3/16"x1-9/16") at 108.1 and 109.0'	R13: 10 minutes
			2	95.9-96.3' - Fracture, vertical, rough, undulating, open up to 1/4"			
			0	96.6' - Fracture, horizontal, rough, undulating, multiple fragments			
			2	97.5' - Mechanical break			
			2	98.1, 98.5' - Fractures (2), 65 deg, rough, undulating, tight			
100	R14-HQ 5 ft 94%	53	2	99.1-99.7' - Fracture, 60 deg, rough, undulating, tight			
-57.7			NR	99.2' - Fracture, 60 deg, rough, undulating, tight			
			3	100.2' - Fracture, horizontal, smooth, undulating, open to 1/2", black staining on surface (70%)			
			0	100.7-100.9' - Fracture zone			
			1	101.35' - Mechanical break			
	R15-HQ 5 ft 100%	93	1	102.5' - Mechanical break			SC-6 collected at 101.35-102.5'
			1	103.0-104.0' - Fracture, 70 deg, rough, undulating			
			1	104.0-104.7' - Fracture, vertical, rough, undulating			
105			NR				
-62.7			1	105.9' - Mechanical break			
	R16-HQ 5 ft 96%	82	1	106.6' - Fracture, 45 deg, rough, undulating, open up to 1/8"		110.0-114.8' - Same as 100.9-104.7' except fewer fossils and fewer cavities larger than 3/16"	SC-7 collected at 108.85-110.0' R15: 8 minutes
			2	107.0-107.3' - Fracture zone, multiple fragments, up to 1-1/2"			
			2	107.85' - Fracture, 45 deg, rough, undulating, open up to 1/8"			
			0	108.15' - Fracture, 20 deg, rough, undulating, tight			
			0	108.6' - Fracture, 40 deg, rough, undulating, tight			
110	R16-HQ 5 ft 96%	82	0			110.0-114.8' - Same as 100.9-104.7' except fewer fossils and fewer cavities larger than 3/16"	SC-8 collected at 113.65-114.5'
-67.7			1				
			2	111.8-112.1' - Fracture, 45 deg, rough, undulating, dark staining on 5% of surface, open <1/8"			
			1	112.1-112.6' - Fracture, 65 deg, open up to 1/4"			
			0	112.5-112.7' - Fracture, 45 deg, tight			
	R16-HQ 5 ft 96%	82	1	113.25-113.45' - Fracture, 55 deg, tight			R16: 8 minutes
			0	113.65, 114.5' - Mechanical break (2)			
115	115.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-20

SHEET 7 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

WATER LEVELS : 1.07 ft bgs on 4/4/07				START : 4/24/2007		END : 5/1/2007		LOGGER : C. Dougherty, R. McCool	
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	
-72.7	R17-HQ 5 ft 78%	37	NR/NA 0	115.5-116.3' - Fracture zone		No Recovery 114.8-115.0' Silty Sand (SM) 115.0-115.5' - light olive gray, (5Y 5/2), fine grained, strong HCl reaction, carbonate derived	R17: 7 minutes		
1			116.25-116.5' - Fracture, 65 deg, rough, undulating, open	Limestone 115.5-118.2' - yellowish gray, (5Y 7/2), moderate HCl reaction, medium strong (R3), fine grained, moderately fossiliferous, (casts and molds), small (<1/16") voids cover about 20% of core surface, several large (3/8"x3/4") voids below 117.5'					
1			117.5' - Mechanical break 117.7' - Mechanical break						
NA									
NR									
120	120.0	R18-HQ 5 ft 96%	85	1		No Recovery 118.9-120.0' Limestone 120.0-124.6' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak (R2), moderately fossiliferous, particularly from 120.0-121.0, small (1/16") voids over 25% of surface, larger (3/8"x3/4") voids (fossil molds) 5-10% of surface from 120.0-121.0'	SC-9 collected at 122.8-123.9'		
-77.7	0			120.8' - Fracture, horizontal, rough, undulating, open up to 1/2"					
	2			122.4' - Mechanical break 122.65' - Fracture, horizontal, smooth, planar, open up to 1/4", coating of carbonate derived sandy silt					
	1			122.8' - Fracture, 45 deg, rough, undulating, open up to 1/8", coating of carbonate derived sandy silt					
	1			123.9' - Fracture, 30 deg, rough, undulating, open up to 1/2"					
125	125.0	R19-HQ 5 ft 86%	68	NR		124.6-124.8' - Same as 120.0-124.6' except medium strong (R3), 3/16" fossil molds/casts on 5% of surface, small (<1/16") voids on 10% of surface	SC10 collected at 127.7-128.6'		
-82.7	2			124.2' - Fracture, horizontal, rough, undulating, open up to 1/4"		No Recovery 124.8-125.0' Limestone 125.0-129.3' - light olive gray, (5Y 5/2), moderate HCl reaction, medium strong to strong (R3 to R4), laminated bedding with areas of few small voids and light gray (N7) color to 126.5, zone of larger (3/8") cavities from 127.4-127.8			
	3			125.1-125.4, 125.2-125.4' - Fractures (2), 60 deg, rough, undulating, tight					
	1			126.45, 126.6' - Fractures (2), horizontal, smooth, undulating, coating of carbonate derived silt on faces, open up to 1/8"					
	2			126.9' - Mechanical break 127.7' - Fracture, horizontal, smooth, undulating, coating of carbonate derived silt on faces					
			0	128.6' - Fracture, 45 deg, rough, undulating, open up to 1/8"		R19: 7 minutes			
			NR	128.7' - Fracture, horizontal, smooth, undulating, open up to 1/4"	No Recovery 129.3-130.0'				
130	130.0	R20-HQ 5 ft 94%	40	2		Limestone 130.0-133.0' - Same as 124.6-124.8' except very fossiliferous below 131.0'	R20: 7 minutes		
-87.7	1			130.4' - Mechanical break					
	>10			131.0' - Fracture, horizontal, rough, undulating, open to 1/4"					
	3			131.65' - Fracture or mechanical break, 35 deg, rough, undulating					
	4			131.8-132.8' - Fracture zone, multiple fragments					
			NR	131.1, 133.6' - Fractures (2), horizontal, smooth, planar, coating of carbonate derived silt, open to 1/4"					
				133.9' - Fracture, 15 deg, rough, undulating, coating of silt, open					
135	135.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

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SHEET 8 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

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			
-92.7	R21-HQ 5 ft 98%	40	4	134.2, 134.5, 134.6' - Fractures (3), smooth, planar, along bedding planes, coating of silt		Limestone 134.2-134.7' - yellowish gray and light olive gray, (5Y 7/2 and 5Y 5/2), fine grained, mild to moderate HCl reaction, thinly laminated bedding. Yellowish gray areas are very weak rock (R1) with small (<1/16") voids over 30% of area. Olive gray areas have no small voids, medium strong rock (R3). Cavities up to 3/8"x1-3/16" are along bedding planes. No Recovery 134.7-135.0' Limestone 135.0-139.2' - Same as 133.0-134.2' except with thinly laminated bedding from 135.0-136.1' and predominantly the stronger light olive gray rock 139.2-139.9' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, very weak (R1), small (<1/16") voids over about 25% surface larger (3/16") voids over 5% of surface No Recovery 139.9-140.0' Silt (ML) 140.0-140.5' - light olive gray, (5Y 5/2), carbonate derived	SC-11 collected at 137.4- 138.45' R21: 8 minutes
			>10	136.1-137.0' - Fracture zone, horizontal, smooth to rough, open up to 1/4"			
			0	137.0, 137.4, 138.45' - Mechanical break (3)			
			1	138.7-139.2' - Fracture, 60 deg, rough, undulating, tight			
			1	139.3' - Fracture, horizontal, rough, undulating, coating of carbonate-derived silt, open up to 1/2"			
140	R22-HQ 5 ft 80%	25	NR				Driller's Remark: Loss of circulation at 141'
-97.7			0				
			>10	141.3-142.7' - Fracture zone, fragments up to 2"			
			>10				
			>10				
			NR				
145	R23-HQ 5 ft 64%	42	3			Limestone 140.5-141.1' - yellowish gray and medium light gray, (5Y 7/2 and N6), fine grained, strong HCl reaction, medium strong to strong (R3 to R4), very fossiliferous. 141.1-144.0' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, weak (R2), very fossiliferous No Recovery 144.0-145.0' Limestone 145.0-146.0' - yellowish gray, (5Y 7/2), strong HCl reaction, weak to medium strong (R2 to R3), few small (1/16") voids, poorly fossiliferous 146.0-147.05' - yellowish gray, (5Y 7/2), moderate HCl reaction, weak to medium strong (R2 to R3), moderately fossiliferous, small (<1/16") voids cover about 10% of core, few larger (3/16") voids, laminated bedding at about 146.5' 147.05-148.2' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, small (1/16") voids over 40% of surface No Recovery 148.2-150.0' Limestone 150.0-151.8' - Same as 147.05-148.2' except gradual contact at bottom	SC-12 collected at 147.1- 148.2' R23: 6 minutes
-102.7			3	146.0' - Fracture, horizontal, rough, undulating			
			3	146.1' - Fracture, 10 deg, rough, planar, black staining on surface			
			1	146.15' - Fracture, 65 deg, rough, undulating, dark staining on surface			
			0	146.5, 146.63' - Fractures (2), smooth, planar, dark staining on surface			
			NR	147.05' - Fracture, horizontal, rough, undulating, possible mechanical break			
150	R24-HQ 5 ft 94%	70	2	150.35' - Fracture, horizontal, rough, planar, open up to 1/4"			R24: 8 minutes
-107.7			2	150.85' - Fracture, 15 deg, rough, planar, tight			
			1	151.3-152.1' - Fracture, 60-40 deg, rough, undulating, open up to 1/8"			
			1	151.6' - Fracture, horizontal, rough, undulating, open up to 1/8"			
			0	152.95' - Fracture, 45 deg, rough, undulating, tight			
			>10	154.0-154.7' - Fracture zone, multiple fragments up to 1-1/2"			
155	155.0		NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

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SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-112.7	R25-HQ 5 ft 92%	58	5	155.1, 155.4, 155.5, 155.6' - Fractures (4), smooth, planar, staining present on faces at 155.4' and 155.5'	Limestone 151.8-154.0' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), fossiliferous (casts and molds), small ($<1/16''$) voids cover 15% of surface, few clasts ($<3/16''$) of lighter colored material, laminated bedding from 153.5 - 154.0	SC-13 collected at 155.6- 156.5'
			2	155.2-155.45' - Fracture, 45 deg, rough, undulating		
			1	156.65, 156.7' - Fractures (2), horizontal, smooth, undulating, open up to 1/2"		
			>10	157.9-158.1' - Fracture, 45 deg, rough, undulating, dark staining on faces (50% of area)		
			1	158.3-158.9' - Fracture zone, most fractures appear to be horizontal		
160	R26-HQ 5 ft 42%	27	NR	159.5' - Fracture, horizontal, smooth, planar	No Recovery 154.7-155.0' Limestone 155.0-155.5' - Same as 154.0-154.7' except with irregular uneven thinly laminated bedding 155.5-158.0' - light olive gray, (5Y 5/2), moderate HCl reaction, medium strong (R3), poorly fossiliferous, gradual contact below, few small ($<1/16''$) voids 158.0-158.9' - moderate olive brown, (5Y 4/4), fine grained, mild HCl reaction, weak (R2), small ($<1/16''$) voids cover about 50% of surface 158.9-159.6' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), few small ($<1/16''$) voids, group of healed vertical fractures from 158.9-159.3'	R25: 7 minutes End of drilling for 4/25/07, 160' at 15:45. Resume coring at about 07:35, 4/26/07 Core barrel was clogged. Barrel was cleared and run completed. Rock fragments at top of run are probably pieces from first attempt; bit marks in 2 directions are on some fragments End of R26-HQ fits together with start of R27- HQ R26: 4 minutes
-117.7			1	160.0-160.3' - Fracture zone, multiple fragments up to 1-1/2"		
			2	161.1' - Fracture, horizontal, smooth, planar, open up to 1/8"		
			1	161.4' - Fracture, horizontal, open up to 1"		
			NR	162.0' - Mechanical break		
165	R27-HQ 5 ft 84%	38	2	165.2' - Fracture, 15 deg, rough, undulating, open to up to 1/4"	No Recovery 159.6-160.0' Limestone 160.0-161.5' - moderate yellowish brown, (5Y 4/4), fine grained, mild HCl reaction, medium strong (R3), small ($<1/16''$) voids cover about 25% of core surface, thin (1/2") zones have no small voids 161.5-162.1' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, strong (R4), small ($<1/16''$) voids, few fossil molds and casts No Recovery 162.1-165.0' Limestone 165.0-168.0' - Same as 161.5-162.1' except except larger voids and fossil molds/casts (3/16") over 5% of area from 165.0-166.3', laminated bedding at 166.0-167.5' 168.0-169.2' - light olive gray, (5Y 5/2), moderate HCl reaction, weak (R2), small (1/16") voids over 15% of surface, clasts of light gray (N7), limestone up to 3/16"x1-3/16" cover <5% of surface, clasts are oriented horizontally No Recovery 169.2-170.0'	R27: 6 minutes End of core at 169.2' fits together with start of core at 170.0'
-122.7			4	165.5' - Fracture, horizontal, rough, undulating, open up to 1/2"		
			2	166.1' - Fracture, horizontal, rough, undulating, open up to 1/2"		
			3	166.55-167.2' - Fracture zone, horizontal, smooth, planar, spaced at about 0.05'		
			0	167.7' - Fracture, horizontal, smooth to planar on one side, rough to undulating on the other, open to about 3/4"		
170	R28-HQ 5 ft 100%	85	NR	168.3' - Fracture, horizontal, rough, undulating, dark staining on 40% of surface, open to 1/4"		SC-14 collected at 172.0- 172.85' R28: 6 minutes
-127.7			0	168.3-168.7' - Fracture, 75 deg, rough, undulating, open $<1/4''$		
			0	168.9' - Mechanical break		
			2	172.1' - Fracture, horizontal, rough, undulating on one face, smooth to planar on the other, open up to 1/2"		
			3	172.95' - Fracture, horizontal, rough, undulating, coating of carbonate derived silt on one face, open up to 1/2"		
175			3	173.15-173.3' - Fracture, 45 deg, rough, undulating, tight		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

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SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

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.
-132.7	R29-HQ 5 ft 72%	23	5	173.7, 173.9' - Fractures (2), horizontal, smooth, planar, open up to 1/4"		Limestone 170.0-172.0' - Same as 168.0-169.2' except moderately fossiliferous (molds and casts), gray clasts now 5% of core, area of 3/16" to 3/8" voids from 171.0-171.6 172.0-173.7' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), small (1/16") voids over 15% of surface 173.7-175.0' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), small (<1/16") voids cover about 20% of core surface 175.0-178.0' - Same as 173.7-175.0' except with larger (3/8"x3/8") cavities from 175.7-177.4' and fewer small (1/16") voids below 176.0' 178.0-178.6' - yellowish gray and light olive gray, (5Y 7/2 and 5Y 5/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), thinly laminated bedding with few small (1/16") voids (bedding about 1/2" thick) No Recovery 178.6-180.0' Silty Sand (SM) 180.0-180.4' - moderate olive brown, (5Y 4/4), fine grained, mild HCl reaction, carbonate derived	R29: 4 minutes
			1	174.0, 174.4, 174.5' - Fractures (3), horizontal, rough, undulating, coating of silt infill at 174.0', open up to 1/2"			
			>10	175.2, 175.3, 175.35, 175.6, 175.7' - Fractures (5), horizontal, rough, planar, open 1/8" to 1/4"			
			2	175.7-176.2' - Fractures (2), 70 deg, rough, undulating, tight			
			NR	177.2' - Fracture, horizontal, rough, undulating, tight 177.4-178.2' - Fracture zone 178.3' - Fracture, smooth, undulating, open up to 1/8"			
180	R30-HQ 5 ft 90%	13	2	178.4' - Fracture, 45 deg, rough, undulating, open <1/8"		180.0-180.6' - soil and rock fragments 180.1, 180.95' - Fractures (2), horizontal, smooth, planar, coating of carbonate derived silt, open up to 1/8" 181.1-181.7' - Fracture zone 182.0' - Fracture, 20 deg, rough, undulating, open up to 1/8" 182.3' - Fracture, horizontal, rough, undulating, coating of carbonate derived silt, open to 1/4" 182.7' - Fracture, horizontal, rough, undulating, rock fragments up to 1", open 183.0, 183.2, 183.4, 183.5' - Fractures (4), horizontal, rough, undulating, open from 1/4 to 1/2" 184.3' - Fracture, horizontal, smooth, undulating, open up to 3/8" 185.5' - Fracture, 30 deg, rough, undulating, dark staining on 40% of surface, tight 186.4-187.0' - Fractures (6), horizontal, smooth, planar, except at 186.4' which is rough and undulating, all are open up to about 1/4" 186.8-187.0' - Fracture, vertical, rough, undulating, tight 187.1' - Fracture, horizontal, smooth, planar, open up to 1/4" 187.4, 187.5, 187.6' - Fractures (3), horizontal, rough, undulating, open up to 1/2" 188.0' - Fracture, 15 deg, rough, undulating, coating of carbonate derived silt, dark staining on 50% of surface, open to 1" 188.2' - Fracture, horizontal, rough, undulating, open up to 1/2" 188.8' - Fracture, horizontal, smooth, undulating, open up to 1/2" 188.8-189.0' - Fracture, vertical, rough, undulating, tight 189.7' - Fracture, horizontal, rough, undulating, dark staining on 70% of surface 189.9' - Fracture, 55 deg, smooth, undulating 190.2' - Fracture, horizontal, smooth, undulating, open up to 1/8"	R30: 9 minutes
-137.7			>10	180.0-180.6' - soil and rock fragments			
			3	180.1, 180.95' - Fractures (2), horizontal, smooth, planar, coating of carbonate derived silt, open up to 1/8"			
			4	181.1-181.7' - Fracture zone			
			1	182.0' - Fracture, 20 deg, rough, undulating, open up to 1/8"			
			NR	182.3' - Fracture, horizontal, rough, undulating, coating of carbonate derived silt, open to 1/4"			
185	R31-HQ 5 ft 100%	52	1	182.7' - Fracture, horizontal, rough, undulating, rock fragments up to 1", open		Limestone 180.4-181.1' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, medium strong (R3), thinly laminated bedding, few small (<1/16") voids 181.1-183.5' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak to strong (R1 to R4), few small (<1/16") voids, few fossil molds/casts (3/16"), large (3/8"x1-3/16") void at 183' 183.5-184.5' - yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), small (<1/16") voids cover about 25% of surface, larger (3/16") voids and fossil molds are about 5%, moderately fossiliferous No Recovery 184.5-185.0' Limestone 185.0-186.6' - Same as 183.5-184.5' except few fossil casts/molds, few larger voids. 186.6-187.5' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, strong (R4), laminated bedding (1/2"-1" thick), small (<1/16") voids present in alternating bedding laminations	SC-15 collected at 185.6-186.35'
-142.7			7	183.0, 183.2, 183.4, 183.5' - Fractures (4), horizontal, rough, undulating, open from 1/4 to 1/2"			
			4	184.3' - Fracture, horizontal, smooth, undulating, open up to 3/8"			
			3	185.5' - Fracture, 30 deg, rough, undulating, dark staining on 40% of surface, tight			
			3	186.4-187.0' - Fractures (6), horizontal, smooth, planar, except at 186.4' which is rough and undulating, all are open up to about 1/4"			
			3	186.8-187.0' - Fracture, vertical, rough, undulating, tight			
190	R32-HQ 5 ft 90%	65	3	187.1' - Fracture, horizontal, smooth, planar, open up to 1/4"		183.5-184.5' - yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), small (<1/16") voids cover about 25% of surface, larger (3/16") voids and fossil molds are about 5%, moderately fossiliferous No Recovery 184.5-185.0' Limestone 185.0-186.6' - Same as 183.5-184.5' except few fossil casts/molds, few larger voids. 186.6-187.5' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, strong (R4), laminated bedding (1/2"-1" thick), small (<1/16") voids present in alternating bedding laminations	R31: 10 minutes
-147.7			1	187.4, 187.5, 187.6' - Fractures (3), horizontal, rough, undulating, open up to 1/2"			
			1	187.1' - Fracture, horizontal, smooth, planar, open up to 1/4"			
			1	188.0' - Fracture, 15 deg, rough, undulating, coating of carbonate derived silt, dark staining on 50% of surface, open to 1"			
			3	188.2' - Fracture, horizontal, rough, undulating, open up to 1/2"			
			NR	188.8' - Fracture, horizontal, smooth, undulating, open up to 1/2"			
195				188.8-189.0' - Fracture, vertical, rough, undulating, tight			
				189.7' - Fracture, horizontal, rough, undulating, dark staining on 70% of surface			
				189.9' - Fracture, 55 deg, smooth, undulating			
				190.2' - Fracture, horizontal, smooth, undulating, open up to 1/8"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-20

SHEET 11 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

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.
-152.7	R33-HQ 5 ft 94%	23	1	190.6' - Fracture, 5 deg, rough, planar, open up to 1/4"		Limestone 187.5-188.7' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, strong (R4), very fossiliferous, small (<1/16") voids cover about 25% of surface, larger (> 3/8") voids and fossil molds/casts cover about 5% of surface 188.7-190.0' - Same as 185.0-186.6' except with zone of small (<1/16") voids 10% and fossil molds from 189.0-189.3', laminated bedding at top and bottom of interval 190.0-190.5' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, strong (R4), laminated bedding (1/4" to 3/4" thick beds), small (<1/16") voids present in alternating beds, 10% overall coverage 190.5-191.0' - moderate olive brown, (5Y 4/4), fine grained, mild to moderate HCl reaction, medium strong (R3), very fossiliferous, fragments (up to 1.5") of light olive grey (5Y 5/2) limestone, cavities up to 1.5" diameter occupy about 25% of core surface. 191.0-194.5' - dusky yellow to light olive, (5Y 6/4 to 5Y 5/2), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), with dusky yellow areas being weaker, crenelated bedding lamination grading into more uniform laminated bedding by 194.0', small (<1/16") voids about 10% coverage, trace organics, large (3/8"x1-3/16") cavity at about 192.0' No Recovery 194.5-195.0' Limestone 195.0-198.0' - yellowish gray, (5YR 7/2), moderate HCl reaction, weak to medium strong (R2 to R3), very fossiliferous, small voids (1/16") over 30% of surface, larger (3/16") cavities over < 5% of surface (molds/casts) 198.0-199.7' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), laminated bedding 198.0-198.8, few fossil molds/casts, small (<1/16") voids about 10% coverage No Recovery 199.7-200.0'	SC-16 collected at 195.5-196.8'
			2	190.9' - Fracture, horizontal, rough, undulating, fragments, open up to 1"			
				191.1-191.3' - Fracture, 45 deg, rough, undulating, tight			
			>10	192.1' - Fracture, horizontal, rough, undulating, open up to 1/4"			
			>10	193.3' - Fracture, horizontal, rough, undulating, tight			
			0	193.7, 193.8' - Fractures (2), horizontal, rough, undulating, open up to 3/4"			
200	R34-HQ 5 ft 100%	48	NR	195.0-195.5' - rock fragments with rough and undulating surfaces			R33: 7 minutes End of drilling, 200', 4/25/07 at 10:57 Resume drilling 5/1/07 R. McComb is the logging person from 200' to the end of borehole
-157.7			6	196.8' - Fracture, 45 deg, rough, undulating, tight			
			>10	169.9-197.3' - Fracture, 70 deg, rough, undulating, open up to 1/2"			
			4	197.4-197.8' - Fracture, 60 deg, rough, undulating, open up to 1/8"			
			0	197.8-198.5' - Fracture zone, multiple fragments up to 3" long			
			1	200.1' - Fracture, <5 deg, rough, undulating, loose			
205	R35-HQ 5 ft 97%	52		200.2' - Fracture, <5 deg, rough, stepped, loose			SC-17 collected at 202.95-204.05' R34: 9 minutes
-162.7			1	200.55, 200.82' - Fractures (2), horizontal, rough, undulating, loose			
			3	200.9, 200.95' - Fractures (2), horizontal, smooth, stepped, loose			
			1	200.95-201.85' - Fracture zone, horizontal, rough, stepped to undulating, loose			
			0	202.25' - Fracture, 20 deg, rough, stepped, loose			
			3	202.35' - Fracture, 40 deg, rough, stepped to undulating, loose			
210	R36-HQ 5 ft 80%	0	NR	202.8' - Fracture, horizontal, rough, stepped to undulating, loose			SC-18 collected at 207.55-209.04' R35: 6 minutes
-167.7			>10	202.95' - Fracture, horizontal, smooth, planar, loose			
			>10	204.05' - Fracture, 40 deg, rough, stepped, tight			
			>10	205.4' - Fracture, <5 deg, rough, stepped, loose			
			>10	206.2' - Fracture, 0-90 deg, rough, stepped, tight			
			NR	206.8, 206.9' - Fractures (2), 40 deg, rough, stepped, loose			
215				207.7' - Fracture, 70 deg, rough, stepped, loose			R36: 5 minutes
				209.01' - Fracture, horizontal, smooth, planar, loose			
				209.1, 209.27' - Fracture (2), <5 deg, smooth, undulating, loose			
				210.1' - Fractures (2), horizontal, smooth, planar, loose			
				210.3' - Fracture, 60 deg, smooth, stepped, loose			
				210.5, 210.6' - Fractures (2), horizontal, smooth, planar, loose			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-20	SHEET 12 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/24/2007 END : 5/1/2007 LOGGER : C. Dougherty, R. McComb

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-172.7	R37-HQ 5 ft 98%	55	3	210.9' - Fracture, <5 deg, rough, stepped, loose	Limestone 200.0-205.0' - yellowish gray, (5Y 7/2), very fine grained, weak to medium strong (R2 to R3), cavities up to 1/16" over to 40% of surface (more common 204.0-205.0) with zone of cavities interbedded with zones of few cavities. Cavities typically 1/16"x1/16" (casts/molds), largest is 2"x1/2" at 203.55 Limestone 205.0-206.0' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), fine to very fine grained, weak (R2), with angular medium strong (R3) limestone fragments (brecciated), cavities cover 50% in fine grained material, about 3-5% in fine grained angular limestone rock fragments 206-208.7' - light olive gray, (5Y 5/2), fine to very fine grained, mild HCl reaction, very weak (R1), cavities of 1/16" to 1/32" covering 40-50% of surface, trace fossil casts/molds 208.7-209.85' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, very weak (R1), voids/cavities up to 3/8"x3/8" covering 30-40% of surface, becoming very thinly laminated with depth No Recovery 209.85-210.0' Limestone 210.0-210.6' - Same as 208.7-209.85' except voids <10% 210.6-211.4' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, very weak (R1), cobble- to gravel-sized limestone, voids up to 1/16" covering 20-30%, trace fossil mold/casts 211.4-213.3' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), extremely weak (R0), voids and cavities up to 1"x1-3/16" cover 100% of surface, fossil molds/casts 213.3-214.0' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, weak (R2), interlaminated with very fine grained, weak (R2) limestone No Recovery 214.0-215.0' Limestone 215.0-218.4' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, very weak to weak (R1 to R2), coarser grained limestone with voids and cavities up to 3/8"x3/16" over 30-40% of surface, fossiliferous (molds/casts),	SC-19 collected at 217.45-218.25'
			2-10	210.9-211.5' - Fracture zone, various orientations, rock fragments		
			3-10	211.5' - Fracture, 20 deg, rough, stepped, loose		
			>10	212.0, 212.1' - Fractures (2), 40 deg, rough, undulating, loose		
			>10	212.25, 212.55' - Fractures (2), <5 deg, rough, undulating, loose		
	R38-HQ 5 ft 66%	14	3	212.8-213.1' - Fracture zone, 40-0 deg, rough, loose	R37: 6 minutes	
			>10	213.3, 213.45' - Fractures (2), <5 deg, rough, stepped, loose		
			NR	213.75, 213.85' - Fractures (2), horizontal and vertical, rough, stepped, loose		
			>10	214.0' - Fracture, horizontal, rough, undulating, loose		
			3	215.1' - Fracture, horizontal, smooth, undulating, loose		
	R39-HQ 5 ft 70%	12	>10	215.6, 215.75' - Fractures (2), <5 deg, rough, stepped, loose	R38: 5 minutes	
			0	216.2' - Fracture, <5 deg, rough, undulating, loose		
			NR	216.65' - Fracture, 40 deg, rough, undulating, loose		
			>10	216.85-217.1' - Fracture zone, 0-90 deg, rough, undulating to stepped, loose		
			>10	217.45' - Fracture, <5 deg, rough, undulating, loose		
	R40-HQ 5 ft 48%	8	>10	218.3' - Fracture, horizontal, smooth, stepped, loose	R39: 7 minutes	
			3	218.45-219.3' - Fracture zone, 0-90 deg, smooth to rough, undulating, loose		
			>10	219.3' - Fracture, <5 deg, rough, stepped, loose		
			>10	220.01-220.45' - Fracture zone, various orientations		
			NR	220.85' - Fracture, 50 deg, rough, stepped, loose		
	R40-HQ 5 ft 48%	8	>10	221.2' - Fracture, 20 deg, smooth, planar, loose	R40: 5 minutes	
			0	221.65' - Fracture, 60 deg, rough, undulating, loose		
			NR	221.85' - Fracture, <5 deg, rough, stepped to undulating, loose		
			>10	222.3' - Fracture, 0-50 deg, rough, stepped, loose		
			>10	222.55-222.7, 222.9 - 223.1' - Fracture zone, horizontal, rough, stepped, loose		
	R40-HQ 5 ft 48%	8	0	225.0-226.0' - Fracture zone, limestone fragments, various orientations		
			NR	226.55' - Fracture, horizontal, rough, stepped, loose		
			NR	226.7, 226.85' - Fractures (2), horizontal, smooth, planar, loose		
			NR	227.1-227.6' - Fracture zone, 0-90 deg, rough, stepped		
			NR	227.6' - Fracture, horizontal, smooth, loose		
	R40-HQ 5 ft 48%	8	NR	227.6-227.8' - Fracture, vertical, rough, stepped, tight		
			NR			
			NR			
			NR			
			NR			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-20

SHEET 13 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

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.
-192.7	R41-HQ 5 ft 20%	0	NR	227.8-228.8' - Fracture zone, 0-90 deg, rough, stepped to undulating, loose 230.1' - Fracture, 0-40 deg, rough, stepped, loose 230.7' - Fracture, 30 deg, smooth to rough, stepped, loose 230.7-232.4' - Fracture zone, 0-90 deg, smooth to rough, stepped to planar, loose to tight 235.0-236.0' - Fracture zone, 0-90 deg, smooth to rough, stepped to planar, loose to tight		218.4-219.9' - yellowish gray, (5Y 7/2), fine grained, weak (R2), with gravel- to cobble-sized, angular limestone rock fragments (very fine grained, weak (R2)), voids/cavities up to 3/4"x3/4" over 15-20% of surface No Recovery 219.9-220.0' Limestone 220.0-220.1' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, weak (R2), no voids/cavities Limestone 220.1-220.5' - dusky yellow, (5Y 6/4), moderate HCl reaction, weak to very weak (R2 to R1), cavities/voids up to 3/8"x3/8" over 20-30%, sharp contact with underlying limestone 220.5-221.9' - yellowish gray and light olive brown, (5Y 7/2 and 5Y 5/6), mottled, very weak (R1), voids over 10-15%, cavities up to 3/8"x3/16" 221.9-223.3' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak (R1), voids and cavities up to 3/8"-3/4" x 3/8"-3/4" over 70-80% of surface. Very fine grained limestone in fine grained matrix No Recovery 223.3-225.0' Limestone 225.0-228.5' - yellowish gray, (5Y 7/2), extremely weak to weak (R0 to R2), fossiliferous (cast/molds), becoming predominantly gravel to sand-sized limestone fragments, cavities up to 3/4" to 1-3/16" in diameter, thinly laminated, with few voids (<15%) from 226.5-226.9' No Recovery 228.5-230.0' Limestone 230.0-232.4' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), trace fossil molds/casts, voids (<1/16") covering 5-10% with occasional 20-30% coverage in fine grained limestone No Recovery 232.4-235.0' Limestone 235.0-236.0' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, very weak (R1), voids <1/16" over 50-60% of surface No Recovery 236.0-240.0'	R41: 4 minutes
240				240.0-242.0' - Fracture zone, 0-90 deg, smooth to rough, stepped to planar, loose to tight 242.0' - Fracture, 0-30 deg, rough, undulating 242.2' - Fracture, 0-30 deg, rough, undulating, loose			
-197.7	R42-HQ 5 ft 54%	8	2				
	R43-HQ 5 ft 16%	0	NR	245.0-245.8' - Fracture zone, various orientations, gravel and cobble sized rock fragments			R42: 5 minutes
245							
-202.7	R44-HQ 5 ft 18%	0	NR	250.0-250.9' - Fracture zone, various orientations, gravel and cobble sized rock fragments			R43: 2 minutes
250							
-207.7							
255							R44: 4 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-20

SHEET 14 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723068.1 N, 458060.9 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/24/2007

END : 5/1/2007

LOGGER : C. Dougherty, R. McComb

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.
-212.7	R45-HQ 5 ft 54%	0	NA	257.2-257.7' - Fracture zone, 0-90 deg, smooth to rough, undulating to stepped		Limestone 240.0-242.7' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, very weak (R1), voids typically 1/16" or less over 60-70% surface, rare cavities (3/8"x3/8"), fossil casts/molds rare, sandy/friable texture, 1 to 2 thin very fine grained limestone laminae 241.0-242.0 No Recovery 242.7-245.0'	R45: 4 minutes
			NA			Limestone 245.0-245.8' - Same as 240.0-242.7' No Recovery 245.8-250.0'	
			>10			Limestone 250.0-250.9' - Same as 245.0-245.8' No Recovery 250.9-255.0'	
			NR			Poorly Graded Sand (SP) 255.0-256.8' - dusky yellow to light olive brown, (5Y 6/4 to 5Y 5/6), wet, loose, mild to moderate HCl reaction, very poorly sorted, silty to clayey Silt With Limestone Fragments (ML) 256.8-257.2' - pale greenish yellow, (10Y 8/2), wet, loose	
260 -217.7	R46-HQ 5 ft 34%	0	>10	260.0-267.7' - Fracture zone, 0-90 deg, rough, stepped to undulating, loose, gravel sized rock fragments		Limestone 257.2-257.7' - yellowish gray, (5Y 7/2), moderate to mild HCl reaction, very weak (R1), fossiliferous, molds and casts, voids and cavities No Recovery 257.7-260.0'	
			>10			Limestone 260.0-261.0' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, very weak (R1), voids <1/16" over 50-60%, cavities typically 3/16"x3/8", fossiliferous (mold/casts) 261.0-261.7' - pale greenish yellow, (10Y 8/2), very fine grained, mild to moderate HCl reaction, very weak (R1), becoming silty to sandy, soft, and loose with depth No Recovery 261.7-265.0'	
			NR			Bottom of Boring at 265.0 ft bgs on 5/1/2007	
265 -222.7							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-21
SHEET 1 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723168.5 N, 458055.6 E (NAD83)
 ELEVATION : 42.4 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 wing bit ORIENTATION : Vertical
 WATER LEVELS : 4.72 ft bgs on 3/12/07 START : 3/11/2007 END : 3/20/2007 LOGGER : C. LeBlanc, M. Faurete

WATER LEVELS : 4.72 ft bgs on 3/12/07			START : 3/11/2007		END : 3/20/2007		LOGGER : C. LeBlanc, M. Paulote	
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	
42.4							Start with 2-7/8" bit	
							J. Schaffer and Le Blanc start logging	
	3.5							
5		1.1	SS-1	4-3-3 (6)	Silty Sand (SM) 3.5-4.6' - yellowish gray, (5Y 7/2), moist to wet, loose, very fine to fine grained, no HCl reaction, trace organics, 20% low plastic fines, trace organics, root fragments, sand is silica			
37.4	5.0							
	8.5							
		1.0	SS-2	4-8-13 (21)	Silt (ML) 8.5-9.5' - dark yellowish orange, (10YR 6/6), wet, very stiff, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, very strong (R5), 5-10% very fine to fine sand, carbonate materials			
10	10.0						Driller's Remark: Harder drilling at 10.5'	
32.4								
	13.5							
	14.3	0.8	SS-3	17-50/3 (67/9")	Silt (ML) 13.5-14.3' - dark yellowish orange, (10YR 6/6), wet, hard, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, 13% very fine to fine sand-sized grains			
15							Driller's Remark: Slight circulation loss at 15.0'	
27.4								
	18.5							
	18.9	0.1	SS-4	50/5 (50/5")	Limestone Fragments 18.5-18.6' - yellowish gray, (5Y 8/1), mild to moderate HCl reaction, highly fossiliferous			
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-21
SHEET 2 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723168.5 N, 458055.6 E (NAD83)
 ELEVATION : 42.4 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 wing bit ORIENTATION : Vertical
 WATER LEVELS : 4.72 ft bgs on 3/12/07 START : 3/11/2007 END : 3/20/2007 LOGGER : C. LeBlanc, M. Faurete

WATER LEVELS : 4.72 ft bgs on 9/12/07			START : 9/11/2007		END : 9/20/2007		LOGGERS : C. LeBlanc, M. Pauriol	
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	
22.4								
	23.5							
25	25.0	1.5	SS-5	17-26-20 (46)	Silt With Sand (ML) 23.5-25.0' - dark yellowish orange, (10YR 6/6), moist to wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 15% very fine to medium sand-sized grains, all carbonate			
17.4								
	28.5							
30	30.0	1.1	SS-6	3-2-2 (4)	Silty Sand With Gravel (SM) 28.5-29.6' - moderate yellowish brown, (10YR 5/4), wet, very loose, fine to coarse grained, mild HCl reaction, 25% fine gravel-sized, 39% nonplastic fines, gravel-sized material appears to be limestone fragments			
12.4								
	33.5							
35	34.7	0.8	SS-7	26-36-50/2 (86/8")	Gravelly Silt With Sand (ML) 33.5-34.25' - dark yellowish orange to dark olive gray, (10YR 6/6 to 5Y 5/2), wet, hard, nonplastic, very rapid dilatancy, strong HCl reaction, 30% fine gravel-sized limestone fragments, 20% fine to coarse sand, mild to moderate HCl reaction for limestone			
7.4								
	38.5							
	39.4	0.9	SS-8	37-50/5 (87/11")				
40								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-21

SHEET 3 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723168.5 N, 458055.6 E (NAD83)

ELEVATION : 42.4 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 wing bit

ORIENTATION : Vertical

WATER LEVELS : 4.72 ft bgs on 3/12/07

START : 3/11/2007

END : 3/20/2007

LOGGER : C. LeBlanc, M. Faurete

WATER LEVELS : 4.72 ft bgs on 3/12/07		START : 3/11/2007		END : 3/20/2007		LOGGERS : G. LeBlanc, M. Paulite	
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		
2.4					Silty Sand (SM) 38.5-39.4' - moderate yellowish brown, (10YR 5/4), moist to wet, very dense, very fine to medium grained, mild to moderate HCl reaction, 35-40% nonplastic fines, trace organics and/or black minerals, appears massive with no bedding, carbonate materials		
	43.5						
	44.4	0.8	SS-9	47-50/5 (97/11")	Silty Gravelly Sand (SM) 43.5-44.3' - moderate yellowish brown, (10YR 5/4), moist to wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 30% fine to coarse gravel-sized limestone fragments, 20% nonplastic fines, all carbonate materials		
45							
-2.6							
	48.5						
	50.0	0.9	SS-10	2-2-20 (22)	Silty Sand With Gravel (SM) 48.5-49.4' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), wet, medium dense, fine to coarse grained, mild HCl reaction, 25% fine to coarse gravel-sized limestone fragments, 20% nonplastic fines, all carbonate		
50							
-7.6							
	53.5						
	55.0	1.5	SS-11	9-22-14 (36)	Silty Sand With Gravel (SM) 53.5-55.0' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), wet, dense, fine to coarse grained, mild HCl reaction, 20% fine gravel-sized limestone fragments, 25% nonplastic fines, trace organics, all carbonate		
55							
-12.6							
	58.5						
		0.0	SS-12	50/1 (50/1")	Limestone Fragments 58.5' - few coarse sand-sized limestone fragments recovered		No chatter, smooth drilling
60							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-21

SHEET 4 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723168.5 N, 458055.6 E (NAD83)

ELEVATION : 42.4 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 wing bit

ORIENTATION : Vertical

WATER LEVELS : 4.72 ft bgs on 3/12/07

START : 3/11/2007

END : 3/20/2007

LOGGER : C. LeBlanc, M. Faurete

WATER LEVELS : 4.72 ft bgs on 3/12/07							START : 3/11/2007							END : 3/20/2007							LOGGERS : G. LeBlanc, M. Fauriol																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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PROJECT NUMBER: 338884.FL	BORING NUMBER: A-21	SHEET 5 OF 11
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723168.5 N, 458055.6 E (NAD83)

ELEVATION : 42.4 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 wing bit ORIENTATION : Vertical

WATER LEVELS : 4.72 ft bgs on 3/12/07 START : 3/11/2007 END : 3/20/2007 LOGGER : C. LeBlanc, M. Faurete

WATER LEVELS : 4.72 ft bgs on 3/12/07							START : 3/11/2007		END : 3/20/2007		LOGGERS : G. LeBlanc, M. Paurite	
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				
-37.6									Significant drill chatter 80-82'			
									Driller's Remark: 82-83.5', soft drilling			
	83.5											
	84.4	0.8	SS-17	47-50/5 (97/11")	Silty Gravelly Sand (SM) 83.5-84.3' - moderate yellowish brown, (10YR 5/4), wet, very dense, fine to coarse grained, mild HCl reaction, 32% fine to coarse gravel-sized limestone fragments, 19% nonplastic fines, all carbonate							
85 -42.6									Sporadic drill chatter 85-87'			
									Drill chatter 87-88'			
	88.5								Driller's Remark: "Softened considerably" 88-88.5'			
90 -47.6	90.0	1.0	SS-18	7-2-15 (17)	Silt (ML) 88.5-89.0' - moderate yellowish brown, (10YR 5/4), wet, stiff, low plasticity, rapid dilatancy, mild HCl reaction, 10-15% very fine sand-sized grains, sharp contact at bottom							
					Silty Gravelly Sand (SM) 89.0-89.5' - Same as 83.5-84.3'				Circulation loss at 90' Water level on 3/12/07 at 08:00 4.72' from top of 10" casing Set 15' of 6" casing then set 90' of 4" casing (HW); changed to 3-7/8" bit			
	93.5											
	93.7	0.1	SS-19	50/2 (50/2")	Limestone Fragments 93.5-93.6' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, 20% coverage of small (1/16") voids on fragment surfaces, several fine gravel-sized limestone fragments							
95 -52.6									Maintained circulation from 90-115'			
	98.5											
	99.3	0.8	SS-20	37-50/4 (87/10")								
100												



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-21
SHEET 6 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723168.5 N, 458055.6 E (NAD83)
 ELEVATION : 42.4 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 wing bit ORIENTATION : Vertical
 WATER LEVELS : 4.72 ft bgs on 3/12/07 START : 3/11/2007 END : 3/20/2007 LOGGER : C. LeBlanc, M. Faurete

WATER LEVELS : 4.72 ft bgs on 3/12/07			START : 3/11/2007		END : 3/20/2007		LOGGERS : G. LeBlanc, M. Paulite		
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			
-57.6					Silty Gravelly Sand (SM) 98.5-99.3' - moderate yellowish brown, (10YR 5/4), wet, dense, fine to coarse grained, mild HCl reaction, 30% fine to coarse gravel-sized material, 25% fines, sand and gravel-sized material appears to be limestone fragments			Soft steady drilling with no chatter	
									Slight drill chatter at 102.5'
103.5									
	0.4	SS-21	10-50/5.5 (60/11.5")		Silt With Sand And Gravel (ML) 103.5-103.9' - moderate yellowish brown, (10YR 5/4), wet, hard, nonplastic, mild HCl reaction, interbedded layers of silt and sand-sized and fine to coarse gravel-sized limestone fragments				
105									Driller's Remark: Smooth soft drilling from 105' to 108.5'
-62.6									
108.5									
108.9	0.2	SS-22	50/5 (50/5")		Limestone Fragments 108.5-108.7' - mild HCl reaction, coarse sand-sized and fine to coarse gravel-sized limestone fragments				Minor chatter at 107' and 108'
110									Soft drilling from 110-112' with minor chatter, maintained circulation
-67.6									
									Driller's Remark: Soft drilling at 112' Minor chatter at 113'
113.5									
	1.3	SS-23	21-12-20 (32)		Silt With Sand (SM) 113.5-115.0' - moderate yellowish brown, (10YR 5/4), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 20-25% very fine sand-sized carbonate particles, scattered fine to coarse sand-sized particles, coarse gravel-sized limestone fragments				Advanced 4" casing from 95' to 115' below ground surface. Ground water level on morning of 3/13/07 is 4.69' below top of casing
115									Maintained circulation from 115' 115-117' Soft drilling with no chatter
-72.6									
118.5									117-117.5', Sporadic minor drill chatter Drill chatter 117.5'-118', softened 118'-118.5'
	1.1	SS-24	8-30-50/1.5 (80/7.5")						
119.6									
120									



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-21	SHEET 7 OF 11
SOIL BORING LOG		

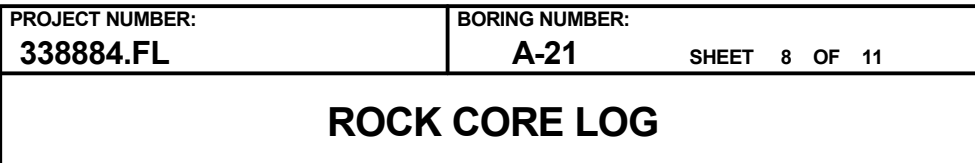
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723168.5 N, 458055.6 E (NAD83)

ELEVATION : 42.4 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 wing bit ORIENTATION : Vertical

WATER LEVELS : 4.72 ft bgs on 3/12/07 START : 3/11/2007 END : 3/20/2007 LOGGER : C. LeBlanc, M. Faurete

WATER LEVELS : 4.72 R bgs on 3/12/07			START : 3/11/2007		END : 3/20/2007		LOGGER : C. LeBlanc, M. Paquette		
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			
-77.6					Silty Sand With Gravel (SM) 118.5-119.6' - moderate yellowish brown, (10YR 5/4), wet, very dense, mild HCl reaction, fine to coarse sand-sized limestone fragments, 20% gravel-sized limestone fragments, 15% nonplastic fines, all carbonate		Driller's Remark: Drill chatter 120-122', soft 122-123', drill chatter 123-123.5'		
	123.5								
	123.8	0.3	SS-25	50/4 (50/4")	Silty Sand With Gravel (SM) 123.5-123.8' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), wet, very dense, mild HCl reaction, fine to coarse sand-sized limestone fragments, 20% gravel-sized limestone fragments, 15% nonplastic fines, all carbonate		Chatter 125-126' Driller's Remark: Softened considerably on 126-128.5', circulation maintained to 136'		
125 -82.6									
	128.5								
	130.0	1.1	SS-26	19-25-33 (58)	Silty Gravelly Sand (SM) 128.5-129.6' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), wet, very dense, mild HCl reaction, fine to coarse sand-sized limestone fragments, 30% gravel-sized limestone fragments, 22% nonplastic fines, all carbonate		Driller's Remark: Soft 130-132.5' Driller's Remark: Harder 132-133.5', minor chatter observed on 133-133.5'		
130 -87.6									
	133.5								
	133.8	0.3	SS-27	50/3 (50/3")	Silty Sand With Gravel (SM) 133.5-133.75' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), wet, very dense, mild HCl reaction, fine to coarse sand-sized limestone fragments, 20% gravel-sized limestone fragments, 15% nonplastic fines, all carbonate		Steady chatter 135-138.5'		
135 -92.6								Significant chatter 136-138.5' Circulation loss at 136.5'	
	138.5								
	138.7	0.2	SS-28	50/2.5 (50/2.5")	Limestone Fragments 138.5-138.7' - light olive gray, (5Y 5/2), mild to moderate HCl reaction, fine to coarse sand-sized fragments, few voids or fossils, trace black particles, possibly pyrite		Very hard at 139.0' End of soil boring at 139', begin rock coring		
140									
					Begin Rock Coring at 139.0 ft bgs See the next sheet for the rock core log				



ELEVATION : 42.4 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

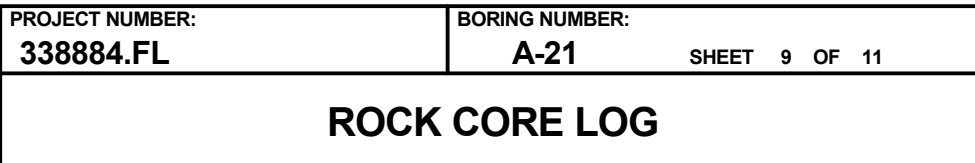
WATER LEVELS : 4.72 ft bgs on 3/12/07

START : 3/11/2007

END : 3/20/2007

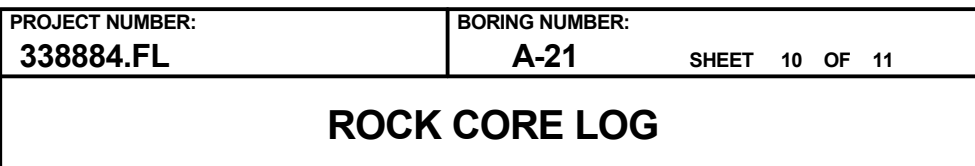
LOGGER : C. LeBlanc, M. Faurote

APPENDIX 2BB-257



LOGGER : C. LeBlanc, M. Faurote

Rev. 4



LOGGER : C. LeBlanc, M. Faurote

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-21
SHEET 11 OF 11	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

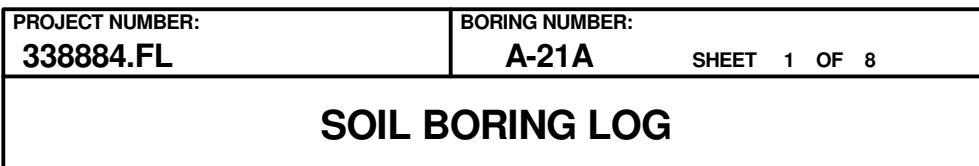
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723168.5 N, 458055.6 E (NAD83)

ELEVATION : 42.4 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

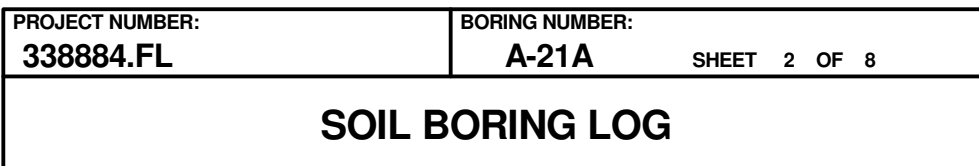
WATER LEVELS : 4.72 ft bgs on 3/12/07 START : 3/11/2007 END : 3/20/2007 LOGGER : C. LeBlanc, M. Faurote

WATER LEVELS : 4.72 ft bgs on 3/12/07		START : 3/11/2007		END : 3/20/2007		LOGGER : C. LeBlanc, M. Paurite	
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			
200 -157.6	200.3		NR	192.55-193.4' - Fracture, 10-80 deg, multiple fractures with crystallization of iron compounds and organics 193.4-195.0' - Mechanical break, multiple breaks 195.0' - Fracture, 45 deg, recrystallized carbonate microcrystalline masses 196.45-197.1' - Fracture zone, numerous small rock fragments, one fragment shows intersecting 45 deg fractures with deposit of recrystallized minerals 197.05-198.1' - Fracture, 65-80 deg, rough, irregular edged joint exhibiting dark stains, the surface shows recrystallized minerals including iron oxides 198.4' - Fracture, horizontal, planar, iron oxide minerals and some (2-5%) fine grained, silt sized infilling 198.7' - Fracture, 65 deg, rough, angular faces with some silt sized infilling		197.0-198.1' - moderate yellowish brown to light brown, (10YR 5/4 to 5YR 6/4), mild HCl reaction, medium strong to strong (R3 to R4), solution channels along fracture plans 198.1-198.4' - light brown, (5YR 5/6), thin to laminar bedded in regular planes with silt and sand-sized grains in varying proportions 198.4-198.8' - pale yellowish brown, (10YR 6/2), moderate HCl reaction, weak to medium strong (R2 to R3), fossil void spaces about 30% No Recovery 198.8-200.3 Bottom of Boring at 200.3 ft bgs on 3/20/2007	R13: 4 minutes Shows interrupted bedded and differential compaction, plus a variety of clasts types in less than 1/4" sizes. At 198.4' there is an undulant contact that looks like shallow ripple marks of low amplitude May exhibit healed subsidence features TD=200.3' at 17:48 on 3/20/07 Water level at 3' below ground surface on 3/21/07



LOGGER : R. Gomez

Rev. 4



LOGGER : R. Gomez

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-21A	SHEET 3 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723171.1 N, 458054.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 4.72 ft bgs on 3/12/07 START : 5/22/2007 END : 5/23/2007 LOGGER : R. Gomez

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.
7.8	35.0	50	1	35.6' - Bedding plane, 0-30 deg, rough, planar, tight		Limestone 35.0-38.6' - pale yellowish brown, (10YR 6/2), moderate to strong HCl reaction, very weak (R1), thin bedding, moderately fossiliferous (casts/molds), sample is 20-30% voids/casts <1/8", trace irregular shaped cavities 1/4"x1/8", trace coarse grain organic fragments, carbonate silt lenses present at 37.9-38.1' No Recovery 38.6-40.0'	Begin rock coring at 08:17, 5/23/07 R1: 5 minutes
			1				
			4	36.8' - Bedding plane, 5-10 deg, rough, undulating, tight to open (1/8")			
			2	37.7' - Fracture, 50 deg, rough, undulating 37.85, 37.95' - Bedding plane (2), horizontal, wavy bedding plane contacts with carbonate fines			
			NR	38.5' - Mechanical break			
40.2.8	40.0	23	2	40.3, 40.4' - Mechanical break (2), horizontal, rough, undulating, tight		Limestone 40.0-43.0' - pale yellowish brown, (10YR 6/2), fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), 3-5% fine grain moderately dark gray (N4) particles in matrix, 5-7% coarse grain black particles, moderately fossiliferous (casts/molds), fossils (up to 3/8"), 15-25% voids/casts (<1/16") No Recovery 43.0-45.0'	R2: 3 minutes
			4	41.0, 41.1' - Mechanical break (2), horizontal, rough, undulating, tight			
			4	41.6, 41.8' - Bedding plane (2), horizontal, rough, undulating, tight			
			NR	42.15' - Fracture, 40 deg, smooth, planar, tight 42.2, 42.5, 42.9' - Mechanical break (3), <5 deg, rough, undulating, tight			
			NR				
45-2.2	45.0	15	>10	45.0-46.4' - Mechanical break, multiple irregular breaks		Limestone 45.0-48.9' - dark yellowish brown, (10YR 4/2), extremely weak to very weak (R0 to R1), 3-7% black organic lamination (<1/16") and coarse grain particles, 25-35% spheroidal voids (<1/8"), moderately fossiliferous (casts and molds), most fossils <1/8", trace dissolution cavities across the entire run No Recovery 48.9-50.0'	R3: 2 minutes
			>10				
			6	47.2, 47.4, 47.6, 47.8, 48.4, 48.8, 48.9' - Mechanical break (7), horizontal, rough, undulating, tight			
			3				
			NR				
50-7.2	50.0	28	>10	50.0-50.3' - Fracture zone, subangular rock fragments 1/2"-1-1/8" in size		Limestone 50.0-54.2' - dark yellowish brown, (10YR 4/2), very fine to fine grained, moderate HCl reaction, very weak to weak (R1 to R2), 15-20% spheroidal and elongated voids <1/8", 5-10% elongated dissolution cavities unfilled, both elongated voids and cavities appear to be sub horizontally aligned, 3-5% organic material as coarse black particles and laminations at 51.3' and 52.3' No Recovery 54.2-55.0'	R4: 5 minutes
			5	50.0, 50.1, 50.3, 50.45' - Bedding plane (4), 5-10 deg, rough, undulating, open (1/16"), occurring on organic laminations			
			2	50.6, 50.7' - Bedding plane (2), 5-10 deg, rough, undulating, open (1/16")			
			3	51.7' - Bedding plane, horizontal, rough, undulating, open (1/8")			
			0	52.1, 52.65, 53.0, 53.15' - Bedding plane (4), 15-20 deg, rough, undulating, tight			
55	55.0		NR	53.25' - Bedding plane, 30 deg, rough, undulating, organics on upper surface			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-21A

SHEET 4 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723171.1 N, 458054.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.72 ft bgs on 3/12/07

START : 5/22/2007

END : 5/23/2007

LOGGER : R. Gomez

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			
-12.2	R5-HQ 5 ft 78%	47	>10	55.2-55.45' - Fracture zone, 1/4" to 1-1/2" rock fragments		Limestone 55.0-58.9' - pale yellowish brown with trace olive gray mottling, (10YR 6/2 with 5Y 4/1), very fine to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), 10-15% voids (<1/16"), elongated, poorly fossiliferous (casts), fossils are <1/16", 3-7% medium grained angular shaped black particles, trace short (<1/16") discontinuous black laminations grading from weak rock (R2) at top to medium strong rock (R3) at the bottom No Recovery 58.9-60.0'	SC-1 collected at 57.5-58.9' R5: 7 minutes
			3	55.65' - Bedding plane, 2-5 deg, rough, planar, open (<1/16")			
			4	55.95' - Bedding plane, 5 deg, rough, stepped, open (<1/16")			
			1	56.1, 56.3' - Mechanical break			
			NR	56.5' - Fracture, 60 deg, rough, undulating, open (<1/8")			
60	R6-HQ 5 ft 92%	35	1	57.3' - Fracture, 50 deg, rough, undulating, open (<1/8")		Limestone 60.0-61.2' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), moderate to strong HCl reaction, medium strong (R3), 3-5% voids <1/16", 5-10% horizontally aligned <3/8" flat black flakes 61.2-61.4' - Same as 60.0-61.2' except weak (R2), 25-35% voids <1/16", 5-10% coarse grain black particles 61.4-62.0' - Same as 60.0-61.2' 62.0-64.6' - Same as 61.2-61.4' No Recovery 64.6-65.0'	R6: 6 minutes
-17.2			2	57.4' - Bedding plane or mechanical break			
			3	57.5' - Bedding plane, horizontal, rough, stepped, 3/8" relief on surface			
			4	58.9' - Bedding plane or mechanical break, horizontal, rough, planar, open (< 1/16")			
			0	60.3' - Bedding plane, horizontal, rough, undulating, open (1/2")			
			NR	61.2, 61.4' - Bedding plane or mechanical break (2), 5-10 deg, rough, undulating, open (3/4")			
65			NR	62.0' - Bedding plane, horizontal, rough, undulating, open (1/8")			
-22.2	R7-HQ 5 ft 100%	68	>10	62.3' - Bedding plane, 5-10 deg, rough, undulating, tight		Limestone 65.0-71.0' - mottled pale yellowish brown and dark yellowish brown, (10YR 6/2 and 10YR 4/2), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), 10-15% voids <1/16", voids restricted to pale yellowish brown color, 3-7% medium grain black flakes present as short discontinuous laminations across rock sample, very thinly bedded at 69.0-69.3', mottled areas appear to be bioturbated zones oriented subhorizontally 71.0-74.4' - pale yellowish brown, (10YR 6/2), fine grained, moderate to strong HCl reaction, 20-30% voids/casts <1/16", moderately fossiliferous with casts (up to 1/2"), 5-10% medium to coarse grain black particles, 3-5% medium to coarse grained dark gray angular to subangular shaped particles, 1/2" thick organic layer at 73.6', below 73.6' rock looks more weathered than above	SC-2 collected at 65.78-66.77' R7: 10 minutes
			0	62.5' - Mechanical break			
			1	62.8, 63.05, 63.3, 63.5, 63.8' - Bedding plane or mechanical break (5), horizontal, rough, undulating, open (<1/16")			
			0	65.6-65.78' - Fracture zone, rock fragments			
			4	67.2' - Bedding plane, horizontal, rough, undulating			
			2	69.0' - Bedding plane, horizontal, rough, planar, 1/16" silt and/or clay sized infilling			
70			2	69.3' - Bedding plane, horizontal, rough, planar, tight medium grained black flakes on surface			
-27.2	R8-HQ 5 ft 88%	60	2	69.6' - Fracture, 20-30 deg, smooth, stepped, 1-3/4" fossil on fracture surface			R8: 7 minutes
			2	69.8' - Fracture, 80 deg, rough, planar, tight			
			1	70.68' - Bedding plane, 10-15 deg, rough, undulating, at top of extremely weak rock			
			1	70.8' - Bedding plane, 5-10 deg, rough, undulating, top of fractured rock			
			1	71.0' - Bedding plane, <5 deg, rough, undulating, base of fractured zone			
			NR	71.3' - Fracture, 80 deg, rough, undulating, tight, fracture up to 7" long			
75				72.7' - Bedding plane, 5-10 deg, rough, undulating, tight			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-21A

SHEET 5 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723171.1 N, 458054.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.72 ft bgs on 3/12/07

START : 5/22/2007

END : 5/23/2007

LOGGER : R. Gomez

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.
-32.2	R9-HQ 5 ft 96%	40	0	73.6' - Bedding plane, 0-5 deg, rough, undulating, 1/2" thick organic layer		No Recovery 74.4-75.0' Limestone 75.0-78.6' - moderate yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), moderate HCl reaction, weak (R2), 25-30% voids <1/16", trace unfilled cavities 1"x1/2" (mostly near bottom), moderately fossiliferous (casts), 3-7% fine to medium grained black particles; 1-1/2" thick organic lense 78.6-79.8' - Same as 75.0-78.6' except very weak (R1)	R9: 6 minutes
			1	73.8' - Mechanical break, 30 deg, rough, undulating, tight			
			>10	74.1' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
			>10	76.6' - Fracture, 30 deg, rough, undulating, tight			
			0	76.6-77.1' - Fracture, vertical, rough, undulating, black staining on 15% of surface, multiple intersecting mechanical breaks			
80	R10-HQ 5 ft 88%	10	NR	77.6-78.6' - Fracture zone, high angle fractures through an interval of apparently weathered rock		No Recovery 79.8-80.0' Limestone 80.0-84.4' - pale yellowish brown, (10YR 6/2), moderate to strong HCl reaction, weak (R2), moderately fossiliferous (cast/molds), 3-7% medium to coarse grain black particles, fossils (up to 5/8"), various fossil types present including tubular shaped organisms, top 0.4' of run appears weathered	R10: 10 minutes
-37.2			>10	78.6, 78.8' - Bedding plane (2), horizontal, rough, undulating, top and base of organic-rich carbonate fines layer			
			3	80.0-80.3' - Fracture zone, rock fragments			
			2	80.6' - Bedding plane or mechanical break, horizontal			
			2	81.0' - Fracture, 65-75 deg, rough, undulating, tight			
	R11-HQ 5 ft 46%	15	1	81.3' - Fracture, 30 deg, rough, undulating, tight		No Recovery 84.4-85.0' Limestone 85.0-85.9' - pale yellowish brown, (10YR 6/2), strong HCl reaction, strong (R4), 5-10% void <1/16", 10-20% unfilled cavities irregularly shaped up to 1" in size, some are dissolution cavities, moderately fossiliferous (casts/molds), fossils up to 5/8" in size, intervals of weathering/dissolution cavities of fragmented core, subrounded to subangular in shape, brownish black staining on some fragments, stained dark yellowish brown over bottom 0.4'	SC-3 collected at 85.0-85.82' Circulation loss at 87.0' Core loss assumed to occur from 85.9-88.6' R11: 6 minutes
85			NR	81.7' - Fracture, 40 deg, rough, undulating, tight			
-42.2			0	82.1' - Fracture, 30 deg, rough, undulating, top of zone of fragmented rock			
			>10	82.7' - Fracture, 70-80 deg, rough, undulating, tight			
			>10	83.1' - Fracture, 70 deg, rough, undulating, tight			
	R12-HQ 5 ft 94%	52	10	83.2' - Fracture, horizontal, rough, undulating		No Recovery 85.9-88.6' Limestone 88.6-90.0' - Same as 85.0-85.9' 90.0-91.5' - moderate yellowish brown with 40% mottled with very pale orange, (10YR 5/4 with 10YR 8/2), moderately fossiliferous (cast/molds), fossils (mostly <1/4" but a few are up to 1/2"), 25-30% spheroidal voids (<1/16"), voids mostly restricted to the pale yellowish brown color areas	R12: 7 minutes
			2	83.8-84.3' - Fracture zone			
			1	84.3' - Fracture, 30-40 deg, rough, undulating, base of fractured zone			
			4	85.9' - Fracture, 30 deg, rough, undulating, infilling on surface			
			1	88.5-89.6' - Fracture zone, fragments from 3/8" to 1", staining on few surfaces, possibly weathered rock, possible dissolution cavity			
90			10	89.7' - Fracture, 60 deg, rough, undulating, open (<1/16")			
-47.2			2	90.3-91.0' - Fracture zone, 1/2"-2" rock fragments			
			1	91.1' - Fracture, 40-50 deg, rough, undulating, open (2")			
			4	91.5' - Fracture, 70 deg, rough, undulating, open (1/16")			
			1	92.7' - Fracture, 5-10 deg, rough, undulating, open (<1/16")			
95			NR	93.0, 93.1' - Fracture (2), 30 deg, rough, undulating, tight			
				93.3' - Fracture, 50 deg, rough, undulating, tight			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-21A

SHEET 6 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723171.1 N, 458054.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.72 ft bgs on 3/12/07

START : 5/22/2007

END : 5/23/2007

LOGGER : R. Gomez

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.
-52.2	R13-HQ 5 ft 52%	15	0	93.95, 94.3' - Bedding plane or mechanical break (2), 5-10 deg, rough, undulating, tight		91.5-94.7' - Same as 90.0-91.5' except pale yellowish brown, (10YR6/2), with brownish black rippled lamination at 94.5' No Recovery 94.7-95.0' Limestone 95.0-97.6' - moderate yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), fine grained, weak to medium strong (R2 to R3), 15-20% elongated voids <1/8" sub horizontally oriented, moderately fossiliferous with casts up to 3/8" No Recovery 97.6-100.0'	SC-4 collected at 95.13-95.96' R13: 4 minutes
			>10	95.0-95.2' - Fracture zone, zone of mechanical breaks			
			>10	96.0-97.6' - Fracture zone, 50-70 deg, fractures are intersected by potential mechanical breaks			
			NR				
100	R14-HQ 5 ft 64%	18				Limestone 100.0-103.2' - pale yellowish brown, (10YR 6/2), fine grained, moderately fossiliferous with casts up to 5/8" weathered over top 0.7', color may be due to potential staining or weathering, 10-15% medium to coarse grain black particles, trace short (1/16") discontinuous black laminations throughout core run No Recovery 103.2-105.0'	R14: 3 minutes
-57.2			>10	100.0-100.2' - Fracture zone			
				100.5-100.75' - Fracture zone			
			>10	100.9' - Fracture, 20 deg, rough, undulating, open (1/8")			
				101.4' - Fracture, 20 deg, rough, undulating, open (1/2")			
			0	101.6' - Fracture, 80 deg, rough, undulating, tight			
	R15-HQ 5 ft 90%	38	0	101.7' - Fracture, 0-10 deg, rough, undulating, tight		Limestone 105.0-109.5' - moderate yellowish brown with 15-20% dark yellowish brown mottling, (10YR 5/4 with 10YR 4/2), fine grained, moderate HCl reaction, weak (R2), 15-25% voids <1/16", poorly fossiliferous (molds), trace irregular shaped unfilled cavities up to 5/8" No Recovery 109.5-110.0' Limestone 110.0-112.5' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, weak (R2), 5-10% voids up to 1/8", trace cavities up to 3/4"x3/4" infilled with fine grained weak (R2) carbonate material No Recovery 112.5-115.0'	R15: 5 minutes
			NR	101.8' - Fracture, 15-20 deg, rough, undulating, top of fractured zone			
				102.0' - Fracture, 60 deg, rough, undulating, base of fractured zone			
105			2	105.1' - Bedding plane or mechanical break, horizontal, rough, undulating, open (1/8")			
-62.2			0	105.35' - Bedding plane or mechanical break, 30 deg, rough, undulating, tight			
			>10	107.35' - Fracture, horizontal, rough, undulating, open			
			9	107.35-107.55' - Fracture zone			
				107.6-107.8' - Fracture, 60 deg, rough, undulating, open (1/4")			
	R16-HQ 5 ft 50%	0	2	107.95-108.7' - Fracture, 80 deg, rough, undulating, open			
			NR	108.2' - Fracture, horizontal, intersects one fragment of fracture at 107.95-108.7'			
110			9	108.4' - Fracture, horizontal, rough, undulating, open, intersects one fragment of fracture at 107.95-108.7'			
-67.2			>10	108.8-109.0' - Fractures, 60 deg, rough, undulating, open			
			>10	109.0-109.5' - Fracture, vertical, rough, undulating, open			
				109.5' - Fracture, 15 deg, rough, undulating, open			
			NR	110.15' - Fracture, horizontal, rough, undulating, open			
				110.15-110.5' - Fracture, vertical, rough, undulating, open, rock fragments on smaller side of fracture			
115	115.0						R16: 7 minutes



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-21A	SHEET 7 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723171.1 N, 458054.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

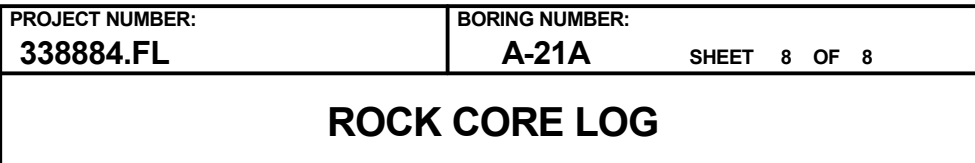
WATER LEVELS : 4.72 ft bgs on 3/12/07

START : 5/22/2007

END : 5/23/2007

LOGGER : R. Gomez

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			
-72.2	R17-HQ 5 ft 60%	18	>10	111.0-111.5' - Fractures (2), 85 deg and vertical, rough, undulating, open		Limestone 115.0-118.0' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), fine to medium grained, moderate to strong HCl reaction, weak (R2), except very weak (R1) at 115.0-115.3', moderately fossiliferous, 25% coverage of very small (<1/16") voids, 5-10% small (1/16"-3/16") voids, trace cavities up to 1-3/16"x3/8", 50% of cavities infilled with carbonate material similar to 110.0-112.5', visible shell fragments at 115.0-115.5', large (about 50% of core by volume) cavity (not infilled) at 115.45-115.65', strength of HCl reaction decreases with depth No Recovery 118.0-120.0' Limestone 120.0-124.5' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), fine grained, mild HCl reaction, weak (R2), except very weak (R1) at 124.1-124.5', very small (<1/16") voids, trace small (1/16"-1/8") voids, trace casts/cavities up to 3/4"x3/8", 10% casts/cavities at 120.0-120.75' with partial (carbonate) infilling No Recovery 124.5-125.0' Limestone 125.0-126.45' - pale yellowish brown, (10YR 6/2), fine grained, mild HCl reaction, weak (R2), weathered, 10-15% (<1/16") voids, trace small (1/16"-1/4") voids, 5-10% casts/cavities up to 1-3/16"x3/4", poorly fossiliferous 126.45-127.0' - Same as 125.0-126.45' except weak to medium strong (R2 to R3), trace voids up to 1/16", no fossils casts/cavities No Recovery 127.0-130.0' Limestone 130.0-133.1' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), trace voids (<1/16), no visible casts/cavities, dark gray to black irregular laminae at 130.5-131.0' 133.1-133.3' - Same as 130.0-133.1' except very fine to fine grained, moderate HCl reaction, medium strong (R3)	R17: 4 minutes
			2	111.4-111.65' - Fracture, 60 deg, rough, undulating, open			
			4	111.65-112.0' - Fractures, 75 deg, rough, undulating, open			
			NR	112.0-112.5' - Fracture zone			
120	R18-HQ 5 ft 90%	57		115.0-115.15' - Fracture zone		R18: 4 minutes	SC-5 collected at 120.88-121.71'
-77.2				115.2, 115.35' - Fractures (2), <10 deg, rough, undulating, open			
				115.65, 115.75' - Fractures (2), horizontal, rough, stepped, open			
				115.75-116.0' - Fracture zone			
				116.1-116.25' - Fracture, 45 deg, rough, planar, tight			
				116.35' - Fracture, horizontal, rough, undulating, open			
	R19-HQ 5 ft 40%	0	>10	117.1' - Fracture, <10 deg, rough, undulating, open		R19: 5 minutes	SC-6 collected at 131.2-132.1'
			2	117.5, 117.6, 117.65' - Fractures (3), horizontal, rough, planar, open			
			1	120.2' - Fracture, horizontal, rough, undulating, open			
			0	120.25-120.6' - Fracture zone			
			5	120.85' - Fracture, horizontal, rough, undulating, open			
			NR	121.75, 121.9' - Fractures (2), horizontal, rough, undulating, open			
125				122.2-122.3' - Fracture, 45 deg, rough, undulating, open			
-82.2				124.1, 124.2' - Fractures (2), horizontal, rough, undulating, open			
				124.2-124.35' - Fracture, vertical, smooth, planar, open			
				124.3, 124.7' - Fractures (2), 10 deg, rough, undulating, open			
	R20-HQ 5 ft 78%	45	>10	125.0-125.6' - Fracture zone (8)		R20: 5 minutes	
				125.6' - Fracture, horizontal, rough, undulating, open			
				125.6-125.9' - Fracture, 75 deg, rough, undulating, open			
				125.9-126.05' - Fracture, 75 deg, rough, undulating, open			
				126.05-126.3' - Fracture zone			
				126.45-126.6' - Fracture zone			
				126.55-127.0' - Fracture, vertical, rough, undulating, tight			
				126.75' - Fracture, horizontal, rough, undulating, open			
	R20-HQ 5 ft 78%	45	1	126.75-127.0' - Fracture, 60 deg, rough, undulating, tight		R20: 5 minutes	
			2	130.0-130.15' - Fracture, vertical, rough, planar, open			
			1	130.15' - Fracture, horizontal, rough, planar, open			
				130.15-130.85' - Fracture, vertical, rough, undulating, 1/4" relief			
			NR	130.75' - Fracture, horizontal, rough, undulating, open			
135				130.8-131.0' - Fracture zone			



LOGGER : R. Gomez

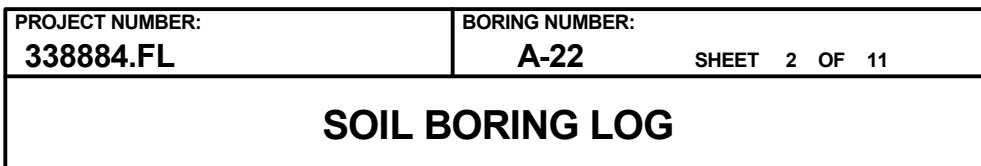
Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-22
SHEET 1 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)
 ELEVATION : 42.6 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 : 6.6 ft bgs on 3/23/07 START : 3/22/2007 END : 3/27/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 0.010050 ft 3/23/07			START : 3/22/2007		END : 3/27/2007		LOGGER : N. Salzman		
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			
42.6								10:08 Begin drilling with 2-7/8" tri-cone bit	
	3.5							Soil sampling every 5' from 3.5' below ground surface	
5	5.0	0.9	SS-1	3-3-3 (6)	Poorly Graded Sand With Silt (SP-SM) 3.5-4.4' - moderate yellowish brown with dusky brown, (10YR 5/4 with 5YR 2/2), wet, loose, very fine to fine grained, 10% organics, 10-15% nonplastic fines, sand is silica				
37.6	8.5								
	10.0	1.1	SS-2	12-16-13 (29)	Silt (ML) 8.5-9.6' - yellowish gray, (5Y 7/2), wet, very stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 10% very fine sand-sized material, coarse gravel-size limestone fragments (white [N9] to yellowish gray [5Y 8/1] at top of sample, strong HCl reaction), all carbonate				
10	13.5								
32.6	14.5	0.9	SS-3	28-78/11.5 (82")	Silt With Sand (ML) 13.5-14.4' - Same as 8.5-9.6' except hard, 25% very fine to fine sand-sized material, one coarse gravel-sized limestone fragment				
15	18.5								
27.6	18.9	0.2	SS-4	50/4.5 (50/4.5")	Limestone Fragments 18.5-18.7' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, fragments to 1/2", 25% silt- and sand-sized carbonate materials similar to 13.5-14.4'				
20									



LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-22
SHEET 3 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)
 ELEVATION : 42.6 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 : 6.6 ft bgs on 3/23/07 START : 3/22/2007 END : 3/27/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 0.01 RDS ON 9/23/07							START : 9/22/2007		END : 9/27/2007		LOGGERS : N. Jaiszimeck	
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				
2.6						Silty Sand (SM) 38.5-40.0' - moderate olive brown, (5Y 4/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 20-25% low plastic fines, 10% fine gravel-sized material						
43.5												
44.5	1.0	SS-9	24-50/6 (74/12")			Silt With Sand And Limestone (ML) 43.5-44.5' - dusky yellow, (5Y 6/4), wet, hard, low plasticity, rapid dilatancy, mild to moderate HCl reaction, 10-25% fine to coarse sand-sized grains (varies throughout sample), limestone lens at 43.8-43.9', organic lens 1/8" thick at 43.65'						
45 -2.4												
48.5												
49.5	1.0	SS-10	22-9-2 (11)			Silty Sand With Limestone (SM) 48.5-50.0' - moderate yellowish brown, (10YR 6/4), wet, medium dense, fine to coarse grained, mild to moderate HCl reaction, 37% low plastic fines, limestone lenses at 48.6', 48.8', 49.3'						
50 -7.4												
53.5												
55 -12.4	1.5	SS-11	19-34-48 (82)			Sandy Silt (ML) 53.5-55.0' - moderate olive brown, (5Y 4/4), wet, hard, low plasticity, slow to rapid dilatancy, mild HCl reaction, 35-40% fine to coarse sand-sized grains, all carbonate, organic lenses (olive gray [5Y 3/4]) at 54.5-55.0'						
58.6	0.1	SS-12	50/2 (50/2")			Sandy Silt (ML) 58.5-58.7' - Same as 53.5-55.0' except with organics						
60												



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-22
SHEET 4 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)
 ELEVATION : 42.6 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 : 6.6 ft bgs on 3/23/07 START : 3/22/2007 END : 3/27/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 6.6' bgs on 3/23/07							START : 3/22/2007		END : 3/27/2007		LOGGER : N. Salzman	
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				
-17.4												
	63.5											
	64.5	0.8	SS-13	40-50/5.5 (90/11.5")	Silt With Sand (ML) 63.5-64.3' - yellowish gray, (5Y 7/2), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 15-25% fine to coarse sand-sized grains, light olive gray (5Y 5/2) laminations at 64.1-64.2'							
65 -22.4												
	68.5											
	68.5	0.0	SS-14	50/1.5 (50/1.5")	No Recovery 68.5'							4" HW casing set to 70' below ground surface
70 -27.4												16:56 Resume drilling, clearing hole
	73.5											3/22/07 End drilling for the day at 73.5'
	73.8	0.3	SS-15	50/4 (50/4")	Elastic Silt (MH) 73.5-73.6' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), wet, soft, low to medium plasticity, slow to rapid dilatancy, mild HCl reaction, trace fine to medium sand-sized material, white carbonate clay stringers throughout Silty Sand With Limestone (SM) 73.6-73.8' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), wet, dense, fine to coarse grained, mild HCl reaction, 32% low plastic fines, limestone lens at 73.6', all carbonate						3/23/07, 07:58 Water level 6.6' below ground surface	
75 -32.4												08:17 Resume drilling by bringing up 73.5' sample
	78.5											
	78.8	0.1	SS-16	50/3 (50/3")	Limestone Fragments 78.5-78.6' - dusky yellow, (5Y 6/4), mild HCl reaction, fragments to 1/2", voids over 50% of surface							
80												



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-22

SHEET 5 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)

ELEVATION : 42.6 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 : 6.6 ft bgs on 3/23/07

START : 3/22/2007

END : 3/27/2007

LOGGER : N. Jarzyniecki

WATER LEVELS : 0.011055 ft 9/23/07							START : 9/22/2007		END : 9/27/2007		LOGGER : N. Salzman	
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						
-37.4								Driller's Remark: Slight chatter during drilling				
83.5 83.7	0.1	SS-17	50/2 (50/2")	Limestone Fragments 83.5-83.6' - Same as 78.5-78.6'								
85 -42.4												
88.5												
90 -47.4	1.3	SS-18	18-28-27 (55)	Silty Sand With Limestone (SM) 88.5-89.8' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 20-25% nonplastic fines, 5-10% organics, 10% fine gravel-sized grains, limestone lens at 88.95', all carbonate								
93.5												
95 -52.4	1.2	SS-19	33-12-15 (27)	Limestone With Silty Sand 93.5-94.7' - moderate yellowish brown, (10YR 5/4), wet, mild to moderate HCl reaction, 60% limestone fragments to 1", 15-20% nonplastic fines, 20% fine to coarse sand, all carbonate				Driller's Remark: Lost circulation at 96'				
98.5												
100	1.0	SS-20	10-8-2 (10)									



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-22
SHEET 6 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)
 ELEVATION : 42.6 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 : 6.6 ft bgs on 3/23/07 START : 3/22/2007 END : 3/27/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 0.0 ft bgs on 3/23/07			START : 3/22/2007		END : 3/27/2007		LOGGERS : N. Jaiszimeck	
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	
-57.4					Limestone With Silty Sand 98.5-99.5' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), mild to moderate HCl reaction, fine to coarse gravel-sized fragments to 1-1/2", soil fraction is fine to medium sand-sized grains with 32% nonplastic fines (varies in sample), limestone lens from 98.5-98.8', all carbonate		Casing advanced to 100'	
	103.5						Driller's Remark: Slight loss of circulation at 102'	
105		1.5	SS-21	11-14-6 (20)	Silty Sand With Limestone (SM) 103.5-105.0' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), wet, medium dense, fine to coarse grained, mild HCl reaction, 20% nonplastic fines, 30% fine to coarse gravel-sized limestone fragments, all carbonate		Advancing casing to 105'	
-62.4	105.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-22

SHEET 7 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)

ELEVATION : 42.6 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 : 6.6 ft bgs on 3/23/07

START : 3/22/2007

END : 3/27/2007

LOGGER : N. Jarzyniecki

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.
110 -67.4	R1-NQ 2.5 ft 96%	28	1	109.3' - Fracture, vertical, rough, undulating		Limestone 109.0-111.4' - light olive gray, (5Y 5/2), very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), poorly fossiliferous, voids up to 1/16" over 15-20% of surface, larger cavities/fossil molds up to 1/4" x 1/2" over <5% of surface, <5% fine black inclusions No Recovery 111.4-111.5' Limestone 111.5-114.9' - Same as 109.0-111.4' except medium strong (R3), with increasing fossil content, voids up to 1/16" over 20-25% of surface, fossil molds up to 1/4" x 1/8" on 5-10% of surface 114.9-115.0' - Same as 111.5-114.9' except extremely weak to medium strong (R0 to R3), limestone has moderate HCl reaction, silts have delayed mild HCl reaction No Recovery 115.0-116.5' Limestone 116.5-120.6' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), very fine grained, very weak to medium strong (R1 to R3), fossiliferous with casts and molds up to 1/4" x 1/2". Voids up to 1/16" over 25% of surface, larger cavities/molds up to 1/2" x 1/2" on <5% of surface, thinly bedded No Recovery 120.6-121.5'	3/23/07, 16:48 Start coring Note: R1 is short run (2.5') to set stroke R1: 2 minutes Slight loss of circulation during run, driller advancing casing to 111.5' 3/23/07 End drilling for the day at 111.5' 3/24/07, 07:54 water level is 8.9' below ground surface 08:17 Begin drilling SC-1 collected as 112.8-113.5' Slight circulation loss during R2-NQ run R2: 18 minutes
			2	109.7' - Fracture, 55 deg, smooth, undulating			
			2	110.0' - Fracture, vertical, smooth to rough, undulating			
115 -72.4	R2-NQ 5 ft 70%	52	NR	110.7' - Mechanical break		110.7' - Mechanical break 111.15, 111.35' - Fracture (2), 70 deg, smooth to rough, undulating 112.1' - Mechanical break 112.2' - Bedding plane, <10 deg, smooth, undulating 112.85, 113.25' - Bedding plane (2), <20 deg, rough, undulating 113.4' - Bedding plane, <10 deg, rough, undulating 113.5, 113.9' - Mechanical break 114.9' - Fracture, 50 deg, rough, undulating 115.2' - Bedding plane, <20 deg, rough to smooth, undulating	
			2	111.15, 111.35' - Fracture (2), 70 deg, smooth to rough, undulating			
			3	112.1' - Mechanical break			
			0	112.2' - Bedding plane, <10 deg, smooth, undulating			
			2	112.85, 113.25' - Bedding plane (2), <20 deg, rough, undulating			
			NR	113.4' - Bedding plane, <10 deg, rough, undulating			
			NR	113.5, 113.9' - Mechanical break			
			NR	114.9' - Fracture, 50 deg, rough, undulating			
			NR	115.2' - Bedding plane, <20 deg, rough to smooth, undulating			
			NR				
120 -77.4	R3-NQ 5 ft 82%	44	4	117.05, 117.25, 117.4' - Bedding plane (3), 20 deg, rough, undulating		121.5-122.85' - light olive gray, (5Y 5/2), fine grained, weak to medium strong (R2 to R3), voids (1/16") over 15-20% of surface, moderately fossiliferous with casts up to 1/4" x 1/4", larger cavities up to 1" x 1/2" over <5% of surface, thinly bedded 122.85-122.9' - medium light gray, (N6), very fine grained, medium strong (R3), no voids/fossils/cavities 122.9-125.7' - Same as 121.5-122.85' No Recovery 125.7-126.5'	R3: 22 minutes
			3	117.7, 117.8, 117.9' - Bedding plane (3), <10 deg, smooth, planar			
			2	118.0, 118.75, 119.25, 120.0, 120.15' - Bedding plane (5), <10 deg, smooth, planar, infill of fine grained material at 119.25'			
			2				
			NR				
			NR				
125 -82.4	R4-NQ 5 ft 84%	58	5	121.95' - Bedding plane, 20 deg, rough, undulating		121.5-122.85' - light olive gray, (5Y 5/2), fine grained, weak to medium strong (R2 to R3), voids (1/16") over 15-20% of surface, moderately fossiliferous with casts up to 1/4" x 1/4", larger cavities up to 1" x 1/2" over <5% of surface, thinly bedded 122.85-122.9' - medium light gray, (N6), very fine grained, medium strong (R3), no voids/fossils/cavities 122.9-125.7' - Same as 121.5-122.85' No Recovery 125.7-126.5'	SC-2 collected at 124.0-125.4' R4: 15 minutes
			3	122.0, 122.1, 122.3, 122.5, 122.6, 122.75, 122.85, 122.9' - Bedding plane (8), <10 deg, smooth, undulating			
			3	123.65, 123.8, 123.95' - Bedding plane (3), <10 deg, smooth to rough, undulating			
			0				
			NR				
			NR				
	R5-NQ		3	126.85' - Fracture, 85 deg, rough to smooth, undulating			SC-3 collected at 127.10-128.15'
			1	126.95, 127.05' - Bedding plane (2), horizontal, smooth, undulating			
				128.15' - Bedding plane, <10 deg, rough to smooth, undulating			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-22	SHEET 8 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)

ELEVATION : 42.6 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

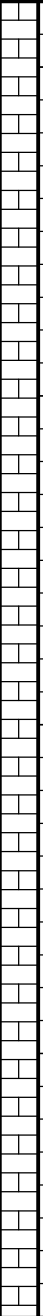
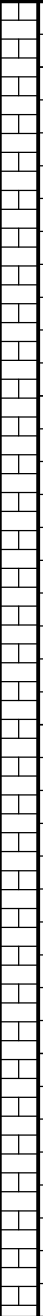
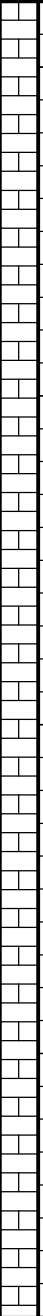
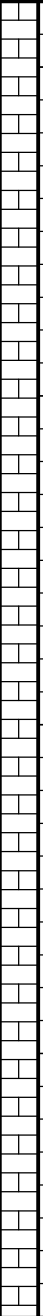
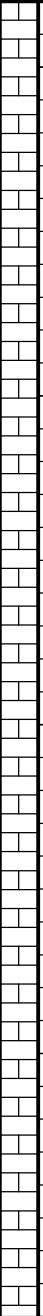
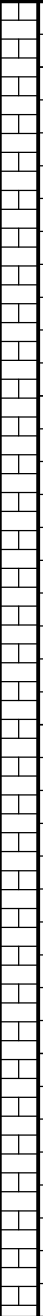
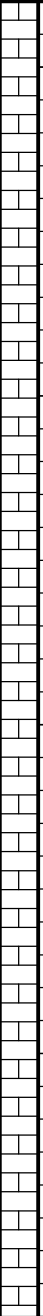
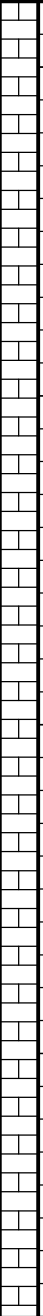
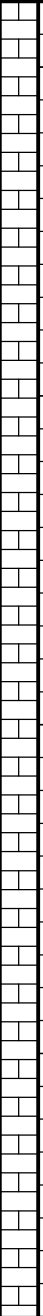
ORIENTATION : Vertical

WATER LEVELS : 6.6 ft bgs on 3/23/07

START : 3/22/2007

END : 3/27/2007

LOGGER : N. Jarzyniecki

WATER LEVELS: 6.0 RDS ON 3/23/07		START: 3/22/2007		END: 3/27/2007		LOGGERS: T. JARZYMECKI		
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
130 -87.4	5 ft 80%	48	4	128.55, 128.75' - Bedding plane (2), horizontal, smooth, undulating		Limestone 126.5-128.7' - light olive gray, (5Y 5/2), fine grained, weak (R2), small (1/16") voids over 15% of surface, fossiliferous, fossil casts up to 1/2" x 1/4", cavities 1" x 1/2" over <5% of surface, light gray (N6) mottling at 128.15-128.7' with decrease in small voids (<1/16") to <5% 128.7-130.5' - dusky yellow, (5Y 6/4), extremely weak to very weak (R0 to R1), small (<1/16") voids over 35% of surface, highly fossiliferous No Recovery 130.5-131.5'	Circulation loss during run, advancing casing R5: 21 minutes	
		>10	129.3, 129.7' - Mechanical break (2)					
		NR	129.4' - Bedding plane, 20 deg, smooth, undulating					
		NR	129.95-130.5' - Fracture zone					
135 -92.4	R6-NQ 5 ft 80%	53	>10	131.5-131.7' - Fracture zone, 50-60 deg, intersecting fractures		131.5-135.5' - light olive gray, (5Y 5/2), fine grained, weak to medium strong (R2 to R3), small (<1/16") voids over 15-30% of surface increasing with depth, larger cavities up to 1" x 1" over 10% of surface, discontinuous black organic laminae (<5%), interbed of very fine grained light olive gray (5Y 5/2) dense limestone with <5% voids (<1/16") over surface No Recovery 135.5-136.5'	Lost circulation at 135' R6: 5 minutes	
			>10	132.4' - Bedding plane, <5 deg, smooth to rough, planar				
			2	132.7-132.8' - Fracture zone				
			3	132.9' - Bedding plane, <5 deg, smooth to rough, planar				
140 -97.4	R7-NQ 5 ft 64%	36	NR	133.1' - Bedding plane, <10 deg, rough, undulating		133.5-135.5' - light olive gray, (5Y 5/2), fine grained, weak to medium strong (R2 to R3), small (<1/16") voids over 15-30% of surface increasing with depth, larger cavities up to 1" x 1" over 10% of surface, discontinuous black organic laminae (<5%), interbed of very fine grained light olive gray (5Y 5/2) dense limestone with <5% voids (<1/16") over surface No Recovery 139.7-141.5'	R7: 8 minutes 3/24/07 End drilling for the day at 141.5' 3/25/07, 07:59 Water level 2.9' below ground surface 08:41 Resume drilling	
			>10	134.35, 134.5' - Fracture (2), 20 deg, rough, undulating				
			>10	134.6' - Fracture, 70 deg, rough, undulating				
			NR	135.0' - Fracture, 15 deg, smooth, planar				
145 -102.4	R8-NQ 5 ft 74%	35	NR	135.1' - Bedding plane, horizontal		141.5-141.8' - medium gray, (N5), weak to medium strong (R2 to R3), 20% small voids (<1/16") over surface, cavities up to 1/4" x 1/4" <10% of surface 141.8-143.5' - yellowish gray with light gray and brownish gray interbed layering, (5Y 7/2 with N7 and 5Y 4/2), very fine grained, strong to very strong (R4 to R5), small (<1/16") voids <5" coverage, poorly fossiliferous 143.5-144.5' - Same as 141.8-143.5' except weak to medium strong (R2 to R3), interbedded with light olive gray (5Y 5/2), highly fossiliferous layers exhibiting small voids (<1/16") over 30% of surface	R8: 14 minutes	
			>10	136.8-137.05' - Fracture zone				
			>10	137.25' - Bedding plane, <15 deg, rough, undulating				
			NR	137.4' - Bedding plane, associated with cavity				
	R9-NQ		2	137.95' - Fracture, 15-20 deg, rough, undulating		141.5-141.8' - medium gray, (N5), weak to medium strong (R2 to R3), 20% small voids (<1/16") over surface, cavities up to 1/4" x 1/4" <10% of surface 141.8-143.5' - yellowish gray with light gray and brownish gray interbed layering, (5Y 7/2 with N7 and 5Y 4/2), very fine grained, strong to very strong (R4 to R5), small (<1/16") voids <5" coverage, poorly fossiliferous 143.5-144.5' - Same as 141.8-143.5' except weak to medium strong (R2 to R3), interbedded with light olive gray (5Y 5/2), highly fossiliferous layers exhibiting small voids (<1/16") over 30% of surface	Driller's Remark: Circulation loss 100% near beginning of run R9 SC-4 collected at 147.0-147.8'	
			0	138.4-138.55' - Fracture zone				
			NR	138.95' - Mechanical break				
			NR	139.15, 139.45' - Bedding plane or mechanical break (2), 10-15 deg, rough to smooth, undulating				
			>10	139.15, 139.45' - Bedding plane or mechanical break (2), 10-15 deg, rough to smooth, undulating		141.5-141.8' - medium gray, (N5), weak to medium strong (R2 to R3), 20% small voids (<1/16") over surface, cavities up to 1/4" x 1/4" <10% of surface 141.8-143.5' - yellowish gray with light gray and brownish gray interbed layering, (5Y 7/2 with N7 and 5Y 4/2), very fine grained, strong to very strong (R4 to R5), small (<1/16") voids <5" coverage, poorly fossiliferous 143.5-144.5' - Same as 141.8-143.5' except weak to medium strong (R2 to R3), interbedded with light olive gray (5Y 5/2), highly fossiliferous layers exhibiting small voids (<1/16") over 30% of surface	Driller's Remark: Circulation loss 100% near beginning of run R9 SC-4 collected at 147.0-147.8'	
			>10	141.65-141.8' - Fracture zone				
			>10	141.9' - Fracture, 60 deg, smooth, partial mineralization on surface, open				
			2	142.0' - Bedding plane, <5 deg, smooth, undulating, stains on surface				
			6	142.1, 142.2' - Fractures (2), 85 deg, smooth to rough, mineralization on surface		141.5-141.8' - medium gray, (N5), weak to medium strong (R2 to R3), 20% small voids (<1/16") over surface, cavities up to 1/4" x 1/4" <10% of surface 141.8-143.5' - yellowish gray with light gray and brownish gray interbed layering, (5Y 7/2 with N7 and 5Y 4/2), very fine grained, strong to very strong (R4 to R5), small (<1/16") voids <5" coverage, poorly fossiliferous 143.5-144.5' - Same as 141.8-143.5' except weak to medium strong (R2 to R3), interbedded with light olive gray (5Y 5/2), highly fossiliferous layers exhibiting small voids (<1/16") over 30% of surface	Driller's Remark: Circulation loss 100% near beginning of run R9 SC-4 collected at 147.0-147.8'	
			NR	143.15, 143.55' - Bedding plane (2), <10 deg, rough to smooth, undulating				
			NR	144.3' - Bedding plane, <5 deg, smooth, undulating to planar, slight staining (<20%) on fracture surface				
			NR	144.5' - Bedding plane, <20 deg, smooth to rough, undulating, partially associated with organic lens				
			>10	144.75' - Bedding plane, smooth, undulating		141.5-141.8' - medium gray, (N5), weak to medium strong (R2 to R3), 20% small voids (<1/16") over surface, cavities up to 1/4" x 1/4" <10% of surface 141.8-143.5' - yellowish gray with light gray and brownish gray interbed layering, (5Y 7/2 with N7 and 5Y 4/2), very fine grained, strong to very strong (R4 to R5), small (<1/16") voids <5" coverage, poorly fossiliferous 143.5-144.5' - Same as 141.8-143.5' except weak to medium strong (R2 to R3), interbedded with light olive gray (5Y 5/2), highly fossiliferous layers exhibiting small voids (<1/16") over 30% of surface	Driller's Remark: Circulation loss 100% near beginning of run R9 SC-4 collected at 147.0-147.8'	
			>10	145.05-145.15' - Fracture zone				
			3	146.5-146.7' - Fracture zone				
			NR	147.7, 147.85' - Bedding plane (2), <20 deg, smooth, undulating				
			NR	147.95, 146.9' - Mechanical break		141.5-141.8' - medium gray, (N5), weak to medium strong (R2 to R3), 20% small voids (<1/16") over surface, cavities up to 1/4" x 1/4" <10% of surface 141.8-143.5' - yellowish gray with light gray and brownish gray interbed layering, (5Y 7/2 with N7 and 5Y 4/2), very fine grained, strong to very strong (R4 to R5), small (<1/16") voids <5" coverage, poorly fossiliferous 143.5-144.5' - Same as 141.8-143.5' except weak to medium strong (R2 to R3), interbedded with light olive gray (5Y 5/2), highly fossiliferous layers exhibiting small voids (<1/16") over 30% of surface	Driller's Remark: Circulation loss 100% near beginning of run R9 SC-4 collected at 147.0-147.8'	
			>10	147.7, 147.85' - Bedding plane (2), <20 deg, smooth, undulating				
			3	147.95, 146.9' - Mechanical break				
			NR	147.95, 146.9' - Mechanical break				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-22

SHEET 9 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)

ELEVATION : 42.6 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 : 6.6 ft bgs on 3/23/07

START : 3/22/2007

END : 3/27/2007

LOGGER : N. Jarzyniecki

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				
150 -107.4	5 ft 75%	62	1	NR	148.15' - Bedding plane, <15 deg, smooth, undulating, associated with slightly softer zone 148.85' - Bedding plane, <5 deg, smooth, planar 149.95, 150.15' - Mechanical break (2)		Limestone 144.5-145.2' - dusky yellow, (5Y 6/4), weak to medium strong (R2 to R3), 30% small voids (<1/16"), similar to interbeds 143.5-144.5' No Recovery 145.2-146.5' Limestone 146.5-150.25' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, medium strong to strong (R3 to R4), poorly to moderately fossiliferous with fossil casts/molds up to 1/2" x 1/4", small 1/16" voids over <10% of surface increasing to 35% over interval from 147.9-148.9' No Recovery 150.25-151.5' Limestone 151.5-155.8' - yellowish gray, (5Y 7/2), fine grained, weak to medium strong (R2 to R3), poorly fossiliferous, <5% small 1/16" voids over surface, fine black organic lamination from 153.9-154.3' No Recovery 155.8-156.5' Limestone 156.5-159.95' - yellowish gray, (5Y 7/2), fine grained, weak to medium strong (R2 to R3), poorly fossiliferous, <5% small (1/16") voids, interval from 159.0-159.5' is laminated with alternating colors of dusky yellow (5Y 6/4) and light olive gray (5Y 5/2), laminations are inclined 30%, olive gray material is fine grained and is medium strong to strong (R3 to R4) No Recovery 159.95-161.5' No Recovery 161.5-166.5'	R9: 7 minutes Casing advanced to 151'	
			2						
			NR						
155 -112.4	R10-NQ 5 ft 86%	53	>10	NR	151.9-152.4' - Fracture zone, smooth to rough, undulating, zone of organic layering 152.9, 153.25, 153.4' - Bedding plane (3), 15-20 deg, smooth to rough, undulating 153.45' - Fracture, 65 deg, rough, undulating, medium gray infill (N5) infill on fracture face 153.55' - Fracture, 25 deg, smooth to rough, undulating, black staining on 50% of surface 154.3' - Bedding plane, <20 deg, organic laminations throughout 155.25' - Bedding plane, <20 deg 155.6' - Mechanical break 156.6, 157.6' - Bedding plane (2), 10 deg, smooth to rough, undulating 157.25, 159.75' - Mechanical break 157.8, 157.9, 158.75' - Bedding plane (3), <5 deg, planar 159.0-159.5' - Bedding plane, 30 deg, smooth, planar, organic staining on 35% of surface at 159.5'		R10: 9 minutes		
			4						
			>10						
			1						
			0						
			NR						
			1						
160 -117.4	R11-NQ 5 ft 69%	53	3	NR			R11: 15 minutes		
			2						
			1						
			NR						
			NR						
165 -122.4	R12-NQ 5 ft 0%	0	NR	NR			R12: 2 minutes		
			7						
			2						
			>10						
			R13-NQ						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-22

SHEET 10 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)

ELEVATION : 42.6 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 : 6.6 ft bgs on 3/23/07

START : 3/22/2007

END : 3/27/2007

LOGGER : N. Jarzyniecki

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.
170 -127.4	5 ft 54%	38		168.4' - Bedding plane, 10 deg, smooth, undulating 168.55' - Fracture zone, 1-3" pieces 168.6' - Bedding plane, 15 deg, rough, undulating, open		Limestone 166.5-169.2' - light olive gray, (5Y 5/2), moderate HCl reaction, medium strong to strong (R3 to R4), zones and blebs of 30-50% small (<3/16") voids alternating with fine grained material with few voids, void-rich zones occur along undulating bedding planes, larger cavities/fossil molds (up to 1/2" x 3/4") vary from <5-10% over surface No Recovery 169.2-171.5'	R13: 8 minutes Casing advanced to 170' 3/25/07 End of drilling for the day at 171' 3/26/07, 08:05 Cleaning out hole to resume drilling
175 -132.4	R14-NQ 5 ft 94%	50		171.5, 171.6, 171.9, 172.2, 172.4, 173.0, 173.15' - Bedding plane (7), horizontal, smooth, planar 173.1' - Fracture, 80 deg, smooth, undulating 173.4-173.8' - Fracture zone, 3/4"-2" fragments 173.95' - Fracture, horizontal, rough, undulating, black staining on 50% of surface 174.2' - Fracture or mechanical break, 10 deg, rough, undulating 174.5' - Fracture, horizontal, rough, planar 174.8-175.2' - Fracture zone		Limestone 171.5-176.2' - light olive gray, (5Y 5/2), dense, very fine grained, moderate HCl reaction, strong (R4), thinly laminated in zones 2-4" thick alternating with zones of 25-30% small (<1/8") voids and few (<5%) larger cavities up to 1/2" diameter No Recovery 176.2-176.5'	SC-5 collected at 175.4-176.2' R14: 13 minutes SC-6 collected at 176.5-177.45'
180 -137.4	R15-HQ 5 ft 46%	19		177.75' - Fracture, horizontal, rough, undulating 177.75-178.8' - Fracture zone, 3/4"-3" fragments		Limestone 176.5-178.8' - light olive brown to yellowish gray, (5Y 5/6 to 5Y 7/2), strong HCl reaction, strong (R4), fossiliferous with casts/molds up to 1/2", small (1/16") voids over 10-20% of surface occurring in zones, very fine lens of rock with no voids No Recovery 178.8-181.5'	R15: 107 minutes Stop drilling to mix mud
185 -142.4	R16-NQ 5 ft 22%	0		181.5-181.75' - Fracture zone, 1"-2" fragments 182.05' - Bedding plane 182.3-182.6' - Fracture zone, 1"-3" fragments		Limestone 181.5-182.6' - moderate olive brown with light olive gray zones, (5Y 3/4 with 5Y 3/4), fine to very fine grained, moderate to strong HCl reaction, strong (R4), <5% small (1/16") voids, poorly fossiliferous No Recovery 182.6-186.5'	R16: 15 minutes
	R17-NQ			186.5-186.9' - Fracture zone, 3/4"-2" fragments 187.55' - Fracture, 25 deg, rough, undulating 187.85' - Bedding plane, rough, stepped 188.35-188.65' - Fracture zone			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-22

SHEET 11 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723199.8 N, 458088.0 E (NAD83)

ELEVATION : 42.6 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 : 6.6 ft bgs on 3/23/07

START : 3/22/2007

END : 3/27/2007

LOGGER : N. Jarzyniecki

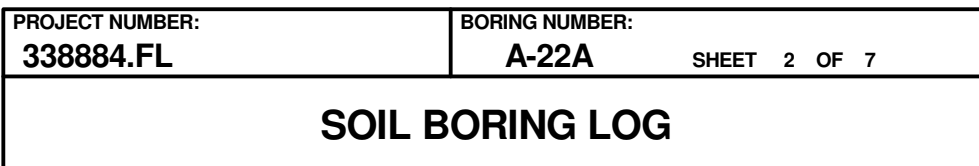
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, 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.
190 -147.4	5 ft 48%	22	NR	188.7' - Fracture, 80 deg, rough, stepped, black fine particles on fracture face		Limestone 186.5-188.9' - Same as 181.5-182.6' except increasingly mottled moderate olive brown and light olive gray, (5Y 4/4 and 5Y 5/2), fossils casts/molds up to 1/4" x 1/2", small (1/16") voids over 15% of surface, except <5% over 188.2-188.4', moderate HCl reaction, medium strong to strong (R3 to R4) rock No Recovery 188.9-191.5'	R17: 12 minutes
191.5			5	192.0-193.5' - Bedding plane, numerous 2" long bedding plane		Limestone 191.5-193.6' - olive brown, (5Y 4/4), fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), less than 5% small (<1/16") voids on surface, highly fossiliferous, casts/molds up to 1/4" x 1/4"	
			4	192.25' - Bedding plane, <15 deg, rough, undulating, organic staining		No Recovery 193.6-196.5'	
			0	192.75, 193.1' - Fracture (2), 75 deg, rough, undulating, black staining			
195 -152.4	R18-NQ 5 ft 42%	25	NR				
196.5			>10	196.5, 196.6, 197.55, 197.7, 197.9, 198.1' - Fractures (6), 0-15 deg, mostly rough and undulating, semi planar, organic black staining		Limestone 196.5-199.0' - light olive gray to dark yellowish orange mottled, (5Y 5/2 to 10YR 6/6), dense, fine grained, moderate to strong HCl reaction, strong to very strong (R4 to R5), moderately fossiliferous, fossil casts up to 1/4" x 1/4", small 1/16" voids over <10% of surface No Recovery 199.0-201.5'	R18: 10 minutes 3/26/07, 17:31 End drilling for the day at 196.5' 3/27/07, 07:51 Water level is 3.3' below ground surface 08:05 Resume drilling
			>10	196.5-198.9' - Fracture zone, rough, undulating, numerous 0-25 deg. fractures over 1-2" intervals			
			0	196.85' - Fracture, 50 deg, rough, undulating, black organic staining			
200 -157.4	R19-NQ 5 ft 50%	28	NR				R19: 25 minutes 3/27/07, 09:30 Boring total depth 201.5' Water level at 3.5' below ground surface
201.5						Bottom of Boring at 201.5 ft bgs on 3/27/2007	



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-22A
SHEET 1 OF 7	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723191.2 N, 458083.4 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 6/13/07 START : 6/13/2007 END : 6/14/2007 LOGGER : C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
		RECOVERY (ft)				
		#TYPE				
42.9			6"-6"-6" (N)			A-22A is re-drill of A-22 with intent of starting rock coring at approximately 35.0' Blind drill in soils to 35.0'
5						Driller's Remark: Sand at 2.0'
37.9						Water level 4.0' below ground surface
10						Driller's Remark: Tan silt at 8.0'
32.9						
15						Driller's Remark: Weak sandy limestone at 14.3'
27.9						
20						Driller's Remark: Harder limestone at 17'



LOGGER : C. Sump

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-22A

SHEET 3 OF 7

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723191.2 N, 458083.4 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, SW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 6/13/07

START : 6/13/2007

END : 6/14/2007

LOGGER : C. Sump

WATER LEVELS: 4.0 (RDS) ON 9/13/07			START: 9/13/2007		END: 9/14/2007		LOGGER: C. Sump	
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				
7.9	35.0 R0-NQ 1 ft 100%	0	>10	35.0-36.0' - Fracture zone, limestone fragments		Limestone Fragments 35.0-36.0' - Same as 36.0-37.6'	Begin rock core at 35.0'; 6" casing installed from surface to 10.0', HW casing to 35.0' R0: 1 minute Note: core discarded	
			3	36.0-36.1' - Fracture zone, limestone fragments 36.1' - Fracture, horizontal, rough, undulating, slight clayey infill in fossil mold on surface 36.8' - Fracture or mechanical break, 70 deg, rough, undulating to semi-planar, slightly radiused 36.9' - Fracture or mechanical break, horizontal, rough, undulating 37.2' - Mechanical break, vertical, non-planar, spall 37.5-37.6' - Fracture zone, limestone fragments		Limestone 36.0-37.6' - light olive gray, (5Y 5/2), moderate HCl reaction, medium strong (R3), 10-15% small (1/16" diameter) void space across surface, fossiliferous (many more molds than casts), few larger cavities (up to 3/8" diameter) No Recovery 37.6-41.0'		
40 2.9		9	NR					R1: 4 minutes
	41.0		0	41.0-43.0' - Compacted silty sand (carbonate derived)				42.5-43.0' More competent limestone beds with softer compacted silt material in between
			0					
		20	5	43.0, 43.1, 43.2, 43.3' - Fractures or mechanical break (4), horizontal, rough, undulating 44.0' - Fracture, >60 deg, rough, undulating, non-planar 44.3' - Fracture, horizontal, rough, with sand on surface (possible thin interbed)				
45 -2.1			1					
	46.0		NR					
			3	46.3, 46.5, 46.8, 47.4' - Fractures (4), rough, undulating, mostly horizontal				SC-1 collected at 47.4-48.5'
			1					
		34	>10	48.5-49.1' - Fractures (2), 75 deg, rough, undulating			R3: 3 minutes	
			NR					
50 -7.1			2	51.7, 51.9' - Mechanical break, horizontal, rough, undulating to semi-planar 52.1, 52.3, 52.9, 53.2, 53.4, 53.9' - Fractures (6), 30-40 deg, rough, undulating to semi-planar				
			3					
		62	3					
			0					
55								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-22A

SHEET 4 OF 7

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723191.2 N, 458083.4 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, SW/HW casing

ORIENTATION : Vertical

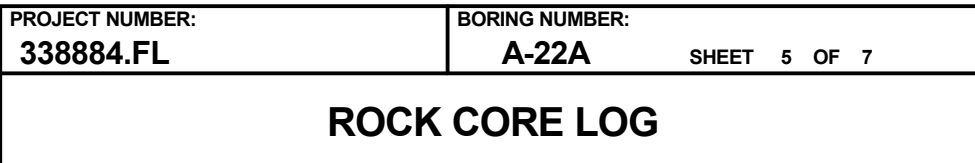
WATER LEVELS : 4.0 ft bgs on 6/13/07

START : 6/13/2007

END : 6/14/2007

LOGGER : C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)		CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
						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							
-12.1			3	55.1' - Fracture, 60 deg, rough, semi planar slightly radiused		Limestone 56.0-56.5' - moderate yellowish brown, (10YR 5/4), 10-15% voids cover surface, few voids/cavities >3/16" 56.5-56.9' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), very weak (R1), silt material with black laminar inclusions (organics, possibly lignite) 56.9-59.5' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, very weak (R1), small voids (<1/16") occurring in irregular zones (possible bioturbation), thin zones containing fine black laminae (organics), slightly friable No Recovery 59.5-61.0' Limestone 61.0-65.7' - moderate yellowish brown to dusky yellow, (10YR 5/4 to 5Y 6/4), mild to moderate HCl reaction, medium strong (R3), variable (5-15%) small (<1/16") voids across surface, thin silt zones (1"-1-1/2" thick) at 62.3' and 64.6'	R4: 5 minutes
56.0		25	3	55.5' - Fracture, rough, undulating			R5: 4 minutes
	R5-NQ 5 ft 70%		1	55.9' - Bedding plane, horizontal, smooth, parting along organic laminae			
			>10	56.5, 56.8' - Fractures (2), rough, undulating			
			>10	56.9' - Bedding plane, horizontal, smooth, 1/4" thick black organic (lignite) laminae			
			NR	57.8-59.5' - Fracture zone, limestone fragments			
60							
-17.1			1	61.3, 62.15, 62.25' - Fractures or mechanical break (3), 30-60 deg, rough, undulating		No Recovery 65.7-66.0' Limestone 66.0-67.0' - dusky yellow, (5Y 6/4), fine grained, weak (R2), fossiliferous, silty, 5-10% small voids (<1/16") over surface 67.0-68.7' - dusky yellow to moderate yellowish brown, (5Y 6/4 to 10YR 5/4), intermingled zones of fine grained silty limestone (no voids) and limestone with 20-25% small voids (1/16" - 1/8") 68.7-70.5' - weak (R2), very finely laminated (1/16"-1/8"), silty, with sparse inclusions of void rich (20-25%) limestone preferentially oriented parallel to bedding planes 70.5-70.8' - grayish yellow, (5Y 8/4), medium strong (R3), fossiliferous, 15% small voids (<1/16") No Recovery 70.8-71.0'	R5: 4 minutes
		46	3	62.75' - Fracture, horizontal, rough, undulating			R6: 5 minutes
	R6-NQ 5 ft 94%		1	63.0, 64.1' - Fractures (2), >80 deg, rough, undulating to semi-planar, open			
			1	64.4-64.5' - Carbonate sand interbed			
			4	65.0, 65.2, 65.35, 65.7' - Fractures (4), horizontal, rough, undulating to planar			
			NR				
65			1	66.35' - Fracture, horizontal, rough		Possible bioturbation	
-22.1			1	67.0' - Fracture or mechanical break, rough, stepped			R7: 3 minutes
		74	3	68.0' - Fracture, >80 deg, rough, undulating to semi-planar			
			4	69.1' - Fracture, 45 deg, rough, undulating to planar			
			2	69.1-70.5' - Fracture, vertical, undulating, tight (possibly healed)			
			NR	69.7, 69.9, 70.1, 70.5' - Fractures (4), horizontal, rough, undulating, (possible bedding planes)			
70			1	71.8, 73.5, 74.1, 74.3' - Mechanical break (4), rough, undulating, irregular		Start drilling 6/14/07 at 08:00, depth at 71.0' Water level 3.9' below ground surface	
-27.1			0				
		62	1				
			3	74.5' - Fracture, >80 deg, non-planar (spall)			
75							



ORIENTATION : Vertical

LOGGER : C. Sump

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-22A

SHEET 6 OF 7

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723191.2 N, 458083.4 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, SW/HW casing

ORIENTATION : Vertical

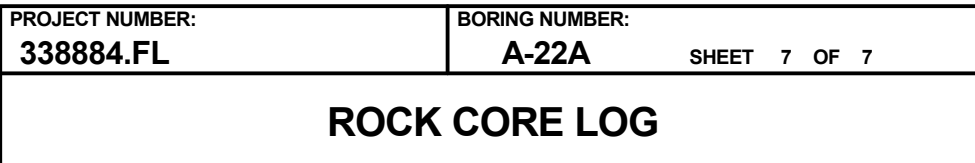
WATER LEVELS : 4.0 ft bgs on 6/13/07

START : 6/13/2007

END : 6/14/2007

LOGGER : C. Sump

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.
-52.1			NR			Limestone 91.8-94.4' - pale yellowish brown, (10YR 6/2), medium strong (R3), 10-15% small voids covering surface (<1/16"), few larger cavities infilled with fine grained yellowish gray (5Y 7/2) material, marbled zone of yellowish brown void-rich limestone with yellowish gray fine grained voidless limestone 94.0-94.4' (possible breccia) No Recovery 94.4-96.0'	R12: 4 minutes
96.0			>10	96.0-97.4' - Fracture zone, limestone fragments			
			>10				
	R13-NQ 5 ft 28%	0	NR			Limestone 96.0-97.4' - pale yellowish brown, (10YR 6/2), mild to moderate HCl reaction, medium strong (R3), 15-20% small voids covering surface (90% are voids <1/16", 10% are larger voids [3/16" - 3/4"]), fossiliferous (many more molds than casts) No Recovery 97.4-101.0'	R13: 3 minutes
100			>10	101.0-102.5' - Fracture zone, limestone fragments with irregular non-planar surfaces			
-57.1			>10				
	R14-NQ 5 ft 64%	40	2	102.5' - Fracture or mechanical break, 45 deg, rough, undulating, irregular		Limestone 101.0-104.2' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), moderate to mild HCl reaction, medium strong (R3), fossiliferous (many more molds than casts), 10-15% small voids (<1/16") over surface, variable larger voids/cavities (fossil molds) 3/16" to >3/4" diameter, larger cavities comprise up to 25% volume from 101.6-102.5' decreasing with depth No Recovery 104.2-106.0'	R14: 3 minutes
105			0	103.4' - Fracture, 45 deg, rough, stepped, irregular			
-62.1			NR				
			1	106.6, 107.1, 107.3' - Fractures or mechanical break (3), 60-70 deg, rough, undulating to semi-planar, slightly radiused		Limestone 106.0-111.0' - Same as 101.0-104.2' except few voids/cavities greater than 3/16"	
			3				
	R15-NQ 5 ft 100%	48	1	107.7' - Fracture or mechanical break, low angle, undulating			
110			4	108.7, 109.1, 109.5, 109.6, 109.9, 110.0' - Fractures or mechanical break (6), rough, undulating, irregular			
-67.1			1				R15: 5 minutes
			>10	111.0-113.7' - Fracture zone, rough, undulating, limestone fragments, irregular		111.0-113.7' - Same as 106.0-111.0' except variable percentage of voids (<10-20%), thin zone of yellowish gray (5Y 7/2) fine-grained limestone at 111.8-112.0'	
			>10				
	R16-NQ 5 ft 54%	0	>10			No Recovery 113.7-116.0'	
115			NR				



ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, SW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 6/13/07

START : 6/13/2007

END : 6/14/2007







LOGGER : C. Sump

APPENDIX 2BB-286



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-23
SHEET 1 OF 13	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, NWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0.5 ft bgs on 4/10/07 START : 4/9/2007 END : 4/17/2007 LOGGER : R. McComb, C. Dougherty

WATER LEVELS : 0.5 TDS ON 4/10/07			START : 4/9/2007			END : 4/17/2007			LOGGERS : R. McCOMB, C. Dougherty		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS				
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)								
40.8	0.0	0.8	SS-1	1-2-2 (4)	Poorly Graded Sand With Organics (SP) 0.0-0.1' - topsoil						
	1.5				Poorly Graded Sand (SP) 0.1-0.75' - grayish black grading to medium gray, (N2 to N5), moist, very loose, fine grained, trace nonplastic fines, organics						
5	5.0										
35.8		0.5	SS-2	2-3-3 (6)	Clayey Sand (SC) 5.0-5.4' - greenish gray, (5G 6/1), moist, loose, fine grained, 40% fines, medium to high plasticity, silica sand						
	6.5				Silty Sand (SM) 5.4-5.5' - yellowish gray, (5Y 7/2), moist, loose, fine to medium grained, 20% fines, strong HCl reaction, nonplastic fines, carbonate material						
10	10.0										
30.8		1.0	SS-3	10-9-5 (14)	Silt And Limestone (ML) 10.0-11.0' - very pale orange, light olive brown to light yellow, (10YR 8/4, 5Y 5/6 to 5Y 7/6), wet, stiff, moderate HCl reaction, nonplastic, carbonate; 20-25% limestone fragments, fine to coarse gravel-sized		End drilling at 11.5' on 4/9/07 Resume drilling 4/10/07 water level is 0.5' below ground surface (start)				
	11.5										
15	15.0										
25.8		1.1	SS-4	10-11-14 (25)	Silt (ML) 15.0-16.05' - very pale orange, (10YR 8/2), wet, very stiff, rapid dilatancy, moderate HCl reaction, nonplastic, carbonate; trace coarse sand to fine gravel-sized		Driller's Remark: hard drilling from 14-15.0', Limestone rock fragments in cuttings				
	16.5										
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-23
SHEET 2 OF 13	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, NWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0.5 ft bgs on 4/10/07 START : 4/9/2007 END : 4/17/2007 LOGGER : R. McComb, C. Dougherty

WATER LEVELS : 0.5 TDS ON 4/10/07			START : 4/9/2007			END : 4/17/2007			LOGGERS : T. McCOMB, C. Dougherty		
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			
20.8	20.0	0.9	SS-5	13-17-16 (33)	Silt With Sand (ML) 20.0-20.9' - very pale orange, (10YR 8/2), moist to wet, hard, rapid dilatancy, mild to moderate HCl reaction, 20% fine to medium grained sand, nonplastic, all carbonate						
	21.5										
25	25.0										
15.8		0.9	SS-6	19-24-11 (35)	Sandy Silt (ML) 25.0-25.9' - Same as 20.0-20.9' except up to 38% sand-sized grains with carbonate material						
	26.5										
30	30.0										
10.8		1.4	SS-7	8-22-35 (57)	Silt With Sand (ML) 30.0-31.4' - moderate yellow, (5Y 7/6), wet, hard, 15-20% sand, nonplastic to low plasticity, rapid dilatancy, moderate HCl reaction, <1/16" thick calcite stringers, all carbonate						
	31.5										
35	35.0										
5.8	35.2	0.1	SS-8	50/2 (100")	Limestone Fragments 35.0-35.1' - light olive gray, (5Y 5/2), mild HCl reaction, up to 3/8" Begin Rock Coring at 35.0 ft bgs See the next sheet for the rock core log						
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-23

SHEET 3 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing




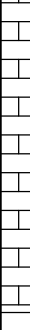
ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

WATER LEVEL: 63.48 ft on 4/10/07		DISCONTINUITIES		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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			
5.8	35.0	51	>10	35.4-36.0' - Fracture zone, rough, stepped, vertical fracture, limestone fragments on top, various orientation		Limestone 35.0-38.4' - pale yellowish brown, (10YR 6/2), fine grained, mild to moderate HCl reaction, very weak (R1), voids <1/16" over 10-30% of surface (becoming more numerous with depth), shallow cavities covering <1% (1/16"-1/8"x3/8"), high angle (60-70 degrees) unbroken fracture zone from 37.7-38.0' No Recovery 38.4-40.0'	Change to HQ rock coring at 35.0' on 4/10/07 at 10:00 hours R1: 9 minutes
	0						
	1						
	0						
	NR						
40.0	40.0	0	NA	38.4' - Fracture, 50 deg, rough, stepped, open		Silt (ML) 40.0-43.4' - dusky yellow, (5Y 6/4), wet, soft, rapid dilatancy, mild HCl reaction, sandy, carbonate material No Recovery 43.4-45.0'	R2: 3 minutes
	NR						
45.0	45.0	13	2	45.2' - Fractures, rough, stepped, open		Limestone 45.0-46.0' - dusky yellow, (5Y 6/4), fine grained, mild HCl reaction, extremely weak (R0), voids <1/16" over 15-20% of surface, cavities up to 3/16"x3/16", trace mold/ casts Silt With Sand (ML) 46.0-48.2' - dusky yellow, (5Y 6/4), wet, soft to stiff, fine grained, 15-20% sand, rapid dilatancy No Recovery 48.2-50.0'	R3: 6 minutes
			0	45.9' - Fractures, rough, planar, open			
	R3-HQ 5 ft 64%		0				
			0				
			NR				
50.0	50.0	9	>10	50.0-50.45' - Fracture zone		Limestone 50.0-50.45' - Same as 46.0-48.2' except with some limestone fragments 50.45-51.3' - light olive brown, dusky yellow, (5Y 5/6 to 5Y 6/4), fine grained, mild to moderate HCl reaction, very weak (R1), laminated black organic material from 50.9-51.3', voids <1/16" over 5-10% of surface No Recovery 51.3-55.0'	R4: 12 minutes
			>10	50.45' - Fracture zone, 30 deg, rough, undulating, open			
	R4-HQ 5 ft 26%			51.0' - Fracture zone, 60 deg, rough, undulating, open			
				51.3-55.0' - Fracture zone, 80-90 degrees, black organic material covering up to 40-50% of some surface			
			NR				
55	55.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-23

SHEET 4 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-14.2	R5-HQ 5 ft 100%	30	1	55.6' - Fractures, 0- <5 deg, rough, stepped, open	Limestone 55.0-59.5' - dusky yellow to light olive brown, (5Y 6/4 to 5Y 5/6), fine grained, mild HCl reaction, extremely weak to very weak (R0 to R1), extremely weak rock is friable, voids <1/16" over 3-5% of surface, interval of black carbonaceous laminae up to 3/4" thick	R5: 8 minutes
			3	56.2' - Fractures, horizontal, rough, stepped, open		
			2	56.65-56.95' - Fractures, <5 deg, rough, stepped, open		
			2	57.1' - Fractures, 20-0 deg, rough, stepped		
			2	57.85-58.1' - Fractures, <5 deg, rough, stepped, open		
	R6-HQ 5 ft 100%	38	0	58.5-58.8' - Fracture zone, 50 deg, rough, stepped, open	59.5-60.0' - yellowish gray, (5Y 7/2), very fine to fine grained, mild to moderate HCl reaction, weak (R2), voids (<3/16") over 10-15% of surface, weak vertical fractures from 59.5-60.0', mottled	R6: 7 minutes
60			1	59.4' - Fracture, 50 deg, rough, stepped, open		
-19.2			>10	60.6' - Fracture, rough, stepped, planar, open		
			2	61.2-61.8' - Fracture zone, stepped, undulating, open		
			2	62.35' - Fractures, 50 deg, rough, undulating, tight		
	R7-NQ 5 ft 100%	20	1	62.8' - Fractures, <5 deg, rough, undulating, open	60.0-65.0' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, extremely weak to very weak (R0 to R1), voids (<3/16") over 10-15% of surface becoming <1% at 63.0', fossils (casts/molds) rare to absent with depth, trace black organic material at 61.0'	R7: 3 minutes
			1	63.4' - 30 deg, rough, undulating, open		
			1	63.9 - 64.0' - Fracture zone, horizontal, rough, stepped, undulating, open		
65			4	65.3' - Fractures, rough, stepped, open		
-24.2			>10	65.5' - Fractures, horizontal, smooth, planar, open		
	R8-HQ 5 ft 96%	26	2	65.65-66.02' - Fracture zone, horizontal, rough, undulating, open	65.0-66.9' - dusky yellow, (5Y 6/4), fine grained, mild to moderate HCl reaction, very weak to extremely weak (R1 to R0), voids <10% of surface becoming more common with depth, very friable from 56.3-66.9'	SC-1 collected at 68.9-70.0'
			10	66.25-66.9' - Fracture zone, 0- 90 deg, rough, undulating, various orientations		
			10	67.35' - Fractures, 50 deg, rough, stepped, open		
			0	67.60-68.5" - Fracture zone, 50-90 deg, rough, undulating, open		
			0	68.9' - Fractures, 0-80 deg, rough, undulating		
70	R8-HQ 5 ft 96%	26	>10	70.0-71.05' - Fracture zone, 60 deg, rough, undulating to stepped, open	70.0-70.4' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak (R1), voids <1/16" over 10-15% of surface, trace fossil molds/casts	SC-2 collected at 71.05-72.0'
-29.2			1	72.0' - Fractures, rough, undulating to stepped, open		
			4	72.5' - Fractures, horizontal and 70 deg, rough, stepped, open		
			>10	72.7' - Fractures, horizontal, rough, stepped, open		
			>10	72.8' - Fractures, 60 deg, rough, stepped, open		
75					Silt (ML) 70.4-70.65' - yellowish gray, (5Y 7/2), wet, soft, rapid dilatancy, mild HCl reaction Limestone 70.65-72.5' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak (R1), voids <1/16" over 10-15% of surface, trace fossil molds/casts 72.5-73.5' - Same as 70.0-70.4' except voids 5-10% of surface	R8: 7 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-23

SHEET 5 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

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			
-34.2	R9-HQ 5 ft 100%	64	NR	73.2-75.5' - Fracture zone, 60 deg, rough, stepped, open		Limestone 73.5-74.8' - yellowish gray, (5Y 7/2), mild HCl reaction, extremely weak (R0), highly fractured, friable, silt and clay along fracture planes and on fragments of rock No Recovery 74.8-75.0' Limestone 75.0-76.4' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), friable along fracture planes, voids <3/16" over 50-60% of surface, 1-2 cavities (3/16"x3/16") 76.4-79.0' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine to very fine grained, mild HCl reaction, very weak (R1), voids <3/16" over 25% to <5% of surface (decreasing with depth), >5 cavities (3/4"-2"x3/8") and 1/16"x1/16" 79.0-79.5' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, mild HCl reaction, extremely weak (R0), fragmented 79.5-80.0' - Same as 76.4-79.0' 80.0-82.4' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, mild HCl reaction, extremely weak (R0), voids over 10-15% of surface, >5 cavities up to 1-3/4"x3/4"-1-3/16", interconnected 82.4-84.3' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, mild HCl reaction, very weak (R1), voids <1/16" over 25-30% of surface, 3 to 4 cavities up to 3/8"x 3/16", trace fossils molds/casts 84.3-85.0' - Same as 82.4-84.3' except with >5 cavities (3/8"x3/8"), trace fossil molds/casts 85.0-88.2' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), voids <1/16" over 15-20% of surface, >3 cavities (1/16"x3/16") interconnected, trace casts/molds No Recovery 88.2-89.5' Limestone 89.5-90.0' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, extremely weak (R0), friable, gravel-sized rock fragments with carbonaceous material over 15-20% of surface	R9: 4 minutes
			10	73.5-75.0' - Fracture zone, various orientations			
			0	75.0-75.3' - Fracture zone, horizontal, rough, undulating, open			
			2	75.3' - Fractures, horizontal, rough, undulating, open			
			10	75.9' - Fractures, <5 deg, rough, undulating, open			
			2	77.45' - Fractures, <5 deg, rough, stepped, open			
80	R10-HQ 5 ft 100%	36	2	77.7' - Fractures, 60 deg, rough, undulating, tight		SC-3 collected at 82.7- 83.6'	R10: Run time not recorded Stop drilling for the day, 4/10/07 Water level 0.5' below ground surface Resume drilling on 4/11/07 Water level 0.5' below ground surface
-39.2			1	78.0-79.0' - Fractures, 60 deg, rough, stepped, open			
			5	79.3-79.65' - Fractures, <5 deg, rough, stepped, open			
			2	80.1' - Fracture, <5 deg, rough, undulating, open			
			1	81.1-81.3' - Fractures, <5 deg, rough, undulating, open			
			10	81.5-81.7' - Fractures, horizontal, rough, undulating, open			
85	R11-HQ 5 ft 74%	64	0	81.9-82.05' - Fractures, <5 deg, rough, undulating, open		DR: Soft at 88.2-90.0', assumed core loss from this interval R11: 6 minutes	
-44.2			0	82.65' - Fractures, horizontal, rough, stepped, open			
			1	83.65' - Fracture, <5 deg, rough, undulating, open			
			1	83.8-84.7' - Fracture, 60 deg and 70 deg, rough, stepped, open			
			NR	84.95' - Fractures, 60 deg, rough, stepped, open			
			NR	87.25' - Fracture, rough, undulating, open, horizontal			
90	R12-HQ 5 ft 78%	15	0	88.15' - Fracture zone, 40 deg, rough, stepped, open		R12: 10 minutes	
-49.2			>10	90.0-94.0' - Fracture zone, gravel			
			2	90.4' - Fracture zone, 60 deg, rough, stepped, open			
			10	90.8' - Fracture zone, 0-<5 deg, rough, undulating, open			
			10	91.1' - Fractures, 60 deg, rough, stepped, open			
			NR	91.5' - Fractures, 70 deg, rough, stepped, open, (7-1/5" long) from 91.3-91.9'			
			10	92.1' - Fractures, 0-90 deg, rough, stepped, open from 92.1-92.7'			
			NR	92.7-92.9' - Fractures, 60 deg, rough, stepped, open			
95			NR	93.4-93.8' - Fractures, 0-90 deg, rough, stepped, open			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-23	SHEET 6 OF 13
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-54.2	R13-HQ 5 ft 100%	82	2	95.4' - Fractures, horizontal, rough, stepped, open	Limestone 90.0-91.0' - light olive gray, (5Y 5/2), very fine grained, moderate to strong HCl reaction, medium strong (R3), voids <1% to absent, (2-3 inches) carbonaceous laminae, 1 cavity 2-3/8"x3/8", 1 cavity 3/8"x3/16" 91.0-93.9' - yellowish, (5Y 7/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), voids <1/16" over 25-30% of surface, several cavities (3/8"x3/8"), fragmented at bottom No Recovery 93.9-95.0' Limestone 95.0-96.9' - yellowish gray, (5Y 7/2), very fine to fine grained, mild to moderate HCl reaction, weak (R2), cavities <3/8"x3/8" (many infilled), fine grained contains voids over 15-20% of surface, very fine grain rock contains less void percentage, trace fossil casts/molds. 96.9-100.0' - dusky yellow, (5Y 6/4), fine grained, very weak to weak (R1 to R2), voids <3/16" over 35-40% of surface, several cavities (1/16"x3/8"), one cavity through core, cavities more abundant with depth. 100.0-103.0' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, mild HCl reaction, very weak (R1), voids <3/16" over 25-30% of surface, cavities (several) 3/16"x3/16", black carbonaceous laminae at 100.9' No Recovery 103.0-105.0' Limestone 105.0-109.9' - dusky yellow, (5Y 6/4), fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), voids <1/16" over 25-30% of surface becoming less abundant with depth, cavities (>5) 3/16"x3/8" No Recovery 109.9-110.0' Limestone 110.0-115.0' - dusky yellow, (5Y 6/4), fine to very fine grained, mild HCl reaction, very weak to extremely weak (R1 to R0), becoming weaker with depth, voids <1/16" over 10-15% of surface, cavities (>5) below 114.0' (1/16"x1/8"), trace fossil mold/casts	SC-4 collected at 95.8-96.9'
			1	95.8' - Fractures, horizontal, rough, undulating, open		
			0	96.9' - Fracture, 50 deg, rough, stepped		
			3	98.5' - Fractures, 60 deg, rough, stepped, open		
			10	98.7' - Fractures, rough, undulating, vertical 98.9' - Fractures, <5 deg, rough, undulating, open		
100 -59.2	R14-HQ 5 ft 60%	24	>10	99.15-99.4' - Fracture zone, 60-70 deg, rough, stepped	R13: 9 minutes	
			>10	99.9-100.0' - Fracture, 60-70 deg, rough, stepped, open		
			>10	100.0-101.0' - Fracture zone, 60-70 deg, rough, planar to undulating, open, some black carbonaceous staining		
			>10	101.0-102.0' - 70-80 deg, 7-1/5"- 8-2/5" long		
			NR	102.0-103.0' - fractures resulting in gravel-sized limestone fragments		
105 -64.2	R15-HQ 5 ft 98%	88	3	105' - Fractures, rough, stepped, open	R14: 5 minutes	SC-5 collected at 105.9-107.4'
			0	105.2' - Fractures, rough, planar, open		
			2	105.3' - Fractures, 50 deg, rough, stepped, open		
			0	107.35-107.5' - Fractures, 30 deg, rough, stepped, open		
			0			
110 -69.2	R16-HQ 5 ft 100%	35	NR		R15: 5 minutes	
			3	110.2' - Fractures, horizontal, rough, undulating, open		
			>10	110.6-110.9' - Fracture zone, 70-0 deg, rough, stepped, open		
			>10	111.0-113' - Fracture zone, horizontal, rough, undulating, open		
			1	113.15' - Fracture, horizontal, rough, undulating		
115	115.0		1		R16: 7 minutes	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-23

SHEET 7 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

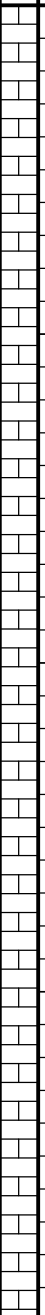



ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

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							
-74.2	R17-HQ 5 ft 66%	8	>10	115.0-116.0' - Fracture zone, horizontal, rough, stepped, open		Limestone 115.0-116.0' - dusky yellow, (5Y 6/4), fine grained, mild HCl reaction, extremely weak (R0), abundant cavities (>5) up to 3/4"-2"x 3/8"-3/4", voids over 60% of surface, fossil molds/casts 116.0-117.4' - dusky yellow, (5Y 6/4), fine grained, mild HCl reaction, very weak (R1), fossiliferous (molds/casts) and organized shell material 117.4-118.3' - light olive brown, (5Y 5/6), fine grained, mild HCl reaction, extremely weak (R0), friable, coarse sand to gravel-sized fragments No Recovery 118.3-120.0'	R17: 4 minutes				
>10			116.0-118' - Fracture zone, 90-<5 deg, rough, stepped, open	Limestone 120.0-121.6' - dusky yellow, (5Y 6/4), fine grained, weak (R2), voids up to 1/16" covering 15-20%, > cavities up to 3/4-1-3/16"x3/8", fossil casts/molds 121.6-121.9' - dusky yellow, (5Y 6/4), fine grained, weak (R2), <10% voids over surface, no cavities at 121.0' 121.9-124.1' - dusky yellow, (5Y 6/4), fine grained, weak (R2), extremely weak (R0), at 122.6-123.0' No Recovery 124.1-125.0'							
>10								Limestone 125.0-129.0' - dusky yellow, (5Y 6/4), fine grained, very weak to extremely weak (R1 to R0), punctuated with thin beds up to 2-1/2" thick, fissile, very weak, (R1), laminations (126.5-126.5'; 126.8-127.5') mild to moderate HCl reaction, voids up to 1/16" over 30-40% of surface, cavities >5 (1/16"x3/16") fossiliferous (molds/casts) and shell material, laminated from 128.8-128.9'. No Recovery 129.0-130.0'			
>10									Limestone 130.0-131.5' - Same as 125.0-129.0' 131.5-131.9' - dusky yellow, (5Y 6/4), fine to very fine grained, punctuated with thin beds of fine grained laminations with voids 131.9-133.9' - Same as 125.0-129.0' except from 133.25-133.5 (<10% voids) No Recovery 133.9-135.0'		
NR											
120	120.0										
-79.2	R18-HQ 5 ft 82%	40	5	120.2' - Fractures, horizontal, rough, undulating, open		No Recovery 118.3-120.0'	SC-6 collected at 123.0-124.1'				
			4	120.3' - Fractures, 40 deg, rough, stepped, open				Limestone 120.0-121.6' - dusky yellow, (5Y 6/4), fine grained, weak (R2), voids up to 1/16" covering 15-20%, > cavities up to 3/4-1-3/16"x3/8", fossil casts/molds 121.6-121.9' - dusky yellow, (5Y 6/4), fine grained, weak (R2), <10% voids over surface, no cavities at 121.0' 121.9-124.1' - dusky yellow, (5Y 6/4), fine grained, weak (R2), extremely weak (R0), at 122.6-123.0' No Recovery 124.1-125.0'			
			10	120.5-120.65' - Fractures, horizontal, rough, stepped, open					Limestone 125.0-129.0' - dusky yellow, (5Y 6/4), fine grained, very weak to extremely weak (R1 to R0), punctuated with thin beds up to 2-1/2" thick, fissile, very weak, (R1), laminations (126.5-126.5'; 126.8-127.5') mild to moderate HCl reaction, voids up to 1/16" over 30-40% of surface, cavities >5 (1/16"x3/16") fossiliferous (molds/casts) and shell material, laminated from 128.8-128.9'. No Recovery 129.0-130.0'		
			0	120.75' - Fractures, 40-60 deg, rough, stepped, open						Limestone 130.0-131.5' - Same as 125.0-129.0' 131.5-131.9' - dusky yellow, (5Y 6/4), fine to very fine grained, punctuated with thin beds of fine grained laminations with voids 131.9-133.9' - Same as 125.0-129.0' except from 133.25-133.5 (<10% voids) No Recovery 133.9-135.0'	
			0	121.05-121.4' - Fractures, <5 deg, rough, stepped, open							Limestone 125.0-129.0' - dusky yellow, (5Y 6/4), fine grained, very weak to extremely weak (R1 to R0), punctuated with thin beds up to 2-1/2" thick, fissile, very weak, (R1), laminations (126.5-126.5'; 126.8-127.5') mild to moderate HCl reaction, voids up to 1/16" over 30-40% of surface, cavities >5 (1/16"x3/16") fossiliferous (molds/casts) and shell material, laminated from 128.8-128.9'. No Recovery 129.0-130.0'
			NR	121.55-121.85' - Fractures, horizontal, rough, planar, open							
125	125.0										
-84.2	R19-HQ 5 ft 80%	30	10	122.55' - Fractures, rough, stepped, open		No Recovery 124.1-125.0'	R19: 6 minutes				
			3	122.8-103.0' - Fractures, horizontal, rough, open				Limestone 125.0-129.0' - dusky yellow, (5Y 6/4), fine grained, very weak to extremely weak (R1 to R0), punctuated with thin beds up to 2-1/2" thick, fissile, very weak, (R1), laminations (126.5-126.5'; 126.8-127.5') mild to moderate HCl reaction, voids up to 1/16" over 30-40% of surface, cavities >5 (1/16"x3/16") fossiliferous (molds/casts) and shell material, laminated from 128.8-128.9'. No Recovery 129.0-130.0'			
			0	124.1' - Fracture, horizontal, rough, stepped, open					Limestone 130.0-131.5' - Same as 125.0-129.0' 131.5-131.9' - dusky yellow, (5Y 6/4), fine to very fine grained, punctuated with thin beds of fine grained laminations with voids 131.9-133.9' - Same as 125.0-129.0' except from 133.25-133.5 (<10% voids) No Recovery 133.9-135.0'		
			2	125.4-125.85' - Fracture zone, 0-<5 deg, rough, stepped to undulating, open						Limestone 125.0-129.0' - dusky yellow, (5Y 6/4), fine grained, very weak to extremely weak (R1 to R0), punctuated with thin beds up to 2-1/2" thick, fissile, very weak, (R1), laminations (126.5-126.5'; 126.8-127.5') mild to moderate HCl reaction, voids up to 1/16" over 30-40% of surface, cavities >5 (1/16"x3/16") fossiliferous (molds/casts) and shell material, laminated from 128.8-128.9'. No Recovery 129.0-130.0'	
			NR	126.1-126.7' - Fracture zone, 50 deg, rough, stepped, open							Limestone 130.0-131.5' - Same as 125.0-129.0' 131.5-131.9' - dusky yellow, (5Y 6/4), fine to very fine grained, punctuated with thin beds of fine grained laminations with voids 131.9-133.9' - Same as 125.0-129.0' except from 133.25-133.5 (<10% voids) No Recovery 133.9-135.0'
				126.5-126.75' - Fractures, horizontal, rough, stepped, open							
130	130.0										
-89.2	R20-HQ 5 ft 78%	28	>10	128.35' - Fractures, 30 deg, rough, tight, undulating to stepped, clay and silt		Limestone 130.0-131.5' - Same as 125.0-129.0' 131.5-131.9' - dusky yellow, (5Y 6/4), fine to very fine grained, punctuated with thin beds of fine grained laminations with voids 131.9-133.9' - Same as 125.0-129.0' except from 133.25-133.5 (<10% voids) No Recovery 133.9-135.0'	R20: 7 minutes				
			10	128.75' - Fractures, 10 deg, rough, undulating, clay infilling, tight, 10% of surface <1/16" thick				Limestone 125.0-129.0' - dusky yellow, (5Y 6/4), fine grained, very weak to extremely weak (R1 to R0), punctuated with thin beds up to 2-1/2" thick, fissile, very weak, (R1), laminations (126.5-126.5'; 126.8-127.5') mild to moderate HCl reaction, voids up to 1/16" over 30-40% of surface, cavities >5 (1/16"x3/16") fossiliferous (molds/casts) and shell material, laminated from 128.8-128.9'. No Recovery 129.0-130.0'			
			1	130.3-131.85' - Fracture zone, smooth, planar, open					Limestone 130.0-131.5' - Same as 125.0-129.0' 131.5-131.9' - dusky yellow, (5Y 6/4), fine to very fine grained, punctuated with thin beds of fine grained laminations with voids 131.9-133.9' - Same as 125.0-129.0' except from 133.25-133.5 (<10% voids) No Recovery 133.9-135.0'		
			2	131.85' - Fractures, <5 deg, rough, stepped, open						Limestone 125.0-129.0' - dusky yellow, (5Y 6/4), fine grained, very weak to extremely weak (R1 to R0), punctuated with thin beds up to 2-1/2" thick, fissile, very weak, (R1), laminations (126.5-126.5'; 126.8-127.5') mild to moderate HCl reaction, voids up to 1/16" over 30-40% of surface, cavities >5 (1/16"x3/16") fossiliferous (molds/casts) and shell material, laminated from 128.8-128.9'. No Recovery 129.0-130.0'	
			NR	132.85' - Fracture, rough, stepped, open							Limestone 130.0-131.5' - Same as 125.0-129.0' 131.5-131.9' - dusky yellow, (5Y 6/4), fine to very fine grained, punctuated with thin beds of fine grained laminations with voids 131.9-133.9' - Same as 125.0-129.0' except from 133.25-133.5 (<10% voids) No Recovery 133.9-135.0'
				133.05' - Fractures, 0-90 deg, rough, stepped, open							
135	135.0										



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-23

SHEET 8 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-94.2	R21-HQ 5 ft 88%	38	2	135.1' - Fractures, 50 deg, smooth, undulating, open	Limestone 135.0-136.4' - dusky yellow, (5Y 6/4), fine grained, very weak to extremely weak (R1 to R0), trace fine grained laminations 136.4-139.4' - greenish gray, (5GY 6/1), very light gray mottled, very fine grained, strong HCl reaction, medium strong (R3), voids <3/16" over 3-5% of surface becoming more common with depth, cavity 1-3/16"-1-9/16", ovate shape (>5) becomes numerous with depth, black carbonaceous material especially along fracture plane common below 138.5', HCl reaction becoming mild with depth No Recovery 139.4-140.0' Limestone 140.0-143.1' - yellowish gray mottled with light olive gray, (5Y 7/2 with N8), very fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), interbedded/laminae of fine grained limestone, laminations from 140.0-140.8' and 141.0-141.4', voids (<1/16") concentrated in fine grained material over 25% of surface, cavities less than <3/8", material is medium strong to strong rock (R3 to R4) 143.1-145.0' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), friable, coarse grained from 143.1-143.6 becoming fine grained with depth, voids, cavities over 70-80% from 143.6, diminishing to 10-15% with depth 145.0-145.75' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface, <5 cavities 3/16"x3/16" 145.75-147.3' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), voids are 70-80% of surface 147.3-150.0' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), fossils (casts/molds), becoming fragmented at base, friable, weak (R2) 150.0-150.3' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface	SC-7 collected at 137.25-138.05'
			>10	135.95' - Fractures, <5 deg, rough, undulating, open 136' - Fracture zone, gravels 136.4' - Fracture zone, 40 deg, rough, stepped, open 136.9' - Fracture zone, 60-70 deg, rough, undulating, open 137.1' - Fractures, 50 deg, rough, undulating, open 137.3' - Fractures, 30 deg, rough, undulating to stepped, open 138.1' - Fractures, <5 deg, rough, undulating, open		
			2	136.9' - Fracture zone, 60-70 deg, rough, undulating, open		
			4	137.1' - Fractures, 50 deg, rough, undulating, open		
			>10	137.3' - Fractures, 30 deg, rough, undulating to stepped, open		
140	R22-HQ 5 ft 100%	76	NR	138.1' - Fractures, <5 deg, rough, undulating, open	No Recovery 139.4-140.0' Limestone 140.0-143.1' - yellowish gray mottled with light olive gray, (5Y 7/2 with N8), very fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), interbedded/laminae of fine grained limestone, laminations from 140.0-140.8' and 141.0-141.4', voids (<1/16") concentrated in fine grained material over 25% of surface, cavities less than <3/8", material is medium strong to strong rock (R3 to R4) 143.1-145.0' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), friable, coarse grained from 143.1-143.6 becoming fine grained with depth, voids, cavities over 70-80% from 143.6, diminishing to 10-15% with depth 145.0-145.75' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface, <5 cavities 3/16"x3/16" 145.75-147.3' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), voids are 70-80% of surface 147.3-150.0' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), fossils (casts/molds), becoming fragmented at base, friable, weak (R2) 150.0-150.3' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface	R21: 9 minutes
-99.2			10	138.45' - Fractures, 30 deg, rough, stepped, open, dark brown to black stain over 60-70% of surface		
			1	138.7' - Fractures, 80 deg, rough, stepped, open		
			1	138.95' - Fractures, rough, undulating, open		
			1	139.1-140.3' - Fracture zone		
	R23-HQ 5 ft 100%	62	1	140.7' - Fractures, <5 deg, rough, undulating, open	140.0-143.1' - yellowish gray mottled with light olive gray, (5Y 7/2 with N8), very fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), interbedded/laminae of fine grained limestone, laminations from 140.0-140.8' and 141.0-141.4', voids (<1/16") concentrated in fine grained material over 25% of surface, cavities less than <3/8", material is medium strong to strong rock (R3 to R4) 143.1-145.0' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), friable, coarse grained from 143.1-143.6 becoming fine grained with depth, voids, cavities over 70-80% from 143.6, diminishing to 10-15% with depth 145.0-145.75' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface, <5 cavities 3/16"x3/16" 145.75-147.3' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), voids are 70-80% of surface 147.3-150.0' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), fossils (casts/molds), becoming fragmented at base, friable, weak (R2) 150.0-150.3' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface	R22: 9 minutes
			1	141.7' - Fracture, horizontal, rough, undulating, open		
			5	142.4' - Fracture, <5 deg, rough, stepped, open		
145			2	143.6' - Fracture, <5 deg, smooth, undulating, tight		
-104.2			4	144.1-144.85' - Fractures, <5 deg, rough, undulating, open		
	R24-HQ 5 ft 72%	42	2	144.9' - Fractures, vertical, rough, stepped, open	140.0-143.1' - yellowish gray mottled with light olive gray, (5Y 7/2 with N8), very fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), interbedded/laminae of fine grained limestone, laminations from 140.0-140.8' and 141.0-141.4', voids (<1/16") concentrated in fine grained material over 25% of surface, cavities less than <3/8", material is medium strong to strong rock (R3 to R4) 143.1-145.0' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), friable, coarse grained from 143.1-143.6 becoming fine grained with depth, voids, cavities over 70-80% from 143.6, diminishing to 10-15% with depth 145.0-145.75' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface, <5 cavities 3/16"x3/16" 145.75-147.3' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), voids are 70-80% of surface 147.3-150.0' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), fossils (casts/molds), becoming fragmented at base, friable, weak (R2) 150.0-150.3' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface	R23: 5 minutes
			4	145.75-145.85' - Fractures, <5 deg, rough, undulating, open		
			2	146.0-146.5' - Fractures, <5 deg, rough, undulating, open		
			0	146.9' - Fractures, rough, planar, open		
			1	147.3' - Fractures, <5 deg, rough, undulating, open		
150	R24-HQ 5 ft 72%	42	1	147.5-148.0' - Fractures, 75 deg, rough, undulating, tight	140.0-143.1' - yellowish gray mottled with light olive gray, (5Y 7/2 with N8), very fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), interbedded/laminae of fine grained limestone, laminations from 140.0-140.8' and 141.0-141.4', voids (<1/16") concentrated in fine grained material over 25% of surface, cavities less than <3/8", material is medium strong to strong rock (R3 to R4) 143.1-145.0' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), friable, coarse grained from 143.1-143.6 becoming fine grained with depth, voids, cavities over 70-80% from 143.6, diminishing to 10-15% with depth 145.0-145.75' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface, <5 cavities 3/16"x3/16" 145.75-147.3' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), voids are 70-80% of surface 147.3-150.0' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), fossils (casts/molds), becoming fragmented at base, friable, weak (R2) 150.0-150.3' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface	R24: 5 minutes
-109.2			3	149.3' - Fracture, 20 deg, rough, planar, open		
			0	149.9' - Fracture, vertical, rough, stepped, open		
			3	150.3-150.7' - Fractures, smooth, planar to undulating, light tan to dark staining over 20-50% surface		
			1	152.2' - Fractures, horizontal, rough, undulating, open		
	R24-HQ 5 ft 72%	42	3	152.3' - Fractures, <5 deg, rough, undulating, open	140.0-143.1' - yellowish gray mottled with light olive gray, (5Y 7/2 with N8), very fine grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), interbedded/laminae of fine grained limestone, laminations from 140.0-140.8' and 141.0-141.4', voids (<1/16") concentrated in fine grained material over 25% of surface, cavities less than <3/8", material is medium strong to strong rock (R3 to R4) 143.1-145.0' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), friable, coarse grained from 143.1-143.6 becoming fine grained with depth, voids, cavities over 70-80% from 143.6, diminishing to 10-15% with depth 145.0-145.75' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface, <5 cavities 3/16"x3/16" 145.75-147.3' - moderate olive brown, (5Y 4/4), mild HCl reaction, extremely weak (R0), voids are 70-80% of surface 147.3-150.0' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, very weak (R1), fossils (casts/molds), becoming fragmented at base, friable, weak (R2) 150.0-150.3' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, very weak (R1), voids over 10-15% of surface	R23: 5 minutes
			1	152.4' - Fractures, 60 deg, rough, undulating, tight		
			NR	153.3' - Fracture, 0-90 deg, rough, stepped, open		
155			NR			
			NR			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-23	SHEET 9 OF 13
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

WATER LEVELS : 0.0 ft bgs on 4/10/07			START : 4/9/2007		END : 4/17/2007		LOGGER : K. McComb, C. Dougherty	
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				
-114.2	R25-HQ 5 ft 60%	32	2	155.15' - Fractures, rough, undulating, open	150.3-150.7' - moderate olive brown, (5Y 4/4), fine grained, mild HCl reaction, extremely weak (R0), very thick laminations (wavy), voids up to 1/16" over 20-25% of surface, linear-shaped cavities up to 1-3/16"x3/16" Limestone 150.7-152.2' - yellowish gray, (5Y 7/2), mottled, fine to medium grained, mild HCl reaction, very weak to weak (R1 to R2), voids over 35% of surface 152.2-153.6' - light olive brown, (5Y 7/2), very weak (R1), voids over 25-30% of surface, cavities (3/16"x3/16"), some black organic material throughout No Recovery 153.6-155.0' Limestone 155.0-155.4' - Same as 152.2-153.6' 155.4-156.0' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids/cavities absent, laminated, weak/unbroken fracture separated by overlying limestone 156.0-158.0' - light olive brown, (5Y 7/2), very weak (R1), voids over 25-30% of surface, cavities (3/16"x3/16"), some black organic material throughout No Recovery 158.0-160.0' Limestone 160.0-160.2' - light olive brown, (5Y 7/2), very weak (R1), voids over 25-30% or surface, cavities (3/16"x3/16"), some black organic material throughout 160.2-162.15' - yellowish gray, (5Y 7/2), mild HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over <1% of surface, < 5 cavities (3/16"x3/16") 162.15-164.0' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to very fine grained, extremely weak to medium strong (R0 to R3), laminated, void percentage from <1% up to 30-40%, cavities (3/8"x3/16"), primarily in upper 1.0' of section No Recovery 164.0-165.0' Limestone 165.0-168.0' - yellowish gray, (5Y 7/2), fine to very fine grained, mild HCl reaction, weak to very weak (R2 to R1), voids <1/16" over 10-15% of surface, >5 cavities 3/8"x 1/16", fossils (mold/cast)	R25: 5 minutes		
			2	155.7' - Fractures, 10 deg, smooth, planar, open				
			>10	155.8' - Fractures, rough, undulating 156.03' - Fractures, rough, stepped, open 156.7' - Fractures, <5 deg, rough, undulating, tight				
			NR	157.0-160.0' - Fracture zone, 90-0 deg, rough, open, gravel sized fragments				
160	R26-HQ 5 ft 80%	50	0	162.0' - Fracture zone, rough, predominantly horizontal undulating to stepped, open	R26: 7 minutes			
-119.2			0					
			>10					
			10					
165	R27-HQ 5 ft 100%	26	NR	163.3' - Fracture, rough, stepped, open, horizontal, fracture connecting 163.3-163.4' 163.4-163.65' - Fractures, <5 deg, undulating, smooth to rough 163.7-163.85' - Fractures 163.85' - Fractures, horizontal, rough, undulating, open 165.1-165.75' - Fracture zone, 0-90 deg, rough, undulating, open	SC-9 collected at 165.7-167.0'			
-124.2			10					
			0					
			>10					
	R28-HQ 5 ft 92%	30	>10	167.0-168.3' - Fracture zone, 90-0 deg, rough, undulating to stepped, open	R27: 9 minutes			
			4	168.3' - Fracture zone, horizontal, smooth, undulating 168.7' - Fracture zone, vertical, stepped, open 168.85' - Fracture zone, horizontal, rough, undulating, open				
170			3	169.1-169.65' - Fractures, horizontal, rough, undulating, open				
-129.2			10	170.1' - Fractures, <5 deg, rough, undulating, open				
	R28-HQ 5 ft 92%	30	10	170.35' - Fractures, 10 deg, smooth, planar 170.9' - Fractures, rough, undulating, open 171.3' - Fractures, rough, stepped, open 171.45' - Fractures, smooth, planar, open 172.0-172.2' - Fractures, <5-90 deg, rough, undulating to stepped, open 172.25-173.0' - Fractures, horizontal, intersecting angles 173.2-173.8' - Fractures, rough, undulating, vertical fracture along face of core, open	R28: 7 minutes			
			5					
			1					
175			NR					



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-23	SHEET 10 OF 13
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07 START : 4/9/2007 END : 4/17/2007 LOGGER : R. McComb, C. Dougherty

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.
-134.2	R29-HQ 5 ft 91%	60	1	173.8' - Fractures, horizontal, rough, undulating, open		168.0-170.0' - yellowish gray, (5Y 7/2), very fine grained, weak (R2) 170.0-174.0' - yellowish gray, (5Y 7/2), light olive gray mottled, fine to very fine grained, mild HCl reaction, weak (R2), voids up to 1/16" over 10-15%, cavities (>5) 3/16"x3/16", fossil (casts/mold) concentrated at 171.6-172.0' Limestone 174.0-174.6' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, weak (R2), laminated, voids (<1/16") <1% of surface becoming more numerous, 5-10% is brown laminae becoming thicker with depth. No Recovery 174.6-175.0' Limestone 175.0-175.3' - dusky yellow, (5Y 6/4), mild HCl reaction, extremely weak (R0), friable 175.3-176.9' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, medium strong (R3), voids confined to cavity infilling 176.9-179.55' - yellowish brown to dusky yellow, (5Y 7/2 to 5Y 6/4), strong HCl reaction, weak to medium strong (R2 to R3), voids 1/16" over 5-10% of surface, cavities abundant in upper 0.5' (1-3/16"-1-9/16"x3/8-3/4") less frequent with depth No Recovery 179.55-180.0' Limestone 180.0-181.7' - yellowish brown to dusky yellow, (5Y 7/2 to 5Y 6/4), strong HCl reaction, weak to medium strong (R2 to R3), voids 1/16" over 5-10% of surface, cavities (1-3/16" to 1-9/16"x3/8" to 3/4") abundant in upper 0.5' less frequent with depth 181.7-183.4' - yellowish gray mottled with pale greenish yellow, (5Y 7/2 with 10Y 8/2), strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/16", ovate cavities up to 3/4"-1-3/16", fossil (cast), voids 183.4-185.0' - yellowish brown to dusky yellow, (5Y 7/2 to 5Y 6/4), strong HCl reaction, weak to medium strong (R2 to R3), interbeds of limestone similar to 181.7-183.4' 185.0-186.0' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, extremely weak (R0), voids, cavities (up to 3/8"-3/4"x3/8") over 50-60% of surface, fossils (mold/casts)	R29: 9 minutes
			>10	173.9' - Fractures, smooth, planar, open 174.3' - Fracture, <10 deg, smooth, planar, tight, slightly inclined 175.2' - Fracture, smooth, undulating, open, sand-sized grains 176.0-177.0' - Fracture zone, 0-90 deg, undulating, smooth to rough, open			
			0				
			3	178.6-178.75' - Fractures, 10 deg, smooth, planar, tight			
			3	178.85' - Fractures, <5 deg, rough, undulating to stepped, open			
180	R30-HQ 5 ft 100%	54	NR	179.25-179.35' - Fractures, horizontal, smooth, planar, open			R30: 9 minutes
-139.2			2	179.45' - Fractures, rough, stepped, open			
			0	180.8' - Fractures, rough, undulating, open 180.9' - Fractures, <5 deg, rough, stepped, open			
			1				
			>10	182.95' - Fracture, <5 deg, rough, undulating, open 183.0-184.0' - Fracture zone, 0-<5 deg, smooth to rough, undulating stepped, open			
	R31-HQ 5 ft 100%	26	>10	185.0-186.0' - Fracture zone, gravels, vertical orientation			R31: 8 minutes Stopped drilling for the day 4/11/07 Resume drilling 4/12/07 Water level 0.5' below ground surface
			>10	186.0' - Fracture zone, 0-90 deg, rough, stepped, open			
			>10	186.1' - Fracture zone, vertical, rough, generally stepped to undulating			
			>10	186.4' - Fracture zone, horizontal, rough, planar, open			
			10	187.5' - Fracture zone, 60 deg, rough, undulating, open			
	R32-HQ 5 ft 100%	15	3	188.0-188.7' - Fracture zone, 60 deg and 70 deg, rough, undulating to stepped, open			R32: 6 minutes
190			2	190.1' - Fractures, rough to smooth, undulating, open			
-149.2			10	190.75' - Fractures, 10 deg, smooth, planar, open			
			>10	190.85' - Fractures, <5 deg, rough, stepped, open			
			>10	191.0-191.2' - Fracture zone, 60 deg, rough, stepped, open			
	R33-HQ 5 ft 100%	15	>10	191.4' - Fractures, 10 deg, smooth, planar, tight			
			>10	191.7' - Fractures, 10 deg, smooth, undulating, open			
			>10	192.0' - Fracture zone, 90-<5 deg, rough, stepped, open			
195							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-23

SHEET 11 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing


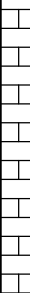


ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

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				
-154.2	R33-HQ 5 ft 86%	0	>10	192.25-192.4' - Fracture zone, 60 deg, rough, stepped, open, horizontal		186.0-188.0' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, medium strong (R3), voids <1/16" over <1% of surface 188.0-190.0' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, extremely weak (R0), voids, cavities (up to 3/8"-3/4"x 3/8") over 50-60% of surface, fossils (mold/casts) Limestone 190.0-190.85' - light olive brown, (5Y 4/4), fine grained, mild HCl reaction, extremely weak to very weak (R0 to R1), laminated, voids and cavities up to 2"x3/8" (coating) >5 at 190.3-190.4' becoming smaller with depth 190.85-191.4' - light olive brown, (5Y 4/4), fine grained, no to mild HCl reaction, extremely weak (R0), voids 1/16" or less over 3-5% of surface 191.4-195.0' - grayish yellow, (5Y 7/2), very fine to fine grained, very weak to extremely weak (R1 to R0), laminated from 191.4-191.9, becoming massive-bedded with depth (gravelly) with fossil mold/casts 195.0-199.3' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, very weak (R1), easily breaks along fracture plane, voids over 1-3% to absent, cavities rare <5 (3/16"x3/16"), trace laminations, trace calcareous stain No Recovery 199.3-200.0' Limestone 200.0-201.0' - pale olive, (10Y 6/2), fine grained, moderate HCl reaction, medium strong (R3), 1/4" thick zones with voids up to 1/16" 201.0-203.2' - light olive gray, (5Y 6/1), fine to medium grained, moderate HCl reaction, weak (R2), 20% voids up to 1/16", collapse breccia zone from 202.0-203.2' No Recovery 203.2-205.0' Limestone 205.0-207.0' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, weak (R2), voids to 1/16"x1/16" over 25% of surface, few cavities 1"x1/4", poorly fossiliferous (molds/casts), voids over 3-5% of surface 207.0-208.6' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, weak (R2), moderately fossiliferous molds/casts, voids over 35% of surface No Recovery 208.6-210.0'	R33: 12 minutes	
			>10	192.6' - Fracture zone, 60 deg, rough, stepped, open				
			>10	192.6-195.0' - Fracture zone, various orientation from subhorizontal to very vertical, stepped to undulating, rough to smooth, open				
			>10	195.0-199.5' - Fracture zone, smooth, undulating				
			>10					
200			NR					
-159.2	R34-HQ 5 ft 64%	0	>10	200.0-201.0' - Fracture zone		190.3-190.4' becoming smaller with depth 190.85-191.4' - light olive brown, (5Y 4/4), fine grained, no to mild HCl reaction, extremely weak (R0), voids 1/16" or less over 3-5% of surface 191.4-195.0' - grayish yellow, (5Y 7/2), very fine to fine grained, very weak to extremely weak (R1 to R0), laminated from 191.4-191.9, becoming massive-bedded with depth (gravelly) with fossil mold/casts 195.0-199.3' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, very weak (R1), easily breaks along fracture plane, voids over 1-3% to absent, cavities rare <5 (3/16"x3/16"), trace laminations, trace calcareous stain No Recovery 199.3-200.0' Limestone 200.0-201.0' - pale olive, (10Y 6/2), fine grained, moderate HCl reaction, medium strong (R3), 1/4" thick zones with voids up to 1/16" 201.0-203.2' - light olive gray, (5Y 6/1), fine to medium grained, moderate HCl reaction, weak (R2), 20% voids up to 1/16", collapse breccia zone from 202.0-203.2' No Recovery 203.2-205.0' Limestone 205.0-207.0' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, weak (R2), voids to 1/16"x1/16" over 25% of surface, few cavities 1"x1/4", poorly fossiliferous (molds/casts), voids over 3-5% of surface 207.0-208.6' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, weak (R2), moderately fossiliferous molds/casts, voids over 35% of surface No Recovery 208.6-210.0'	Stopped drilling HQ on 4/12/07 Resume drilling on 4/17/07 C. Dougherty begins logging	
			>10	201.0-202.0' - Fracture zone				
			>10	202.0-203.0' - Fracture zone				
			0	203.0-203.2' - Fracture zone				
			NR					
205	205.0					R34: 9 minutes		
-164.2	R35-HQ 5 ft 72%	8	5	205.1' - Fractures, rough, undulating, horizontal, open		205.5' - Fractures, horizontal, rough, undulating, open 205.8' - Fractures, horizontal, smooth, stepped 205.9' - Fractures, horizontal, smooth, stepped, black staining 206.0' - Fractures, horizontal, smooth, stepped, slight black staining 206.2' - Fractures, 45 deg, rough, undulating, black staining 206.4-206.5' - Fractures, horizontal, smooth, undulating, <1/16" coating of silt size particles on surface 206.8' - Fractures, horizontal, rough, undulating 207.0-208.6' - Fracture zone 211.0' - Fractures, 20 deg, smooth, undulating 211.2' - Fractures, horizontal, rough, undulating, brown staining, on 50% of surface 211.5-211.9' - Mechanical break, 35 deg, rough, undulating 212.5' - Fractures, horizontal, rough, undulating, fine to medium grain particles on surface 213.2' - Fractures, horizontal, smooth, stepped	R35: 8 minutes	
			7	205.5' - Fractures, horizontal, rough, undulating, open				
			>10	205.8' - Fractures, horizontal, smooth, stepped				
			>10	205.9' - Fractures, horizontal, smooth, stepped, black staining				
			>10	206.0' - Fractures, horizontal, smooth, stepped, slight black staining				
			NR	206.2' - Fractures, 45 deg, rough, undulating, black staining				
			NR	206.4-206.5' - Fractures, horizontal, smooth, undulating, <1/16" coating of silt size particles on surface				
210	210.0							
-169.2	R36-HQ 5 ft 90%	40	>10	206.8' - Fractures, horizontal, rough, undulating		206.8' - Fractures, horizontal, rough, undulating 207.0-208.6' - Fracture zone 211.0' - Fractures, 20 deg, smooth, undulating 211.2' - Fractures, horizontal, rough, undulating, brown staining, on 50% of surface 211.5-211.9' - Mechanical break, 35 deg, rough, undulating 212.5' - Fractures, horizontal, rough, undulating, fine to medium grain particles on surface 213.2' - Fractures, horizontal, smooth, stepped	R36: 8 minutes	
			5	207.0-208.6' - Fracture zone				
			3	211.0' - Fractures, 20 deg, smooth, undulating				
			3	211.2' - Fractures, horizontal, rough, undulating, brown staining, on 50% of surface				
			2	211.5-211.9' - Mechanical break, 35 deg, rough, undulating				
			NR	212.5' - Fractures, horizontal, rough, undulating, fine to medium grain particles on surface				
215			215.0					NR



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-23

SHEET 12 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

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			
-174.2	R37-HQ 5 ft 70%	17	>10	213.6' - Fractures, horizontal, smooth, planar, thin, (1/16" silt infill)		Limestone 210.0-211.2' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, weak (R2), some iron staining on fracture planes 211.2-213.2' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, weak (R2), highly fossiliferous (molds/casts) Limestone 213.2-214.5' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, weak (R2), some iron staining on fracture planes No Recovery 214.5-215.0' Limestone 215.0-215.7' - light olive gray, (5Y 5/2), fine to medium grained, moderate HCl reaction, weak (R2), 15% voids up to 1/16", moderately fossiliferous 215.7-216.9' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), carbonate derived silt zone from 216.0-216.6' is laminated 216.9-217.8' - yellowish gray, (5Y 7/2), weak (R2), uneven bedding plane, laminated, black staining along bedding planes, <5% voids 217.8-218.5' - yellowish gray, (5Y 7/2), weak (R2), 10% voids, fractured, poorly fossiliferous No Recovery 218.5-220.0' Limestone 220.0-221.3' - yellowish gray, (5Y 7/2), moderate HCl reaction, weak (R2), laminated bedding some are uneven, voids over 20% of surface, iron staining on bedding plane, poorly fossiliferous, fractures are along bedding plane 221.3-223.5' - light olive gray, (5Y 5/2), fine grained, mild to moderate HCl reaction, weak (R2), voids 1/16" over 20% of surface, cavities 3/8"x3/4" over 5% highly fossiliferous (molds/casts) 223.5-224.3' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak (R2), laminated, no voids, non fossiliferous No Recovery 224.3-225.0' Limestone 225.0-225.7' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak (R2), fragments have voids 15% below 225.4'	SC-10 collected at 217.0-217.8'
			>10	213.8' - Fractures, horizontal, rough, undulating, silt to fine grained particles			
			1	214.1' - Mechanical break, horizontal, rough, undulating			
			1	215.0-216.0' - Fracture zone			
			NR	216.9' - Fracture zone, iron staining on some surfaces			
	R38-HQ 5 ft 86%	35		217.8' - Fracture, 45 deg, rough, undulating, brown iron staining		R37: 9 minutes	
				218.2' - Fracture, horizontal, rough, undulating			
220							
-179.2			>10	220.0-221.8' - Fracture zone, fracture zone, brown iron, staining on some partings, fractures appear to be mainly along bedding planes			
			>10				
	R39-HQ 5 ft 50%	0	1	223.3-223.0' - Mechanical break, rough, uneven		R38: 6 minutes	
			2	223.5' - Fractures, horizontal, smooth, undulating, iron staining			
			>10				
225			NR				
-184.2			>10	225.0-227.5' - Fracture zone, no fragments larger than 3" on the longest direction, about 50% of volume is fragments 1" or less			
	R40-HQ 5 ft 68%	0	>10			R39: 13 minutes	
			>10				
			>10				
230			NR				
-189.2			>10	230.0-232.0' - Fracture zone, rock fragments, with some 1-3" long sections of core			
	R40-HQ 5 ft 68%	0	>10			Sample pulverized below 232.9'	
			>10				
			>10	232.0-233.4' - Fracture zone, carbonate derived fine to medium grain particles with some rock fragments			
			>10				
			NR				
235	235.0					R40: Run time not recorded	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-23

SHEET 13 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723141.4 N, 458146.5 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.5 ft bgs on 4/10/07

START : 4/9/2007

END : 4/17/2007

LOGGER : R. McComb, C. Dougherty

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.
-194.2	R41-HQ 5 ft 22%	0	>10	235.0-236.1' - Fracture zone, rock fragments, irregular shape, generally 2" length or less		225.7-227.5' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), voids, casts/molds, iron staining on partings, voids <5% of surface, poorly fossiliferous No Recovery 227.5-230.0' Limestone	R41: 5 minutes
240			>10			230.0-231.9' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak (R2), zone of voids over 40% of surface from 230.7-231.1' Limestone	
-199.2	R42-HQ 5 ft 68%	0	>10	240.0-243.0' - Fracture zone, mostly rock fragments 240.0-243.0', with 2 pieces of core about 3" long		231.9-233.4' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, very weak (R1) No Recovery 233.4-235.0' Limestone	R42: 6 minutes
245			>10			235.0-236.1' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, weak (R2), fragments have 10% voids, poorly fossiliferous No Recovery 236.1-240.0' Limestone	
-204.2			2	242.7-245.9' - Fracture zone, top and bottom are 10 to 20 degrees from horizontal, respectively		240.0-241.3' - Same as 235.0-236.1'	
250	R43-HQ 5 ft 60%	0	NR	243.0-243.1' - Fractures, horizontal, smooth, undulating, carbonate derived fine grain particle on faces of fracture, bedding plane		241.3-242.0' - yellowish gray, (5Y 7/2), fine grained, very weak (R1), poorly fossiliferous	R43: 4 minutes
-209.2			>10	245.0-248.0' - Fracture zone, rock fragments		242.0-242.5' - light olive gray, (5Y 5/2), fine grained, medium strong (R3), poorly fossiliferous, iron staining along bedding planes, bedding planes are uneven and undulating	
			>0			242.5-243.4' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, weak (R2), voids over 50% of surface, moderately fossiliferous (casts/molds) No Recovery 243.4-245.0' Limestone	
			NR			245.0-248.0' - yellowish grey, (5Y 7/2), fine to medium grained, mild to moderate HCl reaction, very weak (R1), fractures, massive, poorly fossiliferous (casts) No Recovery 248.0-250.0' Bottom of Boring at 250.0 ft bgs on 4/17/2007	



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-24
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723114.5 N, 458174.3 E (NAD83)
 ELEVATION : 40.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 04/20/07 START : 4/18/2007 END : 4/20/2007 LOGGER : C. Dougherty

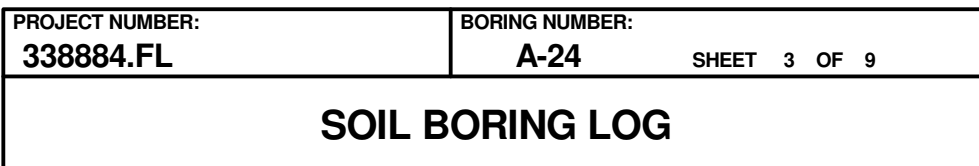
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
40.6	0.0	1.1	SS-1	2-2-3 (5)	Poorly Graded Sand With Silt (SP-SM) 0.0-1.1' - medium light gray, (N6), moist, loose, fine grained, no HCl reaction, 5% nonplastic fines, organics roots decreasing with depth, sand is silica		
	1.5						
5	5.0						
35.6		1.1	SS-2	2-2-2 (4)	Silty Sand (SM) 5.0-6.1' - yellowish gray, (5Y 7/2), wet, very loose, fine grained, no HCl reaction, 25% low to nonplastic fines, trace iron nodules, trace roots, sand is silica		
	6.5						
10	10.0						
30.6		1.0	SS-3	3-5-4 (9)	Silty Sand And Limestone (SM) 10.0-10.95' - light gray, (N7), wet, loose, very fine to fine grained, moderate to strong HCl reaction, mixed with yellowish gray (5Y 8/1) fine to medium sand sized carbonate grains, 24% fines, 30% fine to coarse gravel-sized carbonate grains, limestone fragments at bottom of sample, sand is silica		
	11.5						
15	15.0						
25.6		1.5	SS-4	40-49-17 (66)	Silt (ML) 15.0-16.5' - very pale orange, (10YR 8/2), wet, hard, rapid dilatancy, moderate HCl reaction, 5% gravel, trace fine grained sand, fine grained lamination, nonplastic, all carbonate		
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-24
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723114.5 N, 458174.3 E (NAD83)
 ELEVATION : 40.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 04/20/07 START : 4/18/2007 END : 4/20/2007 LOGGER : C. Dougherty

WATER LEVELS : 4.0 TDS ON 4/20/07			START : 4/18/2007			END : 4/20/2007			LOGGERS : G. Dougherty		
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			
20.6	20.0	1.5	SS-5	39-20-13 (33)	Limestone Fragments And Silt (ML) 20.0-20.5' - dusky yellow, (5Y 6/4), fine to coarse grained, moderate to strong HCl reaction, angular, limestone fragments			Casing set at 20' below ground surface			
	21.5				Silt (ML) 20.5-21.5' - Same as 15.0-16.5' except moderate to strong HCl reaction, 1/2" fragments of coarse sand to fine limestone gravel at 20.6' and 21.0', all carbonate						
25	25.0										
15.6		1.1	SS-6	10-10-4 (14)	Sandy Silt (ML) 25.0-26.1' - yellowish gray, (5Y 7/2), wet, stiff, rapid dilatancy, moderate HCl reaction, 31% fine to medium grained sand, nonplastic						
	26.5										
30	30.0										
10.6		1.1	SS-7	5-6-25 (31)	Silt With Sand (ML) 30.0-31.1' - Same as 25.0-26.1' except 20-25% fine to coarse grained sand			Drilling ends 4/18/07 Drilling resumes 4/19/07 at 07:35 hrs			
	31.5										
35	35.0	0.6	SS-8	22-72/7 (72/7")	Silty Gravelly Sand (SM) 35.0-35.6' - pale yellowish brown, (10YR 6/2), wet, very dense, mild to moderate HCl reaction, 30% fine to coarse grained gravel, 30% low plastic fines, all carbonate						
5.6	35.6										
								Driller's Remark: Organic material in cuttings at about 37' below ground surface			
40											



LOGGER : C. Dougherty

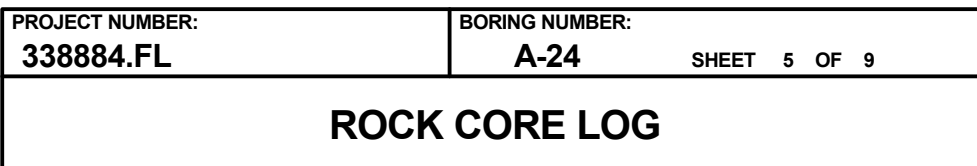
Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-24
SHEET 4 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723114.5 N, 458174.3 E (NAD83)
 ELEVATION : 40.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 04/20/07 START : 4/18/2007 END : 4/20/2007 LOGGER : C. Dougherty

WATER LEVELS : 4.0 fbs on 4/20/07			START : 4/19/2007			END : 4/20/2007			LOGGERS : G. Dougherty		
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				
-19.4	60.0	0.4	SS-13	34-50/2 (50/2")	Silt (ML) 60.0-60.4' - moderate yellowish brown, (10YR 5/4), wet, hard, rapid dilatancy, moderate HCl reaction, 10-15% fine to medium grained sand, 1/16" layers of organic material at top 3.6" of samples, trace iron nodules, has a bedded appearance, irregularly laminated, all carbonate		Driller's Remark: Organics in cuttings at about 62' below ground surface				
	60.7										
65	65.0										
-24.4		1.1	SS-14	13-15-13 (28)	Silty Sand (SM) 65.0-65.7' - yellowish gray, (5Y 7/2), wet, medium dense, fine to medium grained, moderate HCl reaction, 40% low plastic fines, trace coarse grained sand at 65.4', all carbonate						
	66.5				Silt With Sand (ML) 65.7-66.1' - yellowish gray, (5Y 7/2), wet, hard, rapid dilatancy, moderate HCl reaction, 26% fine to medium grained sand, low plastic fines, all carbonate						
70	70.0										
-29.4	70.2	0.1	SS-15	50/2 (50/2")	Limestone Fragments 70.0-70.1' - light olive gray, (5Y 5/2), black iron staining Begin Rock Coring at 70.0 ft bgs See the next sheet for the rock core log						



ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 04/20/07

START : 4/18/2007

END : 4/20/2007

LOGGER : C. Dougherty

APPENDIX 2BB-304



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-24

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723114.5 N, 458174.3 E (NAD83)

ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 04/20/07

START : 4/18/2007

END : 4/20/2007

LOGGER : C. Dougherty

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.
-49.4	R5-HQ 5 ft 60%	35	0	90.9-91.8' - Fracture zone, rock fragments, some fragmens have partial (10%) coating of grayish brown (5YR 3/2) clay 92.1' - Joint, smooth, undulating, possible cavity, open		Limestone 91.0-93.0' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), voids <1/16" over 20% of surface, solution cavity 1/2"x1.5"x3/4" deep at 92.5', 1/16" wide weathered area around edges of cavity No Recovery 93.0-95.0'	SC-2 collected at 90.0- 90.9' Driller's Remark: Lost circulation at 92' R5: 9 minutes
			>10				
			1				
			NR				
95	R6-HQ 5 ft 100%	57	>10	96.8' - Joint, 60 deg, smooth, undulating, coating of carbonate derived silt, tight 97.2-98.0' - Fracture, vertical, rough, undulating		Limestone 95.0-99.2' - Same as 80.0-85.0' except trace organics at 97.6' 99.2-99.6' - medium light gray, (N6), very fine grained, moderate HCl reaction, medium strong to strong (R3 to R4) 99.6-104.0' - Same as 95.0-99.2'	R6: 10 minutes
-54.4			1				
			1				
			0				
	R7-HQ 5 ft 80%	48	>10	100.4-100.8' - Fracture zone 101.5-101.9' - Fracture zone 102.3' - Joint, 35 deg, rough, undulating, black iron staining, open 103.8' - Joint, horizontal, rough, undulating, open		No Recovery 104.0-105.0'	R7: 8 minutes
100			>10				
-59.4			1				
			NR				
	R8-HQ 5 ft 74%	40	2	105.6, 105.9' - Fractures (2), horizontal, rough, undulating, open 107.0' - Fracture or mechanical break, horizontal 107.0-107.4, 107.7-107.9' - Fracture zone (2), horizontal, coating of carbonate derived silt 108.4' - Fracture or mechanical break, horizontal, loose		Limestone 105.0-108.7' - light olive gray, (5Y 5/2), very fine grained, weak to medium strong (R2 to R3), <1/16" voids over 40% of surface, moderately fossiliferous (cast and molds), color change to yellowish gray, (5Y 7/2), at 108.3' and very weak (R1) No Recovery 108.7-110.0'	R8: 5 minutes
			0				
105			>10				
-64.4			1				
			NR				
110							
110.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-24

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723114.5 N, 458174.3 E (NAD83)

ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 04/20/07

START : 4/18/2007

END : 4/20/2007

LOGGER : C. Dougherty

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.
-69.4	R9-HQ 5 ft 100%	78	0			Limestone 110.0-114.0' - Same as 105.0-108.7' except poorly fossiliferous	SC-3 collected at 111.4-112.4'
			0				
			0	112.6-112.9' - Mechanical break			
			2	113.3' - Joint, 20 deg, smooth, undulating, dark staining, loose			
			1	113.7' - Joint, 60 deg, smooth, undulating, dark staining, loose			
115	R10-HQ 5 ft 90%	40	1	114.0, 114.9' - Mechanical break (2)		114.0-115.0' - dusky yellow, (5Y 6/4), fine to very fine grained, strong HCl reaction, very weak (R1), 1/16" voids over 15% of surface, poorly fossiliferous	R9: 8 minutes
-74.4			0	114.3' - Fracture zone or mechanical break		115.0-117.0' - Same as 110.0-114.0' except <1/16" voids over 20% of surface	
			>10	115.0-115.4' - Joint, 80 deg, rough, undulating, black iron staining on 25% of the surface		117.0-118.2' - moderate olive brown, (5Y 4/4), moderate HCl reaction, very weak (R1), zone of carbonate derived silt at 117.0-117.4' and 117.8-118.0'	
			0	115.5' - Mechanical break		118.2-119.5' - light olive gray, (5Y 5/2), moderate HCl reaction, weak (R2), voids (1/16") over 20% of surface, larger voids (up to 3/8") over 5% of surface, moderately fossiliferous (molds)	
			>10	116.3-116.5' - Mechanical break		No Recovery 119.5-120.0'	
120	R11-HQ 5 ft 72%	20	NR	117.0-118.1' - Fracture zone		Limestone 120.0-120.5' - Same as 118.2-119.5'	Fragments from 120.4-120.4' appear to have been cored at two different angles indicating they were loose in borehole
-79.4			3	120.4-120.7' - Fracture zone		120.5-123.6' - light olive gray, (5Y 5/2), moderate HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over 30% of surface, few large voids (3/8"x1"), moderately fossiliferous, voids oriented parallel to bedding plane at about 20 degrees, large cavity (3/8"x1-3/16") present at 122.0', laminated bedding (1/16"-1/4") below 122.5'	
			3	121.3' - Fracture, 20 deg, smooth, planar, coating of carbonate derived fine sand particles on face, along bedding plane		No Recovery 123.6-125.0'	
			1	121.5-121.8' - Fracture zone		Limestone 125.0-127.8' - Same as 118.2-119.5' except zone of larger (3/4"x3/8") cavities from 125.8-126.3' over 30% of surface, voids (<1/16") over 25% of surface	
			0	121.7' - Fracture, 20 deg, smooth, planar, along bedding plane		No Recovery 127.8-130.0'	
125	R12-HQ 5 ft 56%	38	NR				R11: 6 minutes
-84.4			1	125.8' - Fracture, horizontal, rough, undulating, coating of carbonate derived silt on faces, loose			
			1	126.3' - Joint or mechanical break, horizontal, rough, undulating			
			0				
130			NR				R12: 5 minutes
130							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-24

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723114.5 N, 458174.3 E (NAD83)

ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 04/20/07

START : 4/18/2007

END : 4/20/2007

LOGGER : C. Dougherty

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			
-89.4	R13-HQ 5 ft 40%	0	NA	130.0-130.7' - Fracture zone, mostly carbonate derived fine sand and silt size fragments		Carbonate Derived Silty Sand (SM) 130.0-130.7' - light olive gray, (5Y 6/1), wet, fine to medium grained, moderate to strong HCl reaction, staining, 25% silt	End drilling 4/19/07, 17:20 hrs Resume drilling 4/20/07, 07:45 hrs Driller's Remark: Water level 4' below ground surface
			>10	130.7-132.0' - Fracture zone, only rock fragments, 2"x3", breakage is mostly along bedding planes			
			NR				
135	R14-HQ 5 ft 88%	57				Limestone 130.7-132.0' - light olive gray and dusky yellow, (5Y 5/2 and 5Y 6/4), fine grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), gray and yellow areas interbedded in 1-inch beds, grey areas are medium to strong (R3 to R4) with few (1/16" or less) voids, dusky yellow areas are weak (R2) with 30% voids, light olive gray limestone increases with depth, bedding oriented from 0-10 degrees No Recovery 132.0-135.0'	R13: 7 minutes
-94.4			>10				
			1	136.6' - Joint, horizontal, rough, undulating, iron staining, open			
			1	137.5' - Fracture zone or mechanical break, horizontal			
			0				
	R15-HQ 5 ft 92%	70	0			135.0-137.7' - moderate olive brown, (5Y 4/4), fine grained, mild HCl reaction, medium strong (R3), moderately fossiliferous, (1/16") voids over 20% of surface, cavities (>3/16") and fossil molds over 10% of surface, <3/16" fragments of gray limestone included in matrix at about 2-3% from 136.3-137.5', 1" fragments 137.5'-137.7'. 137.7-139.4' - medium gray mottled yellowish gray, (N5, mottled 5Y 7/2), fine to very fine grained, mild HCl reaction, medium strong (R3), coloration surroundings and within cavities, highly fossiliferous (cavities and molds), few (<1/16") voids, cavities (up to 1.5"x2.5") over 15% No Recovery 139.4-140.0'	R14: 11 minutes
140			NR				
-99.4			0				
			1	141.5' - Joint, horizontal, rough, undulating, iron staining, coating of carbonate derived fine sands on 15% of surface			
			0				
	R16-HQ 5 ft 76%	68	0			140.0-142.0' - Same as 137.7-139.4' except yellowish gray (5Y 7/2) at 140.7-142.0' 142.0-143.0' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), thinly laminated (crenulated in top 2.4" of section), few (<1/16") voids above 142.5', 15% voids from 142.5-148.0', few voids to 3/16" 143.0-144.6' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), moderate HCl reaction, weak (R2), laminated bedding, areas of voids (1/16") correspond to bedding No Recovery 144.6-145.0'	SC-4 collected at 143.5- 144.6' R15: 9 minutes
145			NR				
-104.4			0				
			0				
			0				
			NR				R16: 5 minutes
150							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-24

SHEET 9 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723114.5 N, 458174.3 E (NAD83)

ELEVATION : 40.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 04/20/07

START : 4/18/2007

END : 4/20/2007

LOGGER : C. Dougherty

DISCONTINUITIES				SYMBOLIC LOG	LITHOLOGY	COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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.
-109.4	R17-HQ 5 ft 100%	92	0	153.3-153.8' - Fracture zone, fragments 1/16" to 1-9/16"			



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-24A
SHEET 1 OF 5	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723110.0 N, 458176.7 E (NAD83)
 ELEVATION : 40.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 04/20/07 START : 6/15/2007 END : 6/15/2007 LOGGER : J. Townes

WATER LEVELS : 4.0 TUBES ON 9/13/2007			START : 9/13/2007		END : 9/13/2007		LOGGERS : J. Lowrie	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS		
	RECOVERY (ft)			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		
	#	TYPE	6"-6"-6" (N)					
40.3						Blind drill to 25' Install SW casing to 10'		
5								
35.3						Water level obtained from boring A-24		
10								
30.3								
15								
25.3								
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-24A
SHEET 2 OF 5	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723110.0 N, 458176.7 E (NAD83)
 ELEVATION : 40.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, auto hammer, AWJ rods, 3-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 04/20/07 START : 6/15/2007 END : 6/15/2007 LOGGER : J. Townes

WATER LEVELS : 4.0 TDS ON 04/20/07			START : 9/19/2007			END : 9/19/2007			LOGGERS : J. Lowrie		
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				
20.3											
25	25.0										
15.3		1.3	SS-1	3-5-8 (13)	Silt With Sand (ML) 25.0-26.3' - grayish orange, (10YR 7/4), moist, stiff, rapid dilatancy, mild to moderate HCl reaction, 15-20% fine to medium sand, 10% coarse sand to fine gravel-sized limestone fragments, all carbonate						
	26.5										
30	30.0										
10.3		0.9	SS-2	3-4-11 (15)	Silt With Sand (ML) 30.0-30.9' - Same as 25.0-26.3'						
	31.5										
35	35.0										
5.3	35.1	0.0	SS-3	50/1 (50/1")	No Recovery 35.0-35.1' Begin Rock Coring at 35.0 ft bgs See the next sheet for the rock core log		Install HW casing to 35'				
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-24A

SHEET 3 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723110.0 N, 458176.7 E (NAD83)

ELEVATION : 40.3 ft (NAVD88)

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

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 04/20/07

START : 6/15/2007

END : 6/15/2007

LOGGER : J. Townes

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				
5.3	35.0	R1-NQ 1.5 ft 60%	33	1	35.72' - Fracture, 52 deg, rough, undulating, minor recrystallization, 3/16" open, rock, rubble at top of run 0.2" thick		Limestone 35.0-35.9' - pale reddish brown, (10R 5/4), very fine to fine grained, moderate HCl reaction, very weak (R1), voids up to 1/16" over 85% of surface, 10% irregular cavities (up to 9/16"x3/4"), minor recrystallization, some with fossil casts/ fossil molds, moderately fossiliferous No Recovery 35.9-36.5'	Begin NQ coring; first run 1.5' to set stroke R1: Run time not recorded SC-1 collected at 36.1-37.05'	
	36.5	R2-NQ 5 ft 72%		NR					
			0	37.85' - Fracture, 65 deg, rough, undulating, open 3/16"		36.5-40.1' - Same as 35.0-36.5' except fewer irregular cavities, 5% cavities, most with fossil cast/molds, cavities up to 3/16"x3/8", two larger cavities 1-3/16"x3/8", moderately fossiliferous No Recovery 40.1-41.5'	R2: 2 minutes		
			1						
			1						
40				1	39.0' - Fracture, 75 deg, rough, undulating, open 1/16", minor carbonate recrystallization 39.75' - Fracture, 75 deg, rough, undulating, open 1/16"				
0.3			NR						
	41.5	R3-NQ 5 ft 30%	8	3	41.7-42.0' - Fracture (2), horizontal, smooth, undulating, open 3/16" 42.45' - Fractures, horizontal, rough, undulating, open 3/8" 42.75-43.0' - Fracture zone		Limestone 41.5-43.0' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild to moderate HCl reaction, extremely weak (R0), voids up to 1/16" over 40% of surface. a few subangular rock (gray) clasts up to 3/16"x3/16", poorly to moderately fossiliferous casts/molds, few black organic inclusions, most 1/16"-1/8", one inclusion 1"x3/8" No Recovery 43.0-46.5'	R3: 1 minute	
				>10					
				NR					
				NR					
45		R4-NQ 5 ft 48%	15	2	46.6' - Fracture, 45 deg, rough, undulating, open 46.95' - Fracture, 35 deg, rough, undulating, open 3/4", minor carbonate recrystallization 47.7' - Fracture, horizontal, rough, undulating, open 1/16", tight 48.0' - Fracture, horizontal, rough, undulating, open 3/8" 48.35' - Fracture, horizontal, rough, undulating, open 1/16", slightly tight 48.55' - Fracture, 50 deg, rough, undulating, open		Limestone 46.5-48.0' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, extremely weak (R0), some voids with fossil mold/casts, voids up to 1/16"x1/16" covering 100% of surface; 5% subangular, gray, rock clasts up to 3/16"x3/16", poorly to moderately fossiliferous 48.0-48.9' - Same as 41.5-43.0' except very few organic inclusions No Recovery 48.9-51.5'	R4: 1 minute	
				3					
				2					
				NR					
				NR					
50		R5-NQ 5 ft 72%	14	2	52.0' - Fracture, 30 deg, smooth, planar 52.35' - Fracture, horizontal, smooth, planar 52.6' - Fracture or mechanical break, horizontal, rough, undulating 52.7' - Mechanical break, horizontal, rough, undulating 52.95, 53.1' - Fractures (2), horizontal, rough, undulating		Limestone 51.5-53.0' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild to moderate HCl reaction, extremely weak (R0) 53.0-54.0' - Same as 51.5-53.0' except 2% black staining		
				5					
				3					
				0					
				0					
55									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-24A

SHEET 4 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723110.0 N, 458176.7 E (NAD83)

ELEVATION : 40.3 ft (NAVD88)

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

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 04/20/07

START : 6/15/2007

END : 6/15/2007

LOGGER : J. Townes

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.
-14.7				53.4' - Fractures, 50 deg, rough, undulating, minor carbonate recrystallization, open 1/16"		Limestone 54.0-55.1' - light brown, (5YR 6/4), fine to medium grained, mild HCl reaction, weak (R2), voids (<1/16") over 85% of surface, poorly to moderately fossiliferous, irregular voids up to 9/16" over 2% of surface	R5: 3 minutes
56.5			NR	53.7' - Mechanical break			
			3	54.45' - horizontal, rough, undulating, tight			
			4	54.95' - Fracture, <90 deg, rough, undulating			
			0	56.7' - Fractures, horizontal, rough, undulating, tight, open 1/16"			
			NR	57.05' - Fractures, horizontal, rough, undulating, open 1/16"			
			NR	57.4' - Fractures, horizontal, rough, undulating, open 3/8", minor black organic laminae			
			NR	57.6, 57.7, 57.8' - Fractures (3), horizontal, rough, undulating, abundant black organic laminae			
			NR	58.0' - Fracture, horizontal, rough, undulating, open 3/4", small black laminae			
60							
-19.7							
			0				
			3	62.8' - Fracture or bedding plane, 10 deg, rough, undulating, open 3/8"			
			2	63.15' - Fractures, horizontal, rough, undulating, open 2"			
			2	63.5' - Fractures, 5 deg, rough, undulating, open 3/8"			
			2	63.9' - Fractures, horizontal, rough, undulating, minor recrystallization			
			2	64.15' - Bedding plane, horizontal, rough, undulating			
			NR	64.8' - Bedding plane, horizontal, rough, undulating, open 3/4"			
			1	65.1' - Fractures, rough, undulating, minor recrystallization			
			2	65.7' - Fractures, 5 deg, rough, undulating			
			2	66.1' - Fracture, horizontal, rough, undulating, open 1-3/16"			
			2	66.95' - Fracture, horizontal, rough, undulating, open 3/8", minor recrystallization			
			1	67.7' - Fractures, 60 deg, rough, undulating, minor recrystallization			
			2	68.4' - Bedding plane, 5 deg, rough, undulating			
			2	69.05' - Fracture, 30 deg, rough, undulating, minor recrystallization			
			2	69.3' - Fracture, horizontal, rough, undulating, open 2"			
			2	69.7' - Fracture, horizontal, rough, undulating, minor recrystallization			
			>10	70.6, 71.3' - Mechanical break (2)			
			1	72.2' - Fractures, horizontal, rough, undulating, minor recrystallization			
			1	72.5-72.9' - Fracture zone, rubble, minor recrystallization			
			1	73.35' - horizontal, rough, undulating, tight			
			1	73.5' - Fractures, 60 deg, rough, undulating, minor recrystallization			
75							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-24A

SHEET 5 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723110.0 N, 458176.7 E (NAD83)

ELEVATION : 40.3 ft (NAVD88)

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

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 04/20/07

START : 6/15/2007

END : 6/15/2007

LOGGER : J. Townes

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.
-34.7			1			Limestone	
			>10	75.3-75.7' - Fracture zone, rough, irregular, minor recrystallization		71.5-72.1' - grayish pink to moderate reddish orange, (5R 8/2 to 10R 6/6), moderate HCl reaction, weak (R2), poorly fossiliferous, voids over 5% of surface	R9: 2 minutes
	76.5		NR	76.5-77.0' - Fracture zone		72.1-75.8' - moderate reddish orange, (10R 6/6), moderate HCl reaction, amount of voids varies in alternating 1' thick layers, voids range from 10-90%, irregular cavities throughout, up to 9/16"x9/16" over 40% of surface, poorly fossiliferous	
			>10			No Recovery 75.8-76.5'	
			>10	77.4' - Fracture zone, 20 deg, rough, undulating, minor recrystallization		Limestone	
			>10	78.2-78.4' - Fracture zone		76.5-80.25' - moderate reddish orange, (10R 6/6), moderate HCl reaction, very weak (R1), voids over 80% of surface, irregular cavities up to 9/16" over 20% of surface	R10: 2 minutes
			>10	78.9-79.1' - Fracture zone		No Recovery 80.25-81.5'	
80			2			Limestone	
-39.7			NR	80.1' - Fractures, 60 deg, rough, undulating, two intersecting fractures		81.5-86.45' - moderate reddish orange, (10R 6/6), fine to medium grained, moderate HCl reaction, very weak (R1), voids <1/16" over 80% of surface, irregular cavities up to 3/8" over 20% of surface, some voids and cavities contain fossil casts/molds, trace, black organics throughout, fossil and organics especially prevalent from 83.0-84.0'.	
			1				
			2	82.2' - Mechanical break, horizontal, rough, undulating			
			1	82.8' - Fractures, 30 deg, rough, undulating, open 3/8", organic material			
			>10	83.1' - Fractures, rough, undulating, surface open 1-9/16", minor recrystallization			
			>10	83.9-84.0' - Fracture zone, horizontal, undulating, organics			
85			>10	84.5-85.6' - Fracture zone, 3/8"-3-1/8" long rock fragments			
-44.7			NR	86.05' - Fracture zone, 60 deg, rough, undulating, open 1-3/16", minor recrystallization		No Recovery 86.45-86.5'	
						Bottom of Boring at 86.5 ft bgs on 6/15/2007	Drilling ended at 13:00 hours; grouting completed at 17:00 hours Total depth is 86.5'



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 1 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
205 -163.0	R1-HQ 2.5 ft 100%	24	>10	204.0-204.7' - Fracture zone, multiple intersecting fractures, gravel-sized fragments <3" diameter		Limestone 204.0-206.5' - yellowish gray, (5Y 7/2), very fine to medium grained, mild to moderate HCl reaction, extremely weak (R0), with areas of 1" diameter weak (R2) rock, voids over 40% of surface, trace laminations, fossiliferous, medium strong to strong (R3 to R4) from 204.0-204.2', HCl reaction 1-3 seconds 206.5-208.5' - yellowish gray, (5Y 7/2), very fine to medium grained, extremely weak to very weak (R0 to R1), 206.5-207.15': light olive gray (5Y 5/2), high organic content; slow, moderate HCl reaction, trace strong organic odor, 207.15-208.5': laminated with trace organics in laminations, <10% voids over surface No Recovery 208.5-209.0' Limestone 209.0-209.4' - yellowish gray, (5Y 7/2), very fine to fine grained, medium strong to strong (R3 to R4), voids <1/16" over <20% of surface, poorly fossiliferous, trace laminations, trace organics Sandy Silt (ML) 209.4-210.6' - yellowish gray, (5Y 7/2), moist to dry, hard, strong HCl reaction, >60% low to moderate plasticity carbonate fines, <40% fine to medium grained carbonate sand, trace H ₂ S odor No Recovery 210.6-214.0' Limestone Fragments 214.0-215.3' - yellowish gray, (5Y 7/2), slow moderate HCl reaction, weak (R2), 2-3" fragments from 214.0-214.7' decreasing to <1" from 214.7-215.3', voids 1/16-1/8" over 15-25% of surface Limestone And Limestone Fragments 215.3-219' - yellowish gray, (5Y 7/2), fine grained, slow moderate HCl reaction, extremely weak to very weak (R0 to R1), finely laminated (<1/16"), thin zone (217.0-217.1') of medium strong (R3) rock fragments, fine grained laminated material appears argillaceous No Recovery 217.8-219.0' Limestone 219.0-219.7' - Same as 215.3-217.8'	Boring AD-1 blind drilled to approximately 204 feet below ground surface before beginning sampling/logging. Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" 08/22/07 HW casing set to 204.25' below ground surface 08/23/07 Begin rock coring HQWL Use thick mud mix with 250-350 rpm rotation R1: 4 minutes 204-204.2': Probable sluff fallen to bottom of borehole during sonic advancement R2: 3 minutes R3: 6 minutes 08/26/07 Switch drill rigs and crew: Boart Longyear BL300T drill rig operated by Minnesota crew. Using HW casing previously set. Using face discharge type bit. C. Sump takes over logging. R4: 7 minutes R5: 13 minutes
			4	204.7, 204.9, 205.1, 205.3' - Fractures (4), <10, 80, <10, and <10 deg, rough, undulating, intersecting fractures			
			>10	205.9-206.5' - Fracture zone, rough, undulating, fragments <2" diameter			
			>10	206.5-207.15' - Fracture zone, rough, undulating, multiple intersecting fractures, gravel-sized fragments <2" diameter			
			>10	207.3, 207.4, 207.55, 207.6, 207.9, 208.15' - Fractures or mechanical break (6), <10 deg, undulating, smooth to rough, bedding planes			
			NR	208.15-208.5' - Fracture zone, gravel-sized fragments <2" diameter			
			NA	209.0-209.4' - Fracture zone, rough, undulating, gravel-sized fragments <2" diameter			
			NA	209.4-210.6' - Sandy silt interval, friable			
			0				
			NR				
210 -168.0	R2-HQ 2.5 ft 80%	0	>10				
			>10				
			NR				
			0				
			NR				
215 -173.0	R3-HQ 5 ft 32%	0	NA				
			NA				
			0				
			NR				
			NR				
214.0							
215 -173.0	R4-HQ 5 ft 76%	8	>10	214.0-214.7' - Fracture zone, angular limestone fragments 2-3"			
			>10	214.7-215.3' - Fracture zone, fragments <1" diameter			
			>10	215.3-217.1' - Fracture zone, fragments range from 1/2" to >3" in zones			
			3	217.0, 217.5' - Mechanical break (2), rough, undulating			
			NR	217.8' - Fracture, horizontal, rough, undulating, possible bedding plane			
			NR				
219.0							
			3	219.0' - Fracture or mechanical break, horizontal, rough, undulating			
			2	219.4' - Fracture, rough, stepped			
				219.7' - Bedding plane, horizontal, rough, bedding plane fracture			
				220.2, 220.5' - Fractures (2), rough, undulating, ends of single full core piece			
				220.5-222.0' - Fracture zone			
220 -178.0	R5-HQ 5 ft 60%	13	>5				
			NR				
			NR				
224.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 2 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
225 -183.0	R6-HQ 5 ft 56%	8	1	224.3' - Fracture, horizontal, rough, undulating, contact with very soft sandy silt carbonate material		Limestone And Silty Sand 219.7-222.0' - mild to moderate HCl reaction, with gravel-sized limestone fragments, very fine to fine grained fragments are fossiliferous (casts and molds up to 1/2" diameter over 10-15% of surface), voids (1/16-1/8") over 15-20% of surface, larger fragments and full core diameter zones medium strong to very strong (R3-R5), small fragments (<1") weak (R2) No Recovery 222.0-224.0' Limestone 224.0-226.8' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, extremely weak to very weak (R0 to R1), voids (1/16") over <1-5% in zones, trace fossil casts/molds (<1%), larger fragments tend to be more competent, 225.6-226.1' medium strong (R3), extremely weak (R0) zones, friable, trace bedding (laminae 1/16-1/8"), recurring sequence of thin (6") more competent limestone beds separated by extremely weak very fine grained silt-sized carbonate material No Recovery 226.8-229.0' Limestone Fragments 229.0-229.2' - yellowish gray, (5Y 7/2), very fine to fine grained, mild to moderate HCl reaction, weak (R2), 3/4"-2-1/2" fragments, fossiliferous with fossil molds/casts over 20% of surface, voids (1/16-1/8") over 15% of surface 229.2-229.5' - Same as 229.0-229.2' except strong (R4), thin, fine-grained bed, trace voids (1/16"), very fine (<1/32") black inclusions (possibly pyrite) Limestone 229.5-229.9' - yellowish gray, (5Y 7/2), very fine to fine grained, weak (R2), voids (1/16") over 40-50% of surface, larger cavities up to 1/2" over 5-10% Silty Sand Sized Material (SM) 229.9-231.4' - with gravel-sized very weak (R1) limestone fragments similar to 224.0-226.5' No Recovery 231.4-234.0' Limestone Fragments 234.0-234.7' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), small voids (1/16-1/8") over 10-15% of surface, trace small fossil molds (<3/8")	R6: 10 minutes
			0	224.3-225.1' - carbonate silt with gravel sized fragments (1/4-1/2")			
			0	225.1-225.7' - Fracture zone, very weak limestone fragments 1-4"; full core piece laminated, easily parted on bedding plane fractures			
			NR	225.7-226.8' - Fracture zone, limestone material with fragments			
229.0	R7-HQ 5 ft 48%	0	NA	229.0-229.55' - Fracture zone, limestone fragments, 3/4-2", weak (R2), fine oxidation staining on fracture surfaces			R7: 13 minutes
230 -188.0			NA	229.55-230.2' - Extremely weak rock fractured into sand/gravel sized carbonate material			
			NA	229.8' - Mechanical break, horizontal, rough			
			NR	230.2-230.4' - Fracture zone, more competent limestone fragments, angular, fine grained, 1/4-1" diameter 230.4-231.4' - Extremely weak material, same as 229.55-230.2'			
234.0	R8-HQ 5 ft 32%	0	NA	234.0-234.7' - Fracture zone, limestone fragments 1/2-2" in size, weak to medium strong (R2-R3)			R8: 13 minutes
235 -193.0			NA	234.7' - Horizontal contact with silty, sandy fine gravel-sized limestone fragments			
			NR				
			NR				
239.0	R9-HQ 5 ft 36%	8	>10	239.0-239.7' - Fracture zone, limestone fragments 1" to 2-1/2" diameter			R9: 8 minutes
240 -198.0			2	239.7' - Fracture, horizontal, rough, undulating, chipped fracture face			
			NR	240.0, 240.4' - Mechanical break (2), horizontal, smooth, planar			
			NR				
244.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-01	SHEET 3 OF 17
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07 START : 8/23/2007 END : 9/7/2007 LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
245 -203.0	R10-HQ 5 ft 50%	20	>10	244.0-244.6' - Mechanical break, 1-2" Limestone core pieces and fragments, mostly horizontal, rough, undulating fracture faces; extremely weak rock		Silt (ML) 234.7-235.6' - yellowish gray and dark olive gray in alternating mottled bands, (5Y 7/2 and 5Y 3/2), moderate to strong HCl reaction, extremely weak (R0), finely laminated, all carbonate material No Recovery 235.6-239.0' Limestone 239.0-240.8' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, extremely weak (R0), finely laminated (1/16-3/16"), <5% fine black inclusions (<1/16"), 1/4" thick more competent bed at 239.9' (very weak -R1) No Recovery 240.8-244.0' Limestone 244.0-246.5' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), voids (1/16") over 10-20% of surface, variable in zones, trace fossil molds (<1/2"), light olive gray (5Y 5/2) thinly laminated zones up to 1/4" thick spaced 1-2" apart over 244.6-245.1' No Recovery 246.5-249.0' Limestone 249.0-249.4' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), pitted surface, <1/16" dark brown laminations, many with 1/2" relief 249.4-251.9' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids (1/16") over surface variably <5-10% in thin zones, larger cavities/fossil molds up to 1/2" variable from trace to 5%; thinly bedded (1/2-3/4") at 249.6-250.4', very fine grained thin beds (<2") with no voids/fossils 251.2-251.5', very fine black inclusions (<1/16") over 1-2% No Recovery 251.9-254.0' Limestone 254.0-258.8' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), medium density, alternating zones of very fine grained and fine grained, voids (1/16") occur in horizontal zones up to 25% of surface, fossil molds and casts up to 1/2" in discrete zones 1/2-1" thick No Recovery 258.8-259.0'	244.0': Slightly improved recovery/RQD after mixing new batch of mud
			3	244.6, 245.1' - Bedding plane (2), horizontal, rough, undulating, fractures on intact core pieces			R10: 8 minutes
			>10	245.2, 245.9' - Fractures or mechanical break (2), rough, undulating, very weak rock			
249.0	R11-HQ 5 ft 58%	24	NR	245.9-246.2' - Fracture zone, 1/4-3/4" fragments (very weak)			
			3	246.2-246.5' - Fractures (2), rough, undulating, on either end of single core piece of very weak (R1) limestone		250.0': Not re-circulating mud	R11: 10 minutes
250 -208.0			>10	249.4' - Fracture, 10 deg, rough, undulating			
	R12-HQ 5 ft 96%	35	4	249.5' - Fracture or mechanical break, 60-70 deg, rough, undulating		255.0-259.0' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), voids (1/16") over 10-20% of surface, variable in zones, trace fossil molds (<1/2"), light olive gray (5Y 5/2) thinly laminated zones up to 1/4" thick spaced 1-2" apart over 244.6-245.1'	R12: 8 minutes
			NR	249.6' - Fracture, horizontal, rough, undulating, contact with finer grained limestone			
254.0			NR	249.6-250.4' - Fracture zone, limestone fragments 1/2-3/4" thick up to 3" diameter			
255 -213.0	R13-HQ 5 ft 44%	0	>10	250.4, 250.9' - Fractures or mechanical break (2), horizontal, rough, undulating		259.0-264.0' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), medium density, alternating zones of very fine grained and fine grained, voids (1/16") occur in horizontal zones up to 25% of surface, fossil molds and casts up to 1/2" in discrete zones 1/2-1" thick	R13: 7 minutes
			>10	251.1' - Disk-shaped discontinuity with finer grained limestone below, brown staining on surface			
			>10	251.2, 251.35' - Bedding plane (2), horizontal, bedding plane fractures			
	R13-HQ 5 ft 44%	0	>10	251.4' - Fracture, 10 deg, rough, undulating, stepped, crosses bedding planes		264.0' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), medium density, alternating zones of very fine grained and fine grained, voids (1/16") occur in horizontal zones up to 25% of surface, fossil molds and casts up to 1/2" in discrete zones 1/2-1" thick	R13: 7 minutes
			>10	254.0-254.7' - Fracture zone, 30% limestone fragments 1/2-3/4" in size, 4" half core diameter with vertical rough undulating fracture or mechanical break, remaining fragments 1-2" diameter			
			>10	255.1' - Fracture, horizontal, rough, undulating			
259.0	R13-HQ 5 ft 44%	0	2	255.4' - Fracture or mechanical break, horizontal, rough, undulating, stepped, 1/2"		264.0' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), medium density, alternating zones of very fine grained and fine grained, voids (1/16") occur in horizontal zones up to 25% of surface, fossil molds and casts up to 1/2" in discrete zones 1/2-1" thick	R13: 7 minutes
			>10	255.6-255.8' - Fracture zone, 1/2" thick bedding plane parting			
			NR	255.8, 256.2' - Bedding plane (2), horizontal, smooth, bedding plane partings			
260 -218.0	R13-HQ 5 ft 44%	0	2	256.2-256.6' - Fracture zone, similar to 255.6-255.8'		264.0' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), medium density, alternating zones of very fine grained and fine grained, voids (1/16") occur in horizontal zones up to 25% of surface, fossil molds and casts up to 1/2" in discrete zones 1/2-1" thick	R13: 7 minutes
			>10	256.9, 257.1' - Bedding plane (2), horizontal, rough, bedding plane partings			
			NR	257.8' - Fracture or mechanical break, 70-80 deg			
264.0	R13-HQ 5 ft 44%	0	>10	257.9-258.4' - Fracture zone, fragments 1-2" in length		264.0' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), medium density, alternating zones of very fine grained and fine grained, voids (1/16") occur in horizontal zones up to 25% of surface, fossil molds and casts up to 1/2" in discrete zones 1/2-1" thick	R13: 7 minutes
			NR	259.0-259.4' - Coarse carbonate sand			
			NR	259.4-259.6' - Fractures (2), horizontal, rough, undulating, single full-core diameter, limestone, fracture faces on both ends			



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-01	SHEET 4 OF 17
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)
ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson
CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical
WATER LEVELS : 5.17 ft bgs on 9/13/07 START : 8/23/2007 END : 9/7/2007 LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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		
265 -223.0	R14-HQ 5 ft 0%	0	NR	259.6-261.2' - Fracture zone, limestone fragments 1/2" to 1-1/2" with 20% sand and fine gravel material		Limestone 259.0-261.2' - Same as 254.0-258.8' except extremely weak (R0), fractured during drilling process into silty sand/gravel-sized material No Recovery 261.2-269.0'	264.0': Driller's Remark: No loss of torque Tag bottom of hole at 268.5' Bit clear Mud pump on low (6 - 8 gallons per minute) Sand-sized limestone material in previous run - possible washout
269.0							
270 -228.0	R15-HQ 5 ft 32%	0	NR	269.0-269.6' - Fracture zone, limestone fragments; 1/2-2" diameter, <5% fines (sand-sized) 269.6-270.1' - Fracture zone, sandy gravel sized material 270.1' - Discontinuity with competent limestone, weak rock (R2) 270.3' - Fracture or mechanical break, horizontal, undulating, bedding plane fracture 270.6' - Mechanical break		Limestone Fragments 269.0-269.8' - yellowish gray, (5Y 7/2), mild HCl reaction, fine to medium gravel-sized fragments range in size from 1/4-2", fragments exhibit voids (1/16-1/8") over 10-25% of surface, cavities (up to 3/4") variable from trace to 15% Clayey Silt (ML) 269.8-270.0' - slow strong HCl reaction	
274.0							
275 -233.0	R16-HQ 5 ft 62%	0	NR	274.0-274.2' - Fracture zone, 3/4-1" limestone fragments 274.2, 274.5, 274.7' - Bedding plane (3), horizontal, smooth, planar, bedding plane fractures 274.7-275.1' - Fracture zone, 3/4" to 1-1/2" fragments 275.2' - Fracture or mechanical break, vertical, rough, undulating 275.4' - Contact between fractured limestone above and very weak limestone below 275.6-276.2' - Fracture zone, 1/4" to 1-1/2" fragments 276.2-277.1' - Fracture zone, limestone fragments 3-4" with sandy fine gravel sized pieces at end 279.0-280.7' - Fracture zone, 80% fragments 3/4" to 1-1/2", few larger fragments up to 3", undulating fracture surfaces		Limestone 270.0-270.6' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, extremely weak (R0), medium density, thinly bedded (1-2") with fine laminations (<1/16") between beds, voids (1/16") up to 30% in discrete horizontal zones 1/2" thick No Recovery 270.6-274.0' Limestone 274.0-275.8' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids (1/16") over 5% of surface concentrated in discrete horizontal zones (bedding plane fractures) Limestone Fragments 275.8-276.1' - very fine grained, with 1" thick bed of greenish gray (5G 6/1) limestone, very strong (R5), numerous cavities up to 7/8" on one side of bed (cannot determine bed orientation) Limestone 276.1-277.1' - yellowish gray, (5Y 7/2), fine to medium grained, mild HCl reaction, medium strong (R3), voids (1/16") over 15% of surface, larger cavities up to 1" over 10-15% of rock No Recovery 277.1-279.0'	R15: 11 minutes
279.0							
280 -238.0	R17-HQ 5 ft 34%	0	NR				
284.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-01	SHEET 5 OF 17
ROCK CORE LOG		

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ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

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WATER LEVELS : 5.17 ft bgs on 9/13/07 START : 8/23/2007 END : 9/7/2007 LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
285 -243.0	R18-HQ 5 ft 82%	22	>10	284.0-285.65' - Fracture zone, 70% fragments 1-3" in size, 30% 1/2-1" in size, thinly bedded (1/4" thick) smaller fragments; fragments exhibit bedding plane partings		Limestone Fragments 279.0-280.7' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), trace voids (1/16") over surface, fossil molds and casts over 10-15% surface of most fragments, 90% of fossil molds <3/8" in longest dimension, few molds up to 3/4", fragments from 279.0-279.1' contain only trace fossils (casts and molds) and exhibit smooth bedding plane fractures No Recovery 280.7-284.0' Limestone 284.0-284.3' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), HCl reaction on fresh (powdered) surface Limestone Fragments 284.3-284.7' - yellowish gray, (5Y 7/2), fine grained, weak (R2), very mild HCl reaction, moderate where pulverized, 5-10% voids (1/16") over surface, fossil molds and casts 1/4-3/4" over 25% of surface 284.7-285.7' - yellowish gray with light gray mottling, (5Y 7/2 and N7), fine grained, 50% fragments exhibit thin bedding plane partings (1/4-1/2" thick), light gray clayey seam at 284.7-285.0' Limestone 285.7-288.1' - light gray, (N7), very fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), mostly weak (R2), with thin zones of weaker (R1) material, voids (1/16-3/16") over 10-15% of surface, larger cavities/fossil molds up to 1/2" diameter over 15-20% of surface No Recovery 288.1-289.0' Limestone And Limestone Fragments 289.0-291.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction on powdered surface, weak to medium strong (R2 to R3), voids (1/16-1/8") over 15-25% of surface, trace cavities/fossil molds (up to 1/2"), extremely weak (R0) fractured soft material 290.4-290.7": silty, sandy gravel-sized limestone material No Recovery 291.1-294.0'	284.0-286.5': Note core barrel plugged after coring 2.5 feet. Pulled barrel and core, then cored second 2.5 feet with clean barrel. Upper portion of second run indicates material fell out of 1st run (cored twice). Combined cores for 5 foot interval. R18: combined run time: 15 minutes
			>10	285.65' - Fracture, 5 deg, smooth, with black staining			
			>10	286.1' - Fracture or mechanical break, horizontal, rough, undulating			
			3	286.1-286.4' - Fracture zone, 1/2-2" fragments			
	R19-HQ 5 ft 42%	7	NR	286.4' - Fractures, 45 deg, rough, undulating, intersecting fracture set (end of full core diameter limestone)		284.0-284.3' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), HCl reaction on fresh (powdered) surface Limestone Fragments 284.3-284.7' - yellowish gray, (5Y 7/2), fine grained, weak (R2), very mild HCl reaction, moderate where pulverized, 5-10% voids (1/16") over surface, fossil molds and casts 1/4-3/4" over 25% of surface 284.7-285.7' - yellowish gray with light gray mottling, (5Y 7/2 and N7), fine grained, 50% fragments exhibit thin bedding plane partings (1/4-1/2" thick), light gray clayey seam at 284.7-285.0' Limestone 285.7-288.1' - light gray, (N7), very fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), mostly weak (R2), with thin zones of weaker (R1) material, voids (1/16-3/16") over 10-15% of surface, larger cavities/fossil molds up to 1/2" diameter over 15-20% of surface No Recovery 288.1-289.0' Limestone And Limestone Fragments 289.0-291.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction on powdered surface, weak to medium strong (R2 to R3), voids (1/16-1/8") over 15-25% of surface, trace cavities/fossil molds (up to 1/2"), extremely weak (R0) fractured soft material 290.4-290.7": silty, sandy gravel-sized limestone material No Recovery 291.1-294.0'	R19: 11 minutes
289.0			NR	286.85' - Fracture or mechanical break, 45 deg, rough, undulating			
			>10	287.3' - Fracture, 45 deg, rough, undulating			
			>10	287.7' - Fracture, 5 deg, rough, undulating, soft material			
290 -248.0	R20-HQ 5 ft 58%	18	NR	287.9' - Fracture, horizontal, rough, undulating, stepped (1/4" relief)		284.0-284.3' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), HCl reaction on fresh (powdered) surface Limestone Fragments 284.3-284.7' - yellowish gray, (5Y 7/2), fine grained, weak (R2), very mild HCl reaction, moderate where pulverized, 5-10% voids (1/16") over surface, fossil molds and casts 1/4-3/4" over 25% of surface 284.7-285.7' - yellowish gray with light gray mottling, (5Y 7/2 and N7), fine grained, 50% fragments exhibit thin bedding plane partings (1/4-1/2" thick), light gray clayey seam at 284.7-285.0' Limestone 285.7-288.1' - light gray, (N7), very fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), mostly weak (R2), with thin zones of weaker (R1) material, voids (1/16-3/16") over 10-15% of surface, larger cavities/fossil molds up to 1/2" diameter over 15-20% of surface No Recovery 288.1-289.0' Limestone And Limestone Fragments 289.0-291.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction on powdered surface, weak to medium strong (R2 to R3), voids (1/16-1/8") over 15-25% of surface, trace cavities/fossil molds (up to 1/2"), extremely weak (R0) fractured soft material 290.4-290.7": silty, sandy gravel-sized limestone material No Recovery 291.1-294.0'	SC-1 collected at 294.0-294.91'
			NR	289.0-289.15' - Fracture zone, fragments 3/4" to 1-1/2"			
			NR	289.15' - Silty sand material on fracture surface of full core diameter limestone piece			
			NR	289.6' - Fracture, 10 deg, undulating, very rough			
295 -253.0	R21-HQ 5 ft 78%	29	1	289.7-290.1' - Fracture zone, fragments 1-3" in size		284.0-284.3' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), HCl reaction on fresh (powdered) surface Limestone Fragments 284.3-284.7' - yellowish gray, (5Y 7/2), fine grained, weak (R2), very mild HCl reaction, moderate where pulverized, 5-10% voids (1/16") over surface, fossil molds and casts 1/4-3/4" over 25% of surface 284.7-285.7' - yellowish gray with light gray mottling, (5Y 7/2 and N7), fine grained, 50% fragments exhibit thin bedding plane partings (1/4-1/2" thick), light gray clayey seam at 284.7-285.0' Limestone 285.7-288.1' - light gray, (N7), very fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), mostly weak (R2), with thin zones of weaker (R1) material, voids (1/16-3/16") over 10-15% of surface, larger cavities/fossil molds up to 1/2" diameter over 15-20% of surface No Recovery 288.1-289.0' Limestone And Limestone Fragments 289.0-291.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction on powdered surface, weak to medium strong (R2 to R3), voids (1/16-1/8") over 15-25% of surface, trace cavities/fossil molds (up to 1/2"), extremely weak (R0) fractured soft material 290.4-290.7": silty, sandy gravel-sized limestone material No Recovery 291.1-294.0'	R20: 8 minutes
			>10	290.15-290.4' - Fractures (2), horizontal, rough, undulating, fractures on both of ends of single core diameter limestone			
			>10	290.4-290.7' - Fracture zone, 3/4-1" fragments with soft sandy material			
			NR	290.7-291.1' - Fractures, undulating, partial full core diameter limestone rock; vertical fracture surfaces intersected by 45 deg fracture set			
	R21-HQ 5 ft 78%	29	NR	294.95' - Fracture, 45 deg, rough, undulating		284.0-284.3' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), HCl reaction on fresh (powdered) surface Limestone Fragments 284.3-284.7' - yellowish gray, (5Y 7/2), fine grained, weak (R2), very mild HCl reaction, moderate where pulverized, 5-10% voids (1/16") over surface, fossil molds and casts 1/4-3/4" over 25% of surface 284.7-285.7' - yellowish gray with light gray mottling, (5Y 7/2 and N7), fine grained, 50% fragments exhibit thin bedding plane partings (1/4-1/2" thick), light gray clayey seam at 284.7-285.0' Limestone 285.7-288.1' - light gray, (N7), very fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), mostly weak (R2), with thin zones of weaker (R1) material, voids (1/16-3/16") over 10-15% of surface, larger cavities/fossil molds up to 1/2" diameter over 15-20% of surface No Recovery 288.1-289.0' Limestone And Limestone Fragments 289.0-291.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction on powdered surface, weak to medium strong (R2 to R3), voids (1/16-1/8") over 15-25% of surface, trace cavities/fossil molds (up to 1/2"), extremely weak (R0) fractured soft material 290.4-290.7": silty, sandy gravel-sized limestone material No Recovery 291.1-294.0'	R21: 11 minutes
			NR	294.95-296.9' - Fracture zone, 2-3" fragments to 296.0' then rock becomes extremely weak and fractures into silt, sand, and fine gravel sized pieces (<3/4")			
299.0			NR	299.0-299.1' - Fracture zone, fragments 1-3" in size			
			NR	299.15-299.4' - Fractures (2), horizontal, rough, undulating, fractures on both of ends of single core diameter limestone			
300 -258.0	R21-HQ 5 ft 78%	29	2	299.4-299.7' - Fracture zone, 3/4-1" fragments with soft sandy material		284.0-284.3' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), HCl reaction on fresh (powdered) surface Limestone Fragments 284.3-284.7' - yellowish gray, (5Y 7/2), fine grained, weak (R2), very mild HCl reaction, moderate where pulverized, 5-10% voids (1/16") over surface, fossil molds and casts 1/4-3/4" over 25% of surface 284.7-285.7' - yellowish gray with light gray mottling, (5Y 7/2 and N7), fine grained, 50% fragments exhibit thin bedding plane partings (1/4-1/2" thick), light gray clayey seam at 284.7-285.0' Limestone 285.7-288.1' - light gray, (N7), very fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), mostly weak (R2), with thin zones of weaker (R1) material, voids (1/16-3/16") over 10-15% of surface, larger cavities/fossil molds up to 1/2" diameter over 15-20% of surface No Recovery 288.1-289.0' Limestone And Limestone Fragments 289.0-291.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction on powdered surface, weak to medium strong (R2 to R3), voids (1/16-1/8") over 15-25% of surface, trace cavities/fossil molds (up to 1/2"), extremely weak (R0) fractured soft material 290.4-290.7": silty, sandy gravel-sized limestone material No Recovery 291.1-294.0'	R21: 11 minutes
			1	300.3' - Fracture, horizontal, with loose material; top of dark black (organic) silt clay seam (1" thick)			
			>10	301.1' - Fractures (2), rough, undulating, vertical and horizontal intersecting fractures, possible mechanical break			
			>10	301.1-301.4' - Fracture zone, gravel sized limestone fragments (1/4-3/4") with silty sandy fines			
	R21-HQ 5 ft 78%	29	NR	301.7' - Fractures, vertical, rough, undulating, intersecting fracture set in 3-1/2" core piece		284.0-284.3' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), HCl reaction on fresh (powdered) surface Limestone Fragments 284.3-284.7' - yellowish gray, (5Y 7/2), fine grained, weak (R2), very mild HCl reaction, moderate where pulverized, 5-10% voids (1/16") over surface, fossil molds and casts 1/4-3/4" over 25% of surface 284.7-285.7' - yellowish gray with light gray mottling, (5Y 7/2 and N7), fine grained, 50% fragments exhibit thin bedding plane partings (1/4-1/2" thick), light gray clayey seam at 284.7-285.0' Limestone 285.7-288.1' - light gray, (N7), very fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), mostly weak (R2), with thin zones of weaker (R1) material, voids (1/16-3/16") over 10-15% of surface, larger cavities/fossil molds up to 1/2" diameter over 15-20% of surface No Recovery 288.1-289.0' Limestone And Limestone Fragments 289.0-291.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction on powdered surface, weak to medium strong (R2 to R3), voids (1/16-1/8") over 15-25% of surface, trace cavities/fossil molds (up to 1/2"), extremely weak (R0) fractured soft material 290.4-290.7": silty, sandy gravel-sized limestone material No Recovery 291.1-294.0'	R21: 11 minutes
304.0			NR	301.7' - Fractures, vertical, rough, undulating, intersecting fracture set in 3-1/2" core piece			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 6 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
305 -263.0	R22-HQ 5 ft 91%	9	>10	301.9-302.9' - Fracture zone, silty sandy material with gravel sized (1/4-3/4") limestone fragments (25%)		Limestone And Limestone Fragments 294.0-295.2' - yellowish gray to grayish yellow, (5Y 7/2 to 5Y 8/4), strong HCl reaction, extremely weak to very weak (R0 to R1), intact core from 294.0-294.9': finely laminated with darker laminae (1/16" thick) spaced 1/2-1" apart Limestone Fragments 295.2-296.2' - Same as 294.0-295.2' except voids (1/16-1/8") over 5-10% of surface, trace cavities up to 1/2" diameter 296.2-296.9' - Same as 294.0-295.2' except moderate HCl reaction, extremely weak (R0), fractured into silty sandy gravel-sized material 25% gravel / 75% coarse to fine-grained silt and sand-sized particles No Recovery 296.9-299.0' Limestone 299.0-300.3' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), moderate HCl reaction, extremely weak (R0), fragments with preferred horizontal orientation (yellowish gray) with fine grained light olive gray matrix material, fragments up to 1" in longest dimension, finely laminated Clay (CL) 300.3-300.5' - dark black, no HCl reaction, finely laminated, organic Limestone 300.5-301.9' - yellowish gray, (5Y 7/2), fine grained, extremely weak (R0), dark gray/black blebs covering 5-10% of surface, dark brown staining on few fracture surfaces 301.9-302.9' - Same as 300.5-301.9' except fractured into silt and gravel-sized limestone fragments No Recovery 302.9-304.0' Limestone 304.0-307.8' - yellowish gray, (5Y 7/2), fine grained, slow strong HCl reaction, extremely weak to weak (R0 to R2), with dark gray blebs up to 1/2" in size 307.8-308.55' - light olive gray, (5Y 5/2), strong HCl reaction, medium strong (R3), sharp contact with yellowish gray limestone above, finely laminated 307.8-307.9', voids 1/16" over 30-40% of surface, few larger cavities up to 3/8" (<2%) No Recovery 308.55-309.0'	R22: 12 minutes
			>10	304.0-304.7' - Fracture zone, extremely weak silt-sized material			
			>10	305.1, 305.2, 305.35, 305.7' - Fractures or mechanical break (4), horizontal, slightly rough to smooth, weak rock, possible bedding planes			
			2	305.7-305.9' - Fragments (1/2-1")			
			1	305.9-306.5' - Fracture zone, extremely fractured zone slightly healed (intact core piece)			
309.0	R23-HQ 5 ft 76%	22	NR	306.5-307.0' - Fracture zone, 1-3" fragments		R23: 11 minutes	
			>10	307.3, 307.6, 307.9, 308.0' - Fractures (4), horizontal, rough, undulating, partially stepped (1/4" relief)			
			1	309.0-310.3' - Fracture zone, 3/4-3" fragments			
			2	310.9, 311.2, 311.4, 312.1, 312.4, 312.6' - Fractures or mechanical break (6), horizontal, rough, undulating			
			3				
314.0	R24-HQ 5 ft 94%	20	NR			R24: 8 minutes	
			>10	314.0-316.5' - Fracture zone, 1-3" limestone fragments			
			>10				
			>10	316.8' - Fracture, 45 deg, rough, undulating			
			>10	317.0' - Fracture, 50 deg, rough, undulating, tight			
	R25-HQ 5 ft 82%	37	2	317.5' - Fracture or mechanical break, horizontal, rough, undulating		R25: 9 minutes	
			NR	317.5-317.8' - Fracture zone, silty material with gravel sized fragments (3/4")			
			5	318.1' - Fracture, 15 deg, rough, undulating			
			>10	318.3' - Fracture or mechanical break, horizontal, rough, undulating			
			>10	319.3, 319.4, 319.6, 319.7, 319.85' - Fractures (5), horizontal, rough, undulating, bedding plane partings 2-4"			
320 -278.0			>10	320.2-321.8' - Fracture zone			
			>10				
			2	321.8' - Contact with competent limestone			
			NR	322.1' - Fracture, horizontal, stepped, (1/4" relief)			
			NR	322.7' - Fracture or mechanical break, horizontal, rough, undulating			
324.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 7 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
325 -283.0	R26-HQ 5 ft 14%	0	>10 NR	324.0-324.7' - Fracture zone, 1" to 1-1/2" fragments; 324.0-324.2' thin very weak fractured silty material		Limestone 309.0-311.5' - yellowish gray, (5Y 7/2), weak (R2), very strong HCl reaction, voids (1/16-1/8") variable 10-30% of surface concentrated in zones preferentially oriented along horizontal bedding planes 311.5-312.1' - Same as 309.0-311.5' except pale yellowish brown, (10YR 6/2) 312.1-312.8' - Same as 309.0-311.5' except more fragmented, color becoming pale yellowish brown (5YR 5/2) at 317.0' No Recovery 312.8-314.0' Limestone 314.0-318.7' - Same as 309.0-311.5' except more fragmented, color becoming pale yellowish brown (5YR 5/2) at 317.0' No Recovery 318.7-319.0' Limestone 319.0-321.8' - pale yellowish brown with zones of yellowish gray, (5Y 5/2 with 5Y 7/2), strong HCl reaction, very weak (R1), grading to fractured material 320.2-321.8', voids (1/16") over 25-30% of surface, trace cavities up to 3/8" 321.8-323.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), finely laminated (1/16") 321.8-322.2' No Recovery 323.1-324.0' Limestone Fragments 324.0-324.2' - very light gray, (N8), fine grained, strong HCl reaction, strong to very strong (R4 to R5), voids/fossil molds (1/16-3/16") over 15-20% of surface Fractured Limestone 324.2-324.7' - yellowish gray, fine grained, very strong HCl reaction, extremely weak (R0), with fine gravel-sized limestone fragments (1/4-1/2"), dark brown organic material (<2%) No Recovery 324.7-329.0' Sandy Silt To Gravelly Silt (ML) 329.0-329.4' - yellowish gray, (5Y 7/2), moist, moderate to strong HCl reaction, >50% silt with <50% limestone fragments as sand to gravel-sized fraction Limestone 329.4-330.4' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), trace fossil fragments, strong organic odor	Driller's Remark: No loss of torque during drilling; wash out fine soft material possible R26: 10 minutes
330 -288.0	R27-HQ 5 ft 70%	19	>10 >10 >10 0 NR	329.0-329.4', 330.4-331.15', 331.7-331.95' - Silt intervals 329.6, 329.95, 330.4, 331.15, 331.5, 331.7, 331.95' - Bedding plane fractures, mechanical breaks, or silt contacts (7), <10 deg, smooth to rough		319.0-321.8' - pale yellowish brown with zones of yellowish gray, (5Y 5/2 with 5Y 7/2), strong HCl reaction, very weak (R1), grading to fractured material 320.2-321.8', voids (1/16") over 25-30% of surface, trace cavities up to 3/8" 321.8-323.1' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), finely laminated (1/16") 321.8-322.2' No Recovery 323.1-324.0' Limestone Fragments 324.0-324.2' - very light gray, (N8), fine grained, strong HCl reaction, strong to very strong (R4 to R5), voids/fossil molds (1/16-3/16") over 15-20% of surface Fractured Limestone 324.2-324.7' - yellowish gray, fine grained, very strong HCl reaction, extremely weak (R0), with fine gravel-sized limestone fragments (1/4-1/2"), dark brown organic material (<2%) No Recovery 324.7-329.0' Sandy Silt To Gravelly Silt (ML) 329.0-329.4' - yellowish gray, (5Y 7/2), moist, moderate to strong HCl reaction, >50% silt with <50% limestone fragments as sand to gravel-sized fraction Limestone 329.4-330.4' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), trace fossil fragments, strong organic odor	C. Sump and R. Bitely logging R27: 7 minutes
335 -293.0	R28-HQ 5.5 ft 100%	55	3 4 1 1 2 0	334.25, 334.6, 334.85, 335.15, 335.45, 335.65, 335.9, 336.25, 337.5, 338.3, 338.65' - Fractures (11), <10 deg, rough, undulating, bedding plane fractures or mechanical breaks, tight to <1/2" open 336.5' - Mechanical break		324.0-324.2' - very light gray, (N8), fine grained, strong HCl reaction, strong to very strong (R4 to R5), voids/fossil molds (1/16-3/16") over 15-20% of surface Fractured Limestone 324.2-324.7' - yellowish gray, fine grained, very strong HCl reaction, extremely weak (R0), with fine gravel-sized limestone fragments (1/4-1/2"), dark brown organic material (<2%) No Recovery 324.7-329.0' Sandy Silt To Gravelly Silt (ML) 329.0-329.4' - yellowish gray, (5Y 7/2), moist, moderate to strong HCl reaction, >50% silt with <50% limestone fragments as sand to gravel-sized fraction Limestone 329.4-330.4' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), trace fossil fragments, strong organic odor	R28: 9 minutes SC-2 collected at 338.6-339.4'
340 -298.0	R29-HQ 4.5 ft 100%	53	>10 >5 2 2 1	339.9, 340.1' - Fractures (2), <10 deg, smooth, undulating, bedding plane fractures or mechanical breaks 340.1-340.75' - Fracture zone, rough, undulating, gravel sized fragments <3" diameter 341.35, 341.5, 341.65, 343.65' - Fractures or mechanical break (4), <10 deg, rough, undulating, bedding plane fractures or mechanical breaks, tight to open <1/2" 342.25-342.3' and 343.15-343.45' - Clay seams and silt seams		329.0-329.4' - yellowish gray, (5Y 7/2), moist, moderate to strong HCl reaction, >50% silt with <50% limestone fragments as sand to gravel-sized fraction Limestone 329.4-330.4' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), trace fossil fragments, strong organic odor	6" of R29 at end of R28 run; adjust R28 to 5.5' and R29 to 4.5' to accommodate R29: 7 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 8 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
345 -303.0	R30-HQ 5 ft 100%	77	1	344.4, 345.25, 345.5, 345.75, 346.0, 346.5, 346.75, 348.3' - Fractures (8), 40 deg, bedding plane fractures or mechanical breaks, smooth to rough, undulating		Sandy To Gravelly Silt (ML) 330.4-331.15' - Same as 329.0-329.4'	Driller's Remark: 100% circulation J. Burkard and C. Sump logging SC-3 collected at 344.4- 345.25'
			4			Limestone 331.15-331.7' - Same as 329.4-330.4'	
			2			Sandy To Gravelly Silt (ML) 331.7-331.95' - Same as 329.0-329.4'	
			0			Limestone 331.95-332.5' - Same as 329.4-330.4'	
			1			No Recovery 332.5-334.0' Limestone 334.0-339.5' - yellowish gray, (5Y 7/2), very fine to medium grained, strong HCl reaction, very weak to medium strong (R1 to R3), voids <1/16" over <30% of surface, highly variable, trace bedding plane of 30 deg, trace bedding plane 40 deg, trace inclusion clasts 339.5-340.05' - very light gray to yellowish gray, (N8 to 5Y 8/1), very fine to medium grained, strong HCl reaction, extremely weak to weak (R0 to R2), highly variable, increasing organic laminations with depth to mildly to moderately competent organic lens, olive gray to dark gray (5Y 4/1 to N3), very fine to fine grained, extremely weak (R0), no apparent HCl reaction on organic material, mild reaction on limestone in section, 10-20% limestone probably due to boxing, limestone same as 340.05-344.0' 340.05-344.0' - Same as 339.5-340.5' except strong HCl reaction, very weak to weak (R1 to R2), trace voids <1/16" intermittent over surface, trace laminated organics, variable hardness, variable grain sizes, trace fossil structure, trace mottled coloration, silt seam at 342.25-342.3' and clay seam at 343.15-343.45', carbonate derived, friable, nonplastic silts and moderately to highly plastic clays 344.0-349.0' - very light gray with yellowish gray mottling, (N8 and 5Y 8/1), very fine grained, moderate to strong HCl reaction, very weak to medium strong (R1 to R3), trace voids <1/16" over surface, trace fossil casts, few cavities <1"x1/4" 349.0-350.3' - yellowish gray, (5Y 8/1), fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), few cavities <1"x1/4"	
350 -308.0	R31-HQ 5 ft 94%	50	2	349.6, 349.8' - Mechanical break (2), 10-30 deg, rough, undulating 350.2-351.7' - Fracture zone, rough, undulating, multiple breaks with sharp angular fragments, no visible orientation 352.7' - Fracture, 70-80 deg, rough, undulating, tight			08/29/07 16:30 Stop drilling AD-1 for shift. Remove core barrel for geophysical logging R30: 7 minutes 09/05/07 10:00 Start drilling at the beginning of the shift R31: 8 minutes
			>10				
			>10				
			1				
			0				
355 -313.0	R32-HQ 5 ft 100%	95	NR				
			1	354.6, 355.2, 356.0, 356.5, 357.5, 358.2, 358.7, 358.8' - Mechanical break (8), horizontal to 10 deg, rough to smooth, undulating 359.7, 359.8, 361.2, 361.9, 362.0, 362.5, 363.1' - Mechanical break (7), horizontal to 15 deg, rough to smooth, undulating 360.3-360.7' - Horizontal bedding plane followed by a fracture zone composed of very weak (R1) rock fragments 362.7-363.1' - Fracture, 70-80 deg, rough, undulating, trace stain			R32: 7 minutes R33: 7 minutes
			2				
			1				
			1				
			3				
360 -318.0	R33-HQ 5 ft 90%	60	2				
			>10				
			2				
			4				
			1				
			NR				



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-01	SHEET 9 OF 17
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07 START : 8/23/2007 END : 9/7/2007 LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
365 -323.0	R34-HQ 5 ft 98%	35	1	364.5, 365.0, 365.3, 365.6, 365.9, 366.3, 367.3, 367.6, 368.3' - Mechanical break (9), horizontal to 10 deg, rough to smooth, undulating		350.3-351.0' - yellowish gray, (5Y 7/2), very fine grained, mild HCl reaction, very weak to weak (R1 to R2), <1/16" thick laminar bedding planes	Driller's Remark: loss of circulation at 366.8'
			5	364.6-366.5' - Silt-size particle infill		351.0-351.7' - yellowish gray transition to pale blue, (5Y 7/2 to 5B 6/2), fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), visible casts and molds	
			>10	366.5-367.0' - Fracture zone, angular fragments up to 1/2"x1" in size		351.7-353.7' - yellow gray, (5Y 8/1), fine grained, mild HCl reaction, very weak to weak (R1 to R2), no casts or molds	
			2			No Recovery 353.7-354.0' Limestone	
			2			354.0-358.4' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), fine to medium grained, mild to moderate delayed HCl reaction, very weak to weak (R1 to R2), moderately fossiliferous (casts and molds), <1/16" voids cover 20-50% of surface, solution cavities 1/8"x1"	
370 -328.0	R35-HQ 5 ft 96%	55	NR	369.7, 370.3, 371.4' - Fractures (3), horizontal to 40 deg, rough to smooth, undulating, no stain, no infill		358.4-359.0' - yellowish gray, (5Y 7/2), fine to very fine grained, moderate to strong delayed HCl reaction, weak to medium strong (R2 to R3), <1/16" voids covering <5% of surface	R34: 7 minutes
			1	370.7-370.9' - Fracture zone, with clay size particle infill		359.0-361.3' - very pale orange, (10YR 8/2), very fine to fine grained, moderate HCl reaction, very weak to weak (R1 to R2), trace voids 1/16" on surface, mildly fossiliferous (casts and molds), 360.4' undulating bedding plane 1/4" thick, dark yellowish brown (10YR 4/2)	R35: 7 minutes
			>10	372.4-373.4' - Fracture zone, top of zone along a smooth bedding plane, bottom section is rough and undulating		361.3-362.4' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to strong delayed HCl reaction, contains silt-sized particles between breaks	T. Borton and J. Burkard logging
			>10			362.4-363.5' - grayish yellow, (5Y 8/4), fine to medium grained, strong HCl reaction, solution cavities 1/8"x1/2"	
375 -333.0	R36-HQ 5 ft 100%	67	NR	374.2-374.5' - Fracture zone, no visible orientation, gravels 1/2", angular to subangular		No Recovery 363.5-364.0' Limestone	
			3	375.3-376.1' - Fracture, 80 deg, rough, undulating, 9-9/16" length visible		364.0-364.6' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), fine to medium grained, delayed HCl reaction, very weak to weak (R1 to R2), 1/16" voids cover 10-20% of surface, few cavities 1/4"x1/2"	
			2	375.5, 375.7, 376.1, 377.6, 378.3' - Fractures or mechanical break (5), horizontal, rough, undulating		364.6-366.5' - dusky yellow, (5Y 6/4), very fine to fine grained, delayed mild to strong HCl reaction, very weak to weak (R1 to R2), laminar bedding 1/8" planes throughout the section	
			1	376.8' - Fracture or mechanical break, horizontal, smooth			R36: 5 minutes
			1				
380 -338.0	R37-HQ 5 ft 82%	60	>10	379.2-379.4' - Fracture zone, subangular fragments, 1" length or less			
			>10	379.9' - Fracture or mechanical break, horizontal, smooth			
			3	380.1-380.6' - Fracture zone, subangular fragments, 1" length or less, no visible orientation between fractures			SC-4 collected at 381.7-382.8'
			1	380.1' - Fracture, horizontal, rough, undulating			
			1	380.6' - Fracture, 35 deg, rough			
			NR	381.0' - Fracture, <5 deg, rough, undulating			
				381.2, 381.7' - Fractures (2), horizontal, rough, undulating			R37: 5 minutes
				382.7' - Fracture, 50 deg, rough, undulating			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 10 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
385 -343.0	R38-HQ 5 ft 74%	13	>10	384.0-385.0' - Fracture zone, rough, undulating, no visible orientation, angular fragments up to 1" length		366.5-368.9' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), highly fossiliferous (molds and casts), two casts at 368.4' (bivalve crinoids, 1"), solution cavities 1/4"x1"	R38: 6 minutes
			1	385.3' - Fracture or mechanical break, horizontal, rough, undulating, 20% of fractured plane stained black		No Recovery 368.9-369.0' Limestone	
			>10	385.8-387.7' - Fracture zone, no visible orientation, angular fragments up to 2" in length		369.0-372.3' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to very fine grained, strong HCl reaction, very weak to weak (R1 to R2), moderately fossiliferous (casts and molds), 369.0-370.2': 1/16" voids 20-40% of surface, 370.2-372.3': 1/16" voids covering up to 0-10% of surface	
			>10			372.3-373.8' - yellowish gray, (5Y 7/2), fine to medium grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), moderately fossiliferous (casts and molds), solution cavities 1/2"x1" in size	
390 -348.0	R39-HQ 5 ft 90%	48	NR			No Recovery 373.8-374.0' Limestone	R39: 7 minutes
			>10	389.4' - Fracture zone, no visible orientation, subangular fragments up to 1/2" length		374.0-378.5' - transitions from grayish yellow to dusky yellow, (5Y 8/4 to 5Y 6/4), fine to medium grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), voids to <1/16" over 10-20% of surface, moderately fossiliferous (casts and molds)	
			1	389.9' - Fracture or mechanical break, horizontal, rough, undulating		378.5-379.0' - bluish white, (5B 9/1), fine grained, delayed strong HCl reaction, weak (R2), voids to <1/16" over 30-50% of surface	
			4	390.5' - Fracture, horizontal, smooth, possible mechanical break		379.0-380.6' - yellowish gray, (5Y 8/1), fine to medium grained, delayed moderate to strong HCl reaction, very weak to weak (R1 to R2), planar laminations, trace fossils	
	R40-HQ 5 ft 100%	43	3	391.0, 391.1' - Fractures (2), horizontal, smooth, bedding plane parting		380.6-383.1' - Same as 378.5-379.0' except yellowish gray, (5Y 7/2)	R40: 7 minutes
			3	391.5, 391.8, 392.0, 392.3, 392.4' - Fractures (5), horizontal, smooth, undulating		No Recovery 383.1-384.0' Limestone	
			3	393.1, 393.2' - Fractures (2), horizontal, smooth, undulating, bedding plane parting		384.0-385.0' - yellowish gray, (5Y 7/2), fine to medium grained, moderate HCl reaction, weak (R2), voids to <1/16" over 20-30% of surface	
			NR	393.3' - Fracture or mechanical break, horizontal, rough, undulating		385.0-386.0' - light bluish gray, (5B 7/1), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), trace organics	
			3	394.3, 394.4, 394.7' - Fractures (3), horizontal, smooth, bedding plane parting			
			>10	395.0, 395.2' - Fractures (2), horizontal, rough, undulating			
395 -353.0	R41-HQ 5 ft 74%	37	2	395.4-395.7' - Fracture zone, no visible orientation, subangular fragments up to 1"			R41: 5 minutes
			2	395.9' - Fracture, horizontal, rough			
			2	396.2' - Fracture, <5 deg, rough, undulating			
			3	396.6, 396.8, 397.8' - Fractures (3), horizontal, rough, undulating			
			3	398.4' - Fracture, horizontal to 10 deg, smooth, undulating			
			4	399.2, 399.4, 399.6' - Fractures (3), <10 deg, rough, undulating			
400 -358.0	R41-HQ 5 ft 74%	37	3	399.9' - Fracture, horizontal, smooth, undulating			
			2	400.1, 400.2' - Fractures (2), horizontal, rough, undulating, bedding parting			
			1	400.6' - Fracture or mechanical break, horizontal, rough, undulating			
			NR	401.0' - Fracture or mechanical break, horizontal, smooth, undulating			
				401.8, 402.1' - Fractures (2), horizontal, smooth, undulating			
404.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 11 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
405 -363.0	R42-HQ 5 ft 100%	60	2	404.3' - Fracture, <5 deg, rough, undulating		386.0-387.7' - yellowish gray, (5Y 7/2), fine to medium grained, delayed mild to moderate HCl reaction, weak (R2), layered organics, laminae visible, voids to 1/16" over 20-30% of surface, possible cross bedding No Recovery 387.8-389.0' Limestone 389.0-391.5' - very pale orange, (10YR 8/2), fine to medium grained, delayed mild to moderate HCl reaction, very weak (R1), voids to <1/16" over 0-10% of surface 391.5-393.5' - yellowish gray, (5Y 8/1), fine to medium grained, delayed mild to moderate HCl reaction, very weak (R1), trace surface voids (<1/16"), 393.1': chert lens 0.05" No Recovery 393.5-394.0' Limestone 394.0-395.2' - pale greenish yellow, (10Y 8/2), fine grained, strong HCl reaction, very weak (R1), <1/16" voids over 0-5% of surface 395.2-396.8' - Same as 394.0-395.2' except fine to medium grained, moderate to strong HCl reaction, voids to <1/16" over 10-20% of surface 396.8-399.8' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2), voids to <1/16" over 20-30% of surface 399.8-402.7' - Same as 395.2-396.8' except yellowish gray, (5Y 8/1), fine grained, delayed strong HCl reaction No Recovery 402.7-404.0' Limestone 404.0-407.4' - yellowish gray, (5Y 8/1), fine to medium grained, delayed strong HCl reaction, very weak (R1), voids up to <1/16" over 0-5% of surface 407.4-409.4' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to medium grained, mild to moderate HCl reaction, weak (R2), trace voids <1/16", fine scale laminar and planar bedding 409.4-410.45' - yellowish gray with undulating laminae of olive gray, (5Y 8/1 and 5Y 4/1), fine to medium grained, mild HCl reaction, extremely weak to very weak (R0 to R1), voids to <1/16" over 0-5% of surface, delayed HCl reaction but strong reaction when pulverized, undulating laminations	0.3' of core placed in box with R41 Mechanical break at bottom of 0.3' is horizontal and smooth SC-5 collected at 404.75-405.55' R42: 10 minutes
			1	404.9, 405.7' - Fractures or mechanical break (2), horizontal, smooth			
			2	406.4' - Fracture, <10 deg, rough, undulating			
			3	406.7' - Fracture, 20 deg, rough, undulating			
			5	407.0' - Fracture, horizontal, smooth, undulating 407.2' - Fracture, horizontal, smooth 407.7-407.9' - Fracture, horizontal, rough, undulating, fine to very fine grained			
410 -368.0	R43-HQ 5 ft 72%	40	>10	408.0' - Fracture, <5 deg, rough, undulating 408.3' - Fracture, 10 deg, rough, undulating 408.7' - Fracture, horizontal, rough, undulating 408.9' - Fracture or mechanical break, <10 deg, rough, undulating, bedding plane parting		R43: 10 minutes	
			1	409.0' - Fracture or mechanical break, <10 deg, smooth, undulating			
			>10	409.3' - Fracture zone, horizontal orientation of fragments up to 1-3/16"			
			1	409.6' - Fracture, horizontal, smooth, bedding plane parting			
415 -373.0	R44-HQ 5 ft 88%	18	NR	410.4' - Fracture or mechanical break, horizontal, rough, undulating 411.1-411.5' - Fracture zone, no visible orientation, one fragment 2-3/8", most <1-3/16", subangular, silty clay size, fine to very fine fill		R44: 8 minutes	
			>10	411.9' - Fracture, horizontal, smooth, undulating			
			1	412.5' - Fracture or mechanical break, 5 deg, rough, undulating			
			>10	414.3-414.6' - Fracture zone, no visible orientation, fragments up to 2-3/8", subangular, silt/clay intermixed with limestone fragments			
			>10	414.9-415.0' - Fracture zone, no visible orientation, fragments up to 5/8", subangular			
420 -378.0	R45-HQ 5 ft 42%	17	NR	415.4' - Fracture, horizontal, rough, undulating, lithologic discontinuity 416.0, 416.05, 416.1, 416.2, 416.35' - Fractures (5), horizontal, rough, undulating, bedding plane partings		Driller did not note a change in drilling patterns (no given reason for low recovery) R45: 10 minutes	
			>10	416.5' - Mechanical break			
			>10	416.8-416.9' - Fracture zone, no visible orientation, fragments up to <5/8", subangular to angular			
			NR	417.4' - Fracture, <5 deg, rough, undulating, trace fill			
			NR	417.8-418.1' - Fracture zone, no visible orientation, fragments up to 1-7/8", trace fine to very fine grained fill			
424.0				419.0-419.9' - Fracture zone, no visible orientation, fragments up to 2-3/8", subround, fine to very fine fill 419.9' - Fracture, 10-20 deg, smooth			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 12 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
425 -383.0	R46-HQ 5 ft 88%	30	>10	420.2-420.6' - Fracture zone, <10 deg at 420.2', no visible orientation elsewhere; fragments up to 2-3/8", mostly smaller varying sizes, trace dark brown-black staining		410.45-412.6' - yellowish gray, (5Y 7/2), fine to medium grained, delayed mild HCl reaction, very weak (R1), trace voids <1/16"	424.4': Man-made break
			>10	424.7-424.9' - Fracture zone, no visible orientation, subangular fragments up to <5/8", fine to very fine grained fill		No Recovery 412.6-414.0' Limestone	
			>10	425.3-425.5' - Fracture zone, no visible orientation, fragments up to 1-3/16", angular, trace very fine fill		414.0-414.5' - Same as 410.45-412.6'	
			1	425.8-426.2' - Fracture zone, large fragments up to 3", possible multiple mechanical breaks		414.5-415.3' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), medium grained, mild to moderate HCl reaction, very weak (R1), voids to <1/16" over 10-20% of surface	R46: 12 minutes
			>10	426.4-427.0' - Fracture zone, fragments up to 4", subangular to angular, multiple mechanical breaks during extraction		Silty Clay (CL-ML)	
429.0	R47-HQ 4 ft 100%	46	NR	427.2' - Mechanical break		415.3-415.9' - dark greenish gray transition to greenish gray, (5GY 4/1 to 5GY 6/1), very fine to fine grained, no HCl reaction, extremely weak (R0)	429.5' and 429.8': Man-made breaks
			1	427.5' - Fracture, horizontal, smooth, bedding plane parting		Limestone	Only able to obtain 4.0' run due to core blockage
			>10	427.8-428.4' - Fracture zone or mechanical break, fragments up to 3", trace dark gray/blue staining		415.9-418.4' - yellowish gray, (5Y 8/1), fine to medium grained, very weak (R1), moderate to strong HCl reaction where pulverized	
			>10	429.5' - Fracture, horizontal, smooth, undulating, bedding plane parting		No Recovery 418.4-419.0' Limestone	R47: 12 minutes
			>10	430.1-430.2' - Fracture zone, no visible orientation, fragments up to 1-3/16", trace fine to very fine infill		419.0-419.9' - yellowish gray, (5Y 7/2), fine to medium grained, weak to medium strong (R2 to R3), strong HCl reaction when pulverized, clays are very fine to fine grained, extremely weak (R0), no HCl reaction, medium plasticity	
433.0	R48-HQ 6 ft 100%	56	2	430.7' - Fracture, horizontal, smooth, undulating, bedding plane parting		Limestone	SC-6 collected at 435.3-436.2'
			2	430.85' - Fracture, 80 deg, rough, undulating		419.9-421.1' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), fine grained, slightly delayed strong HCl reaction, weak to medium strong (R2 to R3), <1/16" voids on 10-20% of surface	
			1	431.0' - Fracture, horizontal, smooth, bedding plane parting		No Recovery 421.1-424.0' Limestone	
			3	431.5' - Fracture, 45 deg, rough, undulating, fragments of quartz up to 1/2", angular to subangular		424.0-424.7' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids <1/16" on surface 10-20%	R48: 20 minutes
			>10	431.9-433.0' - Fracture zone, no visible orientation, fragments up to 2", angular, trace fine to very fine fill		Clayey Gravel (limestone Fragments) (GC)	
439.0	R49-HQ 5 ft 46%	0	>10	433.4, 433.6' - Fractures or mechanical break (2), horizontal, bedding plane parting, trace black staining		424.7-425.55' - yellowish gray, (5Y 8/1), moderate to mild HCl reaction, extremely weak (R0), fine to medium grained limestone gravels, <1/2"	
			>10	434.0' - Fracture, horizontal, smooth, undulating		Limestone	
			2	434.5' - Fracture or mechanical break, <10 deg, smooth		425.55-426.2' - yellowish gray, (5Y 8/1), fine grained, very weak (R1), strong HCl reaction where pulverized	R49: 10 minutes
			>10	435.1-435.5' - Fracture or mechanical break, 45-50 deg, rough, stepped			
			>10	436.3' - Fracture, horizontal, smooth, trace fill			
444.0			NR	436.5, 436.6' - Fractures (2), 20-30 deg, rough, undulating, large solid fragment 1-3/16" in between			
				437.1-437.6' - Fracture zone, no visible orientation, fragments up to 2-3/8", angular to subangular, trace amounts of very fine fill			
				437.6-438.1' - Fracture, 80 deg, rough, undulating			
				438.1' - Fracture, horizontal, smooth, bedding plane parting			
				438.4' - Fracture or mechanical break, 40 deg, rough, undulating			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 13 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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.
445 -403.0	R50-HQ 5 ft 94%	53	>10		Clayey Gravel (limestone Fragments) (GC) 426.2-426.4' - Same as 424.7-425.55' except slightly delayed strong HCl reaction, clay, low to medium plasticity	Manual break above 446.5' to fit in box
			2		Limestone 426.4-428.4' - Same as 425.55-426.2' except very fine to fine grained, slightly delayed moderate to strong HCl reaction, medium strong to strong (R3 to R4), laminations	
			2		No Recovery 428.4-429.0' Limestone 429.0-430.2' - alternating yellowish gray and very light gray, (5Y 8/1 and N8), fine grained, delayed mild HCl reaction, very weak to weak (R1 to R2), laminar planar bedding with some variation	
			1		Clay (CL) 430.2-430.7' - yellowish gray, (5Y 8/1), very fine to fine grained, delayed mild HCl reaction, medium strong to strong (R3 to R4), trace voids <1/16"	
			NR		Clay (CL) 430.7-431.0' - dark greenish gray, (5G 4/1), very fine grained, low to medium plasticity, no HCl reaction, extremely weak (R0)	
450 -408.0	R51-HQ 5 ft 44%	13	>10		Limestone 431.0-431.5' - yellowish gray, (5Y 7/2), fine to medium grained, extremely weak (R0)	R51: 14 minutes
			3		431.5-431.9' - Same as 429.0-430.2' except yellowish gray, (5Y 7/2), weak to medium strong (R2 to R3), laminations	
			>10		Clayey Gravel (limestone Fragments) (GC) 431.9-433.0' - yellowish gray, (5Y 7/2), moderate HCl reaction, weak to medium strong (R2 to R3), very fine to fine grained gravel, low to medium plasticity clay	
			NR		Limestone 433.0-436.2' - light olive gray, (5Y 5/2), fine to medium grained, weak to medium strong (R2 to R3), strong HCl reaction when pulverized, undulating lamination	
			NR		436.2-437.5' - yellowish gray, (5Y 7/2), fine to medium grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over 20% of surface	
455 -413.0	R52-HQ 5 ft 86%	0	>10			R52: 17 minutes
			2			
			>10			
			NR			
			NR			
460 -418.0	R53-HQ 2 ft 95%	0	>10			R53: 8 minutes
			1			
			NR			
			2			
			>10			
	R54-HQ 3 ft 100%	39	>10			461.65': circular void with drusy crystals
			2			
			>10			
			2			
			2			
464.0						R54: 10 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 14 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
465 -423.0	R55-HQ 5 ft 82%	17	>10	461.9' - Mechanical break, horizontal, rough, undulating		437.5-438.0' - dark greenish gray with dusky yellow, yellowish gray, very light gray, (N8 with 5Y 6/4, 5GY 8/1, 5Y 4/1), very fine to fine grained, very strong delayed HCl reaction, strong (R4), trace chert layers	R55: 15 minutes
			1	462.2' - Fracture, horizontal, smooth, bedding plane parting		438.0-439.0' - yellowish gray, (5Y 7/2), moderate to strong delayed HCl reaction, strong (R4), <1/16" voids over <5% of surface, trace organics (peat or coal)	
			>10	462.7-463.15' - Fracture zone: at 462.7', 20-30 deg; at 463.15', 20-30 deg (opposite directions), elsewhere no visible orientation, fragments up to 1-3/4", angular to subangular		Coal 439.0-439.5' - black, (N1), very fine to fine grained, extremely weak (R0), trace amounts of limestone fragments: dusky yellow (5Y 6/4), fine to medium grained, mild HCl reaction, trace calcite crystals to 1/8"	
			>10	463.4' - Fracture, horizontal, rough, undulating, bedding plane parting		Limestone Fragments 439.5-441.3' - moderate olive brown, (5Y 4/4), fine to medium grained, extremely weak (R0), fine grains have strong HCl reaction, gravels have moderate HCl reaction, 20-30% voids on gravel, some weak (R1) gravel	
	R56-HQ 5 ft 90%	42	NR	463.7' - Fracture, horizontal, rough, undulating		No Recovery 441.3-444.0' Limestone 444.0-447.4' - yellowish gray, (5Y 7/2), fine to medium grained, very weak to weak (R1 to R2), strong HCl reaction where pulverized, voids to <1/16" over <5% of surface	SC-7 collected at 470.85 to 472.05'
469.0				464.3-465.0' - Fracture zone, no visible orientation, angular fragments up to 1-13/16"		Limestone 447.4-448.7' - grayish orange, (10YR 7/4), fine grained, medium strong (R3), strong HCl reaction where pulverized	
			>10	465.3' - Fracture, horizontal, rough, undulating		Limestone 449.0-450.0' - yellowish gray with light gray laminations, (5Y 8/1 and N7), fine to medium grained, mild to moderate HCl reaction, alternating very weak (R1) and weak (R2)	
			>10	465.7-466.8' - Fracture zone, (465.7-466.1': fine to medium infill with limestone fragments); fragments up to 1-3/4", black staining, mostly infill at 466.6-466.8'		Limestone Fragments 450.0-451.2' - transition from yellowish gray to moderate yellowish brown, (5Y 7/2 to 10YR 5/4), fine to medium grained, moderate to strong HCl reaction, medium strong (R3) in yellowish gray fragments, strong (R4) in moderate yellowish brown gravels	
470 -428.0	R57-HQ 5 ft 100%	65	4	467.4-467.9' - Fracture zone, rough, undulating, horizontal at 467.4', no visible orientation elsewhere, fragments up to 2-1/16", angular to subangular, similar infill to 465.7-466.8', fine to medium grained, <10% black staining		No Recovery 451.2-454.0'	R56: 10 minutes
			0	469.0-470.0' - Fracture zone, rough, undulating, fragments to 2-3/8", horizontal plane at 470.0'; possible bedding plane parting			
			>10	470.6, 470.7, 470.75, 470.85' - Fractures (4), horizontal, rough, undulating			
			NR	472.0, 472.3' - Fractures or mechanical break (2), 20 deg, rough, undulating, opposite directions			
475 -433.0	R58-HQ 5 ft 96%	22	1	472.6' - Fracture, horizontal, rough, undulating			R57: 13 minutes
			3	472.6-473.3' - Fracture zone, no visible orientation, fragments up to 4", mostly <2-3/8"			
			3	474.3-474.5' - Fracture, horizontal to <10 deg, open with fragment 2-3/8"			
			1	475.0' - Fracture or mechanical break, horizontal to <10 deg, rough, undulating			
	R58-HQ 5 ft 96%	22	3	475.3' - Fracture, 20-30 deg, rough, with fragment 1-3/16", subangular			R58: 10 minutes
479.0			>10	475.9' - Fracture or mechanical break, horizontal, rough, undulating, bedding plane parting			
			>10	476.3, 476.4' - Fractures (2), horizontal to <10 deg, rough, undulating			
			>10	476.5' - Fracture, 40-50 deg, rough, undulating, with large fragments			
480 -438.0	R58-HQ 5 ft 96%	22	1	477.4' - Fracture or mechanical break, 10-20 deg, rough, undulating			R58: 10 minutes
			2	478.2, 478.5' - Fractures or mechanical break (2), <10 deg, rough, undulating, black staining			
				478.8' - Mechanical break, horizontal, rough, undulating			
484.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-01

SHEET 15 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724033.5 N, 457716.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

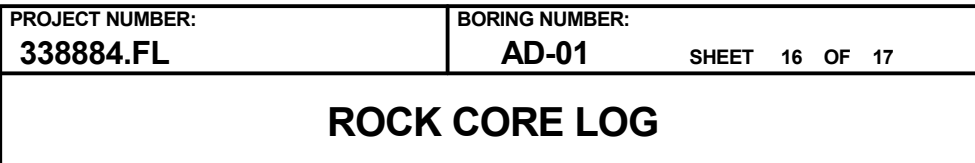
WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

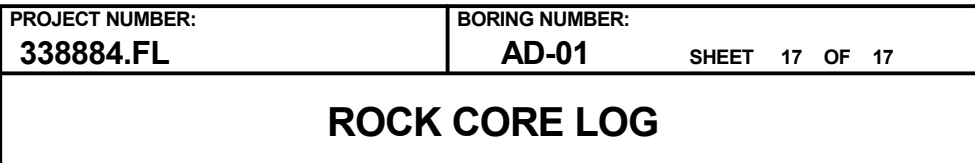
LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

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			
485 -443.0	R59-HQ 4 ft 88%	0	NR >10	478.9' - Fracture or mechanical break, 40-50 deg, rough, undulating 479.4-479.7' - Fracture zone, horizontal at 479.7', no visible orientation elsewhere, fragments up to 1-3/4"		Limestone 454.0-456.8' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to medium grained, strong HCl reaction, medium strong to strong (R3 to R4), <1/16" voids on 0-10% of surface	R59: 13 minutes
			2	479.7-480.0' - Fracture or mechanical break, 80-90 deg, rough, undulating		456.8-457.3' - moderate yellowish brown, (10YR 5/4), medium grained, moderate HCl reaction, very weak (R1), trace organics	
			>10	480.0' - Fracture, 30-40 deg, rough, undulating		Limestone Fragments 457.3-458.3' - Same as 454.0-456.8' except more fragmented No Recovery 458.3-459.0'	
			3	480.0-480.4' - Fracture zone, fragments up to 1-3/4", angular		Limestone 459.0-460.0' - white to very light gray, (N9 to N8), fine to medium grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), voids to <1/16" over 10-20% surface area, laminations	SC-8 collected at 490.35-491.25'
			NR	480.4' - Fracture, horizontal, rough, undulating, bedding plane parting		460.0-460.4' - Same as 456.8-457.3' except yellowish gray, (5Y 7/2), fine to medium grained	
			3	480.9-481.3' - Fracture zone, no visible orientation, fragments up to 1-3/4", angular to subangular		460.4-460.9' - Same as 459.4-460.0' except moderate HCl reaction No Recovery 460.9-461.0'	
			>10	481.7' - Fracture, 30 deg, slightly rough, slightly undulating		Limestone 461.0-462.2' - Same as 459.0-460.0' except fine grained, strong HCl reaction	R60: 20 minutes
			>10	481.9-482.2' - Fracture zone, no visible orientation, fragments up to 1-3/16"		462.2-463.0' - Same as 460.0-460.4' except yellowish gray with olive gray laminations, (5Y 7/2 with 5Y 3/2)	
			>10	482.9' - Fracture, horizontal to <10 deg, rough, undulating		463.0-464.0' - Same as 461.0-462.2' except very light gray with light bluish gray, (N8 with 5B 7/1), fine to medium grained, strong to very strong HCl reaction, <10% voids on surface	
			>10	483.3' - Fracture, <5 deg, rough, undulating		Limestone 464.0-465.7' - pale greenish yellow, (10Y 8/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), long voids to 1-1/2", mostly <1/16", over 20-30% of surface, possible dissolution features	R61: 18 minutes
			>10	483.6-483.7' - Fracture, horizontal, rough, large fragment in between 1-3/16"		Silty Limestone Fragments (GM) 465.7-466.8' - dusky yellow, (5Y 6/4), medium grained, moderate to strong HCl reaction, extremely weak (R0)	
			NR	484.0-484.1' - Fracture zone, no visible orientation, fragments up to 1-5/8", mostly <5/8", subangular		Limestone 466.8-467.4' - yellowish gray, (5Y 7/2), fine to medium grained, moderate to strong HCl reaction, weak (R2), <10% voids to <1/16" on surface, undulating laminations transition to planar, trace organics	
			NR	484.3, 484.5' - Fractures (2), horizontal, slightly rough, slightly undulating, bedding plane partings			
			3	484.7, 484.8' - Fractures or mechanical break (2), horizontal, rough, undulating			
			>10	484.9-485.2' - Fracture zone, fragments up to 2-3/8", rough, angular; horizontal fractures at 484.9' and 485.2': rough, undulating			
			1	485.4, 485.5' - Fractures or mechanical break (2), <10 deg, rough, undulating, possible bedding partings			
			>10	485.8-486.3' - Fracture zone, fragments up to 3", mostly <5/8", subangular to angular			
			NR	486.6' - Fracture or mechanical break, horizontal, rough, undulating			
				486.8, 487.0, 487.2' - Fractures or mechanical break (3), horizontal, rough, undulating			
				487.2-487.5' - Mechanical break, >80 deg, rough, undulating			
				488.0-488.3' - Fracture, 70 deg, rough, undulating			
				488.3' - Fracture or mechanical break, horizontal, rough, undulating			
				488.9' - Fracture or mechanical break, horizontal, rough, undulating, bedding plane parting			
				489.3' - Fracture, horizontal, rough, undulating, open with large rock fragment 1-3/4", angular			
				489.8-490.3' - Fracture zone, horizontal fragments, two large <4", mostly <1-3/16", trace silty infill			



LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

Rev. 4



ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.17 ft bgs on 9/13/07

START : 8/23/2007

END : 9/7/2007

LOGGER : R. Bitely, C. Sump, T. Borton, J. Burkard, J. Townes

APPENDIX 2BB-330



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 1 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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.
-157.7	200.0		>10	200.1, 200.3, 200.7, 201.7' - Mechanical break (4), 0-30 deg, rough, undulating		Limestone 200.0-201.9' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), sand to gravel-sized broken fragments, infill in section, trace voids (<1/16") over surface	Boring AD-2 blind drilled to approximately 200 feet below ground surface before beginning sampling/logging. Start Drilling at 08:45 09/08/07, Water level 3.0' below ground surface Logger is J. Burkard R1: 7 minutes
			>10	200.9-201.6' - Fracture zone, angular fragments up to 2" in diameter		201.9-202.5' - yellowish gray, (5Y 7/2), fine to medium grained, moderate to strong HCl reaction, very weak (R1)	
			>10	202.1-202.5' - Mechanical break		No Recovery 202.5-204.0'	
			NR				
	204.0		>10	204.0-204.7' - Fracture zone, broken fragments		Limestone 204.0-204.7' - very pale orange, (10Y 8/2), fine to medium grained, moderate to strong HCl reaction, very weak (R1), voids <1/16" over 15-30% of surface	R2: 9 minutes
			3	204.9, 205.4, 205.7, 206.0, 206.8, 207.2, 207.6' - Mechanical break (7), 0-20 deg, rough, undulating		204.7-205.6' - yellowish gray, (5Y 7/2), fine to medium grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), trace voids less than 1/16" of surface	
			>10	207.2-207.8' - Fracture, vertical, rough, undulating, split core in two halves		Silty Sand (SM) 205.6-206.4' - silty sand sized particles with broken limestone fragments up to 1/2" in diameter	
			NR	207.5' - Mechanical break 207.8-208.0' - Mechanical break			
	209.0		>10	209.3-210.3' - Fracture zone, angular fragments up to 2" in diameter		Limestone 206.4-207.8' - pale greenish yellow, (10Y 8/2), very fine to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), laminar bedding planes <1/16"	R3: 11 minutes
			>10	210.4-210.8' - Mechanical break		207.8-208.0' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak to extremely weak (R1 to R0)	
			NR			No Recovery 208.0-209.0'	
			NR				
	214.0		8	214.0-214.4' - Fracture zone, rough, undulating, broken fragments up to 2" in diameter		209.0-209.7' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 10-20% of surface	SC-1 collected at 217.8-218.9' R4: 9 minutes
			5	214.6, 214.7, 214.9, 215.2, 216.6, 216.8, 217.0, 217.4, 217.7, 218.8' - Mechanical break (10), 0-30 deg, rough to smooth, undulating, minor black organic staining		209.7-210.3' - pale greenish yellow, (10Y 8/2), very fine to fine grained, strong HCl reaction, very weak (R1), <1/16" horizontal bedding planes	
			>10	215.7-216.4' - Fracture zone, rough, undulating, rock fragments up to 3" in diameter		210.3-210.8' - very pale orange, (10Y 8/2), fine grained, strong HCl reaction, very weak (R1), silt infill	
			3	217.5-217.7' - Mechanical break		No Recovery 210.8-214.0'	
			1			Limestone 214.0-219.0' - yellowish gray to pale greenish yellow, (5Y 7/2 to 10Y 8/2), fine to medium grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), fossil casts and molds, voids (<1/16") throughout from 214.0-214.4' and 215.0-216.5'	
	219.0		4				
	220						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 2 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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.
-177.7	R5-HQ 5 ft 82%	22	4	219.3, 219.4, 219.9, 220.0, 200.2, 200.4, 200.5, 200.9, 221.3, 222.5, 222.8, 223.0' - Mechanical break (12), 0-15 deg, rough, undulating		Silty Limestone Fragments 219.0-219.3' - yellowish gray, (5Y 7/2), mild HCl reaction, with broken limestone fragments up to 1/8" in diameter Limestone 219.3-220.0' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), laminar bedding planes 220.0-223.1' - pale greenish yellow, (10Y 8/2), moderate to strong HCl reaction, weak (R2), fossil molds and casts, surface cavities (trace amounts) up to 1/4" wide and 1/4" in height, pitting on surface No Recovery 223.1-224.0' Limestone 224.0-228.9' - pale greenish yellow, (10Y 8/2), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), wavy bedding plane up to 1/16" in thickness throughout section - some black organic material, surface pitting is present throughout the section No Recovery 228.9-229.0' Limestone 229.0-233.0' - yellowish gray, (5Y 7/2), fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), surface pitting throughout sample, 1/16" voids on surface throughout section, fossil casts No Recovery 233.0-234.0' Limestone 234.0-236.7' - yellowish gray, (5Y 7/2), fine to medium grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), surface pitting throughout entire section Silt (ML) 236.7-237.1' - yellowish gray, (5Y 7/2), mild HCl reaction, mottling present	R5: 9 minutes
			>10	219.9, 223.0' - Fractures, 60-90 deg, rough, undulating			
			4	221.5-221.8' - Fracture zone, fragments up to 1/2" in diameter			
			NR				
224.0	R6-HQ 5 ft 98%	43	>10	224.1, 225.1, 225.5, 226.1, 226.7, 227.1, 227.6, 228.3' - Mechanical break (8), rough to smooth, undulating		R6: 9 minutes	
			3	224.4-224.8' - Fracture zone, multiple breaks, angular fragments up to 1" in diameter			
			1				
			>10	227.7-228.0' - Fracture zone, smooth to rough, along bedding planes, horizontal along bedding planes to 40 deg			
			>10	228.6' - Bedding plane, horizontal, smooth			
229.0	R7-HQ 5 ft 80%	60	NR			R7: 12 minutes	SC-2 collected at 230.5-231.55'
			6				
			1	230.0-230.3' - Fracture zone, rough, angular rock fragments			
			1	230.5, 231.8, 232.6, 232.8' - Mechanical break, 0-30 deg, rough, undulating			
			2	231.5' - Mechanical break			
	R8-HQ 5 ft 96%	0	NR	232.5' - Mechanical break		R8: 8 minutes	
234.0			>10	234.0, 234.6, 235.5-235.8, 236.1-236.7, 237.1-237.5, 237.8-238.8' - Fracture zone (6)			
			>10				
			>10				
			>10				
239.0			NR				
240			1				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 3 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

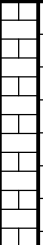








ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

WATER LEVELS : 3.0 ft bgs on 9/3/97				START : 9/9/2007		END : 9/12/2007		EOGGER : J. Burkard, R. Birely, T. Burton, J. Townes	
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					
-197.7	R9-HQ 5 ft 88%	53	2	239.5, 240.1, 241.6, 241.8, 242.3, 242.7, 243.0, 243.3' - Mechanical break, 0-10 deg, rough, undulating		Limestone 237.1-238.8' - yellowish gray, (5Y 7/2), fine to medium grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), with 1/4" sections of very fine grain limestone No Recovery 238.8-239.0' Limestone 239.0-243.4' - pale greenish yellow, (10Y 8/2), fine to medium grained, moderate to strong HCl reaction, very weak (R1), surface pitting throughout section, trace voids (1/16") throughout section	R9: 7 minutes		
>10			241.1-241.3' - Fracture zone						
3									
1									
244.0		NR		244.0-244.7' - Fracture zone					
245	R10-HQ 5 ft 100%	22	>10	244.0-244.7' - Fracture zone		No Recovery 243.6-244.0' Limestone 244.0-249.0' - pale greenish yellow, (10Y 8/2), fine to medium grained, moderate to strong HCl reaction, very weak (R1), surface pitting throughout section, very brittle rock	R10: 6 minutes		
-202.7			3	245.0, 245.5, 245.9, 246.1, 246.5, 246.8, 246.9, 247.3, 247.5, 247.8, 247.9' - Mechanical break (11), 0-10 deg, rough, undulating					
			4						
			4						
			>10	248.1-248.5, 248.7-250.0' - Fracture zone (2), rough, undulating					
250	R11-HQ 5 ft 100%	23	3	249.4, 249.6, 250.1, 250.5, 251.6, 252.7' - Mechanical break (6), 0-30 deg, rough, undulating			R11: 9 minutes		
-207.7			4						
			4	250.8-251.1' - Bedding plane, horizontal, smooth, undulating					
			6	252.3-252.4, 253.1-253.2' - Fracture zone (2), rough, undulating					
			3	253.0' - Bedding plane, horizontal, smooth					
	R12-HQ 5 ft 100%	73	2	254.2, 254.3, 255.1, 255.2, 255.8, 256.3, 256.9, 257.2, 257.4, 257.7, 258.3, 258.8' - Mechanical break (12), smooth to rough, undulating to stepped			R12: 9 minutes		
255			3						
-212.7			2						
			3						
			7	258.4-258.5' - Fracture zone, angular rock fragments					
259.0									
260			2						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 4 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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.
-217.7	R13-HQ 5 ft 96%	50	2	259.1, 259.5, 260.1, 260.7, 261.3, 261.4, 261.8, 263.2, 263.6' - Mechanical break (9), 0-10 deg, rough, undulating		259.0-263.8' - pale greenish yellow, (10Y 8/2), fine to medium grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), surface cavity at 259.7 up to 3/4" wide and up to 1/4" in height, wavy bedding planes less than 1/16" in thickness throughout intact sections, voids to 1/16" over 5-10% of surface	R13: 8 minutes
			2				
			>10	262.1-262.2' - Fracture zone, angular rock fragments up to 1/2"			
			8	262.5-263.1' - Fracture zone, rough, undulating, 10 angular rock fragments up to 2" in diameter			
264.0	R14-HQ 5 ft 94%	40	>10	264.3-265.0' - Fracture zone, rough, undulating, up to 1" in length angular rock fragments		No Recovery 263.8-264.0' Limestone 264.0-266.9' - pale greenish yellow, (10Y 8/2), fine to medium grained, moderate to strong HCl reaction, very weak (R1), wavy bedding plane from 265.0-265.5' <1/16" in thickness, 1/16" voids over 0-5% of surface	R14: 8 minutes
265			5	265.5, 265.7, 266.0, 266.1, 266.3, 266.6, 267.4, 267.7, 268.4' - Mechanical break (9), 0-20 deg, rough, undulating			
-222.7			4				
			5	267.0-267.2' - Fracture zone, rough, undulating, up to 1" in length angular rock fragments		266.9-267.5' - pale greenish yellow, (10Y 8/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), wavy bedding planes 1/16" in thickness	
			1			267.6-268.7' - pale greenish yellow, (10Y 8/2), fine to medium grained, moderate to strong HCl reaction, very weak to weak (R1 to R2)	
269.0	R15-HQ 5 ft 82%	33	NR	269.0-271.0' - Fracture zone		No Recovery 268.7-269.0' Limestone 269.0-271.9' - light olive gray, (5Y 5/2), fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), with angular gravel-sized rock fragments	SC-3 collected at 270.95- 272.35'
270			>10	269.8-269.9' - Fracture zone		271.9-272.3' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), trace voids	
-227.7			>10			272.3-273.1' - yellowish gray, (5Y 8/1), moderate to strong HCl reaction, very weak to weak (R1 to R2), bedding planes transition from wavy to laminar	
			1	271.3, 272.3, 272.7, 273.0' - Mechanical break (4), 0-30 deg, rough, undulating to stepped		No Recovery 273.1-274.0' Limestone 274.0-276.3' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, very weak (R1), solution cavities up to 1-3/8" by 3/8" over 1-2% of rock surface, bedding laminations with trace organics from 275.2-275.7'	
			4			No Recovery 276.3-279.0'	
274.0	R16-HQ 5 ft 46%	13	NR	274.3' - Fracture, horizontal, rough, undulating, tight			R15: 7 minutes End drilling for the day at 16:43, 09/08/07 Continue drilling 09/09/07, Water level 3' below ground surface
			>10	274.45' - Fracture, 85 deg, rough, undulating, tight			
			>10	274.55-274.8' - Fracture zone, multiple intersecting fractures with rock fragments up to 1-3/16" in diameter			
			>10	275.0' - Bedding plane, horizontal, smooth, tight			
			NR	275.4' - Fracture, horizontal, rough, undulating, open (3/8"), organic layering			
275	R16-HQ 5 ft 46%	13	NR	275.7-276.3' - Fracture zone, fragments up to 1-3/16" in diameter			R16: 11 minutes
-232.7			>10				
			>10				
			>10				
			NR				
279.0	R16-HQ 5 ft 46%	13	NR				R. Bitely begins logging
			NR				
280			NA	279.25' - Mechanical break, horizontal, rough, undulating			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 5 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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			
-237.7	R17-HQ 5 ft 82%	0	5	279.45' - Fracture, 60 deg, rough, undulating, tight		Sandy Silt (ML) 279.0-280.0' - yellowish gray to light olive gray, (5Y 7/2, 5Y 5/2), fine to medium grained, mild to moderate HCl reaction, trace laminated bedding Limestone 280.0-283.1' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, very weak (R1), voids up to 9/16" diameter over 3-4% of rock surface, poorly fossiliferous, bedding plane laminations from 282.0-283.1' No Recovery 283.1-284.0' Limestone 284.0-289.0' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), voids up to 3/8" diameter over 5% of rock surface, solution cavities up to 1-3/16" in diameter over 5% of rock surface, poorly fossiliferous, trace bedding plane laminations, trace organics	R17: 9 minutes
			>10	279.65-280.0' - Fracture zone, multiple intersecting fractures with rock fragments up to 1-3/16" in diameter			
			7	280.3' - Fractures (2), 60 deg, rough, undulating, tight			
			NR	280.5' - Fracture, 30 deg, rough, undulating 280.7-280.8' - Fracture zone, slight brown staining, fragments up to 3/4" in diameter 280.95' - Fracture, 60 deg, rough, undulating, tight			
284.0	R18-HQ 5 ft 100%	46	>10	281.3' - Fracture, horizontal, rough, undulating, slight brown-black staining, open 1-3/16" calcite crystallization		289.0-291.6' - yellowish gray, (5Y 7/2), very fine to coarse grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), voids up to 3/8" diameter over 5% of rock surface, solution cavities up to 1-3/16" in diameter over 5% of rock surface, poorly fossiliferous, trace bedding plane laminations, trace organics	R18: 9 minutes
			>10	281.55-281.8' - Fracture zone, fragments up to 3/4" in diameter			
			3	281.9, 282.05, 282.25, 282.45, 282.8, 282.85' - Bedding plane (6), horizontal, smooth			
			1	282.65' - Fracture, rough, undulating, open 284.25-284.4' - Fracture zone, multiple intersecting fractures with rock fragments up to 3/4" in diameter			
			1	284.75' - Fracture, 60 deg, rough, undulating, open to 3/8"			
			1	285.2' - Fracture, horizontal, rough, undulating, open from 1/2" to 1"			
285 -242.7	R19-HQ 5 ft 52%	22	>10	285.3' - Mechanical break		294.0-297.9' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), 60% carbonate sandy silt	SC-4 collected at 289.75-290.55'
			>10	285.4' - Mechanical break or fracture, horizontal, rough, undulating			
			>10	285.7-285.9' - Fracture zone, rock fragments up to 1-3/16"			
			>10	286.4, 286.45, 286.7' - Bedding plane (3), horizontal, smooth			
			NR	287.4' - Mechanical break, horizontal, rough, undulating, open to 3/8"			
			NR	288.1' - Fracture, horizontal, rough, undulating, tight			
290 -247.7	R20-HQ 5 ft 78%	14	>10	289.0-289.3' - Fracture zone, multiple intersecting fractures with rock fragments up to 1-3/16" in diameter		299.3' - Fracture, 45 deg, smooth, trace black organic staining, tight	R19: 10 minutes
			>10	289.8' - horizontal, rough, undulating, open to 3/8"			
			>10	290.6-291.6' - Fracture zone, rock fragments up to 1-9/16" in diameter			
			>10	294.0-294.9' - Fracture zone, rock fragments up to 1-3/16" in diameter			
			>10	295.6-297.0' - Fracture zone, rock fragments up to 1-3/16" in diameter			
			NR	297.3' - Fracture, horizontal, rough, undulating, tight			
295 -252.7			3	299.3' - Fracture, 45 deg, smooth, trace black organic staining, tight			R20: 19 minutes
299.0							
300							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 6 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

WATER LEVEL: 30.18 ft (9.84 m) ON 03/07/2017		DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		SYMBOLIC LOG	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					
-257.7	R21-HQ 5 ft 74%	11	3	299.5, 299.6, 300.2, 300.3' - Fractures (4), horizontal, rough, undulating, trace black organic staining, tight			Limestone 299.0-300.3' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate HCl reaction, extremely weak (R0), black organic mottling over 20% of rock surface 300.3-300.7' - olive gray to yellowish gray, (5Y 3/2, 5Y 7/2), very fine grained, extremely weak (R0), organic content decreasing with depth from 1-3/16" lens of organic silt at 300.3' below ground surface, faint to mild organic odor, fossiliferous, transition to a carbonate silt with depth	R21: 12 minutes	
NA			301.0' - Fracture zone, rock fragments up to 3/4" in diameter						
NA			301.2' - Mechanical break, 20 deg						
NR			301.8-301.9, 302.2-302.7' - Fracture zone (2), rock fragments up to 3/4" in diameter						
304.0	R22-HQ 5 ft 90%	40	>10	304.65, 305.4, 305.7, 306.35, 306.75' - Bedding plane or mechanical break (5), <10 deg, smooth to rough, planar to undulating			Sandy Silt (ML) 300.7-302.7' - yellowish gray, (5Y 7/2), low to medium plasticity, >50% silt, <50% limestone fragments as sand sized fraction No Recovery 302.7-304.0' Silt (ML) 304.0-304.6' - yellowish gray, (5Y 7/2), low to medium plasticity, mild to moderate HCl reaction, limestone fragments as sand sized fraction >50% Limestone 304.6-305.1' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, extremely weak to weak (R0 to R2), light gray mottling over 40% of surface, moderately fossiliferous casts and molds (1/8-1/4"), laminated organics Silt (ML) 305.1-305.4' - Same as 304.0-304.6'	R22: 12 minutes	
10			305.95-306.35' - Fracture zone, rough, undulating to planar, rock fragments <2" in diameter						
>10			306.9-307.0' - Fracture zone, rough, undulating, rock fragments <1" in diameter						
0			308.3-308.5' - Fracture zone, rough, undulating, rock fragments <1-1/2" in diameter						
4			309.5-309.75' - Fracture zone, rough, undulating, silt lenses, rock fragments <2" in diameter						
NR			310.25, 310.9' - Fractures or mechanical break (2), rough, undulating						
309.0	R23-HQ 5 ft 100%	58	>10	309.5-309.75' - Fracture zone, rough, undulating, silt lenses, rock fragments <2" in diameter			Limestone 305.4-308.5' - Same as 304.6-305.1' No Recovery 308.5-309.0' Limestone 309.0-314.0' - yellowish gray, (5Y 7/2), fine to medium grained, moderate to strong HCl reaction, extremely weak to medium strong (R0 to R3), highly variable trace voids 1/16", poorly fossiliferous, trace organic lamination, laminated silty intervals from 311.35-311.5 and 311.65-311.8'	R23: 7 minutes	
3			310.5' - Fracture or mechanical break, 30 deg, rough, undulating						
>10			312.0, 312.05, 312.1, 312.2' - Fractures (4), 0-90 deg, rough, undulating						
6			312.45, 313.05, 313.45, 313.95' - Fractures or mechanical break (4), <10 deg, rough, undulating						
3			314.9, 315.2' - Fractures or mechanical break (2), 10 deg and 40 deg, rough, undulating						
2			315.7-316.75' - Fracture zone, rough, undulating, silt lenses, rock fragments <3" in diameter						
314.0	R24-HQ 5 ft 98%	30	2	314.9, 315.2' - Fractures or mechanical break (2), 10 deg and 40 deg, rough, undulating				R24: 9 minutes	
2			315.7-316.75' - Fracture zone, rough, undulating, silt lenses, rock fragments <3" in diameter						
>10			317.1, 317.5' - Fractures or mechanical break (2), 70 deg and 50 deg, rough, undulating						
>10			317.5-317.9' - Fracture zone, rough, undulating, rock fragments <3" in diameter						
>10			318.2' - Fractures or mechanical break, <10 deg, rough, undulating						
NR									
319.0			>10						
320									



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-02	SHEET 7 OF 15
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing


ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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						
-277.7	R25-HQ 5 ft 100%	27	>10	318.65-318.9' - Fracture zone or mechanical break, rough, undulating, rock fragments <2" in diameter		314.0-318.9' - yellowish gray, (5Y 7/2), fine to medium grained, moderate to strong HCl reaction, extremely weak to medium strong (R0 to R3), highly variable trace voids <1/16", poorly fossiliferous, trace organic laminations, interlaminated silt lenses and limestone rock fragments at 314.4-314.55' and 315.7-316.75'	R25: 9 minutes			
>10			319.3-319.8, 320.1-320.4, 320.6-320.8, 321.7-322.1, 322.35-322.65, 323.2-323.3' - Fracture zone (6), undulating, rock fragments <1" in diameter, friable	No Recovery 318.9-319.0' Limestone						
>10			319.9, 321.1, 321.2, 321.3, 322.8, 323.8' - Fractures or mechanical break (6), 20 deg, rough, undulating	319.0-324.0' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), with friable carbonate silts with <50% sand-sized limestone fragments, poorly fossiliferous						
10										
324.0	R26-HQ 5 ft 100%	42	2	324.45, 324.95, 325.4, 325.8, 326.3' - Fractures or mechanical break (5), <10-30 deg, rough, undulating		324.0-326.7' - yellowish gray, (5Y 7/2), very fine to fine grained, extremely weak to very weak (R0 to R1), trace laminated organics	R26: 13 minutes			
2				325.1-325.7' - Same as 324.0-326.7' except mild to moderate HCl reaction, moderately fossiliferous, fossil shells to 1/2"						
2			326.7-329.0' - Fractures or mechanical break, smooth to rough, undulating							
NA										
NA										
329.0	R27-HQ 5 ft 92%	67	>10	329.0-329.3' - Fracture zone, rough, undulating, rock fragments <1" in diameter		Sandy Silt With Limestone (ML) 326.7-329.0' - very fine to fine grained, low to medium plasticity, mild to moderate HCl reaction, sandy silt (carbonate), carbonate silt with <50% limestone fragments as sand fraction; limestone interbeds, extremely weak to very weak (R0 to R1), strong to very strong odor (crude petroleum and hydrogen sulfide), poorly fossiliferous	SC-5 collected at 330.85-331.9'			
2			329.4, 329.45' - Fractures or mechanical break (2), 40 deg and 20 deg, rough, undulating							
1			329.7, 330.4, 330.85, 331.9' - Bedding plane or mechanical break (4), <10 deg, rough, undulating							
>10			332.15-332.35' - Fracture zone, rough, undulating, rock fragments <2" diameter							
0										
NR										
334.0	R28-HQ 5 ft 88%	8	>10	334.4-334.5, 334.8-334.9, 335.1-335.25, 336.2-336.6, 336.6-337.0, 337.3-338.0, 338.25-338.4' - Fracture zone (7), rough, undulating, sandy silt lenses with rock fragments <2" in diameter	329.0-333.6' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, extremely weak to weak (R0 to R2), voids <1/16" over 10% of surface, one cavity or fossiliferous cast 1" in diameter, few cavities <1/4" in diameter, trace organic lenses, moderately fossiliferous, trace laminated organics	R27: 8 minutes				
>10			335.45, 335.7, 335.95' - Bedding plane or mechanical break (3), <10 deg, rough, undulating	No Recovery 333.6-334.0' Limestone						
>10										
>10										
>10										
NR										
339.0		2				R28: 12 minutes				
340						J. Townes begins logging				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 8 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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			
-297.7	R29-HQ 5 ft 94%	62	>10	339.4' - Mechanical break, horizontal, silt lens with angular rock fragments up to 3/4" in diameter		Limestone 334.0-338.4' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate to strong HCl reaction, extremely weak (R0), silt lenses interbedded with extremely weak rock, 80% of core is sandy silt carbonate material of low to medium plasticity, >50% limestone fragments as sand fraction, trace decomposing organic odor No Recovery 338.4-339.0' Limestone 339.0-339.85' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), limestone fragments up to 3/4" in diameter, calcite crystals, moderate yellow Organic Material (OH) 339.85-340.0' - dark brown to black, mild HCl reaction, organic layer, bedding laminations Limestone 340.0-340.4' - Same as 339.0-339.85' 340.4-343.7' - light gray, (N7), very fine to medium grained, moderate to strong HCl reaction, very weak (R1), black organic mottling over 20% of rock surface No Recovery 343.7-344.0' Limestone 344.0-349.0' - light gray, (N7), very fine to medium grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), black and blue mottling over 20% or rock surface, trace laminations 349.0-353.85' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), trace laminated bedding with organics, cavities up to 3/8" in diameter are fossil burrows and over 10% of rock surface from 351.0-352.0' bgs. No Recovery 353.85-354.0' Limestone 354.0-359.0' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16" over 50% of rock surface and are fossil molds, cavities up to 2" in diameter over 1-2% of rock surface, fossiliferous	R29: 7 minutes
			2	339.6' - Mechanical break, horizontal, rough, undulating, along bedding plane			
			0	340.25-340.4' - Fracture zone or mechanical break, silt lens			
			1	341.35, 341.7' - Bedding plane (2), horizontal, fractures along contact of silt lens			
	R30-HQ 5 ft 100%	71	NR	343.25' - Fracture, horizontal, rough, undulating, tight		SC-6 collected at 347.8-348.8' R30: 7 minutes Complete drilling at 17:00 on 09/09/07, water level at surface	
344.0			1				
345			2	344.8, 345.55, 345.9, 346.4, 346.6, 346.9, 347.45, 348.9' - Bedding plane (8), horizontal, rough, undulating, tight			
-302.7			3				
	R31-HQ 5 ft 97%	76	1			R31: 10 minutes	
			1				
349.0			0	350.35, 350.9, 351.85, 352.4' - Bedding plane or mechanical break (4), horizontal, rough, undulating, tight			
			2				
350	R32-HQ 5 ft 100%	94	1	352.9, 353.6' - Mechanical break (2), 0-90 deg, rough, undulating		R32: 11 minutes	
-307.7			NR				
			1	354.4, 357.0, 357.9' - Fractures (3), horizontal, rough, undulating, open up to 3/8"			
			0				
354.0			1	356.3, 356.5' - Mechanical break (2)			
355			1				
-312.7			0				
			2				
359.0							
360							



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-02	SHEET 9 OF 15
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07 START : 9/8/2007 END : 9/12/2007 LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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.
-317.7	R33-HQ 5 ft 98%	62	2	359.6' - Mechanical break, horizontal, rough, undulating, 3/4" relief		Limestone 359.0-363.9' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16" over 10% of rock surface and are fossil molds, cavities up to 3/4" in diameter over 1-2% of rock surface, trace organics, moderately fossiliferous	R33: 8 minutes
			1	359.8' - Mechanical break, vertical, rough, undulating			
			2	360.2' - Bedding plane, horizontal, rough, undulating, bedding plane fracture along organic layer			
			1	360.5, 361.3, 362.5, 362.9, 363.55' - Mechanical break, horizontal, rough, undulating			
	R34-HQ 5 ft 98%	82	NR	361.5' - Mechanical break		No Recovery 363.9-364.0' Limestone 364.0-366.55' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16" over 10% of rock surface and are fossil molds, trace organic laminations, fossiliferous 366.55-368.55' - white to very light gray, (N9 to N8), very fine to fine grained, strong HCl reaction, medium strong (R3), voids up to 3/8" over 20% of rock surface and are fossil molds, cavities up to 1-3/16" over 5% of rock surface, fossiliferous 368.55-368.9' - Same as 364.0-366.55' No Recovery 368.9-369.0' Limestone 369.0-373.55' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, medium strong (R3), voids up to 3/8" over 20% of rock surface and are fossil molds, trace organic layering, moderately fossiliferous No Recovery 373.55-374.0' Limestone 374.0-378.5' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, medium strong (R3), voids up to 3/8" over 10% of rock surface and are fossil molds, trace organic layering, fossiliferous, cavities up to 9/16" over 1-2% of rock surface and are dissolution fossil molds No Recovery 378.5-379.0'	SC-7 collected at 367.3-368.3' R34: 9 minutes
365 -322.7			1	364.6, 365.45' - Bedding plane, horizontal, rough, undulating			
			1				
			>10	366.5-366.65' - Fracture zone, rock fragments up to 3/4" in diameter			
	R35-HQ 5 ft 91%	66	1	367.3, 368.3' - Mechanical break (2), horizontal, rough, undulating			R35: 8 minutes
			1				
			NR				
			2	369.45, 369.85' - Fractures (2), horizontal, rough, undulating, tight			
370 -327.7	R36-HQ 5 ft 90%	46	1	370.5' - Bedding plane, horizontal, smooth, tight, fracture along organic layering			R36: 8 minutes
			>10	371.4-371.5' - Fracture zone, rock fragments up to 3/4" in diameter			
			>10	372.1' - Fracture, horizontal, rough, undulating, tight			
			0	372.8-373.1' - Fracture zone, rock fragments up to 1-9/16" in diameter			
	R37-HQ 5 ft 90%	46	NR				R37: 8 minutes
			4	374.25, 374.4, 374.75, 374.95, 375.3, 375.5, 376.45, 377.7, 378.15' - Mechanical break or bedding plane (9), horizontal, rough, undulating, tight			
			2				
			1				
375 -332.7	R38-HQ 5 ft 90%	46	3	377.1, 377.35' - Mechanical break or bedding plane (2), horizontal, rough, undulating, tight			R38: 8 minutes
			1				
			NR				
			>10	379.0-379.3' - Fracture zone, rock fragments up to 1-9/16" in diameter			
	R39-HQ 5 ft 90%	46	NR				R39: 8 minutes
			>10				
380							



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-02	SHEET 10 OF 15
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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.
-337.7	R37-HQ 5 ft 82%	36	3	379.6, 379.8, 380.0' - Fractures (3), horizontal, smooth, tight		Limestone 379.0-383.1' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, medium strong (R3), voids up to 3/8" over 20% of rock surface and are fossil molds, fossiliferous	R37: 8 minutes
			1	380.2-380.4' - Fracture zone, rock fragments up to 1-9/16" in diameter			
			>10	380.8, 381.4' - Fractures (2), horizontal, rough, undulating, open to 3/4"			
			0	382.7-382.9' - Fracture zone, rock fragments up to 1-9/16" in diameter			
384.0	R38-HQ 5 ft 88%	53	NR			No Recovery 383.1-384.0' 384.0-384.5' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16" over 20% of rock surface and are fossil molds, moderately fossiliferous 384.5-385.75' - light gray, (N7), very fine to coarse grained, strong HCl reaction, medium strong to strong (R3 to R4), voids up to 3/32" over 10% of rock surface and are fossil molds, cavities up to 3/8" over 3-5% of rock surface 385.75-385.95' - Same as 384.5-385.75' except organic laminated limestone 385.95-388.4' - Same as 384.0-384.5' No Recovery 388.4-389.0' Limestone 389.0-391.7' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, very weak (R1), voids up to 1/16" over 1-2% of rock surface, poorly fossiliferous, trace organic laminations No Recovery 391.7-394.0'	R38: 8 minutes
			>10	384.0-384.5' - Fracture zone, rock fragments up to 1-9/16" in diameter			
385			>10	384.7, 384.95' - Fractures (2), horizontal, rough, undulating, 3/4" relief			
-342.7			2	385.6-385.75' - Fracture zone, rock fragments up to 3/4" in diameter			
			1	386.2, 386.55, 387.15' - Fractures (3), horizontal, rough, undulating, 3/8" relief			
			0	386.4-386.8' - Mechanical break			
389.0	R39-HQ 5 ft 54%	9	NR			Limestone 394.0-399.0' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids up to 3/16" over 10% of rock surface and are fossil molds, moderately fossiliferous, trace laminations	R39: 8 minutes
			>10	389.0-389.9' - Fracture zone, rock fragments up to 1-9/16" in diameter			
390			>10	390.0' - Fracture, vertical, rough, undulating, tight			
-347.7			>10	390.1, 390.3' - Fractures (2), horizontal, rough, undulating, tight			
			NR	390.5-390.6' - Fracture zone, rock fragments up to 3/4" in diameter			
			NR	390.8, 391.95, 391.2' - Fractures (3), horizontal, rough, undulating, tight			
394.0	R40-HQ 5 ft 100%	46	NR	391.5' - Mechanical break			R40: 6 minutes
			1				
395			3	395.0, 395.4, 395.75, 396.0, 396.4' - Fractures (5), horizontal, rough, undulating, tight to open			
-352.7			>10				
			4	396.7-397.1' - Fracture zone, rock fragments up to 1-3/16" in diameter			
			>10	397.45, 397.65, 397.9' - Fractures (3), horizontal, rough, undulating, tight			
399.0			4	398.3-399.0' - Fracture zone, rock fragments up to 1-9/16" in diameter			
			4				
400							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 11 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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					
-357.7	R41-HQ 5 ft 69%	31	4	399.2, 399.6, 399.8, 400.0, 400.2, 400.4, 400.6, 400.9, 401.05, 401.45, 402.05' - Fractures (11), horizontal, rough, undulating, tight, to 3/8" relief		Limestone 399.0-402.45' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, weak (R2), voids up to 3/32" over 20% of rock surface and are fossil molds, moderately fossiliferous No Recovery 402.45-404.0'	R41: 6 minutes		
2									
1									
NR									
404.0	R42-HQ 5 ft 86%	25	3	404.5, 404.75, 404.9, 405.15, 405.35, 405.95, 406.1, 406.2, 406.4, 406.7, 406.85, 407.1' - Fractures (12), horizontal, rough, undulating, tight, open 406.0' - Fracture zone, fragments up to 1-9/16" in diameter 407.4-408.3' - Fracture zone, fragments up to 1-9/16" in diameter, quartz grains up to 3/8" found as infill material		Limestone 404.0-408.3' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids up to 3/8" over 10% of rock surface and are fossil molds, secondary quartz mineralization found in fractured material near bottom of run, trace organic laminations near top of run No Recovery 408.3-409.0'	R42: 8 minutes		
3									
>10									
>10									
2									
NR									
409.0	R43-HQ 5 ft 100%	58	>10	409.1, 409.25, 409.45, 410.85, 411.35, 412.85, 413.2, 413.7, 413.9' - Bedding plane or mechanical break (9), <10 deg, rough, undulating, tight to open 1/2" 409.7-410.05' - Fracture zone, rough, undulating, rock fragments with carbonate silt matrix, fragments <1" in diameter		Limestone 409.0-414.0' - yellowish gray, (5Y 7/2), very fine to medium grained, strong HCl reaction, extremely weak to very weak (R0 to R1), laminated organics over 20% of rock surface, voids <1/16" over <10% of rock surface especially along bedding planes, trace cavities up to 1" diameter, carbonate silt and limestone fragments at 409.7-410.5', carbonate clay/silt with limestone fragments at 412.8-413.0'	Complete drilling at 15:15 on 09/10/07 due to proximal lighting, water level at surface R. Bitely begins logging R43: 8 minutes		
1									
1									
1									
3									
414.0	R44-HQ 5 ft 94%	26	>10	414.5-415.0' - Fracture zone, rough, undulating, rock fragments <2" in diameter 415.2, 415.4, 416.35, 416.5, 418.35, 418.45, 418.55' - Bedding plane or mechanical break, <10 deg, rough, undulating, tight to open 1/2" 415.6-415.85' - Fracture zone, rough, undulating, rock fragments <2" in diameter 416.55-416.7, 417.1-417.15, 417.4-417.45, 417.65-418.05' - Fracture zone (4), rough, undulating, organic silt and rock fragments <2" in diameter with carbonate silt lenses interbedded.		Organic Elastic Silt To Organic Fat Clay (MH-CH) 416.6-417.4' - dark greenish gray, (5G 4/1), no HCl reaction, extremely weak (R0), laminated, poorly fossiliferous, moderate hydrogen sulfide odor	R44: 10 minutes		
10									
NA									
NA									
3									
NR									
419.0			>10						
420									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 12 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-377.7	R45-HQ 5 ft 88%	13	>10		Limestone 417.4-418.7' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), voids <1/16" over 30% of surface, few cavities 1/2" in diameter, moderately fossiliferous No Recovery 418.7-419.0'	R45: 8 minutes
			>10			
			>10			
			>10			
424.0	R46-HQ 5 ft 80%	16	NR		Limestone 419.0-423.4' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), interbedded carbonate silt lenses, voids <1/16" over 10% of surface, cavity up to 0.5' long from 421.75-422.25' with crystalline quartz growth, laminated bedding over 10% of surface No Recovery 423.4-424.0'	R46: 12 minutes
			>10			
			>10			
			>10			
425 -382.7	R47-HQ 5 ft 92%	8	NR		Limestone 424.0-428.0' - yellowish gray, (5Y 7/2), very fine to medium grained, moderate HCl reaction, extremely weak to medium strong (R0 to R3), variable voids <1/16" over 30% of rock surface from 424.0-424.5', trace voids, <1/16" of remaining core, laminated organics from 424.5-424.8' over 20%, trace grayish blue (5PB 5/2) mottling over core from 425.6-427.0', all poorly fossiliferous No Recovery 428.0-429.0'	R47: 15 minutes
			>10			
			>10			
			>10			
430 -387.7	R48-HQ 5 ft 100%	48	NR		Limestone 429.0-433.6' - yellowish gray to grayish black, (5Y 7/2 to N2), strong HCl reaction, extremely weak to medium strong (R0 to R3), organic lenses, organics as laminae and lenses up to 1" thick comprising 20% of core especially 432.0-432.6', mottled coloration along bedding planes, especially in stronger limestone, poorly fossiliferous, trace voids <1/16" No Recovery 433.6-434.0'	SC-8 collected at 436.35-437.35'
			>10			
			0			
			3			
435 -392.7			>10		Organic Carbonate To Coal Seam 434.3-434.6' - black to greenish black, (N1 to 5GY 2/1), no HCl reaction, laminated, friable	R48: 13 minutes
			>10			
			>10			
			>10			
439.0						
440						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-02

SHEET 13 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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			
-397.7	R49-HQ 5 ft 64%	11	>10	439.0-439.3, 439.5-440.15, 440.7-441.1, 441.9-442.2' - Fracture zone (4), rough, undulating, rock fragments <2" in diameter		Clay (CL) 434.6-436.2' - dark greenish gray, (5GY 4/1), carbonate, varve-like laminated organics, few silica nodules to subhedral quartz up to 1/2" diameter at 435.2' Limestone 436.2-439.0' - dark greenish gray, (5GY 4/1), very fine to fine grained, strong HCl reaction, medium strong to strong (R3 to R4), laminated, varve-like organic laminations, trace limestone casts or secondary carbonate mineralization up to 1" diameter, poorly fossiliferous 439.0-439.7' - yellowish gray, (5Y 7/2), mild HCl reaction, weak to medium strong (R2 to R3), with interbedded carbonate silt lenses, voids <1/16" over 20% of surface, poorly fossiliferous, 1/4" organic peat lens at 439.35' Silt (ML) 439.7-440.2' - medium plasticity, <50% limestone fragments as sand sized fraction, organic peat lens at 440.2' Limestone 440.2-441.25' - medium light gray to yellowish gray, (N6 to 5Y 7/2), mild HCl reaction, strong (R4), voids <1/16" over 30% of rock surface, cavities <1" diameter over 10% of surface, mottled coloration due to secondary mineralization of cavities, organic associated with cavities, with calcite crystals at 440.2-441.25' and 441.27-442.2' 441.25-442.2' - moderate yellowish brown, (10YR 5/4), very weak to weak (R1 to R2), faintly laminated organics No Recovery 442.2-444.0' Limestone 444.0-447.3' - medium light gray, (N6), very fine grained, strong HCl reaction, strong (R4), voids up to 3/32" over 20% of rock surface, cavities up to 9/16" over 1-2% of rock surface and some are filled with quartz crystallization No Recovery 447.3-449.0'	R49: 14 minutes
444.0			>10	444.0-445.5' - Fracture zone, multiple intersecting fractures with rock fragments up to 1-9/16" in diameter			
445			>10	445.1, 445.9' - Fractures (2), 45 deg, rough, undulating, tight			
-402.7	R50-HQ 5 ft 66%	7	3	446.4' - Fracture, 45 deg, rough, undulating, tight		Limestone 440.2-441.25' - medium light gray to yellowish gray, (N6 to 5Y 7/2), mild HCl reaction, strong (R4), voids <1/16" over 30% of rock surface, cavities <1" diameter over 10% of surface, mottled coloration due to secondary mineralization of cavities, organic associated with cavities, with calcite crystals at 440.2-441.25' and 441.27-442.2' 441.25-442.2' - moderate yellowish brown, (10YR 5/4), very weak to weak (R1 to R2), faintly laminated organics No Recovery 442.2-444.0' Limestone 444.0-447.3' - medium light gray, (N6), very fine grained, strong HCl reaction, strong (R4), voids up to 3/32" over 20% of rock surface, cavities up to 9/16" over 1-2% of rock surface and some are filled with quartz crystallization No Recovery 447.3-449.0'	R50: 16 minutes
446.0			0	446.5' - Mechanical break 446.9, 447.0' - Fractures (2), horizontal, rough, undulating, tight			
449.0			NR				
450	R51-HQ 5 ft 66%	24	3	449.45' - Fracture, 45 deg, rough, undulating, tight		Limestone 440.2-441.25' - medium light gray to yellowish gray, (N6 to 5Y 7/2), mild HCl reaction, strong (R4), voids <1/16" over 30% of rock surface, cavities <1" diameter over 10% of surface, mottled coloration due to secondary mineralization of cavities, organic associated with cavities, with calcite crystals at 440.2-441.25' and 441.27-442.2' 441.25-442.2' - moderate yellowish brown, (10YR 5/4), very weak to weak (R1 to R2), faintly laminated organics No Recovery 442.2-444.0' Limestone 444.0-447.3' - medium light gray, (N6), very fine grained, strong HCl reaction, strong (R4), voids up to 3/32" over 20% of rock surface, cavities up to 9/16" over 1-2% of rock surface and some are filled with quartz crystallization No Recovery 447.3-449.0'	J. Townes begins logging
-407.7			>10	449.7, 449.95' - Fractures (2), horizontal, rough, undulating, tight			
450.5			>10	450.5' - Fracture, horizontal, rough, undulating, tight			
451.6	R52-HQ 5 ft 82%	28	>10	450.9-451.2' - Fracture zone, rock fragments up to 1-9/16" in diameter		Limestone 440.2-441.25' - medium light gray to yellowish gray, (N6 to 5Y 7/2), mild HCl reaction, strong (R4), voids <1/16" over 30% of rock surface, cavities <1" diameter over 10% of surface, mottled coloration due to secondary mineralization of cavities, organic associated with cavities, with calcite crystals at 440.2-441.25' and 441.27-442.2' 441.25-442.2' - moderate yellowish brown, (10YR 5/4), very weak to weak (R1 to R2), faintly laminated organics No Recovery 442.2-444.0' Limestone 444.0-447.3' - medium light gray, (N6), very fine grained, strong HCl reaction, strong (R4), voids up to 3/32" over 20% of rock surface, cavities up to 9/16" over 1-2% of rock surface and some are filled with quartz crystallization No Recovery 447.3-449.0'	R51: 9 minutes
454.0			>10	451.6-452.3' - Fracture zone, rock fragments up to 1-9/16" in diameter			
455			NR				
-412.7	R52-HQ 5 ft 82%	28	>10	454.0-455.5' - Fracture zone, multiple, high angle, intersecting fractures, rock fragments up to 2-3/8" in diameter		Limestone 440.2-441.25' - medium light gray to yellowish gray, (N6 to 5Y 7/2), mild HCl reaction, strong (R4), voids <1/16" over 30% of rock surface, cavities <1" diameter over 10% of surface, mottled coloration due to secondary mineralization of cavities, organic associated with cavities, with calcite crystals at 440.2-441.25' and 441.27-442.2' 441.25-442.2' - moderate yellowish brown, (10YR 5/4), very weak to weak (R1 to R2), faintly laminated organics No Recovery 442.2-444.0' Limestone 444.0-447.3' - medium light gray, (N6), very fine grained, strong HCl reaction, strong (R4), voids up to 3/32" over 20% of rock surface, cavities up to 9/16" over 1-2% of rock surface and some are filled with quartz crystallization No Recovery 447.3-449.0'	R52: 15 minutes
455.6			>10	455.6, 456.0, 456.4, 456.9, 457.0, 457.1' - Fractures (6), horizontal, rough, undulating, tight			
459.0			>10	456.6-456.7' - Fracture zone, rock fragments up to 3/4" in diameter			
460			NR	457.45-457.65' - Fracture zone, rock fragments up to 1-3/16" in diameter			
			>10	459.0-459.3' - Fracture zone, rough, undulating, rock fragments <2" in diameter			



PROJECT NUMBER:
338884.FL

BORING NUMBER:
AD-02

SHEET 14 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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			
-417.7	R53-HQ 5 ft 80%	46	>10	459.9-460.05' - Fracture zone, rough, undulating, rock fragments <1" in diameter		Limestone 449.0-452.3' - light brownish gray to light brown, (5YR 6/1 to 5YR 6/4), very fine to fine grained, strong HCl reaction, strong (R4), carbonate sandy silt lens from 451.6-451.8' is extremely weak rock, voids up to 3/16" over 5% of rock surface and are filled with crystallization, trace organic laminations at 451.5' No Recovery 452.3-454.0'	R53: 14 minutes
			3	460.3-460.75' - Fracture zone, rough, undulating, rock fragments <3" in diameter, 2 vertical fractures from 460.4-460.7'			
			1	460.85, 461.25, 461.95, 462.3' - Bedding plane or mechanical break (4), rough, undulating, tight, open to <1/2"			
			NR	461.5' - Mechanical break			
464.0							
465							
-422.7	R54-HQ 5 ft 78%	0	>10	464.3' - Fractures (3), horizontal and vertical, rough, undulating, tight, three intersecting fractures		454.0-458.1' - light brownish gray to light brown, (5YR 6/1 to 5YR 6/4), very fine to fine grained, strong HCl reaction, strong (R4), voids up to 3/16" over 5% of surface, trace organic laminations at 456.9' No Recovery 458.1-459.0'	R54: 10 minutes
			NA	464.6-465.4' - Fracture zone, rock fragments up to 1-3/16" in diameter			
			NA	465.6-465.9' - Fracture zone, rock fragments up to 3/4" in diameter			
			NR	466.2' - Bedding plane, horizontal, rough, undulating, tight			
				466.5-467.9' - Fracture zone, rock fragments up to 1-9/16" in diameter			
469.0							
470							
-427.7	R55-HQ 5 ft 98%	44	>10	469.0-469.6' - Fracture zone, multiple high angle, intersecting fractures, rock fragments up to 2-3/8" in diameter		459.0-463.0' - light gray to yellowish gray, (N7 to 5Y 7/2), very fine to fine grained, weak to strong (R2 to R4), voids <1/16" over <10% of rock, cavities <3/4" from 462.0-463.0', trace laminated organics, cavity infilling, crystalline growth of calcite/aragonite, very weak to weak transition from 461.25-461.55' No Recovery 463.0-464.0'	R55: 12 minutes
			3	469.9' - Fracture, horizontal, rough, undulating			
			2	470.1' - Bedding plane, horizontal, smooth, stepped, intersecting fractures, rock fragments up to 2-3/8" in diameter			
			2	470.2' - Fracture, 30 deg, rough, undulating, tight			
			1	470.5' - Fracture, 45 deg, rough, undulating, tight		464.0-464.9' - light brownish gray to light brown, (5YR 6/1 to 5YR 6/4), very fine to fine grained, strong HCl reaction, medium strong to strong (R3 to R4), trace organic increasing with depth, voids up to 3/32" over 1-2% of rock surface Silt With Limestone Fragments (ML) 464.9-465.9' - fine grained, strong HCl reaction, extremely weak (R0), with limestone fragments, high organic content, strong organic odor	Complete drilling at 17:00 on 09/11/07, water level at surface
			NR	471.75, 472.0, 472.15, 472.75, 473.1' - Fractures (5), horizontal, rough, undulating, except 45 deg at 472.75'			
			3	474.3' - Fracture, horizontal, rough, undulating, tight			
			4	474.7' - Fracture, 30 deg, rough, undulating, tight			
				474.9' - Fracture, horizontal, rough, undulating		465.9-466.5' - Same as 464.0-464.9' Silt With Limestone Fragments (ML) 466.5-467.9' - Same as 464.9-465.9' No Recovery 467.9-469.0'	R56: 15 minutes
			>10	475.3' - Fracture, 30 deg, rough, undulating, tight			
			3	475.9' - Fracture, horizontal, rough, undulating, high relief at 3/4"			
			>10	475.6, 475.9' - Fractures (2), horizontal, rough, undulating, tight			
				476.4, 475.9' - Fracture zone, horizontal, rough, undulating, tight, rock fragments to 3/4"		469.0-473.9' - light brownish gray to light brown, (5YR 6/1 to 5YR 6/4), very fine to fine grained, strong HCl reaction, medium strong to strong (R3 to R4), voids up to 3/16" over 20% of rock surface and are fossil molds, moderately fossiliferous, trace organics near top of run No Recovery 473.9-474.0'	
			1				
479.0							
480							



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-02	SHEET 15 OF 15
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723982.5 N, 457716.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 9/08/07

START : 9/8/2007

END : 9/12/2007

LOGGER : J. Burkard, R. Bitely, T. Borton, J. Townes

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.
-437.7	R57-HQ 5 ft 96%	37	4	476.75, 477.0, 477.65, 478.0, 478.35' - Fractures (5), horizontal, rough, undulating, tight		Limestone 474.0-479.0' - yellowish gray, (5Y 7/2), very fine to fine grained, mild to strong HCl reaction, medium strong to strong (R3 to R4), voids up to 3/16" over 10% of rock surface and are fossil molds, cavities up to 3/8" diameter over 1-2% of rock surface, moderately fossiliferous, secondary mineralization from 478.0-479.0' 479.0-483.8' - yellowish gray to light gray, (5Y 7/2 to N7), very fine to fine grained, mild to strong HCl reaction, medium strong to strong (R3 to R4), with and extremely weak carbonate sandy silt lens from 481.5-481.8', voids up to 3/8" over 10% of rock surface and are fossil molds, trace organics, moderately fossiliferous No Recovery 483.8-484.0'	R57: 12 minutes
			>10	478.6-478.8' - Fracture zone, rock fragments up to 1-3/16" in diameter			
			3	479.6, 480.15, 480.45, 480.6, 480.95, 481.25' - Fractures (6), horizontal, rough, undulating, tight			
			>10	481.5-481.8' - Fracture zone, rock fragments to 3/4" diameter			
484.0	R58-HQ 5 ft 76%	42	NR	481.9, 482.1, 482.75, 482.95, 483.2, 483.4' - Fractures (6), horizontal, rough, undulating, open to 3/4"		Limestone 484.0-487.8' - light brownish gray, (5YR 6/1), very fine to fine grained, mild to strong HCl reaction, strong (R4), voids up to 3/16" diameter over 20% of rock surface are fossil molds, quartz crystallization at 487.2', 1-9/16" diameter and contains carbonate crystallization No Recovery 487.8-489.0'	SC-9 collected at 485.8- 486.85'
			>10	482.85' - Fracture, vertical, rough, undulating, tight			
485			4	483.55-483.7' - Fracture zone, rock fragments up to 1-3/16" in diameter			
-442.7			2	484.0-484.5' - Fracture zone, rock fragments up to 2" in diameter			
			1	484.85, 485.0, 485.3, 485.4, 485.8, 486.9, 487.0' - Fractures (7), horizontal, rough, undulating, tight			
			NR	487.2' - Fracture, horizontal, rough, undulating, open to 3/4"			
489.0	R59-HQ 5 ft 81%	64	3	489.2' - Fracture, horizontal, rough, undulating, aragonite crystallization		Limestone 489.0-493.05' - light brownish gray, (5YR 6/1), very fine to fine grained, mild to strong HCl reaction, strong (R4), voids up to 3/16" over 10% of rock surface and are fossil molds, cavities up to 1-3/8" over 1% of rock surface are filled with carbonate crystallization and found from 489.0-490.0', moderately fossiliferous No Recovery 493.05-494.0'	R58: 11 minutes
			0	489.45, 489.9' - Fractures (2), horizontal, rough, undulating, tight			
490			>10	491.45-491.6' - Fracture zone, rock fragments up to 1-3/16" in diameter			
-447.7			1	492.4' - Fracture, horizontal, rough, undulating, tight			
	R60-HQ 6 ft 73%	19	NR			Limestone 494.0-498.4' - light brownish gray, (5YR 6/1), very fine to fine grained, mild to strong HCl reaction, medium strong to strong (R3 to R4), carbonate sandy silt, extremely weak rock from 497.3-497.9', voids up to 3/16" over 10% of rock surface and are fossil molds, cavities up to 9/16" diameter over 1% of rock surface and are filled with aragonite crystallization, trace organics No Recovery 498.4-500.0'	R59: 12 minutes
			5	494.2, 494.3, 494.45, 494.75, 495.1, 495.55, 495.9' - Fractures (7), horizontal, rough, undulating, trace brown staining, tight			
			4	495.65' - Fracture, vertical, rough, undulating, tight, intersecting with horizontal fractures at 495.55 and 495.9'			
			4	496.2, 496.45, 496.65' - Fractures (3), horizontal, rough, undulating, tight			
			>10	497.0' - Fracture, 0-90 deg, rough, undulating to stepped, tight			
			1	497.3-497.6' - Fracture zone, rock fragments up to 3/4", soft material			
	500.0		NR	498.15' - Fracture, horizontal, rough, undulating, tight			
500						Bottom of Boring at 500.0 ft bgs on 9/12/2007	R60: 10 minutes, 6' run to 500' below ground surface 9/12/07 at 10:30, total depth at 500.0' below ground surface



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-03

SHEET 1 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing


ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Fauroute, C. Sump

WATER LEVELS : 3.66 ft bgs on 9/19/07		START : 9/24/2007		END : 9/24/2007		LOGGER : P. De Saeghe, J. Townes, R. Biley, M. Faudet, C. Sump	
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			
-157.6	200.0		>10	200.0-200.6' - Fracture, vertical, rough, undulating, open		Limestone 200.0-203.6' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), trace voids (<1/16") 201.4-201.5' - horizontal black organic laminae 202.8-203.1' - horizontal black organic laminae 203.6-205.0' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), 30% voids (<1/16"), trace casts/cavities (<1/16") 205.0-207.1' - light olive gray to medium gray, (5Y 5/2 to N5), fine grained, moderate HCl reaction, medium strong (R3), trace medium to coarse subrounded fragments 206.5-207.1' - 5 to 10% voids to 1/16", trace cavities up to 3/4 x 1-3/16" 207.1-209.0' - pale yellowish brown to yellowish gray, (10Y 5/4 to 5Y 7/2), fine grained, weak HCl reaction, trace voids to 1/16", strong HCl reaction in pulverized material 209.0-209.85' - grayish orange pink, (5YR 7/2), fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), voids (<3/16") over 70% of surface, moderately fossiliferous 209.85-210.7' - moderate orange pink, (5YR 8/4), very fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), voids over 10% of surface, cavities up to 3/8" over 1% of surface, laminated, very poorly fossiliferous No Recovery 210.7-213.0' Limestone 213.0-217.0' - grayish orange pink, (5YR 7/2), very fine grained, mild to moderate HCl reaction, medium strong (R3), voids <1/16" over 50% of surface, few cavities up to 3/4", poorly fossiliferous No Recovery 217.0-219.0'	Boring AD-3 blind drilled to approximately 200 feet below ground surface before beginning sampling/logging. "Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" Logger: C. Sump (limited space in header) Approximately 1.8' of slough (from 0.0-200.0' drilling) removed from top of run R1: 12 minutes 15:25: Segment of R2 clogged, removed for logging and resumed R2 - HQ at 206.5' Driller's Remark: R2 - HQ was a 4.0' run due to blockage in core barrel R2: 14 minutes R3: 15 minutes R4: 16 minutes J. Townes continues logging
	R1-HQ 5 ft 100%	0	>10	200.6-201.4' - Fracture zone, angular fragments, 1-3" in size			
			>10	201.7-202.2' - Fracture zone, angular fragments, 1" to 2-1/2"			
			>10	202.4' - Fracture, horizontal, smooth, undulating, open			
			>10	202.5-202.7' - Fracture (3), 60 deg, rough, undulating, 1/8" relief			
			>10	202.9' - Fracture, horizontal, rough, undulating, open			
			>10	203.1-204.7' - Fracture zone, fragments 1/4-3"			
205	205.0		>10	204.7-205.0' - Fracture zone, fragments 2-3"			
-162.6			>10	205.0-205.5' - Fracture zone, fragments 1/2' to 2" in size			
	R2-HQ 4 ft 100%	0	>10	205.5-206.5' - Fracture zone, fragments 1/4-1" in size			
			9	205.8, 206.0, 207.1, 207.3, 207.4, 207.5, 207.5, 207.6, 207.7, 207.8, 207.9' - Fractures or bedding plane (11), horizontal, rough, planar to undulating, 1/8" open			
			>10	208.1, 208.15, 208.2' - Fractures or bedding plane (3), smooth to rough, planar to undulating, 1/8-1/4" open			
	209.0		>10	208.3-208.6' - Fracture zone, smooth to rough, planar to undulating, 1/4-2" open			
			4	208.6-209.0' - Fracture zone, fragments 2-3"			
210			8	209.0-209.85' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1/8"			
-167.6	R3-HQ 4 ft 43%		NR	210.25' - Bedding plane, horizontal, smooth			
			NR	210.3' - Fracture, vertical, rough, undulating, <1/16" open			
			NR	210.4' - Fracture, horizontal, rough, undulating, 3/8" open			
	213.0		>10	210.6' - Fracture, vertical, rough, undulating, <1/16" open			
			>10	213.0-213.4' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1/8"			
			>10	213.6' - Fracture, horizontal, rough, undulating, 3/8" open			
			>10	214.05' - Fracture, rough, undulating, 3/16" open			
215			6	214.25-216.15' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1-9/16"			
-172.6	R4-HQ 6 ft 67%		>10	216.3, 216.55, 216.65' - Fracture (3), horizontal, smooth, bedding plane, very low relief			
			NR	216.65-217.0' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1-3/16"			
	219.0		>10	219.0-220.8' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1-3/16"			
220			>10				



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-03	SHEET 2 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07 START : 8/16/2007 END : 8/24/2007 LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurote, C. Sump

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.
-177.6	R5-HQ 5 ft 36%	0	>10			Limestone 219.0-220.8' - yellowish gray to grayish orange pink, (5Y 7/2 to 5YR 7/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over 5% of surface, poorly fossiliferous No Recovery 220.8-224.0'	R5:13 minutes
224.0			NR				
225			2			Limestone 224.0-226.9' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over 60% of surface, cavities up to 3/8" over 10% of surface, fossil molds, moderately fossiliferous No Recovery 226.9-229.0'	
-182.6	R6-HQ 5 ft 58%	12	>10	224.7-224.9' - Fracture, 10 deg, rough, undulating, high relief (3/4") due to fossil molds 225.2-226.9' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1-3/16"			R6:5 minutes
			>10				
			NR				
229.0							
230			>10			Limestone 229.0-231.3' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), voids up to 1/16" over 20% of surface, cavities up to 3/4" over 1-2% of surface, fossil molds, poorly fossiliferous, trace laminations No Recovery 231.3-234.0'	
-187.6	R7-HQ 5 ft 46%	0	>10	229.55' - Fracture, 10 deg, rough, undulating, <1/16" open 229.7-231.0' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1-3/16"			
			>1	231.0' - Fracture, vertical, rough, undulating, ~3/8" open			R7:7 minutes
			NR				
234.0							
235			>10			Limestone 234.0-235.5' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, weak (R2), voids <1/16" over 5% of surface, cavities up to 1" over 1-2% of surface, fossil molds, trace laminations, poorly fossiliferous No Recovery 235.5-239.0'	
-192.6	R8-HQ 5 ft 30%	8	>10	234.0-234.5' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1-3/16"			
			>10	234.9-235.5' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1-3/16"			R8:7 minutes
			NR				
239.0							
240			>10	239.0-240.0' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1-9/16"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-03

SHEET 3 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

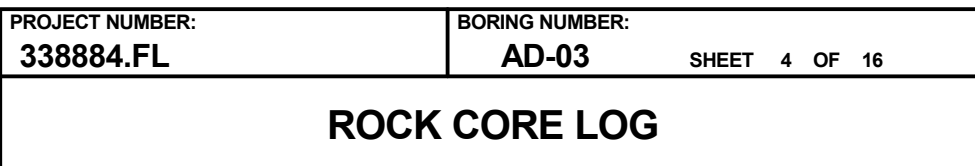
WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurote, C. Sump

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.
-197.6	R9-HQ 5 ft 24%	0	1	240.1' - Fracture, 60 deg, rough, undulating		Limestone 239.0-240.2' - yellowish gray, (5Y 7/2), very fine grained, mild HCl reaction, weak (R2), voids up to 3/32" over 30% of surface, fossil molds, poorly fossiliferous, trace laminations No Recovery 240.2-244.0'	R9:7 minutes
244.0			NR				
245	R10-HQ 5 ft 10%	0	>10	244.0-244.5' - Fracture zone, multiple high angle intersecting fractures, rock fragments up to 1-3/16"		Limestone 244.0-244.5' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids <1/16" over 50% of surface, trace laminations, area of oxidized pyrite 3/4", poorly fossiliferous No Recovery 244.5-249.0'	Driller's Remark: Smooth drilling, no loss of resistance or rod drops; incompetent material being ground up and washed out
-202.6			NR				
249.0	R11-HQ 5 ft 12%	0	>10	249.0-249.6' - Fracture zone, multiple high angle intersecting fractures, rock fragments to 1-3/16"		Limestone 249.0-249.6' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), trace laminations, nonfossiliferous No Recovery 249.6-254.0'	R10:7 minutes
250			NR				
-207.6	R12-HQ 5 ft 28%	0	>10	254.0-255.0' - Fracture zone, rough, undulating, multiple high angle intersecting fractures, rock fragments up to 1.5"		Limestone 254.0-256.5' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, very weak to weak (R1 to R2), trace laminations, cavities up to 3/8" over 5% of surface, fossil molds, poorly fossiliferous No Recovery 256.5-259.0'	R11: 7 minutes
255			2	255.2' - Fractures (2), 60 deg and horizontal, rough, undulating, 3/16" open			
-212.6			NR				R12: 7 minutes
259.0			>10				
260							



LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurote, C. Sump

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-03

SHEET 5 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurate, C. Sump

WATER LEVELS : 3.66 ft bgs on 9/19/07		START : 9/10/2007		END : 9/24/2007		LOGGER : P. De Saeghe, J. Towles, R. Biley, M. Faurte, C. Smith	
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		
-237.6	R17-HQ 5 ft 34%	0	>10		Limestone 279.0-280.7' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, medium strong to strong (R3 to R4) No Recovery 280.7-284.0'	R17: 10 minutes	
284.0			NR				
285	R18-HQ 5 ft 62%	12	>10		Limestone 284.0-284.9' - yellowish gray, (5Y 7/2), very fine to fine grained, medium strong to strong (R3 to R4), <1/16" voids over 10% of surface, fossiliferous	R18: 6 minutes	
-242.6			>10		284.8' - Bedding plane, 10 deg, rough, undulating		
			>10		285.15' - Fracture, <10 deg, rough, undulating, intersecting fractures		
			>10		285.2' - Fracture, 55 deg, rough, undulating, intersecting fractures		
			NR		285.25' - Fracture, <10 deg, rough, undulating, intersecting fractures		
			NR		285.75' - Fracture or mechanical break, <10 deg, rough, undulating		
	R19-HQ 5 ft 30%	0	NR		286.4' - Fracture or mechanical break, <10 deg, rough, undulating	R19: 5 minutes	
289.0			>10		286.6' - Fracture or mechanical break, <10 deg, rough, undulating		
			>10		286.6' - Fracture or mechanical break, <10 deg, rough, undulating		
			NR		289.0-290.5' - Fracture zone, rough, undulating, multiple intersecting fractures		
			NR		289.0-290.5' - Fracture zone, rough, undulating, multiple intersecting fractures, rock fragments <4"x1"		
			NR		290.4' - Fracture, rough, undulating, potential healed fractures, intersecting		
290	R20-HQ 5 ft 38%	10	>10		Limestone 289.0-290.5' - yellowish gray, (5Y 7/2), very fine to medium grained, mild HCl reaction, extremely weak to medium strong (R0 to R3), voids over 15 to 30% of surface (<1/16"), poorly to moderately fossiliferous No Recovery 290.5-294.0'	R20: 5 minutes	
-247.6			>10		294.0		
			3		294.3' - Fracture, 70 deg, rough, undulating		
			10		294.6' - Fracture, 70 deg, rough, undulating		
			NR		294.6-295.0' - Fractures, multiple intersecting fractures, fragments <2"		
			NR		295.2' - Bedding plane or mechanical break, <10 deg, smooth to rough, undulating		
295	R20-HQ 5 ft 38%	10	NR		295.3' - Fracture or mechanical break, 60 deg, rough, undulating	Driller's Remark: Slow rotation to approx. 400 rpm to achieve better recovery in softer material M. Faurte continues logging	
-252.6			NR		295.8-295.9' - Fracture zone, rough, undulating, >3 fractures intersect		
			NR		295.8-295.9' - Fracture zone, rough, undulating, >3 fractures intersect		
299.0			3		299.35' - Mechanical break or bedding plane, <10 deg, smooth to rough		
300							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-03

SHEET 6 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing


ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurate, C. Sump

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			
-257.6	R21-HQ 5 ft 82%	51	>10	299.45' - Mechanical break or bedding plane, <10 deg, smooth to rough, slickensided		Limestone 299.0-299.3' - grayish orange, (10YR 7/4), very fine grained, mild HCl reaction, extremely weak (R0), trace laminations 299.3-299.35' - olive gray, (5Y 4/1), very fine grained, no HCl reaction, extremely weak (R0) 299.35-301.0' - yellowish gray to light olive gray, (5Y 8/1 to 5Y 6/1), very fine to medium grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), laminated bedding 301.0-303.1' - yellowish gray, (5Y 7/2), very fine to fine grained, mild to moderate HCl reaction, laminated bedding, voids <1/16" over 10% of surface No Recovery 303.1-304.0' Limestone 304.0-305.9' - yellowish gray, (5Y 8/1), mottled colorations with trace organics, very fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), trace voids <1/16", poorly fossiliferous No Recovery 305.9-309.0' Limestone 309.0-312.8' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, extremely weak to weak (R0 to R2) 309.0-310.8' - very fine grained, mottled laminations 310.8-312.8' - very fine to fine grained, laminated bedding, with voids (<1/16") over 30% of surface No Recovery 312.8-314.0' Limestone 314.0-315.6' - yellowish gray, (5Y 8/1), very fine to medium grained, moderate HCl reaction, extremely weak to weak (R0 to R2), voids <1/16" over 10% of surface No Recovery 315.6-319.0'	SC-1 collected at 302.0-302.8' R21: 7 minutes
			>10	299.7' - Mechanical break or bedding plane, <10 deg, smooth to rough, slickensided			
			1	300.4-300.65' - Fracture zone, rough, undulating, gravel sized fragments <2"			
			0	301.0-301.1' - Fracture zone, rough, undulating, sand sized fragments			
304.0	R22-HQ 5 ft 38%	0	NR	301.5' - Fracture or mechanical break, <10 deg, smooth to rough, undulating			R22: 7 minutes
			>10	301.9-302.1' - Fracture, <10 deg, smooth to rough, undulating, gravel sized fragments <1"			
			>10	302.85' - Fracture or mechanical break, <10 deg, rough, undulating			
			NR	304.0-305.9' - Fracture zone, rough, undulating, gravel sized fragments <2"			
305 -262.6	R23-HQ 5 ft 76%	33	>10	309.0-309.7' - Fracture zone, rough, undulating, gravel sized fragments <2"			R23: 5 minutes
			>10	310.25-310.35' - Fracture zone, rough, undulating, gravel sized fragments <1"			
			3	310.8, 311.15, 311.55, 311.95, 312.1' - Bedding plane (5), <10 deg, rough, undulating			
			>10	312.3-312.8' - Fracture zone, rough, undulating, gravel sized fragments <1"			
310 -267.6	R24-HQ 5 ft 32%	0	NR	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			R24: 5 minutes
			>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			
			>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			
			NR	318.0-320.0' - Fracture zone, rough, undulating, gravel sized fragments <2"			
315 -272.6	R24-HQ 5 ft 32%	0	>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			R24: 5 minutes
			>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			
			>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			
			NR	318.0-320.0' - Fracture zone, rough, undulating, gravel sized fragments <2"			
319.0	R24-HQ 5 ft 32%	0	>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			R24: 5 minutes
			>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			
			>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			
			NR	318.0-320.0' - Fracture zone, rough, undulating, gravel sized fragments <2"			
320	R24-HQ 5 ft 32%	0	>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			R24: 5 minutes
			>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			
			>10	314.0-315.6' - Fracture zone, rough, undulating, gravel sized fragments <3"			
			NR	318.0-320.0' - Fracture zone, rough, undulating, gravel sized fragments <2"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-03

SHEET 7 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing


ORIENTATION : Vertical

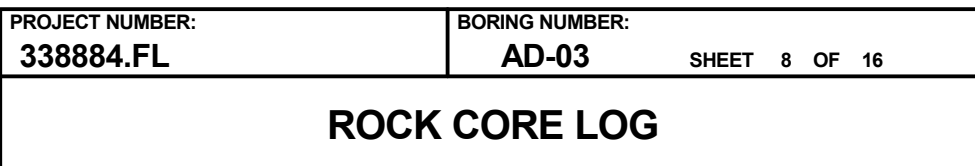
WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Fauroute, C. Sump

WATER LEVELS : 3.66 ft bgs on 9/13/07			START : 9/10/2007			END : 9/24/2007			LOGGERS : P. De Saeghe, J. Towles, R. Bitley, M. Paulite, C. Smith		
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							
-277.6	R25-HQ 5 ft 30%	0	4	320.1' - Fracture, 30 deg, rough, undulating, 4 intersecting fractures 320.3' - Fracture, 70 deg, rough, undulating, 4 intersecting fractures		Limestone 319.0-320.5' - yellowish gray, (5Y 8/1), very fine to medium grained, mild to moderate HCl reaction, very weak to weak (R1 to R2) No Recovery 320.5-324.0'	R25: 6 minutes				
324.0			NR	324.0-326.1' - soil interval		Silty Sand (SM) 324.0-326.1' - yellowish gray, (5Y 7/2), moist, dense, fine to coarse grained, mild HCl reaction, 40 to 60% carbonate sands, 40 to 60% low plasticity carbonate silts No Recovery 326.1-329.0'	Begin drilling at 8:00 on 8/22/07; water level at 3' below ground surface Driller's Remark: No slough in boring, clean to 324' below ground surface Driller's Remark: Moderate to slow advancement rate; very consistent advancement Driller's Remark: Slow rotation rate to approx. 300 rpm to achieve better recovery in softer material R26: 7 minutes				
325	NA										
-282.6	NA										
	NR										
329.0	R26-HQ 5 ft 42%	0	NA	Sandy Silt (ML) 329.0-331.3' - yellowish gray, (5Y 7/2), dry to moist, very dense, fine to coarse grained, >50% low plasticity carbonate silts, carbonate sands	Limestone 331.3-333.4' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), trace organic laminations No Recovery 333.4-334.0' No Recovery 334.0-339.0'	R27: 6 minutes					
330			NA								
-287.6			NA								
			2								
	R27-HQ 5 ft 88%	40	2	331.5' - Mechanical break, boxing core 331.7' - Bedding plane or mechanical break, <10 deg, rough, undulating 331.85' - Bedding plane or mechanical break, <10 deg, rough, undulating 332.5' - Fracture or mechanical break, 60 deg, rough, undulating 332.9' - Bedding plane or mechanical break, <10 deg, rough, undulating	No Recovery 339.0-342.0'	Driller's Remark: Possible void space; low torque on drill indicating very soft material or no material; no fluid return; fluid return at higher flow rate of approx. 25 gpm and not drilling (approx. 25% circulation)					
334.0			NR								
335											
-292.6											
	R28-HQ 5 ft 0%	0	NR	No Recovery 339.0-342.0'		R28: 7 minutes					
339.0											
340											



LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurote, C. Sump

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-03	SHEET 9 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Fauroute, C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-317.6	R33-HQ 5 ft 82%	50	>10 359.95' - Bedding plane, rough, undulating 360.2-360.4' - interbedded, generally horizontal 360.95' - Mechanical break		Limestone 358.2-361.1' - pale orange, (10YR 8/2), very fine grained, weak to medium strong (R2 to R3), 20% voids (<1/16"), fossiliferous 361.1-361.3' - very fine grained, transition zone, irregular, convoluted surface, laminar, horizontal bedding, organic interbedding, rip-up clasts 361.3-363.1' - yellowish gray, (5Y 8/1), trace mottling, very fine to medium grained, moderate to strong HCl reaction, weak (R2), fossil casts (1/16 to 3/8") over 10 to 15% of the surface, faint bedding	SC-2 collected at 361.75-362.65'
364.0		NR	>10 361.5' - Fracture or bedding plane, horizontal and vertical, rough, undulating 361.6' - Fracture or bedding plane, horizontal and vertical, rough, undulating 361.7' - Fracture or bedding plane, horizontal and vertical, rough, undulating 362.7-363.1' - Fracture zone, smooth to rough, undulating, multiple fragments, no visible orientations		No Recovery 363.1-364.0' Limestone 364.0-364.25' - pale orange, (10YR 8/2), trace mottling, very fine grained, moderate to strong HCl reaction, weak (R2), fossil casts (1/16 to 3/8") over 10 to 15% of the surface, faint bedding	R33: 6 minutes
365 -322.6	R34-HQ 5 ft 100%	52	7 364.25-364.45' - Bedding plane, smooth, undulating 364.7' - Fracture, 85 deg and vertical, rough, undulating 364.9' - Bedding plane, horizontal, smooth, contact, with 45 deg fracture 366.2' - Bedding plane, rough, contact very irregular 366.9-368.0' - Fracture zone, smooth, undulating, irregular contact with uneven surfaces		364.25-364.9' - pale orange, (10YR 8/2), very fine grained, strong HCl reaction, medium strong (R3), granular, voids (<1/16") over 15% of surface, cavities (up to 1/2 to 1/4") over 10% of surface (fossil molds) 364.9-366.15' - grayish orange, (10YR 7/4), very fine grained, strong to very strong HCl reaction, medium strong (R3), trace organics as laminae at top of interval 366.15-368.2' - white, pale orange, (N9, 10YR 8/2), very fine grained, medium strong to strong (R3 to R4), 20% burrows, molds, and 5% voids (<1/16"), trace organics 368.2-368.6' - pale orange, (10YR 8/2), very fine grained, very weak to weak (R1 to R2), granular, 1/8" organic layer at 368.3', few voids, few cavities	R34: 6 minutes
369.0		1	368.7' - Bedding plane, horizontal			
370 -327.6	R35-HQ 5 ft 74%	44	>10 369.35-369.8' - Fracture zone or bedding plane, 0-90 deg, smooth to rough, planar to undulating, iron oxides and trace organics 370.1' - Fractures, horizontal and 8 deg, rough, undulating 370.6-370.7' - Fracture zone 371.5' - Mechanical break 371.9' - Mechanical break			
		1	372.6' - Mechanical break			
		NR				R35: 5 minutes
374.0						
375 -332.6	R36-HQ 5 ft 66%	12	>10 374.0-374.3' - Fracture zone, fragments 1/4" to 3/4" 374.3' - Bedding plane, horizontal and 5 deg, smooth, undulating 374.4' - Bedding plane, horizontal and 5 deg, smooth, undulating 374.6' - Bedding plane, horizontal and 5 deg, smooth, undulating 374.85' - Fracture, 20 deg, rough, undulating 374.9-375.3' - Fracture zone, multiple orientations, fragments are 1/2"x1" to 2"x1" 375.55' - Mechanical break 375.7-375.95' - Fracture zone 376.55' - Fracture zone, horizontal and 25 deg, rough, undulating 376.6-376.8' - Fracture zone, trace iron oxide staining		Limestone 369.4-370.5' - white to pale orange, (N9 to 10YR 8/2), very fine grained, strong HCl reaction, medium strong (R3), trace organics, burrows and molds create cavities to 1/2", 10% voids (<1/16") 370.5-372.7' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, medium strong to strong (R3 to R4), 20 to 25 % voids (<1/16") and fossil molds and casts No Recovery 372.7-374.0'	R36: 7 minutes
379.0		NR				
380		2				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-03

SHEET 10 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Fauroute, C. Sump

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.
-337.6	R37-HQ 5 ft 82%	18	5	380.1, 380.2, 380.45' - Bedding plane (3), horizontal		Limestone 374.0-374.45' - grayish orange, (10YR 7/4), fine to medium grained, moderate HCl reaction, very weak (R1), laminated bedding, organic interbedding 374.45-377.3' - yellowish gray, (5Y 8/2), very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), 25 to 35 % burrows, cavities (molds), 5 to 10% voids (<1/16"), locally heavily fractured No Recovery 377.3-379.0' Limestone 379.0-381.75' - grayish orange, (10YR 7/4), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), nonreactive granular material, localized laminated bedding with trace organics 381.0-381.3' - extremely weak (R0), friable, dissembles in water 381.75-383.1' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, medium strong (R3), 10% voids (<1/8") 382.7-383.1' - very weak to weak (R1 to R2) No Recovery 383.1-384.0' Limestone 384.0-384.5' - yellowish gray, (5Y 7/2), very fine grained, very strong HCl reaction, extremely weak (R0) 384.5-387.0' - grayish orange, (10YR 7/4), very fine grained, strong HCl reaction, medium strong (R3), 20% <1/16" voids, trace organics, cavities to 3/4" 387.0-388.8' - light gray, light blue gray, (N7, 5B 7/1), very fine to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), 25% fossil casts (1/16 to 9/16" max.) of forams, pelecypods, and echinoderms No Recovery 388.8-389.0' Limestone 389.0-393.7' - grayish orange, very pale orange (392.0'), (10YR 7/4, 10YR 8/2), strong HCl reaction, extremely weak to very weak (R0 to R1), fracture zone, breccia begins at 390.5', 15-18% voids (<1/16") in rock fragments No Recovery 393.7-394.0' Limestone 394.0-395.8' - Same as 389.0-393.7' 395.6' - becomes tacky, heavy silt content No Recovery 395.8-399.0'	R37: 6 minutes
			4	380.8, 380.9' - Mechanical break (2) 381.05' - stepped fracture over 3/4", angular 381.4' - Bedding plane, smooth, undulating, stepped			
			4	381.7, 381.9, 382.15, 382.6' - Bedding plane (4), smooth, undulating 382.7, 382.9' - Bedding plane (2), rough, undulating			
			NR				
384.0	R38-HQ 5 ft 96%	39	8	384.2, 384.4, 384.5, 384.7' - Bedding plane or mechanical break (4)			SC-3 collected at 387.8-388.8' R38: 7 minutes
			6	384.9' - mid point of vertical fracture along center of core			
			>10	385.05, 385.2, 385.7, 385.9' - rough, multiple fragments, angular to spike random angles 386.0' - Fracture, 20 deg			
			>10	386.6-387.5' - Fracture zone, multiple fragments up to 2", crosses lithology change			
			0	387.8' - Bedding plane, 10 deg, smooth, undulating			
			NR				
389.0	R39-HQ 5 ft 94%	27	4	389.05' - Mechanical break 389.4-389.5' - Bedding plane, horizontal and 5 deg, smooth, undulating, silt/clay infill			R39: 8 minutes
			2				
			2	390.5-391.5' - Fracture zone, fragments to 2", subangular to angular, 40-60% infill <1"			
			1	391.5-391.8' - Bedding plane, horizontal, smooth, undulating, rock partings on both ends			
			>10	391.8-392.6' - Fracture zone, fragments to 1-1/2", subangular to angular			
			NR	392.9' - Bedding plane, smooth, undulating, contact rock with silt/sand			
394.0	R40-HQ 5 ft 36%	0	>10	393.4-393.7' - Fracture zone, fine infill, angular fragments to 1"			R40: 6 minutes
			>10	394.0-394.55' - Fracture zone, fractures from horizontal to vertical, immediately below 3/8" gravel sized fragments, clay/silt rock fragments to end of run			
			NR				
			NR				
399.0			1	399.65' - Bedding plane, smooth, horizontal			
400							



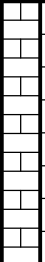

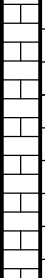
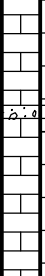
PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-03	SHEET 11 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07 START : 8/16/2007 END : 8/24/2007 LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurote, C. Sump

WATER LEVELS - 3.66 ft bgs on 9/13/07		START : 9/10/2007		END : 9/24/2007		LOGGER : P. De Saegh, J. Towles, R. Ditley, M. F. Adair, C. Smith		
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				
-357.6	R41-HQ 5 ft 88%	67	2	400.0' - Fracture, horizontal, rough, undulating 400.1' - Fracture, vertical, rough, undulating 401.0' - Mechanical break		Limestone 399.0-399.25' - very pale orange, (10YR 8/2), moderate HCl reaction, very weak (R1), 30% voids (<1/8") (fossil molds), sand-sized grains, fossil fragments 399.25-403.4' - yellowish gray, (5Y 8/1), mild to strong HCl reaction, weak (R2), trace iron oxides on shell casts, 15% <1/16" voids with sporadic fossil casts to 1/4" No Recovery 403.4-404.0'	SC-4 collected at 401.5- 402.65' R41: 6 minutes	
			1					Limestone 404.0-408.95' - grayish orange pink, (5YR 7/2), fine to medium grained, moderate HCl reaction, very weak (R1), HCl reaction delayed, brecciated at 410.2-410.35'
			1					
			1					
404.0			NR	402.7' - Fracture, 45 deg, planar				
405 -362.6	R42-HQ 5 ft 99%	86	2	404.1' - Bedding plane, 5 deg, undulating			R42: 6 minutes	
			1	404.85' - Fracture, 15 deg, smooth, planar 405.05' - Bedding plane or mechanical break, core contacts spun against each other				
			1	406.65' - Bedding plane, horizontal and 5 deg, smooth, undulating 407.05' - Bedding plane, 10 deg, smooth, planar 407.75' - Mechanical break				
			2					
			1					
409.0			NR	408.85' - Mechanical break, probably when breaking core run off bottom		No Recovery 408.95-409.0'		
410 -367.6	R43-HQ 5 ft 60%	14	>10	409.7-410.0' - Mechanical break, undulating, heavily fractured near vertical planes, probably mechanically induced 410.3' - Fracture, 40 deg and 45 deg, zone infilled with 1/8" or less rock fragments in silt matrix 410.6-412.0' - Fracture zone, horizontal and vertical, multiple fragments of varying size ranging to 3"x1-1/2"x1", organic (coatings) on planar surfaces and lining casts from 411.3-412'		Limestone 409.0-411.3' - Same as 404.0-408.95' Limestone 411.3-412.0' - mild HCl reaction, very weak (R1), dark organic laminae, trace iron oxides on bedding plane surfaces No Recovery 412.0-414.0'	R43: 7 minutes	
			>10					
			>10					
			NR					
			414.0					
415 -372.6	R44-HQ 5 ft 89%	57	5	414.15' - Bedding plane, horizontal, smooth, planar 414.4' - Fracture, vertical and 60 deg 414.6' - Bedding plane, rough, undulating 414.95, 415.2, 415.5, 415.8' - Mechanical break (4)		Limestone 414.0-414.6' - very pale orange, (10YR 5/2), very fine grained, very strong HCl reaction, weak (R2), 5% (<1/16") voids on surface, trace organics Conglomerate 414.6-414.8' - strong HCl reaction, variegated, silica gravel up to 3/8", limestone grains Limestone 414.8-418.45' - very pale orange, (10YR 8/2), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), 5 to 20% (<1/16") voids, fossil molds, some including cavities up to 1/2", trace organic material No Recovery 418.45-419.0'	R44: 8 minutes	
			3					
			2	416.4' - Mechanical break, horizontal 416.8' - Fracture, 65 deg, planar to undulating, 1/16" separation 417.15, 417.25' - Fracture (2), horizontal and 80 deg, 1/16" to 1/16" separation				
			2					
			1					
			NR	418.4' - Bedding plane, smooth, undulating				
			419.0					
420			1	419.2' - Bedding plane, probable organic stain and/or infill				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-03

SHEET 12 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurate, C. Sump

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.
-377.6	R45-HQ 5 ft 96%	65	1		Peat 419.0-419.2' - brownish black, (5YR 2/1), malleable	R45: 9 minutes
			2		Limestone 419.2-421.8' - very pale orange, (10YR 8/2), very fine grained, strong HCl reaction, medium strong (R3), fossil mold rich, 25% (<1/16") voids, trace organics	
			>10		421.8-423.8' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), very fine grained, moderate to strong HCl reaction, medium strong to weak (R3 to R2), voids (<1/16") over 10-15% of surface, 3-8% cavities (1" x 1/4"), weak (R2) rock (last 1' of interval), trace organics, laminar interbeds with fossil coatings	
			>10		No Recovery 423.8-424.0' Limestone 424.0-428.3' - Same as 421.8-423.8'	
424.0	R46-HQ 5 ft 100%	86	NR			R46: 8 minutes Driller's Remark: Lost circulation at 428.2-429.3'
			1		428.3-433.3' - very pale orange, (10YR 8/2), very fine grained, moderate to strong HCl reaction, very weak (R1), voids (1/16"-1/8") over <10% of surface, 1/16"-3/16" fossil casts, at 428.3-429.0' vertical channel-like voids (1/2"-1-1/2" wide)	
			2			
			4			
-382.6	R47-HQ 5 ft 98%	50	2			R47: 9 minutes
			4			
			2			
			3			
429.0	R48-HQ 5 ft 88%	22	3			R48: 12 minutes
			3			
			1			
			1			
430	R49-HQ 5 ft 98%	22	2			SC-5 collected at 430.5-431.55'
			3			
			1			
			1			
-387.6	R50-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
434.0	R51-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
435	R52-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
-392.6	R53-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
439.0	R54-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
440	R55-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R56-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R57-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R58-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R59-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R60-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R61-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R62-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R63-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R64-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R65-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R66-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R67-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R68-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R69-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R70-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R71-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R72-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R73-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R74-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R75-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R76-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R77-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R78-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R79-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R80-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R81-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R82-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R83-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R84-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R85-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R86-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R87-HQ 5 ft 98%	22	2			SC-7S collected at 434.0-434.25'
			3			
			1			
			1			
	R88-HQ 5 ft 98%	22	2			SC-



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-03

SHEET 13 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing





ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurate, C. Sump

WATER LEVELS : 3.66 ft bgs on 9/19/07		START : 9/10/2007		END : 9/24/2007		LOGGERS : P. De Sarteo, J. Towles, K. Biley, M. Paulose, C. Smith		
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
-397.6	R49-HQ 5 ft 94%	42	3	439.9, 440.5, 441.0' - Mechanical break (3)		Peat 436.5-436.6' - brownish black, (5YR 2/1), platy, malleable, parting tendencies, HCl reaction on parting surfaces	R49: 10 minutes	
4			441.25, 441.4' - Bedding plane (2), rough, planar, 1/16" open 441.6' - Bedding plane, 60 deg, rough, planar, 1/16" open, planar fracture with organic material as sporadic blebs 442.2-444.0' - Fracture zone, very strongly broken rock fragments in silty sand or sandy silt	Conglomerate 436.6-436.95' - strong HCl reaction, extremely weak (R0), variegated, limestone fragments (1/2"x3/8") and silica grains (up to 5/16"), trace organics, angular silica				
>10								
>10								
444.0			NR			Limestone 436.95-437.5' - grayish orange, (10YR 7/4), very fine grained, moderate HCl reaction, medium strong (R3), thin bedding, 5 to 10% discontinuous organic stringers and blebs 437.5-437.7' - very pale orange, (10YR 8/2), very fine grained, strong HCl reaction, extremely weak (R0), laminated bedding, organic partings, undulant to scour like bedding 437.7-438.4' - moderate orange pink, (5YR 8/4), very fine grained, mild HCl reaction, weak (R2), voids (1/16") over <5% of surface, trace organics, fossil molds infilled, recrystallized carbonate minerals		
445 -402.6	R50-HQ 5 ft 92%	8	2	444.6, 444.95' - Bedding plane (2), rough, stepped to undulating, fragmented separations 445.3' - Fracture, 75 deg, rough, irregular, trace organics 446.1-446.3' - Fracture, vertical, multiple small fractures throughout			R50: 8 minutes	
2								
>10								
>10								
>10								
449.0			NR	449.0-450.1' - Fracture zone, random orientations, fragments to 2-1/2" x 2"				
450 -407.6	R51-HQ 5 ft 52%	8	>10			No Recovery 438.4-439.0' Limestone 439.0-441.25' - yellowish gray, (5Y 7/2), very fine grained, very strong HCl reaction, very strong (R5), 5-10% blebs and stringers of organic material, voids (<1/8") over 5% of surface, 1-1/2 x 1/2" cavities, lined or partially lined with calcite	R51: 13 minutes	
>10			450.6' - Fracture, 70 deg, rough, planar 450.7-454.0' - Bedding plane or fracture zone, smooth, undulating					
>10								
NR								
454.0				454.0-454.6' - Fracture zone		Peat 441.25-441.5' - black, (N1), above carbonate derived silt		
455 -412.6	R52-HQ 5 ft 58%	20	>10	454.8, 454.95' - Fracture (2), 15 deg and 30 deg, rough, undulating, recrystallized 455.15, 455.6' - Bedding plane (2), smooth, planar 455.7' - Fracture, 75 deg, undulating to planar		Limestone 441.5-443.7' - pale brown to pale yellowish brown, (5Y 5/2 to 10YR 6/2), moderate HCl reaction, extremely weak to very weak (R0 to R1), limestone fragments, trace organics No Recovery 443.7-444.0'	R52: 12 minutes	
2								
>10			457.2-459.0' - Bedding plane or fracture zone, horizontal, smooth, undulating	Peat 444.0-444.1' - black, (N1), amorphous				
NR				Limestone 444.1-448.6' - light brown, (5YR 5/6), very fine to fine grained, mild to moderate HCl reaction, very weak to strong (R1 to R4), voids (<1/8") over 15% of surface No Recovery 448.6-449.0'				
>10			459.0-460.0' - Fracture zone, fragments to 3"x2"x1"					
459.0								
460								








PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-03	SHEET 14 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07 START : 8/16/2007 END : 8/24/2007 LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Fauroute, C. Sump

WATER LEVELS : 3.66 ft bgs on 9/19/07		START : 9/24/2007		END : 9/24/2007		LOGGERS : P. De Salgado, J. Towles, R. Ditley, M. T. Adair, C. Smith				
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES				SYMBOLIC LOG	LITHOLOGY	COMMENTS		
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION						
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS						
-417.6	R53-HQ 5 ft 84%	0	5	460.3, 460.4, 460.6, 460.65, 460.95' - Mechanical break or bedding plane (5), 60 deg, trace organic staining		Limestone 449.0-451.5' - yellowish gray, (5Y 7/2), very fine grained, mild to very strong HCl reaction, strong to very strong (R4 to R5), voids (<1/8") over 10% of surface No Recovery 451.5-454.0'	R53: 14 minutes			
>10			461.3' - Fracture, 60 deg, rough, undulating, intersecting	Peat 454.0-454.1' - brown black, (5YR 2/1)						
>10			461.7-462.0' - Fracture zone, 60 deg, rough, undulating, angular							
2			462.1' - Bedding plane, smooth							
464.0	R54-HQ 5 ft 86%	17	NR	462.4, 462.6' - Fracture (2), 45 deg, undulating, one healed is parallel to these, tight		Limestone 454.1-456.9' - light brown to pale yellowish brown, (5YR 6/4 to 10YR 6/2), very fine grained, mild to very strong HCl reaction, very strong (R5), voids (<1/16") over 5-8% of surface, trace cavities (1/2" x 1/4"), trace organics No Recovery 456.9-459.0'	R54: 13 minutes			
2			462.8' - Fracture, 85 deg, rough, undulating	Silt (ML) 459.0-459.2' - with subrounded gravel to 1/2"						
>10			463.2' - Fracture, 30 deg and vertical, smooth, undulating							
>10			463.3' - Fracture, vertical, smooth, undulating					Limestone 459.2-461.8' - moderate yellow brown, (10YR 5/4), very fine to fine grained, mild to strong HCl reaction, very weak to weak (R1 to R2), thin bedding, voids (<1/16") over 10-15% of surface		
>10			464.1' - Fracture, 45 deg, rough, undulating						Fine Sand (SP) 461.8-462.0' - dusky yellow, (5Y 6/4), carbonate	
>10			464.6' - Mechanical break, 10 deg, core pieces spun against each other							Limestone 462.0-462.75' - moderate yellow brown, (10YR 5/4), very fine to fine grained, mild to strong HCl reaction, very weak to weak (R1 to R2), thin bedding, voids (<1/8") over 10-15% of surface
NR			465.1' - Fracture zone, 70 deg, rough, planar, may extend to 496' with multiple fragments between							
NR	466.0-467.0' - Fracture zone, fragments to 2", sporadic organic staining									
469.0	R55-HQ 5 ft 90%	31	2	467.8' - Fracture, 15 deg, rough, undulating, angular		Limestone 463.0-463.2' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, very weak (R1), small blebs of black organics throughout No Recovery 463.2-464.0'	R56: 9 minutes			
5			468.0' - Fracture, 20 deg, rough, undulating, angular	Limestone 464.0-464.65' - pale reddish brown, (10R 5/4), very fine grained, moderate HCl reaction, strong (R4), voids (<1/16") over 5% of surface						
>10			469.3' - Bedding plane, rough, stepped to planar, organic staining locally					Limestone 464.65-466.1' - grayish orange, (10YR 7/4), very fine grained, delayed mild HCl reaction, medium strong (R3), thin bedding, irregular bedding		
2			469.6' - Bedding plane, rough, stepped to planar, organic staining							
2			470.05' - Bedding plane, smooth, undulating, contact							
NR			470.4' - Fracture, 45 deg, smooth, planar, intersecting, fractures at a bedding plane parting with veneer to laminar bedded black (organic) material							
474.0	R56-HQ 5 ft 94%	24	NR	471.05' - Fracture, rough, irregular, trace organics						
2			471.1-471.5' - Fracture zone, stepped, irregular, fracture along suture type material							
2			471.9' - Bedding plane, stepped to undulating							
>10			472.55' - Fracture, horizontal, rough, undulating							
3			472.8' - Fracture, 60 deg, smooth, undulating, trace organics							
3			473.3' - Fracture, 15 deg, rough, undulating							
2			474.6' - Fracture, vertical, rough, planar							
NR	474.95' - Fracture, vertical, rough, undulating, angular									
479.0			NR	475.2-476.1' - Fracture zone						
>10			476.5' - Fracture, 15 deg, rough, undulating, angular							
>10			476.7' - Fracture, 75 deg, rough, undulating							
480				477.2' - Fracture, 60 deg, rough, undulating, infilled, limestone fragments and fines						
				477.6' - Fracture, 5 deg and 30 deg, bottom of previous fracture area						
				477.9' - Fracture, 85 deg, rough, undulating						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-03

SHEET 15 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723083.8 N, 458040.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

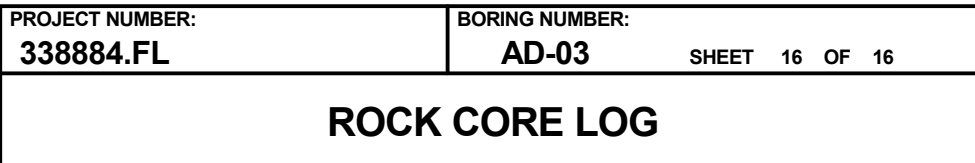
WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurate, C. Sump

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.
-437.6	R57-HQ 5 ft 74%	26	>10	478.15' - Fracture, 60 deg, smooth, planar		Limestone 466.1-468.3' - dusky yellow, (5Y 6/4), very fine to medium grained, mild to moderate HCl reaction, extremely weak to strong (R0 to R4), granular, voids (<1/16") over 18-20% of surface No Recovery 468.3-469.0' Limestone 469.0-470.15' - Same as 466.1-468.3' 470.15-471.5' - light brown, (5YR 6/4), very fine grained, moderate to strong HCl reaction, weak (R2), laminated to very thin bedding, black beds, lenticels and lenses, at 470.45' and 471.0' beds to 1/4" 471.5-482.25' - light brown, (5YR 5/6), very fine to fine grained, weak to very strong HCl reaction, very weak to medium strong (R1 to R3) No Recovery 473.7-474.0' Limestone 475.2-475.8' - limestone fragments in carbonate silt, fracture or cavity infill, fragments subangular to subrounded, 15% voids (<1/8") and fossil molds (up to 3/8") Breccia 477.0-477.6' - sand and silt matrix No Recovery 478.7-479.0' Limestone 482.85-487.7' - grayish orange, dark gray, (10YR 8/2, N3), very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (<1/8") over 5-15% of surface, fossil molds filled or partially infilled with aragonite/calcite, cavities range to greater than width of core and over 2" high, trace organics (shells or shell fragments) No Recovery 482.7-484.0' Limestone 487.7-491.7' - dusky yellow to light brown with 1 to 2" grayish orange, (5YR 6/4 to 10YR 7/4), very fine to fine grained, mild to strong HCl reaction, very weak to medium strong (R1 to R3), voids (<1/16") over 15-30% of surface, solution cavities (1/2" to 2-1/2"x2") No Recovery 488.75-489.0' Limestone 490.1-492.0' - numerous thin dissolution cavities subparallel to bedding 491.5-497.0' - extremely weak to very weak (R0 to R1), 1/4" black organic bed at/near contact	Driller's Remark: Lost circulation on this run, water column dropped to 50' below top of casing R57: 6 minutes
			>10	479.0-481.0' - Fracture zone, 60 deg, random fragments 1/2 to 2", 480.7-481.6' is single fragment with fracture			
			0	481.0-481.3' - Fracture zone, random angles, sizes from 1/4" to 2", average about 3/8"			
			1	482.2' - Bedding plane, 0-5 deg, smooth, undulating			
484.0	R58-HQ 5 ft 95%	43	NR			484.3' - Mechanical break, 15 deg, smooth, undulating 484.55' - Mechanical break, 15 deg, smooth, undulating 484.75' - Bedding plane, 30 deg, smooth, undulating 485.8' - Mechanical break 486.2' - Fracture, edges do not match, could be up to 0.3' separation 486.7' - Mechanical break or bedding plane, smooth, undulating 487.6-488.3' - Fracture zone, fragments from 1/8" to 1" 488.4' - Fracture, 65 deg, rough, planar, flat 489.05, 489.35, 489.5, 489.6' - Bedding plane (4), smooth, flat 489.75, 489.85' - Bedding plane (2), 65 deg, rough, planar 489.9, 490.0, 490.15, 490.3, 490.6, 490.85, 491.05, 491.3, 491.5, 491.68, 491.9' - Bedding plane (11), smooth, flat 492.15' - Fracture, 20 deg, rough/smooth, undulating	Driller's Remark: Lost circulation in large cavity where the two opposing fragments do not match indicating the cavity exceeds the apparent volume R58: 10 minutes
485			3				
-442.6			1				
			3				
			>10				
			>10				
489.0	R59-HQ 5 ft 82%	19	NR			492.15' - Fracture, 20 deg, rough/smooth, undulating	SC-6 collected at 492.2-493.15' R59: 10 minutes
			9				
490			6				
-447.6			5				
			1				
	R60-HQ 6 ft 92%	62	NR			494.6' - Fracture, 15 deg, smooth, undulating 494.9, 495.0, 495.15, 495.3, 495.9' - Fracture (5), horizontal and 10 deg, smooth, undulating 496.1' - Bedding plane, horizontal, smooth, planar, lithology change 496.5' - Mechanical break 497.5' - Fracture, rough, planar, angular, stepped 497.95' - Fracture, 55 deg, rough, planar, gently arcuate 498.4' - Fracture, horizontal and 20 deg, rough, irregular 498.75' - Fracture, 45 deg, rough, planar	
494.0							
495			2				
-452.6			4				
			2				
			2				
			2				
			1				
500	500.0		NR				



ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: A. Anderson

CORING METHOD AND EQUIPMENT : BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 8/16/2007

END : 8/24/2007

LOGGER : P. De Sa'rego, J. Townes, R. Bitely, M. Faurote, C. Sump

APPENDIX 2BB-361



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-04

SHEET 1 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 9/6/2007

END : 9/27/2007

LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		R Q D (%)	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.
-157.4						No Recovery 200.0-212.0'	Boring AD-4 blind drilled to approximately 200 feet below ground surface before beginning sampling/logging. "Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" 8/26-8/29/07: Sonic casing at 200.0' below ground surface, attempt advancement of HQWL with only 2.5' of advancement, no recovery of material and two rock coring bits (#636) destroyed 9/5/07: Sonic rig setup on AD-4, advances sonic 4" core barrel from 202.5-207.5' below ground surface, no recovery of material due to broken HQWL bit plugging Sonic core barrel; no voids noted; HQWL bit removed, advance 207.5-213' below ground surface
205 -162.4							
210 -167.4							
212.0	R1-HQ 2 ft 50%	0	>10	212.0-213.0' - Fracture zone, rough, angular to undulating, limestone fragments, <2" diameter fracture zone		Limestone 212.0-213.0' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, weak to strong (R2 to R4), voids <1/16" over 30% of surface, poorly fossiliferous with few fossils <1/4" diameter, no organics, no cavities	Advance Sonic 4" casing to 213' below ground surface; retrieve 5.0' of crushed limestone fragments and limestone core segments, 4" long each; no void space; set Sonic 6" casing to 210.0' below ground surface; R1: 13 minutes
214.0			NR			No Recovery 213.0-214.0' 213.0-214.0'	
215 -172.4	R2-HQ 2 ft 100%	33	2	214.8, 215.0' - Bedding plane (2), <10 deg, rough, undulating		Limestone 214.0-216.0' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over 10-40% of surface decreasing with depth, few cavities, poorly to moderately fossiliferous with fossil casts <1/4" diameter, trace laminated bedding	9/6/07: Begin rock coring after advancing HWT casing to 2.38' below ground surface, 1.0' material inside casing to 212.0', core blockage at 214.0' bgs due to fragment locking in sample barrel; no further advancement for R1, limestone inside casing to 212.0'; SC-1 collected at 214.0-214.8' R2: 5 minutes
216.0			>10	215.25-215.85' - Fracture zone, rough, undulating, limestone fragments <2" diameter			
			1	216.8-216.95' - Fracture zone, <10 deg and <20 deg, rough, undulating, limestone fragments <3" diameter, bedding plane fractures with high angle intersecting fractures			
	R3-HQ 5 ft 90%	56	3	217.25, 218.15, 218.25, 219.15, 219.4' - Bedding plane or mechanical break (5), <10 deg, rough, undulating			
			>10				
220							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-04

SHEET 2 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 9/6/2007

END : 9/27/2007

LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

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.
-177.4			>10	219.4-219.85' - Fracture zone, rough, undulating, limestone fragments <2" diameter		Limestone 216.0-221.0' - yellowish gray, (5Y 7/2), very fine to medium grained, strong HCl reaction, medium strong to strong (R3 to R4), voids <1/16" over 10-30% of surface, variable, moderately fossiliferous with several fossil casts/molds <1/2" diameter, few cavities <1", trace organic laminations	Consistent slow to moderate drilling rate with approx. 50% circulation return; circulated mud is losing to formation through 4" HWT's, 6" sonic casing gap
	221.0		NR	219.85-220.3' - Bedding plane (2), 30 deg and 70-90 deg, rough, undulating			
			3	220.3' - Fracture zone, rough, undulating, limestone fragments <2" diameter			
			3	221.75-221.9' - Fracture or mechanical break (2), <30 deg, rough, undulating, 3 fractures			
			>10	222.15' - Fracture or mechanical break, <10 deg, rough, undulating, 3 fractures			
				222.25' - Fracture or mechanical break, 40 deg, rough, undulating			
				222.5' - Bedding plane or mechanical break, rough, undulating			
			NR	223.2-223.35' - Fracture zone, rough, undulating, silt lens, limestone fragments <1" diameter with silt lens			
225 -182.4						No Recovery 220.5-221.0' Limestone 221.0-223.6' - yellowish gray to light gray, (5Y 7/2 to N7), very fine to medium grained, strong HCl reaction, very weak to strong (R1 to R4), strength decreasing with depth, voids <1/16" over <10-25% of surface, few cavities up to 2"x1", poorly to moderately fossiliferous with few fossil molds and casts <1/2" diameter, secondary infill present over <30% of surface; 223.2- 223.35' silt lens with limestone fragments <1" diameter, rough, calcareous silt	R4: 5 minutes
	226.0						
			>10	226.3-226.9' - Fracture zone, multiple intersecting fractures with rock fragments up to 1-9/16" diameter			
			>10	226.95-227.0, 227.1' - Fractures (3), 60 deg, rough, undulating, three intersecting fractures Y shaped, moderate relief (~3/8")			
			4	227.25' - Fracture, 30 deg, rough, undulating, ~3/8" relief, fossil molds			
			4	227.7-227.9' - Fracture zone, multiple intersecting fractures with rock fragments up to 1-3/16" diameter			
			NR	228.3' - Fracture, 30 deg, rough, undulating, relief ~3/8"			
230 -187.4				228.5' - Fracture, 80 deg, rough, undulating, low relief			
	231.0			228.65-229.0, 229.35' - Bedding plane (3), 80 deg, rough, undulating, stepped, low relief			
			>10	229.8-229.9' - Fracture zone or mechanical break			
			>10	231.0-231.9' - Fracture zone, multiple intersecting fractures with rock fragments up to 1-3/16" diameter			
				232.15' - Fracture, 50 deg, rough, undulating, 3/8" relief			
			NR	232.3-232.4' - Fracture zone			
				232.55' - Fracture, 60 deg, rough, undulating, 3/8" relief			
				232.9-233.0' - Fracture zone			
235 -192.4						No Recovery 229.9-231.0' Limestone 231.0-233.0' - yellowish gray, (5Y 7/2), very fine to fine grained, weak to moderate HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16" cover 10% of rock surface, poorly fossiliferous	Driller's Remark: Rapid advancement at 232.0-233.0' and 234.0-235' due to possible void space or unconsolidated material
						No Recovery 233.0-236.0'	
	236.0						
			>10	236.0-237.2' - Fracture zone, multiple intersecting fractures with rock fragments up to 1-9/16" diameter			
			>5	237.2' - Fracture, 30 deg, smooth, stepped, low relief			
			>10	238.0' - Mechanical break, 30 deg, rough, undulating, tight, hardness test			
				238.85-239.2' - Fracture zone			
240						No Recovery 239.2-241.0'	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-04

SHEET 3 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 9/6/2007

END : 9/27/2007

LOGGER : R. Bitely, J. Townes, S. Roberti, K. Watkins

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-197.4						R7: 3 minutes
241.0						
	R8-HQ 5 ft 24%	0	241.0-242.2' - Fracture zone, multiple intersecting fractures with rock fragments up to 1-3/16" diameter		Limestone 241.0-242.2' - yellowish gray, (5Y 7/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids up to 3/32" cover 5% of rock surface, trace organics No Recovery 242.2-246.0'	Driller's Remark: Rapid, consistent drilling; potential cavity or silt infill washed out during drilling
245 -202.4						R8: 2 minutes
246.0						
	R9-HQ 5 ft 20%	0	246.0-247.0' - Fracture zone, multiple intersecting fractures with rock fragments up to 2" diameter		Limestone 246.0-247.0' - yellowish gray, (5Y 7/2), very fine to fine grained, weak to moderate HCl reaction, weak to medium strong (R2 to R3), voids up to 3/32" cover 1-2% of surface, poorly fossiliferous No Recovery 247.0-251.0'	Driller's Remark: Potential cavity at 246.0-250.0' or silt zone washed out-- consistent 50% circulation
250 -207.4						9/6/07: Complete drilling at 17:00, water level at surface 9/7/07: Re-spool 650.0' wireline, transmission down time for repair, start drilling at 12:15
251.0						
	R10-HQ 5 ft 50%	18	251.2' - Mechanical break or fracture, rough, undulating, angular rock fragment potentially fallen from above onto top of run, no discernible rock contact/fracture angle 251.85-252.05' - Fracture zone, rough, undulating, multiple intersecting fractures 252.5' - Fracture or mechanical break, 60-70 deg, rough, undulating, variable 252.6-253.5' - Fracture zone, rough, undulating, interbedding with silt seams		Limestone 251.0-251.2' - yellowish gray, (5Y 7/2), very fine to medium grained, strong (R4), no voids, cavities or fossil, light organic stain on <30% of surface 251.2-252.6' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), voids <1/16" over 20-30% of surface, poorly fossiliferous, trace laminated bedding 252.6-253.5' - yellowish gray, (5Y 7/2), extremely weak (R0), silt lenses interbedded No Recovery 253.5-256.0'	Driller's Remark: at 253.0- 254.0' light chatter; core blockage at 254.25'
255 -212.4						R10: 5 minutes
256.0						
	R11-HQ 5 ft 75%	15	256.0-257.5' - Fracture zone, rough, undulating, intersecting fractures and gravel sized fragments 3" diameter 258.3-258.5' - Fracture zone, rough, undulating, gravel sized fragments <2" diameter 258.5' - Mechanical break or fracture, 50 deg, rough, undulating		Limestone 256.0-259.75' - yellowish gray, (5Y 7/2), very fine to medium grained, strong HCl reaction, extremely weak to weak (R0 to R2), voids <1/16" over <10% of surface, poorly fossiliferous, trace organic staining/laminar from 256.0 to 257.0'; laminated bedding predominant from 258.8 to 259.75'	Driller's Remark: at 257.0- 259.0' light to moderate chatter, consistent drilling rate
260						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-04

SHEET 4 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 9/6/2007

END : 9/27/2007

LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

DISCONTINUITIES		LITHOLOGY		SYMBOLIC LOG	COMMENTS
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					
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT		
-217.4			NR		No Recovery 259.75-261.0'
261.0					No Recovery 261.0-266.0'
	R12-HQ 5 ft 0%	0	NR		Driller's Remark: Rapid advancement 262.0-265.0' below ground surface, possible voids or silt lens; continuous circulation (approximately 50% return) through run; minimum of pump pressure increasing intermittently through run indicating core/fluid blockage due to formation back pressure on equipment, likely silt/soil zone washed out to formation
265 -222.4					No Recovery 266.0-271.0'
266.0					R12: 5 minutes
	R13-HQ 5 ft 0%	0	NR		Driller's Remark: Rapid advancement 266.0-271.0' below ground surface, as above, no recovery due to unconsolidated silt/soil concentration; pressure on flow increasing during drilling indicating back pressure from formation; HQ core barrel set on formation at 271.0' below ground surface with no free rod drop: material is present but not retrievable due to unconsolidated nature
270 -227.4					R13: 4 minutes
271.0			>10		K. Watkins and Robert logging
	R14-HQ 3 ft 8%	0	NR		Coring Equipment: BL 300T
274.0					R14: No Time Recorded
275 -232.4					
	R15-HQ 5 ft 0%	0	NR		Driller's Remark: Slow drilling; used 300 gallons of muck with no recovery, decision to trip out rod and barrel to check bit, bit inspected and appears intact, hole tagged at 279.0', tripped back in to try another run
279.0					R15: 20 minutes
280	R16-HQ		4		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-04

SHEET 5 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 9/6/2007

END : 9/27/2007

LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

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.
-237.4	2 ft 95%	21	>10	279.4, 279.6, 279.85, 279.9, 280.3, 280.4, 280.5, 280.65, 280.75' - Fractures, horizontal, smooth, planar to undulating, horizontal, clayey white infilling, open (1/5" pore)		Limestone 279.0-279.85' - yellowish gray, (5Y 7/2), medium grained, moderate HCl reaction, very weak (R1), <1% voids on surface, <1/32"	Driller's Remark: More pieces of bit recovered R16: 6 minutes
281.0	R17-HQ 2 ft 80%	0	NR	280.0-280.15' - clay infilling		279.85-280.0' - Same as 279.0-279.85' except yellowish gray, (5Y 8/1), with clayey striation	R17: 6 minutes Driller's Remark: Slow drilling
			>2	281.4, 281.5, 281.6' - Fractures (3), horizontal, rough, planar to undulating, 9/16" relief		280.0-280.3' - clay - white, soft, moderate HCl reaction	
			NR	281.6-281.75' - soft infill, clayey		280.3-280.9' - yellowish gray, (5Y 8/1), very fine grained, moderate HCl reaction, medium hard, 25% surface area voids 3/16"	
			2	281.9, 281.95, 282.0, 282.1, 282.3, 282.5, 282.6' - Fractures (7), horizontal, rough, stepped		No Recovery 280.9-281.0' Limestone 281.0-282.6' - light gray, (N7), fine to medium grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), abundantly fossiliferous, voids to 3/16" (molds)	
285			1	283.0-238.5' - Fracture zone, broken/crushed		No Recovery 282.6-283.0' Limestone 283.0-283.5' - light gray to pale yellow brown, (N7 to 10YR 6/2), mild HCl reaction	SC-4 Collected at 287.3- 288.5' R18: 16 minutes
-242.4	R18-HQ 6 ft 100%	50	2	283.9' - Fracture, 85 deg, rough, stepped, 9/16" relief		283.5-285.0' - light gray, (N7), fine to medium grained, abundant fossils, voids to 9/16" over 100% (molds)	
			1	284.4, 285.0' - Fractures (2), horizontal, rough, 11-4/5" relief, infill, limestone		285.0-287.3' - loose fragments as in 283.0 to 283.5'	
			1	285.1-285.4' - Fracture zone		287.3-288.4' - light gray to very light gray, (N7 to N8), medium grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), irregularly spaced voids to 9/16"; highly fossiliferous	
			0	285.5-287.3' - Fracture zone, infill of loose medium-grained limestone		289.0-293.7' - very light gray to very light bluish gray, (N8 to 5B 8/1), very fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), some portions clayey, <5% voids (molds)	R19: 13 minutes
			1	288.5' - Mechanical break, horizontal, rough, stepped, 9/16" relief, across large 1" void		No Recovery 293.7-294.0' Limestone 294.0-295.5' - yellowish gray, (5Y 8/1), fine grained, weak (R2), poorly to moderately fossiliferous, <5% voids (molds) to 1/16" near 294.0'	
290			3	289.25, 289.5, 289.85' - Fractures (3), horizontal, rough, stepped, medium limestone, 9/16" relief		295.5-298.9' - very light gray to very light bluish gray, (N8 to 5B 8/1), mild to moderate HCl reaction, very weak to weak (R1 to R2), poorly to abundantly fossiliferous, voids to 3/4" (molds)	
-247.4	R19-HQ 5 ft 94%	57	3	290.9, 291.4, 291.85, 292.25, 292.8, 293.0, 294.5, 294.7' - Fractures (8), horizontal, rough, stepped, infill, loose, broken		No Recovery 298.9-299.0'	R20: 11 minutes
			2				
			3				
			2				
			NR				
295			>10	294.0-295.2' - Bedding plane, smooth, undulating, slight (mt) metal oxide staining, parting on bedding planes			
-252.4	R20-HQ 5 ft 98%	55	3				
			>10	295.8, 298.7' - Fractures (2), horizontal, rough, 9/16-1" relief			
			1				
			2				
			NR				
			>10	299.0-304.0, 304.0-309.0' - Mechanical break (2)			
300							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-04

SHEET 6 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 9/6/2007

END : 9/27/2007

LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

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.
-257.4	R21-HQ 5 ft 62%	0	>10			Limestone 299.0-301.0' - very light gray to very light bluish gray, (N8 to 5B 8/1), fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), fossil molds, voids to 3/4" (less than 5%) Clayey Limestone 301.0-302.1' - light yellowish gray to light bluish gray, (5Y 7/2 to 5B 8/1), very fine grained, moderate HCl reaction, with layers of very weak (R1) dark olive silty clay No Recovery 302.1-304.0' Clayey Limestone 304.0-308.5' - light yellowish gray with bluish gray mottling, (5Y 7/2 with 5B 8/1), very fine grained, moderate HCl reaction, extremely weak (R0), very poorly unconsolidated, bioturbation filled with bluish gray infill; <5% voids No Recovery 308.5-309.0'	R21: 16 minutes
304.0			>10				
			NR				
305	R22-HQ 5 ft 90%	28	>10	309.0-310.8, 311.5-311.8, 312.6-312.8' - Mechanical break (3)		Limestone 309.0-310.0' - very light bluish gray with medium bluish gray mottling, (5B 8/1 with 5B 5/1), very fine grained, very weak (R1) 310.0-313.5' - yellowish gray with bluish gray streaking, (5Y 7/2 with 5B 8/1), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), scarce voids (bioturbation)	R22: 15 minutes
-262.4			>10				
			>10				
			>10				
			>10				
			NR				
310	R23-HQ 5 ft 90%	43	>10	311.0, 312.2' - Fractures (2), <5 deg, smooth, planar to undulating, tight 312.6-312.8' - Mechanical break		No Recovery 313.5-314.0' 314.0-318.6' - Same as 310.0-314.0'	R23: 15 minutes
-267.4			>10				
			>10				
			>10				
			>10				
			NR				
315	R24-HQ 5 ft 92%	17	>10	319.0-319.9, 320.8-322.9, 323.4-323.8' - Mechanical break (3)		No Recovery 318.6-319.0'	R24: 15 minutes
-272.4			>10				
			>10				
			>10				
			>10				
			NR				
320			>10				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-04

SHEET 7 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 9/6/2007

END : 9/27/2007

LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

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.
-277.4	R25-HQ 5 ft 96%	30	>10	320.05, 320.3' - Mechanical break (2), <5 deg, smooth, undulating, tight to 1/4" open		Limestone 319.0-323.4' - yellowish gray, (5Y 7/2), medium grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), friable, <5% voids (molds) at 322.0-323.0', otherwise <1%	R25: 15 minutes
			>10				
			>10				
			>10	320.5-320.8, 322.9-323.4' - Mechanical break or fracture zone (2), smooth, undulating			
324.0	R26-HQ 5 ft 95%	32	NR			No Recovery 323.4-324.0' Limestone 324.0-324.5' - light gray with bluish gray mottling, (N7 to 5B 8/1), moderate HCl reaction, weak (R2), brown organic peat staining 324.5-328.8' - yellowish gray, (5Y 7/2), medium grained, strong HCl reaction, very weak (R1), to unconsolidated	R26: 15 minutes
			>10	324.4-324.7' - Mechanical break, multiple breaks			
			>10				
			>10				
325 -282.4	R27-HQ 5 ft 74%	15	NR	329.0-330.0' - Fracture zone, loose		No Recovery 328.8-329.0' Limestone 329.0-330.0' - light yellowish gray, (5Y 7/2), medium grained, strong HCl reaction, extremely weak (R0), loose 330.0-330.2' - medium dark gray, (N4), medium strong (R3), very hard with calcite filled bioturbation voids Clayey Limestone 330.2-332.0' - yellowish gray, (5Y 8/1), medium grained, strong HCl reaction, extremely weak (R0), loose 332.0-332.7' - Same as 330.0-332.0' except very weak (R1) No Recovery 332.7-334.0'	Driller's Remark: 15:26 - pulling core
			>10	330.0-330.4' - Mechanical break, fracture/breakage zone across friable rocks			
			>10	330.4-331.5' - Mechanical break			
			1	331.95' - Bedding plane, horizontal, smooth, undulating, tight to 1/4" open			
	R28-HQ 5 ft 100%	62	0			Limestone 334.0-337.6' - yellowish gray, (5Y 7/2), medium grained, moderate HCl reaction, very weak to weak (R1 to R2), abundantly fossiliferous, <5% voids (molds) at 334.0-336.8', voids to 3/8"	R27: No Time Recorded
			NR				
			3	334.6' - Mechanical break, 40 deg, rough, undulating, 3/8" relief (mechanical)			
			2	334.75' - Fracture, horizontal, rough, planar, 1/16" relief			
335 -292.4			1	335.1' - Fracture, horizontal, rough, 9/16" relief			SC-5 Collected at 335.9-336.6'
			1	335.8, 336.7, 337.2' - Fractures (3), 30 deg, rough, undulating, 15 deg, and horizontal, 9/16" relief			
			3	337.6' - Fracture, horizontal, rough, planar, loose infill			
			>10	337.8-339.2' - abundant breaks in very loose limestone			
339.0			>10				
340			>10				







PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-04	SHEET 8 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07 START : 9/6/2007 END : 9/27/2007 LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

WATER LEVELS : 3.66 ft bgs on 9/19/07		START : 9/19/2007		END : 9/27/2007		LOGGERS : K. Bilely, J. Townes, C. Roberts, K. Wainins		
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
-297.4	R29-HQ 5 ft 96%	0	>10	342.4' - Fracture, smooth, undulating, brown organic staining, tight, ~1/8" thick		Limestone 339.0-343.8' - yellowish gray, (5Y 7/2), medium grained, mild to moderate HCl reaction, extremely weak to very weak (R0 to R1), voids 1/32-1/16" throughout; friable	R29: 15 minutes	
>10								
>10								
>10								
344.0	R30-HQ 5 ft 96%	75	NR	344.7' - Mechanical break or bedding plane, 10 deg, smooth, undulating, 1/16" relief 345.0-345.7' - Fracture zone, large angular, brittle limestone 346.6' - Mechanical break, rough, planar, along bedding plane 347.0' - Fracture, horizontal, rough, undulating, 3/16" relief 348.0, 348.8' - Fractures or bedding plane (2), horizontal, rough		No Recovery 343.8-344.0' Limestone 344.0-348.8' - light bluish gray with medium bluish gray mottling, (5B 7/1 with 5B 5/1), very fine grained, strong HCl reaction, very weak (R1), clayey, voids (bioturbation); otherwise <1% voids	SC-6 Collected at 347.0- 347.9' R30: 10 minutes	
1								
>10								
1								
1								
1								
349.0	R31-HQ 5 ft 96%	42	NR	349.1, 350.0, 351.5, 351.7, 352.0, 352.2, 352.3, 352.8' - Bedding plane (8), horizontal, smooth, undulating, tight to 1/4" open, bedding planes 349.8, 349.9' - Fractures (2), 60 deg, smooth, undulating, tight 350.35' - Mechanical break, <5 deg, rough, stepped, tight 351.0-351.5' - Fracture zone 352.2' - Fracture, vertical, smooth, undulating, 1.1' long fracture, tight		No Recovery 348.8-349.0 Limestone 349.0-353.5' - bluish white with light bluish gray mottling, (5B 9/1 with 5 B 7/1), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), friable, <1% visible voids	R31: 8 minutes	
1								
1								
>10								
5								
1								
354.0	R32-HQ 5 ft 100%	48	NR	353.5' - Mechanical break, <5 deg, rough, undulating, tight 353.6' - Fracture, vertical, smooth, undulating, 4" long fracture, tight 354.8' - Fractures (2), 40 deg, smooth, undulating, two intersecting fractures, tight 354.9' - Fractures (2), vertical, smooth, undulating, two 2-7/16" fractures, tight 355.05, 355.55, 355.8, 355.91, 356.05, 356.2, 357.85' - Bedding plane (7), horizontal, smooth, planar to undulating, tight to 1/4" open 356.2-357.2' - Fracture zone, fragments, 3" diameter 358.2' - Fractures (2), 10 deg and 40 deg, rough, undulating, broken up there, force not tight, broken at 1" fossil cast 359.2' - Fracture, 60 deg, smooth, undulating, tight to 1/4" open, 4-3/16" long		No Recovery 353.5-354.0 Limestone 355.7-356.5' - yellowish gray, (5Y 8/1), medium grained, moderate to strong HCl reaction, weak (R2), abundantly fossiliferous, primarily foraminiferous <1/32" molded voids (forams) throughout; brown organic silt partings 356.5-359.0' - Same as 349.0-355.7' except bluish white to yellowish gray, (5B 9/1 to 5Y 8/1), scarce bioturbation	R32: 10 minutes	
1								
3								
>10								
2								
1								
359.0			2					
360								



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-04	SHEET 9 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07 START : 9/6/2007 END : 9/27/2007 LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

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.
-317.4	R33-HQ 5 ft 100%	50	>10	359.9, 360.2, 360.45, 360.6, 362.15, 362.35, 362.55, 362.65, 363.45' - Bedding plane (9), horizontal, smooth, undulating, tight to 1/4" open		Limestone 359.0-365.5' - yellowish gray, (5Y 7/2), medium grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), moderately to abundantly fossiliferous, forams, pelecypods, bryozoa; <1/32" voids and foraminiferous molds ~ 50% bioturbated and finer grained, 359.0 to 360.2' and 363.0 to 365.5'	R33: 12 minutes
			>10	360.6-360.95, 361.25-362.15, 362.55-362.65' - Fracture zone (3), fragments 3" diameter			
			>10				
364.0			2	363.75' - Fracture, vertical, smooth, undulating, 6" long, tight		Limestone 365.5-366.8' - yellowish gray, (5Y 8/1), fine grained, mild to moderate HCl reaction, weak (R2), friable, silty, voids over <5% 366.8-367.7' - pale yellow gray to very light gray, (5Y 7/2 to N8), weak to medium strong (R2 to R3), >50% bioturbated with voids over 60% of sample, abundantly fossiliferous 367.7-369.0' - yellowish gray, (5Y 7/2), very fine to fine grained, mild to moderate HCl reaction, abundantly fossiliferous (pelecypods, forams) voids, molds up to 1/16" >50% bioturbated 369.0-370.3' - yellowish gray, (5Y 7/2), fine to medium fine grained, mild HCl reaction, very weak to weak (R1 to R2), <1/32" voids (primarily foraminifera molds), friable, silty 370.3-373.7' - very light gray, (N8), with <5% light bluish gray mottling, moderate to strong HCl reaction, abundantly fossiliferous (primarily foraminifera), molds <1/32-1/16", >50% bioturbated No Recovery 373.7-374.0' Limestone 374.0-374.9' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2), voids to 3/16"; friable and very weak rock (R1) rock at 374.0-374.3' 374.9-376.8' - yellowish gray, (5Y 8/1), strong HCl reaction, weak (R2), friable, as at 374-374.3' above, but with occasional olive gray organic streaks No Recovery 376.8-378.0'	SC-7 Collected at 366.8- 367.7'
365			2	364.6, 365.6, 364.9, 366.0' - Bedding plane (4), horizontal, smooth, undulating, tight to 1/4" open			
-322.4	R34-HQ 5 ft 100%	60	2	365.0' - Fracture or mechanical break, 20 deg, rough, undulating, open, fragment missing			
			1	365.4' - Fracture or mechanical break, 30 deg, rough, undulating to stepped, missing fragments, tight to 1" open			
			1	366.5-366.8' - Fracture zone, fragments to 1-2"			
369.0			2	368.05-368.6' - Fracture zone, fragments to 2-3" rock weakened by fossiliferous zone			R34: 12 minutes
370			4	369.2' - Bedding plane, horizontal, moderately smooth, planar, 1/16-3/16" open (typ)			
-327.4			3	369.4, 369.6, 369.8, 370.1, 370.3' - Bedding plane (5), horizontal, moderately smooth, planar, 1/16-3/16" open (typ)			
	R35-HQ 5 ft 88%	35	3	370.3-370.7' - Fracture zone, lithology change			
			1	371.1' - Fracture, rough, undulating, 9/16" relief, break across void			
			1	371.5, 371.8, 371.9, 373.0' - Bedding plane (4), 0-10 deg, rough, undulating, 3/16-3/4" open			R35: 12 minutes
374.0			NR				
375			2	374.3, 374.6, 375.1' - Fractures (3), horizontal, rough, undulating, 3/16-9/16" open			
-332.4			>10				
	R36-HQ 4 ft 70%	10	>10	375.5-376.8' - fragments, silty limestone			
			NR				Driller's Remark: Hard rocks lodged in inner core, only advanced 4'
378.0							
			1	378.6, 379.3' - Fractures (2), horizontal, rough, undulating, poorly fit 3/16-9/16" open			
380			2				R36: 15 minutes




PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-04	SHEET 10 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07 START : 9/6/2007 END : 9/27/2007 LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

WATER LEVELS - 3.06 ft bgs on 9/13/07				START - 9/12/07		END - 9/27/2007		LOGGER - R. Ditty, J. Townes, S. Roberts, R. Wainins	
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	
-337.4	R37-HQ 6 ft 78%	39	3	379.6, 380.0, 380.1, 380.2, 380.7' - Bedding plane (5), horizontal, tightly fill 1/16-3/16" relief		Limestone 378.0-379.5' - very light gray, (N8), very fine grained, moderate HCl reaction, weak (R2), >50% voids <1/32" wide and bioturbated	R37: 16 minutes		
		>10	380.9-382.7' - Fracture zone	379.5-382.6' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), friable, silty, voids <1/32", well distributed but <5%					
		>10		382.6-382.9' - pale yellowish gray, (5Y 8/1), strong HCl reaction, weak to medium strong (R2 to R3), bioturbated, voids 1/8" wide					
		NR		No Recovery 382.9-384.0'					
384.0			>10	384.0-384.3' - Fracture zone, fragments to 4"x2"		Limestone 384.0-385.7' - Same as 379.5-382.6' except 3/8" single very extensive void across sample 385.2-385.7'	R38: 10 minutes		
			3	384.3, 384.5, 384.8, 385.3, 387.85' - Bedding plane (5), 0-5 deg, smooth, undulating, tight to 1/2" open		385.7-388.5' - Same as 384.0-385.7'			
			1	385.5' - Fracture, rough, undulating, 4-3/16" void					
			2	385.65' - Mechanical break, <5 deg, rough, undulating, tight					
			>10	387.5' - Mechanical break, 20 deg, rough, undulating, tight					
385									
-342.4	R38-HQ 5 ft 100%	55		388.4-388.8' - Fracture zone, fragments to 2"x2"				R39: 10 minutes	
			2	389.4' - Fracture, 80 deg, rough, undulating, open, missing face		388.5-390.0' - light gray, (N7), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), hard, abundant voids <1/32-1/8" throughout, primarily foraminiferous			
			0	389.6' - Mechanical break, <5 deg, rough, undulating, tight		Clay (CL) 390.0-390.3' - soft, calcareous with dark brown orange silt			
			>10	389.8' - Bedding plane, horizontal, smooth, planar to undulating		Limestone 390.3-394.0' - yellowish gray, (5Y 7/2), moderate HCl reaction, very weak to weak (R1 to R2), friable, organic staining within many fractures <1/32-3/16" voids			
			>10	389.9-394.0' - Fracture zone, some brown organic staining on fractures, various fragments of all orientation within limestone; mechanical					
			>10						
390									
-347.4	R39-HQ 5 ft 100%	0							
			3	394.2, 394.3, 394.5, 394.9' - Mechanical break or bedding plane (4), horizontal and 10 deg, rough, undulating, organic staining at 394.5', 3/16 to 3/8" relief			R40: 9 minutes		
			>10	395.3-395.8' - Fracture zone, 3/4 to 1-1/2" blocky fragments	394.0-399.0' - yellowish gray, (5Y 8/1), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids <1/32-3/16" (molds and casts) 394.0-395.0' bioturbated				
			2	396.4, 396.9' - Mechanical break (2), horizontal, rough, undulating, 1-3/16" relief					
			0						
			0						
			NR						
394.0									
395									
-352.4	R40-HQ 5 ft 90%	53							
			3	399.3, 399.7, 400.1' - Bedding plane (3), horizontal, smooth					
399.0									
400									



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-04	SHEET 11 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07 START : 9/6/2007 END : 9/27/2007 LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-357.4	R41-HQ 5 ft 96%	53	2		Limestone 399.0-404.0' - yellowish gray, (5Y 8/1), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), mold and casts over 20% of rock, foraminifera, gastropods, pelycypods, bioturbated 400.0-401.0'	R41: 9 minutes Finished at 15:15 on 9/20/07 Started at 07:30 on 9/21/07
			2			
			2			
			3			
404.0	R42-HQ 5 ft 99%	40	NR		No Recovery 403.8-404.0' Limestone 404.0-409.0' - Same as 399.0-404.0' except molds and casts 1/16-3/16" between 405.0-407.0'	R42: 11 minutes
			5			
			3			
			2			
	R43-HQ 5 ft 80%	27	1		No Recovery 408.95-409.0' 409.0-411.3' - light yellowish gray, (5Y 9/1), fine grained, moderate HCl reaction, very weak (R1), voids to 1/4", fine black needle form mineral throughout 5% (possibly phosphate or organic)	R43: 14 minutes
			3			
			NR			
			2			
409.0	R44-HQ 5 ft 96%	50	0		Clay (CL) 411.3-411.7' - light gray calcareous silty clay Limestone 411.7-413.0' - Same as 409.0-411.3' except medium strong (R3) No Recovery 413.0-414.0' Limestone 414.0-416.5' - yellowish gray, (5Y 8/1), moderate HCl reaction, medium strong (R3), finely crystalline; 415.0-416.5' medium strong (R3); 414.0-415.0' very weak; 414.7-414.9' very weak (R1), dark brown organics 416.5-418.7' - yellowish gray, (5Y 8/1), fine grained, very weak to weak (R1 to R2), >5% fossiliferous casts and molds (foraminifera, echinoderma, pelycypods, gastropods), occasional black mineral growth in voids, very soft, voids <1/32-3/16" Clayey Silt (ML) 418.7-418.8' - greenish black	R44: 13 minutes
			3			
			NR			
			2			
414.0	R44-HQ 5 ft 96%	50	5		Clayey Silt (ML) 418.7-418.8' - greenish black	R44: 13 minutes
			1			
			1			
			3			
419.0	R44-HQ 5 ft 96%	50	NR		Clayey Silt (ML) 418.7-418.8' - greenish black	R44: 13 minutes
			0			
			2			
			2			
420						



PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-04	SHEET 13 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07 START : 9/6/2007 END : 9/27/2007 LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

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.
-397.4	R49-HQ 6 ft 43%	14	>10	439.4-440.6' - Fracture zone, through soft material		438.0-439.4' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, medium strong (R3), abundant voids to 1/8" with some voids filled with organic silt, <5% fossils, primarily molds 439.4-440.6' - dusky yellow, (5Y 6/4), strong HCl reaction, very weak (R1), friable silt No Recovery 440.6-444.0'	R49: 18 minutes
444.0			NR				
445			2	444.5' - Fracture, 15 deg, very rough		Limestone 444.0-446.0' - moderate yellowish brown, (10YR 5/4), fine to very fine grained, mild HCl reaction, very weak to weak (R1 to R2), dolomite, crystalline friables, >5% voids up to 1/16"	
-402.4			1	445.0' - Fracture, possible void			
	R50-HQ 5 ft 56%	20	NR	445.6' - Mechanical break, notched medium fit 1/16" open 446.0' - Fracture, bit dropped, assumed void location		446.0-447.8' - missing	Driller's Remark: Bit drop 2.0 ft into run, interpreted as void
			1	447.6' - Fracture, 60 deg, break across void			R50: 9 minutes
449.0			NR				
450			NR	449.0' - Fracture, void		447.8-448.6' - dusky yellowish brown to pale yellow brown, (10YR 2/2 to 10YR 4/2), fine grained, strong HCl reaction, crystalline, calcite, large voids to 1-1/4" with calcite rhombic crystals and clean hexagonal quartz crystals other voids filled with silty friable dolomite No Recovery 448.6-449.0' No Recovery 449.0-451.0' Limestone 451.0-452.0' - pale yellowish brown, (10YR 6/2), medium strong to strong (R3 to R4), crystalline >5%, of voids (molds) voids up to 1/8", dolomite No Recovery 452.0-454.0'	Driller's Remark: Void at top of run, 1.0' of drilling in middle of void near bottom, (based on bit drop)
-407.4	R51-HQ 5 ft 32%	0	>10	451.0-452.0' - Fracture zone, limestone (dolomite)			
			NR	452.0' - Fracture, void			R51: No Time Recorded
454.0			>10	454.0-456.0' - Mechanical break, large angular fractures at all angles		Limestone 454.0-455.9' - pale yellowish brown, (10YR 6/2), fine grained, <5% voids to 3/16", poorly fossiliferous	
455			>10				
-412.4	R52-HQ 5 ft 76%	7	4	456.2, 456.3, 456.6, 456.7' - Fractures (4), horizontal, smooth, planar to undulating, tight		455.9-457.0' - light olive gray to pale olive, (5Y 5/2 to 10Y 6/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), friable, silty 457.0-457.8' - Same as 454.0-455.9' except first 3" are amber brown, dolomite No Recovery 457.8-459.0'	R52: No Time Recorded
			5	457.3-457.7' - shattered dolomite, large angular fragment			Finished drilling on 9/21/07 at 459.0'
			NR				
459.0			>10	459.0-459.5' - Fracture zone, 1"-3" rock fragments of hard dolomite			Start drilling on 9/22/07
460							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

AD-04

SHEET 14 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 9/6/2007

END : 9/27/2007

LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

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.
-417.4	R53-HQ 5 ft 100%	25	3	460.0, 462.7' - Fracture (2), 75 deg, planar, fracture through hard dolomite, 3/16" relief		Limestone 459.0-460.2' - moderate brown to grayish brown, (5YR 3/4 to 5YR 3/2), dense, fine to medium grained, mild HCl reaction, medium strong to strong (R3 to R4), crystalline, dolomite; <1/32" voids over 70% of surface 460.2-462.2' - fine to medium grained, mild HCl reaction, very weak (R1), friable breaks on bedding planes 462.2-464.0' - Same as 459.0-460.2' except moderate brown to grayish brown, (5YR 3/4 to 5YR 3/2), dolomite Limestone 464.0-466.5' - Same as 462.2-464.0'	R53: 13 minutes
			>10	460.4' - Fracture or mechanical break, 30 deg, rough, planar			
			5	460.6, 460.8, 461.2, 461.3' - Bedding plane or mechanical break (4), horizontal, planar, 3/16" relief			
			>10	461.7-462.3' - Fracture zone, horizontal, undulating, dolomite, poorly fit			
464.0	R54-HQ 5 ft 60%	0	>10	463.4-463.8' - Fracture zone		466.5-467.0' - yellowish brown, (10YR 5/4), moderate HCl reaction, friable, silty, streaks of organic staining on bedding No Recovery 467.0-469.0'	R54: 12 minutes
			>10	464.0-466.3' - Fracture zone, large fragments of blocky to angular dolomite			
465 -422.4			>10				
			NR	466.5' - Fracture or mechanical break, 45 deg, across hard dolomite over friable dolomite below, tightly fit 466.7' - Fracture, horizontal, planar, 3/16-3/8" relief, contact between hard dolomite and friable dolomite below			
469.0	R55-HQ 5 ft 60%	13	>10	469.0-470.2, 471.0-471.4' - Fracture zone (2), hard, dolomite		Limestone 469.0-472.0' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, very weak to weak (R1 to R2), finely crystalline, dolomite, voids throughout variable 1/16-3/4" No Recovery 472.0-474.0'	R55: 12 minutes
			1	470.6' - Fracture, horizontal, rough, planar, break tensely fit, 9/16" relief			
			>10	471.8-472.0' - Fracture zone			
			NR				
474.0	R56-HQ 5 ft 80%	27	>10	474.0-475.1' - Fracture zone		Limestone 474.0-478.0' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, very weak to weak (R1 to R2), extensive voids throughout 1/16-3/4", finely crystalline dolomite, few of the voids with clean hexagonal quartz crystals (1/8") No Recovery 478.0-479.0'	R56: 14 minutes
			1	475.5' - Fracture or mechanical break, 50 deg, very rough, undulating, tight			
			3	476.5' - Mechanical break, 45 deg, tightly fit			
			>10	476.7' - Mechanical break, 10 deg, planar, tight			
			NR	477.3' - Mechanical break, horizontal, undulating, tight			
479.0			2	479.0-479.3' - Fracture zone, hard dolomite			
480				479.3' - Fracture, 45 deg, rough, irregular break across voids			



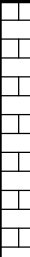

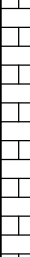
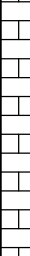
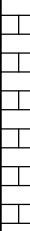
PROJECT NUMBER: 338884.FL	BORING NUMBER: AD-04	SHEET 15 OF 16
ROCK CORE LOG		

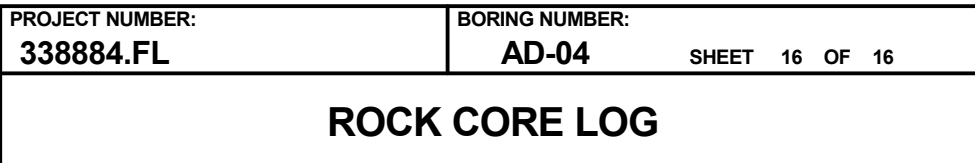
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723034.6 N, 458030.5 E (NAD83)

ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07 START : 9/6/2007 END : 9/27/2007 LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

WATER LEVELS : 3.66 ft bgs on 9/13/07		START : 9/9/2007		END : 9/27/2007		LOGGERS : K. Diety, J. Townes, C. Roberts, K. Watkins		
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				
-437.4	R57-HQ 5 ft 88%	48	2	480.0-480.3' - Fracture zone, through dolomite			Limestone 479.0-481.7' - yellowish orange, (10YR 7/4), very weak to weak (R1 to R2), finely crystalline, dolomite, voids throughout to 3/4" 481.7-483.4' - grayish orange, (10YR 7/4), dolomite with calcareous infill voids; 482.6': portion of gray infilled limestone 3" thick No Recovery 483.4-484.0'	SC-10 Collected at 481.7-483.3' R57: 14 minutes
484.0			6	480.8' - Fracture, horizontal, rough, undulating, horizontal break through voids 481.0-481.4' - Fracture zone, through friable dolomite 481.4-481.7' - Fracture, 60 deg, through hard dolomite 481.7' - Fracture, horizontal, very rough, undulating, Mt oxide staining				
			0					
			0					
			NR					
485	R58-HQ 5 ft 90%	38	4	484.2-484.5' - Mechanical break, 45 deg and horizontal, undulating, poorly fit			Limestone 484.0-487.0' - yellowish gray, (5Y 7/2), moderate HCl reaction, weak to medium strong (R2 to R3), finely crystalline dolomite, voids to <1/16-3/16"; many filled with amber calcite 487.0-488.5' - dusky yellow, (5Y 6/4), very weak (R1), very friable, finely crystalline dolomite No Recovery 488.5-489.0'	R58: 12 minutes
-442.4			1	485.7' - Mechanical break, horizontal, undulating, across void, tightly fit 486.4' - Fracture zone, irregular				
			2	487.0, 487.3' - Mechanical break (2), horizontal, planar, very poorly fit across friable dolomite 487.3-488.5' - Fracture zone, friable to unconsolidated dolomite				
			>10					
			>10					
			NR					
489.0	R59-HQ 5 ft 92%	50	>10	489.0-489.8' - Fracture zone, large angular block, limestone fragments			Limestone 489.0-489.3' - yellowish gray, (5Y 8/1), very fine grained, very strong HCl reaction, weak to medium strong (R2 to R3), <1/32" void over 10%, 1" thick layer of soft calcareous clay 489.3-493.6' - pale grayish orange to dusky yellow, (10YR 7/4 to 5Y 6/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), >8% voids throughout <1/32-1/16", many voids with amber calcite fill, finely crystalline No Recovery 493.6-494.0'	R59: 14 minutes
490			6	490.0-490.1' - Fracture, horizontal, smooth, undulating, discontinuity with 1" white clay infill				
			2	490.1, 490.3' - Mechanical break (2), horizontal, planar, poorly fit 490.6' - Mechanical break, 15 deg, rough, planar, tightly fit				
			2	490.8-491.0' - Mechanical break, 85 deg, fracture between 2 horizontal bedding plane breaks 491.7' - Mechanical break, undulating, 1/16-3/16" open				
			0	492.4-492.5' - Mechanical break (2), planar, 3/16-5/16" open 494.4, 494.7, 494.9, 495.0' - Mechanical break (4), 0-15 deg, rough, poorly fit				
			NR					
494.0	R60-HQ 6 ft 95%	47	4	495.8' - Fractures (2), horizontal, light brown clay infill (1"), poorly fit 495.9' - Fracture (2), horizontal, light brown clay infill (1"), poorly fit			SC-11 Collected at 496.0-496.9'	
495			3					
			>10					
			2	497.7-498.3' - Mechanical break or bedding plane (4), horizontal, planar, through friable dolomite				
			4	498.8, 498.9, 499.0, 499.3, 499.5, 499.6' - Bedding plane (6), horizontal, poorly fit, friable dolomite				
			3					
500	500.0	NR				R60: 14 minutes		



ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Boart Longyear, Huntsville, AL; Driller: K. Heinrich, A. Anderson

CORING METHOD AND EQUIPMENT : Dietrich D-120 S/N 820; BL300T S/N 1517, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.88 ft bgs on 9/13/07

START : 9/6/2007

END : 9/27/2007

LOGGER : R. Bitely, J. Townes, S. Roberti, K. Waikins

APPENDIX 2BB-377



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-01
SHEET 1 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723999.6 N, 457491.6 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, NWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 5/23/07 START : 5/23/2007 END : 5/30/2007 LOGGER : R. Bitely

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
40.8	0.0	0.9	SS-1	1-3-5 (8)	Topsoil 0.0-0.3' - brownish black, (5YR 2/1), moist, 15% roots 85% organic fines Poorly Graded Sand (SP) 0.3-0.85' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), moist, loose, very fine to fine grained, trace roots, trace nonplastic fines, silica sand		Additional equipment note: 3-7/8" tricone bit, split spoon Start drilling 5/23/07 at 08:15; water level = 1' ft below ground surface
	1.5						
	5.0						
5 35.8	6.5	1.1	SS-2	1-4-6 (10)	Poorly Graded Sand With Silt (SP-SM) 5.0-6.1' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), moist to wet, loose, very fine to fine grained, no HCl reaction, 12% nonplastic fines, trace roots, silica sand		
	10.0						
10 30.8	11.5	1.1	SS-3	4-9-10 (19)	Poorly Graded Sand (SP) 10.0-11.1' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), moist to wet, medium dense to dense, fine to medium grained, no HCl reaction, trace black minerals, silica sand		
	15.0						
15 25.8	16.5	0.8	SS-4	6-9-9 (18)	Poorly Graded Sand With Silt (SP-SM) 15.0-15.8' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), wet, medium dense, no HCl reaction, 5% nonplastic fines, silica sand		
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-01
SHEET 2 OF 9	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723999.6 N, 457491.6 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, NWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 5/23/07 START : 5/23/2007 END : 5/30/2007 LOGGER : R. Bitely

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
20.8	20.0	1.5	SS-5	2-2-2 (4)	Silty Sand (SM) 20.0-21.5' - pale yellowish brown, (10YR 6/2), wet, very loose, no HCl reaction, 35% nonplastic fines, silica sand		
	21.5						
25	25.0						
15.8		1.5	SS-6	1-1-1 (2)	Silty Sand (SM) 25.0-26.5' - Same as above except 35-40% nonplastic fines		
	26.5						
30	30.0						
10.8		1.5	SS-7	0-1-1 (2)	Silty Sand (SM) 30.0-31.5' - Same as above except 35-40% non to low plastic fines		
	31.5						
35	35.0						
5.8		0.5	SS-8	1-2-4 (6)	Silt (ML) 35.0-35.5' - pale yellowish brown, (10YR 6/2), moist to wet, low plasticity, rapid dilatancy, mild to moderate HCl reaction, very thinly bedded, 5-10% fine to medium grained silica sand, lens of coarse sand-sized material from 35.4-35.5', all carbonate materials, trace organics throughout, one 1/4" thick organic lense		
	36.5						
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-01
SHEET 3 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	





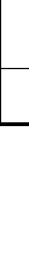
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723999.6 N, 457491.6 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, NWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 5/23/07 START : 5/23/2007 END : 5/30/2007 LOGGER : R. Bitely

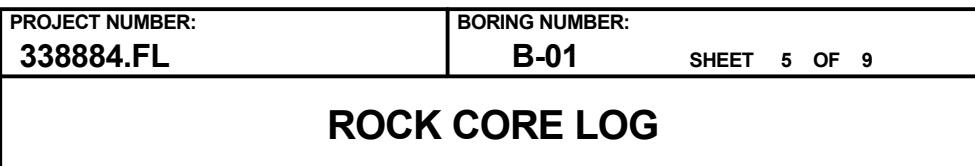
WATER LEVELS : 1.0 TUBES ON 9/29/07			START : 9/29/2007		END : 9/30/2007		LOGGERS : T. Bailey	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS	
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION			
0.8	40.0	1.5	SS-9	2-2-2 (4)	Clayey Sand With Organics (SC) 40.0-41.5' - olive gray, (5Y 4/1), moist to wet, very loose, very fine to fine grained, no HCl reaction, organic lenses, 16% medium plastic fines, fines appear to be organic, silica sand		HW casing down to 45.0'	
	41.5							
45	45.0							
-4.2	45.4	0.4	SS-10	50/5 (50/5")	Organic Soil (OL) 45.0-45.2' - greenish black, (5GY 2/1), moist to wet, hard, very fine to fine grained, medium plasticity, slow dilatancy, no HCl reaction, 5-10% silica sand Clayey Sand (SC) 45.2-45.4' - light olive gray, (5Y 6/1), moist to wet, 35% medium to plastic fines, silica sand			
50	50.0							
-9.2	50.9	0.9	SS-11	27-50/5 (77/11")	Silty Sand (SM) 50.0-50.85' - moderate yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), moist to wet, very dense, very fine to medium grained, strong HCl reaction, 45-50% nonplastic fines, all carbonate material			
55	55.0							
-14.2	55.3	0.3	SS-12	50/4 (50/4")	Sandy Silt (ML) 55.0-55.3' - light olive gray, (5Y 5/2), wet, nonplastic to low plasticity, rapid dilatancy, moderate to strong HCl reaction, 30% very fine to medium sand, 10% coarse sand, all carbonate materials			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-01
SHEET 4 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723999.6 N, 457491.6 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, NWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 5/23/07 START : 5/23/2007 END : 5/30/2007 LOGGER : R. Bitely

WATER LEVELS : 1.011035019/23/07			START : 3/23/2007			END : 3/30/2007			LOGGERS : R. Bailey		
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					
-19.2	60.0	1.5	SS-13	32-15-10 (25)	Sandy Silt (ML) 60.0-60.8' - light olive gray, (5Y 5/2), wet, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 30-40% fine to coarse sand, all carbonate			There is no distinct boundary between the subunits; boundary is gradational			
	61.5				Silty Sand (SM) 60.8-61.5' - light olive gray, (5Y 5/2), wet, medium dense, mild to moderate HCl reaction, 40% nonplastic fines, limestone lenses up to 1/4"-1/2" thick, all carbonate						
65	65.0	0.0	SS-14	50/0.25 (50/0.25")	Limestone Fragments 65.0-65.1' - light olive gray, (5Y 5/2), mild to moderate HCl reaction, fine gravel-size fragments			Driller's Remark: Hit rock at 65.0'			
-24.2											
70	70.0	0.0	SS-15	50/1 (50/1")	No Recovery 70.0-70.1' Begin Rock Coring at 70.0 ft bgs See the next sheet for the rock core log			10:00 Began rock coring; water level at 2.3' below ground surface			
-29.2	70.1										
											
75											
-34.2											
80											



ORIENTATION : Vertical

LOGGER : R. Bitely

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-01	SHEET 6 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723999.6 N, 457491.6 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 5/23/07

START : 5/23/2007

END : 5/30/2007

LOGGER : R. Bitely

WATER LEVELS : 1.0 (RDS) ON 3/23/07		START : 3/23/2007		END : 3/30/2007		LOGGER : R. Biley		
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
-49.2	R5-NQ 5 ft 46%	29	>10	90.2' - Bedding plane or mechanical break, <10 deg, smooth, undulating, open <1/2" 90.4-90.8, 91.3-91.45' - Fracture zone (2), fine to coarse gravel sized fragments		Limestone 90.0-90.4' - yellowish gray, (5Y 8/1), moderate HCl reaction, weak (R2), voids (<1/16") over 5% of surface, trace fossil molds/cavities Limestone 90.4-92.3' - moderate olive brown, (5Y 4/4), strong HCl reaction, weak (R2), voids (1/16") over 40% of surface, fossil molds No Recovery 92.3-95.0'	Driller's Remark: 92.0-93.0' silty clay 	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-01

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723999.6 N, 457491.6 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 5/23/07

START : 5/23/2007

END : 5/30/2007

LOGGER : R. Bitely

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.
-69.2	R9-NQ 5 ft 84%	20	>10	110.5' - Mechanical break, 60 deg, smooth, undulating, tight		Limestone 110.0-114.2' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak (R1), voids (<1/16") over 40% of surface, few cavities, fossil molds	R9: 4 minutes
			7	110.7, 110.9-111.1, 111.3, 111.35, 111.55' - Bedding plane or mechanical break (5), <10 deg, smooth, planar to undulating, open <1/8"			
			5	111.1-111.35' - Fracture (2), 80 deg, smooth, undulating, tight			
			6	112.4, 112.45' - Mechanical break (2), <15 deg, undulating, smooth to rough, open <1/2"			
			1	112.75-112.85' - Fracture zone			
115	R10-NQ 5 ft 56%	13	NR	113.3, 113.45, 113.7, 113.8' - Bedding plane or mechanical break (4), <15 deg, undulating, smooth to rough, open <1/2", gray/black staining on rock core and fracture surface from 112.8-113.6'		No Recovery 114.2-115.0'	R10: 3 minutes
-74.2			2	113.8-114.2' - Fracture zone			
			3	115.2-115.4' - Fracture zone, sand- to gravel-size fragments			
			>10	115.75, 116.3, 117.0' - Bedding plane or mechanical break (3), <10 deg, rough, undulating to stepped, tight to open <1/2"			
			NR	116.0-116.1, 117.2-117.8' - Fracture zone (2), fine to coarse gravel-sized fragments			
120	R11-NQ 5 ft 97%	16	3	120.15' - Fracture, 30- 50 deg, rough, undulating, open <1/4"		Limestone 120.0-124.85' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, extremely weak (R0), trace secondary recrystallization voids	R11: 3 minutes
-79.2			>10	120.55' - Fractures, 10 - 50 deg, undulating, smooth to rough, open <1/2"			
			>10	121.0, 121.1, 121.25, 121.4, 121.6, 121.65, 121.8, 122.05, 122.1, 122.2, 122.75, 122.8, 122.95' - Bedding plane (13), <10 deg, smooth, undulating, open <1/4"			
			6	123.2, 123.4, 123.45, 123.75, 124.2, 124.35' - Fractures (6), 10 - 50 deg, undulating, smooth to rough, <1/2" open			
			3	123.7' - Bedding plane, <10 deg, smooth, undulating, open <1/4"			
125	R12-NQ 5 ft 89%	38	NR	125.2, 125.4, 125.9' - Bedding plane (3), <10 deg, smooth, undulating, open <1/2"		No Recovery 124.85-125.0' Limestone 125.0-129.45' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, extremely weak (R0)	16:00 Stopped drilling and left core barrel in overnight due to possibility of hole caving
-84.2			3	125.9' - Fractures, 30 deg, smooth, undulating, tight to open <1/4"			
			3	126.1, 126.2, 126.3' - Bedding plane (3), <10 deg, smooth, undulating, open <1/2"			
			5	127.1' - Fractures, 30 deg, smooth, undulating, tight to open <1/4"			
			3	127.8, 127.9, 128.2, 128.5, 128.7, 128.85' - Bedding plane (6), <10 deg, smooth, undulating, open <1/2"			
130			2	129.25' - Fractures, 30 deg, smooth, undulating, tight to open <1/4"		No Recovery 129.45-130.0'	R12: 5 minutes
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-01

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723999.6 N, 457491.6 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

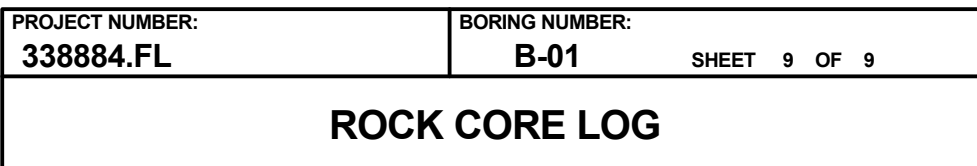
WATER LEVELS : 1.0 ft bgs on 5/23/07

START : 5/23/2007

END : 5/30/2007

LOGGER : R. Bitely

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.
-89.2	R13-NQ 5 ft 98%	73	>10	130.2, 130.4, 130.7, 131.0, 131.1, 131.2, 131.25' - Bedding plane or mechanical break (7), <10 deg, undulating, smooth to rough, open <1/2"		Limestone 130.0-134.9' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, extremely weak (R0), very fine grained from 130.7-131.3'	SC-3 collected at 133.1- 134.1' R13: 5 minutes
			5	131.3' - Fractures, 15 -20 deg, smooth, undulating, open <1/2"			
			7	132.0, 132.25, 132.5, 132.6, 132.75, 132.95, 133.9' - Bedding plane or mechanical break (7), <10 deg, undulating, smooth to rough, open <1/2"			
			0				
			3	133.95' - Fractures, 15- 20 deg, smooth, undulating, open <1/2"			
135	R14-NQ 5 ft 78%	7	NR	134.65, 134.75, 134.8' - Bedding plane or mechanical break (3), <10 deg, undulating, smooth to rough		No Recovery 134.9-135.0' Limestone 135.0-138.9' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, extremely weak (R0), except 135.1-135.3' and 136.7-137.1', very fine grained material with lineations (1/8" thick) of yellowish gray (5Y 8/1) and light olive gray (5Y 5/2), gray material in few voids	R14: 5 minutes
-94.2			5	135.1, 135.25, 135.3, 135.4, 135.6, 135.75, 136.1, 136.2, 136.3' - Bedding plane or mechanical break (9), <10 deg, smooth, planar to undulating, open <1/4"			
			9	136.4' - Fracture or mechanical break, 15 deg, rough, undulating, tight			
			6	136.5, 136.6, 136.7, 136.75, 136.95, 137.05, 137.3, 137.55, 137.7, 137.8, 138.05, 138.2, 138.3' - Bedding plane or mechanical break (13), <10 deg, smooth, planar to undulating, open <1/4"			
			3				
			NR				
140	R15-NQ 5 ft 80%	12	>10	140.2, 140.3' - Bedding plane or mechanical break (2), <10 deg, smooth, undulating, tight to open <1/2"		Limestone 140.0-140.8' - yellowish gray, (5Y 8/1), very fine grained, moderate to strong HCl reaction, strong (R4), voids (<1/16") over 15% of surface, few cavities of fossil molds (1/4"x1/2") 140.8-144.0' - yellowish gray, (5Y 8/1), fine grained, strong HCl reaction, very weak (R1), trace localized medium to coarse grained material, voids (<1/16") over 40% of surface, few cavities, abundant fossil casts	Driller's Remark: 142-143' void Driller's Remark: 143.5- 144' soft R15: 5 minutes
-99.2			3	140.5' - Fracture, vertical, rough, undulating, open <1/4"			
			4	140.7-140.9' - Fracture zone 141.1, 141.7, 141.95, 142.2, 142.25, 142.35, 142.88, 143.16, 143.42, 143.55' - Bedding plane or mechanical break (10), <10 deg, rough, undulating, tight to open <1/2"			
			>10	143.65-143.85' - Fracture zone			
			NR				
145	R16-NQ 5 ft 90%	36	>10	145.05' - Bedding plane or mechanical break, 10 deg, smooth to rough, planar to undulating		No Recovery 144.0-145.0' Limestone 145.0-146.7' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, strong (R4), voids (1/16") over 15% of surface, few cavities (1/8"x3/4"-elongated) 146.7-149.5' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak (R1), trace coarse grained material, voids (<1/16") over 40-50% of surface, abundant fossil casts and molds	R16: 6 minutes
-104.2			>10	145.5-145.6' - Fracture zone 145.7, 145.75, 146.0' - Bedding plane or mechanical break (3), <10 deg, smooth to rough, planar to undulating			
			3	146.0-146.35' - Fracture zone 146.65' - Mechanical break			
			3	146.83, 146.86' - Bedding plane or mechanical break (2), <10 deg, smooth to rough, planar to undulating			
			2	147.3' - Bedding plane 147.47' - Bedding plane			
150			NR			No Recovery 149.5-150.0'	
						Bottom of Boring at 150.0 ft bgs on 5/30/2007	







LOGGER : R. Bitely

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-02
SHEET 1 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724128.3 N, 457619.4 E (NAD83)
 ELEVATION : 41.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 4/18/07 START : 4/18/2007 END : 4/19/2007 LOGGER : T. Stewart

WATER LEVELS : 4.0 (RDS) DT 4/10/07			START : 4/10/2007			END : 4/19/2007			LOGGERS : T. Stewart		
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						
41.8	0.0	1.0	SS-1	2-2-2 (4)	Poorly Graded Sand With Silt (SP-SM) 0.0-1.0' - mottled dark gray, yellowish gray and pale yellowish brown, (N3, 5Y 8/1 and 10YR 6/2), moist, very loose, very fine to fine grained silica sand, 5-10% nonplastic fines, 10% rootlets <1/16" up to 2-1/2" long, trace dark yellowish orange (10YR 6/6) mottling near top		NW-Rod (5.0' sections) QuikGel brand bentonite (50 lb bags) 24" split spoon (SS) 8:56 Driller's Remark: 3-7/8" tricone roller drill bit in use, 2.0' adaptor length (to help set 5.0' stroke) when drilling Add 1/2 bag bentonite to mud vat Water level assumed at 4.0' below ground surface due to moisture content of SS-1 and SS-2				
5	1.5										
36.8	5.0										
	6.5	0.5	SS-2	2-3-2 (5)	Clayey Sand (SC) 5.0-5.5' - moderate yellowish brown and pale green, (10Y 5/4 and 10G 6/2), mottled, moist to wet, loose, 30-35% medium plastic, fine grained silica sand, cohesive, trace rounded concretions up to 1/4" dusky brown (5YR 2/2), trace roots up to 1/16" and 2"			9:32 Driller's Remark: a rock ledge at 6.5'			
10											
31.8	10.0										
	11.5	1.2	SS-3	1-5-42 (47)	Silt With Sand (ML) 10.0-11.2' - grayish yellow to moderate yellow, (5Y 8/4 to 5Y 7/6), wet, hard, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, 5-10% fine to medium grained silica sand, 20% medium to coarse grained in pockets, all carbonate		10:17 Driller's Remark: switched to 4-3/4" tricone roller bit to straighten out the hole, will add 10' of 4" HW casing to ensure a 90° borehole through confirmed drilling Original B-2 hole has been offset 1.5' NW and re-drilled. This redrilled hole will be called B-2R ("R" for redrill). Original B-2 borehole could not be straightened to 90°. Add 1/4 bag bentonite 11:26 Driller's Remark: 12.5-14.5' soft drilling, hard slow drilling at 14.5', 2' adaptor and 1-3/8" tricone roller drill				
15	15.0										
26.8	15.2	0.1	SS-4	50/2 (50/2")	Limestone Fragments 15.0-15.1' - grayish yellow to moderate yellow, (5Y 8/4 to 5Y 7/6), moderate to strong HCl reaction, poorly fossiliferous						
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-02
SHEET 2 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724128.3 N, 457619.4 E (NAD83)
 ELEVATION : 41.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 4/18/07 START : 4/18/2007 END : 4/19/2007 LOGGER : T. Stewart

WATER LEVELS : 4.0 (RDS) ON 4/18/07		START : 4/19/2007		END : 4/19/2007		LOGGER : T. Stewart			
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				
21.8	20.0	1.1	SS-5	10-10-24 (34)	Silty Sand (SM) 20.0-21.1' - grayish yellow, (5Y 8/4), wet, dense, fine to medium grained, moderate to strong HCl reaction, 30-40% nonplastic fines, 5-10% fine gravel, trace fine grained silica sand moderate gray (5G 5/6) particles, trace fine grained silica sand white particles, all carbonate		Driller's Remark: softened drilling at 16.5-20.0'		
	21.5						13:27 Driller's Remark: 21.5' hard drilling, soft again at 23.0'		
25	25.0								
16.8	25.8	0.8	SS-6	47-50/4 (100")	Silt (ML) 25.0-25.8' - grayish yellow, (5Y 8/4), wet, nonplastic, very rapid dilatancy, moderate to strong HCl reaction, 10-15% very fine to fine grained, 5-10% fine grained silica sand white particles, homogeneous, all carbonate		13:50 Driller's Remark: 26.5' hard drilling		
							13:55 Driller's Remark: 28.5-29.5' soft drilling		
30	30.0								
11.8		1.3	SS-7	48-39-37 (76)	Silt With Sand (ML) 30.0-31.3' - Same as 25.0-25.8' except yellowish gray to moderate yellow, (5Y 8/4 to 5Y 7/6), wet, nonplastic, very rapid dilatancy, 20-25% very fine to medium grained silica sand				
	31.5								
35	35.0						14:08 Driller's Remark: hardened drilling at 34.0'		
6.8	35.3	0.3	SS-8	50/3 (50/3")	Silty Gravel With Sands (GM) 35.0-35.3' - moderate yellowish brown, (10YR 5/4), wet, dense, mild to moderate HCl reaction, fine gravel-sized angular to subangular limestone fragments, 30% fine to coarse grained silica sand-sized, 25% low plastic fines		14:23 Remove silt/sand cuttings from mud vat, add 1/4 bag bentonite before continuing down hole to 40'		
							14:34 Driller's Remark: Observe light to moderate drill chatter and bouncing		
40									



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-02
SHEET 3 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724128.3 N, 457619.4 E (NAD83)
 ELEVATION : 41.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 4/18/07 START : 4/18/2007 END : 4/19/2007 LOGGER : T. Stewart

WATER LEVELS : 4.0 (bgs) on 4/19/07			START : 4/19/2007			END : 4/19/2007			LOGGERS : T. Stewart		
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						
1.8	40.0	1.5	SS-9	50-46-37 (83)	Silt With Limestone Fragments (ML) 40.0-41.5' - moderate olive brown, (5Y 4/4), wet, hard, nonplastic to low plasticity, rapid dilatancy, mild to moderate HCl reaction, 5-10% very fine grained silica sand, 15-25% very fine to fine grained silica sand, medium dark gray (N4) fragments, 40.0-40.4' lens of 1/8"-1/4" thick limestone disks, all carbonate						
	41.5										
45	45.0	1.1	SS-10	16-34-50/3 (84/9")	Silty Sand (SM) 45.0-46.1' - moderate olive brown to light olive gray, (5Y 4/4 to 5Y 5/2), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 10% fine gravel-sized, 36% nonplastic fines, trace very fine black fragments, one 1/2"x1/4" brittle black fragment, gray staining near black fragment, all carbonate			15:24 45-50' with very light chatter intermittently			
-3.2	46.3										
								Driller's Remark: 48.5' to bottom was soft drilling (very soft)			
50	50.0	0.5	SS-11	40-50/0.5 (90/6.5")	Silty Sand And Limestone Fragments (SM) 50.0-50.5' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 4/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 25% nonplastic fines, 60% of sample is limestone fragments 1/4"-3/8" thick disks, 1/2" to 1" fragments, trace brownish black (5YR 2/1) organic staining on limestone, all carbonate			15:45 Driller's Remark: 50% circulation loss			
-8.2	50.5										
								15:54 Driller's Remark: 52.0-53.0' soft drilling			
55	55.0	0.3	SS-12	50/4 (50/4")	Limestone Fragments 55.0-55.3' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), wet, mild to moderate HCl reaction Begin Rock Coring at 55.5 ft bgs See the next sheet for the rock core log			16:22 Driller's Remark: last SS/SPT for B-2R, will switch to NQ coring assembly, will install 55' of 3" NW 8:07 Water level on 4/19/07 is 1.2'			
-13.2	55.3										
60											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-02

SHEET 4 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724128.3 N, 457619.4 E (NAD83)

ELEVATION : 41.8 ft (NAVD88)

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

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





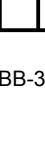
ORIENTATION : Vertical

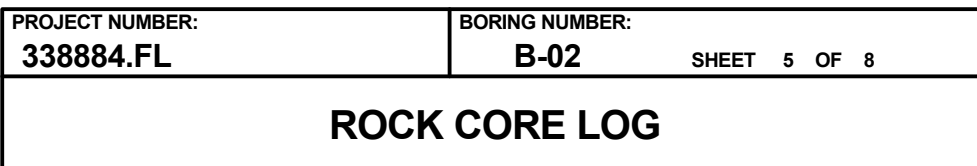
WATER LEVELS : 4.0 ft bgs on 4/18/07

START : 4/18/2007

END : 4/19/2007

LOGGER : T. Stewart

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		
60 -18.2	55.5	R1-NQ 5 ft 76%	62	NR		No Recovery 55.5-56.7'	3" NW casing is set to 55.5', 50 lb bags of QuikGel brand bentonite 8:57 Total depth tape measured at 55.5' below ground surface 9:12 Added 1/8 bag to mud vat SC-1 collected at 57.0-58.15'	
				3		Limestone 56.7-57.0' - dusky yellow, (5Y 6/4), mild to moderate HCl reaction, extremely weak to very weak (R0 to R1), friable, 30-35% spheroidal voids <1/16" 57.0-60.5' - olive gray with yellow gray mottling, (5Y 3/2 with 5Y 7/2), moderate HCl reaction, highly laminated in black discontinuous ribbons (<1/16" thick), voids <1/16" up to 20% of surface, 60.0-60.5' is yellowish gray (5Y 7/2) with 10-15% fine to medium grained organic black fragments horizontally aligned, laminations are horizontal then grade to wavy downward 60.5-61.5' - light olive gray, (5Y 5/2), moderate HCl reaction, medium strong (R3), voids <1/16" over 20-25% of surface, poorly fossiliferous (casts up to 3/8"), 10% short black discontinuous laminae <1/16" thick 61.5-65.0' - dusky yellow, (5Y 6/4), mild HCl reaction, very weak (R1), 35-40% voids up to 1/16", trace 3/16" elongated cavities, poorly fossiliferous (casts 3/16"), trace voids infilled with medium gray mineralization, medium gray staining over interval No Recovery 65.0-65.5' Limestone 65.5-70.5' - dusky yellow, (5Y 6/4), very fine grained, mild to moderate HCl reaction, very weak to medium strong (R1 to R3), voids up to 1/16" over 25-35% of surface, medium gray staining over 20% of surface, powdery feel in sections of core run		
				1				
				0				
				2				
	65 -23.2	60.5	R2-NQ 5 ft 90%	75	0		60.55' - Mechanical break, rough, undulating, tight, fragments in rock matrix to 1/4"	R1: 13 minutes
					0		61.5' - Mechanical break, horizontal	
					0		62.15' - Mechanical break, horizontal, rough, undulating, tight 62.4, 62.9' - Mechanical break (2), horizontal, rough, undulating, tight 63.0' - Mechanical break, 3-7 deg, rough, undulating, tight	
					1		64.5' - Mechanical break or bedding plane, horizontal, rough, undulating, open 1/4"-1" 64.8' - Fracture or mechanical break, 75-85 deg, rough, undulating, tight 65.6' - Mechanical break or bedding plane, horizontal, rough, planar, open 1/4" 66.15' - Mechanical break, horizontal to 5 deg	
					NR		67.3, 67.5' - Mechanical break (2)	
70 -28.2	65.5	R3-NQ 5 ft 100%	98	1		68.55' - Fracture or bedding plane, rough, undulating, tight 69.4' - Fracture or mechanical break, horizontal, rough, undulating, open up to 5/8" 69.8' - Fracture or mechanical break, horizontal, rough, undulating, tight to open 1/4", vertical stress joints from 69.8-70.35'	R2: 3 minutes	
				0				
				0				
				2				
				1				
	75 -33.2	70.5	R4-NQ 5 ft 91%	77	0		70.5-73.55' - moderate brown to grayish brown, (5Y 4/4 to 5Y 3/2), moderate HCl reaction, medium strong to strong (R3 to R4), voids up to 3/16" spheroidal over 30-40% of surface, trace 1/4"x3/16" elongated cavities, poorly fossiliferous (casts up to 1/4") 1" thick extremely weak (R0) rock layer at 72.1'	R3: 8 minutes
					1			
75 -33.2	75.5	NR	NR	0		72.1' - Bedding plane, horizontal, rough, undulating, carbonate fine infill up to 1/4" thick 72.8, 72.95, 73.1' - Mechanical break (3) 73.55' - Bedding plane, 20-30 deg, rough, undulating, contact with extremely weak rock (R0) below and medium strong to strong (R3 to R4) rock above	11:10 Additional 0.35' recovered during R5-NQ core run which belongs in the R4-NQ data. Driller's Remark: Able to identify redrill marks on core pieces R4: 10 minutes	
				1				
				2				



ORIENTATION : Vertical

LOGGER : T. Stewart

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-02

SHEET 6 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724128.3 N, 457619.4 E (NAD83)

ELEVATION : 41.8 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 4/18/07

START : 4/18/2007

END : 4/19/2007

LOGGER : T. Stewart

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.
100 -58.2	R9-NQ 5 ft 96%	93	0	96.2' - Mechanical break, horizontal-5 deg, rough, undulating, tight		Limestone 90.5-95.5' - white to yellowish gray, (N9 to 5Y 8/1), very fine grained, strong HCl reaction, weak (R2), voids up to 15% increasing percentage with depth, moderate to highly fossiliferous (microforams, casts up to 3/16", mostly a few larger fossil casts), organic soil bed 1" thick at 91.95', trace cavities up to 3/8" rimmed with white, hard mineral (maybe replacement of echinoderms) 95.5-100.3' - Same as 95.5-100.3' except yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), strong HCl reaction, very weak (R1), very fossiliferous (microforams, casts and molds), voids or spaces between microforam casts and molds, trace cavities up to 5/8"x1/8" (possible echinoderms with white secondary mineralization as replacement), trace voids 1/8"x1/8", trace medium dark gray (N4), fine grained fragments in matrix, trace black short 3/8" discontinuous organic laminations, "powdery" chalk-like feel over entire run No Recovery 100.3-100.5' Limestone 100.5-105.5' - Same as 105.5-110.5' except 10% echinoderm molds up to 5/8"x1/8" with white calcite replacement, olive gray mottling (5Y 3/2) as wavy horizontal beds, from 103.0-104.0' trace organic black fragments as medium grained fragments throughout run, spheroidal to subrounded voids <1/16" over 20-25% of surface, 130.5-131.2 is without olive mottling 105.5-110.5' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), voids up to 1/16" over 35-40% of surface, from 105.5-107.5' grading to 15%, from 107.5-110.5' chalk-like feel, very fossiliferous (casts from 1/8" to greater than 2"), spiral shaped casts and shell patterns 110.5-115.45' - no visible coral shaped casts, casts of echinoderms/ ostracods 1/4"x1/16" with white calcite mineral replacement	R9: 4 minutes
			0				
			1	97.7' - Fracture, horizontal, rough, undulating, tight to open 1/4", breakage in area with 3/4" size fossil casts and 3/8" spiral shaped casts			
			0				
			0	98.0, 99.0, 99.2' - Mechanical break (3)			
			NR				
105 -63.2	R10-NQ 5 ft 100%	97	1	100.7' - Fracture or mechanical break, horizontal, rough, undulating, open 1/16"			R10: 5 minutes
			0				
			0	103.0' - Mechanical break			
			0				
			0				
			0				
110 -68.2	R11-NQ 5 ft 100%	83	0	106.3-109.0' - Fracture, vertical, large >2" sized fossil molds and casts along surface			R11: 7 minutes
			2				
			1	106.65' - Fracture or mechanical break, horizontal, rough, undulating, tight			
			2	106.95' - Fracture or mechanical break, horizontal, rough, undulating, tight			
			0	107.65' - Fracture, vertical, rough, undulating, >2" size fossil casts or molds along surface			
			0	108.5' - Fracture or mechanical break, horizontal, rough, undulating, tight			
115 -73.2	R12-NQ 5 ft 99%	99	0	108.7' - Fracture or mechanical break, horizontal, rough, undulating, tight			R12: 5 minutes
			1	111.45' - Fracture or mechanical break, horizontal, rough, undulating, tight			
			0				
			0	113.0' - Mechanical break			
			0				
			0	114.3' - Fracture, 20 deg, rough, undulating, open 1/8"-1/4"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-02

SHEET 7 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724128.3 N, 457619.4 E (NAD83)

ELEVATION : 41.8 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 4/18/07

START : 4/18/2007

END : 4/19/2007

LOGGER : T. Stewart

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.
120 -78.2	R13-NQ 5 ft 100%	97	1	115.7' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/8", surfaces of fracture have molds or voids filled with secondary mineralization		No Recovery 115.45-115.5' Limestone 115.5-120.5' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), very fossiliferous, microforams, casts of echinoderms/ ostracods with yellowish gray (5Y 7/2) replacement mineralization, olive gray (5Y 3/2) thin beds and laminations at 116.0', medium light gray staining from 118.0-119.0', rock sample contains 25-35% medium grain, medium dark gray (N4) fragments in rock matrix, overall the sample has a "gritty" feel	SC-3 collected at 114.5-115.5' R13: 8 minutes
			0	116.9' - Mechanical break, 50-60 deg, rough, undulating, tight			
			0				
			1				
			0				
125 -83.2	R14-NQ 5 ft 98%	80	1			120.5-125.4' - yellowish gray, (5Y 7/2), strong HCl reaction, weak (R2), voids <1/16" over 30-40% of surface, olive gray (5Y 3/2) staining over 20% of rock (122.0-122.7' and 124.0-124.45'), extremely weak (R0) rock at 124.35', very fine grained limestone bed from 121.35-121.75', medium strong, highly fossiliferous (microforams, casts), trace molds with white mineral replacement	R14: 7 minutes
			3	121.35, 121.5, 121.75, 122.05' - Fracture or mechanical break (4), horizontal, rough, undulating, open 1/16"-1/8"			
			2	122.7' - Mechanical break, horizontal, rough, undulating, tight			
			2	123.35, 124.45' - Bedding plane (2), horizontal, rough, undulating, open 1/16"			
			0	123.5' - Bedding plane or mechanical break, rough, undulating, open up to 1/2"			
130 -88.2	R15-NQ 5 ft 100%	97	0	123.75' - Mechanical break, horizontal, rough, undulating, tight		No Recovery 125.4-125.5' Limestone 125.5-130.5' - yellowish gray and olive gray, (5Y 7/2 and 5Y 5/2), wavy bedded, strong HCl reaction, very weak (R1), voids <1/16" over 5-10% of surface, trace molds with white calcite mineral replacement at sizes of 5/8"x1/8" and 3/16"x1/16", medium dark gray (N4), medium grain particles over 30-40% of rock matrix	R15: 8 minutes
			0				
			0	127.5, 127.65, 128.0' - Mechanical break (3), horizontal, rough, undulating			
			1	129.0, 129.5' - Bedding plane (2), horizontal, rough, planar, tight			
			2	129.75' - Fracture or mechanical break, horizontal, rough, undulating, open 1/4"			
135 -93.2	R16-NQ 5 ft 96%	78	0			130.5-135.3' - Same as 125.5-130.5' except no molds with replacement mineralization, casts up to 5/8" (spiral shapes without infilling), more thinly bedded than 125.5-130.5'	SC-4 collected at 134.35-135.3' R16: 10 minutes
			1				
			3	132.15' - Fracture, 20 deg, rough, planar, tight			
			4	132.75' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
			0	132.95, 133.1' - Bedding plane or mechanical break (2), horizontal, smooth, planar, tight			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-02

SHEET 8 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724128.3 N, 457619.4 E (NAD83)

ELEVATION : 41.8 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 4/18/07

START : 4/18/2007

END : 4/19/2007


LOGGER : T. Stewart

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.
140 -98.2	R17-NQ 5 ft 100%	100	NR 0	134.35' - Bedding plane, horizontal, smooth, planar, tight		No Recovery 135.3-135.5' Limestone 135.5-136.8' - Same as 125.5-130.5'	R17: 9 minutes
			1	136.65' - Bedding plane, horizontal, rough, undulating, tight		136.8' - intact discontinuity 136.8-138.6' - yellowish gray, (5Y 7/2), medium to coarse grained, strong HCl reaction, very weak (R1), chalk-like feel, medium dark gray (N4) particles over 25-30% of matrix, 5-7% medium dark gray (N4) subrounded cavities up to 5/8"	
			0				
			1	138.55' - Bedding plane or mechanical break, rough, undulating, open 5/8", exposed filled cavities on surfaces		138.6-142.8' - variegated yellowish gray to grayish yellow, (5Y 7/2 to 5Y 8/4), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids increasing with depth (1/16") ranging from 1-2% to 15-20%, fossil molds/casts common with cavities 1-3/16" - 1-9/16" x 3/4"- 1-3/16" penetrating deep into core, few cavities filled with very weak (R0) limestone with voids more than 40-50% decreasing with depth	
			0			142.8-145.4' - variegated yellowish gray to dusky yellow to light olive gray, (5Y 7/2 to 5Y 6/4 to 5Y 5/2), strong HCl reaction, medium strong (R3), voids over less than 1-2% of surface becoming more common with depth, thin black organic laminae from subhorizontal to vertical throughout interval, thin subvertical to vertical fractures (tight), unbroken, permeate nearly full length of interval, trace fossil casts/molds predominantly in last 0.3' of interval	
145 -103.2	R18-NQ 5 ft 98%	82	2	140.35' - Mechanical break, horizontal, rough, undulating, tight		No Recovery 145.4-145.5' Limestone 145.5-148.7' - yellowish gray mottled with light gray, (5Y 7/2 mottled with N7), fine to medium grained, strong HCl reaction, very weak (R1), sharp contact at 146.4' with rocks above containing abundant lithoclasts up to 1/2" (well rounded to rounded nodules), possibly bioclastic, lithoclasts less apparent below contact, appears to be very thinly laminated, voids and trace cavities >3/8"x1/16" over 1-3% of surface	
			2	140.85' - Bedding plane or mechanical break, horizontal, rough, undulating, open up to 3/4"		148.7-150.5' - yellowish gray, (5Y 7/2), very fine grained, mild HCl reaction, medium strong to weak (R3 to R2), very faintly mottled, voids up to 1/16" over 3-5% of surface, cavities rare (<1/16"x3/16")	
			1	141.55' - Fracture or mechanical break, horizontal, rough, undulating, open up to 3/4"		Bottom of Boring at 150.5 ft bgs on 4/19/2007	
			2	141.7' - Bedding plane, horizontal, rough, undulating, <1/32" brownish black organic material infill over 100% surface, tight			
			0	142.8' - Bedding plane, horizontal, rough, undulating, tight, horizontal mottling surface			
			2	144.2' - Fracture, 30 deg, rough, undulating			Total depth is 150.5' on 4/19/07
			0	144.4' - Fracture or mechanical break, horizontal, rough, undulating, open 1/2"			
150 -108.2	R19-NQ 5 ft 100%	92	1	145.7' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/2"			
			0				
			0	147.7, 147.9' - Mechanical break (2), horizontal, rough, undulating, tight			
			2	148.55, 148.6' - Bedding plane (2), horizontal, rough, undulating, crumbled rock fragment between surfaces			
			0				



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-03
SHEET 1 OF 8	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724210.1 N, 457702.3 E (NAD83)
 ELEVATION : 43.9 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, 4-3/4" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 3/26/07 START : 3/26/2007 END : 3/26/2007 LOGGER : T. Stewart

WATER LEVELS : 3.0 TUBS ON 3/26/07			START : 3/20/2007		END : 3/20/2007		LOGGERS : T. Stewart	
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			
43.9	0.0	0.5	SS-1	1-1-1 (2)	Poorly Graded Sand With Organics (SP) 0.0-0.5' - medium gray to dusky brown, (N5 to 5YR 2/2), moist, very loose, very fine to fine silica sand, organics are fines and roots		24" split spoon, 5' AWJ rod	
	1.5							
							Driller switch to N-rod, 4.75" tricone roller drill bit add 12.5lb quick gel bentonite	
							Water level reached at ~3.0' below ground surface based upon SS-1 and SS-2 on 3/26/07 at 12:00	
5	5.0							
38.9		0.9	SS-2	6-7-9 (16)	Poorly Graded Sand With Silt (SP-SM) 5.0-5.9' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), wet, medium dense, very fine to fine rounded silica sand, 5% nonplastic fines as black particles and pale yellowish orange (10YR 8/6) particles, trace fine gravel-sized concretions with moderate yellowish brown (10YR 5/4) centers and grayish brown (5YR 3/2) rims, trace roots up to 3"			
	6.5							
10	10.0							
33.9		0.8	SS-3	5-6-7 (13)	Poorly Graded Sand (SP) 10.0-10.8' - very light gray to light gray, (N8 to N7), wet, medium dense, no HCl reaction, very fine to fine rounded silica sand, trace nonplastic fines that are predominantly black particles			
	11.5							
							Driller's Remark: Hitting hard rock at 13' drilling slow	
15	15.0							
28.9		1.1	SS-4	6-4-5 (9)	Fat Clay With Sand (CH) 15.0-15.4' - medium light gray, (N6), wet, stiff, medium to high plasticity, no to low dilatancy, mottled with greenish gray (5G 6/1) and light olive brown (5Y 6/6), 20-25% very fine to fine rounded silica sand, trace very fine sand-sized black particles Fat Clay (CH) 15.4-16.1' - bluish white, (5B 9/1), moist, stiff, medium to high plasticity, no to low dilatancy, no HCl reaction, mottled with grayish blue (5PB 5/2) streaks, 10% fine to medium sand-sized white particles			
	16.5							
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-03
SHEET 2 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724210.1 N, 457702.3 E (NAD83)
 ELEVATION : 43.9 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, 4-3/4" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 3/26/07 START : 3/26/2007 END : 3/26/2007 LOGGER : T. Stewart

WATER LEVELS : 3.6 TUBES ON 9/20/07		START : 9/20/2007		END : 9/20/2007		LOGGERS : T. Stewart	
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
23.9	20.0	1.2	SS-5	6-5-5 (10)	Lean Clay With Sand (CL) 20.0-21.2' - light gray, (N7), wet, stiff, 30% very fine to fine grained, low plasticity, slow to no dilatancy, no HCl reaction, pale green (10GB 8/2) mottling, mottled at bottom (21.2'), trace of black particles, 50% very fine to fine silica sand, trace fine gravel-sized grains		
	21.5						
25	25.0						
18.9		1.3	SS-6	2-1-2 (3)	Silty Sand (SM) 25.0-26.25' - yellowish gray, (5Y 7/2), wet, very loose, medium grained, no HCl reaction, very fine to fine rounded silica sand, 20-30% nonplastic fines, trace of very fine sand-sized black particles		
	26.5						
30	30.0						
13.9		1.2	SS-7	2-2-3 (5)	Clayey Sand (SC) 30.0-31.2' - light olive gray mottled with greenish gray and purple streaks, (5Y 6/1 with 5GY 6/1), wet, loose, no HCl reaction, very fine to fine rounded silica sand, 20% medium plastic fines, trace very fine sand-sized black particles		
	31.5						
35	35.0						
8.9		1.0	SS-8	14-28-7 (35)	Silt (ML) 35.0-36.0' - light olive gray with olive black and dark yellowish brown, (5Y 5/2 with 5Y 2/1 and 10YR 4/2), wet, hard, low plasticity, rapid dilatancy, 5-10% fine sand-sized black particles, mild HCl reaction from 35.5-40.0', carbonate material, organic seam at 35.0', 0.35' thick black and brown mottling, strong organic odor		
	36.5						
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-03
SHEET 3 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724210.1 N, 457702.3 E (NAD83)
 ELEVATION : 43.9 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, 4-3/4" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 3/26/07 START : 3/26/2007 END : 3/26/2007 LOGGER : T. Stewart

WATER LEVELS : 3.0 TUBS ON 3/20/07			START : 3/20/2007			END : 3/20/2007			LOGGERS : T. Stewart		
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					
3.9	40.0	1.3	SS-9	30-41-46 (87)	Silt (ML) 40.0-41.3' - light olive gray, (5Y 5/2), wet, very dense, fine to medium grained, mild to moderate HCl reaction, 50% nonplastic fines, trace fine gravel-sized, all carbonate, many sand-sized particles can be broken into silt sized by hand						
	41.5										
45	45.0	1.4	SS-10	29-40-46 (86)	Silty Sand (SM) 45.0-46.4' - light olive gray, (5Y 5/2), wet, very dense, fine to medium grained, mild to moderate HCl reaction, sand, 10% coarse sand-sized, 35-40% nonplastic fines, all carbonate						
-1.1	46.5										
50	50.0	0.5	SS-11	50/6 (50/6")	Sandy Silt With Limestone Fragments (ML) 50.0-50.5' - yellowish gray, (5Y 7/2), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 40% fine to coarse sand-sized, 1/4"-1/2" limestone lenses at top and bottom of sample, all carbonate			Start of sampling on 3/27/07 Driller's Remark: Soft drilling			
-6.1	50.5										
55	55.0	0.3	SS-12	50/4.5 (50/4.5")	Silt With Sand (ML) 55.0-55.3' - yellowish gray, (5Y 7/2), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 20% fine to medium sand-sized, all carbonate			Light to moderate bit chatter over 1st foot (drilling from 51.5-55.0')			
-11.1	55.4										
	60.0	0.2	SS-13	50/2.5 (50/2.5")	Limestone Fragments 60.0-60.2' - light olive gray to olive gray, (5Y 5/2 to 5Y 3/2), moderate to strong HCl reaction, fossiliferous (molds), trace medium grain sized black fragments, very fine (1/32") spheroidal particles are the matrix			Driller's Remark: Hard at 57', soft at 57.5', hard again at 58.3'			
	60.2										
60					Begin Rock Coring at 60.0 ft bgs See the next sheet for the rock core log						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-03

SHEET 4 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724210.1 N, 457702.3 E (NAD83)

ELEVATION : 43.9 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, HW casing

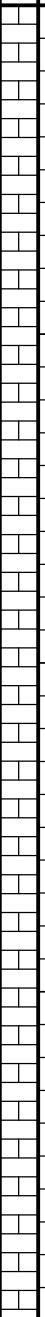
ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 3/26/07

START : 3/26/2007

END : 3/26/2007

LOGGER : T. Stewart

WATER LEVEL: 60.0 RQD 85% 07.07.1.0/20/2007		DISCONTINUITIES		LITHOLOGY		COMMENTS		
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		SYMBOLIC LOG	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				
-16.1	60.0 R1-NQ 1 ft 85%	85	0	60.65' - Mechanical break			Limestone 60.16-61.0' - dusky yellow, (5Y 6/4), fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), voids up to 1/16" on 15-20% of surface, no fossils 61.0-65.9' - dusky yellow, (5Y 6/4), mild to moderate HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16"x3/16" (some infilled with very fine to medium grain mineralization) voids up to 25% of surface, extremely weak carbonate silt interval from 64.3-64.6' mottled gray from 63.5-64.5', very poorly fossiliferous (trace molds)	R1: 1 minute
			2					Start at drilling 3/28/07, water level at surface (mud) at 7:55 =3/28/07
			2					
	R2-NQ 5 ft 98%	65	0	63.05', 63.4' - Mechanical break				
			3					
65 -21.1			1					R2: 12 minutes
	66.0		NR					
			0					
			0					
	R3-NQ 5 ft 100%	78	2	68.5', 68.6' - Fractures, 50-60 deg, rough, undulating, tight, black particles on surface				No Recovery 65.9-66.0' Limestone 66.0-71.0' - Same as 61.0-65.9' except very weak rock (peels with knife over first foot) grades to medium strong over last 3.0' of run, extremely weak rock (compressed by thumb) from 68.95' to 69.15', 10% unfilled spheroidal cavities up to 1/2"x1/2", stratified with black laminations from 69.4-70.8', 5-10% medium grain black particles, some voids (<1/16") in lower half infilled with gray mineral moderately fossiliferous (casts, molds), up to 3/8" fragment molds 71.0-71.5' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, voids (mostly <1/16") up to 45% surface, gray staining, moderately fossiliferous (mold, casts), 71.0-72.75' and 74.7-75.7' very weak rock (R1) peels with knife, 72.75-74.7' medium strong rock (R3) cannot be scraped with knife 72.5-75.7' - Same as 71.0-71.5' except moderate to strong HCl reaction
			3	68.95' - Bedding plane, <10 deg, top of extremely weak rock				
70 -26.1			1	69.15' - Bedding plane, 40 deg, base of extremely weak rock				
	71.0		>10	69.5' - Bedding plane or mechanical break, horizontal, rough, undulating, tight				
			2	70.0' - Fracture, 60-70 deg, rough, undulating, medium black particles		R4: 23 minutes		
			2	71.15'-71.7' - Fracture zone, fractured rock core black stains on fractures				
	R4-NQ 5 ft 94%	72	2	72.15' - Bedding plane, 0-5 deg, rough, undulating, open 5/8"				
			1	72.75' - Bedding plane or mechanical break, horizontal, rough, planar				
75 -31.1			0	73.35'-74.35' - Fracture, rough, planar, no stains, curved fracture				
	76.0		NR	73.95' - Fracture, 40 deg, rough, planar, tight, (bisecting curved fracture)				
			2	74.7' - Bedding plane or mechanical break, horizontal, rough, undulating, open up to 1/2" discontinuity between rock		No Recovery 75.7-76.0'		
			1	76.7' - Fracture, 80-90 deg, rough, undulating, tight				
			1	76.95' - Fracture, horizontal, rough, undulating, open up to 1"				
	R5-NQ 5 ft 98%	90	1	77.25' - Fracture or mechanical break, horizontal, rough, undulating, open 1/4"				
			1	78.35' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/2"				
80				79.3' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/2"				



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-03	SHEET 5 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724210.1 N, 457702.3 E (NAD83)

ELEVATION : 43.9 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, HW casing ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 3/26/07 START : 3/26/2007 END : 3/26/2007 LOGGER : T. Stewart

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			
-36.1			2			Limestone 76.0-80.9' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 4/4), moderate to strong HCl reaction, spherical voids up to 1/16"x1/16" covering up to 30% of core surface, 5-10% irregularly shaped cavities up to 1-1/4", no infill, predominantly weak rock (R2), gray mottling of stains at 80.5', zone of brown lamination (very weak rock R1 at 78.35'), moderate olive brown interval from 76.0-76.6'	R5: 7 minutes
81.0			NR	80.5' - Fracture, 30-40 deg, rough, undulating, tight			
			2	80.6' - Fracture, 10-15 deg, rough, undulating, tight			
			0	81.0'-81.2' - Fracture zone			
	R6-NQ 5 ft 96%	90	0				
85			0				
-41.1			0	85.15' - Mechanical break		Limestone 81.0-85.8' - dusky yellow, (5Y 6/4), mottled, mottled, irregular shaped cavities infilled with medium gray (N5) mineral and extremely weak rock (R0) yellowish gray in color, voids up to 3/16"x3/16", spheroidal cavities covering 15% of the surface of first 2.5' of run, infilled cavities up to 2"x1/2" over bottom 2.5' of run, entire run moderately fossiliferous (molds and casts), yellowish gray (5Y 8/1) clay seam at 83.2'	SC-1 collected at 84.2-85.15' Driller's Remark: 100% loss of circulation at 84.5' R6: 8 minutes
			NR	86.1' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/4"			
			0	86.3' - Mechanical break or bedding plane, horizontal, rough, undulating, open 1/8"-1/4"			
	R7-NQ 5 ft 100%	88	2	88.05' - Fracture, 15-20 deg, rough, undulating, tight			
			3	88.35' - Mechanical break, 5-10 deg, rough, planar, black stain, tight			
			0	88.5' - Mechanical break			
90			0	88.95' - Fracture, 70-80 deg, rough, undulating, black staining			
-46.1			0	89.5', 89.6' - Bedding plane or mechanical break, 5-10 deg, rough, planar, black stains, tight			R7: 12 minutes
			1	90.65' - Mechanical break			
			0	91.6' - Fracture, 60-70 deg, rough, undulating, tight			
	R8-NQ 5 ft 100%	100	0				
			0				
95			0				
-51.1			0				R8: 6 minutes
			2	96.3', 96.85', 96.55' - Fractures (3), horizontal, rough, undulating, tight			
			0				
	R9-NQ 5 ft 98%	88	1				
			1	98.95' - Fracture, horizontal, rough, undulating, 1/8" relief			SC-2 collected at 96.85-97.8'
100							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-03	SHEET 6 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724210.1 N, 457702.3 E (NAD83)

ELEVATION : 43.9 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, HW casing ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 3/26/07 START : 3/26/2007 END : 3/26/2007 LOGGER : T. Stewart

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.
-56.1			2	99.7' - Fracture, 10 deg, rough, undulating, open			R9: 8 minutes
	101.0		NR	100.65' - 100.75' - Bedding plane, rough, planar, 1/16" relief (bedding plane fracture)		No Recovery 100.9-101.0' Limestone 101.0-106.0' - Same as 88.0-91.0' except highly fossiliferous at 101.3-102.1' and 103.5-104.2'	
			1	101.2' - Mechanical break			
			0	101.25' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/4"			
	R10-NQ 5 ft 100%	96	0	103.5', 104.2' - Mechanical break (2)			
			0	104.25', 104.7', 105.25', 105.65' - Mechanical break (4), horizontal, rough, undulating, tight			
105 -61.1			0				R10: 8 minutes
	106.0		0			106.0-109.0' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), gray mottling, staining over 106.0-109.0', 10-15% spherical voids (<1/16"), poorly fossiliferous (molds mostly casts up to 1/8" in size), 25-30% very fine grain white and dark gray particles	
			0				
	R11-NQ 5 ft 100%	92	1	108.6' - Fracture, 60-70 deg, rough, undulating, tight		109.0-111.0' - Same as 106.0-109.0' except yellowish gray, (5Y 8/1)	
			2	109.0' - Bedding plane or mechanical break, horizontal, smooth, planar			
			2	109.8' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/4"			R11: 7 minutes
110 -66.1			2	110.2' - Bedding plane or mechanical break, horizontal, smooth, planar, open 1/8"			
	111.0		1	110.35' - Bedding plane or mechanical break, horizontal, rough, undulating, open up to 5/8"		111.0-113.0' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2), up to 10% elongated cavities up to 1/4"x1/2" rimmed with secondary mineralization, trace fossil casts up to 1/2"	
			2	111.3' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/8" open			
			2	111.6' - Mechanical break, <10 deg, rough, undulating, tight		113.0-116.0' - white, (N9), strong HCl reaction, very weak to weak (R1 to R2), mottled with soft white clay, poorly fossiliferous (casts and molds up to 1/4") more larger voids, voids are spheroidal and up to 1/16", no infill	
	R12-NQ 5 ft 100%	80	2	112.0' - Mechanical break, <10 deg, rough, undulating, tight			
			1	112.9' - Mechanical break or bedding plane, <10 deg, rough, undulating, tight			R12: 5 minutes
115 -71.1			1	113.7-113.95' - Fracture zone, rough, undulating, gray stains, also brown stains			
			1	114.4' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
	116.0		1	115.35' - Bedding plane or mechanical break, rough, undulating, tight to 1/8" gap		116.0-119.5' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak to weak (R1 to R2), grades from moderate to highly fossiliferous from 116.0-119.0' (casts, molds) up to 1/2"x1/2" micro fossils, gray staining predominantly over 117.0-119.0'	SC-3 collected at 115.1-116.0'
			5	116.45' - Bedding plane or mechanical break, horizontal, rough, undulating, open up to 1/4"			
			1	117.2' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
	R13-NQ 5 ft 100%	72	1	117.4' - Fracture, 60-70 deg, rough, undulating, open 1/8"			
			2	117.55' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/8"			
120				117.65' - Mechanical break, horizontal, smooth, planar, open 1/8"			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-03	SHEET 7 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724210.1 N, 457702.3 E (NAD83)

ELEVATION : 43.9 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, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 3/26/07

START : 3/26/2007

END : 3/26/2007

LOGGER : T. Stewart

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.
-76.1			1	117.9' - Mechanical break or bedding plane, rough, undulating, tight		Limestone 119.5'-120.5' - Same as 116.0'-119.5' except grayish yellow, (5Y 8/4), up to 25% spheroidal voids (<1/16")	R13: 7 minutes
121.0			2	118.25' - Mechanical break or bedding plane, <10 deg, rough, undulating, tight		120.5'-121.0' - Same as 116.0'-119.5' except yellowish gray, (5Y 8/1), very fine grained, trace voids, 15% elongated cavities up to 1/8"x1/2", poorly fossiliferous	Chalk like or powder like rock, this run contains rock with vertical fractures-possible stress related to over burden
			0	119.45' - Mechanical break or bedding plane, <10 deg, rough, undulating, dark gray stains, open up to 1/2"		121.0'-125.0' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2), 10% voids up to 1/16", wavy bedded discontinuity 1/2" thick at 122.0', gray staining over entire interval, poorly fossiliferous (casts), trace dark gray very fine particles, upper most 1' is the same as the bottom of R13	SC-4 collected at 124.5-125.0'
			2	119.65' - Bedding plane, horizontal		No Recovery 125.0-126.0'	R14: 5 minutes
			2	120.3' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/8" gap		Limestone 126.0'-129.6' - yellowish gray with moderate gray staining, (5Y 8/1), strong HCl reaction, 126-128.5' is very fine chalk-like feel, poorly fossiliferous (trace casts), 25% spheroidal voids (mostly 1/16"x1/16"), trace cavities up to 1/2"x1/4"	Driller's Remark: Soft drilling at 124.5-125.0'
			1	121.75' - Bedding plane or mechanical break, horizontal, rough, undulating, tight		128.5'-129.6' highly fossiliferous (casts, molds, micro fossil), 20-25% cavities partially filled (rimmed with calcite)	R15: 7 minutes
125			NR	121.85' - Bedding plane or mechanical break, horizontal, rough, undulating, tight		No Recovery 129.6-131.0'	Driller's Remark: Soft lense from 127.0-128.0'
-81.1			NR	123.05' - Bedding plane or mechanical break, horizontal, rough, planar, tight		Limestone 131.0'-135.0' - Same as 126.0-128.5' except bottom most 0.5' returns to "clean" un-stained yellowish gray (5Y 8/1)	Appears similar to 90-115', a vertical fracture in this interval is over 1.5' long
			NR	123.35, 123.55' - Mechanical break			
			1	123.9' - Mechanical break, rough, planar, tight			
			1	124.05' - Mechanical break or bedding plane, smooth, planar, tight			
			2	126.5' - Mechanical break or bedding plane, horizontal, rough, planar, open 1/16"			
			2	127.0' - Mechanical break, horizontal, rough, undulating, tight			
			2	127.3-127.45' - Fracture zone			
			NR	128.3' - Mechanical break or bedding plane, horizontal, rough, undulating, open 1/16"			
130			NR	128.8' - Mechanical break, horizontal, rough, undulating, tight			
-86.1			NR	129.02-129.05' - Fracture zone			
			>10	129.4' - Bedding plane or mechanical break, horizontal, rough, undulating, tight, assume core loss from bottom of run			
			>10	132.0' - Mechanical break, horizontal, rough, planar, for horizontals, vertical stained set of fractures at 132'. 80-100% surface covered.			
			>10				
			2				
135			NR				
-91.1			NR				
			0				
			>10	137.45' - Bedding plane, 15-20 deg, brownish black stains, tight			
			>10	137.8-138.15' - Fracture zone, up to 2" subrounded pieces			
			2	138.35' - Fracture or mechanical break, 70-80 deg			
140							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-03

SHEET 8 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724210.1 N, 457702.3 E (NAD83)

ELEVATION : 43.9 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, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 3/26/07

START : 3/26/2007

END : 3/26/2007

LOGGER : T. Stewart

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			
-96.1			1	138.5-138.75' - Fracture zone, brownish black stains		Limestone 137.45-140.8' - white to yellowish gray, (N9 to 5Y 8/1), strong (R4), voids up to 1/16"x1/16" over 25% of surface, cavities up to 2"x1-1/2" irregularly shaped filled with a weak secondary mineral, poorly to moderately fossiliferous (casts, molds), fossils up to 3/4"	R17: 8 minutes
	141.0		NR	139.35' - Bedding plane or mechanical break, horizontal, rough, undulating, open up to 1/2"			Stopped drilling at 141.0' on 3/28/07
			1	139.55' - Fracture or mechanical break, 40-50 deg, rough, undulating, open up to 1/2"			Starts drilling from 141.0' on 3/29/07, 08:01 water level to 3'10" below ground surface in NQ barrel
			0	140.25' - Mechanical break or bedding plane, horizontal, rough, undulating			
			1	141.35' - Bedding plane, horizontal, rough, undulating, 1/16" clay infilling, open 1/8"		No Recovery 140.8-141.0' Limestone	
	R18-NQ 5 ft 100%	88	1	142.8' - Bedding plane or mechanical break, <10 deg, rough, undulating, tight to 1/4" open		141.0-146.0' - light olive gray, strong HCl reaction, weak (R2), 5-10% spherical voids up to 1/8"x1/8" laminated rim <1/16" thick over entire interval, trace cavities up to 3/8"x1/16" elongated with secondary white mineral rimmed (60% infill), bottom most 0.15' is a very light gray medium strong (R3) limestone	R18: 9 minutes
145			0	143.4', 143.5', 143.85', 144.15', 144.55' - Mechanical break (5), horizontal, rough, undulating, tight		146.0-148.5' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), very fine grained, strong HCl reaction, medium strong to strong (R3 to R4), voids up to 3/16"x1/8" covering 20-30% of surface, trace cavities elongated horizontally 1"x1/4" in size, trace fossil (casts/molds)	
-101.1			2	144.55' - Bedding plane or mechanical break, horizontal, rough, undulating, tight		148.5-149.45' - very weak (R1), stratified section of yellowish gray and brownish black lamination, rock has powdery feel to touch	
	146.0		0	145.8' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/8" gap between weaker rock above and stronger rock below		149.45-151.2' - fine grained, very thinly bedded, voids up to 1/8"x1/8", some infilled with white mineralization, rock has powdery feel to touch	
			1	147.55' - Bedding plane or mechanical break, horizontal, rough, undulating, tight		Bottom of Boring at 151.2 ft bgs on 4/3/2007	
			2	148.05', 148.5', 149.4' - Bedding plane or mechanical break (3), horizontal, rough, planar, 148.5' has organic black infill <1/16" thick			SC-5 collected at 148.5-149.45'
	R19-NQ 5.2 ft 100%	100	1				
150			0				R19: 10 minutes
-106.1							Driller's Remark: Circulation loss has been continuing (60-100%) during core runs, total depth tape measured at 151.0', borehole open to total depth
	151.2						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-04

SHEET 1 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724317.2 N, 457809.8 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 4/10/07

START : 4/10/2007

END : 4/17/2007

LOGGER : R. McComb

WATER LEVELS : 3.0 TDS ON 4/10/07		START : 4/17/2007		END : 4/17/2007		LOGGERS : R. MCCOMB		
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				
42.8	0.0	1.1	SS-1	1-2-2 (4)	Topsoil 0.0-0.15' - brownish black, (5YR 2/1), moist, 30-35% roots		Samples taken using 5' sections of N-rod, 3-7/8" tricone drag bit, 50 lb bags of quick gel brand bentonite 08:40 Water level at 3.0' below ground surface based on SS-1 moist, SS-2 wet	
	1.5				Poorly Graded Sand With Organics (SP) 0.15-1.1' - grayish black to very light gray, (N2 to N8), moist, very loose, very fine to fine grained, silica sand, trace nonplastic fines, 10% organics decreasing with depth			
5	5.0							
37.8		1.0	SS-2	2-2-2 (4)	Poorly Graded Sand (SP) 5.0-6.0' - grayish orange to pale yellowish brown mottled with trace dusky brown, (10YR 7/4 to 10YR 6/2 with 5YR 2/2), wet, very fine to fine grained, trace to 3% nonplastic fines, trace very fine sand-sized black particles, silica sand			
	6.5							
10	10.0							
32.8		0.9	SS-3	4-6-7 (13)	Poorly Graded Sand To Clayey Sand (SP-SC) 10.0-10.9' - yellowish gray, (5Y 7/2), wet, very fine to fine grained, grading from sand (SP) to clayey silt (SC) with depth, trace nonplastic fines in SP, 25-30% low to medium plastic fines in SC, trace of angular shaped black particles			
	11.5							
15	15.0							
27.8		1.2	SS-4	7-10-12 (22)	Silty Sand (SM) 15.0-16.2' - yellowish gray, (5Y 7/2), wet, medium dense, very fine to fine grained, 25-30% nonplastic fines, very fine black particles, 3/8" thick vertically oriented seam of SP as above (10.0-10.9'), trace moderate yellow (5Y 7/6) staining over last 1/3 of sample, silica sand			
	16.5							
20								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-04

SHEET 2 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724317.2 N, 457809.8 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 4/10/07

START : 4/10/2007

END : 4/17/2007

LOGGER : R. McComb

WATER LEVELS : 3.0 TUBS ON 4/10/07			START : 4/10/2007		END : 4/17/2007		LOGGERS : R. MCCORM	
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			
22.8	20.0	1.2	SS-5	9-10-9 (19)	Silty Sand (SM) 20.0-21.2' - yellowish gray, (5Y 7/2), wet, very fine to fine grained, 14% nonplastic fines, trace very fine angular black particles, silica sand			
	21.5							
25	25.0							
17.8		1.3	SS-6	5-6-5 (11)	Clayey Sand (SC) 25.0-25.1' - dark yellowish orange, (10YR 6/6), moist, very fine to fine grained, 30-35% medium plastic fines, silica sand			
	26.5							
					Sandy Fat Clay (CH) 25.1-25.4' - greenish gray, (5GY 6/1), moist, stiff, medium to high plasticity, no to slow dilatancy, 30% fine silica sands laminated with very light gray (N8), very fine to fine silica sands about 1/6" thick, light brown (5YR 5/6) laminations <1/16" thick			
					Fat Clay (CH) 25.4-25.7' - grayish black, (N2), moist, high plasticity, no dilatancy			
30	30.0				Silty Sand (SM) 25.7-26.0' - light brown, (5YR 5/6), wet, fine to medium grained, strong HCl reaction, 25-30% low plastic fines carbonate derived			
12.8		1.4	SS-7	7-11-41 (52)	Silty Sand (SM) 26.0-26.3' - grayish yellow, (5Y 8/4), wet, fine to medium grained, strong HCl reaction, 25% nonplastic fines, pockets of yellowish gray (5Y 8/1) material		09:36 Driller's Remark: Will change to 3-7/8" tricone roller bit	
	31.5							
					Silty Sand With Gravel (SM) 30.0-31.4' - yellowish gray with moderate yellow and yellowish gray staining, (5Y 8/1 with 5Y 7/6 and 5Y 7/2), wet, fine to coarse grained, strong HCl reaction, angular to subrounded sand-sized, 23% low plastic fines, 20% fine to coarse gravel, all carbonate			
35	35.0							
7.8		1.5	SS-8	3-4-14 (18)	Interbedded Silt With Sand (ML) 35.0-36.5' - medium light gray mottled with medium dark gray interbedded with very pale orange mottled with yellowish gray, (N6 mottled with N4 interbedded with 10YR 8/2 mottled with 5Y 8/1), moist, low plasticity, strong to very strong HCl reaction, 20-25% very fine to fine grained sand, 1" angular limestone fragments at bottom of sample			
	36.5							
40								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-04
SHEET 3 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724317.2 N, 457809.8 E (NAD83)
 ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 4/10/07 START : 4/10/2007 END : 4/17/2007 LOGGER : R. McComb

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
2.8	40.0	1.4	SS-9	5-5-9 (14)	Silt With Sand (ML) 40.0-41.4' - light gray mottled with yellowish gray, (N7) mottled with 5Y 7/2), wet, nonplastic, rapid dilatancy, very strong HCl reaction, 20% very fine to fine sand, all carbonate		
	41.5						
45	45.0						
-2.2		1.5	SS-10	6-10-14 (24)	Elastic Silt With Sand And Limestone Fragments (MH) 45.0-46.5' - medium light gray, (N7), wet, low to medium plasticity, rapid dilatancy, very strong HCl reaction, 25% fine to medium grained sand, 10-15% fine to coarse grained gravel limestone fragments, all carbonate		
	46.5						
50	50.0						
-7.2		1.0	SS-11	17-17-18 (35)	Silty Sand (SM) 50.0-51.0' - medium gray, (N5), wet, dense, fine to coarse grained, very strong HCl reaction, predominantly fossils including shell fragments, 20% low plastic fines		
	51.5						
55	55.0						
-12.2		1.5	SS-12	15-24-33 (57)	Sandy Silt (ML) 55.0-56.5' - very light gray, (N8), wet, low plasticity, rapid dilatancy, very strong HCl reaction, 30% fine to coarse grained sand, fossils and fossil fragments ranging from yellowish gray to medium dark gray (5Y 5/1 to 5Y 8/1)		
	56.5						
60							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-04

SHEET 4 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724317.2 N, 457809.8 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 4/10/07

START : 4/10/2007

END : 4/17/2007

LOGGER : R. McComb

WATER LEVELS : 3.0 (RDS) DT 4/10/07		START : 4/10/2007		END : 4/17/2007		LOGGER : R. MCCOMB	
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		
-17.2	60.0	1.5	SS-13	28-27-24 (51)	Silty Sand With Gravel (SM) 60.0-61.5' - medium light gray, (N6), wet, very dense, fine to coarse grained, very strong HCl reaction, predominantly fossil fragments, 25-30% low to medium plastic fines, 15% fine gravel-sized fragments composed of shale fragments		10:58 Driller's Remark: Change mud vat, add 1/4 bag (50 lb), quick gel bentonite
	61.5						
65	65.0						
-22.2	65.8	0.8	SS-14	37-50/4.0 (87/10")	Silty Sand (SM) 65.0-65.8' - very light gray to light gray mottled with medium gray, (N8 to N2 mottled with N5), wet, very dense, fine to coarse grained, very strong HCl reaction, fossil fragments and carbonate material, 43% low to medium plastic fines, 10-15% fine gravel-sized fragments		
70	70.0						
-27.2		1.5	SS-15	24-26-30 (56)	Silty Sand (SM) 70.0-71.5' - Same as 65.0-65.9'		
	71.5						
75	75.0						
-32.2		1.5	SS-16	11-12-15 (27)	Clay With Sand (CL) 75.0-75.8' - grayish green mottled with grayish green and brownish black, (10GY 5/2 mottled with 10G 4/2 and 5Y 2/1), moist, very stiff, high plasticity, no dilatancy, mild HCl reaction, 25% very fine to fine silica sand; irregular shaped, laminated bedding; brownish black material may be organics Elastic Silt With Sand (MH) 75.8-76.5' - yellowish gray, (5Y 8/1), moist to wet, low to medium plasticity, rapid dilatancy, mild HCl reaction, 25% fine silica and carbonate sands, 1-1/2" lens of sandy fat clay at bottom of sample, same as 75.7-75.8'		Transitional boundary between CH/MH subunits
	76.5						
80							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-04

SHEET 5 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724317.2 N, 457809.8 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 4/10/07

START : 4/10/2007

END : 4/17/2007

LOGGER : R. McComb

WATER LEVELS : 3.0100501 4/10/07		START : 4/10/2007		END : 4/17/2007		LOGGERS : R. MCCOMB	
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		
-37.2	80.0	0.9	SS-17	18-50/4.5 (68/10.5")	Clayey Sand (SC) 80.0-80.9' - light olive gray mottled with dusky yellow green, (5Y 5/2 mottled with 5BG 3/2), wet, very dense, fine grained, predominantly clayey sand (SC) with pockets of clay (CH) and silt (ML), 35% medium plastic fines, mild HCl reaction, silica sand CH- dusky blue green, (5BG 3/2), with very shiny appearance, no HCl reaction ML- yellowish gray (5Y 8/1), same as 45.0-46.5', mild HCl reaction, olive gray (5Y 2/1) organic pockets at bottom of sample, high plastic, no HCl reaction		14:29 Driller's Remark: Observed hard drilling light rig bouncing
	80.9						
85	85.0						
-42.2	85.2	0.1	SS-18	50/2 (50/2")	Limestone Fragments 85.0-85.1' - light olive gray, (5Y 5/2), moderate to strong HCl reaction, organic fragments		14:49 Driller's Remark: Light rig bouncing over entire 5-foot run to 90'
90	90.0						
-47.2	90.3	0.3	SS-19	50/4 (50/4")	Silt (ML) 90.0-90.3' - yellowish gray mottled with medium dark gray, (5Y 7/2 mottled with N4), moist, low plasticity, rapid dilatancy, strong HCl reaction, brownish black irregular laminations, organics at bottom of sample, carbonate derived		
95	95.0						
-52.2		0.7	SS-20	40-50/4.5 (90/10.5")	Sandy Silt (ML) 95.0-95.7' - yellowish gray, (5Y 8/1), wet, low plasticity, rapid dilatancy, strong HCl reaction, 25-30% fine to medium grained sand, 5% coarse grained sand, all carbonate derived		
	95.9						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-04

SHEET 6 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724317.2 N, 457809.8 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 4/10/07

START : 4/10/2007

END : 4/17/2007

LOGGER : R. McComb

WATER LEVELS : 3.0 TUBS ON 4/10/07			START : 4/10/2007			END : 4/17/2007			LOGGER : R. MCCOMB		
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						
-57.2	100.0	0.3	SS-21	50/4 (50/4")	Sandy Silt (ML) 100.0-100.3' - Same as 95.0-95.7' except limestone lens 0.1' thick at bottom of sample		16:10 Driller's Remark: Last sample of 4/10/07, end of drilling 08:15 Water level at 2.5' below ground surface on 4/11/07 4/11/07 Adding 5' sections of AWJ to reach depth				
105	105.0										
-62.2		0.8	SS-22	41-50/5.5 (91/11.5")	Silt With Sand (ML) 105.0-105.8' - yellowish gray mottled with gray, (5Y 8/1 mottled with N5), moist, low plasticity, rapid dilatancy, strong HCl reaction, 20% fine to medium grained sand, trace wafer shaped limestone lenses <1/8" thick, one 1/2" dark yellowish orange coarse fragment, all carbonate		09:44 Starting drilling to 105' added 1/2 bag bentonite				
	106.0										
110	110.0										
-67.2		0.8	SS-23	33-50/5 (83/11")	Silty Sand (SM) 110.0-110.8' - yellowish gray, (5Y 8/1), wet, fine to coarse grained, strong HCl reaction, 10-15% fine gravel-sized, 25-30% low to medium plastic fines, all carbonate		10:36 Driller's Remark: 33-50/5" (83/11") Add 1/2 bag bentonite to mud vat				
	110.9										
115	115.0										
-72.2		1.5	SS-24	1-1-3 (4)	Sandy Clay With Silt (CL-ML) 115.0-116.5' - olive gray mottled with greenish black, (5Y 4/1 mottled with 5GY 2/1), low plasticity, slow dilatancy, moderate to strong HCl reaction, 15-20% of clay is fine to coarse grained sand; fossils and fossil fragments; the clay is irregularly interbedded with 30% light olive gray (5Y 6/1) fine grained, poorly graded silica sand (SP)						
	116.5										
120											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-04
SHEET 7 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724317.2 N, 457809.8 E (NAD83)
 ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 4/10/07 START : 4/10/2007 END : 4/17/2007 LOGGER : R. McComb

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
-77.2	120.4	0.3	SS-25	50/5 (50/5")	Silt With Sand And Limestone Fragments (ML) 120.0-120.3' - yellowish gray, (5Y 8/1), moist, strong HCl reaction, 50% limestone fragments, 20% fine to medium sand-sized material, all carbonate		
125	125.0						
-82.2	125.3	0.2	SS-26	50/3 (50/3")	Silt (ML) 125.0-125.2' - yellowish gray, (5Y 8/1), moist, low plasticity, rapid dilatancy, strong HCl reaction, 5-10% fine to medium sand-sized, all carbonate		
130	130.0						
-87.2	130.3	0.3	SS-27	50/3 (50/3")	Silt With Sand (ML) 130.0-130.3' - Same as 125.0-125.2' except 20-25% fine to coarse sand-sized material		14:20 Driller's Remark: Light rig chatter at 133.5', 131.5'
135	135.0						
-92.2	135.9	0.1	SS-28	50/1 (50/1")	Limestone Fragment 135.0-135.1' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, trace olive gray (5Y 3/2) staining, fossil casts, fragment is a 1" disc shaped Begin Rock Coring at 136.0 ft bgs See the next sheet for the rock core log		15:02 Driller's Remark: Will switch to NQ coring, last soil sample for B-4 boring
140							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-04	SHEET 8 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724317.2 N, 457809.8 E (NAD83)

ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis

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

WATER LEVELS : 3.0 ft bgs on 4/10/07 START : 4/10/2007 END : 4/17/2007 LOGGER : R. McComb

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			
136.0	R1-NQ 5 ft 92%	74	2	136.5, 136.9' - Fractures (2), horizontal, rough, undulating		Limestone 136.0-137.35' - light olive gray, (5Y 5/2), fine to medium grained, strong HCl reaction, medium strong (R3), voids (<1/16") on 20% of surface, cavities (3/16" - 1-3/4"), secondary crystallization in 35-40% of surface, fossiliferous 137.35-137.39' - light olive gray, (5Y 5/2), very fine grained, moderate to mild HCl reaction, extremely weak (R0), fine wavy laminations 137.39-140.6' - yellowish gray, (5Y 7/2), fine to medium grained, strong to extremely strong HCl reaction, weak to medium strong (R2 to R3), weaker with depth, voids (<1/16") on <5% of surface, irregular laminations, powder feel increases with depth, shell fragments, fossiliferous (casts, molds) No Recovery 140.6-141.0' Limestone 141.0-145.9' - transition from yellowish gray to light olive gray, (5Y 8/1 to 5Y 5/2), fine to medium grained, extremely strong HCl reaction, very weak to weak (R1 to R2), fines increase with depth, voids (<1/16") over 40-50% of surface, fossiliferous casts and molds mainly in weaker rock 144.0-145.9', dark gray stains at 144.5' No Recovery 145.9-146.0' Limestone 146.0-149.6' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids to <1/16" over 20% of rock, black organic staining, secondary crystallization in voids, poorly fossiliferous (casts/molds) No Recovery 149.6-151.0'	4/12/07 Start coring at 09:40:15 from 136-141' The interval from 135.0- 136.0' was drilled down to set a 5' stroke; no data for 135.0-136.0' is available 07:45 Water level at 7' 10"
140 -97.2			2	137.3' - Fracture or bedding plane, horizontal, smooth			
			1	137.35' - Fracture, horizontal, smooth 137.8, 138.5' - Fractures (2), horizontal, rough, undulating			
			2	139.8' - Fracture, <10 deg, rough, undulating			
141.0	R2-NQ 5 ft 98%	78	NR	140.4' - Fracture, 20-30 deg, rough, undulating		141.0-145.9' - transition from yellowish gray to light olive gray, (5Y 8/1 to 5Y 5/2), fine to medium grained, extremely strong HCl reaction, very weak to weak (R1 to R2), fines increase with depth, voids (<1/16") over 40-50% of surface, fossiliferous casts and molds mainly in weaker rock 144.0-145.9', dark gray stains at 144.5' No Recovery 145.9-146.0' Limestone 146.0-149.6' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids to <1/16" over 20% of rock, black organic staining, secondary crystallization in voids, poorly fossiliferous (casts/molds) No Recovery 149.6-151.0'	R1: 25 minutes R2-NQ is the first run on 4/17/07 08:45 Water level at 6.5' below ground surface
			>10	141.6-142.6' - Fracture zone, 70-80 deg, rough, <20 deg at 142.6' and 146.6', rough, undulating			
			>10	143.1, 143.5' - Mechanical break (2)			
145 -102.2			0	144.0' - Mechanical break or bedding plane, horizontal, open 3/8", clay infill, very soft			
	R3-NQ 5 ft 72%	19	1	145.45' - Fracture or mechanical break, 50-60 deg, rough, undulating, black staining on 70% surface		146.0-149.6' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids to <1/16" over 20% of rock, black organic staining, secondary crystallization in voids, poorly fossiliferous (casts/molds) No Recovery 149.6-151.0'	R2: 8 minutes Driller's Remark: Loss of circulation 100% at 146.5' SC-1 collected at 147.35- 148.4'
			NR	145.75' - Bedding plane or fracture, vertical, rough, undulating, black stains on 60-70% of surface, tight			
			>10	146.1, 146.2, 146.45, 146.55' - Mechanical break or bedding plane (4), rough, undulating, tight, broken along wavy bedded laminations, organic beds (<1/16")			
150 -107.2			2	147.05' - Fracture or bedding plane, horizontal, rough, undulating, open 1/8", black stains over 25% of surface			
			5	147.4' - Fracture, 20-30 deg, rough, undulating, black staining over 100% of surface, open 1/32"		Bottom of Boring at 151.0 ft bgs on 4/14/2007	R3: 4 minutes End of B-4 boring at 151.0' below ground surface on 4/17/07
			4	148.5' - Fracture, 40 deg, rough, undulating, 100% black staining, tight			
			NR	148.55' - Fracture or mechanical break, rough, undulating, black staining over 100% of surface, tight			
			NR	148.7, 148.8, 149.0' - Mechanical break or bedding plane (3), rough, undulating, tight to open 1/16"			
				149.15' - Fracture or mechanical break, horizontal, black stains on 80% surface, open 1/4"-1/2"			
				149.45' - Fracture or mechanical break, 40-50 deg, rough, undulating, tight			
				149.55' - Mechanical break or bedding plane, horizontal, rough, undulating, open 1/2" - 5/8"			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-04A
SHEET 1 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724269.5 N, 457868.6 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 25.0 ft bgs on 6/14/07 START : 6/12/2007 END : 6/13/2007 LOGGER : A. Teal

WATER LEVELS : 23.0 ft bgs on 6/14/07		START : 6/12/2007		END : 6/13/2007		LOGGERS : A. Earl	
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
42.0	0.0	1.3	SS-1	1-2-3 (5)	Poorly Graded Sand Grading To Poorly Graded Sand With Silt (SP) 0.0-1.3' - light gray grading to dark yellowish orange, (N7 to 10YR 6/6), moist, no HCl reaction, trace to 10-15% nonplastic fines, very fine to fine silica sand, trace roots		"Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)"
	1.5						
5	5.0						
37.0		0.9	SS-2	3-6-7 (13)	Silty Sand (SM) 5.0-5.3' - black with orange staining, matrix is dark yellowish orange, (10YR 6/6), wet, loose, no HCl reaction, predominantly coarse sand to 3/16", 20% nonplastic fines, angular to rounded sand Clayey Sand (SC) 5.3-5.6' - dusky yellow green, (5GY 5/2), moist, no HCl reaction, very fine to fine silica sand, 35% stiff clay with medium to high plasticity Silt With Sand (ML) 5.6-5.9' - yellowish gray, (5Y 8/1), wet, nonplastic, mild HCl reaction, 15-20% very fine sand-sized, carbonate material, trace fine to medium black sand-like 5.0-5.3' (possibly pyrite)		Sand in 5.0-5.3' may be pyrite
	6.5						
10	10.0						
32.0		0.4	SS-3	9-8-7 (15)	Silt With Sand (ml) To Silty Sand (SM) 10.0-10.4' - grayish orange, (10YR 7/4), wet, medium dense, very fine to fine grained, mild to moderate HCl reaction, nonplastic fines, carbonate material, sample is 50% ML and 50% SM, trace black sand		Driller's Remark: change at 9.0'
	11.5						
15	15.0						
27.0		1.0	SS-4	2-3-11 (14)	Silty Sand (SM) 15.0-16.0' - yellowish gray, (5Y 8/1), with mottling and streaking, wet, nonplastic, mild to moderate HCl reaction, 51% fine sand, trace fine gravel-sized (limestone) fragments, carbonate material		Driller's Remark: 10-15% circulation loss at 16.5'
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-04A
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724269.5 N, 457868.6 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 25.0 ft bgs on 6/14/07 START : 6/12/2007 END : 6/13/2007 LOGGER : A. Teal

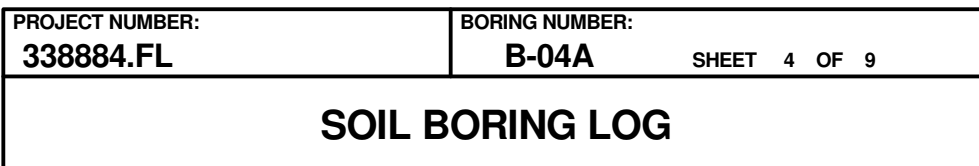
WATER LEVELS : 23.0 ft bgs on 6/14/07			START : 6/12/2007			END : 6/13/2007			LOGGERS : A. Earl		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS			
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION					
22.0	20.0	0.7	SS-5	22-22-12 (34)	Silty Sand (SM) 20.0-20.7' - pale yellowish gray, (5Y 8/1), wet, dense, medium to coarse grained, mild HCl reaction, 45% nonplastic fines, carbonate material			Blind drill to 20.0' after moving drill rig due to split spoon shoe lost in previous hole Begin SPTs at 20.0'. Each of the following samples belong to the redrilled hole B-04A.			
	21.5										
25	25.0	0.4	SS-6	50/5.5 (50/5.5")	Silt (ML) 25.0-25.4' - grayish orange, (10YR 7/4), wet, nonplastic, mild to moderate HCl reaction, trace to 10% fine to medium sand-sized material, streaks of white in matrix and trace fine sand-sized green material, carbonate material						
17.0	25.5										
30	30.0	0.6	SS-7	13-8-3 (11)	Silt With Sand (ML) 30.0-30.6' - grayish orange, (10YR 7/4), wet, nonplastic, mild HCl reaction, up to 25% fine to coarse sand-sized material decreasing with depth, carbonate material						
12.0	31.5										
35	35.0	0.0	SS-8	50/1.5 (50/1.5")	No Recovery 35.0-35.1'			Driller's Remark: some chatter at 35.0-36.0'			
7.0											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-04A
SHEET 3 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724269.5 N, 457868.6 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 25.0 ft bgs on 6/14/07 START : 6/12/2007 END : 6/13/2007 LOGGER : A. Teal

WATER LEVELS : 23.0 ft bgs on 07/14/07				START : 07/12/2007		END : 07/13/2007		LOGGERS : A. Earl	
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		
2.0	40.4	0.4	SS-9	50/5 (50/5")	Silt With Sand (ML) 40.0-40.4' - olive gray, (5Y 4/1), wet, nonplastic to low plasticity, mild to moderate HCl reaction, 20-25% very fine sand, carbonate material		Driller's Remark: 35.0-40.0' fairly hard		
45	45.0								
-3.0	45.2	0.1	SS-10	50/2.5 (50/2.5")	Limestone Fragments 45.0-45.1' - olive gray, (5Y 4/1), mild HCl reaction, a few limestone fragments and silt as in 40.0-40.4'				
50	50.0								
-8.0	51.1	1.0	SS-11	48-50-50/1 (100/7")	Silty Sand (SM) 50.0-51.0' - olive gray mottled with light gray, (5Y 4/1 mottled with 5Y 6/1), wet, very dense, fine to coarse grained, moderate HCl reaction, 30-40% low plastic fines, carbonate material		Driller's Remark: drilling remains fairly hard		
55	55.0								
-13.0	55.9	0.1	SS-12	50/1 (50/1")	Limestone Fragments 55.0-55.1' - olive gray, (5Y 4/1), mild to moderate HCl reaction, limestone fragments		A few limestone fragments and silt		
60									



WATER LEVELS : 25.0 ft bgs on 6/14/07 START : 6/12/2007 END : 6/13/2007 LOGGER : A. Teal

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-04A

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724269.5 N, 457868.6 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner

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

ORIENTATION : Vertical

WATER LEVELS : 25.0 ft bgs on 6/14/07

START : 6/12/2007

END : 6/13/2007

LOGGER : A. Teal

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.
-23.0	65.0	19	2	65.7, 65.85, 66.2' - Fractures (3), <10 deg, rough, undulating, open 3/16" 66.25-66.7' - Fracture, vertical, rough, undulating, changing to 30 deg over last 1" from 66.6-66.7', open 1/8" 66.9' - Fracture zone		Limestone 65.0-65.4' - pale yellowish brown, (10YR 6/2), medium grained, moderate HCl reaction, very weak (R1), voids (up to 1/8") over 30% of surface, trace casts/cavities (up to 3/8"x1/4"), poorly fossiliferous 65.4-66.9' - light olive gray, (5Y 5/2), fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), voids (up to 3/16") over 30% of surface, trace linear casts (1/16"x1/16"), poorly fossiliferous No Recovery 66.9-70.0'	Installed HW casing to 65.0' Driller's Remark: 65.5-67.0' very soft (silt lense) Driller's Remark: 68.0-68.5' very soft (silt lense) R1: 10 minutes
			3				
			NR				
70	70.0	0	>10	70.0-70.6' - Fracture zone		Limestone 70.0-70.6' - light olive gray, (5Y 5/2), strong HCl reaction, medium strong (R3), voids (1/16") over 5% of surface, trace spherical casts/cavities (3/8"), partial infill with material similar to 65.4-66.9', trace thread-like black (organic) inclusions at 70.5' No Recovery 70.6-75.0'	Driller's Remark: Approximately 3.0' of R2-NQ lodged in core barrel, driller removing string of NQ rod to retrieve sample (14:38) Driller's Remark: unable to retrieve sample from core barrel R2: 6 minutes
-28.0			NR				
75	75.0	51	>10	75.0-75.4' - Fracture zone 75.8-76.0, 76.0-76.2' - Fractures (2), 60 deg, smooth, undulating, tight 76.6-76.7' - Fracture, 45 deg, smooth, undulating, tight 77.5' - Mechanical break 77.7' - Fracture, horizontal, rough, undulating, open 77.85-78.05' - Fracture zone 78.05-78.8' - Fracture, vertical, smooth, undulating, open 1/8" 78.8' - Fracture, <5 deg, rough, undulating, open 3/8" 80.1' - Fracture, no discerning orientation		Limestone 75.0-79.2' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, very weak to weak (R1 to R2), 77.95-78.05' is extremely weak to very weak (R0 to R1), voids (up to 1/8") over 20% of surface, trace cavities, large cavity (1-9/16"x1-3/16") partially infilled with soft (R0) carbonate at 77.2' No Recovery 79.2-80.0'	Driller's Remark: medium to hard 17:00 stop due to lightning 17:30 shut down for day 6/14/07 water level at 25.0' R3: 6 minutes
-33.0			>10				
			>10				
			>10				
			2				
			0				
80	80.0	67	NR			Limestone 80.0-84.7' - Same as 75.0-79.2' except moderate HCl reaction, extremely weak to weak (R0 to R1) at 82.9-83.5', trace casts/cavities (up to 3/4"x9/16") No Recovery 84.7-85.0	Driller's Remark: "stiff" run except soft at last 2.0' R4: 5 minutes
-38.0			1				
			2				
			1				
			>10				
			0				
85	85.0		NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-04A

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724269.5 N, 457868.6 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner

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


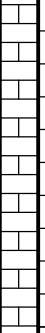


ORIENTATION : Vertical

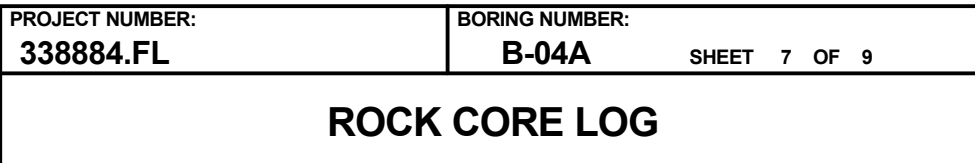
WATER LEVELS : 25.0 ft bgs on 6/14/07

START : 6/12/2007

END : 6/13/2007

LOGGER : A. Teal

WATER LEVELS : 23.0 ft bgs on 6/14/07		START : 6/15/2007		END : 6/15/2007		LOGGER : A. Teal		
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				
-43.0	R5-NQ 5 ft 78%	41	>10	85.0-85.5' - Fracture zone		Limestone 85.0-86.35' - Same as 75.0-79.2' except cavities (1-3/16"x3/8") at 86.3' over 50% of surface	SC-1 collected at 86.35-87.4' Driller's Remark: 87.0-87.5' soft	
1			85.7' - Fracture, horizontal, rough, undulating, open	86.35-87.65' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), trace voids (up to 1/16"), trace cavities (5/16"x1/16")				
2			86.2-86.3' - Fracture, 30 deg, rough, undulating, open	Fat Clay (CH) 87.65-87.8'				
3			87.35-87.55' - Fracture, 60 deg, smooth, stepped, tight	Limestone 87.8-88.9' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), trace voids (up to 1/16"), <2% casts (up to 1/4"x1/4")				
NR			88.25-88.35' - Fracture, 30 deg, rough, undulating, open	88.35-88.9' - Fracture, vertical, smooth, undulating, tight				
90	90.0	25	>10	88.7' - Fracture, horizontal, rough, undulating, tight		87.8-88.9' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), trace voids (up to 1/16"), <2% casts (up to 1/4"x1/4")	R5: 6 minutes	
-48.0	R6-NQ 5 ft 38%		1	90.0-90.2' - Fracture zone		No Recovery 88.9-90.0' 90.0-91.9' - yellowish gray, (5Y 7/2), fine to medium grained, very strong HCl reaction, very weak (R1), voids (up to 3/16") over 15-20% of surface, trace spherical casts and cavities (up to 3/8")	Driller's Remark: 89.0-90.0' soft	
			NR	90.5-90.95' - Fracture zone		No Recovery 91.9-95.0'	SC-2 collected at 90.9-91.8'	
						91.8' - Fracture, horizontal, rough, undulating, open		
								R6: 3 minutes
95	95.0	61	3	90.0-90.2' - Fracture zone		Limestone 95.0-100.0' - very pale orange to yellowish brown, (10YR 8/2 to 10YR 6/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids (up to 3/16") over 15-20% of surface, no visible cavities except 98.0-98.6' 10% casts/cavities (up to 1"x3/8"), poorly fossiliferous, black (organic) laminae at 97.9'	R7: 5 minutes	
-53.0	R7-NQ 5 ft 100%		4	90.5-90.95' - Fracture zone		95.4' - Bedding plane, horizontal, smooth, planar, tight		
			>10	95.65-95.8' - Fracture, 30 deg, smooth, undulating, open		95.65-95.8' - Fracture, 30 deg, smooth, undulating, open		
			1	96.05' - Fractures (2), <30 deg, smooth, undulating, open		96.05' - Fractures (2), <30 deg, smooth, undulating, open		
			1	96.4' - Fracture, 25 deg, smooth, stepped, tight		96.4' - Fracture, 25 deg, smooth, stepped, tight		
100	100.0	26	1	96.6-96.7' - Fractures (2), horizontal, smooth, undulating, open		100.0-100.55' - Same as 95.0-100.0'	R8: 4 minutes	
-58.0	R8-NQ 5 ft 68%		1	97.0-97.7' - Fracture zone (8), 0-30 deg, rough, undulating, open		100.55-103.4' - very pale orange, (10YR 8/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), trace voids (up to 1/16"), no visible casts/cavities		
			>10	98.35, 98.45' - Fractures (2), <10 deg, rough, undulating, tight		No Recovery 103.4-105.0'		
			2	99.55' - Bedding plane, horizontal, rough, undulating, tight				
			5	100.2, 100.4' - Fractures (2), horizontal, smooth, undulating, open				
		2	100.55, 100.9'					
		NR	101.4, 101.85, 102.35, 102.55, 102.7, 102.9' - Fractures (6), horizontal, smooth, undulating, open					
			102.95-103.15' - Fracture zone, black staining over 75% of surface					
105	105.0							



ORIENTATION : Vertical

LOGGER : A. Teal

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-04A

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724269.5 N, 457868.6 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner

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

ORIENTATION : Vertical

WATER LEVELS : 25.0 ft bgs on 6/14/07

START : 6/12/2007

END : 6/13/2007

LOGGER : A. Teal

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.
-83.0				125.0-125.9' - Fracture zone		Limestone 125.0-125.35' - Same as 115.0-116.8' 125.35-125.6' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), trace voids (up to 1/16"), no visible cavities 125.6-125.9' - Same as 115.0-116.8' No Recovery 125.9-130.0'	Driller's Remark: very soft to 128.5' R13: 4 minutes
130	130.0	R13-NQ 5 ft 18%	0				
-88.0						Carbonate Silts And Sands (SM) 130.0-131.6' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), loose, strong HCl reaction, fine to medium grained sands	possible alluvial/fluvial deposit
				131.85-132.25' - Mechanical break		Limestone 131.6-132.8' - yellowish gray, (5Y 7/2), strong HCl reaction, extremely weak to weak (R0 to R2), voids (up to 1/16") over 5-10% of surface and increasing with depth, no visible casts except 133.55-133.8' 20-30% casts (up to 1-3/4"x1")	R14: 5 minutes
				132.0-132.9' - Fracture, vertical, rough, undulating, open			
				132.25-132.5' - Fracture zone			
				133.2, 133.3, 133.4' - Fractures (3), <10 deg, rough, undulating, healed		No Recovery 132.8-135.0'	
135	135.0	R14-NQ 5 ft 56%	0				
-93.0						Carbonate Silts And Sands (SM) 135.0-136.35' - Same as 130.0-131.6'	Possible cuttings or infill
				136.35-136.7' - Fracture zone		Limestone 136.35-137.6' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, medium strong (R3), no visible voids or cavities except 10% voids at 137.4' and 137.6' No Recovery 137.6-140.0'	R15: 26 minutes
				136.95' - Fracture or mechanical break, horizontal, smooth, planar			
				137.05' - Fracture, horizontal, rough, undulating			
140	140.0	R15-NQ 5 ft 52%	10				
-98.0						Carbonate Silts And Sands (SM) 140.0-141.5' - Same as 130.0-131.6' except grades from 60% fines to fine sand at top to 80% medium sand and 20% fines at bottom	Possible cuttings or infill
				141.5-141.9' - Fracture zone		Limestone 141.5-142.9' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak (R1), trace voids (up to 1/16"), no visible cavities No Recovery 142.9-145.0'	R16: 4 minutes
				141.9-142.6' - Fracture, vertical, rough, undulating, open			
				142.35' - Fracture, horizontal, rough, undulating, open			
				142.45' - Fracture, horizontal, rough, undulating, open			
				142.6-142.9' - Fracture zone			
145	145.0	R16-NQ 5 ft 58%	0				



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-04A
SHEET 9 OF 9	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724269.5 N, 457868.6 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner

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





WATER LEVELS : 25.0 ft bgs on 6/14/07 START : 6/12/2007 END : 6/13/2007 LOGGER : A. Teal

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			
-103.0	R17-NQ 5.2 ft 100%	51	0			145.0-146.5' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), trace voids (up to 1/16"), trace casts and cavities (up to 1/8"x3/16")	SC-3 collected at 145.0-145.95'
			2	145.95' - Mechanical break		146.5-147.2' - Same as 145.0-146.5' except voids (1/16") over 10-15% of surface	
			3	146.5, 146.75, 147.2, 147.85, 147.95' - Fractures (5), horizontal, rough, undulating, open		147.2-150.15' - pale yellowish brown to very pale orange, (10YR 6/2 to 10YR 8/2), fine grained, strong HCl reaction, very weak (R1), thin alternating bands of pale yellowish brown to very pale orange (10YR 6/2 to 10YR 8/2) from 147.7-148.45', extremely weak (R0) rock from 147.6-147.8', voids (up to 1/16") over 5-15% of surface and decreasing with depth, trace casts/cavities (up to 3/8"x3/16")	
			3	147.6-147.8' - Mechanical break, extremely weak section		Bottom of Boring at 150.2 ft bgs on 6/13/2007	
			3	147.85-148.15' - Fracture, vertical, rough, undulating, open			
150	150.2			148.15, 148.5' - Fractures (2), horizontal, rough, undulating, open			R17: 4 minutes
-108.0				149.05' - Bedding plane, smooth, planar to undulating, open			
				149.45' - Bedding plane, smooth, planar to undulating, open			Total depth of boring 150.15' below ground surface at 14:10 First batch grout: 32 gallons water, 6 47-lb bags of Portland cement up to approximately 100.0' below ground surface Second batch grout: 32 gallons water, 6 47-lb bags of Portland cement up to approximately 40.0' below ground surface - pull casing up to 25.0' below ground surface Third batch of grout: 32 gallons water, 5 47-lb bags of Portland cement up to ground surface Total grout: 96 gallons of water, 17 47-lb bags of Portland cement
				149.8' - Bedding plane, smooth, planar to undulating, open			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-05
SHEET 1 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724427.7 N, 457904.5 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 5/8/07 START : 5/7/2007 END : 5/9/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 4.0 (RDS) 01/9/07		START : 9/9/2007		END : 9/9/2007		LOGGERS : N. Salzman	
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)						
42.9	0.0	1.5	SS-1	1-2-1 (3)	Poorly Graded Sand (SP) 0.0-1.0' - light gray, (N7), dry to moist, very loose, very fine silica sand, trace nonplastic fines, trace very fine grained black particles, roots		
	1.5				Silty Sand With Organics (SM) 1.0-1.5' - dusky yellowish brown grading to dark yellowish brown, (10YR 2/2 to 10YR 4/2), moist, very loose, very fine to fine grained, silica sand, 15-20% nonplastic organic fines		
5	5.0						
37.9		1.1	SS-2	5-6-4 (10)	Poorly Graded Sand With Silt (SP-SM) 5.0-6.1' - white with dark yellowish orange and pale yellowish brown staining, (N9, with 10YR 6/6 and 10YR 6/2), wet, loose, very fine to fine grained, silica sand, 5% nonplastic fines, trace angular black coarse sand-sized material (pyrite), trace roots		
	6.5						
10	10.0						
32.9		1.3	SS-3	3-3-3 (6)	Silty Sand (SM) 10.0-11.3' - pale yellowish brown, (10YR 6/2), wet, loose, very fine to fine grained, silica sand, 30% nonplastic fines, trace very fine sand-sized black particles		
	11.5						
15	15.0						
27.9		1.1	SS-4	3-2-2 (4)	Silty Sand (SM) 15.0-16.1' - Same as 10.0-11.3' except very loose		
	16.5						
20							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-05

SHEET 2 OF 10

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724427.7 N, 457904.5 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 5/8/07

START : 5/7/2007

END : 5/9/2007

LOGGER : N. Jarzyniecki

WATER LEVELS : 4.0 (RDS) ON 9/9/07			START : 9/9/2007			END : 9/9/2007			LOGGER : N. Salzman		
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						
22.9	20.0	1.4	SS-5	2-3-4 (7)	Sandy Fat Clay (CH) 20.0-21.4' - light greenish gray, (5GY 8/1), wet, stiff, high plasticity, no dilatancy, no HCl reaction, heavily mottled with dark yellowish orange (10YR 6/6), 30% white very fine silica sand, 5-10% very fine sand-sized black particles, scattered pockets of medium sand-sized white particles throughout, up to 1/8" in size						
	21.5										
25	25.0										
17.9		0.7	SS-6	5-6-5 (11)	Silty Sand (SM) 25.0-25.7' - yellowish gray, (5Y 7/2), wet, loose, very fine to fine grained, silica sand, 15-20% nonplastic fines, trace very fine sand-sized black particles						
	26.5										
30	30.0										
12.9		1.0	SS-7	1-3-3 (6)	Silty Gravel With Sand (GM) 30.0-30.95' - yellowish gray, (5Y 8/1), wet, stiff, low to medium plasticity, rapid dilatancy, no HCl reaction, gray staining and laminated appearance, 50% of sample is fine to coarse gravel-sized material, trace organics, limestone appearance, also has appearance of fine grained conglomerate						
	31.5										
35	35.0										
7.9		1.2	SS-8	4-6-5 (11)	Sand With Silt (SP-SM) 35.0-36.15' - yellowish gray, (5Y 7/2), wet, medium dense, very fine to fine grained, no HCl reaction, silica sand, with trace medium dark gray (N4) mottling, 10% nonplastic fines						
	36.5										
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-05

SHEET 3 OF 10

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724427.7 N, 457904.5 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 5/8/07

START : 5/7/2007

END : 5/9/2007

LOGGER : N. Jarzyniecki

WATER LEVELS : 4.0 (RDS) 01/9/07		START : 3/9/2007		END : 3/9/2007		LOGGER : N. Gajzyna	
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	1-2-2 (4)	Elastic Silt And Fat Clay (CH) 40.0-41.5' - grayish olive green, (5GY 3/2), wet, soft, high plasticity, no dilatancy, materials are layered in an irregular way giving a mottled appearance, predominantly clay, mottled with another clay and silt, clay is olive gray (5Y 3/2), high plastic, no dilatancy, no HCl reaction, silt is yellowish gray (5Y 8/1), low to medium plastic, rapid dilatancy, very mild HCl reaction		Driller's Remark: Loss of circulation after pulling up SPT sampler
	41.5						
45	45.0						
-2.1		1.3	SS-10	3-5-5 (10)	Poorly Graded Sand With Silt (SP-SM) 45.0-46.3' - pale yellowish brown with medium dark gray staining, (10YR 6/2 with N4 staining), wet, loose, very fine to fine grained, no HCl reaction, silica sand, 10-15% nonplastic fines, 1/2" lens of grayish olive green (5G 3/2) fat clay (CH), trace very fine to coarse sand-sized pyrite fragments		
	46.5						
50	50.0						
-7.1		1.5	SS-11	1-2-3 (5)	Sandy Lean Clay (CL) 50.0-51.5' - greenish gray and grayish olive green, (5GY 6/1 and 5GY 3/2), wet, stiff, high plasticity, no dilatancy, no HCl reaction, 40% very fine to fine silica sand, seams and pockets of other materials scattered throughout less than 10% of sample, yellowish gray (5Y 7/2) sandy seam, pocket of medium sand-sized white particles, pockets of silty material		
	51.5						
55	55.0						
-12.1		1.5	SS-12	1-1-2 (3)	Poorly Graded Sand With Clay (SP-SC) 55.0-56.5' - greenish gray and grayish olive green, (5GY 6/1 and 5GY 3/2), wet, stiff, no to mild HCl reaction, no white particles, lenses of grayish green (5G 5/2) fat clay (CH) similar to 40.0-41.5' materials, possible organic lens, lenses of other materials are 10% of sample, sample has mottled appearance		
	56.5						
60							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-05
SHEET 4 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724427.7 N, 457904.5 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 5/8/07 START : 5/7/2007 END : 5/9/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 4.0' bgs on 5/7/07		START : 5/7/2007		END : 5/9/2007		LOGGER : N. Jaiszimeck	
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		
-17.1	60.0	1.5	SS-13	0-1-2 (3)	Silty Sand (SM) 60.0-61.5' - yellowish gray, (5Y 7/2), wet, very loose, no HCl reaction, silica sands, 30% nonplastic fines, trace very fine sand-sized black particles		
	61.5						
65	65.0						
-22.1		1.5	SS-14	2-1-3 (4)	Clayey Sand (SC) 65.0-66.5' - yellowish gray, (5Y 7/2), wet, very loose, no HCl reaction, with trace gray staining, very fine to fine silica sands, 35% medium plastic fines		
	66.5						
70	70.0	0.0	SS-15	50/1 (50/1")	No Recovery 70.0-70.1'		18:42 Water level 5.0' below ground surface, last SPT on 5/7/07
-27.1							Driller's Remark: 70-71.5' hard material, maybe rock layer, soft easy Driller's Remark: Drilling with intermittent light chatter, switch to newer tricone roller Driller's Remark: Drill bit 2-7/8" in diameter
75	75.0	0.3	SS-16	50/3.25 (50/3.25")	Limestone Fragments 75.0-75.3' - yellowish gray, light olive gray, and moderate gray, (5Y 7/2, 5Y 8/8, and N5), mild HCl reaction, angular and subangular 1/4" to 3/4" sized fragments		5/8/07, 07:45 Water level 4.0' below ground surface, 4" HW casing installed to 70' below ground surface Driller's Remark: rock fragments are caving into bottom of borehole, advanced 4" HW casing to 75' below ground surface
-32.1	75.3						
80							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-05
SHEET 5 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724427.7 N, 457904.5 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 5/8/07 START : 5/7/2007 END : 5/9/2007 LOGGER : N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		RECOVERY (ft)	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
	#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
-37.1	80.0				Limestone Fragments 80.0-80.1' - greenish gray, (5GY 6/1), moderate HCl reaction, 15% voids/casts on surface, very poor recovery Begin Rock Coring at 81.0 ft bgs See the next sheet for the rock core log		Driller's Remark: Advanced 4" HW casing to 78.6' below ground surface, switch to NQ wireline coring assembly
85 -42.1							
90 -47.1							
95 -52.1							
100							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-05	SHEET 6 OF 10
ROCK CORE LOG		

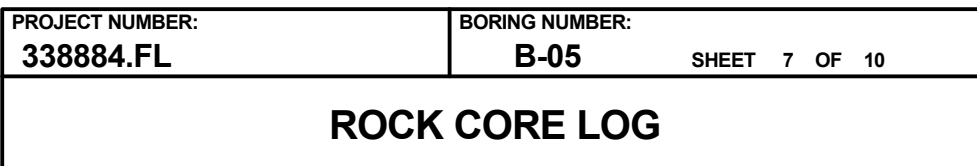
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724427.7 N, 457904.5 E (NAD83)

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 5/8/07 START : 5/7/2007 END : 5/9/2007 LOGGER : N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
		R Q D (%)	FRACTURES PER FOOT				DESCRIPTION
							DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS
81.0 <							



ORIENTATION : Vertical

LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-05	SHEET 8 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724427.7 N, 457904.5 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 5/8/07 START : 5/7/2007 END : 5/9/2007 LOGGER : N. Jarzyniecki

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			
125 -82.1	R9-NQ 5 ft 100%	77	3	117.5' - Fracture or mechanical break, horizontal, rough, undulating, tight to 1/2" open		No Recovery 120.5-121.0' Limestone 121.0-123.4' - yellowish gray, (5Y 8/1), medium to coarse grained, strong HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over 5-10% of rock surface, cavities common (up to 3/8"-3/4"), fossiliferous (echinoderms) and casts/molds, some areas where rock is fine-grained and stronger (R2-R3), some rip-up clasts/intracasts especially at 121.3-121.5' 123.4-126.0' - yellowish gray, (5Y 8/1), very fine to fine grained, alternating beds several inches thick, voids (<1/16") over 1-3% of rock surface, some cavities up to 3/4" (especially at 124.7-124.9'), fossils (molds/casts) rare to absent 126.0-127.8' - Same as 123.4-126.0' except rare fossil echinoids 127.8-128.5' - yellowish gray, (5Y 8/1), medium grained, strong HCl reaction, very weak (R1), voids (<1/16") over 5% or less of rock surface, cavities rare to absent (<3/16" in diameter), fossil molds/casts rare, some laminations 128.5-130.6' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, voids (<1/16") over 3-5% of rock surface, some cavities up to 3/8"-3/4" in diameter (typically elongated), fossiliferous (molds/casts and rare echinoids), very rare (<1/16") dark gray argillaceous grains No Recovery 130.6-131.0' Limestone 131.0-132.6' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2), powder/chalk-like feel, highly fossiliferous (forams), voids/casts (<1/16") over 10-15% of surface, 15-20% cavities infilled with medium light gray (N6) fine grained mineral with strong HCl reaction, cavities are irregularly shaped to spherical and range in size from 3/16"- 1-3/8", horizontal aligned fossil (casts/shells) and gray cavities, bedding/discontinuity at 131.65'	Water level 10.8' below ground surface in outer (4"HW) casing, 3.8' below ground surface in borehole (uncased) R9: Runtime not recorded
			1	118.65' - Fracture or mechanical break, horizontal, rough, undulating, tight			
			4	119.45' - Fracture, 35-40 deg, rough, undulating, tight			
			2	119.95' - Fracture, 20 deg, rough, undulating, tight			
			0	120.35' - Mechanical break 121.1, 121.3, 121.5, 121.6' - Bedding plane or mechanical break (4), horizontal, rough, undulating, open 1/8"			
			>10	122.5' - Fracture, 40 deg, rough, undulating, tight			
			2	123.4' - Fracture, 5-10 deg, rough, undulating, open <1/16"			
			1	123.55, 123.75, 123.95' - Bedding plane or mechanical break (3), horizontal, rough, planar, tight			
			2	124.3' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
			1	124.95' - Bedding plane or mechanical break, horizontal, smooth, planar, tight			
130 -87.1	R10-NQ 5 ft 92%	52	1	125.9' - Mechanical break, 50 deg, rough, undulating		R10: Runtime not recorded	First core run on 5/9/07, water level at 4.1' below ground surface Driller's Remark: NQ core barrel has snapped in two pieces SC-3 collected at 131.85-132.6'
			NR	126.0-127.0' - Mechanical break, horizontal, smooth, planar, multiple breaks along bedding planes, tight			
			3	127.55' - Fracture or mechanical break, 0-5 deg, rough, planar, tight			
			>10	128.5' - Bedding plane, horizontal, rough, undulating, tight			
			>10	129.2' - Fracture or mechanical break, horizontal, open up to 1"			
				129.7' - Bedding plane or mechanical break, horizontal, rough, planar, tight to 1/4" gap			
				130.15' - Fracture, 70-75 deg, rough, undulating, tight			
			NR	131.15, 131.4' - Bedding plane or mechanical break (2), horizontal, smooth, planar, tight to open 1/16"			
				131.85' - Bedding plane, horizontal, rough, undulating, tight, 3/4" sized exposed medium light gray (N6) filled voids on surface			
				132.6' - Fracture zone, angular fragments of rock			
135 -92.1	R11-NQ 5 ft 50%	23	3	136.1, 136.05' - Bedding plane or mechanical break (2), horizontal, rough, undulating, 1/8" open		R11: 23 minutes	
			3	136.3' - Fracture, 60 deg, rough, undulating, tight			
			0	137.1' - Fracture, 45 deg, rough, undulating, centimeter spaced parallel fracture			
			1	137.3' - Bedding plane, horizontal, rough, undulating, light olive gray hard mineralization over 38% surface, 1/32" thick, tight			
			0				
			NR				
140 -97.1	R12-NQ 5 ft 84%	66	3			R12: 15 minutes	
			3				
			0				
			1				
			0				
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-05

SHEET 9 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724427.7 N, 457904.5 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

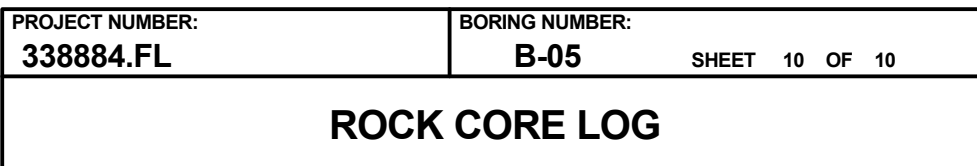
WATER LEVELS : 4.0 ft bgs on 5/8/07

START : 5/7/2007

END : 5/9/2007

LOGGER : N. Jarzyniecki

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			
145 -102.1	R13-NQ 5 ft 94%	50	3	137.35' - Mechanical break, 40-50 deg, rough, planar, tight		Limestone 132.6-133.5' - medium light gray to medium gray, (N6 to N5), very fine grained, strong HCl reaction, medium strong to strong (R3 to R4), trace voids/casts (<1/16"), poorly fossiliferous (1" molds), very fine grain pyrite grains in rock matrix (5-7%), 10-15% cavities from 1/8" to 1" in size, oval in shape unfilled to partially filled with a yellowish gray (5Y 7/2) very fine grained material that is 40-45% voids <1/16" No Recovery 133.5-136.0' Limestone 136.0-137.5' - yellowish gray and light olive gray, (5Y 7/2 and 5Y 5/2), strong HCl reaction, medium strong to strong (R3 to R4), thin bedded alternating with very fine grained rock with medium grain-sized particles in the laminated (<1/16") beds 137.5-140.2' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak (R1), 7-10% coarse grain-sized flat angular fossil fragments horizontally aligned, 15-25% medium to coarse grain-sized medium dark gray (N4), subrounded particles also horizontally aligned, highly fossiliferous, trace voids (<3/16"), sharp discontinuity at 139.5' No Recovery 140.2-141.0' Limestone 141.0-142.6' - yellowish gray, (5Y 8/1), very fine to medium grained, strong HCl reaction, very weak (R1), texture coarsening with depth to sharp contact at 142.6', interval of moderate yellow brown and light brown (5Y 7/6 and 5Y 5/6) fine to medium grained rounded grains, powder to chalk-like texture 142.6-145.0' - Same as 141.0-142.6' except light olive gray, (5Y 5/2), moderate to strong HCl reaction, medium strong (R3), voids 10-15% (<1/16") spheroidal trace elongated cavities 3/16"x1/16" 145.0-145.7' - Same as 141.0-142.6' except yellowish gray, (5Y 8/1), very weak to weak (R1 to R2), 25-30% olive black (5Y 2/1) laminations No Recovery 145.7-146.0' Limestone 146.0-146.5' - Same as 145.0-145.7'	R13: 11 minutes
			1	137.65' - Bedding plane or mechanical break, horizontal, rough, undulating, exposed molds on surface, open 5/8"			
			3	138.5' - Mechanical break 139.25' - Fracture, 40 deg, rough, undulating, tight			
			3	140.1' - Mechanical break, horizontal, rough, undulating, tight			
			3	141.25' - Mechanical break or bedding plane, horizontal, rough, planar, tight			
			2	141.65' - Fracture, vertical, rough, undulating, brown staining over surface (100%), <1/32" infill over 98% surface			
146.0		NR		141.75' - Fracture or mechanical break, horizontal, rough, undulating, tight			
			3	142.5' - Fracture or mechanical break, horizontal, rough, undulating, tight			
			4	143.3' - Fractures or mechanical break (2), 5-10 deg, rough, undulating, tight			
			1	143.85' - Fracture or mechanical break, 0-5 deg, rough, undulating, tight			
150 -107.1	R14-NQ 5 ft 96%	60	2	144.45' - Fracture or mechanical break, horizontal, rough, undulating, tight		SC-4 collected at 147.8- 148.7'	R14: 8 minutes
			2	144.6' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/8" open			
			2	144.8' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/16" open			
			NR	144.9, 144.95' - Mechanical break (2), rough, undulating, open <1/16"			
				145.1, 145.35' - Bedding plane (2), 0-5 deg, rough, undulating, wavy bed of organics, 100% surface coverage with brownish black organics			
				146.5' - Bedding plane, 15-20 deg, rough, undulating			
				146.6' - Fracture, 50 deg, rough, undulating, tight			
				146.8' - Fracture, 70 deg, rough, undulating, black stains over 100% surface, tight			
				147.0' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
				147.3' - Bedding plane or mechanical break, 0-5 deg, rough, planar, tight			
				147.5' - Fracture, 60 deg, rough, undulating, black staining 80-90% surface, tight			
				147.8' - Fracture, 15-20 deg, rough, undulating, tight			
				148.7' - Fracture or mechanical break, horizontal, rough, undulating, tight			
				149.25' - Fracture, 40 deg, rough, undulating, tight to 1/8" open			
				149.45' - Fracture, 10-15 deg, rough, planar, tight			
				150.3' - Fracture or mechanical break, horizontal, rough, undulating, hard mineral infill covering 30-40% surface 1/16" thick, open 1/8"			
				150.6' - Fracture or mechanical break, horizontal, smooth, planar, open 1/16"			



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 5/8/07

START : 5/7/2007

END : 5/9/2007

LOGGER : N. Jarzyniecki

APPENDIX 2BB-429



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-06
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724172.6 N, 457791.6 E (NAD83)
 ELEVATION : 42.5 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, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.4 ft bgs on 4/26/07 START : 4/24/2007 END : 4/26/2007 LOGGER : B. Ellis

WATER LEVELS : 4.4 (lbs) on 4/20/07			START : 4/24/2007		END : 4/20/2007		LOGGERS : D. Lins	
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			
42.5	0.0	1.0	SS-1	0-1-2 (3)	Topsoil 0.0-0.2' Poorly Graded Sand (SP) 0.2-1.0' - light brownish gray, (5YR 6/1), moist, very loose, very fine to fine grained, silica sand with medium dark gray (N4) mottling, trace of nonplastic fines, roots and organics decreasing with depth		16:51 Begin drilling, sample SS-1 taken; first 6"=weight of hammer	
	1.5							
5	5.0							
37.5		1.1	SS-2	4-4-4 (8)	Clayey Sand (SC) 5.0-6.1' - greenish gray, (5G 6/1), moist to wet, loose, very fine to fine grained, no HCl reaction, silica sand, 20% low plasticity fines, trace very fine sand-sized black particles		4/25/07, 07:38 Begin drilling to 5' using tricone bit 07:40: SS-2 taken	
	6.5							
10	10.0							
32.5		1.3	SS-3	3-3-4 (7)	Silty Sand (SM) 10.0-11.25' - light olive gray to greenish gray, (5Y 6/1 to 5GY 6/1), wet, loose, very fine to fine grained, no HCl reaction, silica sand, 15% low plasticity fines, trace very fine black particles, trace organics		07:48: SS-3 taken	
	11.5							
15	15.0							
27.5		1.5	SS-4	4-4-4 (8)	Silty Sand (SM) 15.0-16.5' - light olive gray to light gray, (5Y 6/1 to N7), wet, loose, very fine to fine grained, no HCl reaction, silica sand, 30% low plasticity fines, trace very fine sand-sized black particles		SS-4 is less plastic than SS-3	
	16.5							
20								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-06

SHEET 2 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724172.6 N, 457791.6 E (NAD83)

ELEVATION : 42.5 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, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.4 ft bgs on 4/26/07

START : 4/24/2007

END : 4/26/2007

LOGGER : B. Ellis

WATER LEVELS : 4.4 TDS ON 4/20/07			START : 4/24/2007			END : 4/20/2007			LOGGER : D. Lins		
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						
22.5	20.0	1.2	SS-5	2-5-4 (9)	Clayey Sand (SC) 20.0-21.0' - yellowish gray to light gray, (5Y 8/1 to N7), moist, loose, high plasticity, no dilatancy, no HCl reaction, 28% fines						
	21.5				Fat Clay (CH) 21.0-21.2' - light bluish gray, (5G 7/1), moist, stiff, high plasticity, no dilatancy, no HCl reaction						
25	25.0										
17.5		1.4	SS-6	1-2-2 (4)	Clayey Sand (SC) 25.0-26.4' - yellowish gray, (5Y 8/1), wet, very loose, very fine to fine grained, no HCl reaction, 25% medium plasticity fines, increasing to 40% by 26.2', silica sand						
	26.5										
30	30.0										
12.5		1.5	SS-7	2-2-2 (4)	Silty Sand (SM) 30.0-30.8' - grayish orange, (10YR 7/4), wet, very loose, very fine to fine grained, no HCl reaction, 20% no to low plasticity fines, silica sand						
	31.5				Organic Soil (OH) 30.8-31.5' - olive black, (5Y 2/1), wet, soft, high plasticity, no to slow dilatancy, no HCl reaction, 10-15% very fine grained silica sand, white gravel-sized fragment at 30.9', medium grained						
35	35.0										
7.5		1.5	SS-8	2-3-1 (4)	Clayey Sand (SC) 35.0-36.5' - olive black with grayish orange mottling, (5Y 2/1 with 10YR 7/4), wet, very loose, very fine to fine grained, no HCl reaction, 12% low to medium plasticity fines, silica sand, some organic fines						
	36.5										
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-06

SHEET 3 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724172.6 N, 457791.6 E (NAD83)

ELEVATION : 42.5 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, 3-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 4.4 ft bgs on 4/26/07

START : 4/24/2007

END : 4/26/2007

LOGGER : B. Ellis

WATER LEVELS : 4.4 TDS ON 4/20/07			START : 4/24/2007			END : 4/20/2007			LOGGER : D. Lins		
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						
2.5	40.0	1.5	SS-9	2-1-2 (3)	Clayey Sand (SC) 40.0-41.5' - Same as 35.0-36.0' except no HCl reaction, 16% fines, silica sand, varies in irregular beds throughout						
	41.5										
45	45.0										
-2.5		1.1	SS-10	1-2-1 (3)	Silt (ML) 45.0-46.1' - black mottled with moderate yellowish brown (5Y 2/1 mottled with 10YR 5/4), wet, soft, nonplastic, no dilatancy, no HCl reaction, trace to 10% very fine to fine grained, silica sand						
	46.5										
50	50.0										
-7.5		1.5	SS-11	0-1-1 (2)	Fat Clay (CH) 50.0-50.45' - Same as 45.0-46.1' except pale olive mottled with light olive gray and moderate yellowish brown, (10Y 6/2 mottled with 5Y 5/2 and 10YR 5/4), wet, soft, high plasticity, no dilatancy, no HCl reaction Silty Sand (SM) 50.45-51.3' - moderate yellowish brown, (10YR 5/4), wet, very loose, very fine to fine grained, no HCl reaction, silica sand, 20-25% low plasticity fines Fat Clay (CH) 51.3-51.5' - Same as 50.0-50.45' except interbedded fat clay (CH) with silty sand (SM)						
	51.5										
55	55.0										
-12.5		1.3	SS-12	34-44-50/4.5 (94/10.5")	Silt (ML) 55.0-56.3' - moderate yellowish brown, (10YR 5/4), moist, hard, low plasticity, rapid dilatancy, moderate HCl reaction, 5-10% fine to medium sand grained, trace organics, all carbonate						
	56.4										
60							09:28: Setting casing to 59' (1" stick up 60' casing)				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-06

SHEET 4 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724172.6 N, 457791.6 E (NAD83)

ELEVATION : 42.5 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, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.4 ft bgs on 4/26/07

START : 4/24/2007

END : 4/26/2007

LOGGER : B. Ellis

WATER LEVELS : 4.410 bgs on 4/20/07			START : 4/24/2007		END : 4/20/2007		LOGGER : D. Lins	
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	
-17.5	60.0	0.2	SS-13	50/4 (50/4")	Silt (ML) 60.0-60.2' - Same as 55.0-56.3' except light olive brown, (5Y 5/6), moderate to strong HCl reaction		10:48 Slight chatter while drilling	
							11:03 Bringing up SS-13	
65	65.0							
-22.5	65.4	0.2	SS-14	50/4.5 (50/4.5")	Limestone Fragments 65.0-65.2' - dusky yellow, (5Y 6/4), mild HCl reaction, friable Begin Rock Coring at 65.5 ft bgs See the next sheet for the rock core log		11:22 Bringing up SS-14 11:41 Switching to core barrel	
70								
-27.5								
75								
-32.5								
80								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-06	SHEET 5 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724172.6 N, 457791.6 E (NAD83)

ELEVATION : 42.5 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 : 4.4 ft bgs on 4/26/07 START : 4/24/2007 END : 4/26/2007 LOGGER : B. Ellis

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			
70 -27.5	65.5 R1-NQ 1 ft 100%	0	2	65.5-65.7' - Bedding plane, horizontal, bedding change 65.8' - Fracture, 60 deg, rough, undulating 66.2' - Mechanical break		Silt (ML) 65.5-65.7' - very fine grained, some organics Limestone 65.7-66.5' - yellowish gray, (5Y 7/2), very fine grained, no to moderate HCl reaction, weak (R2), voids up to 1/16" over 20% of surface, poorly fossiliferous, infill of yellowish gray (5Y 8/1) over < 5%, infill has voids/fossils Limestone 66.5-67.9 and 68.5-69.8' - Same as 65.7-66.5' except no silt, light olive gray (5Y 5/2) from 67.9-68.5' voids up to 1/16" over 30% of surface, fossiliferous (fossil casts up to 1"), dissolution features up to 1/8", bedding feature of grayish orange (10YR 7/4) from 67.6-67.7' is fine grained, none to trace voids, fossils infill with light olive gray material 69.8-70.7' - yellowish gray, (5Y 7/2), very fine grained, weak to medium strong (R2 to R3), trace voids up to 1/16", poorly fossiliferous, no dissolution on surface No Recovery 70.7-71.5' Limestone 71.5-72.2' - Same as 65.7-66.5' except discontinuous organic laminations over < 5% of surface up to 1/8"x1/4", infill occurs over 20% of surface 72.2-72.6' - very fine grained, has laminar organic layers within, up to 1/2" width, dusky yellow (5Y 6/4) silt infill 72.6-74.9' - light olive gray to very pale orange, (5Y 5/2 to 10YR 8/2), very fine grained, trace voids up to 1/16", 73.4-73.9' silt infill yellowish gray to very pale orange mottled with very light gray (5Y 7/2 to 10YR 8/2 mottled with N8), 73.9-74.9', 73.9-74.9' has infill of very pale orange with 20% tiny voids, matrix has trace voids up to 1/16", poorly fossiliferous 74.8-74.9' - moderate olive brown, (5Y 4/4), bedding layer with organics of olive gray (5Y 3/2) <1/16" thick	Water level at 0.0 below ground surface (at surface); tooling in hole 13:30 Coring R1-NQ 13:45 Coring R2-NQ
	71.5	R2-NQ 5 ft 84%	77	0		67.5' - Mechanical break 67.9, 68.0, 68.2' - Bedding plane (3), <5 deg, rough, undulating, open up to 1/8" 68.1' - Fracture, 85 deg, rough, undulating, open, no matching end 68.8' - Mechanical break 69.3' - Fracture, 60 deg, smooth, undulating 69.8' - Mechanical break	13:59 Coring R3-NQ SC-1 collected at 71.5-72.2'
				4			
				1			
				0			
				0			
	75 -32.5	R3-NQ 5 ft 99%	63	NR		72.4' - Bedding plane, <5 deg, rough, undulating, with 0.4' of silt infill, very fine 72.2-72.6', has laminar organic layers within, up to 0.05' width 73.0' - Mechanical break 73.6' - Bedding plane, <5 deg, rough, undulating 73.9-74.0' - Mechanical break 74.7' - Bedding plane, <5 deg, smooth to rough, undulating 75.3, 75.8, 76.8' - Mechanical break (3)	14:20 Coring R4-NQ
				1			
				0			
				1			
0							
80 -37.5	R4-NQ 5 ft 76%	31	3	76.55, 76.7, 76.8' - Bedding plane (3), <5 deg, rough to smooth, undulating, <5% organics on fracture surface 77.3' - Mechanical break 77.85, 77.75' - Fractures (2), 10 deg, rough, undulating, fracturing associated with dissolution, open up to 1/2" 78.2' - Fracture, 85 deg, smooth, undulating, a fragment at 79.6' is missing 78.25' - Bedding plane, smooth to rough, undulating, intersects 78.2' 79.0' - Bedding plane, <5 deg, smooth to rough, undulating, change in lithology, open up to 1/4" 79.05' - Fracture, 85 deg, rough, undulating, open up to 1/8" 79.1-79.25' - Fracture zone, intersecting fractures 79.8' - Fractures, 65-70 deg, rough, undulating, intersecting fractures 80.2' - Mechanical break 81.5-81.7' - Fracture zone 82.7' - Mechanical break 83.6' - Fracture, 10 deg, rough, undulating, fracturing associated with dissolution, open up to 1/2" 84.0' - Mechanical break	14:35 Begin R5-NQ SC-2 collected at 82.7-83.7'		
			4				
			>10				
			1				
			NR				
85 -42.5	R5-NQ 5 ft 92%	80	1				
			0				
			1				
			0				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-06

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724172.6 N, 457791.6 E (NAD83)

ELEVATION : 42.5 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 : 4.4 ft bgs on 4/26/07

START : 4/24/2007

END : 4/26/2007

LOGGER : B. Ellis

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			
90 -47.5	R6-NQ 5 ft 100%	100	1	84.2, 85.7' - Mechanical break (2)		74.9-76.45' - yellowish gray, (5Y 7/2), organic laminations (discontinuous) through <5% of surface up to 1/2"x1/4" and infill occurs over 20% of surface, tiny voids up to 1/16" over 20% surface, highly fossiliferous, casts and molds up to 1/2"x1", tiny voids decrease to 10% of surface at 75.7'. No Recovery 76.45-76.5' Limestone 76.5-81.5' - weak to extremely strong (R2 to R6), 76.5-76.7' and 77.5-79.95' same as in R3-NQ from 72.6-74.9 except from 77.5- 78.65 has tiny voids on 5-10% of surface, 2"x1" cavities over <5% of surface. 76.7-77.5' same as 77.5-77.95' except no cavities/fossil molds, moderate yellowish brown (10YR 5/4); 79.0-80.3' same as 76.7-77.0' except from 79.1-80.0' has up to 1/16" voids over 10% of surface, extremely strong at 78.9' No Recovery 80.3-81.5' Limestone 81.5-86.1' - Same as 65.7-66.5' except weak to medium strong (R2 to R3), voids over 30% of surface, fossils up to 1/2"x1/4" (casts), infill of light gray (N7) over 5%, infill is very fine grained, trace voids up to 1/16", trace cavities features up to 1/8", infill is approximately medium strong rock (R3), except 81.5'-81.8' is extremely weak to very weak rock (R0-R1) No Recovery 86.1-86.5' Limestone 86.5-91.5' - 86.5-90.0' dusky yellow, (5Y 6/4), 86.5-88.0' light gray (N7) to very pale orange (10YR 8/2), very fine grained, 30% tiny voids up to 1/16", fossiliferous, fossil casts up to 1/4", trace very fine grained organics, infill is up to 10% light gray (N7) material voids, no visible fossils 89.4-89.6' bedding features up to 1/4", and olive gray (5Y 3/2), thin wavy laminations, 90.0-91.5' yellowish gray (5Y 7/2), mottled with light olive gray (5Y 5/2), very fine grained, voids from 0-10% (decreasing with depth) up to 1/16", trace fossil casts up to 1/4", weak to medium strong (R2 to R3) 91.5-91.7' - silt infill of yellowish gray color (5Y 7/2), discontinuous thin organic layers	15:10 Begin R6-NQ
			NR				
			0	86.95' - Bedding plane or mechanical break, <5 deg, smooth, undulating			
			1	87.3' - Mechanical break			
			1	89.0' - Mechanical break			
			1	89.15' - Bedding plane or mechanical break, <5 deg, rough, undulating			
			1	89.7' - Mechanical break			
			0	90.4' - Bedding plane, <5 deg, rough, undulating, open up to 1/8"			
95 -52.5	R7-NQ 5 ft 95%	42	10	91.0, 91.7, 95.8' - Mechanical break (3)			15:28 Drill R7-NQ
				92.2' - Fracture, 60 deg, rough, undulating			
			3	92.4' - Mechanical break			
				92.7' - Fracture, 60 deg, rough, undulating, multiple missing pieces, intersecting fractures			
			1	93.0' - Fracture, 80 deg, rough, undulating			
				93.8' - Bedding plane, <5 deg, silt infill of yellowish gray color (5Y 7/2), millimeters thick organic layers (discontinuous), thickness of infill is 93.5'-94.3'			
			1	95.3' - Fracture, 60 deg, rough, undulating			
			0				
			NR				
100 -57.5	R8-NQ 5 ft 100%	95	2	96.65, 96.7' - Bedding plane (2), <5 deg, smooth, stepped, open up to 1/8"			16:09 Drill R8-NQ
			0				
			1	98.05' - Mechanical break			
				98.9, 100.5' - Bedding plane or mechanical break (2), <5 deg, rough, undulating			
				99.0' - Mechanical break			
			0	99.9' - Mechanical break			
			1	100.6' - Mechanical break			
105 -62.5	R9-NQ 5 ft 100%	95	1	101.6' - Bedding plane, <5 deg, smooth, undulating			16:10 Begin R9-NQ
			2	102.5' - Fracture, 70 deg, smooth, undulating			
				102.55' - Mechanical break			
			0	103.35' - Bedding plane, 15 deg, smooth, undulating			
			1	104.0' - Mechanical break			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-06

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724172.6 N, 457791.6 E (NAD83)

ELEVATION : 42.5 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 : 4.4 ft bgs on 4/26/07

START : 4/24/2007

END : 4/26/2007

LOGGER : B. Ellis

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.
110 -67.5	106.5		1	104.9' - Bedding plane, <20 deg, rough, undulating, open up to 1/4"		91.7-93.5' - very fine grained, trace voids to 1/16", trace fossils up to 1/4", voids increasing with depth to 20% of surface	16:30 Begin R10-NQ
			0	105.6' - Fracture, 70 deg, smooth, undulating, intersecting high angle fractures		94.3-96.25' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids to 1/4" over 30-40% of surface, voids to 1/2" at 94.55', fossiliferous	
			0	107.8' - Mechanical break		No Recovery 96.25-96.5' Limestone	
	R10-NQ 5 ft 96%	85	2	108.6' - Bedding plane, <20 deg, rough, undulating, open up to 1/8"		96.5-101.5' - yellowish gray, (5Y 7/2), medium to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids up to 1/16" over 20-30% of surface, fossiliferous (casts/molds)	
			1	109.0' - Mechanical break		104.0-105.2' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2)	16:45 Begin R11-NQ
			0	109.2' - Fracture, 75 deg, rough, undulating, open up to 1/8"		105.2-106.5' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), trace tiny voids up to 1/16", poorly fossiliferous, slight increase in fossil casts (approximately 10%)	
			0	110.0' - Bedding plane, <5 deg, rough to smooth, undulating, open up to 1/8"		106.5-111.5' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), fewer voids about 5% of rock	
			NR			No Recovery 111.3-111.5' Limestone	
			1	111.7' - Bedding plane, <5 deg, smooth, planar, open up to 1/8"		111.5-115.5' - from 111.5-112.7' same as R10-NQ	17:00 Begin R12-NQ
			3	112.6, 112.7, 112.8' - Bedding plane (3), <5 deg, rough to smooth, undulating, open up to 1/8"		At 112.7' color goes from yellowish gray (5Y 7/2) to light olive gray (5Y 5/2) with depth, fine grained, voids begin to increase with depth to 15%, fossil casts and molds increase to 20% up to 1/4"x1/8", has <5% infill dusky yellow (5Y 6/4), with voids in infill up to 30%-40% and size of infill is up to 1/8"x1/8"	
	R11-NQ 5 ft 80%	72	0	113.6' - Mechanical break		No Recovery 115.5-116.5' Limestone	
			0	114.0' - Mechanical break		116.5-121.5' - Same as 106.5-111.5' except light olive gray (5Y 5/2) with <5% very pale orange mottling, very fine to fine grained, trace fossils up to 1/4", casts and molds, trace tiny voids up to 1/16"	07:24 Water level at 4.4' below ground surface
			NR	114.6' - Mechanical break		119.4-120.6' medium grained, extremely weak (R0) to weak (R2) rock, up to 30% fossil casts up to 1/4", trace dissolution cavities up to 1/4", 10% voids up to 1/16"	07:31 Drilling R13-NQ
120 -77.5			1	117.0' - Fracture, 50 deg and 60 deg, rough, undulating			
			1	117.5' - Fracture, 50 deg and 60 deg, smooth, undulating			
	R12-NQ 5 ft 100%	78	1	118.7' - Bedding plane, smooth, undulating, open up to 1/8"			
			2	119.0' - Mechanical break			
			1	119.4' - Mechanical break			
			1	120.0' - Bedding plane, <10 deg, rough, undulating, open up to 1/4"			
			1	120.3' - Fracture, 85 deg, rough, undulating			
			1	120.6' - Mechanical break			
			4	121.6, 121.7' - Bedding plane (2), <5 deg, smooth, undulating, open up to 1/8"			
			0	121.9' - Fracture, 75 deg, rough, undulating, open up to 1/8"			
			1	122.25' - Bedding plane, 20 deg, rough, undulating			
	R13-NQ 5 ft 100%	79	1	123.0' - Mechanical break			
			1	123.6' - Fracture, 75 deg, rough, undulating, open up to 1/8"			
			1	124.0' - Mechanical break			
			1	124.8' - Mechanical break			
125 -82.5							SC-4 collected at 124.0-124.8'



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-06

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724172.6 N, 457791.6 E (NAD83)

ELEVATION : 42.5 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 : 4.4 ft bgs on 4/26/07

START : 4/24/2007

END : 4/26/2007

LOGGER : B. Ellis

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			
130 -87.5	126.5		1	125.1' - Bedding plane, <5 deg, smooth, undulating, associated with lithology change		Limestone 121.5-126.5' - Same as 111.5-115.5' except fine grained, very weak to weak (R1 to R2), various layers between dusky yellow (5Y 6/4) and yellowish gray (5Y 5/2) and light olive gray (5Y 5/2), fossils increasing from 125.4-126.5' up to 15%, casts and molds up to 1/2"x1/4" and trace organic features, <5% infill dusky yellow (5Y 6/4), with voids in infill up to 30-40% and size of infill is up to 1/8"x1/8"	07:42 Drilling R14-NQ
			1	125.5' - Mechanical break			
			2	126.3' - Bedding plane, 80 deg, rough, undulating, open up to 1/4"			
			1	126.6' - Bedding plane, <5 deg, rough to smooth, undulating, open up to 1/4"			
			0	127.8' - Bedding plane, <5 deg, smooth, stepped			
	R14-NQ 5 ft 100%	87	1	128.25' - Bedding plane or mechanical break, <5 deg, rough, undulating		Limestone 126.5-131.5' - Same as 121.5-126.5' except fine grained, extremely weak to weak (R0 to R2), fossiliferous layers have color change from light olive gray (5Y 5/2) to yellowish gray (5Y 7/2) 131.5-134.3' - Same as 126.5-131.5' except only one bedding feature is highly fossiliferous from 133.1-133.25', rock is extremely weak (R0) to very weak (R1)	07:55 Begin R15-NQ
			0	128.8-129.0' - Mechanical break			
			1	129.3' - Bedding plane, <5 deg, rough to smooth, undulating, open up to 1/4"			
			1	129.8' - Mechanical break			
			4	130.9' - Bedding plane or mechanical break, <5 deg, rough, undulating			
			1	131.65, 131.7, 131.95, 132.5' - Bedding plane (4), <5 deg, smooth to rough, undulating, open <1/8"		No Recovery 134.3-136.5'	08:13 Begin R16-NQ
	R15-NQ 5 ft 56%	33	0	133.3' - Fracture, 50 deg, rough, undulating, open up to 1/8"			
			NR	133.8-134.3' - Mechanical break, multiple fragments			
			>10	136.7-137.1' - Fracture zone, intersecting fractures			
			0	137.35' - Bedding plane, <5 deg, rough, undulating			
			>10	138.3' - Mechanical break		Limestone 136.5-137.1' - yellowish gray, (5Y 7/2), fine grained, extremely weak to very weak (R0 to R1), fragments are very light gray (N7) to gray (N5), clasts are very weak (R1) to weak (R2), poorly fossiliferous 137.1-139.0' - light olive gray, (5Y 5/2), fine grained, very weak to medium strong (R1 to R3), dusky yellow (5Y 6/4) infill, 15-20% fossil casts up to 1/2"x1/4", trace voids up to 1/16" up to 30% of surface No Recovery 139.0-141.5'	08:38 Begin R17-NQ
			NR	138.75-139.0' - Fracture zone, intersecting fractures			
	R16-NQ 5 ft 50%	28	1	142.2, 143.0, 144.0, 145.7, 145.9' - Bedding plane (5), <5 deg, smooth, undulating, open up to 1/8"			
			1	143.4' - Mechanical break			
			1				
			2			Limestone 141.5-144.0' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), very fine grained, medium strong to strong (R3 to R4), very fine wavy bedding features ranging in color from yellowish gray (5Y 7/2), light olive gray (5Y 5/2) and olive gray (5Y 4/1), <5% voids up to 1/16", trace fossils, casts, trace cavities up to 1/8"	SC-5 collected at 142.2-143.0'
	R17-NQ 5 ft 98%	90	1				
			2				
145 -102.5							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-06
SHEET 9 OF 9	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724172.6 N, 457791.6 E (NAD83)

ELEVATION : 42.5 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 : 4.4 ft bgs on 4/26/07 START : 4/24/2007 END : 4/26/2007 LOGGER : B. Ellis

WATER LEVEL: 147.48 BGS ON 4/26/07		START: 4/24/2007		END: 4/26/2007		EQUIP: D. ENS		
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				
150 -107.5	146.5		1	145.5' - Mechanical break			Limestone 144.0-146.4' - Same as 141.5-144.0' except dusky yellow, (5Y 6/4), fine to medium grained, extremely weak (R0) at 146.0-146.4', zone at 144.5' and 145.3 are same as 136.5-137.1', extremely weak material (R0), rock at 141.5-144.0' is medium strong (R3) to strong rock (R4)	09:42 Begin R18-NQ SC-6 collected at 147.35-148.15'
	R18-NQ 5 ft 92%	NR		146.65, 146.8' - Bedding plane (2), <5 deg, smooth, undulating, open up to 1/4"				
		4		146.7' - Fracture, 75 deg, smooth, undulating				
		0		147.35' - Bedding plane, <5 deg, smooth, undulating				
		3		148.15' - Mechanical break		No Recovery 146.4-146.5'		
		>10		148.9' - Bedding plane, <5 deg, smooth, undulating, open up to 1/8"		Limestone		
		1		149.4, 149.6, 149.9' - Bedding plane (3), <5 deg, smooth, undulating, open up to 1/8"		146.5-151.1' - Same as 141.5-144.0' except interbedded with dusky yellow (5Y 6/4) up to 1' thick, most beds are thick with zones of thin wavy bedding from 150.75-151.1' is same as R10-NQ rock, 146.5-150.75' is medium strong (R3) to strong rock (R4)		
151.5		NR	149.75' - Mechanical break			No Recovery 151.1-151.5' Bottom of Boring at 151.5 ft bgs on 4/26/2007		
				150.05-150.15' - Fracture zone, intersecting fractures				
				150.8' - Bedding plane (<5), smooth, undulating, open up to 1/4"				
				150.95' - Mechanical break				



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07
SHEET 1 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724369.7 N, 457955.5 E (NAD83)
 ELEVATION : 43.1 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 : 2.0 ft bgs on 5/4/07 START : 5/4/2007 END : 5/6/2007 LOGGER : P. De Sa'rego, R. Bitely

WATER LEVELS : 2.0 TDS ON 9/4/07		START : 9/4/2007		END : 9/9/2007		LOGGERS : P. De Santiago, R. Biley	
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		
43.1	0.0	1.0	SS-1	0-2-1 (3)	Poorly Graded Sand With Organics (SP) 0.0-1.0' - dark gray grading to very light gray, (N3 to N8), moist, very loose, very fine to fine grained silica sands, trace nonplastic fines, 10% organics and roots decreasing with depth, last 2.4' is dark yellowish brown (10YR 6/6) with 5% nonplastic fines, trace concretions to 1/2"		Using 2' x 2" split spoon for SPT
	1.5						
5	5.0						
38.1		0.9	SS-2	3-3-2 (5)	Poorly Graded Sand (SP) 5.0-5.9' - very pale orange, (10YR 8/2), wet, loose, very fine to fine grained silica sands, trace nonplastic fines, trace sand-sized black particles		SS-2 taken 09:47 Assumed water level at 2.0' due to moisture content in SS-2 and water level measurements at B-9
	6.5						
10	10.0						
33.1		1.0	SS-3	3-3-5 (8)	Poorly Graded Sand With Silt (SP-SM) 10.0-11.0' - white to very light gray, (N9 to N8), very fine to fine grained silica sands, 10% nonplastic fines, sand-sized black particles		SS-3 taken 09:53 Similar to SS-2
	11.5						
15	15.0						
28.1		0.9	SS-4	3-3-4 (7)	Poorly Graded Sand With Silt (SP-SM) 15.0-15.9' - mottled white and pale yellowish brown, (10YR 6/2), wet, very fine to fine grained silica sands, 7% nonplastic fines, trace very fine sand-sized black particles		SS-4 taken 09:57
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07
SHEET 2 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724369.7 N, 457955.5 E (NAD83)
 ELEVATION : 43.1 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 : 2.0 ft bgs on 5/4/07 START : 5/4/2007 END : 5/6/2007 LOGGER : P. De Sa'rego, R. Bitely

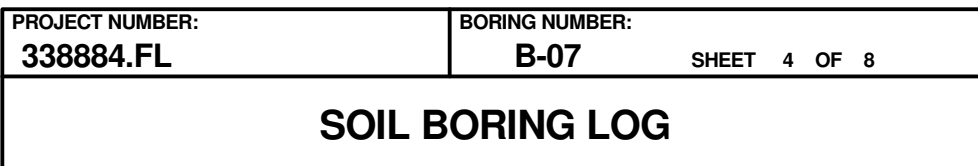
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
23.1	20.0	1.1	SS-5	4-5-5 (10)	Silty Sand (SM) 20.0-21.1' - pale yellowish brown, (10YR 6/2), wet, loose, no HCl reaction, very fine to fine grained silica sands, 20% nonplastic fines		SS-5 taken 10:07
	21.5						
25	25.0						
18.1		1.5	SS-6	2-2-2 (4)	Silty Sand (SM) 25.0-26.5' - pale brown, (5YR 5/2), wet, very loose, no HCl reaction, very fine to fine grained silica sands, 20-25% nonplastic fines		SS-6 taken 10:13
	26.5						
30	30.0						
13.1		1.5	SS-7	2-2-1 (3)	Poorly Graded Sand With Silt (SP-SM) 30.0-31.5' - yellowish gray, (5Y 7/2), wet, very loose, no HCl reaction, very fine to fine grained silica sand, 6% nonplastic fines, trace very fine sand-sized black particles		SS-7 taken 10:20
	31.5						
35	35.0						
8.1		1.5	SS-8	1-1-1 (2)	Poorly Graded Sand With Silt (SP-SM) 35.0-36.5' - Same as 30.0-31.5' except yellowish gray, trace medium bluish gray mottling, (5Y 8/1 trace 5B 7/1)		SS-8 taken 10:25
	36.5						
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07
SHEET 3 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724369.7 N, 457955.5 E (NAD83)
 ELEVATION : 43.1 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 : 2.0 ft bgs on 5/4/07 START : 5/4/2007 END : 5/6/2007 LOGGER : P. De Sa'rego, R. Bitely

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
3.1	40.0	1.5	SS-9	2-2-3 (5)	Poorly Graded Sand With Silt (SP-SM) 40.0-41.5' - yellowish gray, (5Y 8/1), wet, loose, no HCl reaction, very fine to fine grained silica sand, 11% nonplastic fines, trace pyrite fragments		SS-9 taken 10:45 Driller's Remark: Switched to 2-7/8" tricone drag bit
	41.5						
45	45.0						
-1.9		1.5	SS-10	2-2-3 (5)	Poorly Graded Sand With Silt (SP-SM) 45.0-46.5' - Same as 40.0-41.5'		SS-10 taken 10:50
	46.5						
50	50.0						
-6.9		1.5	SS-11	0-1-1 (2)	Poorly Graded Sand With Silt (SP-SM) 50.0-51.5' - moderate yellowish brown to pale yellowish brown, trace medium dark gray mottling, (10YR 5/4 to 10YR 6/2 with N4), wet, very loose, no HCl reaction, very fine to fine grained silica sand, 6% nonplastic fines		SS-11 taken 10:57 Weight of hammer over 4", then 2 blows recorded as 0-1-1 (2)
	51.5						
55	55.0						
-11.9		1.5	SS-12	0-1-1 (2)	Poorly Graded Sand With Silt (SP-SM) 55.0-56.5' - Same as 50.0-51.5' except medium dark gray to dark gray (N4 to N3) mottling		SS-12 taken 11:06 1 blow for first 12"
	56.5						
60							



LOGGER : P. De Sa'rego, R. Bitely

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07	SHEET 5 OF 8
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724369.7 N, 457955.5 E (NAD83)
 ELEVATION : 43.1 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 : 2.0 ft bgs on 5/4/07 START : 5/4/2007 END : 5/6/2007 LOGGER : P. De Sa'rego, R. Bitely

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
-36.9	80.0	1.5	SS-17	1-1-2 (3)	Silty Sand (SM) 80.0-81.5' - pale yellowish brown, (10YR 6/2), wet, very loose, trace medium gray laminated mottling, very fine to fine grained silica sand, 25% nonplastic fines, trace very fine sand-sized black particles		SS-17 taken 14:27 Driller's Remark: Light to medium chatter observed while drilling to 85'
	81.5						
85	85.0						
-41.9	85.3	0.3	SS-18	50/3 (50/3")	Clayey Sand (SC) 85.0-85.4' - mixed silty sands, fat clays (SM, CH), fat clay is mottled olive black (5Y 2/1) and grayish black (N2), silty sand is dark yellowish brown (10YR 4/2) with black streaks, wet, very loose/soft, trace medium to coarse sand-sized carbonate material with moderate HCl reaction, no HCl reaction in silty sands or fat clays		SS-18 taken 14:32 Driller's Remark: Switch to 2-7/8" tricone roller bit at 15:07 SS-18 may be slough
90	90.0						
-46.9		1.4	SS-19	4-19-26 (45)	Silt (ML) 90.0-90.4' - yellowish gray, (5Y 8/1), nonplastic, rapid dilatancy, moderate to strong HCl reaction, very thinly laminated (<1/16" thick) with olive black (5Y 2/1) (organics), all carbonate Silty Sand With Gravel (SM) 90.4-91.4' - yellowish gray, (5Y 8/1), wet, dense, strong HCl reaction, fine to coarse sand-sized, 20% fine to coarse gravel-sized, 30% nonplastic fines, all carbonate		SS-19 taken 15:36
	91.5						
95	95.0						
-51.9		1.5	SS-20	0-7-47 (54)	Sandy Clay With Silt (CL-ML) 95.0-96.5' - yellowish gray, (5Y 8/1), moist, hard, low plasticity, rapid dilatancy, strong HCl reaction, greenish black (5GY 2/1) mottling at 95.8', 10-15% fine to medium sand-sized, trace organics in pockets		SS-20 taken 15:51 Weight of hammer for first 6"
	96.5						
100							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07
SHEET 6 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724369.7 N, 457955.5 E (NAD83)
 ELEVATION : 43.1 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 : 2.0 ft bgs on 5/4/07 START : 5/4/2007 END : 5/6/2007 LOGGER : P. De Sa'rego, R. Bitely

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
-56.9	100.0	0.5	SS-21	38-50/2 (88/8")	Silty Sand (SM) 100.0-100.5' - yellowish gray to very light gray, (5Y 7/2 to N8), wet, very dense, strong HCl reaction, fine to coarse sand-sized, 25% low plasticity fines, 10% fine gravel-sized, all carbonate		SS-21 taken 17:03
	100.7						11:50 100% circulation loss at 101.0' Switch to 2-3/8" tricone roller drill bit 5/5/07 water level taken 08:38, 4.4' below ground surface 09:30 65.0' 4" HW casing installed Driller's Remark: Will use 2-7/8" tricone drag bit to advance boring, AWJ rods
105	105.0				Silty Sand (SM) 105.0-105.9' - yellowish gray, (5Y 7/2), wet, medium dense, strong HCl reaction, fine to coarse sand-sized, 35% low plasticity fines, 10% fine to coarse gravel-sized, all carbonate		Light chatter while drilling with drag bit
-61.9	106.5	0.9	SS-22	10-6-23 (29)			10:40 Driller's Remark: Reached 90.0-91.0' and lost complete circulation Installed 4" HW casing to 105.0' below ground surface
110	110.0				Silty Sand With Limestone Fragments (SM) 110.0-111.5' - very light gray to light gray, (N5 to N7), wet, dense, strong HCl reaction, fine to coarse sand-sized, 35% fine to coarse gravel-sized limestone fragments, 20% low plasticity fines, material is carbonate and highly fossiliferous		SS-23 taken 14:55
-66.9	111.5	1.5	SS-23	13-22-11 (33)			
115	115.0				Silty Sand With Limestone Fragments (SM) 115.0-115.85' - Same as 110-111.5'		SS-24 taken 15:13
-71.9	116.5	0.9	SS-24	7-2-29 (31)			Last SPT on 5/5/07
120							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07
SHEET 7 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724369.7 N, 457955.5 E (NAD83)
 ELEVATION : 43.1 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 : 2.0 ft bgs on 5/4/07 START : 5/4/2007 END : 5/6/2007 LOGGER : P. De Sa'rego, R. Bitely

WATER LEVELS : 2.0 TUBS ON 5/6/07		START : 5/6/2007		END : 5/9/2007		LOGGERS : P. De Santiago, R. Biley	
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		
-76.9	120.0	1.5	SS-25	13-18-19 (37)	Silty Sand With Limestone Fragments (SM) 120.0-121.8' - yellowish gray, (5Y 8/1), wet, dense, strong HCl reaction, fine to coarse sand-sized, 42% low plasticity fines, 15-20% fine fragments-sized carbonate derived, highly fossiliferous with molds and casts		Start drilling on 5/6/07 at 8:05 Water level at 6.4' below ground surface at beginning of day
	121.5						
125	125.0	0.9	SS-26	37-50/5 (87/11")	Silty Sand With Limestone Fragments (SM) 125.0-125.9' - Same as 120-121.8' except 25-30% gravel-sized material in wafer-like lenses up to 1/4"-1/2" thick		Driller's Remark: Continued circulation loss from 120-125' - gained a little back at 125.0'
-81.9	125.9						
130	130.0	0.4	SS-27	50/5.5 (50/5.5")	Silty Sand With Limestone Fragments (SM) 130.0-130.4' - Same as 125.0-125.9' except trace organic fragments		Driller's Remark: 130-135' drilled fairly hard and consistent
-86.9	130.5						
135	135.0	0.1	SS-28	50/4.5 (50/4.5")	Limestone Fragments 135.0-135.1' - strong HCl reaction		Chatter at 136-136.5' Driller's Remark: Harder
-91.9	135.4						
	137.5	0.0	SS-29	50/2 (50/2")	No Recovery 137.5-137.6' Begin Rock Coring at 137.5 ft bgs See the next sheet for the rock core log		End soil sampling at 10:35 on 5/6/07 Switch to rock coring, see rock core log
	137.6						
140							

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724369.7 N, 457955.5 E (NAD83)

ELEVATION : 43.1 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 : 2.0 ft bgs on 5/4/07

START : 5/4/2007

END : 5/6/2007

LOGGER : P. De Sa'rego, R. Bitely

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			
140 -96.9	R1-NQ 4 ft 75%	35	7	137.6-137.8' - Fractures (3), horizontal, smooth to rough, undulating to stepped, heavy drill action marks, open 137.9' - Fracture, horizontal, rough, stepped, possible black staining over 50% of surface, with 1/4" relief, lower side smooth and planar with wear from drilling, black staining with embedded particles over 60% of surface 138' - Bedding plane, <5 deg, rough, undulating, 1/16" relief, open 138.35' - Bedding plane, 15 deg, rough, planar, tight 138.4' - Bedding plane, horizontal, bottom surface is rough, undulating, heavy wear on upper side from drilling, <1/16" relief, open 138.7' - Mechanical break 138.9' - Fracture, 60 deg, rough, undulating, 3/16" relief, tight 139.3' - Bedding plane, horizontal, rough, undulating, rock weak from drilling in upper surface, open 139.45' - Fracture, 5 deg, rough, undulating, 1/16" relief, tight 139.6' - Fracture, 60 deg, rough, undulating, 1/16" relief, tight 140.1' - Mechanical break 141.6' - Mechanical break, 0-90 deg, rough, undulating, <1/16" relief, open 141.8, 142.1' - Fractures, 70 deg, rough, undulating, 1/16" relief, tight 143.3' - Fracture, 80 deg, rough, undulating, 1/16" relief, accretions of iridescent pyrite covering 30% of surface, tight 143.6' - Fracture, 70 deg, rough, undulating, up to 1/16" relief, tight 143.85' - Mechanical break 144.1-144.4' - Bedding plane, 0-5 deg, rough, undulating, open 144.6-145.5' - Fracture, vertical, undulating 145.9' - Mechanical break 146.6' - Bedding plane, horizontal, rough, undulating, open 5/8" 146.7' - Bedding plane, horizontal, rough, undulating, open 1/8", organics covering 50-70% surface 146.8' - Bedding plane, horizontal, rough, undulating, open 1/8", organics covering 50-70% surface 147.3' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/8" 147.8' - Fracture, 30 deg, rough, undulating, tight 149.4' - Fracture, horizontal, rough, undulating, tight 149.7' - Bedding plane, 20 deg, rough, undulating, fossil fragment at surface of break, open up to 3/8"		Limestone 137.5-138.7' - yellowish gray, (5Y 8/1), strong HCl reaction, medium strong (R3), banded with silt lenses between 1/4" and 2", small voids to 1/16" over 25% of surface in a few lenses, trace fossil molds, casts, cross-bedding from 138.5-138.7', strongly cemented 138.7-139.2' - Same as 137.5-138.7' 139.2-140.5' - very weak (R1), becomes more massive, highly fossiliferous with molds, casts, clasts of different limestone, subrounded, moderately cemented No Recovery 140.5-141.5' Limestone 141.5-143.5' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2), very few voids of any size, massive appearance, scattered black grains (pyrite), trace fossils 143.5-144.4' - strong HCl reaction, becomes banded with gray particles throughout, 50% of surface covered with voids to 1/16" 144.4-146.5' - moderate HCl reaction, medium strong (R3), trace voids to 1/16", trace fossil molds, casts 145.3-146.5' - mild to moderate HCl reaction, infilling in two 1.2" thick bands 146.5-150.3' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2), highly fossiliferous (molds, casts), echinoderms, brownish black laminations over 146.5-146.8', voids <1/16" over 30-35% surface over 149.4-150.3', particles in rock matrix (medium dark gray particle, fossil mold fragments, fossils) give the appearance of being fine to medium grain textured rock No Recovery 150.3-151.5' Bottom of Boring at 151.5 ft bgs on 5/6/2007	Driller starts with new bit: Boart Longyear Alpha bit 4050089 NQ 06 R8 at 155 Limestone from 137.5-151.5' appears to be detrital limestone R1: 8 minutes SC-1 collected at 142.1-143.1' R2: 17 minutes R3: 8 minutes Assume core loss from bottom of run. Finish drilling at 13:00. Abandoned on 5/7/07 with 61 bags of Bonsal or Quikrete brand Portland Type I/II or Type I cement (47-lb bags) grouted to surface		
			3						
			1						
			NR						
145 -101.9	R2-NQ 5 ft 100%	76	3						
			2						
			1						
			4						
			0						
			4						
150 -106.9	R3-NQ 5 ft 76%	60	1						
			1						
			1						
			NR						
151.5									



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07A
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724358.9 N, 457965.5 E (NAD83)
 ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 4.5 ft bgs on 6/16/07 START : 6/15/2007 END : 6/17/2007 LOGGER : N. Jarzyniecki

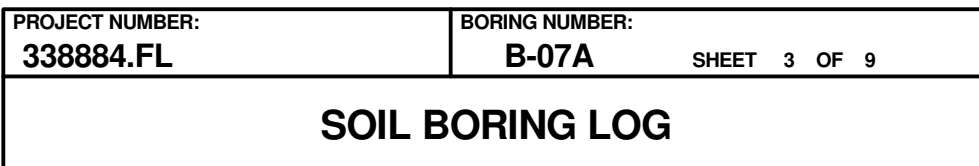
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
43.2	0.0	1.2	SS-1	2-2-3 (5)	Poorly Graded Sand With Organics (SP) 0.0-1.2' - medium dark gray grading to very light gray, (N4 to N8), moist, loose, fine grained, no HCl reaction, trace nonplastic fines, 20% organics and roots decreasing with depth, silica sand		
	1.5						
5	5.0						
38.2		1.0	SS-2	7-7-6 (13)	Poorly Graded Sand (SP) 5.0-6.0' - white to yellowish gray, (N9 to 5Y 8/1), wet, medium dense, fine grained, no HCl reaction, trace nonplastic fines, silica sand		
	6.5						
10	10.0						
33.2		1.0	SS-3	7-9-8 (17)	Poorly Graded Sand (SP) 10.0-10.1' - Same as 5.0-6.0' Silty Sand (SM) 10.1-11.0' - streaked light gray to medium gray, (N7 to N5), moist to wet, medium dense, very fine to fine grained, no HCl reaction, 15% low to medium plastic fines, silica sand		
	11.5						
15	15.0						
28.2		0.9	SS-4	5-8-11 (19)	Poorly Graded Sand With Silt (SP-SM) 15.0-15.9' - yellowish gray, (5Y 8/1), wet, medium dense, very fine to fine grained, no HCl reaction, 10% nonplastic fines, silica sand		
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07A
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724358.9 N, 457965.5 E (NAD83)
 ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 4.5 ft bgs on 6/16/07 START : 6/15/2007 END : 6/17/2007 LOGGER : N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
23.2	20.0	1.5	SS-5	6-6-7 (13)	Poorly Graded Sand With Silt (SP-SM) 20.2-21.5' - yellowish gray, (5Y 8/1), wet, medium dense, very fine to fine grained, no HCl reaction, 5-10% nonplastic fines, silica sand		1.65' recovery noted on log
	21.5						
25	25.0						
18.2		1.5	SS-6	7-3-2 (5)	Poorly Graded Sand With Silt (SP-SM) 25.0-26.5' - Same as 20.0-21.5'		2.0' recovery noted on log
	26.5						
30	30.0						
13.2		1.5	SS-7	1-2-2 (4)	Silty Sand (SM) 30.0-31.5' - yellowish gray, (5Y 7/2), wet, loose, fine grained, no HCl reaction, 15-20% nonplastic fines, silica sand		1.7' recovery noted on log
	31.5						
35	35.0						
8.2		1.5	SS-8	2-1-2 (3)	Poorly Graded Sand With Silt (SP-SM) 35.0-36.5' - yellowish gray, (5Y 7/2), wet, very loose, very fine to fine grained, no HCl reaction, 8% nonplastic fines, silica sand		1.75' recovery noted on log
	36.5						
40							



LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07A
SHEET 4 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724358.9 N, 457965.5 E (NAD83)

ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" drag bit ORIENTATION : Vertical

WATER LEVELS : 4.5 ft bgs on 6/16/07 START : 6/15/2007 END : 6/17/2007 LOGGER : N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
-16.8	60.0 60.6	0.6	SS-13	25-50/1 (75/7")	Elastic Silt (MH) 60.0-60.6' - very light gray, (N8), mottled with yellowish gray (5y 8/1), wet, hard, high plasticity, slow dilatancy, 10-15% fine sand (both silica and carbonate), pyrite nodules in top 1.5" of sample to 3/4", mild HCl reaction in carbonate materials, most of sample is non-reactive		HW casing advanced to 61'
65 -21.8	65.0 65.4	0.4	SS-14	50/5 (50/5")	Clayey Sand (SC) 65.0-65.4' - light gray to yellowish gray, (N7 to 5Y 8/1), wet, very dense, medium to coarse grained, moderate HCl reaction in carbonate materials, subangular grains (carbonate material with trace pyrite), 5-10% fine grained silica sand, 25% medium to high plasticity fines		1.0' recovery noted on log
70 -26.8	70.0 71.5	1.2	SS-15	16-17-12 (29)	Interbedded Poorly Graded Sand With Clay To Clayey Sand And Fat Clay (SP-SC, CH) 71.0-71.2' - 60% sand: yellowish gray (5Y 8/1), wet, medium dense, fine silica sand, 5-10% medium sand-sized carbonate grains in upper half of sample, variable fine (10-30%) content, medium plasticity, mild HCl reaction in carbonate grains, 40% of sample fat clay (CH): greenish gray (5G 6/1), moist, high plasticity, at 70.0-70.5' clay in 3/4" irregular beds, at 70.5-71.2' clay occurs in 1-3/16" to 2" lenses interbedded in sand		
75 -31.8	75.0 76.5	1.5	SS-16	4-2-4 (6)	Poorly Graded Sand With Silt (SP-SM) 75.0-76.4' - yellowish gray, (5Y 7/2), wet, loose, very fine to fine grained, no HCl reaction, 5% nonplastic fines, trace black mottling at 75.2-75.3', silica sand		6/16/07: Water level at 4.5' 8:15: HW casing to 70' 8:30: At 75.0' switch to 2-7/8" rock bit 8:57 Driller's Remark: Casing slid approx. 2-1/2' down borehole, added 5' HW casing (to 75')
80							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07A
SHEET 5 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724358.9 N, 457965.5 E (NAD83)
 ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 4.5 ft bgs on 6/16/07 START : 6/15/2007 END : 6/17/2007 LOGGER : N. Jarzyniecki

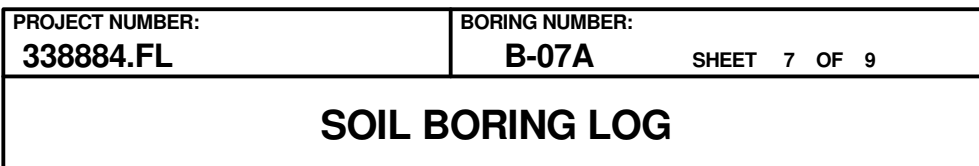
WATER LEVELS : 4.51005010/10/07			START : 9/19/2007		END : 9/17/2007		LOGGERS : N. Jai Zineen		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY					
-36.8	80.0	1.4	SS-17	1-0-50/5 (50/11")	Silty Sand (SM) 80.0-80.9' - yellowish gray, (5Y 7/2), wet, very loose, very fine to fine grained, no HCl reaction, 20-25% nonplastic fines, silica sand				
	81.4				Organic Lens (OL) 80.9-81.1' - brownish black, (5YR 2/1), shiny slickensided appearance, may be compressed leaves				
					Elastic Silt (MH) 81.1-81.4' - medium gray, (N5), moist, hard, medium plasticity, slow to rapid dilatancy, strong HCl reaction, mottled				
85	85.0	0.1	SS-18	50/1.5 (50/1.5")	Silt With Sand (ML) 85.0-85.1' - dusky yellow, (5Y 6/4), moist, hard, nonplastic, rapid dilatancy, strong HCl reaction, 15-20% fine to medium sand, all carbonate			0.3' recovery noted on log	
-41.8									
	90.0	1.5	SS-19	6-9-29 (38)	Silt (ML) 90.0-91.5' - light olive gray, (5Y 5/2), wet, hard, nonplastic, slow to rapid dilatancy, strong HCl reaction, 10-15% fine to medium sand-sized particles (carbonate), carbonate silt			Driller's Remark: Clay lens at 87.5-88.0'	
	91.5							Driller's Remark: Very soft at 88.5'	
90	95.0	0.3	SS-20	50/5.5 (50/5.5")	Silty Sand And Limestone Fragments (SM) 95.0-95.3' - yellowish gray, (5Y 8/1), wet, very dense, strong HCl reaction, fine sand-sized carbonate particles, 25% non to low plasticity fines, limestone fragments to 1/2" in "wafer" like pieces, 50% silty sand/50% limestone			1.6' recovery noted on log	
-46.8	95.5								
95									
-51.8								Driller's Remark: Losing circulation at 95.0'	
100									



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07A
SHEET 6 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724358.9 N, 457965.5 E (NAD83)
 ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 4.5 ft bgs on 6/16/07 START : 6/15/2007 END : 6/17/2007 LOGGER : N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
-56.8	100.0	1.5	SS-21	22-33-45 (78)	Silty Sand (SM) 100.0-101.5' - yellowish gray, (5Y 7/2), light gray mottling, wet, very dense, medium to coarse grained, strong HCl reaction, 25% low plasticity fines increasing to 35-40%, all carbonate		1.6' recovery noted on log
	101.5						
105	105.0						
-61.8	105.9	0.9	SS-22	37-50/5 (87/11")	Poorly Graded Sand With Silt (SP-SM) 105.0-105.1' - pale yellowish brown, (10YR 6/2), wet, very dense, strong HCl reaction in carbonates, 5-10% nonplastic fines, fine silica sand, medium carbonate sand, trace black medium sand-sized minerals Silty Sand (SM) 105.1-105.9' - Same as 100.0-101.5' except very strong HCl reaction, 40% low-plasticity fines		1.35' recovery noted on log
110	110.0						
-66.8	111.3	1.3	SS-23	30-50-50/3 (100/9")	Poorly Graded Sand With Silt (SP-SM) 110.0-110.95' - Same as 105.0-105.1' except yellowish gray to pale yellowish brown, (5Y 7/2 to 10YR 6/2), predominately fine to medium silica sand, 5% white medium carbonate sand, 5-10% nonplastic fines increasing with depth; strong HCl reaction in fines and carbonate grains Limestone Fragments 110.95-111.25' - yellowish gray, (5Y 7/2), fine to coarse grained, very strong HCl reaction, highly fossiliferous		Driller's Remark: Likely to have no recovery if coring begins at 105.0' 2.0' recovery noted on log 15:12: Instruct driller to take one more spoon 115.0'-120.0' and if limestone present, begin coring with NQ
115	115.0						
-71.8	116.5	1.2	SS-24	25-31-32 (63)	Silty Sand With Limestone Fragments (SM) 115.0-116.2' - yellowish gray, (5Y 8/1), wet, very dense, 15% coarse sand to fine gravel-size limestone fragments, 30% low plasticity fines, all carbonate		Driller extends casing (HW) to 110.0'
							06/17/07: Water level at 8.0'
							8:45: Driller clear hole with tri-cone roller bit
120							



LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-07A

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724358.9 N, 457965.5 E (NAD83)

ELEVATION : 43.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner

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

ORIENTATION : Vertical

WATER LEVELS : 4.5 ft bgs on 6/16/07

START : 6/15/2007

END : 6/17/2007

LOGGER : N. Jarzyniecki

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				
-81.8	125.0	13	6	125.0, 125.1' - Bedding plane (2), horizontal, smooth, planar, fractures, open		Limestone 125.0-129.4' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak (R1), 10% voids up to 1/16", 5% casts/cavities up to 3/4"x3/8", poorly fossiliferous, slightly harder (R1-R2) from 127.9'-129.9'	Start rock coring at 125' with NQ WL casing	
	>10		125.35, 125.5' - Fractures (2), horizontal, rough, planar, open, some rock fragments (3)					
	>10		125.85, 125.9' - Fractures (2), horizontal, rough, undulating, open					
	3		126.0-127.9' - Fracture zone, smooth to rough, planar, bedding plane fractures, thin (1/2") beds, open to tight					
	2							
130	130.0	19	NR	128.6, 128.9, 129.0' - Fractures (3), horizontal, rough, undulating, open		No Recovery 129.4-130.0'	R1: 3 minutes	
-86.8			3	129.1, 129.2' - Fractures (2), horizontal, rough, undulating to stepped, open				
			>10	130.1' - Fracture, horizontal, rough, undulating, open				
			>10	130.4' - Fracture, horizontal, rough, undulating, open, associated with large infilled cavity				
			4	130.9, 131.0, 131.45' - Fractures (3), horizontal, rough, undulating, open, sandy organic soil infilling at 131.45'				
		18	NR	131.26-131.4' - Fracture zone, sandy black (possibly organic) soil infilling		Limestone 130.0-130.1' - Same as 125.0-129.4' 130.1-131.55' - yellowish gray mottled with light gray, (5Y 7/2 and N7), moderate HCl reaction, weak to medium strong (R2 to R3), mottling associated with large cavities over 40% of surface, carbonate, fine to medium grained, 5-10% voids up to 1/8", 25% cavities (up to 2-3/8"x1-9/16" at 130.4-130.55', 130.75-130.8'), cavities infilled with carbonate material (pale yellowish brown, medium grained, weak (R2), 25% voids, mild HCl reaction, poorly fossiliferous) 131.55-132.45' - very pale orange, (10YR 8/2), fine grained, moderate HCl reaction, very weak (R1), thinly bedded (1/4"-1/2"), trace voids to 3/16", no visible casts, 25% extremely weak (R0), irregular gray lenses 132.45-133.75' - yellowish gray, mottled light gray, and very pale orange, (5Y 7/2, N7, and 10YR 8/2), fine grained, strong HCl reaction, medium strong (R3), 5-10% voids up to 1/16" increasing with depth, trace cavities up to 9/16"x3/8" No Recovery 133.75-135.0' Limestone 135.0-138.95' - yellowish gray, (5Y 7/2), medium grained, strong HCl reaction, very weak to weak (R1 to R2), trace voids to 1/6", trace casts/cavities to 1/4", poorly fossiliferous (with small 3/16" shell fragments)	R2: 6 minutes	
			>10	131.6-131.85' - Fracture zone				
			7	131.9, 132.1, 132.2' - Bedding plane (3), <10 deg, rough, undulating				
			6	132.0-132.05' - Clay seam, (CH), reacts with HCl				
			0	132.3-132.45' - Fracture zone				
135	135.0	18	>10	132.45-133.0' - Fracture, vertical, smooth, undulating, open, 70% light gray staining			Difficult to distinguish voids due to average worn appearance of unit from drilling action	
-91.8			>10	133.0-133.1' - Fractures (3), horizontal, vertical, and 30 deg, rough, undulating, open				
			7	135.0-136.4', 136.6-136.8' - Bedding plane, horizontal, smooth, planar, fractures every 1/2" over interval, open				
			6	137.05, 137.15, 137.2, 137.6, 137.8, 138.05, 138.15, 138.25, 138.35, 138.5' - Fractures (10), horizontal, smooth to rough, planar				
			0					
		48	NR	138.95' - Fracture, horizontal, rough, undulating, pale yellowish brown (10YR 6/2) clay infill up to 1/4" thick, open				R3: 4 minutes
140	140.0		0					
-96.8			1					
			>10	141.7' - Mechanical break				
			3	141.9' - Fracture, horizontal, smooth, planar, open				
		48	0	142.05-142.1' - Carbonate silt seam (possible infill of fracture with cuttings from drilling)		R4: 5 minutes		
			3	142.15, 142.2, 142.3, 142.4, 142.5, 142.65, 142.7, 142.8, 142.9, 143.05' - Fractures (10), horizontal, smooth to rough, undulating, open				
			0					
			NR	143.3' - Fracture, horizontal, smooth, undulating, open				
145	145.0							



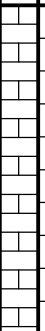
PROJECT NUMBER: 338884.FL	BORING NUMBER: B-07A
SHEET 9 OF 9	
ROCK CORE LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724358.9 N, 457965.5 E (NAD83)

ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: G. Davis; Cathead Operator: A. Turner

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

WATER LEVELS : 4.5 ft bgs on 6/16/07 START : 6/15/2007 END : 6/17/2007 LOGGER : N. Jarzyniecki

WATER LEVEL - 40.0 bgs on 6/16/07		START - 6/16/2007		END - 6/17/2007		LOGGER - R. Salzman		
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				
-101.8	R5-NQ 5 ft 77%	42	8	143.55' - Fracture, horizontal, smooth, planar to undulating, open		138.95-139.4' - yellowish gray to light gray, (5Y 7/2 to 5Y 5/2), fine to medium grained, mild HCl reaction, weak to medium strong (R2 to R3), 10% voids to 1/16" in size, trace voids to 3/8" in size, no visible cavities/casts	R5: 5 minutes	
2			145.1, 145.2, 145.35' - Fractures (3), horizontal, smooth, undulating, open	No Recovery 139.4-140.0' Limestone				
>10			145.15-145.35' - Fracture, vertical, smooth, undulating, open	140.0-142.05' - Same as				
1			145.85' - Fracture, horizontal, smooth to rough, undulating	138.45-139.4' except trace cavities up to 9/16"x3/8", and 20% voids up to 1/16" from 141.3-141.7'				
NR			146.35' - Fracture, <10 deg, rough, undulating, open	142.05-144.15' - yellowish gray, (5Y 7/2 to 5Y 8/1), fine to medium				
150	150.0			146.95, 147.0, 147.2, 147.4' - Fractures (4), horizontal, rough, undulating, open		grained, strong HCl reaction, very weak (R1), 10% voids up to 1/16", trace casts/cavities up to 5/16"x3/16" at 143.5-144.4', irregular gray laminatons and thread-like mottling in 1/16" to 3/16" thick bands at 142.0-142.4'	6/17/07 15:30: 15' HW casing removed to ensure no lock up in boring 6/18/07 8:02 Driller's Remark: Bottom of hole tagged to 138.5' over newer cave-in after casing removal	
-106.8				147.0-147.4' - Fracture, vertical, rough, undulating, open		No Recovery 144.15-145.0' Limestone		
				147.5, 147.55, 147.65' - Fractures (3), horizontal, smooth, planar to undulating, open		145.0-145.85' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak (R1), trace voids to 1/8", trace casts/shell fragments up to 3/8"x3/16"		
				147.65-147.8' - Fracture zone		145.85-147.05' - pale yellowish brown to dusky yellow, (10Y 2/2 to 5Y 6/4), medium grained, moderate HCl reaction, very weak to weak (R1 to R2), 15-20% voids to 1/16", moderately fossiliferous		
				147.95, 148.7' - Fractures (2), horizontal, rough, undulating, open		147.05-147.65' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3)		
						147.65-148.35' - Same as		
						145.0-145.85'		
						No Recovery 148.5-150.0'		
						Bottom of Boring at 150.0 ft bgs on 6/17/2007		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-08

SHEET 1 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.9 N, 457874.5 E (NAD83)

ELEVATION : 42.4 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, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/20/07

START : 5/20/2007

END : 5/22/2007

LOGGER : M. Faurote, N. Jarzyniecki

WATER LEVELS : 4.0 rods on 9/20/07		START : 9/20/2007		END : 9/22/2007		LOGGER : M. Adair, IV. J. J. J. J. J.			
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				
42.4	0.0	0.9	SS-1	1-1-1 (2)	Poorly Graded Sand With Organics (SP) 0.0-0.9' - dark gray, (N2), dry to moist, very loose, angular to sub angular, fine silica sand, 25-30% organics, 10-15% roots and rootlets that are 1"-1.5" long and up to 3/16"x3/16" with organics		08:10 Driller's Remark: 50 lb bags of Halliburton Quik gel bentonite mud mixture		
	1.5								
5	5.0								
37.4		1.0	SS-2	4-3-4 (7)	Silty Sand (SM) 5.0-6.0' - yellowish gray, (5YR 7/2), wet, loose, fine subangular, silica sands, 12% nonplastic fines, brownish black (5YR 2/1), a few very large roots (>5"), with rootlets (<1/8" x 1/8")		Water level assumed at approximately 4.0' below ground surface		
	6.5								
	10.0								
10		1.0	SS-3	20-34-50/5 (84/11")	Silt (ML) 10.0-11.0' - moderate yellow, (5YR 7/6), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 5-10% fine to medium sand-sized carbonate particles, friable, trace black fine sand-sized, trace white carbonate grains, all carbonate		Driller's Remark: 100% circulation loss after pulling out spoon 09:30: Install 10' 6" casing, additional 5' of 6" casing installed 11:00: 15' 6" casing installed to 14.0' below ground surface (1 foot stick up height), drilling and doing SPTs with a NW casing sized stabilizer installed on AWJ rods just above drill bit		
32.4	11.4								
	15.0								
15		1.2	SS-4	31-24-17 (41)	Silty Sand With Limestone Fragments (SM) 15.0-16.25' - grayish yellow, (5Y 8/4), wet, dense, fine to coarse grained, moderate HCl reaction, sand-sized carbonate material, 25% nonplastic fines, 1/8"-1/4" fossiliferous limestone casts (<1/16") limestone, 20-25% gravel-sized fragments, limestone also contains cast voids partially infilled with brilliant green (5G 6/6) material, all carbonate		13:53: Switched to 5 1/2" tricone bit, 100% circulation loss after pulling out spoon, add 1/2 bag bentonite		
27.4	16.5								
20									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-08

SHEET 2 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.9 N, 457874.5 E (NAD83)

ELEVATION : 42.4 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, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/20/07

START : 5/20/2007

END : 5/22/2007

LOGGER : M. Faurete, N. Jarzyniecki

WATER LEVELS : 4.0 TUBS ON 3/20/07			START : 3/20/2007			END : 3/22/2007			LOGGER : M. Adair, IV. Salzman		
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						
22.4	20.0	0.1	SS-5	50/3 (50/3")	Limestone Fragments 20.0-20.3' - Same as 15.0-16.25' except poor recovery		14:12: Full circulation loss, Driller's Remark: add another 5' 6" casing section, adding 1/2 bag bentonite to mud vat				
25	25.0										
17.4	25.9	0.6	SS-6	13-50/4.5 (63/10.5")	Limestone Fragments 25.0-25.2' - Same as 15.0-16.25' Silt With Limestone Fragments (ML) 25.2-25.6' - grayish yellow, (5Y 8/4), wet, hard, rapid dilatancy, nonplastic, 10-15% medium to coarse sand-sized, 25% fine to coarse gravel-sized limestone fragments, 5-10% molds 3/8"		Driller's Remark: Drill bit slippage from 23.0'-24.0' 14:47: Add 1/2 bag bentonite to mud vat				
30	30.0										
12.4	31.5	1.3	SS-7	20-11-13 (24)	Silty Sand With Limestone Fragments (SM) 30.0-31.3' - moderate yellow, (5Y 7/6), wet, medium dense, fine to coarse grained, moderate HCl reaction, 22% nonplastic fines, 30-35% fine to coarse gravel-sized limestone fragments, highly fossiliferous (casts/molds, shells), white-grayish yellow (5Y 8/1) and moderate yellow (5Y 7/6), all carbonate		15:10 Driller's Remark: No circulation, add 4" HW casing, 30' HW casing (4") installed				
35	35.0										
7.4	35.3	0.3	SS-8	50/4 (50/4")	Limestone Fragments 35.0-35.3' - moderate yellowish brown, (10YR 5/4), fine to coarse grained, mild HCl reaction, fine gravel-sized angular fragments, 10-15% nonplastic fines						
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-08
SHEET 3 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.9 N, 457874.5 E (NAD83)
 ELEVATION : 42.4 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, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 5/20/07 START : 5/20/2007 END : 5/22/2007 LOGGER : M. Faurote, N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	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
2.4	40.4	0.2	SS-9	50/5 (50/5")	Limestone Fragments 40.0-40.15' - light olive gray, (5Y 5/2), wet, moderate HCl reaction, medium to coarse sand-sized, moderately fossiliferous (casts/molds), trace very fine black organics Begin Rock Coring at 41.0 ft bgs See the next sheet for the rock core log		Driller's Remark: Install 4" HW casing to 40' below ground surface
45 -2.6							
50 -7.6							
55 -12.6							
60							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-08

SHEET 4 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.9 N, 457874.5 E (NAD83)

ELEVATION : 42.4 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 5/20/07

START : 5/20/2007

END : 5/22/2007

LOGGER : M. Faurote, N. Jarzyniecki

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.
41.0						No Recovery 41.0-43.7'	
	R1-NQ 5 ft 54%	33	NR	43.3-43.9' - Fracture zone, 1"-2" fragments			
45 -2.6			>10				
			0				
			2	45.6, 45.8' - Bedding plane or mechanical break (2), horizontal, rough, undulating, tight		Limestone 43.7-46.0' - moderate olive brown, (5Y 4/4), wet, moderate HCl reaction, very weak (R1), highly fossiliferous (casts/molds), 15-20% voids on surface up to 1/16", 5-7% cavities infilled with medium gray (N5) up to 3/8", trace black sand-sized coarse grained and short 3/4" discontinuous laminations (<1/16" thick) No Recovery 46.0-48.3'	Start R1-NQ at 09:00 on 5/21/07, water level 6" SW casing at 4.9' below ground surface, 4" HW casing to 41.0', will advance 4" HW casing after pulling out R1-NQ Driller's Remark: First 1.5' of run very fast drilling-slippage; will assume core loss occurs at top of run 4" HW casing installed to 47.0' below ground surface R1: 4 minutes
46.0							
	R2-NQ 5 ft 46%	24	NR	48.95' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/2"		Limestone 48.3-51.0' - Same as 43.7-46.0'	
50 -7.6			1	49.1, 49.4' - Bedding plane or mechanical break (2), 25 deg, rough, undulating, tight			
			5	49.5, 49.6' - Bedding plane or mechanical break (2), horizontal, rough, undulating, open 1/16"			R2: 2 minutes
			2	49.9, 50.1' - Bedding plane or mechanical break (2), horizontal, rough, undulating, open 1/8" for 49.9', tight for 50.1'		51.0-55.3' - medium olive brown, (5Y 4/4), moderate HCl reaction, weak to medium strong (R2 to R3), poorly to moderately fossiliferous (casts), 15-20% spheroidal voids mostly <1/16", trace coarse sized black grains, carbonate fines/silts from 54.6-54.85', fossil casts from 1/8"-1/2"	
	R3-NQ 5 ft 86%	72	2	50.4, 50.5' - Bedding plane or mechanical break (2), horizontal, rough, undulating, open 1/16"			
55 -12.6			2	51.4' - Bedding plane or mechanical break, horizontal, rough, undulating, tight		No Recovery 55.3-56.0'	
			0	51.75' - Fracture, 50 deg, rough, undulating, tight			R3: 5 minutes
			NR	52.8' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
			0	53.1' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1", very weak rock, friable		Limestone 56.0-60.3' - moderate olive brown, (5Y 4/4), moderate HCl reaction, medium strong rock (R3) from 56.0-56.85', 56.8-58.5' black fine carbonate laminations, medium strong rock (R3), grading to very weak rock (R1) 58.5-60.3', 56.0-58.5', 5-10% voids/casts <1/16", 58.5-60.3', 30-35% voids <1/16", 3-7% medium sized black grains in rock matrix (carbonaceous)	
			0	53.3' - Mechanical break or bedding plane, horizontal, rough, undulating, tight			
			0	54.6-54.85' - Fracture zone, extremely weak, carbonate silt			
			0	56.85-58.5' - Fracture, extremely to very weak rock			
	R4-NQ 5 ft 86%	45	1	58.75' - Fracture, 50 deg, rough, undulating, tight		No Recovery 60.3-61.0'	
60 -17.6			2	60.0, 60.2' - Mechanical break or bedding plane (2), horizontal, rough, undulating, tight			R4: 3 minutes SC-1 collected at 58.75-60.0'
			0				
			NR				
61.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-08

SHEET 5 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.9 N, 457874.5 E (NAD83)

ELEVATION : 42.4 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 5/20/07

START : 5/20/2007

END : 5/22/2007

LOGGER : M. Fauroute, N. Jarzyniecki

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.
65 -22.6	R5-NQ 5 ft 100%	90	0	61.2, 61.7, 63.1, 64.2, 65.4' - Fractures (5), horizontal, rough, undulating, tight		Limestone 61.0-66.0' - light olive brown, (5Y 5/6), moderate to strong HCl reaction, weak (R2), 63.0-64.0' medium strong rock (R3), 20-25% voids/casts decreasing to 10-15% below 64.0', moderately fossiliferous (casts, few molds), trace black fine to medium grain sized, 3-7% medium to coarse sized, medium dark gray (N4) intraclasts from 65.5-66.0', subrounded bedding interval from 64.0-66.0', short discontinuous (3/8") black laminations and fine grain black grained, 20% staining in olive gray (5Y 3/2) 66.0-71.0' - light olive brown, (5Y 5/6), moderate HCl reaction, similar to 61.0-66.0', medium strong rock (R3), 66.0-66.8' weak rock (R2), 68.7-69.7' extremely weak rock (R0), 10-15% voids <1/16", 5-10% medium dark gray (N4), medium to coarse grained intraclasts, discontinuous, 68.7-69.7' short horizontal black laminations, trace olive gray (5Y 4/1) staining	R5: 5 minutes
			1	62.75' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/4"			
			0	63.5' - Mechanical break			
			1	64.8' - Fracture, 50 deg, rough, undulating, tight			
			1	65.75' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
70 -27.6	R6-NQ 5 ft 100%	88	3	66.55' - Fracture, 35 deg, rough, undulating, open 5/8"			R6: 7 minutes
			0	66.8, 66.95' - Bedding plane or mechanical break (2), horizontal, rough, undulating, tight			
			0	67.9, 68.3, 68.55, 68.7, 68.75' - Mechanical break (5)			
			2	69.6' - Bedding plane, 20 deg, rough, undulating, tight, very weak rock (R1)			
			0	69.9' - Fracture, 60 deg, rough, undulating, tight			
75 -32.6	R7-NQ 5 ft 94%	77	0	72.0' - Fracture, 35 deg, rough, undulating, tight		Limestone 71.0-75.7' - light olive brown to moderate olive brown, (5Y 5/6 to 5Y 4/4), moderate to strong HCl reaction, poorly fossiliferous (casts), medium strong rock, R3, from 71.0-72.5', very weak rock, R1, to extremely weak rock, R0, from 72.5-74.2', medium strong, R3, from 74.2 to 75.7', 10-15% voids <1/16" over 71.0-72.5', 35-40% voids <1/16" over 74.2-75.7', poorly fossiliferous (casts), bottom 2" has gritty feel, medium dark gray (N4) intraclast as seen in 66.0-71.0' interval No Recovery 75.7-76.0' No Recovery 76.0-78.0'	SC-2 collected at 71.0-72.0'
			0	72.6' - Bedding plane, horizontal, rough, undulating, tight			
			0	73.95, 75.1' - Fractures (2), horizontal, rough, undulating, tight			
			0				
			1				
80 -37.6	R8-NQ 5 ft 60%	28	NR				R7: 7 minutes
			>10	78.0-78.4' - Fracture zone			
			>10	78.5' - Fracture or mechanical break, horizontal, rough, undulating, open 1/16"			
			>10	78.8' - Fracture, 15-20 deg, rough, undulating, open 1/6"			
			0	78.95' - Fracture or mechanical break, horizontal, open 1-1/4"			
							R8: 10 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-08

SHEET 6 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.9 N, 457874.5 E (NAD83)

ELEVATION : 42.4 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 5/20/07

START : 5/20/2007

END : 5/22/2007

LOGGER : M. Fauroute, N. Jarzyniecki

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.
85 -42.6	R9-NQ 5 ft 88%	74	3	79.15' - Fracture, horizontal, rough, undulating, open 1/8"		Limestone 78.0-81.0' - light olive brown, (5Y 5/6), strong to moderate HCl reaction, medium strong to strong (R3 to R4), 78.0-78.5' dissolution cavity zone, 10-25% voids mostly <1/16", poorly fossiliferous (casts <3/16") trace cavities 3/16"x1/8", trace black fragment 3/4"x1/8", bedding discontinuity up to 5/8" at 80.7'	R9: 8 minutes
			2	79.25' - Fracture, horizontal, rough, undulating, tight			
			1	79.65-79.95' - Fracture zone			
			1	81.3' - Bedding plane, horizontal, rough, undulating, open 1/2"			
			1	81.45' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/8"			
			1	81.9' - Bedding plane, horizontal, rough, planar			
			0	82.2' - Bedding plane or mechanical break, horizontal, rough, undulating, tight		Limestone 81.0-85.4' - light olive brown to dusky yellow, (5Y 5/6 to 5Y 6/4), moderate to strong HCl reaction, poorly to moderately fossiliferous (casts), 81.0-81.8' strong rock (R4), trace voids <1/16", trace medium dark gray (N4) staining, 81.5-85.4' weak rock (R2), 30% voids/casts <1/16", trace cavities, 10-15% medium gray (N5) staining at 84.5'	R9: 8 minutes
			NR	82.9' - Fracture, 20 deg, rough, undulating, tight			
			1	83.45' - Fracture, 60-70 deg, rough, undulating, tight			
			0	84.4' - Fracture, 60 deg			
			0	86.7' - Bedding plane, horizontal, rough, undulating, tight			
			1	88.0' - Bedding plane, 5-10 deg, rough, undulating, open 1/8"			
90 -47.6	R10-NQ 5 ft 88%	74	>10	88.5' - Fracture zone		No Recovery 85.4-86.0' Limestone 86.0-90.4' - light olive brown to dusky yellow, (5Y 5/6 to 5Y 6/4), moderate to strong HCl reaction, weak (R2), moderate to strongly fossiliferous (molds, casts), 3-7% medium coarse grain-sized black laminations <1/16" thick, casts/molds up to 5/8", voids/casts <1/16" over 25-30% of surface, 3-7% medium to coarse sized, medium dark gray (N4) subrounded sand-sized in rock matrix, 89.9' black intraclast also at 1/8"	SC-3 collected at 88.5-89.4' R10: 9 minutes
			2	88.5' - Fracture, 15-20 deg, rough to undulating, black staining over 15% of surface			
			0	89.4' - Bedding plane, 5-10 deg, rough, stepped, 1/8" black layer organics			
			NR	89.7' - Bedding plane, 30 deg, rough, undulating, tight			
			1	91.85' - Bedding plane, 0-5 deg, smooth, undulating, tight, <1/16" fine infill			
			1	92.95' - Fracture, 40 deg, rough, undulating, tight, fracture surface parallels friable zone 1" thick			
95 -52.6	R11-NQ 5 ft 92%	60	3	93.65, 93.7' - Fractures (2), 45 deg, rough, undulating, tight		No Recovery 90.4-91.0' Limestone 91.0-92.5' - Same as 86.0-90.4'	SC-4 collected at 92.95-93.65' R11: 16 minutes
			4	93.8' - Fracture, 50 deg, rough, undulating, open 1/16"		91.0-95.6' - light olive brown (5Y 5/6) grading to white (N9) at 92.5', light olive gray (5Y 6/1) mottling, strong HCl reaction	
			2	94.0' - Fracture, 55 deg, rough, undulating, tight		92.5-95.0' - yellowish gray (5Y 8/1), medium strong rock (R3), cavities fine grained infill at 92.9', very weak zones at 93.7' with a chalk-like feel, 5-10% voids to <1/16" over surface	
			NR	94.2' - Fracture, horizontal, rough, undulating, open 5/8", friable zone		95.0-95.25' - very weak (R1), 20-25% voids to <1/16" over surface	
			0	94.6' - Fracture, 60 deg, rough, undulating, tight		95.25-95.6' - very weak (R1), with 25% (<1/16") black laminations	
			2	94.7' - Fracture, horizontal, rough, undulating, open 1/8"		No Recovery 95.6-96.0'	
			0	95.1' - Bedding plane, horizontal, very weak rock (white) below			R12: 4 minutes
			0	95.4' - Bedding plane, horizontal, 1/2" thick organic layer			
			2	97.8-97.9' - Fracture zone			
			NR	97.9' - Bedding plane, horizontal, rough, undulating			
100 -57.6	R12-NQ 5 ft 76%	69	2	99.0' - Fracture, 10-20 deg, rough, undulating, open 1/2"			
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-08

SHEET 7 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.9 N, 457874.5 E (NAD83)

ELEVATION : 42.4 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

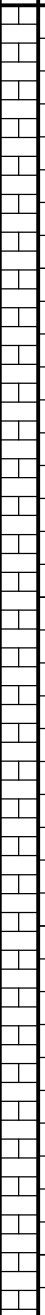
ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/20/07

START : 5/20/2007

END : 5/22/2007

LOGGER : M. Fauroute, N. Jarzyniecki

WATER LEVEL - 4.0 ft bgs on 2/26/07		DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY		COMMENTS				
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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						
105 -62.6	R13-NQ 5 ft 90%	65	1	99.4' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1"		Limestone 96.0-99.8' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak (R1), grading to weak rock (R2), highly fossiliferous (casts, molds), 1/2" fossils decreases with depth, trace brownish black (5YR 2/6) infill, diverse fossil types over upper 2.0' and lower 0.5', 10-15% medium gray (N5) fine to medium sized	R13: 5 minutes				
			4	101.55, 102.0' - Fractures (2), 70 deg, rough, undulating, tight				No Recovery 99.8-101.0' Limestone 101.0-105.5' - Same as 96.0-99.8' except yellowish gray, (5Y 7/2), strong HCl reaction, 20-25% medium dark gray (N4), fine medium sized grains			
			2	102.2' - Bedding plane, horizontal, rough, undulating, tight					No Recovery 105.5-106.0' Limestone 106.0-111.0' - Same as 96.0-99.8' except yellowish gray, (5Y 8/1), with gradational change to smaller (mostly microforams) fossils starting at 107.5'		
			1	102.7' - Fracture, 70 deg, rough, undulating, tight						Limestone 111.0-115.9' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak (R1), gritty/powder-like feel, highly fossiliferous (microforams, shells, casts, molds), grain size increases with depth, 15-20% fine sized, medium dark gray (N4) grains in matrix	
			0	102.95' - Fracture, 40 deg, rough, undulating, tight							No Recovery 115.9-116.0' Limestone 116.0-118.5' - yellowish gray, (5Y 8/1), medium grained, strong HCl reaction, highly fossiliferous (microforams, casts, molds), 15-25% moderate dark gray (N4) intraclasts, 160.4' bedding contact, fossil casts >3/4" (corals)
			NR	103.1' - Fracture, 60 deg, rough, undulating, dark gray stains over 80%, tight							
	106.0	0	103.5' - Fracture, 30 deg, rough, undulating, tight	R14: 5 minutes							
		0	104.7' - Fault, 40 deg, rough, undulating, tight, 50% dark gray staining			SC-5 collected at 112.5-113.3'					
		2	108.4' - Fracture, 60 deg, rough, undulating, black staining over 100% surface, tight				R15: 5 minutes				
		1	108.75' - Fracture, 30 deg, black staining over 100% of surface					R16: 6 minutes			
111.0	3	109.3' - Fracture, 70 deg, rough, undulating, trace dark gray (N3) staining, tight	R15: 5 minutes								
	1	110.25' - Fracture, 70 deg, rough, undulating, dark gray stains over 100% over surface, tight		R16: 6 minutes							
	2	110.5' - Fracture, 70 deg, rough, undulating, tight, dark gray stains over 100% of surface			R15: 5 minutes						
	1	110.75' - Fracture, 70 deg, rough, undulating, dark gray stains over 100% of surface, tight				R16: 6 minutes					
115 -72.6	80	0	111.1' - Bedding plane or mechanical break, horizontal, rough, planar, tight, open 1/16"				R15: 5 minutes				
		1	112.0' - Fracture or mechanical break, 40 deg, rough, undulating, tight	R16: 6 minutes							
		0	112.5' - Fracture, 60 deg, rough, undulating, open 1/16"		R15: 5 minutes						
		2	113.3' - Fracture or mechanical break, horizontal, rough, undulating, tight			R16: 6 minutes					
116.0	NR	115.2' - Fracture, 75-80 deg, rough, undulating, open 1/16"	R15: 5 minutes								
	0	115.8' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1/16"		R16: 6 minutes							
	1	117.2' - Fracture, 70 deg, rough, undulating, tight, large casts			R15: 5 minutes						
	0	119.25' - Bedding plane or mechanical break, horizontal, rough, undulating, tight, fracture through bioturbated zone				R16: 6 minutes					
120 -77.6	100	2	119.6' - Bedding plane or mechanical break, horizontal, rough, planar, tight				R15: 5 minutes				
		0	121.0	R16: 6 minutes							
					R15: 5 minutes						
						R16: 6 minutes					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-08

SHEET 8 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.9 N, 457874.5 E (NAD83)

ELEVATION : 42.4 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

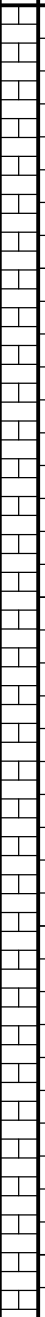
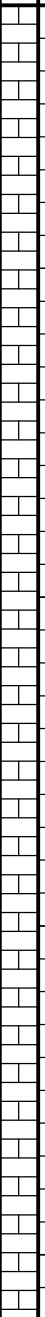
ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/20/07

START : 5/20/2007

END : 5/22/2007

LOGGER : M. Fauroute, N. Jarzyniecki

WATER LEVEL - 140.0 ft (5/22/07)		DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS		
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		SYMBOLIC LOG	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 -82.6	R17-NQ 5 ft 54%	37	NR				No Recovery 121.0-123.3'	07:40: Water level on 5/22/07 at 4.9' below ground surface in 6" SW casing		
			>10	123.3-123.7' - Fracture zone, subangular to subrounded 3/4"-1 5/8" limestone fragments, very weak (friable texture) rock (R1)			Limestone 123.3-123.85' - yellowish gray, (5Y 8/1), highly fossiliferous (fragments, shells, molds, casts), friable 123.85-126.0' - strong HCl reaction, very weak (R1), highly fossiliferous (casts, shells), 1/2"x1/2" shells, 10-15% voids <1/16", very fine to medium grain rock texture, 7-10% yellowish gray (5Y 7/2) mottling 126.0-128.0' - Same as 123.85-126.0'	R17: 5 minutes Add 7.0' of 4" HW casing, now set at 53.0' below ground surface		
			1	123.85, 124.0' - Bedding plane (2), horizontal, rough, planar, open 1/16"						
			2	125.3' - Bedding plane, horizontal, rough, undulating, open 1/16"						
	R18-NQ 5 ft 78%	56	2	125.4' - Bedding plane, rough, undulating, tight, fracture through/across bedding plane 126.05, 126.15, 127.45, 127.55, 127.65, 129.75' - Bedding plane or mechanical break (6), horizontal, rough, planar, open <1/16"			Limestone 128.0-129.9' - medium grained, strong HCl reaction, very weak (R1), friable, 20-25% medium grained sized, medium dark gray (N4) grains, rounded to subrounded, grain size coarsens with depth, 128.0-128.4' very fine grain with >1/2" casts, crystalline carbonate material in rock matrix as cavity infilling and matrix grains No Recovery 129.9-131.0' Limestone 131.0-133.4' - yellowish gray, (5Y 8/1), very weak (R1), 30-40% voids/casts <1/16", trace cavities 3/16"x1/16", friable, highly fossiliferous (casts, molds, shells), very fine grain sized limestone, all carbonate 133.4-134.8' - yellowish gray, (5Y 8/1), very fine to medium grained, (grain size coarsening with depth), thin bedded, medium-sized rounded particles of different colors bedded from 133.5-134.8, carbonate materials No Recovery 134.8-136.0'	R18: 5 minutes		
			4							
			2	127.9-128.0' - Fracture zone, horizontal, rough, undulating 128.4, 129.55, 129.55' - Bedding plane or mechanical break (3), horizontal, rough, undulating, tight						
			3							
	130 -87.6	R19-NQ 5 ft 76%	47	NR				No Recovery 129.9-131.0' Limestone 131.0-133.4' - yellowish gray, (5Y 8/1), very weak (R1), 30-40% voids/casts <1/16", trace cavities 3/16"x1/16", friable, highly fossiliferous (casts, molds, shells), very fine grain sized limestone, all carbonate 133.4-134.8' - yellowish gray, (5Y 8/1), very fine to medium grained, (grain size coarsening with depth), thin bedded, medium-sized rounded particles of different colors bedded from 133.5-134.8, carbonate materials No Recovery 134.8-136.0'	All material is carbonate; larger (1/2"x1/8") shells appear to be bedded at approximate 20°-30° dip over 132.0-133.4' interval SC-6 collected at 131.3-132.55'	
				3	131.1' - Bedding plane, horizontal, rough, undulating, open 1/8"					
1				131.25, 131.30' - Bedding plane (2), horizontal, rough, undulating, open 1/4"						
3				132.55' - Fracture or mechanical break, horizontal, rough, undulating, tight						
R20-NQ 5 ft 80%		58	5	133.3' - Bedding plane or mechanical break, horizontal, rough, undulating, tight 133.5, 133.6, 133.7' - Bedding plane (3), horizontal, rough, planar, open <1/16"		R19: 6 minutes				
			NR	134.05' - Bedding plane, horizontal, rough, undulating, tight 134.1' - Bedding plane, horizontal, rough, undulating, open 1/8"						
			2	134.2, 134.4, 134.5' - Bedding plane (3), horizontal, rough, undulating, open 1/8"						
			3	136.1, 137.1' - Bedding plane or mechanical break (2), 5-10 deg, rough, undulating, tight						
135 -92.6	R20-NQ 5 ft 80%	58	2	136.3' - Bedding plane or mechanical break, horizontal, rough, planar, tight 137.85, 137.95' - Bedding plane or mechanical break (2), horizontal, rough, undulating, tight		SC-7 collected at 136.3-137.1'				
			>10	138.1' - Fracture, 70 deg 138.9' - Fracture, 15-20 deg 139.3' - Bedding plane, 5 deg, rough, undulating						
			NR	139.3-140.0' - Fracture, angular stained black along fracture surfaces						






PROJECT NUMBER: 338884.FL	BORING NUMBER: B-08	SHEET 9 OF 10
ROCK CORE LOG		

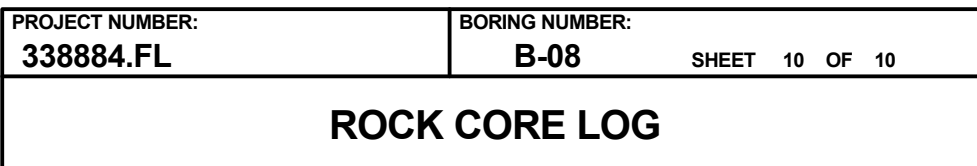
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724091.9 N, 457874.5 E (NAD83)

ELEVATION : 42.4 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 5/20/07 START : 5/20/2007 END : 5/22/2007 LOGGER : M. Fauroute, N. Jarzyniecki

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					
145 -102.6	R21-NQ 5 ft 92%	60	3	141.2' - Bedding plane or mechanical break, 15-20 deg, rough, undulating, open fractured through cavity		Limestone 136.0-139.3' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, very weak (R1), very fine grain rock with medium grained beds at 136.0', 138.0-138.3', very weak (R1), highly fossiliferous (microforams, shells, casts, molds), 5-7% medium sized, medium dark gray (N4) medium sized grain, subrounded, 5-10% voids <1/16", 10% mottling in yellowish gray (5Y 7/2) powder-like texture	R21: 10 minutes		
			2	141.6, 141.9, 142.25' - Mechanical break or fracture (3), horizontal, rough, undulating, tight, fractured through irregularly shaped dissolution cavities, 15% brown or black staining on fracture surface					
			3	142.8' - Bedding plane, 10 deg, rough, undulating, black stains over 10% of surface, open 1/16"					
			1	143.1' - Bedding plane, 15-20 deg, brownish black stains over 85% of surface, tight					
			3	143.25' - Bedding plane, horizontal, rough, undulating, open 1/8"					
			NR	143.9' - Bedding plane, horizontal, rough, stepped					
	146.0	1	144.25' - Fracture, 25 deg, rough, undulating, tight					Limestone 139.3-140.0' - yellowish gray, (5Y 8/1), very fine grained, medium strong to strong (R3 to R4), 3-5% voids <1/16", poorly fossiliferous (casts, molds), interval has broken fragments of core with irregular shaped infilled cavities (bioturbated zones), infilling with grayish yellow (5Y 8/4), hard, brittle minerals with 30-40% voids <1/16"	R22: 9 minutes
		2	145.05' - Bedding plane, horizontal, rough, undulating, tight						
		1	145.35' - Bedding plane, horizontal, rough, undulating, open 1/16"						
		2	145.5' - Fracture, 80 deg, rough, undulating, tight						
150 -107.6	R22-NQ 5 ft 92%	77	1	146.1' - Bedding plane or mechanical break, horizontal, rough, undulating, open 1"		No Recovery 140.0-141.0' Limestone 141.0-145.05' - very fine grained, strong HCl reaction, medium strong to strong (R3 to R4), 5-15% voids <1/16", 15-20% horizontally aligned, irregularly shaped to elongated cavities 3/16" x 1/16", few bedding contacts with brownish black (5YR 2/1) laminations on surface, trace dissolution cavities 3/4", poorly fossiliferous (casts/molds), dense heft	Abandonment: approximately 250 gallons of grout mix (28-47 lb bags of Bonsal brand Portland Type 1 cement), 7 dry 47 lb bags added to top of grouting surface (35-47 lb bags of grout mix used)		
			1	147.35, 147.75' - Bedding plane or mechanical break (2), horizontal, rough, undulating					
			NR	148.2, 148.5' - Mechanical break (2), tight					
			NR	148.9' - Bedding plane, horizontal, rough, undulating, tight					
				149.15' - Fracture, vertical, rough, undulating, tight		145.05-145.6' - light olive brown, (5Y 5/6), strong HCl reaction, weak (R2), 3-5% moderate dark gray (N4) rounded grains, fine to medium grained, trace voids <1/8"			
				149.8' - Fracture, 40-50 deg, rough, undulating, tight		No Recovery 145.6-146.0'			
				150.3' - Fracture or mechanical break, horizontal, rough, undulating, tight, fractured through partially infilled cavity		Limestone 146.0-148.9' - yellowish gray grading to light olive brown, (5Y 8/1 grading to 5Y 5/6), medium grained, strong HCl reaction, very weak (R1), with gritty feel, bedded medium sized carbonate grains (yellowish gray, light olive brown, moderate yellow), particle sizes decreasing with depth, angular to subrounded, medium light gray (N6) coarse sand to fine gravel-sized grains over top 0.7' interval			



ELEVATION : 42.4 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 5/20/07

START : 5/20/2007

END : 5/22/2007





LOGGER : M. Faurote, N. Jarzyniecki

APPENDIX 2BB-465



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		Driller's Remark: Some loss circulation after pulling split spoon	
	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

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
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							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

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) 01/9/97		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	1.5	SS-10	16-22-36 (58)	Sandy Silt (ML) 45.0-46.5' - Same as 40.0-41.5'		
-2.1	46.5						
50	50.0	0.0	SS-11	50/4 (50/4")	No Recovery 50.0-50.3'		
-7.1	50.3						
55	55.0	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		
-12.1	55.4						
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 TUBES ON 9/9/07		START : 9/12/2007		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

BORING NUMBER:

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

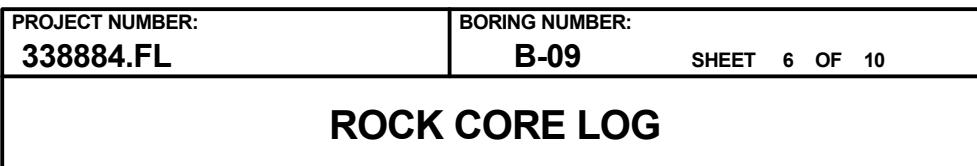
WATER LEVELS : 4.0 ft bgs on 5/3/07

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 (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
61.0	R1-NQ 5 ft 66%	8	4		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 R1: 3 minutes
			6			
			3			
			1			
65 -22.1			NR			
66.0	R2-NQ 5 ft 100%	92	2		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	SC-1 collected at 68.75-69.65' R2: 11 minutes
			2			
			2			
			1			
70 -27.1			0			
71.0	R3-NQ 5 ft 84%	75	2		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'	Driller's Remark: Slight (20%) loss of circulation over first foot of run R3: 7 minutes
			0			
			0			
			1			
75 -32.1			NR			
76.0	R4-NQ 5 ft 62%	43	2		76.0-76.65' - moderate yellowish brown (10yr 5/4) staining, horizontally oriented medium dark gray (N4) 3/8" long fossils No Recovery 75.2-76.0' Limestone 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' Driller's Remark: Loss of circulation at approximately 78' (100%) SC-2 collected at 79.8-81.0' R4: 25 minutes
			NR			
			1			
			3			
80 -37.1			0			
81.0						



ORIENTATION : Vertical

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

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-09

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				
							R11: 2 minutes
							R12: 2 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-09

SHEET 8 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.
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			
			NR	124.9' - Fracture, 80 deg, rough, undulating, black speckled staining over 60% of surface, tight			
130 -87.1	R14-NQ 5 ft 52%	22	>10	125.05' - Mechanical break, <5 deg, rough, undulating, black stains, tight			R14: 3 minutes
			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			
			NR	128.5' - Fracture or mechanical break, horizontal, smooth, planar, tight			
			NR				
135 -92.1	R15-NQ 5 ft 90%	80	3	131.3, 131.4' - Mechanical break or fracture (2), horizontal, rough, undulating, open <1/8"		CS-5 collected at 132.3-133.5'	R15: 3 minutes
			1	131.75' - Mechanical break or fault, horizontal, rough, planar, tight			
			0	132.3' - Fracture, 25 deg, rough, undulating, tight			
			2	133.5-133.75' - Mechanical break, 0 to 10 deg, rough, planar, mechanical break to get in to box, tight			
			0	134.55' - Fracture or mechanical break, 5 to 10 deg, rough, undulating, tight to open 1/16"			
			NR	134.6' - Fracture or mechanical break, 0 to 5 deg, rough, planar, tight to open 1/16"			
140 -97.1	R16-NQ 5 ft 50%	36	1	136.6' - Fracture or mechanical break, horizontal, rough, undulating, open up to 1"		R16: 6 minutes	
			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			
			NR				
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-09

SHEET 9 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

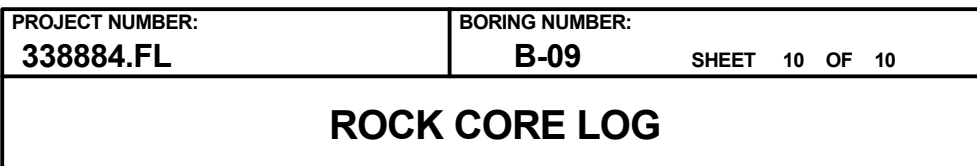
WATER LEVELS : 4.0 ft bgs on 5/3/07

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			
145 -102.1	R17-NQ 5 ft 86%	60	2	141.55' - Fracture or mechanical break, horizontal, rough, undulating, 1/2" open		Limestone 131.0-135.5' - yellowish gray, (5Y 8/1), medium to coarse grained, strong HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over 10-15% of surface, chalk-like/powdery feel to sample, 5-10% coverage of 3/4"x3/16" cavities rimmed with white (N9) mineralization, 134.75' contact (sharp) very fine grained whitish limestone below, medium gray (N6) discoloration as horizontal bands at 132.0', moderately to highly fossiliferous (casts, molds) No Recovery 135.5-136.0' Limestone 136.0-138.5' - very light gray to medium light gray, (N8 to N6), strong HCl reaction, weak to medium strong (R2 to R3) 136.0-137.25' - cavities up to 1-3/4" infilled partially and entirely with very fine grained yellowish gray (5Y 8/1) material, cavities have tubular casts 1/8" diameter, trace elongate shaped cavities 3/4"x3/16" rimmed with white (N9) mineralization (possibly echinoderms with calcite replacement) 137.25-138.5' - yellowish gray (5Y 8/1), very fine grained, moderate to strong HCl reaction, medium strong (R3), bioturbated areas with voids <1/16" over 30-40% of infill, poorly to moderately fossiliferous (casts, molds) No Recovery 138.5-141.0' Limestone 141.0-145.3' - yellowish gray, (5Y 8/1), medium grained, strong HCl reaction, weak to very weak (R2 to R1), possible wavy-load structures, grades from medium grained to fine grained to medium grained with depth 141.7' - with 3-5% medium to coarse grained medium gray (N5) grains, horizontally to subhorizontally aligned, poorly fossiliferous (shells, molds, echinoderms) No Recovery 145.3-146.0'	Driller's Remark: Probable jostling of rock fragments during coring R17: 16 minutes
			1	141.85' - Bedding plane or mechanical break, 85 deg, smooth, undulating, open 1/16"			
			3	142.25, 143.1, 143.45, 143.8' - Fractures (4), 20 to 60 deg, rough, undulating, tight			
			5	144.2' - Fracture or mechanical break, 10 deg, rough, undulating, tight			
			0	144.55, 144.65, 144.8, 144.95' - Mechanical break or fractures (4), 0 to 10 deg, smooth, undulating, open <1/16"			
			NR				
150 -107.1	R18-NQ 5 ft 84%	78	1	146.8' - Fracture, 50 deg, rough, undulating, tight			R18: 8 minutes
			1	147.1' - Bedding plane or mechanical break, horizontal, rough, planar, tight			
			1	147.6' - Mechanical break, horizontal, rough, undulating, tight			
			2	148.25' - Mechanical break, horizontal, rough, undulating, tight			
			0	148.5' - Fracture or mechanical break, rough, undulating, 15% black speckled staining, tight			
			NR	149.35-149.6' - Mechanical break or bedding plane, 5 to 10 deg, rough, undulating, open <1/16"			



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

APPENDIX 2BB-475



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-10
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723789.1 N, 457699.9 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 4/7/07 START : 4/6/2007 END : 4/9/2007 LOGGER : C. Sump

WATER LEVELS : 2.0 (RDS) DT 4/7/07			START : 4/9/2007		END : 4/9/2007		LOGGERS : G. Sump		
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	
42.0	0.0	0.8	SS-1	2-3-5 (8)	Topsoil 0.0-0.25' - brownish black to light brown, (5YR 2/1 to 5YR 5/6), moist, root matter, wood fragments, and organics, with fine silica sand		Cathead Operator: F. Cani		
	1.5				Poorly Graded Sand With Silt (SP) 0.25-0.8' - brownish gray, (5YR 4/1), moist, loose, very fine grained, silica sand, 5% nonplastic fines, trace organics		Driller's Remark: Rapid, smooth drilling Water level between 1.5-3.0' below ground surface Driller's Remark: Light chatter		
5	5.0								
37.0	6.5	1.2	SS-2	4-4-3 (7)	Sandy Lean Clay (CL) 5.0-6.2' - light gray, (N7), moist, medium stiff, medium plasticity, slow dilatancy, no HCl reaction, 30% very fine silica sand				
10	10.0								
32.0	11.5	1.2	SS-3	4-22-22 (44)	Clayey Sand (SC) 10.0-10.5' - transitions from black to yellowish gray, (N1 to 5Y 8/1), moist to wet, soft, high plasticity, no to slow dilatancy, strong HCl reaction, <5% fine to medium grained carbonate sand				
					Silt (ML) 10.5-11.2' - grayish orange, (10YR 7/4), dry to moist, hard, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 10% medium sand-sized, trace fine gravel-sized limestone fragments, all carbonate material				
15	15.0								
27.0	16.5	1.0	SS-4	5-15-19 (34)	Silt (ML) 15.0-16.0' - Same as 10.5-11.2' except coarse gravel-sized limestone fragments (1") at top of interval, no sand-sized material		Driller's Remark: Light chatter, variable at 15-20', drill rate slowing		
20									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-10

SHEET 2 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723789.1 N, 457699.9 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 4/7/07

START : 4/6/2007

END : 4/9/2007

LOGGER : C. Sump

WATER LEVELS : 2.0 (RDS) DT 4/7/07			START : 4/9/2007			END : 4/9/2007			LOGGERS : G. Samp		
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				
22.0	20.8	0.3	SS-5	50\5.5 (50\5.5")	Silt (ML) 20.0-20.3' - Same as 15.0-16.0' except <5% fine sand-sized material		Driller's Remark: Slow advancement rate at 22-30', intermittent to constant heavy chatter, strong H2S odor from mud at 22-24'				
25	25.0										
17.0		1.0	SS-6	23-30-30 (60)	Sandy Silt With Limestone Fragments (ML) 25.0-26.0' - grayish orange, (10YR 7/4), moist to wet, hard, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 25-30% fine to coarse sand-sized, weak (R2) limestone lenses (<1/2" thick) throughout, all carbonate material		Driller's Remark: 100% loss of circulation at 24'				
	26.5						Driller's Remark: Partial to full circulation return with use of thicker mud				
30	30.0										
12.0		1.2	SS-7	11-24-30 (54)	Sandy Silt (ML) 30.0-31.2' - grayish orange, (10YR 7/4), moist to wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 30% very fine to fine sand-sized material, very weak (R1) limestone lens (1/2" thick) at 30.0', trace organics, all carbonate material		Driller's Remark: Moderate drilling rate at 30-45', intermittent light to moderate chatter				
	31.5										
35	35.0										
7.0		1.5	SS-8	9-12-5 (17)	Silty Sand (SM) 35.0-36.5' - moderate yellowish brown, (10YR 5/4), moist to wet, very stiff, fine to medium grained, moderate HCl reaction, 40% nonplastic fines, interbedded (>5) extremely weak (R0) limestone lenses (<1" thick), all carbonate material						
	36.5										
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-10
SHEET 3 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723789.1 N, 457699.9 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 4/7/07 START : 4/6/2007 END : 4/9/2007 LOGGER : C. Sump

WATER LEVELS : 2.0 (RDS) ON 4/7/07		START : 4/6/2007		END : 4/9/2007		LOGGERS : G. Sump	
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
2.0	40.0	0.1	SS-9	50/4 (50/4")	Limestone Fragments 40.0-40.1' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, medium to coarse sand-sized and fine gravel-sized fragments		Driller's Remark: Light to heavy chatter at 40-45', very dense, slow drilling rate
45	45.0						18:30 on 4/6/07 End drilling for the day at 49', water at ground surface
-3.0	46.5	1.4	SS-10	17-29-31 (60)	Sandy Silt With Limestone Fragments (ML) 45.0-46.4' - moderate yellowish brown, (10YR 5/4), moist to wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 35-40% fine to coarse sand-sized, extremely weak (R0) limestone lenses (<1/2" thick) interbedded throughout sample, all carbonate material		08:00 on 4/7/07 Resume drilling from 49' Water level at 2' below ground surface Driller's Remark: Moderately slow drilling rate at 45-60', intermittent light chatter
50	50.0						
-8.0	51.5	1.3	SS-11	37-29-15 (44)	Sandy Silt With Limestone Fragments (ML) 50.0-51.3' - Same as 45.0-46.4'		
55	55.0						
-13.0	55.4	0.4	SS-12	50/5 (50/5")	Limestone Fragments 55.0-55.4' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, extremely weak (R0) limestone lenses (<1/2" thick) interbedded with silt-sized material, all carbonate material		
60							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-10
SHEET 4 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723789.1 N, 457699.9 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 4/7/07 START : 4/6/2007 END : 4/9/2007 LOGGER : C. Sump

WATER LEVEL: 23.4 RBGS ON 4/7/07				START: 4/7/2007		END: 4/7/2007		ECCLES: C. Camp	
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		
-18.0	60.0 60.6	0.6	SS-13	22-50/0.75 (77/6.75")	Sandy Silt (ML) 60.0-60.6' - moderate yellowish brown, (10YR 5/4), moist, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 25% medium to coarse sand-sized and 5% fine to coarse gravel-sized material, all carbonate material, trace organic laminations Begin Rock Coring at 61.0 ft bgs See the next sheet for the rock core log		11:00 on 4/7/07 Set HW casing to 60.5' to begin NQ rock coring		
65 -23.0									
70 -28.0									
75 -33.0									
80									



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-10	SHEET 5 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723789.1 N, 457699.9 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 4/7/07 START : 4/6/2007 END : 4/9/2007 LOGGER : C. Sump

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				
65 -23.0 								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-10

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723789.1 N, 457699.9 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 4/7/07

START : 4/6/2007

END : 4/9/2007

LOGGER : C. Sump

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.
85 -43.0	R6-NQ 5 ft 74%	62	5	81.5-82.0' - Fracture zone, rough, undulating, angular gravel-sized (<1-1/2") fragments		75.1-76.35' - Same as 73.75-75.1' except very light gray, (N8), medium strong to strong (R3 to R4), voids (<1/16") over 20% of surface, elongate cavities (<2"x1") with secondary, dark yellowish brown (10YR 4/2) infill No Recovery 76.35-76.5' Limestone 76.5-79.9' - very light gray transitioning to dark yellowish brown with depth, (N8 to 10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, medium strong to strong (R3 to R4), voids (<3/16") over 10-50% of surface increasing with depth, few cavities (<1/2") with trace secondary infill, trace organic laminae, extremely weak rock (R0) lens (1/2" thick) at 76.65' No Recovery 79.9-81.5' Limestone 81.5-85.2' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 6/1), very fine to fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids (<3/16") over 50% of surface with 20% very fine infill, elongate cavities (<2"x1") over 40% of surface, 80% of cavities with pale yellowish brown (10YR 6/1) weak to medium strong (R1 to R3) secondary infill, poorly fossiliferous No Recovery 85.2-86.5' Limestone 86.5-89.9' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids (<3/16") over 25-40% of surface, few elongate cavities (<1/2"x1/4"), transition from poor to moderately fossiliferous with depth, molds (<1/4"), trace laminations at 86.9-87.4', very weak (R0) lenses from 87.1-87.35' and 89.4-89.5' No Recovery 89.9-92.8' Limestone 92.8-95.6' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, mild HCl reaction, weak to medium strong (R2 to R3), very weak (R1) from 93.6-93.9', voids (<3/16") over 40-60% of surface, few cavities (<2"x1"), light gray (N8) medium strong (R3) secondary infill, moderately fossiliferous, trace organics	16:30 on 4/7/07 End drilling for the day at 81.5', water level at ground surface 07:30 on 04/09/07 Resume drilling, water level at 1.0' below ground surface Driller's Remark: Core barrel locked in formation at 85', advance NW casing from 0.0-80' R6: 20 minutes SC-3 collected from 86.5-87.3'
			0	82.95, 84.0' - Mechanical break (2)			
			1	84.4' - Bedding plane or mechanical break, rough, undulating, open 1/2"			
			0				
			NR				
90 -48.0	R7-NQ 5 ft 68%	46	0	87.3, 89.0' - Mechanical break (2)			R7: 19 minutes Driller's Remark: Core loss (91.5-92.8') due to core barrel blockage
			>10	88.05-88.4', 89.4-89.5' - Fracture zone, rough, undulating, angular gravel-sized (<2") fragments			
			>10	88.6' - Fracture or mechanical break, rough, undulating, open <1")			
			1	89.6' - Fracture or mechanical break, rough, undulating, tight			
			NR				
95 -53.0	R8-NQ 5 ft 74%	54	NR				R8: 33 minutes
			>10	92.8-93.1' - Fracture zone, rough, undulating, angular gravel-sized (<1") fragments			
			1	93.2' - Fracture or mechanical break, <10 deg, rough, undulating, tight			
			0	93.85' - Fracture or mechanical break, 30 deg, rough, undulating, tight			
			3	94.0, 95.0, 95.55' - Mechanical break (3) 95.15, 96.2, 96.25' - Fractures or mechanical break (3), smooth to rough, undulating, tight to open <1/8"			
100 -58.0	R9-NQ 5 ft 95%	64	>10	97.0-97.1' - Fracture zone, rough, undulating, angular gravel-sized (1"-1-1/2") fragments			R9: 15 minutes
			>10	97.45-97.65' - Fracture zone or bedding plane, rough, undulating, open <1/2"			
			5-10	98.65, 98.9' - Fracture zone or mechanical break (2), 35 deg, rough, undulating, tight to open 1/4"			
			>10	99.15' - Fractures (2), vertical, rough, undulating, tight			
			0	99.35' - Bedding plane, rough, undulating, tight			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-10

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723789.1 N, 457699.9 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 4/7/07

START : 4/6/2007

END : 4/9/2007

LOGGER : C. Sump

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 -63.0	101.5 R10-NQ 5 ft 100%	95	NR	99.75-100.0' - Fracture zone, rough, undulating, angular gravel-sized (<2") fragments		95.6-96.5' - yellowish gray, (5Y 8/1), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), trace voids (<3/16"), poorly fossiliferous, few molds (<1/2" diameter) 96.5-98.2' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), extremely weak to very weak (R0-R1) from 97.0-97.5', trace voids (<3/16"), trace bioturbation 98.2-100.0' - Same as 96.5-98.2' except voids (<3/16") over 30-40% of surface, moderately to highly fossiliferous with molds (<1/2"), <20% organic laminations concentrated in extremely weak (R0) rock from 98.9-99.2' 100.0-101.25' - Same as 98.2-100.0' except moderately fossiliferous, few cavities (<1") with secondary infill, trace organics No Recovery 101.25-101.5' Limestone 101.5-106.5' - yellowish gray, (5Y 8/1), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (<3/16") over 20-40% of surface, few cavities (<1"x1/2") with secondary infill, moderately to highly fossiliferous with elongate molds and casts (<1x1/2"), trace organics 106.5-111.5' - yellowish gray, (5Y 8/1), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), moderate yellowish brown (10YR 5/4) from 107.1-108.0', extremely weak (R0) from 107.75-108.3', voids (<3/16") over 30% of surface, laminated bedding from 107.1-108.0', highly fossiliferous with elongate molds, casts (<3/4x1/4") 111.5-116.5' - Same as 106.5-111.5' except strong HCl reaction, voids over 10-30% of surface, poorly fossiliferous with molds at 116.0-116.5' 116.5-121.3' - Same as 111.5-116.5' except fossil molds concentrated from 120.25-121.3'	R10: 13 minutes
			1	101.65' - Bedding plane or mechanical break, horizontal, rough, undulating, tight to open 1/8"			
			0				
			0	104.0, 105.2' - Mechanical break (2)			
			0				
110 -68.0	106.5 R11-NQ 5 ft 100%	100	1			106.4' - Fracture, 65 deg, rough, undulating, tight to open <1/4" 107.5, 109.0, 110.3' - Mechanical break (3)	R11: 18 minutes
			0				
			0				
			0				
			0				
115 -73.0	111.5 R12-NQ 5 ft 100%	68	>10	111.65-113.95' - Bedding plane or fracture (17), <10 deg, smooth to rough, planar to undulating, tight to open <1-1/2"		111.5-116.5' - Same as 106.5-111.5' except strong HCl reaction, voids over 10-30% of surface, poorly fossiliferous with molds at 116.0-116.5' 116.5-121.3' - Same as 111.5-116.5' except fossil molds concentrated from 120.25-121.3'	SC-4 collected from 113.1- 113.9'
			6				
			1				
			1	114.8' - Fracture, 45-50 deg, rough, undulating, tight			
			0				
120 -78.0	116.5 R13-NQ 5 ft 96%	64	>10	116.5-116.7' - Fracture zone, rough, undulating, angular gravel-sized (<1-1/2") fragments		116.5-121.3' - Same as 111.5-116.5' except fossil molds concentrated from 120.25-121.3'	R12: 11 minutes
			>10	117.1' - Fracture, vertical, rough, undulating, open 1", runs from 116.7' to 117.6'			
			>10	117.6-117.8' - Fracture zone, rough, undulating, angular gravel-sized (<2") fragments			
			>10	118.0' - Fracture, vertical, rough, undulating, open <1"			
			>10	118.85-119.1' - Fractures (3), vertical, rough, undulating, open <1/2"			
							R13: 6 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-10

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723789.1 N, 457699.9 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 4/7/07

START : 4/6/2007

END : 4/9/2007

LOGGER : C. Sump

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.
125 -83.0	R14-NQ 5 ft 100%	100	0	119.5' - Fracture, vertical, rough, undulating, open 1", length is from 119.1-119.5'		No Recovery 121.3-121.5' Limestone 121.5-126.5' - Same as 116.5-121.3' except moderately fossiliferous overall with poorly fossiliferous interval from 124.0-125.0', secondary infill at 121.8', very fine grained from 125.2-125.4'	R14: 10 minutes
			NR	119.95-120.25' - Fracture zone, rough, undulating, angular gravel-sized (<2") fragments			
			0				
			1				
			1	123.25, 124.1, 124.8' - Fractures or mechanical break (3), 60 deg, rough, undulating, tight			
			1	123.9, 124.0, 124.2, 125.0' - Mechanical break (4)			
130 -88.0	R15-NQ 5 ft 99%	93	0			126.5-131.45' - yellowish gray, (5Y 8/1), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids over <10% of surface except from 126.5-127.6' (30%), poorly fossiliferous, becoming yellowish gray (5Y 7/2) at 129.0-129.65'	R15: 5 minutes
			2	126.6, 128.4, 129.8, 131.25' - Fractures or mechanical break (4), horizontal, smooth, undulating, tight			
			1				
			0				
			0				
			1				
135 -93.0	R16-NQ 5 ft 99%	87	NR	131.7, 132.35, 132.45' - Mechanical break (3), horizontal, smooth, undulating, infilling		No Recovery 131.45-131.5' Limestone 131.5-136.45' - yellowish gray, (5Y 5/1), very fine to fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), light olive gray (5Y 6/1) from 132.5-132.65', extremely weak (R0) from 132.0-132.5', voids and cavities (<1/2") over <10% of surface, poorly fossiliferous with molds (1/4"), laminated from 132.45-132.65'	SC-5 collected from 133.1- 133.9'
			4				
			0	132.55, 132.9, 134.4, 134.55, 134.62' - Fractures or mechanical break (5), horizontal, smooth, undulating, tight			
			2				
			2				
			0				
140 -98.0	R17-NQ 5 ft 99%	65	NR	137.0, 137.1, 137.2, 137.25, 137.3, 137.35, 137.4, 137.45' - Bedding plane (8), horizontal, smooth, undulating, tight		No Recovery 136.45-136.5' Limestone 136.5-141.45' - yellowish gray from 136.5-138.5' and moderate yellowish brown from 138.5-141.45', (5Y 8/1, 10YR 5/4), very fine to fine grained, mild to strong HCl reaction, very weak to weak (R1 to R2), extremely weak (R0) from 138.25-138.35', poorly fossiliferous (fossils up to 1/4"x1/4"), laminated organic layers (4) at intervals 136.6-136.7', 131.0-137.5', 137.8-138.35', and 139.20-139.70'	R17: 6 minutes
			>10	137.25-137.50' - Fracture zone, rough, undulating, angular gravel-sized (<1-1/2") fragments			
			1	138.0, 138.2, 138.3, 138.35, 138.45, 139.4, 139.65, 140.75' - Bedding plane or mechanical break (8), horizontal, smooth, undulating, tight			
			1				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-10

SHEET 9 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723789.1 N, 457699.9 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing


ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 4/7/07

START : 4/6/2007

END : 4/9/2007





LOGGER : C. Sump

WATER LEVEL: 20 REGS ON 4/9/07		DISCONTINUITIES		LITHOLOGY		COMMENTS		
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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				
145 -103.0	141.5		1	142.1, 143.4, 144.9, 145.7' - Bedding plane or mechanical break (4), <10 deg, smooth, undulating, tight except for open 1" at 143.4'		No Recovery 141.45-141.5' Limestone 141.5-143.5' - yellowish gray to olive gray, (5Y 5/1 to 5Y 6/1), very fine to fine grained, moderate HCl reaction, very weak to medium strong (R1 to R3), voids (<3/16") over 10-20% of surface, many elongate cavities (1-1/2"x1") with secondary infill, poorly fossiliferous, trace laminated bedding 143.5-146.2' - very light gray, (N8), very fine to fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), voids (3/16") over 10-30% of surface, cavities (<2"x1") over 30% of surface, 60% of cavities with secondary infill, poorly fossiliferous	R18: 15 minutes	
		NR						
		1						
		1						
	R18-NQ 5 ft 94%	91	0					
		1						
		146.5		NR		146.5-146.9' - Fracture zone, rough, undulating, angular gravel-sized (<1-1/2") fragments 147.1, 147.25, 147.5, 148.0, 148.7, 149.8, 149.9' - Bedding plane or mechanical break (7), smooth, undulating, tight to open <1/2" 148.45, 149.0, 149.6' - Mechanical break (3)	No Recovery 146.2-146.5' Limestone 146.5-147.25' - light olive gray and moderate yellowish brown, (5Y 6/1, 10YR 5/4), very fine to fine grained, very weak to weak (R1 to R2), voids (3/16") over 20% of surface, many cavities (<1-1/2"x1/4") over >5% of surface, secondary infill of 50% of cavities, poorly to moderately fossiliferous	R19: 12 minutes
			>10					
			2					
	R19-NQ 5 ft 73%	43	0					
150 -108.0			2			147.25-147.5' - Same as 146.5-147.25' except voids (<3/16") over 30% of surface, trace secondary infill of cavities, few cavities <1-1/2"x1/4"		
			NR					
	151.5					147.5-149.8' - Same as 146.5-147.25' except no to moderate HCl reaction, medium strong (R3), voids (<3/16") over 0-30% of surface increasing with depth, trace voids with secondary infill, trace laminated bedding/slump feature, trace organics, poorly to moderately fossiliferous 149.8-150.15' - Same as 147.25-147.5' No Recovery 150.15-150.5' Bottom of Boring at 151.5 ft bgs on 4/9/2007	18:00 on 4/9/07 Water level at ground surface	



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-11
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723966.3 N, 457786.7 E (NAD83)
 ELEVATION : 42.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 6.0 ft bgs on 5/20/07 START : 5/19/2007 END : 5/20/2007 LOGGER : J. Burkard, C. Dellaria, B. Ellis

WATER LEVELS : 0.0 (RDS) ON 9/20/07			START : 9/19/2007			END : 9/20/2007			LOGGERS : J. Burkard, C. DeLaria, D. Ellis		
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					
42.7	0.0	1.5	SS-1	3-4-5 (9)	Poorly Graded Sand (SP) 0.0-0.2' - pale yellowish brown, (10YR 6/2), dry, loose, road material, fine silica sand						
	1.5				Topsoil 0.2-1.5' - brownish black, (5YR 2/1), dry to moist, stiff, 70% organic fines, 30% roots/vegetation						
5	5.0										
37.7		0.9	SS-2	0-2-4 (6)	Lean Clay (CL) 5.0-5.9' - light olive gray, (5Y 5/2), moist to wet, firm, high plasticity, no dilatancy, 10-15% very fine to fine silica sand						
	6.5										
10	10.0										
32.7		1.0	SS-3	6-13-16 (29)	Silt (ML) 10.0-11.0' - moderate yellow, (5Y 7/6), wet, very stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 10-15% fine to medium sand-sized, all carbonate						
	11.5										
15	15.9	0.1	SS-4	50/1.5 (50/1.5")	Silt With Limestone Fragments (ML) 15.0-15.1' - grayish yellow, (5Y 8/4), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 10-15% fine to medium sand-sized, all carbonate, limestone lenses 1/4" thick			Driller's Remark: Lost a little circulation			
27.7											
20											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-11

SHEET 2 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723966.3 N, 457786.7 E (NAD83)

ELEVATION : 42.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 6.0 ft bgs on 5/20/07

START : 5/19/2007

END : 5/20/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

WATER LEVELS : 0.0 TUBES ON 9/20/07			START : 9/19/2007			END : 9/20/2007			LOGGERS : J. Burkard, C. Delaria, D. Ellis		
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						
22.7	20.0	1.2	SS-5	21-24-11 (35)	Silty Sand (SM) 20.0-21.2' - grayish yellow, (5Y 8/4), moist to wet, dense, mild to moderate HCl reaction, fine to coarse grained, 35% nonplastic fines, trace angular fine gravel-sized, all carbonate						
	21.5										
25	25.0										
17.7		1.0	SS-6	9-8-6 (14)	Silty Sand (SM) 25.0-26.0' - yellowish gray, (5Y 7/2), wet, medium dense, moderate HCl reaction, fine to coarse grained, 30-40% nonplastic fines, all carbonate						
	26.5										
30	30.0										
12.7	30.3	0.3	SS-7	50/4 (50/4")	Silty Sand With Limestone Fragments (SM) 30.0-30.3' - dusky yellow, (5Y 6/4), wet, very dense, mild to moderate HCl reaction, fine to coarse grained, 20% nonplastic fines, 35-40% fine to coarse gravel-sized limestone, all carbonate						
35	35.0										
7.7		0.6	SS-8	22-50/3 (72/9")	Silty Sand (SM) 35.0-35.6' - moderate yellow, (5Y 7/6), moist to wet, very dense, strong HCl reaction, fine to coarse grained, 30% nonplastic fines, trace fine gravel, all carbonate						
	35.8										
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-11

SHEET 3 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723966.3 N, 457786.7 E (NAD83)

ELEVATION : 42.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 6.0 ft bgs on 5/20/07

START : 5/19/2007

END : 5/20/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

WATER LEVELS : 0.0 TUBS ON 5/20/07			START : 5/19/2007		END : 5/20/2007		LOGGERS : J. Burkard, C. DeLaria, D. Ellis	
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			
2.7	40.0	0.3	SS-9	50/3 (50/3")	Limestone Fragments 40.0-40.3' - dusky yellow, (5Y 6/4), strong HCl reaction, coarse sand-sized to fine gravel-sized			
45	45.0							
-2.3	45.4	0.4	SS-10	50/5 (50/5")	Silty Sand With Limestone Fragments (SM) 45.0-45.4' - dusky yellow, (5Y 6/4), wet, very dense, strong HCl reaction, fine to coarse grained, 15% nonplastic fines, 40% fine to coarse limestone fragments, all carbonate			
50	50.0							
-7.3	50.4	0.3	SS-11	50/5 (50/5")	Limestone Fragments 50.0-50.3' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, fine to coarse sand-sized and fine to coarse gravel-sized		Soil sampling completed at 10:55 on 5/19/07	
					Begin Rock Coring at 51.5 ft bgs See the next sheet for the rock core log			
55								
-12.3								
60								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-11
SHEET 4 OF 9	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

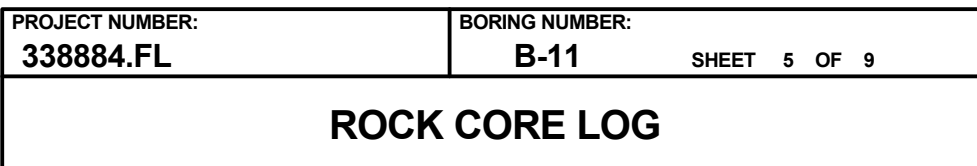
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723966.3 N, 457786.7 E (NAD83)

ELEVATION : 42.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 6.0 ft bgs on 5/20/07 START : 5/19/2007 END : 5/20/2007 LOGGER : J. Burkard, C. Dellaria, B. Ellis

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.
55 -12.3	R1-NQ 5 ft 60%	8	4	51.55-52.3' - Fracture zone, 0-15 deg, rough, undulating, bedding plane fractures or mechanical breaks, up to 3/4" fragments		Limestone 51.5-54.5' - moderate yellowish brown, (10YR 5/4), very fine to coarse grained, strong HCl reaction, weak (R2), 40% coverage of voids 1/16" or less on surface, few cavities <1/2" diameter, trace secondary infill recrystallization No Recovery 54.5-56.5'	Rock coring begins at 11:25 on 5/19/07 Driller's Remark: Soft at 52.0-52.5', 53.0-53.5', 54.5-54.9' R1: 3 minutes
			>10	52.6-54.25' - Fracture zone, rough, undulating to stepped, fine to coarse angular gravel, up to 2" diameter			
			>10				
			NR				
60 -17.3	R2-NQ 5 ft 69%	20	>10	56.5-56.6' - Fracture zone, smooth to rough, undulating, fine to coarse angular gravel		Limestone 56.5-59.95' - pale yellowish brown, (10YR 6/2), very fine to fine grained, strong HCl reaction, weak (R2), 40% coverage of voids 1/16" or less on surface, few cavities some elongate and some spherical, trace spots of black organic material <1/2" diameter No Recovery 59.95-61.5'	R2: 5 minutes
			3	56.9-57.55' - Fracture zone, smooth to rough, undulating, fine to coarse angular gravel			
			0	57.8' - Mechanical break, 30 deg, rough, undulating, tight to <1/16" open			
			0	58.25' - Bedding plane, 10 deg, smooth, undulating, <1/4" open			
65 -22.3	R3-NQ 5 ft 58%	24	NR	58.4-58.5' - Fracture zone, smooth to rough, undulating, fine to coarse angular gravel		Limestone 61.5-64.4' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild HCl reaction, weak to medium strong (R2 to R3), 0-10% coverage of voids 1/16" or less except 20% coverage of voids up to 1/8" on surface at 61.5-61.8', no visible fossils or cavities except 61.5-61.8' cavities up to 3/8" covering 5% of rock, trace black organic staining No Recovery 64.4-66.5'	R3: 5 minutes Driller's Remark: Soft at 66.0-67.0', 68.0-68.5'
			1	59.05' - Mechanical break			
			4	61.7-61.8' - Fracture zone			
			3	62.65' - Fracture, horizontal, rough, stepped			
70 -27.3	R4-NQ 5 ft 66%	37	NR	62.9' - Fracture, horizontal, smooth, undulating		Limestone 66.5-66.95' - Same as 61.5-64.4' 66.95-67.75' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild HCl reaction, very weak (R1), 30% coverage of voids 1/16" or less on surface, trace dark organic inclusions, no visible cavities or fossils	R4: 4 minutes
			1	63.1' - Fracture, horizontal, smooth to rough, undulating			
			4	63.2' - Fracture, horizontal, rough, undulating			
			0	63.5-63.6' - Fracture zone			
71.5			NR	63.2' - Fracture, horizontal, rough, undulating			
			NR	63.5-63.6' - Fracture zone			
				64.1' - Fracture, 28 deg, rough, stepped			
				64.4' - Mechanical break			
				65.9-66.1' - Fracture zone			
				67.3, 67.4' - Fractures (2), <10 deg, rough, stepped			
				67.6, 67.4, 67.6, 67.9' - Fractures (4), 0-18 deg, rough, undulating			
				69.0' - Fracture, 20 deg, smooth to rough, undulating			



ORIENTATION : Vertical

LOGGER : J. Burkard, C. Dellaria, B. Ellis

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-11

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723966.3 N, 457786.7 E (NAD83)

ELEVATION : 42.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 6.0 ft bgs on 5/20/07

START : 5/19/2007

END : 5/20/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

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.
95 -52.3	R9-NQ 5 ft 88%	29	>10	92.1-92.9' - Fracture zone		82.9-83.8' - very pale orange, (10YR 8/2), strong HCl reaction, very strong to extremely strong (R5 to R6), very fine grained, 15% coverage of voids 1/16" or less on surface, few cavities, few black laminations No Recovery 83.8-86.5' Limestone	
			>10	92.95, 93.0, 93.2' - Fractures (3), horizontal, rough, undulating		86.5-90.5' - moderate yellowish brown, (10YR 5/4), fine to medium grained, strong HCl reaction, weak (R2), 40% coverage of voids 1/16" or less, cavities to 3/4" diameter 5% of rock, trace fossil casts to 1/4" diameter No Recovery 90.5-91.5' Limestone	R9: 5 minutes
			7	93.3-93.8' - Fracture zone, horizontal, rough, undulating, fractures along bedding plane		91.5-92.2' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, weak (R2), 5% coverage of voids 1/16" or less, 5% cavities up to 1" x 3/8" partially infilled with fine grain carbonaceous material	
			9	94.0' - Fracture, horizontal, smooth, undulating		92.2-93.8' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate to strong HCl reaction, very weak (R1), 10-20% coverage of voids 1/2" or less, trace cavities up to 3/8" in diameter, moderately fossiliferous, trace black organic material at 93.6' up to 1/16" diameter	
			9	94.1' - Fracture, horizontal, rough, undulating		93.8-95.9' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, weak (R2), 5% coverage of voids 1/16" or less, 5% cavities up to 1" x 3/8" partially infilled with fine grain sized material (carbonaceous), clay seam at 95.2-95.4' (CL) yellowish gray (5Y 7/2) No Recovery 95.9-96.5' Limestone	
			NR	94.5, 94.6' - Fractures (2), horizontal, smooth to rough, undulating		96.5-97.0' - grayish yellow, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), trace voids 1/16" or less, no visible cavities or fossils No Recovery 97.0-101.5' Limestone	
96.5			NR	94.7, 94.9, 95.0' - Fractures (3), horizontal, smooth to rough, planar		101.5-102.0' - very pale orange to grayish orange, (10YR 8/2, 10YR 7/4), fine to medium grained, strong HCl reaction, very weak (R1), 15% coverage of voids 3/16" or less, fossil casts up to 10%	
			>10	95.1, 95.25, 95.3, 95.8' - Fractures (4), horizontal, smooth, planar to undulating		106.5-109.95' - Same as 101.5-102.0' except extremely weak (R0) from 107.2-109.3' No Recovery 109.95-111.5'	
			NR	96.5-97.0' - Fracture zone, horizontal, dark stains on faces, pieces 3" x 2", many bedding plane fractures			
100 -57.3	R10-NQ 5 ft 10%	0	NR	101.6-101.8' - Fracture zone			R10: 9 minutes
			1				
			NR				
101.5			NR				
			NR				
105 -62.3	R11-NQ 5 ft 10%	0	NR				R11: Run time not recorded
			NR				
			NR				
106.5			NR				
			NR				
			NR				
110 -67.3	R12-NQ 5 ft 69%	0	NR				R12: Run time not recorded
			NR				
			NR				
			NR				
111.5			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-11

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723966.3 N, 457786.7 E (NAD83)

ELEVATION : 42.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 6.0 ft bgs on 5/20/07

START : 5/19/2007

END : 5/20/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

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.
115 -72.3	R13-NQ 5 ft 85%	0	>10	111.5-111.9' - Bedding plane, horizontal, smooth, planar, 1" bedding 111.9-112.4' - Fracture zone		Limestone 111.5-111.65' - Same as 101.5-102.0' 111.65-115.25' - yellowish gray, (5YR 7/2), fine grained, very weak (R1), trace voids up to 1/16", thinly bedded (1/8"-3/4"), extremely weak rock (R0) at 114.3-114.9'	R13: 5 minutes
			>10	112.65-115.75' - Bedding plane, smooth, planar to undulating, 1/8" to 1/2" beds			
			>10				
			>10				
			NR			No Recovery 115.75-116.5'	
120 -77.3	R14-NQ 5 ft 72%	13	>10	116.6, 116.7, 116.85, 117.45, 117.55, 117.7, 117.9, 118.0, 118.1, 118.15, 118.5, 118.8' - Bedding plane or mechanical break (12), 10 deg, rough, undulating 117.0-117.2' - Fracture zone		Limestone 116.5-119.1' - yellowish gray, (5Y 8/1), medium grained, strong HCl reaction, weak (R2), trace voids up to 1/16", no visible cavities, trace fossil casts 3/8" X 3/16", trace dark organic material	R14: 3 minutes
			7				
			>10	119.0-119.5' - Fracture zone		119.1-120.1' - yellowish gray, (5Y 8/1), medium to coarse grained, strong HCl reaction, weak (R2), 15-25% coverage of voids to 3/16", fossil casts up to 1" x 3/8" over 60% of rock	
			1	119.8' - Fracture, 15 deg, smooth, undulating, tight		No Recovery 120.1-121.5'	
			NR				
125 -82.3	R15-NQ 5 ft 47%	12	4	121.65, 121.75, 121.8, 122.4, 122.65, 122.8' - Bedding plane or mechanical break (6), 10 deg, rough to smooth, planar to undulating, 1/8"-1/4" open		Limestone 121.5-123.25' - Same as 116.5-119.1'	R15: 4 minutes Driller's Remark: Last foot "feels like gravel"
			10	122.9-123.25' - Fracture zone or bedding plane, 10 deg, smooth, undulating, 1/4" open, beds are 1/2" thick		123.25-123.85' - Same as 119.1-120.1' except 5-10% coverage of <3/8" fossil casts	
			1	123.35-123.6' - Fracture zone, fine to coarse pieces		No Recovery 123.85-126.5'	
			NR	123.75' - Fracture, 20 deg, rough, undulating			
130 -87.3	R16-NQ 5 ft 70%	8	6	126.6, 126.95, 127.1, 127.2, 127.35, 127.4, 127.6, 127.7, 127.8' - Fractures (9), horizontal, smooth to rough, undulating, along bedding, tightly healed to 1/8" open		Limestone 126.5-128.4' - Same as 116.5-119.1'	R16: 3 minutes
			6	127.85-127.95' - Fracture zone			
			7	128.2, 128.4, 128.6, 128.75, 128.85, 129.0, 129.2, 129.45, 129.6, 129.75, 129.8' - Fractures (11), horizontal, rough, undulating, 1/8" -1/4" open		128.4-129.25' - Same as 119.1-120.1'	
			3				
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-11

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723966.3 N, 457786.7 E (NAD83)

ELEVATION : 42.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

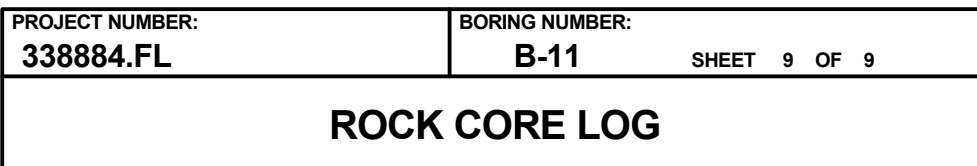
WATER LEVELS : 6.0 ft bgs on 5/20/07

START : 5/19/2007

END : 5/20/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

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.
135 -92.3	R17-NQ 5 ft 17%	0	4	131.5-131.7' - Fracture zone 131.95-132.2' - Bedding plane, 5 deg, smooth, planar to undulating, 1/4" open		Limestone 129.25-130.0' - yellowish gray, (5YR 7/2), medium grained, weak (R2), trace small (<1/16") voids and trace fossil casts interbedded with medium to coarse grained limestone with 15-25% coverage by small (1/16") voids and 60% coverage by fossil casts, layers are 2"-4" thick No Recovery 130.0-131.5' 131.5-132.35' - Same as 116.5-119.1' No Recovery 132.35-136.5'	Driller's Remark: Brief loss of circulation
136.5							
140 -97.3	R18-NQ 5 ft 67%	0	>10	136.5-137.7' - Fracture zone or bedding plane, 10 deg, smooth, planar to stepped, thin beds, 1/3" open, beds are 1/4"-2"		Limestone 136.5-137.6' - Same as 116.5-119.1'	R17: 5 minutes
			>10	137.7-138.95' - Fracture zone or bedding plane, 5 deg, rough, planar to undulating, open 1/8" or less		137.6-139.85' - very pale orange, (10YR 8/2), medium grained, strong HCl reaction, weak (R2), 5-15% coverage of voids to 1/8", trace fossil casts 3/8" x 3/16", no visible cavities, trace dark gray and light gray inclusions, dark laminations at 138.35-138.5', thin beds and laminates 1/4"-1/2"	
			>10	139.2, 139.45, 139.6' - Bedding plane or mechanical break (3), 10 deg, rough, planar, tight		No Recovery 139.85-141.5'	R18: 5 minutes
141.5			1				
			NR				
145 -102.3	R19-NQ 5 ft 78%	14	5	141.55, 141.7, 141.9, 142.3, 145.05, 145.15' - Bedding plane or mechanical break (6), 10 deg, smooth to rough, planar, 1/8"- 1/4" open		Limestone 141.5-143.2' - yellowish gray, (5YR 7/2), medium grained, strong HCl reaction, weak (R2), trace voids up to 1/16", no visible cavities, trace fossil casts 3/8" X 3/16", trace dark organic material	
			>10	142.4, 143.2' - Fractures (2), <5-90 deg, smooth to rough, planar, bedding plane separation zone, beds are up to 1" thick		143.2-144.2' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, medium strong (R3), trace voids up to 1/16", 10-15% coverage of cavities up to 1 9/16" x 3/8" partially infilled with medium grain sized carbonate material, fossil molds, trace dark (organic) infill	
			>10	143.2-144.15' - Fracture zone, 0-90 deg, rough, undulating to stepped, open up to 1", angular fragments		144.2-145.3' - pale yellowish brown, (10YR 6/2), fine grained, weak (R2), 5-10% coverage of voids up to 3/16", 5-10% coverage of cavities up to 3/8" x 9/16", dark laminations at 145.1'	
			1	144.15-144.7' - Fracture zone		145.3-145.4' - yellowish brown, (10YR 6/2), mild HCl reaction, medium strong (R3), no visible fossils or cavities, dark red staining on fracture surfaces	R19: Run time not recorded
			NR	145.43' - Mechanical break, 20 deg, tight		No Recovery 145.4-146.5'	
146.5							
150 -107.3	R20-NQ 5 ft 62%	30	7	146.6, 146.7, 147.1, 147.15, 147.25, 147.9' - Bedding plane or mechanical break (6), 10 deg, smooth, undulating, tight to 1/4" thick			
			2	146.9-147.1' - Fracture zone			
			1	147.5-147.65' - Fracture zone			
			0				
			NR	149.2-149.6' - Fracture, 70 deg, smooth to rough, undulating, tight			R20: Run time not recorded
151.5							



ELEVATION : 42.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 6.0 ft bgs on 5/20/07

START : 5/19/2007

END : 5/20/2007





LOGGER : J. Burkard, C. Dellaria, B. Ellis

APPENDIX 2BB-493



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-12
SHEET 1 OF 8	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723919.8 N, 457828.5 E (NAD83)
 ELEVATION : 43.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.3 ft bgs on 5/17/07 START : 5/8/2007 END : 5/17/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.5 TUBS ON 9/17/07			START : 9/8/2007			END : 9/17/2007			LOGGERS : R. Gomez, R. Birely, T. Stewart		
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					
43.3	0.0	1.3	SS-1	0-2-2 (4)	Poorly Graded Sand With Organics (SP) 0.0-1.25' - dark gray grading to very light to light gray, (N3 to N8 to N7), moist, very loose, very fine to fine grained, 20% organics decreasing to <5% with depth, trace nonplastic fines, sand is silica			For SS-2 the last 6" SPT was weight of hammer			
	1.5										
5	5.0										
38.3		1.5	SS-2	2-1-0 (1)	Poorly Graded Sand With Silt (SP-SM) 5.0-6.5' - dusky yellow, (5Y 6/4), wet, very loose, very fine to fine grained, trace roots, trace concretions to coarse sand-sized, 8% nonplastic fines, sand is silica						
	6.5										
10	10.0										
33.3	10.8	0.8	SS-3	34-50/4 (84/10")	Silt (ML) 10.0-10.8' - yellowish gray, (5Y 7/2), moist to wet, hard, nonplastic, very rapid dilatancy, mild HCl reaction, trace to 10% very fine to fine sand-sized carbonate						
15	15.0	0.8	SS-4	47-50/4 (97/10")	Silt (ML) 15.0-15.8' - yellowish gray, (5Y 7/2), moist to wet, hard, nonplastic, very rapid dilatancy, mild HCl reaction, carbonate, trace fine gravel-sized limestone fragments						
28.3	15.8										



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-12
SHEET 2 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723919.8 N, 457828.5 E (NAD83)
 ELEVATION : 43.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.3 ft bgs on 5/17/07 START : 5/8/2007 END : 5/17/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.5 TUBS ON 9/17/07			START : 9/8/2007			END : 9/17/2007			LOGGERS : R. Gomez, R. Biley, T. Stewart		
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						
23.3	20.0	1.2	SS-5	15-17-14 (31)	Silt With Sand (ML) 20.0-21.2' - dusky yellow, (5Y 6/4), moist to wet, dense, fine to coarse grained, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 5% fine gravel-sized, 20% fine to coarse sand, all carbonate						
	21.5										
25	25.0										
18.3	26.0	0.7	SS-6	17-50/6 (67/12")	Silty Sand With Limestone Fragments (SM) 25.0-25.7' - dusky yellow, (5Y 6/4), moist to wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 25-30% nonplastic fines, 15% fine gravel-sized limestone, all carbonate						
30	30.0										
13.3	31.5	0.9	SS-7	26-15-8 (23)	Limestone Fragments 30.0-30.4' - dusky yellow, (5Y 6/4), mild HCl reaction, wafer shaped fragments to 1/2" thick Silt With Sand (ML) 30.4-30.9' - dusky yellow, (5Y 6/4), moist to wet, very stiff, rapid dilatancy, mild to moderate HCl reaction, 20-25% very fine to medium grained sand, all carbonate						
35	35.0										
8.3	36.5	1.0	SS-8	6-10-19 (29)	Silty Sand With Limestone Fragments (SM) 35.0-36.0' - dusky yellow, (5Y 6/4), moist to wet, medium dense, fine to coarse grained, mild to moderate HCl reaction, 34% nonplastic fines, 15% fine-coarse gravel-sized limestone, all carbonate						
								Driller's Remark: Hit hard layer at 38'			
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-12
SHEET 3 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723919.8 N, 457828.5 E (NAD83)
 ELEVATION : 43.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.3 ft bgs on 5/17/07 START : 5/8/2007 END : 5/17/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.51 bgs on 9/17/07		START : 9/8/2007		END : 9/17/2007		LOGGERS : R. Gomez, R. Biley, T. Stewart	
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
	40.0	0.3					
45 -1.7	45.0						
	46.5	1.5	SS-10	10-18-20 (38)	Silt (ML) 45.0-46.5' - moderate olive brown, (5Y 4/4), moist to wet, dense, fine to coarse grained, mild HCl reaction, 57% nonplastic fines, 15-20% fine gravel-sized limestone fragments, all carbonate		
50 -6.7	50.0						
	51.5	1.3	SS-11	24-37-48 (85)	Silty Sand With Limestone Fragments (SM) 50.0-51.3' - moderate olive brown, (5Y 4/4), moist to wet, dense, fine to coarse grained, mild HCl reaction, 25% nonplastic fines and 30-35% fine to coarse gravel-sized limestone fragments		
55 -11.7	55.0						
	56.1	0.8	SS-12	21-31-50/1 (81/7")	Silty Sand With Limestone Fragments (SM) 55.0-55.8' - moderate olive brown, (5Y 4/4), moist to wet, dense, fine to coarse grained, mild HCl reaction, 25% nonplastic fines and 30-35% fine to coarse gravel-sized limestone fragments		
	60.0						
	60.1	0.1	SS-13	50/1 (50/1")	Limestone Fragments 60.0-60.1' - moderate olive brown, (5Y 4/4), mild HCl reaction, one limestone fragment recovered		End soil sampling at 60.0'
60							
					Begin Rock Coring at 60.0 ft bgs See the next sheet for the rock core log		



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-12	SHEET 4 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723919.8 N, 457828.5 E (NAD83)

ELEVATION : 43.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 4.3 ft bgs on 5/17/07 START : 5/8/2007 END : 5/17/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

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			
-16.7	60.0	58	5	60.1-60.3' - Mechanical break, rough, undulating, multiple angles		Limestone 60.0-61.8' - pale yellowish brown, (10YR 6/2), fine grained, mild to moderate HCl reaction, medium strong (R3), small voids 1/16"-1/8" over 40% of surface, trace organics, 5% voids to 3/8" 61.8-62.6' - pale yellowish brown, (10YR 6/2), mild HCl reaction, extremely weak to very weak (R0 to R1), trace to 30% organics 62.6-63.25' - Same as 60.0-61.8' except up to 50% coverage of small voids and trace fossil molds/casts 63.25-64.5' - Same as 61.8-62.6' except 10% coverage of small voids No Recovery 64.9-65.0' Limestone 65.0-66.0' - light olive gray, grading to yellowish brown, (5Y 5/2, 10YR 5/9), <10% small (<1/16") voids on surface, deep dissolution cavity up to 1-1/2"x1" at 65.8' No Recovery 66.0-67.8' Limestone 67.8-70.0' - moderate olive brown, (5Y 4/4), with compacted carbonate silts, trace fossils on surface, trace small voids to 1/16" 70.0-73.45' - light olive gray, yellowish brown and moderate olive brown, (5Y 5/2, 10YR 5/9 and 5Y 4/4), moderate HCl reaction, weak (R2), very weak (R1) from 70.7-71.5, <10% small voids to 1/16", no fossils seen on surface 73.45-74.0' - yellowish brown, (10YR 5/4), moderate HCl reaction, very weak (R1), tightly compacted silts, shows "infill" of pale olive 10YR 6/2 and medium light gray (N6), shallow dissolution features to 1/2", trace fossils to 1/4", in both the rock and tightly compacted silts the clasts/infill are up to 1/4" No Recovery 74.0-75.0'	Begin rock coring at 60'
			5	60.4' - Fracture, 50 deg, rough, undulating, open, dark gray accretion over 30% of surface, <0.01' thick			
			>10	60.75' - Fracture, horizontal, rough, undulating, tight			
			1	61.15-61.3' - Fracture zone, rough, undulating, multiple angles			
			2	61.8' - Fracture, horizontal, rough, undulating, tight			
65	65.0	40	NR	62.3' - Bedding plane, horizontal, at interface with soft material		R1: 8 minutes	Driller's Remark: Very soft at 66.0-68.0' Assume core loss from 66.0-67.8' based on driller report and recovery
-21.7			0	62.4-62.6' - Fracture zone, soft material, multiple fragments			
			NR	63.3, 64.2, 64.4' - Bedding plane (3), horizontal, rough, undulating, tight			
			0	64.5' - Fracture, 20 deg, rough, undulating, open			
			2	68.2' - Bedding plane, <20 deg, pieces missing could be because soft material or dissolution, open <1/8"			
70	70.0	48	3	68.8' - Fracture, 75 deg, rough, undulating, open <1/8"		R2: 7 minutes	Driller's Remark: Hard at 68.0-70.0'
-26.7			2	69.1' - Fracture, 40-50 deg, rough, undulating, open			
			>10	69.7, 69.9' - Bedding plane (2), <10 deg, pieces missing could be because soft material or dissolution, open <1/8"			
			2	70.7, 71.85, 72.5 and 73.45' - Bedding plane (4), <5 deg, rough, undulating, open <1/8"			
			>10	70.85, 71.1' - Bedding plane (2), <5 deg, rough, undulating, tight			
75	75.0	22	NR	71.15-71.45' - Fracture zone		R3: 8 minutes	Driller's Remark: No resistance felt-very soft at 77.0-77.5' and 78.0-78.2' Assume core loss from 77.1' onward
-31.7			>10	71.95' - Bedding plane, <5 deg, rough, undulating, open 1/2"			
			1	73.8-74.0' - Fracture zone			
		NR	NR	75.0-75.3' - Fracture zone		R4: 6 minutes	
			NR	75.4, 75.6, 75.7' - Bedding plane (3), <10 deg, rough, undulating, open to 1/8"			
				76.25' - Bedding plane, <10 deg, rough, undulating, open to 1/8", not fully broken			
80	80.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-12

SHEET 5 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723919.8 N, 457828.5 E (NAD83)

ELEVATION : 43.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.3 ft bgs on 5/17/07

START : 5/8/2007

END : 5/17/2007

LOGGER : R. Gomez, R. Bitely, T. Stewart

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			
-36.7	R5-NQ 5 ft 72%	23	1	80.1' - Fracture zone, rough		Limestone 75.0-77.1' - Same as 70.0-73.45' except color grades from pale olive (10Y 6/2) to light olive grey (5Y 5/2) at 75.2', moderate yellowish brown (10YR 5/4) mottling, moderate HCl reaction, very weak, weak to medium strong (R2 to R3) at 75.6-77.1', tightly compacted silts, <10% small voids to 1/16", no fossils seen on surface No Recovery 77.1-80.0' Silt (ML) 80.0-80.2' - moderate yellowish brown, (10YR 5/4), medium plasticity, 3/4" limestone fragments Limestone 80.2-83.6' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, weak to medium strong (R2 to R3), small (1/16") voids 15-20% of surface, larger cavities/fossil molds up to 3/4", fine grained interval from 81.3-82.5' No Recovery 83.6-85.0' Limestone 85.0-86.0' - moderate yellowish brown, (10YR 5/4), medium grained, 30-40% voids up to 1/8" in size, trace fossil molds/cavities up to 3/8", trace fossil casts up to 5/16" 86.0-88.1' - Same as 85.0-86.0' except fine grained, weak (R2), 10-20% inclusions of dark orange material up to 3/8" from 87.2-87.4' No Recovery 88.1-90.0' Limestone 90.0-92.2' - Same as 85.0-86.0' 92.2-94.0' - grayish orange, (10YR 7/4), fine grained, weak (R2), voids (up to 1/16") 0-5% from 92.2-93.2', trace fossils casts/cavities up to 3/8"x1-3/16" at 92.8' and at 93.2-93.7', very weak rock (R1) at 93.0-93.2' No Recovery 94.0-95.0' Limestone 95.0-96.3' - very pale orange, (10YR 8/2), very fine to fine grained, weak (R2), <5% voids up to 1/16" in size, dark laminae over 50% of surface at 95.5-95.7' 96.3-97.4' - Same as 95.0-96.3' except very weak (R1), voids (1/16"-1/8") up to 15%, fossil molds/cavities up to 3/8"x3/16" over 5-10% of rock, poorly to moderately fossiliferous with depth No Recovery 97.4-100.0'	End drilling for the day, 80.0' at 1800 hrs on 5/9/07 P. De Sa'Rego begins logging borehole SC-1 collected at 80.2-81.1' R5: 11 minutes
85			6	81.2, 81.3' - Fracture (2), 7 deg, rough, undulating			
-41.7			3	81.4-81.6' - Fracture zone			
			2	81.8' - Mechanical break, 60 deg, rough, undulating, tight			
			NR	82.1' - Fracture, horizontal, rough, planar, open <1/8"			
	R6-NQ 5 ft 62%	20		82.3' - Bedding plane, horizontal, smooth, planar		82.4, 82.75, 83.1, 83.4' - Fractures, <10 deg, smooth to rough, undulating 85.2-85.25' - Fractures (2), 20-30 deg, smooth to rough, planar 85.35, 85.55' - Fractures (2), horizontal, rough, planar 86.2' - Fracture, horizontal, rough, undulating, tight 86.3' - Mechanical break, 45 deg 86.9' - Fracture, horizontal, rough to smooth, undulating, tight 87.2-87.3' - Fracture zone 87.6-87.8' - Fracture zone, 30 deg, rough, stepped to undulating, possible mechanical break 90.0-90.6' - Fracture zone 91.1' - Mechanical break, <5 deg, rough, undulating, tight, possibility due to large cavity 91.65-92.2' - Fracture zone, 0-30 deg, rough, planar to undulating 93.0' - Fracture, horizontal, rough, undulating, 1/8" relief 93.2' - Fracture, horizontal, smooth, planar 93.6' - Fracture, horizontal, smooth, planar, 1/4" relief 95.05' - Fracture, horizontal, smooth, undulating, 3/16" relief 95.32-95.56' - Clay seam, horizontal, smooth, planar, contact on both sides, tight, some black staining on lower surface 95.8-96.0' - Fracture zone 96.2-96.3' - Fracture zone 96.65-96.95' - Mechanical break	Driller's Remark: "soft" zones 87.5-88.0', 89.5-90.0' R6: 5 minutes
85.0				82.4, 82.75, 83.1, 83.4' - Fractures, <10 deg, smooth to rough, undulating			
			4	85.2-85.25' - Fractures (2), 20-30 deg, smooth to rough, planar			
			4	85.35, 85.55' - Fractures (2), horizontal, rough, planar			
			>10	86.2' - Fracture, horizontal, rough, undulating, tight			
90	R7-NQ 5 ft 80%	37		86.3' - Mechanical break, 45 deg		86.9' - Fracture, horizontal, rough to smooth, undulating, tight 87.2-87.3' - Fracture zone 87.6-87.8' - Fracture zone, 30 deg, rough, stepped to undulating, possible mechanical break 90.0-90.6' - Fracture zone 91.1' - Mechanical break, <5 deg, rough, undulating, tight, possibility due to large cavity 91.65-92.2' - Fracture zone, 0-30 deg, rough, planar to undulating 93.0' - Fracture, horizontal, rough, undulating, 1/8" relief 93.2' - Fracture, horizontal, smooth, planar 93.6' - Fracture, horizontal, smooth, planar, 1/4" relief 95.05' - Fracture, horizontal, smooth, undulating, 3/16" relief 95.32-95.56' - Clay seam, horizontal, smooth, planar, contact on both sides, tight, some black staining on lower surface 95.8-96.0' - Fracture zone 96.2-96.3' - Fracture zone 96.65-96.95' - Mechanical break	SC-2 collected at 92.6-93.45' R7: 8 minutes
-46.7				86.9' - Fracture, horizontal, rough to smooth, undulating, tight			
			4	87.2-87.3' - Fracture zone			
			4	87.6-87.8' - Fracture zone, 30 deg, rough, stepped to undulating, possible mechanical break			
			NR	87.2-87.3' - Fracture zone			
90.0	R8-NQ 5 ft 48%	28		87.6-87.8' - Fracture zone, 30 deg, rough, stepped to undulating, possible mechanical break		87.2-87.3' - Fracture zone 87.6-87.8' - Fracture zone, 30 deg, rough, stepped to undulating, possible mechanical break 90.0-90.6' - Fracture zone 91.1' - Mechanical break, <5 deg, rough, undulating, tight, possibility due to large cavity 91.65-92.2' - Fracture zone, 0-30 deg, rough, planar to undulating 93.0' - Fracture, horizontal, rough, undulating, 1/8" relief 93.2' - Fracture, horizontal, smooth, planar 93.6' - Fracture, horizontal, smooth, planar, 1/4" relief 95.05' - Fracture, horizontal, smooth, undulating, 3/16" relief 95.32-95.56' - Clay seam, horizontal, smooth, planar, contact on both sides, tight, some black staining on lower surface 95.8-96.0' - Fracture zone 96.2-96.3' - Fracture zone 96.65-96.95' - Mechanical break	R8: 8 minutes
			>10	87.6-87.8' - Fracture zone, 30 deg, rough, stepped to undulating, possible mechanical break			
			5	87.2-87.3' - Fracture zone			
			1	87.6-87.8' - Fracture zone, 30 deg, rough, stepped to undulating, possible mechanical break			
			NR	87.6-87.8' - Fracture zone, 30 deg, rough, stepped to undulating, possible mechanical break			
95							
-51.7							
95.0							
100							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-12

SHEET 6 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723919.8 N, 457828.5 E (NAD83)

ELEVATION : 43.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing





ORIENTATION : Vertical

WATER LEVELS : 4.3 ft bgs on 5/17/07

START : 5/8/2007

END : 5/17/2007

LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.31 fms on 5/17/07										START : 5/9/2007										END : 5/17/2007										LOGGER : R. Gomez, R. Biley, T. Stewart									
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																																			
-56.7	R9-NQ 5 ft 68%	26	3	100.2' - Fractures (3), 40 deg, planar, small fragments			Limestone 100.0-103.4' - very pale orange, (10YR 8/2), very fine to fine grained, strong HCl reaction, extremely weak (R0), exhibits 8-15% fossil cast related open space, and there are sporadic small <1/4" shells, blebs of carbon are visible at 1% or less	No Recovery 103.4-105.0'	M. Faurote begins logging borehole																														
5			100.4' - Mechanical break, 2-5 deg, smooth, planar																																				
>10			101.2, 101.6' - Mechanical break, 0-2 deg, smooth, planar																																				
>10			101.8' - Fracture, 60 deg, rough, undulating, open, the fracture is sub parallel to another fracture that is not separated																																				
NR			101.9, 101.95' - Fractures (2), fragments are 1" in diameter																																				
105	R10-NQ 5 ft 69%	28		102.5, 102.65, 102.7' - Bedding plane (3), smooth, undulating					R9: 4 minutes																														
-61.7			>10	105.2-106.05' - Fracture zone, 0-3 deg, smooth, undulating, bedding plane separations, primarily depositional, 1/2" spacing			Limestone 105.0-108.45' - very pale orange, (10YR 8/2), very fine to fine grained, strong HCl reaction, extremely weak (R0), thin bedding, the organic content remains the same, but exhibits planar surface coating at 105.1', numerous 1/2" beds with distinctive partings in two zones. The thin bedded materials show 10-15% open space from fossil casts and molds. The more persistent, larger beds exhibit larger shell openings and small dissolution cavities up to 3/8"	No Recovery 108.45-110.0'		R10: 5 minutes																													
			2	106.7' - Mechanical break																																			
			>10	107.1' - Mechanical break																																			
			0	107.2-107.7' - Fracture zone, 0-3 deg, smooth, undulating, bedding plane separations, primarily depositional, 1/2" spacing																																			
	NR	108.0' - Mechanical break, horizontal																																					
110	R11-NQ 5 ft 69%	22	3	110.7-112.0' - Bedding plane, multiple partings with beds from 1/8" or less to 8" or more			No Recovery 113.45-115.0'	No Recovery 115.0-120.0'	There is a carbonate sand associated with some of the lost recovery zones. This limestone continues to at least 115.0'																														
-66.7			2																																				
			>10																																				
			>10																																				
			NR																																				
115	R12-NQ 5 ft 0%	0							R11: 6 minutes End drilling for the day at 17:51 on 5/10/07 D. Whitaker begins logging borehole																														
-71.7																																							
120									Core barrel slid back to bottom of hole																														
									Medium dark sand grains on outside of barrel may/may not not be carbonate																														
									R12: 5 minutes																														



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-12

SHEET 7 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723919.8 N, 457828.5 E (NAD83)

ELEVATION : 43.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.3 ft bgs on 5/17/07

START : 5/8/2007

END : 5/17/2007

LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.3 ft bgs of 3/17/07										START : 3/9/2007										END : 3/17/2007										LOGGER : R. Gomez, R. Birely, T. Stewart																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-12

SHEET 8 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723919.8 N, 457828.5 E (NAD83)

ELEVATION : 43.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.3 ft bgs on 5/17/07

START : 5/8/2007

END : 5/17/2007


LOGGER : R. Gomez, R. Bitely, T. Stewart

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.
-96.7	R17-NQ 5 ft 48%	10	9	140.1-140.9' - Bedding plane (8), <10 deg, slickensided to rough, undulating, open 1/2" or less		Limestone 140.0-141.0' - yellowish gray, (5Y 8/1), very fine to medium grained, strong HCl reaction, extremely weak to very weak (R0 to R1), trace small (1/16" or less) voids, few fossils, trace recrystallization, trace coarse grained 141.0-142.4' - yellowish gray, (5Y 8/1), very fine grained, moderate HCl reaction, medium strong (R3), <5% coverage of small (1/16") voids, 10% cavities and fossil molds, trace fossils No Recovery 142.4-145.0'	R17: 9 minutes
			>10	140.95-141.4, 142.0-142.4' - Fracture zone (2), rough, stepped to undulating, fine to coarse gravel sized fragments <2" diameter			
			>10				
145	R18-NQ 5 ft 90%	72	NR			Limestone 145.0-146.05' - yellowish gray, (5Y 8/1), very fine grained, moderate HCl reaction, weak (R2), 5% voids 1/16" over 50% of interval, no cavities or fossils 146.05-149.5' - yellowish gray, (5Y 8/1), very fine to medium grained, strong HCl reaction, very weak (R1), 20% coverage of voids 1/16", trace fossils and fossil molds No Recovery 149.5-150.0'	SC-3 collected at 147.0-148.0'
-101.7			2	145.6' - Fractures (2), 60 deg, smooth and undulating, rough and stepped, perpendicular fractures, open <1/8"			
			3	146.0' - Mechanical break			
			0	146.3-146.9' - Bedding plane (5), <10 deg, slickensided to rough, undulating, open <1/2"			
			1	148.0' - Mechanical break			
	150	150.0	3	148.85-149.45' - Bedding plane (4), <10 deg, slickensided to rough, undulating, open <1/2"		Bottom of Boring at 150.0 ft bgs on 5/17/2007	Total depth is 150.0'
-106.7			NR				



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-13
SHEET 1 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723995.1 N, 457903.5 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 6/05/07 START : 6/5/2007 END : 6/6/2007 LOGGER : R. McComb

WATER LEVELS : 2.0 TDS ON 9/3/07		START : 9/3/2007		END : 9/3/2007		LOGGERS : T. MCCLUNG	
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		
42.2	0.0	0.9	SS-1	2-2-2 (4)	Topsoil 0.0-0.1' - dark gray, (N2), moist, very fine to fine grained, organic fines, silica sand		
	1.5				Poorly Graded Sand With Organics (SP) 0.1-0.9' - light to medium gray, (N7 to N6), moist, very loose, very fine to fine grained, trace nonplastic fines, 10-15% organic fines and rootlets, decreasing with depth, silica sand		
5	5.0						
37.2		0.6	SS-2	1-1-0 (1)	Silty Sand (SM) 5.0-5.6' - moderate yellowish brown, (10YR 5/4), wet, very loose, no HCl reaction, 10% fines, trace black (non carbonate) gravel, silica sand		
	6.5						
10	10.0						
32.2		1.1	SS-3	29-30-34 (64)	Silt (ML) 10.0-11.1' - grayish orange, (10YR 7/2), wet, hard, rapid dilatancy, mild HCl reaction, trace very fine-grained sand, all carbonate		
	11.5						
15	15.0	0.1	SS-4	50/1 (50/1")	Limestone Fragments 15.0-15.1' - grayish orange, (10YR 7/2), mild HCl reaction, extremely weak (R0), coarse sand-sized pyrite nodules		
27.2							
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-13
SHEET 2 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723995.1 N, 457903.5 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 6/05/07 START : 6/5/2007 END : 6/6/2007 LOGGER : R. McComb

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
22.2	20.0	1.2	SS-5	29-36-26 (62)	Silty Gravel With Sand (GM) 20.0-21.2' - grayish orange, (5Y 8/4), wet, very dense, fine to coarse grained, mild HCl reaction, 30% fine to coarse limestone gravel, 30% nonplastic fines		Some rig chatter from 20-25'
	21.5						
25	25.0						
17.2		0.6	SS-6	5-11-14 (25)	Sandy Silt (ML) 25.0-25.6' - grayish yellow, (5Y 8/4), wet, very stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 25-30% fine to medium grained sand, trace fine gravel, all carbonate		
	26.5						
30	30.0						
12.2	30.2	0.0	SS-7	50/2 (50/2")	No Recovery 30.0-30.2'		
35	35.0						
7.2		1.3	SS-8	32-43-50/5 (93/11")	Silty Sand With Limestone Fragments (SM) 35.0-36.3' - grayish yellow, (5YR 8/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 20-25% nonplastic fines, 30% fine to coarse limestone gravel, organic black staining on some rock fragments, all carbonate		Hard drilling at 38'
	36.4						
	40.0						
	40.2	0.1	SS-9	50/2.5 (50/2.5")	Limestone Fragments 40.0-40.1' - light olive gray, (5Y 5/2), mild HCl reaction, extremely weak (R0)		
40							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-13

SHEET 3 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723995.1 N, 457903.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 6/05/07

START : 6/5/2007

END : 6/6/2007

LOGGER : R. McComb

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.
2.2	40.0		10	40.0-40.35' - Fracture zone, limestone fragments, various orientations		Limestone 40.0-41.7' - dusky yellow, (5Y 6/4), mild to moderate HCl reaction, weak (R2), fossiliferous (casts/molds) with some cavities generally 3/8"x3/16", voids up to 1/16" over 25%-30% of rock surface, light olive gray intraclasts, suspended in fine grained matrix (intraclasts typically 3/8"x3/16" or less). No Recovery 41.7-45.0'	At 40.0' switched over to NQ rock coring R1: 3 minutes
			1	40.35' - Bedding plane or mechanical break, horizontal, rough, planar, loose			
	R1-NQ 5 ft 34%	20	NR	41.35' - Fracture, horizontal to 40 deg, rough, stepped, loose			
45 -2.8	45.0		4	45.1' - Fracture, 70 deg, rough, planar, tight		Limestone 45.0-49.4' - Same as 40.0-41.7' except very weak (R1)	Driller's Remark: 46.0-48.0' very soft R2: 3 minutes
			0	45.5' - Bedding plane, horizontal, undulating, loose			
	R2-NQ 5 ft 88%	69	2	45.65' - Fracture, 60 deg, rough, stepped, loose			
			1	45.9' - Fracture, 50 deg, rough, undulating, loose		No Recovery 49.4-50.0'	
			0	47.2' - Bedding plane, horizontal to <5 deg, rough, stepped, loose			
			NR	47.5, 47.8' - Fractures (2), horizontal to >80 deg, rough, undulating, extending into incipient fracture trace that dies out			
50 -7.8	50.0		2	48.75' - Bedding plane, <5 deg, rough, undulating, loose, intersected by incipient fracture that is nearly vertical and dies out at end of R2		Limestone 50.0-53.5' - Same as 40.0-41.7' except cavities more common up to 3-5%, fossiliferous cast/molds becoming more fossiliferous with depth, extremely weak zone (R0) from 52.65 to 56.85', incipient fracture from 50.9-51.2', inclined 70 degrees.	Driller's Remark: 52.5-53.0' soft
			1	50.35' - Fracture, 20 deg, rough, undulating, tight			
	R3-NQ 5 ft 82%	72	1	50.7' - Fracture, 70 deg, rough, stepped/undulating, tight, black organic staining on 1-3% surface			
			3	51.8' - Fracture or mechanical break, <5 deg, rough, stepped, loose		53.5-54.1' - yellowish gray, (5Y 7/2), fine to very fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids covering 10%-15%, cavities rare (<3/16"x3/16"). No Recovery 54.1-55.0'	Driller's Remark: 53.5-54.5' soft R3: 5 minutes
			NR	52.65' - Fracture or mechanical break, <5 deg, rough, stepped, tight			
				53.01' - Fracture, 40 deg, rough, undulating, tight			
55 -12.8	55.0		1	53.3-53.45' - Fracture zone, rough, stepped to undulating, 60-70 deg to horizontal, tight to loose		Limestone 55.0-55.9' - Same as 53.5-54.1' 55.9-58.5' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 5/6), mild HCl reaction, weak (R2), with thin wispy laminae of black organic (N1) material, fossiliferous (casts and molds), voids covering 35-40% of surface and cavities generally less than 3/16"x3/16". No Recovery 58.5-60.0'	SC-1 collected at 55.0-55.95'
			>10	55.95' - Bedding plane or mechanical break, horizontal to <5 deg, rough, stepped, loose			
	R4-NQ 5 ft 70%	18	10	56.38-56.7' - Fracture zone, gravel-sized limestone rock fragments, various orientations			
			2	56.9-57.05' - Fracture zone, various orientations			R4: 5 minutes
			NR	57.4-57.6' - Fracture zone, same as 56.38-56.7'			
60	60.0						



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-13	SHEET 4 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723995.1 N, 457903.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis

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

WATER LEVELS : 2.0 ft bgs on 6/05/07 START : 6/5/2007 END : 6/6/2007 LOGGER : R. McComb

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.
-17.8	R5-NQ 5 ft 69%	55	3	57.9-58.25' - Fracture zone, horizontal to 60 deg, rough, with bedding plane fractures at 58.15' and 58.25', inclined fracture from 57.9-58.15', rough, undulating to stepped, loose.		Limestone 60.0-63.45' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 4/4), fine to very fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), fossiliferous (casts/molds), voids up to 1/16" covering up to 50-60% surface, extremely weak rock (R0) from 60.1' to 62.5' with some silt and sand-sized limestone rock fragments, some voids up to 3/8-3/4" x 3/8-3/4". No Recovery 63.45-65.0'	Driller's Remark: 62.0-64.0' very soft Driller's Remark: All fairly soft to 64.0' R5: 4 minutes
			0	60.5, 60.6, 60.7' - Bedding plane (3), horizontal to <5 deg, rough, stepped, loose			
			10	62.15-62.55' - Fracture zone, rough, extremely soft rock, some bedding plane fractures horizontal to vertical, undulating/stepped, tight to loose			
			0				
			NR				
65	R6-NQ 5 ft 88%	26	4	65.1, 65.2' - Bedding plane (2), horizontal to <5 deg, rough, stepped, loose		Limestone 65.0-69.4' - Same as 60.0-63.45' except extremely weak rock (R0) (similar to 62.1-62.5') from 66.0-66.7' and 69.0-69.4'. No Recovery 69.4-70.0'	R6: 4 minutes Driller's Remark: 69.5-70.0' very soft
-22.8			2	65.5' - Bedding plane, <5 deg, rough, loose			
			>10	65.8, 66.35' - Bedding plane (2), <5 deg, rough, loose			
			0	66.7- 67.7' - Fracture zone, >80 deg to vertical, series of several fractures, rough, undulating to stepped, loose			
			1	69.0-69.1' - Fracture zone, horizontal to 60 deg, rough, undulating, tight			
			NR				
70	R7-NQ 5 ft 62%	16	1	70.1-70.15' - Fracture zone, horizontal to 60 deg, rough, stepped, loose		Limestone 70.0-73.1' - light olive gray, (5Y 5/2), moderate HCl reaction, weak to medium strong (R2 to R3), fossiliferous (casts and molds) with voids up to 1/16" over 15-20% of surface and occasional cavities, some thin black organic laminae (e.g. at 72.25'), fine to very fine grained. No Recovery 73.1-75.0'	SC-2 collected at 70.15-71.1' Driller's Remark: 71.5-72.0' soft Driller's Remark: 73.0-74.5' very soft R7: 4 minutes
-27.8			3	71.15' - Fracture, horizontal to 40 deg, rough, stepped, loose			
			10	71.35' - Mechanical break or fracture, 50 deg, rough, undulating stepped, tight			
			NR	71.7-72.3' - Fracture zone, vertical to >80 deg, tapering from mid-point of core to one side			
			NR	72.3, 72.5' - Fractures (2), horizontal, rough, stepped, loose			
			NR	72.72' - Bedding plane or mechanical break, horizontal, rough, undulating, loose			
75	R8-NQ 5 ft 64%	30	2	72.73-73.1' - Fracture zone, horizontal to >80 deg, rough, undulating, loose, with horizontal fracture at 72.9' which propagates 1/2 diameter of core		Limestone 75.0-76.5' - Same as 70.0-73.1' except with lithoclasts from 76.3-76.5'; clasts up to 3/8" in length; medium gray (N5), mild reaction to HCl, rounded clasts. 76.5-77.3' - medium dark gray, (N4), very fine grained, moderate HCl reaction, medium strong (R3), trace fossil casts/molds, zones of thinly laminated limestone with <1.0% voids grading to zones with voids up to 10-15%; cavities rare, generally <3/8" in diameter. 77.3-78.2' - Same as 75.0-76.5' No Recovery 78.2-80.0'	End on 6/5/07, water approx. 2.0' below ground surface Start on 6/6/07, water approx. 2.0' below ground surface Incipient fracture 75-75.6' R8: 8 minutes
-32.8			>10	75.7' - Fracture, 70 deg, rough, undulating/stepped, tight			
			3	75.85' - Bedding plane, horizontal to 70 deg, rough, planar, loose			
			1	76.3' - Bedding plane, horizontal, rough, planar			
			NR	76.4-76.9' - Fracture zone, gravel (limestone) various orientations, generally planar to undulating, rough to smooth, loose			
			NR	77.3' - Bedding plane, rough, undulating to stepped, tight			
80							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-13

SHEET 5 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723995.1 N, 457903.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

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

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


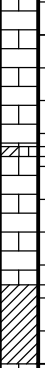
ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 6/05/07

START : 6/5/2007

END : 6/6/2007

LOGGER : R. McComb

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				
-37.8	R9-NQ 5 ft 96%	82	0	77.78' - Bedding plane, <5 deg, rough to smooth, loose		Limestone 80.0-81.2' - fine grained, moderate to strong HCl reaction, medium strong (R3), trace fossils becoming more common with depth (molds/casts), voids grading from 10% to 20% with depth, cavities becoming more common with depth up to 3/8"x3/8". Clay (CL) 81.2-81.3' - black, wet, soft, rapid dilatancy, (carbonaceous, organic layer)	Driller's Remark: 81.5-82.5' soft	
3			77.9' - Bedding plane, <5 deg, rough, loose					
0			78.05' - Fracture, 60 deg, rough, planar					
0			81.2-81.3' - Fracture zone, <5 deg, rough, undulating, tight with 0.05' black carbonaceous (organic) clay lining, soft, wet					
0			81.6' - Bedding plane, horizontal to <5 deg, smooth, stepped to planar, loose					
85	R10-5 ft 80%	71	NR	81.9' - Bedding plane, <5 deg, rough, undulating, loose		Limestone 81.3-81.9' - pale yellowish brown, (10YR 6/7), fine grained, mild HCl reaction, becoming thinly laminated with depth and variegated (mottled), voids (15-20%) decreasing with depth. 81.9-84.8' - Same as 80.0-81.2' except cavities up to 1" in diameter. No Recovery 84.8-85.0' Limestone 85.0-87.55' - Same as 81.9-84.8' 87.55-89.0' - yellowish gray, (5Y 7/2), mild HCl reaction, medium strong (R3), fine grained with some medium to coarse grained interclasts, fossiliferous, (casts/molds) very common, cavities up to 1" in diameter, some cavities filled with black organic material, voids and cavities over 40-50% of surface. No Recovery 89.0-90.0' Limestone 90.0-91.4' - Same as 87.55-89.0' 91.4-91.7' - white to very light gray, (N9 to N8), very fine grained, strong HCl reaction, extremely weak (R0), voids over 3%-5%, clayey. Silty Clay (CL-ML) 91.7-91.85' - white, (N9), moist, soft, no to slow dilatancy, cohesive. Limestone 91.85-92.3' - Same as 91.4-91.7' except gradational with unit below. 92.3-93.8' - white to very light gray, (N9 to N8), very fine grained, strong HCl reaction, medium strong (R3), fossils rare to absent, voids <1/16" over 1%-3%, rare cavities (3/8" x 3/8") with dark stain. Clay (CL) 93.8-93.85' - dark brown, dry, no dilatancy, strong HCl reaction, friable. No Recovery 93.85-95.0'	SC-3 collected at 83.35-84.40' R9: 6 minutes	
-42.8			0	88.0' - Bedding plane or mechanical break, horizontal, rough, undulating, loose				
			0	88.55-88.75' - Fracture zone, horizontal, rough, undulating, gravel sized fragments, loose				
			0					
			10					
90	R11-NQ 5 ft 77%	53	NR	90.0-90.35' - Fracture zone, limestone rock fragments, various orientations		Driller's Remark: 100% loss of water Driller's Remark: 88.5-89.5' soft R10: 7 minutes		
-47.8			>10	90.35' - Fracture, horizontal, smooth, planar to undulating, loose				
			1	90.5' - Bedding plane or mechanical break, horizontal, rough, undulating/stepped, loose				
			1	91.4' - Bedding plane, horizontal to 50 deg, rough, undulating, loose				
			0	92.07' - Bedding plane or mechanical break, 10 deg, smooth, planar, tight				
95	R12-NQ 5 ft 95%	26	NR			Clay (CL) 93.8-93.85' - dark brown, dry, no dilatancy, strong HCl reaction, friable. No Recovery 93.85-95.0'	R11: 9 minutes	
-52.8			5	95.17' - Fracture, >80 deg, rough, stepped, loose				
			10	95.4, 95.6, 95.72, 95.9' - Fractures (4), horizontal to 30 deg, rough, planar to undulating, loose to tight				
			10	96.0' - Fracture, horizontal to <10 deg, rough, planar, loose				
			3	96.2-96.75' - Fracture zone, 70 to 80 deg, rough, undulating, loose				
			1	97.0' - Fracture, horizontal, smooth, undulating, loose				
				97.05-97.5' - Fracture zone, vertical to 0 deg, rough, loose				
100						R12: 7 minutes		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-13

SHEET 6 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723995.1 N, 457903.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 6/05/07

START : 6/5/2007

END : 6/6/2007

LOGGER : R. McComb

WATER LEVEL: 20.0 ft (6.1 m) DATE: 03/20/2017		DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY		COMMENTS			
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	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					
-57.8	R13-NQ 5 ft 100%	34	NR	97.6, 97.9' - Fractures (2), horizontal, rough, planar, loose		Limestone 95.0-96.0' - Same as 92.3-93.8' except with voids becoming more common (up to 5-10%) with depth. 96.0-99.75' - light gray, (N8), very fine to fine grained, strong HCl reaction, weak (R2), fossiliferous (casts/molds) common, possible intraclasts, gastropod casts and molds common, voids and cavities over 40%-50% of rock surface. No Recovery 99.75-100.0' Limestone 100.0-105.0' - Same as 96.0-99.75' except fossils become less common along with voids and cavities; cavities and voids common from 100.0'-100.9' and from 102.2'-103.0', intervals in between consist of very fine grained limestone, with void and cavities over 10%-15% of surface. No Recovery 105.0-107.5'	R13: 7 minutes			
			4	98.0' - Fracture, 40 to 50 deg, rough, planar, loose						
			10	98.2, 98.4' - Fractures (2), horizontal, rough, undulating to stepped, loose						
			1	99.05' - Fracture, <10 deg, rough, stepped, loose						
			>10	100.25, 100.35, 100.6' - Bedding plane or mechanical break (3), <5 deg, rough to smooth, undulating						
105	R14-NQ 5 ft 50%	16	10	100.6-100.95' - Fracture, 70 to 80 deg, smooth, undulating, tight					Poorly Graded Sand (SP) 107.5-108.35' - moderate yellowish brown, (10YR 5/4), wet, loose, fine grained, moderately cohesive, moderate to well sorted, subangular to subrounded, trace to 5% heavy dark minerals, sharp contact with underlying limestone, sand is siliceous Limestone 108.35-110.0' - light gray to white, (N9 to N8), fine to very fine grained, very strong HCl reaction, very weak to weak (R1 to R2), with extremely weak (R0) zone from 109.5'-109.6' containing some clay, fossiliferous (very small echinoids) and other fossils, voids and cavities over 5%-10% with percentage increasing with depth. 110.0-113.7' - yellowish gray, (5Y 7/2), very fine grained, very strong HCl reaction, very weak to weak (R1 to R2), fossils rare, voids generally less than 3/16" over 1%-2% of rock, occasional cavity (worm burrow), 3/8 x 3/8", matrix very "chalk-like". No Recovery 113.7-115.0' Limestone 115.0-116.5' - Same as 110.0-113.7' No Recovery 116.5-118.5'	R14: 8 minutes
-62.8			NR	101.1-101.57' - Fracture zone, horizontal to >80 deg, producing fine gravel limestone rock fragments						
			0	102.35' - Fracture or mechanical break, horizontal, rough, stepped, tight						
			>10	103.2-103.6' - Fracture zone, vertical to <5 deg, rough, undulating to stepped, loose to tight						
			10	108.35-109.0' - Fracture zone, vertical and horizontal planes, tight						
110	R15-NQ 5 ft 74%	0	5	109.5-109.6' - Fracture zone, horizontal to >80 deg			R15: 4 minutes			
-67.8			9	110.1, 110.38, 110.58, 110.63, 110.78, 111.02, 111.05, 111.2, 111.35, 111.4, 111.5, 111.7, 111.75, 111.8, 112.15, 112.28, 112.4, 112.5, 112.55, 112.62, 112.9, 113.1, 113.15, 113.2, 113.25, 113.5' - Bedding plane or mechanical break (26), horizontal, rough, planar to undulating, and loose, vertical fractures between horizontal discontinuities at 111.35-111.5' and 112.9-113.25'						
			10							
			10							
			NR							
115	R16-NQ 5 ft 57%	10	5	110.0-113.7' - yellowish gray, (5Y 7/2), very fine grained, very strong HCl reaction, very weak to weak (R1 to R2), fossils rare, voids generally less than 3/16" over 1%-2% of rock, occasional cavity (worm burrow), 3/8 x 3/8", matrix very "chalk-like". No Recovery 113.7-115.0' Limestone 115.0-116.5' - Same as 110.0-113.7' No Recovery 116.5-118.5'						Driller's Remark: 117.5-118.5' Suspect sand bed, barrel plugged up, no circulation, tried to stop pump, barrel stalled, also evidenced by decreasing core diameter suggesting abrasion by sand
-72.8			10	115.15, 115.3, 115.36, 115.65, 115.9, 116.1, 116.25, 116.3, 116.4, 116.47' - Bedding plane (10), horizontal, rough, planar to slightly undulating, tight						
			NR							
			10	118.5' - Bedding plane, <5 deg, rough, undulating, loose						
			4	119.17, 119.32, 119.6, 119.8' - Bedding plane (4), smooth to rough, planar to slightly undulating, loose						
120										



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-13

SHEET 7 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723995.1 N, 457903.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 6/05/07

START : 6/5/2007

END : 6/6/2007

LOGGER : R. McComb

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.
-77.8	R17-NQ 5 ft 78%	32	4	120.1, 120.3, 120.47, 120.8, 121.04, 121.57, 121.78, 122.2, 122.37, 122.62, 123.21, 123.3, 123.36, 123.55, 123.8' - Bedding plane or mechanical break (15), horizontal to <5 deg, rough, planar to undulating, loose		Limestone 118.5-120.0' - yellowish gray, (5Y 7/2), fine to very fine grained, strong HCl reaction, weak (R2), fossiliferous with numerous casts/molds (gastropods, pelecypods, echinoids); cavities and voids over 20%-30% of surface.	R17: 7 minutes
			3			120.0-120.6' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, weak (R2), fossiliferous (casts/molds) unfilled burrowed cavities/voids over 70%-80%, cavities up to 3/8" x 3/8".	
			4	122.44' - Bedding plane, horizontal, smooth, within thin laminae, loose		120.6-123.2' - yellowish gray, (5Y 7/2), fine to very fine grained, strong HCl reaction, very weak to weak (R1 to R2), fossils rare, voids and cavities rare, some mottling, very thinly laminated from 122.4 to 122.6'. 123.2-123.9' - Same as 120.0-120.6'	
			5			No Recovery 123.9-125.0'	
			NR			Limestone 125.0-129.05' - Same as 120.6-123.2' except laminations absent.	
125 -82.8	R18-NQ 5 ft 81%	0	7	125.05, 125.1, 125.22, 125.27, 125.55, 125.7, 125.97, 126.25, 126.43, 126.52, 126.55, 126.7, 126.85, 126.97, 127.1, 127.32, 127.35, 127.5, 127.82, 127.92, 128.0, 128.1, 128.14, 128.2, 128.25, 128.32, 128.37, 128.42, 128.48, 128.55, 128.67, 128.78, 128.9' - Bedding plane or mechanical break (33), horizontal, rough to smooth, planar to undulating, generally loose; at 126.7' black carbonaceous coating on 40% of surface, fracture zone 127.35-127.5'		No Recovery 129.05-130.0'	R18: 5 minutes
			7				
			10				
			>10				
			NR	128.97, 128.99' - Bedding plane or mechanical break (2), horizontal, rough to smooth, planar to undulating, generally loose			
130 -87.8	R19-NQ 5 ft 84%	24	4	130.35, 130.54, 130.75, 130.85, 131.05, 131.17, 131.25, 131.39, 131.5, 131.67, 131.71, 131.85, 131.99, 132.32, 132.85' - Bedding plane or mechanical break (15), horizontal to <5 deg, smooth to rough, planar to undulating, loose		Limestone 130.0-131.3' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), fossiliferous with numerous casts/molds, echinoids, gastropods, cavities and voids up to 40% increasing in depth, some intraclasts present.	R19: 4 minutes
			9			131.3-132.0' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, "grainy" appearance, thinly laminated, voids and cavities rare.	
			2			132.0-133.6' - Same as 130.0-131.3' except very weak (R1), medium to coarse grained (coarse particularly at 132.0' to 132.3'), similar to coquina, very fossiliferous.	
			3	133.0-133.3' - Fracture, 80 deg, rough, undulating, loose 133.5' - Fracture, horizontal to 80 deg, rough, stepped, loose		133.6-134.2' - Same as 131.3-132.0' except very thinly laminated, voids/cavities rare to absent.	
			NR			No Recovery 134.2-135.0'	
135 -92.8	R20-NQ 5 ft 44%	7	>10	135.2-135.9' - Fracture zone, horizontal to 90 deg, smooth to rough, undulating to planar, loose		Limestone 135.0-135.2' - Same as 131.3-132.0' 135.2-137.03' - Same as 130.0-131.3' except fine grained, very weak (R1), fossiliferous, very thinly laminated at base with organics.	R20: 4 minutes
			7	136.06, 136.13, 136.24, 136.42, 136.8, 136.93, 136.97, 137.2' - Bedding plane or mechanical break (8), horizontal, rough to smooth, undulating to planar, loose			
			1				
			NR				
140	140.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-13

SHEET 8 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723995.1 N, 457903.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 6/05/07

START : 6/5/2007

END : 6/6/2007

LOGGER : R. McComb

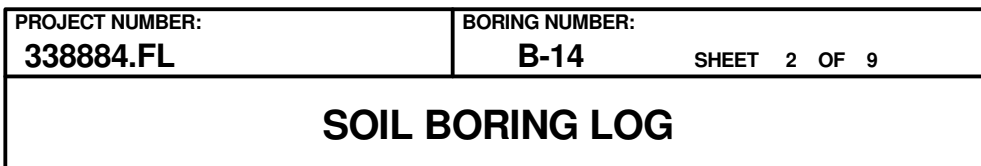
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, 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.
-97.8	R21-NQ 5 ft 89%	31	4	140.4, 140.45, 140.62, 140.76, 141.02, 141.1' - Bedding plane or mechanical break (6), horizontal, smooth, planar, loose		137.03-137.2' - medium gray, (N5), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), few voids.	R21: 6 minutes
			10	141.25-141.6' - Fracture zone, various orientations, limestone gravel		No Recovery 137.2-140.0' Limestone	
			2	141.7, 141.85, 142.0, 142.25, 143.0, 143.15, 143.2, 143.28' - Mechanical break or fractures (8), horizontal to 60 deg, rough, stepped, tight		140.0-141.3' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), fossils rare to absent; "chalk-like" texture, cavity infilling or supported by interclasts in fine grained matrix, grains up to 3/16" in diameter and dark gray and white (N9) in color, voids <1%.	
			5			141.3-144.5' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), bioturbated with some cavities >1" long and >1" deep, some cavities infilled, some cavities lined with dark gray (N3) coatings, mottled texture with area of void-free limestone and zones of limestone with up to 60%-70% voids, fossiliferous in casts/molds of pelecypods and gastropods.	
			>10	144.0-144.45' - Fracture zone, limestone gravels, orientations unknown		No Recovery 144.5-145.0' Limestone	
145	R22-NQ 5 ft 58%	0	NR			145.0-146.15' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), thinly laminated, fossils rare to absent, some voids up to 1/16" or less over 1%-3% of rock, cavities rare (3/8"x3/8"), sharp contact with underlying limestone.	R22: 7 minutes
-102.8			10	145.1' - Fracture, horizontal, smooth, undulating, loose		146.15-147.9' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, weak (R2), very friable and loose (especially at 146.4' to 146.7'), with extremely weak (R0) rock at 146.4'-146.7', trace fossils, voids generally less than 1/16" over 60%-70% producing a grainy texture.	
			>10	145.2' - Fracture, 60 deg, smooth, stepped, tight		No Recovery 147.9-150.0'	
			1	145.6-145.88' - Fracture zone, 85-90 deg along outside 1/5th of core, truncated at 145.88', split at 157.7' by <5 deg fracture		Bottom of Boring at 150.0 ft bgs on 6/6/2007	
			NR	145.93' - Fracture, horizontal, smooth, undulating, loose			
	150	150.0	NR	146.05-146.45' - Fracture zone, vertical, rough, planar, tight, cross cut by horizontal fracture at 146.15' which propagates halfway through core			
				146.45-146.7' - Fracture zone			
-107.8				146.7' - Fracture, <5 deg, rough, undulating, loose			
				146.85, 146.95, 147.05' - Bedding plane or mechanical break (3), horizontal to <5 deg, rough, undulating to stepped, loose			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-14
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724122.8 N, 458024.1 E (NAD83)
 ELEVATION : 41.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 7.0 ft bgs on 6/5/07 START : 6/5/2007 END : 6/6/2007 LOGGER : B. Ellis, D. Thomas

WATER LEVELS : 7.0 (RDS) 6/5/07			START : 6/5/2007			END : 6/5/2007			LOGGER : D. Ellis, D. Thomas		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS				
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)								
41.7	0.0	0.8	SS-1	1-1-4 (5)	Topsoil 0.0-0.3' - grayish black to black, (N2 to N1), moist, organic fines and roots, wood chips Poorly Graded Sand With Silt (SP-SM) 0.3-0.75' - yellowish gray, (5Y 7/2), moist, loose, very fine to fine grained, trace organics decreasing with depth, 5% nonplastic fines, sand is silica		Start SPT at 08:15, 6/5/07				
	1.5										
5	5.0										
36.7		1.1	SS-2	3-4-6 (10)	Sandy Fat Clay (CH) 5.0-5.4' - greenish gray, (5GY 6/1), moist, medium stiff, medium to high plasticity, slow dilatancy, 25-30% very fine to fine grained silica sand Silt (ML) 5.4-6.1' - dark yellowish orange, (10YR 6/6), wet, stiff, nonplastic, very rapid dilatancy, moderate HCl reaction, trace very fine grained sand, all carbonate material		Possible water table encountered at 7'				
	6.5										
10	10.0										
31.7		1.3	SS-3	5-5-2 (7)	Sandy Silt (ML) 10.0-11.3' - dark yellowish orange, (10YR 6/6), wet, nonplastic, very rapid dilatancy, moderate HCl reaction, 25-30% fine to medium grained sand, all carbonate material		Driller's Remark: Lost circulation at 12' Driller's Remark: Hard formation Driller's Remark: Chatter throughout run from 10-15' Driller's Remark: Soft drilling at 12.5' Driller's Remark: Circulation loss at 13', hard drilling				
	11.5										
15	15.0										
26.7		1.5	SS-4	16-3-19 (22)	Sandy Silt (ML) 15.0-15.5' - Same as 10.0-11.3' Limestone Fragments 15.5-16.5' - grayish orange, (10YR 7/4), mild to moderate HCl reaction, coarse sand-size to coarse gravel-size limestone fragments, fossiliferous		4-inch casing set at 15'				
	16.5										
20											



ELEVATION : 41.7 ft (NAVD88)

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 7.0 ft bgs on 6/5/07

START : 6/5/2007

END : 6/6/2007

LOGGER : B. Ellis, D. Thomas

APPENDIX 2BB-511



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-14

SHEET 3 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724122.8 N, 458024.1 E (NAD83)

ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 7.0 ft bgs on 6/5/07

START : 6/5/2007

END : 6/6/2007

LOGGER : B. Ellis, D. Thomas

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			
21.0	R1-HQ 5 ft 48%	35	4	21.0-21.3' - Fracture zone, fine to coarse grained subangular gravel		Limestone 21.0-21.3' - grayish orange, (10YR 7/4), mild to moderate HCl reaction 21.3-23.0' - dusky yellow, (5Y 6/4), mild to moderate HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 25% of rock surface, numerous elongate to platy cavities/molds from 1/4" up to 3/4" long, trace inorganic inclusions 23.0-23.4' - grayish orange, (10YR 7/4), strong HCl reaction, very weak (R1), voids (1/16") over 20% of rock surface, numerous fossil cavities/molds 1" in diameter or larger No Recovery 23.4-26.0' Limestone 26.0-26.7' - dusky yellow, (5Y 6/4), fine grained, strong HCl reaction, very weak (R1) 26.7-29.2' - dusky yellow to medium yellowish brown, (5Y 6/4 to 10YR 5/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (1/16") over 5-25% of rock surface, some 1/4" round cavities No Recovery 29.2-31.0'	Cavities at 21.6', 21.9', 22.6'
			1	21.3' - Fracture, 10 deg, rough, planar			
			3	23.0' - Fracture, 10 deg, rough, stepped, loose			
			NR	23.0-23.1' - Fracture zone			
25 16.7	R2-HQ 5 ft 64%	40	1	26.7' - Fracture or mechanical break, horizontal, smooth, planar		Limestone 31.0-33.1' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak to strong (R2 to R4), voids (1/16") over 10% of rock surface, few elongate cavities up to 1/4", transitions from strong to weak rock with depth, accompanied by increase to voids over 20% of rock surface 33.1-33.6' - Same as 31.0-33.1' lower portion except weak (R2) 33.6-35.2' - Same as 31.0-33.1' upper portion except strong (R4), 10% voids No Recovery 35.2-36.0' Limestone 36.0-36.8' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), voids (1/16") over 10-20% of rock surface, few elongate cavities up to 1/4" 36.8-37.4' - Same as 36.0-36.8' except extremely weak to weak (R0 to R2) 37.4-38.8' - Same as 36.0-36.8' except medium strong (R3) 38.8-39.3' - Same as 36.8-37.4'	R1: Run time not reported
26.0			1				
			2	27.7' - Fracture, 35 deg, rough, undulating, (almost smooth)			
			1	28.0' - Fracture, horizontal, rough, undulating			
			NR	28.6' - Fracture or mechanical break, horizontal, smooth, planar			
30 11.7	R3-HQ 5 ft 84%	40	1	29.05' - Fracture, 30 deg, smooth, planar		Cavity at 28.65'	R2: 3 minutes
			2				
			3	31.9' - Fracture, 10 deg, smooth, planar			
			2	32.2' - Fracture, 45 deg, smooth, undulating			
			3	32.7' - Fracture, vertical, rough, undulating			
			NR	33.0-33.85' - Fracture zone, fine- to coarse-grained gravel			
35 6.7	R4-HQ 5 ft 74%	45	2	33.9' - Fracture, 70 deg, rough, undulating		R3: 3 minutes	R4: 2 minutes
			2	34.2' - Fracture, 10 deg, rough, planar			
			0	34.8' - Fracture, 80 deg, rough, undulating			
			NR				
			2	36.4' - Fracture, 60 deg, rough, undulating			
			2	36.8, 37.1' - Fractures (2), horizontal, smooth, planar			
40 1.7			2	37.45' - Fracture, 70 deg, rough, undulating		Cavities at 37.2', 38.0'	
			2	38.0' - Fracture, 10 deg, smooth, undulating			
			NR	38.8, 39.3' - Fractures (2), horizontal, smooth, planar			
41.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-14	SHEET 4 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724122.8 N, 458024.1 E (NAD83)

ELEVATION : 41.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 7.0 ft bgs on 6/5/07 START : 6/5/2007 END : 6/6/2007 LOGGER : B. Ellis, D. Thomas

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.
45 -3.3	R5-HQ 5 ft 62%	20	>10	41.0-41.3' - Fracture zone		39.3-39.7' - Same as 36.0-36.8' except weak (R2)	R5: 2 minutes
			4	41.3' - Fracture zone, 5 deg, rough, planar, angular gravel (1/2 to 1 1/2")		No Recovery 39.7-41.0' Limestone	
			2	41.6' - Fracture zone, 20 deg, rough, planar, open		41.0-42.2' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), voids (1/16") over 20-25% of rock surface, elongate fossil molds up to 1/5" over 5% of rock surface, few cavities up to 1/4", some gray to black inclusions	
			0	41.7' - Fracture zone, 70 deg, rough, planar, fracture terminates at 41.6' and 41.85', open		42.2-43.4' - Same as 41.0-42.2' except very weak to extremely weak (R1 to R0)	
46.0			NR	41.85' - Fracture zone, 30 deg, rough, stepped, fracture with some fragmentation, open		43.4-44.1' - Same as 41.0-42.2'	R6: 2 minutes
				42.3-42.7' - Clay seam, non-indurated zone bounded by weakly indurated rock		No Recovery 44.1-46.0' Limestone	
				42.9-43.15' - Clay seam, non-indurated zone bounded by weakly indurated rock		46.0-49.9' - moderate yellowish brown, (10YR 5/4), fine grained, mild to moderate HCl reaction, very weak to medium strong (R1 to R3), voids (1/16") over 20% of rock surface	
				43.4, 43.9' - Fractures (2), horizontal, rough, undulating, open		46.4-47.45' - Same as 46.0-49.9' except very weak (R1)	
50 -8.3	R6-HQ 5 ft 78%	62	1	46.4' - Fracture, 10 deg, rough, undulating, open to tight		47.45-48.6' - Same as 46.0-49.9' except medium strong (R3)	R7: 2 minutes
			3	47.15' - Fracture, 10 deg, smooth, planar		48.6-49.4' - Same as 46.0-49.9' except very weak (R1)	
			1	47.3' - Fracture, 50 deg, smooth, planar		49.4-49.9' - Same as 46.0-49.9' except medium strong (R3)	
			NR	47.4' - Fracture, 15 deg, rough, undulating		No Recovery 49.9-51.0' Limestone	
51.0				48.65' - Fracture, 70 deg, rough, undulating		51.0-52.3' - moderate yellowish brown, (10YR 5/4), fine grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), voids (1/16") over 10% of rock surface, trace voids up to 1/5", trace organic inclusions	R8: 2 minutes
				49.6' - Fracture, horizontal, smooth, undulating		52.3-52.8' - Same as 51.0-52.3' except transition with depth from weak (R2) to extremely weak (R0)	
				51.0' - 1/4-inch infilling, strong HCl reaction		52.8-54.75' - Same as 51.0-52.3'	
						54.75-55.3' - Same as 52.3-52.8' except possibly grades to stronger rock at 55.3'	
55 -13.3	R7-HQ 5 ft 86%	57	0	52.3, 52.55, 52.7' - Fractures (3), horizontal, smooth, planar, open		No Recovery 55.3-56.0' Limestone	R8: 2 minutes
			3	53.2' - Fracture, vertical, rough, planar		56.0-60.0' - moderate yellowish brown, (10YR 5/4), fine grained, mild to moderate HCl reaction, medium strong to very weak (R3 to R1), voids (1/16") over 25-30% of rock surface, some cavities up to 1/4", organic inclusions; very similar to R7-HQ	
			4	53.3' - Fracture, 10 deg, smooth, planar			
			4	53.8, 53.9' - Fracture or fractures (2), 10 deg, rough, planar, open			
			1	54.1' - Fracture, 45 deg, smooth, undulating, tight			
			NR	54.4' - Fracture, horizontal, rough, planar to undulating			
				54.75' - Fracture, 10 deg, rough, stepped, open			
				54.9, 55.2' - Fractures (2), horizontal, rough, planar, tight			
				56.6' - Fracture, horizontal and 45 deg, rough, undulating			
				57.3' - Fracture, 10 deg, rough, stepped, open			
				58.1' - Fracture, horizontal, rough, planar, open			
				58.5' - Fracture, 15 deg, rough, undulating			
60 -18.3	R8-HQ 5 ft 80%	58	3	58.8' - Fracture, 35 deg, smooth, undulating, tight to open			
			NR	59.7-59.8' - Fracture zone, 1/2" limestone rock fragments		No Recovery 60.0-61.0'	
61.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-14

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724122.8 N, 458024.1 E (NAD83)

ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 7.0 ft bgs on 6/5/07

START : 6/5/2007

END : 6/6/2007

LOGGER : B. Ellis, D. Thomas

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.
65 -23.3	R9-HQ 5 ft 92%	75	2	59.8' - Fracture, high angle fracture -- partially penetrating core		Limestone 61.0-61.7' - moderate yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, very weak to extremely weak (R1 to R0), voids (1/16") over 3% of rock surface, few cavities up to 1/4" 61.7-63.4' - Same as 61.0-61.7' except medium strong to strong (R3 to R4), voids (1/16") over 5-10% of rock surface 63.4-64.3' - Same as 61.0-61.7' except weak to medium strong (R2 to R3), voids (1/16") over 5% of rock surface 65.4-65.6' - dark yellowish orange, (10YR 6/6), moderate HCl reaction, extremely weak (R0), voids and cavities absent No Recovery 65.6-66.0' Limestone 66.0-66.6' - dark yellowish orange, (10YR 6/6), moderate HCl reaction, extremely weak to very weak (R0 to R1), voids and cavities absent 66.6-70.1' - dark yellowish brown, (10YR 4/2), fine grained, moderate HCl reaction, strong (R4), voids (1/16") over 5% of rock surface, voids (1/8") over 5% of rock surface No Recovery 70.1-71.0' Limestone 71.0-72.9' - moderate yellowish brown to moderate olive brown, (10YR 5/4 to 5Y 4/4), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids (1/16") over 10% of rock surface, few cavities up to 1/4" 72.9-73.5' - olive gray, (5Y 3/2), fine grained, moderate HCl reaction, strong to very strong (R4 to R5), voids (1/16") over 3% of rock surface 73.5-75' - moderate yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, strong (R4), voids (1/16") over 15% of rock surface, few cavities up to 1/4" No Recovery 75.0-76.0' Limestone 76.0-77.55' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very strong (R5), voids (1/16") over 5-10% of rock surface, few cavities from 1/4" up to 3/4", some cavity infilling	R9: 3 minutes
			0	61.4-61.6' - Fracture zone, horizontal, smooth, planar			
			1	63.45' - Fracture, horizontal, rough, planar			
			1	64.0-64.1' - Fracture zone			
			2	64.6' - Fracture, horizontal, smooth, planar, open			
70 -28.3	R10-HQ 5 ft 82%	48	NR	65.35, 65.45' - Fractures (2), 10 deg, smooth, planar			R10: 3 minutes
			5	66.1, 66.15, 66.35, 66.55' - Fractures (4), horizontal, smooth, planar, tight			
			2	66.6' - Fracture, horizontal, smooth, planar, open			
			2	67.6' - Fracture, horizontal, smooth, planar, tight to open			
			2	67.75' - Fracture, 75 deg, smooth, undulating			
75 -33.3	R11-HQ 5 ft 80%	38	4	68.2' - Fracture, 75 deg, rough, undulating			Cavities at 73.9', 74.5'
			0	68.5-69.1' - Fracture zone, vertical and horizontal, smooth, undulating, angular limestone rock fragments			
			NR	69.1' - Fracture, 20 deg, rough, undulating			
			NR	69.3' - Fracture, 20 deg, smooth, undulating, infilled with sediment			
			NR	69.75-70.1' - Fracture zone, vertical, rough, undulating, open			
80 -38.3	R12-HQ 5 ft 88%	45	>10	71.0-71.2' - Fracture zone, subrounded fragments (up to 1 3/4")			R11: 3 minutes
			>10	71.25-71.35' - Fracture zone, horizontal, smooth, planar to undulating			
			6	72.1' - Fracture, horizontal, smooth, planar, tight			
			2	72.3-72.5' - Fracture zone, subangular fragments up to 1/2"			
			NR	72.5' - Fracture, 40 deg, rough, stepped			
			NR	72.8' - Fracture, horizontal, rough, undulating			R12: 3 minutes
			NR	73.0' - Fracture, 30 deg, rough, stepped			
			NR	73.0-73.2' - Fracture zone, angular fragments (up to 1/2")			
			NR	73.4' - Fracture, 10 deg, rough, undulating, open			
			NR	74.1' - Fracture, 10 deg, smooth, planar, tight			
			1	74.9' - Fracture, 50 deg, rough, stepped, open			
			1	77.6' - Fracture, horizontal, rough, planar			
			2	78.0' - Fracture, 10 deg, rough, undulating			
			3	78.9' - Fracture, horizontal, smooth, planar			
			7	79.15, 79.35, 79.65' - Fractures (3), horizontal, rough, planar, open at 79.15'			
			NR	80.15-80.4' - Fracture zone, subangular fragments (up to 2")			
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-14

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724122.8 N, 458024.1 E (NAD83)

ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 7.0 ft bgs on 6/5/07

START : 6/5/2007

END : 6/6/2007

LOGGER : B. Ellis, D. Thomas

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.
85 -43.3	R13-HQ 5 ft 84%	78	1	81.1' - Fracture, horizontal, rough, undulating		77.5-78.9' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, extremely weak (R0), with very fine carbonate-derived sand and silt	SC-1 collected at 81.2-82.3'
			0			78.9-80.4' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), voids (1/16") over 25% of rock surface, some cavities 1/4"-1/2", trace organic inclusions	Cavities at 83.7', 84.0', 84.1', 84.4' (less than 1/4")
			0	84.0' - Fracture, 40 deg, rough, stepped		No Recovery 80.4-81.0'	
			1	85.0' - Fracture, 45 deg, rough, undulating		Limestone	R13: 3 minutes
			NR			81.0-83.15' - dark yellowish orange to dusky yellow, (10YR 6/6 to 5Y 6/4), fine grained, moderate to strong HCl reaction, medium strong (R3), voids (1/16") over 15-20% of rock surface, few cavities up to 1/4"	
90 -48.3	R14-HQ 5 ft 90%	20	2	86.3' - Fracture, 10 deg, rough, planar		83.15-85.2' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), voids (1/16") over 25-30% of rock surface with cavities up to 3/4", some cavities infilled with less strong, gray to brown, limestone	
			>10	86.6' - Fracture, 10 deg, rough, stepped		No Recovery 85.2-86.0'	
			3	87.1-87.5' - Fracture zone, angular fragments (3/4 to 2")		Limestone	R14: 4 minutes
			>10	88.0' - Fracture, 30 deg, rough, undulating, tight		86.0-87.5' - dusky yellow, (5Y 6/4), fine grained, strong HCl reaction, extremely weak (R0), voids (1/16") over up to 3% of rock surface	
			2	88.65' - Fracture, 40 deg, rough, undulating, open		87.5-88.7' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, weak to medium strong (R2 to R3), voids (1/16"-1/8") over 20% of rock surface, few cavities 1/2"-3/4", cavities mostly elongate	Core barrel getting stuck in borehole, some casing withdrawn in order to retrieve core barrel
95 -53.3	R15-HQ 5 ft 18%	0	NR	88.85' - Fracture, vertical, rough, undulating, tight		88.7-90.5' - yellowish gray, (5Y 8/1), fine to very fine grained, strong HCl reaction, very weak to very strong (R1 to R5), fossiliferous (less than 1/16"), rock strength gradually transitions from weak (R2) at 88.7-89.1' to extremely weak (R0) at 89.1-89.7' to strong to very strong (R4 to R5) at 89.7-90.5'	R15: 18 minutes
			>10	89.1' - Fracture, horizontal, rough, stepped, open		No Recovery 90.5-91.0'	
			>10	89.2-89.4' - Fracture zone, angular fragments (1/2 to 1"), terminated by rough-planar horizontal fracture		Limestone	
			>10	89.7' - Fracture, 10 deg, rough, undulating to stepped, tight to open		91.0-91.6' - moderate yellowish brown to light olive gray, (10YR 5/4 to 5Y 5/2), angular to subangular limestone rock fragments (1/2"-2"), no fines	
			>10	90.0' - Fracture, 80 deg, rough, undulating, tight to open		91.6-91.9' - Same as 88.7-90.5' except yellowish gray, (5Y 8/1)	
100 -58.3	R16-HQ 5 ft 4%	0	NR	90.3' - Fracture, horizontal, rough, planar, tight		No Recovery 91.9-96.0'	
			NR	91.0-91.6' - Fracture zone, angular to subrounded fragments 1/2" to 2"			R16: 3 minutes
			NR	91.6' - Fracture, 30 deg, rough, undulating, open			
			NR				
			NR				
101.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-14	SHEET 7 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724122.8 N, 458024.1 E (NAD83)

ELEVATION : 41.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 7.0 ft bgs on 6/5/07 START : 6/5/2007 END : 6/6/2007 LOGGER : B. Ellis, D. Thomas

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			
105 -63.3	R17-HQ 5 ft 96%	80	2	101.3' - Fracture or mechanical break, 30 deg, rough, stepped		Limestone 96.0-96.2' - light olive gray, (5Y 5/2), very fine grained, moderate to strong HCl reaction, very strong (R5), voids (1/16") over 5% of rock surface	SC-2 collected at 102.3-103.4'
			0	101.7' - Fracture, horizontal, smooth, planar, tight		No Recovery 96.2-101.0'	
			1	103.4' - Fracture, horizontal, rough, undulating		Limestone 101.0-105.8' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, extremely weak (R0) from 101.0-101.5', very weak (R1) from 101.5-105.8', trace to 5% fine, gray speckles in matrix	
			0				
			4	105.3, 105.4, 105.5, 105.65' - Fractures (4), horizontal - 20 deg, smooth, planar, open		No Recovery 105.8-106.0'	R17: 3 minutes
106.0			NR	106.1, 106.3' - Fractures (2), horizontal, smooth, planar, tight		Limestone 106.0-111.0' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, very weak to extremely weak (R1 to R0), very small fossil fragments	
			2	107.1' - Fracture, horizontal, smooth, undulating, open			
			1				
110 -68.3	R18-HQ 5 ft 100%	78	1	108.3' - Fracture, 10 deg, smooth, planar, tight			R18: 5 minutes
			2	108.65, 109.2' - Fracture, horizontal, smooth, undulating, tight			
			5	109.9' - Fracture, 10 deg, smooth, undulating, open			
				110.0, 110.05, 110.2, 110.35' - Fractures (4), horizontal, smooth, undulating		111.0-115.7' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids (1/16") over 3% of rock surface, few cavities up to 1/4", increase in voids to 10% with some cavities up to 1/2" below 115.3'	
			>10	110.6' - Fracture or mechanical break, horizontal, smooth, planar			Drilling ends at 16:30 on 6/5/07 Core tends to break along bedding planes, very uniform lithology throughout core Start drilling on 6/6/07 at 08:30
			2	111.0-111.2' - Fracture zone, subrounded fragments 1/2" to 2"			
			1	111.2-111.4, 111.9, 112.3, 112.95' - Fractures (5), horizontal, smooth, planar to undulating, tight			
			2	113.3, 114.4' - Fractures (2), horizontal, smooth, undulating			
115 -73.3	R19-HQ 5 ft 94%	85	2				R19: 2 minutes
			0	114.9' - Fracture, 5 deg, rough, undulating			
			NR			No Recovery 115.7-116.0'	
			1	116.25' - Fracture, horizontal, rough, undulating		Limestone 116.0-118.5' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak (R1), voids (1/16") over 3% of rock surface, bioturbated	
			2	117.4, 117.6' - Fractures (2), 5 deg, rough, stepped			SC-3 collected at 116.3-117.5'
			2	118.3, 118.6' - Fractures (2), horizontal, rough, undulating		118.5-119.8' - Same as 116.0-118.5' except yellowish gray to very pale orange, (5Y 8/1 to 10YR 8/2), fine grained limestone with some textural and color variations	
			4	119.3' - Fracture, 30 deg, rough, planar, tight		119.8-120.7' - Same as 116.0-118.5'	
			2	119.5' - Fracture, 80 deg, rough, undulating, fracture extends from 119.3-119.75'		No Recovery 120.7-121.0'	
120 -78.3	R20-HQ 5 ft 94%	67	NR				Cavities at 117.2', 120.2'; sample tends to break along bedding planes when handled, rock in core uniform throughout R20: Run time not recorded



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-14

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724122.8 N, 458024.1 E (NAD83)

ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 7.0 ft bgs on 6/5/07

START : 6/5/2007

END : 6/6/2007

LOGGER : B. Ellis, D. Thomas

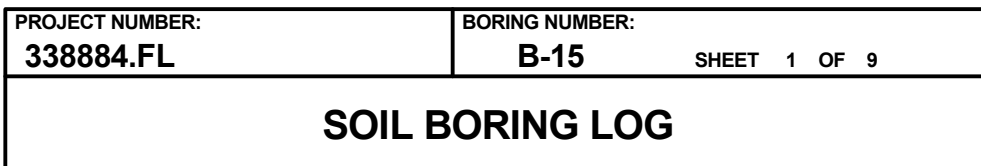
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
125 -83.3	R21-HQ 5 ft 100%	80	2	119.55, 119.75' - Fractures (2), horizontal, smooth to rough, planar to undulating, tight to open		Limestone 121.0-126.0' - yellowish gray to very pale orange, (5Y 8/1 to 10YR 8/2), fine to medium grained, strong HCl reaction, very weak (R1), voids (1/16") over 3-5% of rock surface, few cavities (1/4"-1/2"), some cavities infilled with white calcareous limestone, some textural and color variations similar to 118.5-119.8' from 121.35-122.0', fossiliferous, inclusions at 122.6'	Fossiliferous inclusions at 122.6', cavity at 123.65' (1"), cavities at 125.1' and 125.8' (1/4"-1/2"), partial white infilling of cavities could also be actual fossil
			0	120.4, 120.6, 121.3, 121.4' - Fractures (4), horizontal, smooth, planar			
			4	123.1' - Fracture, horizontal, smooth, planar to undulating, open			
			2	123.25' - Fracture, horizontal, smooth, stepped, open			
			1	123.35, 123.45' - Fractures (2), horizontal, smooth, planar to undulating, open			
126.0	R22-HQ 5 ft 100%	85	1	124.5, 124.6' - Fractures (2), horizontal, smooth, planar		126.0-131.0' - yellowish gray to very pale orange, (5Y 8/1 to 10YR 8/2), fine to medium grained, strong HCl reaction, very weak (R1), voids (1/16") over 3% of rock surface, few cavities up to 1/4" from 126.0-127.5', voids (1/16") over 30% of rock surface, many shallow cavities (1/4"-1/2"), fossiliferous, elongate molds and casts (1/2"-3/4") from 127.5-129.15'	R21: 3 minutes
			6	125.5' - Fracture, horizontal, smooth, planar, tight			
			1	126.1' - Fracture, horizontal, smooth, planar, open			
			0	126.2' - Fracture, 30 deg, smooth, planar, open			
			6	126.75' - Fracture, horizontal, smooth, planar, open			
130 -88.3	R23-HQ 5 ft 94%	47	2	127.8' - Fracture, horizontal, rough, undulating, tight		131.0-135.7' - Same as 126.0-131.0 except voids (1/16") over 30% of rock surface from 131.0-131.8'; thin laminae with bedding planes from 132.6-133.3'; thicker brown laminae (1/16"-1") from 134.7-135.1'	Large bivalve shells at 127.4', 127.5', 126.7'
			6	129.1-129.6' - Fracture zone or bedding plane, smooth, planar, some ridging			
			2	130.0, 130.85' - Fractures (2), horizontal, smooth, planar			
			3	131.2, 131.5, 131.6' - Fracture zone (3), horizontal, rough, undulating			
			3	132.5' - Fracture, 5 deg, smooth, undulating			
135 -93.3	R24-HQ 5 ft 92%	47	2	132.9, 132.95, 133.1, 133.9, 134.5, 134.7, 134.8' - Fractures (7), horizontal, smooth, planar		No Recovery 135.7-136.0' Limestone 136.0-139.6' - yellowish gray to very pale orange, (5Y 8/1 to 10YR 8/2), fine to medium grained, strong HCl reaction, very weak (R1), brown laminations from 137.3-137.8'	R22: Run time not recorded SC-4 collected at 130.1-131.0'
			3	135.2, 135.35' - Fractures (2), horizontal, smooth, undulating			
			NR				
			4	136.1' - Fracture, 80 deg, rough, planar			
			2	136.25-136.4' - Fracture zone, irregular subrounded fragments up to 2-1/2", bounded by horizontal, smooth planar fractures			
140 -98.3	R24-HQ 5 ft 92%	47	2	136.95' - Fracture, 80 deg, smooth, planar, tight			
			2	137.1' - Fracture, horizontal, smooth, undulating, tight			
			5	137.9' - Fracture, horizontal, smooth, planar, tight			
			2	138.25, 138.8' - Fractures (2), horizontal, smooth, planar			
			NR	139.1' - Fracture, horizontal, rough, planar, open to tight			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-14
SHEET 9 OF 9	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724122.8 N, 458024.1 E (NAD83)
 ELEVATION : 41.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 7.0 ft bgs on 6/5/07 START : 6/5/2007 END : 6/6/2007 LOGGER : B. Ellis, D. Thomas

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			
145 -103.3	R25-HQ 5 ft 78%	48	1	139.3' - Fracture, horizontal, rough to smooth, planar to undulating, open		139.6-140.6' - yellowish gray to grayish orange, (5Y 8/1 to 10YR 7/4), fine grained, strong HCl reaction, strong (R4), voids (1/16") over 3% of rock surface, numerous deep cavities (1/2"-3/4") fully penetrating core No Recovery 140.6-141.0' Limestone 141.0-144.9' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, strong HCl reaction, strong (R4), voids (1/16") over 5-10% of rock surface, many elongate cavities (1/4"x1/2") with some infilling from 141.0-143.4; voids (1/16") over 0-5% of rock surface, few to no cavities from 143.4-144.9' No Recovery 144.9-146.0' Limestone 146.0-149.2' - dark yellowish orange, (10YR 6/6), fine to medium grained, strong HCl reaction, weak (R2), voids (1/16") over 30% of rock surface, some fine laminations 149.2-150.9' - moderate olive brown, (5Y 4/4), fine to very fine grained, moderate HCl reaction, strong to very strong (R4 to R5), voids (1/16") over 3% of rock surface, rare cavities (up to 1/4"), trace organic inclusions No Recovery 150.9-151.0' Bottom of Boring at 151.0 ft bgs on 6/6/2007	R24: 4 minutes Cavities at 141.0', 141.35', 141.4', 141.75', 142.1', 142.7', 143.1' SC-5 collected at 143.8-144.8' R25: Run time not recorded
			>10	139.45' - Fracture, 50 deg, rough, undulating			
			>10	139.7' - Fracture, 40 deg, rough, undulating			
			>10	139.9' - Fracture, vertical, rough, planar			
			>10	140.1' - Fracture, 70 deg, rough, undulating			
150 -108.3	R26-HQ 5 ft 98%	75	0	140.25' - Fracture, 50 deg, rough, undulating			
			0	141.6' - Fracture, 30 deg, rough, undulating to stepped, tight			
			0	142.3-142.5, 142.8-142.9, 143.2-143.3' - Fracture zone (3), subangular fragments (up to 1 1/2"), bounded by 10 deg, rough, planar fractures			
			NR	143.5' - Fracture, horizontal, smooth, undulating			
			NR	143.9' - Fracture, horizontal, rough, undulating			
			1	146.3' - Fracture, 45 deg, smooth, planar			
			0				
			1	148.35, 149.15, 149.2' - Fractures (3), horizontal, smooth, planar			
			4	149.4' - Fracture, 80 deg, smooth, undulating			
			4	149.6' - Fracture, horizontal, smooth, planar			
			4	150.0' - Fracture, 80 deg, rough, undulating			
			4	150.3' - Fracture, vertical, rough, undulating			
			4	150.55' - Fracture, horizontal, rough, undulating			
			NR				
			NR				



LOGGER : T. Stewart

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-15
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724222.8 N, 458094.3 E (NAD83)
 ELEVATION : 42.3 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, 2-15/16" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 5/15/07 START : 5/15/2007 END : 5/17/2007 LOGGER : T. Stewart

WATER LEVELS : 4.0 TUBS ON 9/15/07			START : 9/15/2007			END : 9/17/2007			LOGGER : T. Stewart		
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					
22.3	20.0	1.0	SS-5	10-32-50/4 (82/10")	Silty Sand And Limestone Fragments (SM) 20.0-21.0' - moderate yellow, (5Y 7/6), wet, very dense, fine to coarse grained, nonplastic, moderate HCl reaction, 15-20% nonplastic fines, 20% fine to coarse gravel-sized limestone, all carbonate, trace very fine sand-sized white particles, trace brilliant green particles						
	21.3										
25	25.0										
17.3	25.9	0.8	SS-6	25-50/4.5 (75/10.5")	Silty Sand And Limestone Fragments (SM) 25.0-25.8' - Same as 20.0-21.0' except moderate HCl reaction, 50% silt and 50% limestone						
30	30.0										
12.3	30.3	0.2	SS-7	50/3.5 (50/3.5")	Limestone Fragments 30.0-30.2' - medium to coarse sand-sized and fine gravel-sized, poor recovery						
35	35.0										
7.3	35.2	0.0	SS-8	50/2 (50/2")	No Recovery 35.0-35.2'			Driller's Remark: Will install 4" HW casing down to 35.0' below ground surface			
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-15

SHEET 3 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724222.8 N, 458094.3 E (NAD83)

ELEVATION : 42.3 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, 2-15/16" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 5/15/07

START : 5/15/2007

END : 5/17/2007

LOGGER : T. Stewart

WATER LEVELS : 4.0 (bgs) on 9/15/07			START : 9/15/2007			END : 9/17/2007			LOGGER : T. Stewart		
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				
2.3	40.0	0.8	SS-9	44-50/5 (94/11")	Silt With Sand (ML) 40.0-40.8' - light olive brown, (5Y 5/6), wet, hard, fine to coarse grained, 20-30% sand, nonplastic, rapid dilatancy, mild HCl reaction, 5-10% organics, all carbonate						
	40.9										



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-15
SHEET 4 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724222.8 N, 458094.3 E (NAD83)
 ELEVATION : 42.3 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, 2-15/16" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 5/15/07 START : 5/15/2007 END : 5/17/2007 LOGGER : T. Stewart

WATER LEVELS : 4.0 TDS ON 9/15/07			START : 9/15/2007			END : 9/17/2007			LOGGER : T. Stewart		
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			
-17.7	60.0	0.7	SS-13	45-50/3.5 (95/9.5")	Silty Sand And Limestone Fragments (SM) 60.0-60.7' - moderate olive brown, (5Y 4/4), wet, very dense, fine to coarse grained, 20-25% fines, low plasticity, mild to moderate HCl reaction, 40% fine gravel-sized limestone, poorly fossiliferous Begin Rock Coring at 61.0 ft bgs See the next sheet for the rock core log			Driller's Remark: Will install 4" HW casing down to 61.0' below ground surface			
60.8											
65											
-22.7											
70											
-27.7											
75											
-32.7											
80											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-15

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724222.8 N, 458094.3 E (NAD83)

ELEVATION : 42.3 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 5/15/07

START : 5/15/2007

END : 5/17/2007

LOGGER : T. Stewart

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 54%	35	3	61.35' - Mechanical break		Limestone 61.0-63.7' - moderate olive brown to light olive gray, (5Y 4/4 to 5Y 5/2), moderate to strong HCl reaction, medium strong (R3), 15% voids <1/16", infilled cavities with dark gray material (N3) No Recovery 63.7-66.0'	R1: 16 minutes
			2	61.75, 61.9, 61.95' - Bedding plane (3), horizontal, rough, undulating, <1/16" gap, possible mechanical break			
			2	63.0, 63.4' - Bedding plane (2), 5 deg and 10 deg, rough, undulating, open up to 3/16", fracture is through infilled cavity, possible mechanical break			
65 -22.7			NR				
66.0	R2-NQ 5 ft 74%	53	2	66.1' - Bedding plane, horizontal, rough, undulating, open 1/16"		Limestone 66.0-69.7' - Same as 61.0-63.7' except olive gray, (5Y 3/2), trace fossil casts, weak rock interval from 69.0-69.7' No Recovery 69.7-71.0' No Recovery 71.0-72.9'	SC-1 collected at 67.9-68.75'
			2	66.55, 68.75, 69.0' - Bedding plane (3), horizontal, rough, undulating, tight, possible mechanical break			
			2	67.15, 67.9' - Bedding plane (2), 5 deg and 10 deg, rough, undulating, tight, possible mechanical break			
			3	68.75, 69.0' - Bedding plane (2), horizontal, rough, undulating, tight			
70 -27.7			NR	69.25' - Fracture, 10 deg and 15 deg, rough, undulating, tight 69.55, 69.65' - Fracture (2), horizontal and 5 deg, tight, fractures are in weak rock interval			
71.0	R3-NQ 5 ft 62%	38	NR			Limestone 72.9-76.0' - moderate olive brown grading at 74.7' to light olive brown, (5Y 4/4 grading to 5Y 5/6), strong HCl reaction, medium strong to weak (R3 to R2), 15% voids <1/16" on surface in creasing to 30% from 74.7' with depth, poorly fossiliferous (casts), trace unfilled cavities to 3/8"x3/16" elongated, bioturbated areas 3% irregularly shaped cavities >1", trace dark gray infill fines 76.0-81.0' - yellowish gray to light olive brown, (5Y 8/1 to 5Y 5/6), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), 30-35% voids <1/16", poorly fossiliferous (casts), 3-5% dark gray fine to medium grained particles	R3: 17 minutes
			>10	72.9-73.35' - Fracture zone, subangular and rounded fragments up to 1-3/8" in size 73.35-74.1' - Joint, vertical			
75 -32.7			1	74.1' - Fracture, horizontal, rough, undulating, open 1/16", broken across infilled void, black stain			
			3	75.3, 75.5, 75.7' - Fractures (3), 10 deg and 15 deg, rough, undulating, tight, possible mechanical break			
76.0	R4-NQ 5 ft 100%	84	2	76.1' - Bedding plane, horizontal, smooth, stepped, tight, possible mechanical break			SC-2 collected at 76.9-78.05'
			0	76.9' - Fracture, 5 deg and 10 deg, rough, undulating, open 1/16"			
			3	78.05' - Fractures, 15 deg and 20 deg, rough, undulating, tight, possible mechanical break 78.45' - Fracture, horizontal, rough, undulating, tight to 1/2" open			
			2	78.7' - Fracture, horizontal, rough, undulating, up to 3/4" open			
80 -37.7			1	79.4, 79.5' - Bedding plane (2), horizontal, rough, undulating, open 1/8", possible mechanical break			
81.0							R4: 11 minutes



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-15
SHEET 6 OF 9	
ROCK CORE LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724222.8 N, 458094.3 E (NAD83)

ELEVATION : 42.3 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 5/15/07 START : 5/15/2007 END : 5/17/2007 LOGGER : T. Stewart

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.
85 -42.7	R5-NQ 5 ft 100%	88	0	80.2' - Fracture, horizontal, rough, undulating, tight, possible mechanical break		Limestone 81.0-86.0' - light olive brown, (5Y 6/6), strong HCl reaction, weak (R2), 10-15% mottled yellowish gray (5Y 8/1) with olive gray (5Y 5/2), moderately fossiliferous (casts/molds), carbonate fines (irregularly shaped fines possible bioturbation), trace organic lenses to 3/8" thick at 82.15' and 82.5', fossils to 9/16" predominately horizontally oriented and rice shaped with corrugated patterns	R5: 13 minutes
			3	82.15, 82.5' - Bedding plane (2), horizontal, rough, undulating, open 7/16", dry, fine laminations			
			0	82.8' - Bedding plane, horizontal, rough, undulating, tight, possible mechanical break			
			2	84.35' - Bedding plane, horizontal, rough, undulating, tight, in very weak rock, possible mechanical break			
			0	84.6' - Bedding plane, horizontal, fracture in bioturbated zone, possible mechanical break			
86.0	R6-NQ 5 ft 94%	54	6	86.05, 86.2, 86.35, 86.45, 86.5, 86.7' - Bedding plane (6), 0 deg to 5 deg, rough, undulating, 1/16" gap, possible mechanical break		86.0-86.35' - Same as 81.0-86.0' 86.35-90.7' - white to yellowish gray with medium dark gray and moderate yellow, (5Y 8/1 with N4 and 5Y 7/6), very fine grained, strong HCl reaction, strong (R4), very fossiliferous (casts, microforams), trace spherical voids <1/16", bioturbated mottling 30-35% of surface with 15-20% voids <1/16"	R6: 21 minutes
			0				
			2	88.1, 88.5' - Fracture (2), horizontal, rough, undulating, tight, possible mechanical break			
			3	89.1' - Bedding plane, horizontal			
			2	89.4' - Bedding plane, horizontal, possible mechanical break			
90 -47.7	R7-NQ 5 ft 98%	60	NR	89.55' - Fracture, vertical, rough, undulating, gray staining, tight, with bisecting mechanical breaks		No Recovery 90.7-91.0' Limestone 91.0-95.9' - yellowish gray with dark gray and white, (5Y 7/2 with N3 and N9), strong HCl reaction, weak (R2), very fossiliferous (casts, molds, shells) fossils to 7/8", 94.0-95.9' apparent bedding and horizontal fossil alignment	R7: 10 minutes
			4	90.0' - Fracture, horizontal, rough, undulating, 1/8" open			
			3	90.4' - Fracture, horizontal, rough, undulating, tight			
			3	91.4, 91.5, 91.7, 91.95, 92.15, 92.4' - Fractures (6), horizontal, rough, undulating, tight, possible mechanical break			
			2	92.95, 93.25, 93.5' - Fractures (3), 5 deg to 10 deg, rough, undulating, tight, possible mechanical break			
95 -52.7	R8-NQ 5 ft 100%	95	2	93.75' - Fracture, 30 deg, rough, undulating, tight		No Recovery 95.9-96.0' Limestone 96.0-101.0' - Same as 91.0-95.9' except medium-sized white (N9) and dark gray (N3) grains	R8: 9 minutes
			2	94.4, 94.6, 95.2, 95.6' - Fractures (4), 0 deg to 5 deg, rough, undulating, tight, possible mechanical break			
			1	96.6' - Fracture, 45 deg, rough, undulating, tight			
			1				
			2	97.95' - Fracture, horizontal, rough, undulating, open 3/4"			
100 -57.7			1	98.2' - Fracture, 55 deg, rough, undulating, tight			
			1	98.5' - Mechanical break			
			1	98.65' - Bedding plane, horizontal, rough, undulating, tight, possible mechanical break			
			1	99.6' - Bedding plane, horizontal, rough, undulating, tight, possible mechanical break			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-15	SHEET 7 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724222.8 N, 458094.3 E (NAD83)

ELEVATION : 42.3 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 5/15/07

START : 5/15/2007

END : 5/17/2007

LOGGER : T. Stewart

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
105 -62.7	R9-NQ 5 ft 100%	84	2		Limestone 101.0-106.0' - yellowish gray with medium gray, (5Y 7/2 with N9), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), very fossiliferous (microforams, casts, molds >1/8") decreasing abundance with depth, white rounded elongated grains 25-35% increasing with depth, 5-10% medium gray grains, voids <1/16" 30-40% of surface from 101.0-103.2'	R9: 9 minutes
			3			
			2			
			1			
			1			
110 -67.7	R10-NQ 5 ft 100%	65	3		106.0-111.0' - yellowish gray with medium gray, (5Y 7/2 with N5), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), very fossiliferous (predominantly microforams and molds), 3-5% medium gray grains, voids <1/16" 10-15% of surface, 1/4" bedded accumulation of fossils at 109.1'	R10: 8 minutes
			4			
			3			
			1			
			2			
115 -72.7	R11-NQ 5 ft 70%	28	2		111.0-114.5' - yellowish gray, (5Y 7/2), medium grained, strong HCl reaction, very weak (R1), very fossiliferous (microforams, shells, molds) fossils >75% of rock to 1/16" trace to 1"	R11: 9 minutes
			5			
			4			
			2			
			NR			
120 -77.7	R12-NQ 5 ft 100%	46	3		Limestone 116.0-121.0' - Same as 111.0-114.5'	R12: 11 minutes
			2			
			>10			
			2			
			3			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-15

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724222.8 N, 458094.3 E (NAD83)

ELEVATION : 42.3 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 5/15/07

START : 5/15/2007

END : 5/17/2007

LOGGER : T. Stewart

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.
125 -82.7	R13-NQ 5 ft 86%	61	2	119.35' - Fracture or mechanical break, 5 deg to 10 deg, rough, undulating, tight		Limestone 121.0-125.3' - yellowish gray, (5Y 8/1), strong HCl reaction, very weak (R1), voids <1/16" on 15-20% of surface, very fossiliferous (casts, microforams), trace black laminations possible organics, 5-7% medium dark gray grains (angular-subangular), 121.6-121.7', very strong HCl reaction, finely laminated slightly coarser grained infill with undulating bedding planes to 10 deg, possible trace fine quartz sand No Recovery 125.3-126.0'	R13: 10 minutes
			2	119.8' - Bedding plane, horizontal, smooth, undulating, tight			
			3	120.2, 120.35, 120.55' - Mechanical break or bedding plane (3), horizontal, rough, planar, tight			
			3	121.1' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/8" open			
			1	121.6' - discontinuity, nonplanar, undulating, tight, black staining on surface			
			NR	122.05, 122.7, 123.05, 123.4, 123.9, 124.6, 124.9, 125.2' - Bedding plane or mechanical break (8), horizontal, rough, undulating, tight, fractures through cavities at 125.2' and 123.05'			
130 -87.7	R14-NQ 5 ft 100%	41	7	124.0' - Bedding plane or mechanical break, horizontal, rough, undulating, 3/16" gap		Limestone 126.0-131.0' - yellow gray with medium dark gray and pale yellowish orange, (5Y 8/1 with N4 and 10YR 8/6), very fine to medium grained, strong HCl reaction, very weak (R1), thin bedding, grain size alternates 127.5-129.0' medium to coarse grained, very fossiliferous	R14: Run time not recorded
			6	126.05-130.85' - Bedding plane (16), rough, planar, <1/16" gap			
			2	127.7, 128.05' - Mechanical break or bedding plane (2), horizontal, rough, undulating, 1/8" gap at 127.7', tight at 128.05'			
			2	128.2, 129.3' - Bedding plane or mechanical break (2), 5 deg to 10 deg, rough, undulating, tight			
			5	129.55' - Bedding plane, horizontal, rough, undulating, tight			
			NR				
135 -92.7	R15-NQ 5 ft 96%	88	0	132.0' - Bedding plane, 20 deg, rough, undulating, tight		131.0-135.8' - yellowish gray with light olive gray, olive gray and medium dark gray, (5Y 8/1 with 5Y 4/1, 5Y 6/1 and N4), fine to medium grained, strong HCl reaction, laminated bedding, very fossiliferous (microforams, shells, casts/molds), fossils to 5/8"x3/16", voids <1/16" 15-20% of surface, 3-5% cavities to 3/4"x1/2" from 134.5-135.3' infilled, mineralization subhorizontally aligned, 1" scour and fill structure at 134.4'	SC-4 collected at 131.0-132.0'
			3	132.45' - Fracture or mechanical break, horizontal, rough, undulating			
			0	132.95' - Bedding plane or mechanical break, 10 deg to 15 deg, rough, undulating, tight			
			2	134.35' - Bedding plane, 5 deg, rough, undulating, 1/32" silt and/or clay sized infilling, open 1/16"			
			1	134.4' - Fracture, undulating, tight			
			NR	134.9' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
140 -97.7	R16-NQ 5 ft 96%	62	3	135.45' - Bedding plane or mechanical break, horizontal, rough, undulating, tight, 3/4" hard medium gray infilled cavity on surface		No Recovery 135.8-136.0' Limestone 136.0-136.5' - yellowish gray, (5Y 4/4), medium grained, strong HCl reaction, very weak (R1), thin bedding, 136.0-136.25' rounded clast to 1/4" with thin halo on edges, clasts strong rock (R4), strongly suggests possible fluvial deposition	R15: 12 minutes
			3	136.25, 136.4' - Bedding plane or mechanical break, horizontal, rough, planar, 1/16" open			
			2	136.5' - Bedding plane or mechanical break, horizontal, rough, undulating, 1" open, through cavity/ bioturbated pockets			
			3	137.2' - Bedding plane or mechanical break, horizontal, rough, undulating, tight, fracture in bioturbated cavity			
			1	137.65' - Bedding plane or mechanical break, 20 deg, rough, undulating, tight			
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-15

SHEET 9 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724222.8 N, 458094.3 E (NAD83)

ELEVATION : 42.3 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 5/15/07

START : 5/15/2007

END : 5/17/2007

LOGGER : T. Stewart

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			
145 -102.7	R17-NQ 5 ft 94%	70	1	137.8' - Bedding plane or mechanical break, horizontal, rough, undulating, tight, fracture through bioturbated cavity		Limestone 136.5-138.5' - light olive gray, (5Y 5/2), very fine grained, strong HCl reaction, medium strong (R3), 3-5% voids <1/32", 5% irregularly shaped cavities >2" (bioturbation pockets) with 25-30% voids <1/16" and mottling of moderate yellow rimming, moderate yellow infill, poorly fossiliferous (casts, molds) 138.5-140.3' - light olive gray, (5Y 5/2), very fine grained, strong HCl reaction, medium strong (R3), moderately fossiliferous (casts, molds) increase abundance with depth, 5% infilled irregularly shaped cavities to 1" with black staining, 3-5% mottling, trace elongated cavities to 3/8"x3/16" 140.3-140.8' - light olive gray, (5Y 5/2), very fine grained, strong HCl reaction, medium strong to strong (R3 to R4), black (<1/32" thick) microlaminations dipping 20-25 deg, trace voids <1/32" No Recovery 140.8-141.0' Limestone 141.0-142.2' - Same as 140.3-140.8' 142.2-145.7' - yellowish gray with grayish orange and light gray, (5Y 8/1 with 10YR 7/4, N6), fine to medium grained, strong HCl reaction, weak (R2), moderately fossiliferous (casts, shells), fossils horizontally aligned, grayish orange grains have a frosted to translucent luster No Recovery 145.7-146.0' Limestone 146.0-151.0' - light olive gray to moderate olive brown, (5Y 5/2 to 5Y 4/4), very fine to fine grained, strong HCl reaction, medium strong (R3), poorly fossiliferous (casts), 3-5% spherical voids <1/16", 149.2-150.1' weak rock zone of fine to medium grained laminated material alternating yellowish gray and moderate olive brown (5Y 8/1 and 5Y 4/4), 149.2-150.1' similar to 142.2-145.7' No Recovery 150.8-151.0' Bottom of Boring at 151.0 ft bgs on 5/17/2007	SC-5 collected at 141.0-141.8' R17: 11 minutes 13:12 water level in HW casing 6.7' below ground surface End configuration 4" HW to 56.0' below ground surface NQ from 61.0-151.0' below ground surface Soil/split spoon from 0.0-60.0' Abandonment: 16 bags of type I/II Portland cement Mixed with 37 gallons of water Plus 3 dry bags of Portland R18: 16 minutes
			3	138.1' - Bedding plane or mechanical break, horizontal, rough, undulating, tight to 1" open			
			0	138.7' - Fracture zone, 2" wide with 1/2" to 1-1/2" fragments			
			2	139.1' - Fracture or mechanical break, horizontal, rough, undulating, tight organics on 50% of surface			
			3	139.7' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
			NR	139.8' - Bedding plane or mechanical break, 20 deg, rough, undulating			
			1	140.3' - Bedding plane, rough, stepped, tight to 1/16" open, parting along wavy lamination			
			0	141.8-145.55' - Bedding plane or mechanical break (6), horizontal, rough, planar, tight			
			2	142.0' - Fracture, 70 deg to 80 deg, rough, undulating, tight			
			8	142.25' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/2"-1-3/8" open			
150 -107.7	R18-NQ 5 ft 96%	54	2	144.8' - Fracture, 60 deg, rough, undulating, tight			
			2	146.1' - Bedding plane or mechanical break, horizontal, rough, undulating, <1/16" open			
			NR	146.5-147.4' - Fracture, healed			
			NR	148.3' - Bedding plane, horizontal, smooth, stepped, tight			
			NR	148.65' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/16" open			
			NR	149.0, 149.15' - Bedding plane or mechanical break (2), horizontal, rough, undulating, 1/16" open			
			NR	149.2-149.8' - Bedding plane (6), horizontal, rough, undulating, 1/16" open			
			NR	150.1' - Fracture or mechanical break, 5 deg to 10 deg, rough, planar, tight			
			NR	150.6' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-16
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723050.3 N, 457812.4 E (NAD83)
 ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.6 ft bgs on 6/14/07 START : 4/23/2007 END : 4/25/2007 LOGGER : A. Erickson

WATER LEVELS : 1.0 (RDS) 01/01/2007			STARTY : 4/23/2007		END : 4/23/2007		LOGGER : A. LICKSON	
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	
42.6	0.0	1.0	SS-1	0-2-3 (5)	Topsoil 0.0-0.2' - wood chips Poorly Graded Sand (SP) 0.2-1.0' - medium light gray, (N6), moist, loose, fine grained, nonplastic, no HCl reaction, trace fine organics, and rootlets, sand is silica		"Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)"	
	1.5							
5								
37.6	5.0							
	6.5	1.2	SS-2	3-5-4 (9)	Poorly Graded Sand (SP) 5.0-6.2' - pale yellowish gray, (5Y 8/1), some mottling, moist to wet, loose, fine grained, nonplastic, no HCl reaction, trace organics and black mineral, trace pyrite nodules, sand is silica			
10								
32.6	10.0							
	11.5	1.3	SS-3	0-1-2 (3)	Silty Sand (SM) 10.0-10.2' - light olive gray, (5Y 6/1), wet, very loose, fine grained, low plasticity, no HCl reaction, sand is silica Silty Sand With Gravel (SM) 10.2-11.3' - yellowish gray, (5Y 8/1), wet, very loose, fine to coarse grained, strong HCl reaction, 15% sand-sized carbonate material, 15% gravel-sized carbonate material, fossil fragments		10.0-10.2' slough Driller's Remark: Hard material at 11.5' below ground surface	
15								
27.6	15.0							
	16.5	0.8	SS-4	11-15-11 (26)	Limestone Fragments 15.0-15.1' - mottled yellowish gray and dark yellowish orange, (5Y 7/2 and 10YR 6/6), dense, coarse grained, coarse gravel-sized limestone, strong HCl reaction Silt With Sand (ML) 15.1-15.8' - grayish orange, (10YR 7/4), moist to wet, very stiff, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, 15-20% very fine sand, carbonate materials			
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-16
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723050.3 N, 457812.4 E (NAD83)
 ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.6 ft bgs on 6/14/07 START : 4/23/2007 END : 4/25/2007 LOGGER : A. Erickson

WATER LEVELS : 1.0 (RDS) 01/07/14/07			START : 4/23/2007			END : 4/23/2007			LOGGERS : A. LICKSON		
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						
22.6	20.0	1.2	SS-5	13-17-20 (37)	Silt With Sand (ML) 20.0-21.2' - Same as 15.1-15.8' except 25% very fine sand, fine gravel-sized limestone at top of sample						
	21.5										
25	25.0										
17.6	25.9	0.9	SS-6	26-50/5 (76/11")	Sandy Silt (ML) 25.0-25.9' - grayish orange, (10YR 7/4), moist to wet, hard, fine to coarse grained, 30% fine to coarse sand-sized carbonate material, fine to coarse gravel-sized limestone from 25.0'-25.4'				Gray silica sand and white carbonate fragments in sample, assume slough from upper material		
30	30.0										
12.6	31.5	0.9	SS-7	3-36-13 (49)	Silt With Sand (ML) 30.0-30.9' - grayish orange, (10YR 7/4), moist to wet, hard, fine to coarse grained, mild to moderate HCl reaction, 25% fine sand-sized, trace medium to coarse sand-sized, trace fine gravel-sized, all carbonate materials						
35	35.0										
7.6	36.5	1.3	SS-8	8-12-19 (31)	Silty Sand (SM) 35.0-36.3' - grayish orange, (10YR 7/4), moist to wet, dense, fine to coarse grained, 46% fines, all carbonate						
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-16

SHEET 3 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723050.3 N, 457812.4 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 1.6 ft bgs on 6/14/07

START : 4/23/2007

END : 4/25/2007

LOGGER : A. Erickson

WATER LEVELS : 1.01005010/1407			START : 4/23/2007		END : 4/23/2007		LOGGER : A. LICKSON		
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			
2.6	40.0	0.7	SS-9	43-50/6 (93/12")	Silty Sand (SM) 40.0-40.7' - dark yellowish orange to moderate yellowish brown, (10YR 6/6 to 10YR 5/4), wet, very dense, fine to coarse grained, mild HCl reaction, 25% nonplastic fines, 10% gravel-sized, all carbonate			Driller's Remark: Hard material at 43.5' below ground surface	
	41.0								
45	45.0	0.0	SS-10	50/0.5 (50/0.5")	No Recovery 45.0-45.04'				
-2.4					Begin Rock Coring at 46.0 ft bgs See the next sheet for the rock core log				
50									
-7.4									
55									
-12.4									
60									







PROJECT NUMBER: 338884.FL	BORING NUMBER: B-16
SHEET 4 OF 9	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723050.3 N, 457812.4 E (NAD83)

ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.6 ft bgs on 6/14/07 START : 4/23/2007 END : 4/25/2007 LOGGER : A. Erickson

WATER LEVELS : 1.0 (bbs on 4/14/07)			START : 4/23/2007			END : 4/23/2007			LOGGER : A. Erickson		
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			
50 -7.4	R1-NQ 5 ft 100%	95	2	46.2' - 70 deg, smooth, undulating, up to 0.4" gap 46.65' - Bedding plane, horizontal, undulating, bedding plane fracture, smooth to rough, tight up to 0.1" gap 48.5' - 20 deg, rough, undulating		Limestone 46.0-48.5' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), 25% surface void (1/16"), many cavities up to 9/16"x3/16", moderately fossiliferous with fossil molds 48.5-51.0' - Same as 46.0'-48.5' except 40% surface voids (1/16"), very many cavities up to 3/4" diameter, highly fossiliferous with fossil molds, mostly oblong up to 9/16"x1/8"	SC-1 collected at 47.5-48.4'				
			0								
			1								
			0								
			0								
55 -12.4	R2-NQ 5 ft 64%	0	4	50.22, 54.05' - Mechanical break (10), 0 - 20 deg, rough, undulating, infilling, bedding plane fracture probably mechanical break, all have infill due to soft nature of rock fracture surfaces eroding, up to 0.04" gap due to rock surface eroding off/breaking		51.0-53.55' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, extremely weak (R0), very weakly cemented 53.55-53.7' - Same as 51.0'-53.55' except 0-5% surface void up to 1/16", few cavities up to 9/16" diameter, poorly fossiliferous, trace black fine to medium grained material 53.7-54.2' - Same as 51.0'-53.55' No Recovery 54.2-56.0'	R2: 3 minutes				
			3								
			3								
			>10								
			NR								
60 -17.4	R3-NQ 5 ft 88%	30	3	56.15, 56.7, 56.9, 57.0, 57.25, 57.5, 58.05, 58.15, 58.2, 58.3, 59.5, 59.8' - Mechanical break (12), 10 deg, smooth, undulating, infilling, bedding plane fracture or mechanical breaks, smooth to rough, planer to undulating, tight to 3/4" thick gap, infill from eroding fracture surface due to soft quality of rock 58.1, 58.5' - very weakly cemented rock 59.9, 60.1' - Fractures, rock fragments zone, black staining at 60.1' fracture surface		Limestone 56.0-60.4' - yellowish gray, (5Y 7/8), strong HCl reaction, extremely weak (R0), up to 1/2" thick bands of recrystallization from 59.1-59.3' and 60.1-60.4' were very weak rock, weakly cemented, voids (<1/16") on surface, 0% from 56.0-58.6', 5-25% voids from 50.8-60.4', cavities (molds) up to 3/16"x3/8", black lineations up to 1/8" from 60.0-60.4', fine grained, trace medium grained No Recovery 60.4-61.0'	R3: 5 minutes				
			3								
			>10								
			>10								
			NR								
65 -22.4	R4-NQ 5 ft 76%	8	>10	61.0-61.6' - Fracture zone 61.7' - Bedding plane or mechanical break, horizontal, rough, undulating, undulating to stepped up to 1" gap 62.15, 62.25, 62.4' - Bedding plane or mechanical break (3), horizontal, rough, undulating, up to 3/4" gaps on some fractures 62.6' - Fracture or mechanical break, 80 deg, rough, undulating, half of fracture/one side of fracture's rock is missing 62.8-63.2' - Fracture zone 64.2, 64.35' - Bedding plane or mechanical break (2), horizontal, rough, undulating, up to 1/2" gap		Limestone 61.0-62.4' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, extremely weak (R0), small voids (1/16") cover 25% of core surface, many cavities up to 3/8" diameter and 9/16"x3/8", some cavities are fossil molds, black material up to 3/8" and black lineation up to 3/16" from 61.0-61.65' 62.4-64.8' - Same as 61.0'-62.4' except very weak (R1) No Recovery 64.8-66.0'	R4: 6 minutes				
			>10								
			>10								
			>10								
			NR								
66.0											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-16

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723050.3 N, 457812.4 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.6 ft bgs on 6/14/07

START : 4/23/2007

END : 4/25/2007

LOGGER : A. Erickson

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.
70 -27.4	R5-NQ 5 ft 96%	33	2	64.3' - Fractures, 80 deg, rough, undulating		Limestone 66.0-68.9' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2)	R5: 7 minutes
			2	66.8' - Fractures (2), 70 deg, smooth, undulating, tight 1/16" gaps			
			3	67.12, 67.4' - Fractures (2), 5 deg, smooth, undulating, 1/2" gap on same surface at 67.4'			
			5	68.15' - Fracture, 5 deg, smooth, stepped, discontinuity fracture between hard and soft rock, large gap			
			0	68.3' - Fracture, 75 deg, rough, undulating, vertical fracture, tight			
	R6-NQ 5 ft 97%	80	NR	68.9' - Mechanical break		68.9-70.8' - Same as 66.0'-68.9' except dark yellow, (5Y 4/2), extremely weak (R0), 25% voids (<1/16") over core surface from 66.0-67.8' and 70.5-70.6', no surface voids present due to softness of material, few cavities up to 5/16"x1/8", poorly fossiliferous	SC-2 collected at 71.2-72.0'
			3	69.3, 70.8' - Mechanical break, due to rock softness			
			0	71.55, 71.85' - Fractures (2), horizontal and vertical, smooth, undulating, two horizontal fractures, gaps up to 1/2"			
			0	71.7' - Fracture, vertical, rough, undulating, vertical fracture, gap up to 1/2"			
			0				
75 -32.4	R7-NQ 5 ft 92%	34	NR			70.2-70.8' - Same as 66.0'-68.9' No Recovery 70.8-71.0' Limestone 71.0-71.6' - Same as 66.0-68.9' except moderate olive brown, (5Y 4/4), fine grained, strong HCl reaction, extremely weak (R0) 71.6-75.85' - Same as 66.0'-68.9' except very weak to weak (R1 to R2), voids (<1/16") cover 15% of core surface (variable) with depth, many cavities up to 3/16"	R6: 11 minutes
			0	76.4, 76.7, 77.0, 77.3, 77.4, 77.65, 77.8, 79.0, 80.0, 80.25' - Mechanical break (11), infilling, due to erosion of soft fracture surfaces			
			0				
			0				
			0				
	R8-NQ 5 ft 92%	8	NR	80.15-80.45' - Fracture zone		No Recovery 75.85-76.0' Limestone 76.0-76.6' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), 15% surface fractures (<1/16"), few cavities up to 2-3/4" 76.6-78.6' - Same as 76.0'-76.6' except extremely weak (R0) 78.6-79.8' - Same as 76.0'-76.6' except weak (R2), 15-25% surface voids (<1/16"), cavities up to 1-3/8" diameter, trace black organics material up to 2" in diameter 79.8-80.6' - Same as 76.0'-76.6' No Recovery 80.6-81.0' Limestone 81.0-81.8' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), 0-5% surface voids (<1/16") over core surface dependent on softness of rock, many shallow cavities up to 2" diameter 81.8-82.8' - Same as 81.0-81.8' except yellowish brown, (10YR 5/4) 82.8-85.6' - Same as 81.0-81.8'	R7: 9 minutes
			0	81.2, 81.45, 81.72, 81.8, 82.75, 82.95, 83.4, 83.75, 83.8, 84.75, 85.5' - Mechanical break (11)			
			0				
			0				
			4	84.35, 84.4, 84.5' - Fractures (3), horizontal, rough, undulating, horizontal fractures, up to 1/4"			
85 -42.4	R8-NQ 5 ft 92%	8	>10			No Recovery 85.6-86.0'	R8: 7 minutes
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-16

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723050.3 N, 457812.4 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.6 ft bgs on 6/14/07

START : 4/23/2007

END : 4/25/2007

LOGGER : A. Erickson

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			
90 -47.4	R9-NQ 5 ft 57%	30	>10	84.4' - Fracture, vertical, rough, undulating, bounded by horizontal fractures at 84.35-84.4', half of core, other fracture surface not present		Limestone 86.0-86.6' - moderate yellowish brown grading to yellowish gray, (10YR 5/4 to 5Y 7/2), fine grained, strong HCl reaction, extremely weak (R0), black carbon, organic material from 86.0-86.15'	SC-3 collected at 88.0- 89.1'
			>10	84.95-85.2' - Fracture zone		86.6-87.9' - Same as 86.0'-86.6' except extremely weak (R0), 40% surface voids (<1/16"), many cavities up to 9/16" diameter, trace black organic material up to 1/16"	
			0	86.0-87.05' - Fracture zone, rock CaCO3 silt		87.9-88.85' - Same as 86.0'-86.6' except very weak to weak (R1 to R2), 25-40% surface voids (<1/16"), many cavities up to 9/16", few fossil molds	R9: 7 minutes
			NR	87.65-87.9' - Fracture zone		No Recovery 88.85-91.0'	
91.0				88.5' - Mechanical break, to fit in box		Limestone 91.0-95.3' - Same as 87.9'-88.85' except yellowish gray to yellowish brown, (5Y 7/2 to 10YR 5/4)	R10: 8 minutes
95 -52.4	R10-NQ 5 ft 100%	75	3	91.1' - Fracture, 75 deg, rough, undulating, vertical fracture 1/8"		94.95-95.25' - Same as 91.0'-95.3' except 5% surface voids (<1/16"), few cavities up to 3/16"	
			0	91.8' - Fracture, 60 deg, rough, undulating, vertical fracture		95.3-96.0' - Same as 91.0'-95.3' except fine grained, extremely weak (R0), 5% surface voids (<1/16"), black organic material up to 3/8"	R11: 5 minutes
			2	91.9' - Fracture, 40 deg, rough, undulating, diagonal fracture		96.0-97.7' - moderate yellowish brown, (10YR 5/4), fine grained, strong HCl reaction, weak (R2), 25% voids (<1/16") on core surface, many cavities up to 3/8"x9/16", fossil (molds), many fossil casts, recrystallization present	
			1	92.8' - Mechanical break, for hardness test		No Recovery 97.7-101.0'	R12: 8 minutes
			>10	93.5' - Fracture, 60 deg, diagonal fracture, up to 3/4" gap		Limestone 101.0-102.6' - Same as 96.0'-97.7'	
96.0				93.8' - Fracture, horizontal, rough, undulating, horizontal fracture, fracture surfaces eroded, up to 3/4" gap		102.6-103.2' - Same as 96.0'-97.7' except extremely weak (R0), 20% surface voids (<1/16"), many cavities up to 5/16"	SC-4 collected at 103.2- 104.0'
			3	94.1' - Mechanical break		103.2-104.0' - Same as 96.0'-97.7'	
			>10	94.25' - Fracture, 70 deg, rough, undulating, tight up to 1/4" gap		No Recovery 104.0-106.0'	R12: 8 minutes
			NR	94.7, 94.85' - Mechanical break			
100 -57.4	R11-NQ 5 ft 34%	17		95.3-96.0' - Fracture zone			
				96.4-96.6' - Fracture zone, 45 deg, rough, undulating, fracture on either side			
				92.0-97.45' - Fracture zone, horizontal and 50 deg, rough, undulating			
101.0							
			2	101.15' - Fracture, 70 deg, rough, undulating, vertical fracture, large gap			
			>10	101.6' - Bedding plane, horizontal, rough, undulating, 1/8" gap			
				101.95- 102.1' - Fracture zone, rough, undulating, fracture on either side			
			2	102.9' - Bedding plane, horizontal, rough, undulating, up to 1/4" gap			
105 -62.4	R12-NQ 5 ft 60%	52		103.2' - 5 deg, rough, undulating			
			NR				
106.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-16	SHEET 7 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723050.3 N, 457812.4 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.6 ft bgs on 6/14/07

START : 4/23/2007

END : 4/25/2007

LOGGER : A. Erickson

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.
110 -67.4	R13-NQ 5 ft 96%	50	3	106.2' - Fracture zone		Limestone 106.0-107.15' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, strong HCl reaction, very weak (R1), voids (<1/16") over 20-40% of surface, silt infill in void spaces present, many cavities up to 1-3/16"x3/4", many fossil molds	R13: 13 minutes
			4	106.5' - Fractures, horizontal, rough, undulating, up to 1/4" gap			
			1	106.75' - Mechanical break			
			1	107.1' - Fracture, horizontal, rough, stepped, up to 1/2" gap			
			1	107.3' - Fracture, 55 deg, rough, undulating, up to 1/4" gap			
			6	107.35' - Fracture, horizontal, rough, undulating			
111.0			NR	107.9' - Fracture, horizontal, smooth, undulating, large gap with rock crush on part of fracture			
			2	108.7' - Fracture, 80 deg, smooth, undulating, half of fracture is rock crush		No Recovery 110.8-111.0' Limestone 111.0-114.3' - Same as 107.15'-110.8'	
			5	111.2' - Mechanical break			
			1	111.4' - Fracture, 20 deg, rough, stepped, gap up to 1.5"			
			1	111.65' - Mechanical break, 50 deg, smooth, undulating, tight			
115 -72.4	R14-NQ 5 ft 66%	25	NR	112.35' - Fracture, 80 deg, rough, undulating, black, half of fracture surface/side missing, little black staining		No Recovery 114.3-116.0'	R14: 7 minutes
			NR	112.35, 112.75' - Fractures, 20 deg, rough, undulating, gaps up to 3/4" thick with rock fragments			
			>10	112.8' - Fracture, 70 deg, rough, undulating, half of fracture is rock fragments			
			>10	112.95' - 60 deg, smooth, undulating, up to 1/2" gap			
			2	113.7' - Fracture, 30 deg, smooth, undulating, tight		Limestone 116.0-118.4' - moderate yellowish brown, (10YR 5/4), fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over 15% of core surface, many small cavities up to 3/8"x1/16"	SC-5 collected at 116.0- 117.2'
			NR	114' - Fracture, 80 deg, rough, undulating, fracture 113.5-114.3', half fracture is rock fragments		No Recovery 118.4-121.0'	
120 -77.4	R15-NQ 5 ft 48%	25	NR	116.0-116.3' - Fracture zone			
			2	117.3' - Mechanical break			
			NR	117.45-117.9' - Fracture zone			
			NR	118.05' - Fracture, horizontal, smooth, undulating, tight up to 1/8" gap			
			NR	118.25' - 10 deg, rough, undulating			
121.0			1	121.65, 122.6' - Fracture, rough, stepped, half of fracture is not present		Limestone 121.0-124.1' - Same as 116.0'-118.4' except many cavities up to 3/8" diameter or 9/16"x3/16", few fossil molds with recrystallized surfaces	
			>10	121.9' - Fracture, vertical and 5 deg, rough, stepped, fracture pair runs from 121.65-122.6', half of fracture is crushed or not present			
			2	122.1, 122.25' - Fracture zone			
			0	123.2' - Mechanical break, rough, stepped, up to 1/2" gap		No Recovery 124.1-126.0'	
125 -82.4	R16-NQ 5 ft 62%	40	NR	123.5' - Mechanical break, horizontal, rough, stepped, tight up to 1/4" gap			
			NR	123.75' - Mechanical break, horizontal, rough, up to 3/4" gap			R16: 8 minutes
126.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-16

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723050.3 N, 457812.4 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

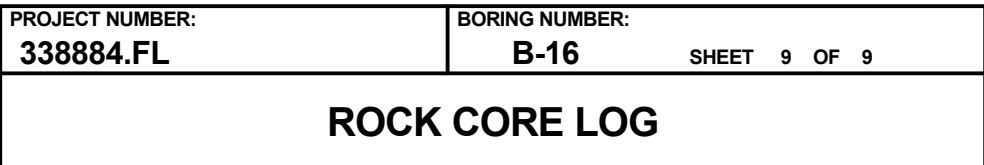
WATER LEVELS : 1.6 ft bgs on 6/14/07

START : 4/23/2007

END : 4/25/2007

LOGGER : A. Erickson

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.
130 -87.4	R17-NQ 5 ft 27%	0	>10 >10 NR	126.0-126.3' - Fracture zone 126.5' - Fracture, horizontal, rough, undulating, up to 1/2" gaps 126.85' - Mechanical break, 5 deg, rough, undulating, up to 1/2" gaps 127.0-127.35' - Fracture zone		Limestone 126.0-127.35' - moderate yellowish brown, (10YR 5/4), fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), surface voids (<1/16") up to 15%, many cavities up to 3/16"x3/8", little recrystallization No Recovery 127.35-131.0'	R17: 6 minutes
135 -92.4	R18-NQ 5 ft 26%	0	>10 >10 NR	131.0-132.3' - Fracture zone		Limestone 131.0-134.3' - Same as 126.0'-127.35' except light olive gray, (5Y 5/2), very weak to weak (R1 to R2), voids (<1/16") over 0-5% at surface, few fossil molds, cavities up to 3/8"	R18: 9 minutes
140 -97.4	R19-NQ 5 ft 50%	15	>10 >10 >10 NR	136.35' - Fracture, 30 deg, rough, stepped, up to 1/4" gap 136.5' - Fracture, 80 deg, rough, undulating, up to 1/8" gap 136.6-136.85' - Fracture zone 136.85, 137.0' - Fracture, vertical, smooth, undulating, half of fracture missing 137.0-137.46' - Fracture zone 137.9' - Fracture, vertical, smooth, undulating, 1/4" gap 138.0-138.1' - Fracture zone 138.2, 138.35' - Mechanical break, horizontal		Limestone 136.0-137.0' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to medium grained, strong HCl reaction, extremely weak (R0), 25% surface voids (<1/16"), many cavities up to 1/4"x3/16", trace fossil casts 137.0-138.5' - light olive gray, (5Y 5/2), fine grained, strong HCl reaction, weak (R2), 5% surface voids (<1/16"), many cavities up to 3/8"x9/16", moderately fossiliferous with molds and casts No Recovery 138.5-141.0'	R19: 8 minutes
145 -102.4	R20-NQ 5 ft 47%	7	>10 >10 1 NR	141.25-141.6' - Fracture zone 141.85, 141.95, 142.05' - Mechanical break (3), horizontal and 15 deg, rough, undulating, tight up to 1/4" gap 141.9' - Fracture, 80 deg, rough, undulating, black, rock fragments on one half of fracture 142.0-142.25' - Fracture zone 142.25, 142.4, 142.55, 142.8, 142.95' - Bedding plane (5), rough, undulating, up to 1/2" gap		Limestone 141.0-141.3' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, weak (R2), 15% surface voids (<1/16"), many cavities and molds up to 3/16"x3/8" 141.3-143.35' - Same as 141.0'-141.3' except extremely weak to very weak (R0 to R1) No Recovery 143.35-146.0'	R20: 8 minutes



ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.6 ft bqs on 6/14/07

START : 4/23/2007

END : 4/25/2007

LOGGER : A. Erickson

APPENDIX 2BB-536



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-17
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723177.4 N, 457948.0 E (NAD83)
 ELEVATION : 42.2 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, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.5 ft bgs on 3/28/07 START : 3/28/2007 END : 4/4/2007 LOGGER : A. Teal, R. McComb

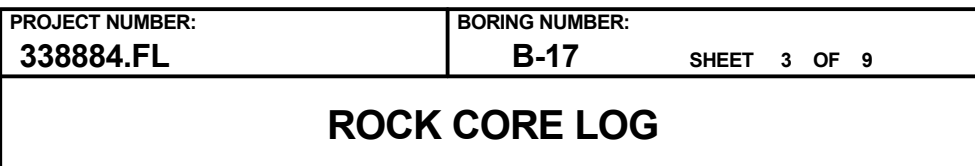
WATER LEVELS : 2.51 RDBS ON 3/20/07			START : 3/20/2007			END : 4/4/2007			LOGGER : A. Earl, R. McComb		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS				
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION						
42.2	0.0	0.3	SS-1	0-1-2 (3)	Topsoil 0.0-0.3' - brownish black, (5YR 2/1)		Drilling with 3-7/8" tri-cone bit				
	1.5										
							Driller's Remark: Water encountered at approximately 2.5' below ground surface				
5											
37.2											
	6.5						Medium to heavy chatter at 5.5-6.0'				
		0.6	SS-2	2-2-1 (3)	Clayey Sand (SC) 6.5-7.1' - light olive gray, (5Y 6/1), wet, very loose, very fine to fine silica sand, 40% medium to high plastic fines, trace roots						
	8.0										
10											
32.2							Moderate chatter at approximately 10'				
	13.0										
		0.8	SS-3	5-5-3 (8)	Limestone Fragments 13.0-13.3' - moderate yellowish brown to grayish orange, (10YR 5/4 to 10YR 7/4), strong HCl reaction Silt (ML) 13.3-13.8' - grayish yellow, (5Y 8/4), wet, medium stiff, nonplastic, rapid dilatancy, strong HCl reaction, 10% very fine sand-sized, carbonate						
	14.5										
15											
27.2											
	19.5										
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-17
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723177.4 N, 457948.0 E (NAD83)
 ELEVATION : 42.2 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, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.5 ft bgs on 3/28/07 START : 3/28/2007 END : 4/4/2007 LOGGER : A. Teal, R. McComb

WATER LEVELS : 2.51 TUBS ON 3/20/07			START : 3/20/2007			END : 4/4/2007			LOGGERS : A. Teal, R. McCord		
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					
22.2		1.2	SS-4	12-11-6 (17)	Silt (ML) 19.5-20.7' - yellowish gray, (5Y 7/2), wet, very stiff, nonplastic, very rapid dilatancy, moderate to strong HCl reaction, 10% very fine to medium sand-sized, all carbonate						
	21.0										
25											
17.2											
	26.0										
		0.4	SS-5	10-3-2 (5)	Silt With Sand (ML) 26.0-26.4' - yellowish gray, (5Y 7/2), wet, medium stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 20% very fine to medium sand-sized, coarse gravel-sized limestone fragments, all carbonate material						
	27.5										
30											
12.2											
	32.5										
		1.3	SS-6	17-18-50/4 (68/10")	Sandy Silt (ML) 32.5-33.75' - dark yellowish orange, (10YR 6/6), moist to wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 25-30% fine to coarse sand-sized, all carbonate						
	33.8										
35					Begin Rock Coring at 34.5 ft bgs See the next sheet for the rock core log						
7.2											



ELEVATION : 42.2 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

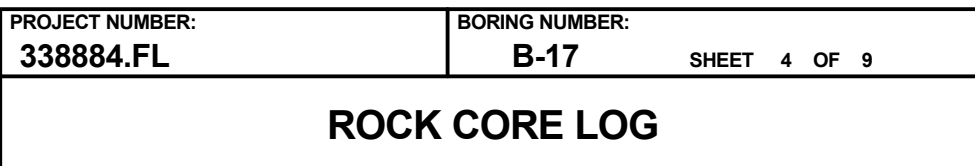
WATER LEVELS : 2.5 ft bgs on 3/28/07

START : 3/28/2007

END : 4/4/2007

LOGGER : A. Teal, R. McComb

APPENDIX 2BB-539



ORIENTATION : Vertical

LOGGER : A. Teal, R. McComb

Rev. 4

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723177.4 N, 457948.0 E (NAD83)

ELEVATION : 42.2 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 : 2.5 ft bqs on 3/28/07

START : 3/28/2007

END : 4/4/2007

LOGGER : A. Teal, R. McComb

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				
75 -32.8	76.5		1	73.6, 74.8' - Fractures (2), 5-10 deg, smooth, undulating, open				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-17

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723177.4 N, 457948.0 E (NAD83)

ELEVATION : 42.2 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 : 2.5 ft bgs on 3/28/07

START : 3/28/2007

END : 4/4/2007

LOGGER : A. Teal, R. McComb

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				
95 -52.8	96.5	42	3	93.55' - Fracture, horizontal, rough, undulating, brown clay coating over 20-30%, open		Limestone 83.4-83.7' - grayish orange, (10YR 7/4), fine grained, mild HCl reaction, very weak (R1), thinly laminated, black carbonaceous laminae present, some voids (<1%) at top of interval, friable 83.7-85.7' - Same as 81.5-83.4' except circular to subcircular cavities common (3/8" or less in diameter), some cavity infilling No Recovery 85.7-86.5' Limestone 86.5-90.7' - Same as 81.3-83.4' except voids and cavities up to 10% coverage from 87.65-89.0' increasing to 20-30% coverage below 89.0', black carbonaceous coating on bedding plane at 90.5' No Recovery 90.7-91.5' Limestone 91.5-92.0' - Same as 81.5-83.4' 92.0-93.0' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, medium strong (R3), moderately fossiliferous, trace coverage of voids 1/16" or less on surface, trace cavities 93.0-93.6' - yellowish gray, (5Y 7/2), fine grained, very weak (R1), cavities numerous at contact of overlying interval, 1-2% coverage of voids 1/16" or less on surface Lignite 93.6-94.1' - no HCl reaction, laminar bedding Limestone 94.1-95.2' - medium grained, mild HCl reaction, extremely weak to very weak (R0 to R1) 95.2-96.0' - yellowish gray, (5Y 7/2), moderate HCl reaction, very weak to weak (R1 to R2), thinly laminated with white HCl reactive limestone, fossiliferous (molds/casts), 10-15% coverage of voids on surface, trace cavities (3/8" or less in diameter) No Recovery 96.0-96.5' Limestone 96.5-100.0' - Same as 92.0-93.0' except becoming pale yellowish brown (10YR 6/2) with depth, fossiliferous, with gastropods common (elongated spiral individuals), intermittently interbedded with medium grained limestone with 15-20% coverage of 1/16" or less voids on surface No Recovery 100.0-101.5'	R13: 7 minutes R. McComb logged discontinuities for R13	
			1	93.8' - Fracture, horizontal, smooth, planar, tight, (clay contact)				
			NR	93.97' - Fracture, horizontal, smooth, planar, horizontal, tight				
	100 -57.8	101.5	20	>10			94.25, 94.37' - Fractures (2), horizontal, rough, undulating, 1 3/16"-1 9/16" open 94.50-94.60' - Fracture zone, rough, multiple orientation	SC-3 collected at 98.7-99.6'
				4			94.9' - Fracture, horizontal, rough, undulating, up to 1/16" open	
				10			95.25' - Fracture, 0-70 deg, rough, undulating, open	
				5			95.5' - Fracture zone, 80 deg, rough, planar to undulating, several en echelon fracture planes	
				NR			96.0' - Fracture, 50 deg, rough, undulating 96.5-97.0' - Fracture zone, low to high angle, rough, stepped to undulating, tight to open	
				10			97.4-97.7' - Fracture zone, high angle, criss cross fractures intersecting at 45 degrees, rough, planar, tight	
		106.5	NR	>10			97.85' - Fracture, 40 deg, rough, stepped, tight 98.0' - Fracture, 15 deg, rough, undulating, open	Driller's Remark: Lost circulation at about 101.0'
0				98.1' - Fracture, 45 deg, rough, planar, tight				
NR				98.7' - Fracture, 20 deg, rough, undulating, open 99.6-100.1' - Fracture zone, various angles, rough, stepped to undulating, tight to open				
NR				101.6' - Fracture, 10 deg, smooth, undulating, open, possible mechanical break 101.7' - Fracture, 15 deg, smooth, undulating, open				
110 -67.8	111.5	40	>10	102.3-103.2' - Fracture zone, predominately horizontal to <5 deg, stepped to undulating, open, coarse gravel size rock fragments 106.5-107.2' - Fracture zone, predominately horizontal to <5 deg, stepped to undulating, open, coarse gravel size rock fragments	R15: 4 minutes			
			1	107.2, 107.35' - Fractures (2), <5 deg, rough, stepped, open				
			1	107.43, 107.57' - Fractures (2), <5 deg, rough, undulating, open				
			>10	109.4' - Fracture, 30 deg, rough, undulating, tight				
			>10	109.8-110.9' - Fracture zone, fragments up to gravel size, angular to subangular				
			NR					
	117.5	78	>10	111.5-111.85' - Fracture zone, limestone fragments from gravel to cobble size 112.0' - Fracture, 50 deg, rough, planar, tight	SC-4 collected at 112.7-113.8'			
			1	112.7-113.8' - Fractures (2), 30 deg, rough, undulating, tight				
			1					
			1					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-17

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723177.4 N, 457948.0 E (NAD83)

ELEVATION : 42.2 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 : 2.5 ft bgs on 3/28/07

START : 3/28/2007

END : 4/4/2007

LOGGER : A. Teal, R. McComb

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.
115 -72.8	R18-NQ 5 ft 96%	85	2	114.75' - Fracture, 65 deg, rough, planar, tight		Limestone 101.5-103.8' - pale yellowish brown, (10YR 6/2), fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), 10-15% coverage of voids 1/16" or less on surface, cavities 3/8"-3/4" in length (elongated), fossiliferous (casts/molds) No Recovery 103.8-106.5' Limestone 106.5-111.0' - Same as 101.5-103.8' except very weak (R1), 20-25% coverage of small cavities, fewer fossils, very friable No Recovery 111.0-111.5' Limestone 111.5-116.5' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, weak (R2), no apparent bedding, 15-25% coverage of voids 1/16" or less, many cavities up to 3/8", trace very fine grained lenses, less fossiliferous 116.5-121.3' - Same as 111.5-116.5' except mild to moderate HCl reaction, except many cavities 1"-2", fossiliferous (molds and casts), intervals of very weak (R1) limestone with few voids/cavities with up to 1/8" thick wavy laminations No Recovery 121.3-121.5' Limestone 121.5-126.05' - yellowish gray, (5Y 7/2), fine grained, medium strong to strong (R3 to R4), 15-20% coverage of voids 1/16" or less, few cavities to 1/4", fossiliferous (molds/casts of echinoids/gastropods), intervals of dusky yellow green (5GY 5/2), very fine grained limestone with strong HCl reaction at 121.7-122.3', 124.6-125.1' and 126.0-126.05' No Recovery 126.05-126.5' Limestone 126.5-131.25' - Same as 111.5-116.5' except weak to medium strong (R2 to R3), with medium strong to strong (R3 to R4) interval at 130.0-130.4' No Recovery 131.25-131.5' Limestone 131.5-133.2' - Same as 126.5-131.25'	R17: 4 minutes
			3	115.4' - Fracture, 25 deg, rough, undulating, open			
116.5			0	115.6' - Fracture, 30 deg, rough, stepped, (bidirectional), open			
			2	116.0' - Fracture, 30 deg, rough, undulating, open			
			3	116.25' - Fracture, vertical, smooth, planar, tight, secondary fracture at 90 degrees to above fracture			
			2	117.5' - Fracture, 20 deg, rough, undulating, tight			
120 -77.8			2	117.9' - Mechanical break			
			2	118.75' - Fracture, 10 deg, rough, undulating, tight, organic infilling (lignite)			
			2	119.1, 119.35' - Fractures (2), 10 deg and 15 deg, rough, undulating, tight			
			NR	120.1' - Fracture, 10 deg, smooth, undulating, open			
120 -77.8	R19-NQ 5 ft 91%	67	>10	120.5' - Fracture, 20 deg, rough, undulating, tight			R18: 3 minutes
			0	121.0' - Fracture, 30 deg, rough, undulating, open			
			2	121.2' - Fracture, 10 deg, smooth, undulating, open			
			2	121.5-121.7' - Fracture zone, horizontal, rough, planar to undulating, open			
			10	121.9' - Fracture, 40 deg, rough, planar, open			
			2	124.3' - Fracture, vertical, smooth, planar, tight			
125 -82.8			NR	124.35-124.65' - Fracture zone, inclined to near vertical, rough, stepped to undulating, tight, several fracture planes			
			1	124.65-124.72' - Fracture zone, rough, planar, gravel size limestone fragments bounded by horizontal open bedding planes			
			1	124.92' - Fracture, <5 deg, smooth, undulating, open			
			3	125.85' - Fracture, 60 deg, rough, undulating, extends from 125.7-126.05', tight, secondary fracture off main fracture also at high angles			
	R20-NQ 5 ft 95%	68	3	127.0' - Fracture, 75 deg, rough, undulating, tight, extends from 126.5-127.3'			R19: 6 minutes
			4	128.1' - Fracture, 60 deg, smooth, planar, tight			
			2	128.8' - Fracture, 15 deg, rough, undulating, open			
			NR	129.0' - Fracture, 85 deg, rough, planar, silty sand infilling			
			0	129.2' - Fracture, <5 deg, rough, undulating, open			
			>10	129.9' - Fracture, 10 deg, rough, undulating, open			
			2	130.0, 130.2, 130.3' - Fractures (3), 20 deg, smooth, undulating, tight			
			2	130.6' - Fracture, 35 deg, rough, undulating, tight			
			48	130.85' - Fracture, 30 deg, rough, undulating, open			



PROJECT NUMBER:
338884.FL

BORING NUMBER:
B-17

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723177.4 N, 457948.0 E (NAD83)

ELEVATION : 42.2 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

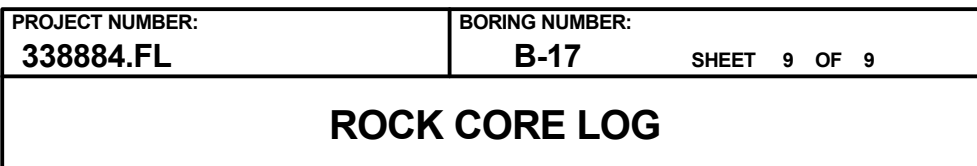
WATER LEVELS : 2.5 ft bgs on 3/28/07

START : 3/28/2007

END : 4/4/2007

LOGGER : A. Teal, R. McComb

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			
135 -92.8			>10	132.8-133.2' - Fracture zone, 0-90 deg, rough to smooth, planar to undulating/stepped		Limestone 133.2-135.25' - yellowish gray, (5Y 7/2), fine to very fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), 1-2% coverage of voids 1/16" or less on surface, fossil molds/casts trace to absent	R21: 4 minutes
			0	133.45, 133.75, 134.3' - Fractures (3), 15-20 deg, smooth, planar, tight			
			NR	134.3-135.2' - Fracture zone, 0-90 deg, rough to smooth, planar to undulating/stepped, multiple high angle fracture planes			
	136.5		2	136.6' - Fracture, <5-90 deg, rough, stepped, open		135.25-136.0' - pale yellowish brown, (10YR 6/2), fine grained, mild HCl reaction, very weak (R1), 3-5% coverage of voids 1/16" or less on surface, cavities (up to 3/8") common No Recovery 136.0-136.5' Limestone 136.5-138.35' - yellowish gray, (5Y 7/2), moderate HCl reaction, weak (R2), 10-15% coverage of voids 1/16" or less distributed unevenly across core surface, cavities common (3/8" or less), poorly fossiliferous (molds/casts)	R22: 12 minutes
			4	137.3' - Fracture, 20 deg, smooth, planar, very tight			
			>10	137.85' - Fracture, 30 deg, rough, undulating, open			
		25	NR	138.0' - Fracture, 70 deg, rough, undulating, tight		138.35-138.8' - Same as 135.25-136.0' 138.8-139.0' - yellowish gray to light gray, (5Y 7/2 to N7), very fine grained, moderate HCl reaction, medium strong (R3), trace coverage of voids 1/16" or less, 1 cavity (3/8"), possible limestone intraclasts, fossils absent	SC-5 collected at 142.0-142.85
				138.37' - Fracture, <5 deg, rough, stepped, tight			
				138.5' - Fracture, 0-60 deg, rough, stepped, tight			
				138.8-139.0' - Fracture zone, 0-90 deg, smooth, stepped		139.0-139.6' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, very weak to weak (R1 to R2), 3-5% coverage of voids 1/16" or less on surface, cavities common up to 3/8"-3/4" No Recovery 139.6-141.5' Limestone 141.5-143.7' - grayish yellow to pale yellowish brown, (10YR 7/4 to 10YR 6/2), very fine grained, mild to moderate HCl reaction, strong to very strong (R4 to R5) from 142.75-143.0', becoming less strong below 143.0', 1-2% coverage of voids 1/16" or less, trace cavities (<3/16"), fossils trace to absent	R23: 12 minutes
				139.3' - Fracture, 0-70 deg, rough, stepped, open			
				139.3-139.6' - Fracture zone, 0-90 deg, smooth, stepped			
				141.5-142' - Fracture zone, 0-90 deg, rough, stepped to undulating, open		143.7-144.0' - variegated moderate yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), fine to medium grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), thinly laminated, possible intraclasts 1/16" in diameter (light gray), cavities/voids trace to absent, fossils trace to absent, possible carbonaceous/organic material on thin laminae	R24: 8 minutes Drilling ended 16:04 on 4/3/07 at 151.5'
				142.85' - Fracture, 20 deg, rough, undulating, tight			
				143.1, 143.25, 143.4' - Fractures (3), 60 deg, smooth, planar, very tight			
				143.5' - Fracture, 60 deg, rough, stepped, bidirectional, open		147.9' - Fracture, 50 deg, rough, undulating, open	
				143.6' - Fracture, 60 deg, rough, stepped, (bidirectional-partial removal of rock core interval), open			
				143.75' - Fracture, 20 deg, smooth, undulating, tight			
				143.95' - Fracture, 40 deg, smooth, planar, open		148.0' - Fracture, horizontal, rough, planar, tight	
				144.0-144.3' - Fracture zone, 0-50 deg, rough to smooth, planar to stepped			
				144.85' - Fracture, <5 deg, rough, undulating, open			
				145.3' - Fracture, 30 deg, rough, undulating, open		150.0, 150.6' - Fractures (2), 15 deg and 30 deg, rough, undulating, open	
				147.65' - Fracture, 60 deg, rough, planar, open			
				147.9' - Fracture, 50 deg, rough, undulating, open			
				148.0' - Fracture, horizontal, rough, planar, tight		151.05' - Fracture, 20 deg, smooth, undulating, tight	
				148.5, 148.55, 149.45' - Fractures (3), 5-10 deg, rough, undulating, tight			
				149.8' - Fracture, 30 deg, smooth, undulating, tight			
				150.0, 150.6' - Fractures (2), 15 deg and 30 deg, rough, undulating, open			
				151.05' - Fracture, 20 deg, smooth, undulating, tight			



ELEVATION : 42.2 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 : 2.5 ft bqs on 3/28/07

START : 3/28/2007

END : 4/4/2007





LOGGER : A. Teal, R. McComb

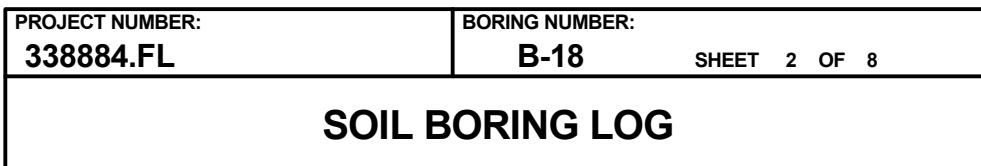
APPENDIX 2BB-545



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-18
SHEET 1 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723259.1 N, 458027.2 E (NAD83)
 ELEVATION : 42.0 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, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.4 ft bgs on 4/22/07 START : 4/19/2007 END : 4/23/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 2.4 (RDS) 4/22/07			START : 4/19/2007			END : 4/23/2007			LOGGER : N. Salzman		
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						
42.0	0.0	1.0	SS-1	1-1-1 (2)	Poorly Graded Sand With Organics (SP) 0.0-1.0' - olive gray, (5Y 3/2), moist, very loose, very fine to fine silica sand, trace nonplastic fines, 20% organics decreasing with depth		14:49 Begin drilling, SPT sample, sand is silica				
	1.5										
5	5.0										
37.0		1.2	SS-2	1-2-1 (3)	Clayey Sand (SC) 5.0-6.2' - pale blue to grayish blue, (5BP 7/2 to 5BP 5/2), mottling light olive brown (5y 5/6), wet, soft, medium plasticity, no dilatancy, 66% fine silica sand						
	6.5										
10	10.0										
32.0		0.8	SS-3	7-4-3 (7)	Limestone Fragments 10.0-10.4' - dusky yellow, (5Y 6/4), moderate HCl reaction Silt (ML) 10.4-10.8' - grayish yellow, (5Y 8/4), wet, firm, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 10 % very fine to medium sand, carbonate						
	11.5										
15	15.0										
27.0		1.3	SS-4	26-29-36 (65)	Silt With Sand And Limestone Fragments (ML) 15.0-16.3' - Same as 10.5-11.5' except 20% fine to coarse sand-sized, 10-15% coarse sand-sized to fine gravel-sized limestone fragments at top of sample						
	16.5										
20											



LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-18

SHEET 3 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723259.1 N, 458027.2 E (NAD83)

ELEVATION : 42.0 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

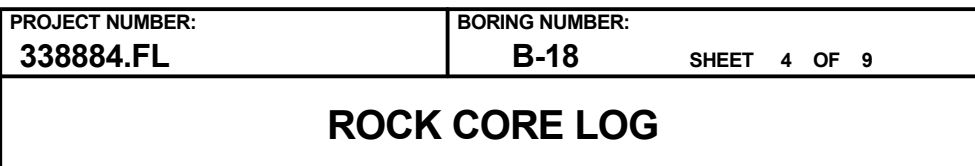
WATER LEVELS : 2.4 ft bgs on 4/22/07

START : 4/19/2007

END : 4/23/2007

LOGGER : N. Jarzyniecki

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.
35 7.0	R1-NQ 5 ft 100%	80	1	31.0' - Bedding plane, 10 deg, rough, undulating, open 1/8"		Limestone 31.0-36.0' - moderate yellow to light olive gray, (5Y 7/6 to 5Y 5/2), with mottling of the two colors from 32.8-35.4', very fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), highly fossiliferous, fossil casts and molds, voids over 50-70% of surface up to 1/16", dissolution cavities up to 1/2"x2" on 10% of surface	16:57 Begin rock coring at 31.0' below ground surface
			4	32.25' - Bedding plane, <5 deg, smooth, planar, tight			SC-broke during movement
			4	32.5' - Mechanical break, 5 deg, rough, undulating, highly fossiliferous			
			0	32.6' - Bedding plane, 10 deg, smooth, planar, highly fossiliferous, tight			
			1	32.9' - Mechanical break, 15 deg, rough, undulating, highly fossiliferous, tight			R1: 10 minutes
40 2.0	R2-NQ 5 ft 94%	0	0	33.1' - Bedding plane, 10 deg, smooth, planar, highly fossiliferous, tight		36.0-40.7' - dusky yellow to pale olive, (5Y 6/4 to 10Y 6/2), fine grained, moderate to strong HCl reaction, extremely weak (R0), fine grained silts, fossiliferous, voids up to 1/16" on 20% of surface, dissolution zones up to 10% of surface up to 1/2"x1" from 36.0-37.1' dusky yellow to pale olive (5Y 6/4 to 10Y 6/2), organic layers throughout	17:07 Begin coring 36.0-41.0'
			0	33.5, 33.8' - Bedding plane (2), 30 deg, smooth, planar, tight			
			0	33.75, 35.5' - Fractures (2), rough, undulating, tight, high angle fractures			
			0				R2: 10 minutes
			NR				
45 -3.0	R3-NQ 5 ft 98%	0	0			No Recovery 40.7-41.0' 41.0-42.5, 44.45-45.9' - Same as 36.0-40.7' except 42.5-44.45 light olive gray to dusky yellow (5Y 5/2 to 5Y 6/4), highly fossiliferous, cavities over 30% of surface, up to 1/16", medium gray infill (N5) over 20% of surface, organics throughout, weak (R2) rock, moderate HCl reaction	17:17 Begin coring 41.0-46.0'
			0				SC-1 collected at 42.5-43.3'
			1	43.4' - Bedding plane or mechanical break, silt and/or clay sized infilling, silt infill, open 1"			
			0				R3: Run time not recorded
			0				
50 -8.0	R4-NQ 5 ft 100%	40	NR			No Recovery 45.9-46.0' Limestone 46.0-51.0' - moderate yellowish brown, (10YR 5/4), fine to very fine grained, moderate to strong HCl reaction, extremely weak to weak (R0 to R2), voids up to 1/16" on 10-20% of surface, trace organics on surface	17:27 Drilled 46.0-51.0'
			1	46.7' - Bedding plane, 10 deg, rough, undulating, tight			
			3	47.1, 47.2, 47.6' - Bedding plane (3), 10 deg, rough to smooth, undulating, tight			
			2	48.55, 48.9, 49.6' - Bedding plane (3), 10 deg, rough, undulating, tight			R4: Run time not recorded
			2	47.4, 48.15, 48.5, 49.4, 50.0' - Mechanical break (4)			4/20/07 08:21 Retrieved R4
			0	49.45' - Bedding plane, 30 deg, rough, undulating, tight			08:27 Water level at 2.7' below ground surface
				50.0' - Mechanical break			



ORIENTATION : Vertical

LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-18	SHEET 5 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723259.1 N, 458027.2 E (NAD83)

ELEVATION : 42.0 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 : 2.4 ft bgs on 4/22/07

START : 4/19/2007

END : 4/23/2007

LOGGER : N. Jarzyniecki

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			
75 -33.0	R9-NQ 5 ft 84%	60	2	70.1' - Bedding plane, <5 deg, silt and/or clay sized infilling, open 1/2", dusky yellow (5Y 6/4) silt infill		69.2-71.0' - moderate yellowish brown, (10YR 5/4), fine to very fine grained, moderate HCl reaction, weak (R2), laminated bedding, voids to 1/16" over 20% of surface, trace laminar bedding	14:46 Begin coring 71.0-76.0'
			0	71.2, 71.7' - Fractures (2), <5 deg and 15 deg, rough, undulating, open 1/4"			
			2	73.0' - Bedding plane, 5 deg, rough, undulating, open 1/4", tight		Limestone	
			1	73.5, 74.9, 75.0' - Mechanical break (3)		71.0-73.0' - dusky yellow to pale olive, (5Y 6/4 to 10Y 6/2), strong HCl reaction, weak (R2), voids to 1/16" over <10% of surface, fossiliferous (casts), dissolution along fractures, 5% cover infill of medium gray (N5)	R9: 5 minutes
			0	73.7, 74.0' - Bedding plane (2), 5 deg, rough, undulating, open 1/4", olive gray (5Y 3/2) clay infilling		73.0-73.7' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, extremely weak (R0), fossiliferous (casts), voids on 20% of surface to 1/16", mottling pale olive (10Y 6/2)	14:51 Begin coring 76.0-81.0'
76.0			NR			73.7-75.2' - dusky yellow to pale olive, (5Y 6/4 to 10Y 6/2), moderate HCl reaction, weak (R2), voids up to 1/16" over 30% of surface, clay infill in some fractures	SC-3 collected at 76-76.9'
			0			No Recovery 75.2-76.0'	
			1	77.8, 78.9' - Bedding plane (2), 20 deg, rough, undulating, silt zone open 1/4"		Limestone	
	R10-NQ 5 ft 96%	64	1	79.6, 76.9, 80.0' - Mechanical break (3)		76.0-77.8, 78.5-79.5, 79.9-80.8' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, extremely weak (R0), fossiliferous (casts), voids over 20-30% of surface to 1/16", mottled with light olive gray to yellowish gray (5Y 5/2 to 5Y 7/2)	R10: Run time not recorded
80 -38.0			1	80.2' - Fracture, 20 deg, rough, undulating, silt and/or clay sized infilling, silt zone open 1/2"		77.8-78.5, 79.5-79.9' - dusky yellow to pale olive, (5Y 6/4 to 10Y 6/2), weak (R2), voids up to 1/16" over 30% of surface	14:58 Begin coring 81.0-83.0'
			NR	81.3' - Bedding plane, <5 deg, rough, undulating, open 1/4"		79.6-79.7' - moderate HCl reaction, clay infill	
			1	82.25, 83.0, 83.5' - Mechanical break (3)		No Recovery 80.8-81.0'	
			0			Limestone	
	R11-NQ 5 ft 90%	83	0	84.0' - Bedding plane, <5 deg, rough, undulating, open 1/4", associated with fossils and dissolution zones		81.0-85.5' - dusky yellow to yellowish gray, (5Y 6/4 to 5Y 7/8), very fine to fine grained, mild to moderate HCl reaction, weak (R2), voids up to 1/16" on 35-40% of surface, fossiliferous (casts, molds), dissolution cavities 83.9-84.4'. Largest dissolution zone is up to 1/2"x1", very weak (R1) to weak (R2) rock, low to moderate HCl reaction	R11: 12 minutes
85 -43.0			1	85.0' - Bedding plane, <15 deg, rough, undulating, open 1/4"		No Recovery 85.5-86.0'	
			NR			Limestone	
			>10	86.45-86.75' - Fracture zone, rough, undulating, intersecting fractures, open		86.0-87.7' - Same as 81.0-85.5'	15:30 Begin coring 86.0-91.0'
			3	87.1, 87.4' - Bedding plane, <5 deg, rough, undulating, open less than 1/4"		No Recovery 87.7-91.0'	Driller's Remark: Slight circulation loss at 87.0'
			NR	87.3' - Fracture, 75 deg, rough, undulating, tight			
90 -48.0	R12-NQ 5 ft 34%	9	NR				R12: Run time not recorded
91.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-18

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723259.1 N, 458027.2 E (NAD83)

ELEVATION : 42.0 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 : 2.4 ft bgs on 4/22/07

START : 4/19/2007

END : 4/23/2007

LOGGER : N. Jarzyniecki

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.
95 -53.0	R13-NQ 5 ft 80%	50	1			Limestone 91.0-95.0' - grayish orange, (10YR 7/4), fine grained, moderate HCl reaction, weak (R2), moderately fossiliferous (casts), voids up to 1/8" over 30% of surface	16:44 Begin coring 91.0-96.0' 16:59 Core drilled to 93.5', drillers remark that core barrel is stuck 17:11 Retrieve core sample 91.0-93.5' 17:20 Set 4" casing 4/22/07 09:38 Water level 2.4' below ground surface 09:52 Begin to set 3" casing 11:18 Core barrel freed (3" casing to 85.0') 13:40 NW casing pulled, setting HW casing to 90.0' 15:28 4" casing set 15:49 Begin coring 93.5-96.0' R13: 23 minutes 4/23/07 08:00 Begin coring 96.0-101.0'
			0	92.3' - Bedding plane, <10 deg, rough, undulating, open 1/4"			
			>10	93.0-93.9' - Fracture zone or mechanical break, smooth to rough, undulating, open up to 1/4", intersecting fractures			
			>10	93.5-94.4' - Fracture zone or mechanical break, smooth to rough, undulating, open 1/4"			
			NR	94.55' - Bedding plane, 15 deg, rough, undulating, open 1/4"			
100 -58.0	R14-NQ 5 ft 58%	17	<10	96.0-96.2, 96.7-97.0' - Fracture zone (2), rough, undulating, open 1/4", intersecting fractures		Limestone 96.0-96.7' - dusky yellow to yellowish gray, (5Y 6/4 to 5Y 7/2), very fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids to 1/8" over 35-40% of surface 96.7-97.15' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, extremely weak (R0), fossiliferous (casts), voids to 1/16" over 20% of surface, mottled with light olive gray to yellowish gray (5Y 5/2 to 5Y 7/2) 97.15-98.9' - dusky yellow matrix with yellowish gray infill, (5Y 6/4 with 5Y 8/1), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), highly fossiliferous (casts), voids to 1/16" over 30% of surface, dissolution cavities up to 1/4"x1/2", infill over 10-50% of surface (same hardness matrix) No Recovery 98.9-101.0' Limestone 101.0-102.7' - dusky yellow with light olive gray infill, (5Y 6/4 with 5Y 5/2), moderate HCl reaction, weak to medium strong (R2 to R3), highly fossiliferous (casts), voids to 1/16" over 30% of matrix and over 15% of infill, dissolution cavities to 1/2"x3/4", infill over 10-20% of surface, fine grained 102.7-105.9' - dusky yellow with yellowish gray infill, (5Y 6/4 with 5Y 8/1), strong HCl reaction, very weak to weak (R1 to R2), highly fossiliferous (casts), voids to 1/16" over 30% of surface, dissolution cavities to 1/4"x1/2", infill over 15-20% of surface, fine grained No Recovery 105.9-106.0'	R14: Run time not recorded 08:09 Begin coring 101.0-106.0' R15: Run time not recorded 08:30 Begin coring 106.0-111.0' SC-4 collected at 106.0-107.0' R16: Run time not recorded
			1	97.6, 98.6' - Bedding plane (2), 10 deg, rough, undulating, tight			
			4	97.7, 98.5' - Mechanical break (2) 98.2' - Bedding plane, 10 deg, rough, undulating, tight			
			NR	98.25, 98.75' - Fracture (2), 50 deg, rough, undulating, with organics in vertical orientation			
105 -63.0	R15-NQ 5 ft 98%	97	1	101.7, 104.9' - Mechanical break (2)			
			0	101.9' - Bedding plane, 10 deg, rough, undulating, open 1/2"			
			1	105.3, 102.4, 103.5, 104.2' - Mechanical break (4) 102.75' - Mechanical break			
			0	103.8' - Bedding plane, 10 deg, rough, undulating, tight			
			0	104.55' - Bedding plane, <5 deg, smooth, undulating			
110 -68.0	R16-NQ 5 ft 100%	90	0	105.05' - Bedding plane, <5 deg, smooth, undulating, very soft material, open 1/4"			
			NR	105.2-105.8' - Fracture zone, smooth to rough, undulating, intersecting fractures, most are high angle, open 1/8"			
			0				
			0				
			0				
			2				



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-18	SHEET 7 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723259.1 N, 458027.2 E (NAD83)

ELEVATION : 42.0 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 : 2.4 ft bgs on 4/22/07

START : 4/19/2007

END : 4/23/2007

LOGGER : N. Jarzyniecki

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			
115 -73.0	R17-NQ 5 ft 96%	80	0	110.4, 110.7' - Fracture (2), 50-60 deg, rough, undulating, tight		Limestone 106.0-111.0' - dusky yellow, (5Y 6/4), fine grained, strong HCl reaction, extremely weak to weak (R0 to R2), voids to 1/16" over <20% of surface, highly fossiliferous, dissolution zones up to 1/2" diameter over < 5% of surface	08:40 Begin coring 111.0- 116.0'
			0			111.0-115.8' - dusky yellow, (5Y 6/4), fine grained, strong HCl reaction, extremely weak to medium strong (R0 to R3), increasing in hardness with depth until 105.2' below ground surface, voids to 1/16" over <20% of surface	R17: Run time not recorded
116.0			1				
			>10				
			NR			No Recovery 115.8-116.0' Limestone 116.0-120.7' - dusky yellow, (5Y 6/4), fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids to 1/8" over <20% of surface, fossiliferous	08:50 Begin drilling 116.0- 121.0'
	R18-NQ 5 ft 94%	70	6	116.0-116.2' - Fracture zone, smooth to rough, undulating			
			0	116.3' - Fracture, 55 deg, rough, undulating, tight			
			0	116.4' - Fracture, 80-85 deg, rough, undulating, tight			
			0	116.6' - Bedding plane, 10 deg, rough, undulating		No Recovery 120.7-121.0' Limestone 121.0-124.5' - Same as 116.0-120.7' 124.5-126.0' - light olive brown with light olive gray, (5Y 5/6 with 5Y 5/2), very fine to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), laminar features throughout and yellowish gray (5Y 7/2) infill over 15% of surface. Matrix is highly fossiliferous, dissolution features over 10% of surface up to 1/2"x1/2", voids over 35% of surface up to 1/16" and trace organics, infill is very fine, poorly fossiliferous and < 5% voids	R18: Run time not recorded
120 -78.0			1	118.8, 120.15' - Mechanical break (2)			
			0	119.9' - Fracture, 80 deg, smooth, undulating, open, end missing			
121.0			NR				09:09 Begin drilling 121.0- 126.0'
	R19-NQ 5 ft 100%	62	1	121.4' - Fracture, 80 deg, rough, undulating, open less than 1/8"			
			0			126.0-126.4' - pale olive with light olive gray laminations, (10YR 6/2 with 5Y 5/2), very fine grained, mild HCl reaction, weak (R2), poorly fossiliferous, no voids	SC-5 collected at 123.5- 124.45'
			0	123.5, 125.8, 124.8' - Mechanical break (3)			
			1	124.5' - Bedding plane, smooth, undulating, dissolution features along outer edges of fracture open 1/4"			R19: 10 minutes
125 -83.0			3	125.25' - Fracture, 85 deg, not open		Limestone 126.4-129.6' - light olive brown, (5Y 5/6), same as limestone in 116.0-120.7' except voids over 25% of surface up to 1/16" and laminar feature at 127.15-127.0', no voids, poorly fossiliferous, weak (R2) to medium strong (R3) rock with exception of 127.2-127.4' which is strong (R4) rock, moderate to strong HCl reaction	09:19 Begin drilling 136.0- 131.0'
			>10	125.85, 125.9' - Bedding plane (2), <5 deg, smooth, planar, tight			
			>10	126.0-126.4' - Fracture zone, intersecting fractures, open 1/8", tight			
			>10	126.75, 127.3, 128.5, 128.7' - Mechanical break (4)			
	R20-NQ 5 ft 72%	40	0	127.4-127.55' - Fracture zone, intersecting fractures, open 1/4", softer material		No Recovery 129.6-131.0'	
			2	127.8, 127.95' - Fracture (2), 60 deg, rough to smooth, undulating, open 1/4"			
130 -88.0			NR	129.35' - Fracture, 60 deg, rough to smooth, undulating, open 1/4"			R20: Run time not recorded
			NR	129.5' - Fracture, 60 deg, smooth, undulating			
131.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-18	SHEET 8 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723259.1 N, 458027.2 E (NAD83)

ELEVATION : 42.0 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

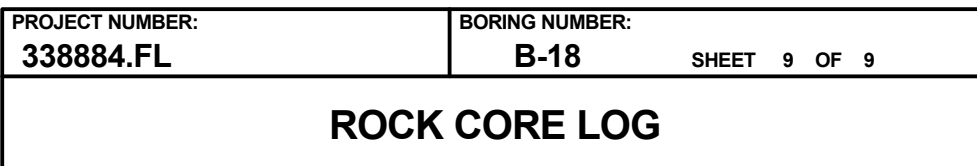
WATER LEVELS : 2.4 ft bgs on 4/22/07

START : 4/19/2007

END : 4/23/2007

LOGGER : N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
135 -93.0	R21-NQ 5 ft 64%	10	>10 131.15, 132.1, 132.8' - Bedding plane (3), <5 deg, smooth, planar, open <1/8" 131.4, 133.2, 134.0' - Mechanical break 131.7-132.0' - Fracture zone, smooth to rough, undulating, intersecting fractures, open 1/4" 132.6' - Bedding plane, <5 deg, smooth, planar, open 1/4" 133.45, 133.6' - Fracture zone (2), 60-70 deg, rough, undulating, open 1/4" on 133.45' 133.6' - Fracture, 60-70 deg, rough, undulating, open 1/4" 133.8' - Bedding plane, <5 deg, rough, undulating, tight 133.9' - Fracture, <5 deg, rough, undulating, tight		Limestone 131.0-132.2' - pale yellowish brown, (10YR 6/2), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids to 1/8" over 20-25% of rock, fossil casts to 3/8"x3/4" over 5% of rock as casts (voids) 132.2-134.2' - grayish orange, (10YR 7/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids to 1/16" over <10% of surface No Recovery 134.2-136.0'	09:34 Begin drilling 131.0-136.0' R21: Run time not recorded
140 -98.0	R22-NQ 5 ft 74%	53	3 134.0' - Fractures, <5 deg, smooth, planar, open 1/4" 135.7' - Bedding plane, <30 deg, smooth, undulating, open 1/4" 136.0-136.3' - Bedding plane, <5 deg, smooth, planar, tight 136.5, 136.6' - Bedding plane (2), 10 deg, rough, undulating, open 1/4" 137.5' - Fracture, 50 deg, smooth, undulating, tight 138.4' - Mechanical break 138.5, 137.9' - Mechanical break (2) 138.7' - Bedding plane, <30 deg, smooth, undulating, open 1/4"		Limestone 136.0-139.7' - grayish orange, (10YR 7/4), fine to medium grained, moderate HCl reaction, weak (R2), voids to 1/8" over 30-40% of surface, fossil casts (voids) to 5/16" diameter over 5% of surface No Recovery 139.7-141.0'	09:50 Begin drilling 136.0-141.0' R22: Run time not recorded
145 -103.0	R23-NQ 5 ft 84%	55	>10 141.2-141.35' - Fracture zone, pieces to 2"x1", open 1/4" >10 142.3-142.49' - Fracture zone, pieces to 1"x1/2", open 1/4" 142.9-143.05' - Fracture zone, pieces to 1-1/2"x1/2", open 1/4" 143.2' - Bedding plane or mechanical break, 20 deg, rough, undulating, organic dark stain, open 1", associated with cavities 143.7-143.95' - Fracture zone, pieces to 1"x1/2", open 1/4" 144.55' - Bedding plane, 50 deg, smooth, undulating, tight 145.0' - Fracture, <5 deg, smooth, undulating, open 1/2"		Limestone 141.0-143.7' - light olive gray mottled with yellowish gray, (5Y 6/1 mottled with 5Y 7/2), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids up to 1/16" over 10-25% of surface, trace fossils up to 1/2"x1/4", cavities to 1"x1/2" over 5-20% of surface 143.7-145.2' - olive gray, fine grained, moderate HCl reaction, medium strong (R3), trace voids to 1/8", trace fossils to 3/16"x1/16", dark 1/16" laminations (wavy) over 5-10% of surface No Recovery 145.2-146.0'	10:06 Begin drilling 141.0-146.0' SC-6 collected at 141.4-142.3' R23: 34 minutes
150 -108.0	R24-NQ 5 ft 56%	33	1 146.95' - Fracture, 20 deg, smooth, undulating, tight 2 147.65' - Bedding plane, 0-5 deg, smooth, planar, tight 2 147.9' - Bedding plane, smooth, undulating, open 1/4" 148.3, 148.35' - Fractures (2), 50 deg, smooth, undulating, tight, open 1/2"		Limestone 146.0-147.9' - grayish orange, (10YR 7/4), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids to 1/8" over 0-40% of surface in interbedded nature interchanging every 3-1/8", trace fossil casts to 1/8"x9/16"	10:40 Begin drilling 146.0-151.0' 10:51 Finish drilling R24: Run time not recorded Used 17 bags of quick cement for abandonment (47-lbs/bag) and about 60 gallons of water



ELEVATION : 42.0 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 : 2.4 ft bgs on 4/22/07

START : 4/19/2007

END : 4/23/2007

LOGGER : N. Jarzyniecki

WATER LEVEL (ft) - 147.9-148.8' - 4/23/2007		START DATE - 4/19/2007		END DATE - 4/20/2007		COREL: J.N. Salzman	
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		
					147.9-148.8' - moderate yellowish brown, (10YR 5/4), medium to coarse grained, moderate HCl reaction, weak (R2), voids to 1/16" over 40% of surface, trace fossils to 3/16"x1/16" No Recovery 148.8-151.0' Bottom of Boring at 151.0 ft bgs on 4/23/2007		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-19

SHEET 1 OF 10

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 4.25 ft bgs on 5/22/07

START : 5/21/2007

END : 5/23/2007

LOGGER : C. Wallestad

WATER LEVELS : 4.25 ft bgs on 3/22/07		START : 3/21/2007		END : 3/23/2007		LOGGERS : C. Wallestad		
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			
41.3	0.0	0.7	SS-1	1-1-2 (3)	Topsoil 0.0-0.25' - brownish black, (5YR 2/1), wet, very loose, nonplastic, organics (root and plant debris) with <10% fine silica sand		Driller's Remark: Set 5' HW surface casing	
	1.5				Poorly Graded Sand With Organics (SP) 0.25-0.55' - brownish black, (5YR 2/1), wet, very loose, very fine to fine grained, 40% organics, silica sand Poorly Graded Sand (SP) 0.55-0.7' - very pale orange, (10YR 8/2), wet, very loose, fine grained, trace nonplastic fines, trace organics, silica sand			
5	5.0							
36.3		1.2	SS-2	5-5-4 (9)	Silty Sand (SM) 5.0-6.15' - grayish orange, (10YR 7/4), wet, loose, fine grained, 15% nonplastic fines, trace organics (roots), silica sand, soil grades to sandy fat clay with 30-40% fine sand at bottom of sample			
	6.5							
10	10.0							
31.3		0.8	SS-3	14-17-14 (31)	Silt (ML) 10.0-10.75' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, trace roots, carbonate derived			Driller's Remark: Set 5' HW casing (10' below ground surface)
	11.5							
15	15.0							
26.3		1.2	SS-4	22-47-42 (89)	Silt (ML) 15.0-16.2' - Same as 10.0-10.75' except strong HCl reaction, 10-15% coarse sand-sized to fine gravel-sized limestone, all carbonate			
	16.5							
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-19
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.25 ft bgs on 5/22/07 START : 5/21/2007 END : 5/23/2007 LOGGER : C. Wallestad

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)				
		#TYPE				
21.3	20.0	1.0	SS-5	3-25-17 (42)		Driller's Remark: Hard at 24' below ground surface
	21.5					
25	25.0					
16.3		1.2	SS-6	13-13-17 (30)		
	26.5					
30	30.0	0.0	SS-7	50/1.5 (50/1.5")		
11.3	30.1					
35	35.0					
6.3		1.4	SS-8	13-19-26 (45)		
	36.5					
40						



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-19
SHEET 3 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.25 ft bgs on 5/22/07 START : 5/21/2007 END : 5/23/2007 LOGGER : C. Wallestad

WATER LEVELS : 4.25 ft bgs on 5/22/07			START : 5/21/2007			END : 5/23/2007			LOGGERS : G. Walstead		
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				
1.3	40.0	0.8	SS-9	30-50/4 (80/10")	Silt With Sand (ML) 40.0-40.75' - dark yellowish orange, (10YR 6/6), wet, hard, low plasticity, rapid dilatancy, moderate to strong HCl reaction, 25% fine to coarse grained sand, all carbonate						
	40.8										
45	45.0										
-3.7											
	46.5	1.4	SS-10	27-29-50/5.5 (79/11.5")	Silt With Sand (ML) 45.0-46.4' - moderate yellowish brown, (10YR 5/4), wet, hard, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 15% fine to coarse sand-sized, trace gravel-sized, all carbonate						
50	50.0										
-8.7											
	50.7	0.5	SS-11	41-50/2 (91/8")	Silt (ML) 50.0-50.5' - moderate yellowish brown, (10YR 5/4), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 10% fine to coarse grained sand, all carbonate			Driller's Remark: Hard rock 50.0-55.0', run time 15-20 minutes			
55	55.0	0.3	SS-12	50/4 (50/4")	Silt (ML) 55.0-55.25' - Same as 50.0-50.5'			Finished drilling at 17:30 on 5/21/07 at 55.0' below ground surface			
-13.7	55.3										
								Resume drilling at 07:52 on 5/22/07			
								Water level at 07:35 is 4.25' below ground surface			
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-19
SHEET 4 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.25 ft bgs on 5/22/07 START : 5/21/2007 END : 5/23/2007 LOGGER : C. Wallestad

WATER LEVELS : 4.25 ft bgs on 3/22/07			START : 3/21/2007			END : 3/23/2007			LOGGER : C. Wailestad		
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					
-18.7	60.0	0.2	SS-13	50/3.5 (50/3.5")	Limestone Fragments And Silt (ML) 60.0-60.2' - dark yellowish orange, (10YR 6/6), nonplastic, mild to moderate HCl reaction, all carbonate		Driller's Remark: 10-15% loss in circulation at 60.5' Driller's Remark: Hard drilling at 61.0', will switch to rock coring				
					Begin Rock Coring at 61.5 ft bgs See the next sheet for the rock core log						
65 -23.7											
70 -28.7											
75 -33.7											
80											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-19

SHEET 5 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 4.25 ft bgs on 5/22/07

START : 5/21/2007

END : 5/23/2007

LOGGER : C. Wallestad

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			
61.5	R1-NQ 5 ft 91%	88	1	62.1' - Mechanical break or bedding plane, horizontal, smooth, undulating, tight		Limestone 61.5-66.05' - dark yellowish orange, (10YR 6/6), fine to medium grained, moderate HCl reaction, extremely weak to weak (R0 to R2), voids to 1/8" diameter over 0-30% of rock (mostly 25%), trace fossil casts to 3/16" diameter, no visible cavities, trace dark (possibly organic) inclusions and laminations	5/22/07 start coring at 11:25 Driller's Remark: Cored fast (soft) at 62.0-63.0'
			1				
			1	63.4, 63.5' - Bedding plane or mechanical break (2), horizontal, smooth, undulating, tight to 1/2" open			
65 -23.7			0				
			0				
66.5	R2-NQ 5 ft 85%	83	NR			No Recovery 66.05-66.5' Limestone 66.5-68.9' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids to 1/8" over 5-20% of rock, trace fossil casts up to 5/16" diameter, no visible cavities, trace dark gray fine grained inclusions 68.9-69.75' - grayish orange, (10YR 7/4), fine to medium grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids to 1/8" over 20-30% of rock, trace fossil casts/molds to 3/16" diameter, no visible cavities, trace dark (possibly organic) particles 69.75-70.75' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids to 1/8" over 15-20% of rock, fossil casts to 3/8" over 5-10% of rock, no visible cavities No Recovery 70.75-71.5' Limestone 71.5-72.75' - grayish orange, (10YR 7/4), fine to medium grained, moderate HCl reaction, medium strong (R3), voids to 1/8" over 20-30% of rock, fossil casts to 9/16" over 10-15% of rock, no visible cavities No Recovery 72.75-74.15' Limestone 74.15-75.6' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, medium strong (R3), trace voids, cavities to 2" diameter most with infill, trace fossil casts to 3/8"x3/16", infill is moderate yellowish brown, (10YR 5/4), medium grained, weak (R2), voids up to 3/16" over 40% of infill	R1: 5 minutes
			1	66.9' - Mechanical break or bedding plane, horizontal, smooth, undulating, tight			
			0				
70 -28.7			0				
			3	69.05' - Mechanical break or bedding plane, horizontal, smooth, undulating, tight 69.75' - Bedding plane, horizontal, smooth, undulating, tight to 1/2" open 70.25' - Fracture, 45 deg, smooth, undulating to planar, tight			
71.5	R3-NQ 5 ft 74%	70	NR			70.75-71.5' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids to 1/8" over 15-20% of rock, fossil casts to 3/8" over 5-10% of rock, no visible cavities No Recovery 70.75-71.5' Limestone 71.5-72.75' - grayish orange, (10YR 7/4), fine to medium grained, moderate HCl reaction, medium strong (R3), voids to 1/8" over 20-30% of rock, fossil casts to 9/16" over 10-15% of rock, no visible cavities No Recovery 72.75-74.15' Limestone 74.15-75.6' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, medium strong (R3), trace voids, cavities to 2" diameter most with infill, trace fossil casts to 3/8"x3/16", infill is moderate yellowish brown, (10YR 5/4), medium grained, weak (R2), voids up to 3/16" over 40% of infill	Driller's Remark: Very soft at 69.0-70.5'
			0				
			NR				
75 -33.7			0				
			1	74.9' - Mechanical break, 0-80 deg, rough, undulating, tight, related to cavities			
76.5	R4-NQ 5 ft 100%	80	1	75.65' - Fracture, 45 deg, rough, undulating, 2" thick silty gravely infill, tight		74.15-75.6' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, medium strong (R3), trace voids, cavities to 2" diameter most with infill, trace fossil casts to 3/8"x3/16", infill is moderate yellowish brown, (10YR 5/4), medium grained, weak (R2), voids up to 3/16" over 40% of infill	R3: 10 minutes
			0				
			1	77.35' - Bedding plane or mechanical break, horizontal, smooth, undulating, associated with cavity, tight to 1" open			
80 -38.7			0				
			1	78.75' - Bedding plane, 10 deg, smooth, undulating, tight			
81.5			2				Driller's Remark: Soft rock 78.5-81.5'



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-19

SHEET 6 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

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

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





ORIENTATION : Vertical

WATER LEVELS : 4.25 ft bgs on 5/22/07

START : 5/21/2007

END : 5/23/2007

LOGGER : C. Wallestad

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 -43.7	R5-NQ 5 ft 100%	98	0	81.1' - Bedding plane or mechanical break, horizontal, rough, undulating, tight		Silt With Limestone Fragments (ML) 75.6-75.8' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, compacted, carbonate	Driller's Remark: Lost 95% circulation at 81.5' SC-1 collected at 81.5-82.8'		
			0	81.3' - Bedding plane or mechanical break, horizontal, rough, undulating, tight		Limestone 75.8-76.5' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), voids to 1/8" over 10-20% of rock, trace fossil casts to 3/16"x1/8", no visible cavities	Driller's Remark: Soft rock at 83.5-85.0'		
			1	84.2' - Mechanical break, horizontal, rough, undulating, associated with cavities, tight to 1" open		76.5-81.5' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate to strong HCl reaction, weak (R2), very weak (R1) at 78.6-78.9' and 81.1-81.3', voids to 1/16" over 15% of rock to 78.6' and over 40% rock below 78.6', trace fossil casts to 3/8" diameter, trace cavities to 3/8" x 1-9/16" increasing to cover 10-15% of rock at 80.4-81.1', trace dark laminations in very weak rock sections, dark fat clay layer 3/8" thick at 78.7'	R5: 7 minutes		
			0						
			0						
90 -48.7	R6-NQ 5 ft 70%	70	0	88.5' - Fracture, 10 deg, rough, undulating, dark stain, tight		81.5-86.5' - moderate yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids to 1/8" over 10-20% of rock (decreasing in percent coverage with depth), cavities to 2" x 1-3/16" over 40% of rock at 83.5-84.5' (open cavities) otherwise trace cavities to 1-3/16" x 3/4" with light gray fine grained infill, fossil casts comprise most of cavities 86.5-90.0' - very pale orange grading to moderate yellowish brown with depth, (10YR 8/2 to 10YR 5/4), fine grained, moderate to strong HCl reaction, medium strong (R3), voids to 1/8" over 15-30% of rock, trace cavities to 1-3/16" x 3/8" at 89.8', trace fossil casts to 3/8" diameter, trace dark (possibly organic) inclusions No Recovery 90.0-91.5' Silt (ML) 91.5-91.9' - grayish orange, (10YR 7/4), very strong HCl reaction, compacted	Driller's Remark: 100% circulation lost at 86.5'		
			0					SC-2 collected at 87.5-88.55'	
			1					Driller's Remark: Very soft at 88.5-90.0'	
			0						
			NR					R6: 11 minutes	
95 -53.7	R7-NQ 5 ft 56%	9	>10	91.5-91.9' - Fracture zone, rounded fragments to 1-1/2" diameter, compacted silts in zone			Driller's Remark: Very soft at 92.0-93.5'		
			10	92.4' - Fracture, 60 deg, smooth, undulating, tight					
			2	92.55' - Fracture, 75 deg, smooth, undulating, tight					
			NR	93.0' - Fracture, 30 deg, smooth, planar, tight			Driller's Remark: Soft at 94.5-95.5'		
				93.2-93.45' - Fracture zone, fragments to 1-1/2" x 1"			R7: 6 minutes		
100 -58.7	R8-NQ 5 ft 30%	8	NR	93.75' - Fracture, <10 deg, smooth, undulating, tight			Driller's Remark: Soft at 96.0-96.5'		
			NR	94.05' - Fracture, 15 deg, smooth, undulating, tight					
			>10	96.5-97.0' - Fracture zone, fragments to 1-1/2" diameter					
			2	97.2' - Bedding plane, horizontal, smooth, undulating, tight to 1/4" open					
			NR	97.5' - Bedding plane, horizontal, smooth, undulating, tight to 1/4" open					
97.65' - Bedding plane, horizontal, smooth, undulating, tight to 1/4" open	Driller's Remark: 99.5-100.0' only resistance in run R8: 3 minutes								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-19	SHEET 7 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)

ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis

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

WATER LEVELS : 4.25 ft bgs on 5/22/07 START : 5/21/2007 END : 5/23/2007 LOGGER : C. Wallestad

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
105 -63.7	R9-NQ 5 ft 100%	52	3		Limestone 91.9-93.15' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, medium strong (R3), in cavity infill, medium grained infill: voids to 1/8" over 5-15% of rock, cavities to 2" diameter over 35-45% of rock, trace fossil casts to 3/16" diameter, cavity infill is grayish orange (10YR 7/4), medium grained, with voids to 3/16" over 25-30% of infill area 93.15-94.3' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate to strong HCl reaction, weak to very weak (R2 to R1), voids to 1/8" over 5-15% of rock, trace cavities to 9/16" diameter, with extremely weak (R0) infill, fossil casts to 3/16"x3/8" over 5-10% of rock No Recovery 94.3-96.5' Limestone 96.5-98.0' - very pale orange, (10YR 8/2), fine to medium grained, strong HCl reaction, weak to very weak (R1 to R2) in cavities, voids to 1/16" over 5-10% of rock, no visible cavities, fossil casts to 3/4" diameter over 10-15% of rock No Recovery 98.0-101.5' Limestone 101.5-106.5' - pale yellowish brown, (10YR 6/2), fine to medium grained, strong HCl reaction, weak to very weak (R2 to R1), voids to 1/16" over 10-15% of rock, no visible cavities, trace fossil casts and molds to 3/16" diameter 106.5-107.55' - very pale orange, (10YR 8/2), fine to medium grained, strong HCl reaction, very weak (R1), trace voids to 1/16", elliptical fossil molds to 1/16" over 25-30% of rock, no visible cavities 107.55-110.75' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), voids to 1/8" over 15% of rock, trace fossil casts to 3/16" diameter, no visible cavities No Recovery 110.75-111.5' Limestone 111.5-113.05' - Same as 107.55-110.75' except trace cavities to 3/4"-1-3/16" 113.05-114.35' - Same as 106.5-107.55' except trace fossil molds to 3/16"x3/8" from 113.05-113.3'	SC-3 collected at 102.8-104.0'
			>10			
			0			
			>10			
			>10			
110 -68.7	R10-NQ 5 ft 85%	66	>10			Driller's Remark: Soft to 105.5' R9: 7 minutes Driller's Remark: Fairly soft at 106.5-109.0'
			2			
			0			
			1			
			1			
115 -73.7	R11-NQ 5 ft 98%	98	NR			R10: 5 minutes Driller's Remark: Soft at 111.0-111.5' Driller's Remark: Soft at 112.0-116.5'
			1			
			1			
			0			
			2			
120 -78.7	R12-NQ 5 ft 99%	78	1			R11: 4 minutes
			0			
			4			
			3			
			0			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-19	SHEET 8 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)

ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis

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

WATER LEVELS : 4.25 ft bgs on 5/22/07 START : 5/21/2007 END : 5/23/2007 LOGGER : C. Wallestad

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			
125 -83.7	R13-NQ 5 ft 100%	89	NR			Limestone 114.35-115.5' - very pale orange, (10YR 8/2), fine to medium grained, strong HCl reaction, very weak (R1), voids to 3/16" over 25% of rock, no visible cavities, fossil casts and molds to 3/16"x9/16" over 0-10% of rock decreasing in coverage with depth 115.5-116.2' - pale yellowish brown with moderate yellowish brown mottling, (10YR 6/2 with 10YR 5/4), medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids to 1/8" over 15% of rock, fossil casts and molds to 3/8" diameter over approximately 5% of rock, no visible cavities 116.2-116.7' - Same as 106.5-107.55' except trace fossil casts and molds to 3/16"x3/8" 116.5-117.3' - Same as 114.35-115.5' except cavities (fossil casts) to 3/4" diameter over approximately 30% of rock from 116.7-117.3' 117.3-119.55' - grayish orange, (10YR 7/4), fine grained, weak (R2), trace voids to 1/16", no visible cavities, trace fossil casts and molds to 3/16" diameter 119.55-120.3' - Same as 117.3-119.55' except increasing void coverage to 5-20% of rock and increase in fossil coverage to 5-10% 120.3-120.9' - Same as 115.5-116.2' except fossil coverage consistent 5-10% 120.9-121.45' - Same as 107.55-110.75' No Recovery 121.45-121.5' Limestone 121.5-122.25' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, medium strong (R3), interbedded with limestone that is the same as 107.55-110.75', no visible voids or fossils, cavities to 3/8" diameter with infill of 107.55-110.75' material, laminations, possible bioturbation 122.5-123.5' - very pale orange grading to moderate yellowish brown with depth, (10YR 8/2 to 10YR 5/4), fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids to 1/16" over 0-15% of surface increasing in coverage with depth, no visible cavities, trace fossil casts and molds to 3/16"x3/8"	Driller's Remark: Soft at 120.5-121.5' Driller's Remark: Soft at 122.0-123.0' R13: 6 minutes SC-4 collected at 125.65- 126.5'
			6	121.9, 122.1, 122.25, 122.35, 122.4, 122.5' - Bedding plane (6), horizontal, smooth, planar to undulating, tight			
			0				
			0				
			0				
130 -88.7	R14-NQ 5 ft 77%	45	3	126.6' - Bedding plane, horizontal, smooth, undulating, tight to 1/4" open			Driller's Remark: Soft at 129.5-130.0' R14: 5 minutes Driller's Remark: Soft at 130.5-131.0' Stop coring for the day at 16:55 on 5/22/07 Begin coring for the day at 07:52 on 5/23/07
			1	127.4' - Bedding plane, horizontal, smooth, planar to stepped, tight to 1/4" open 127.45' - Fracture, vertical, smooth, undulating, tight			
			10	127.5' - Bedding plane, horizontal, smooth, planar to stepped, tight to 1/4" open			
			10	129.2' - Fracture, 20 deg, smooth, undulating, tight to 1/4" open 129.4-129.55' - Fracture zone, fragments to 1" diameter			
			NR	129.55, 129.85' - Bedding plane (2), horizontal, smooth, planar to stepped, tight to 1/4" open			
135 -93.7	R15-NQ 5 ft 80%	54	4	129.9-130.0' - Fracture zone, fragments to 1/2" x 1-1/2", horizontal bedding planes			R15: 9 minutes Driller's Remark: Hard except 136.0-136.5'
			1	129.9, 130.0, 130.1, 130.25' - Bedding plane (4), horizontal, smooth, planar to stepped, tight to 1/4" open			
			10	131.6, 131.7, 132.1' - Bedding plane (3), horizontal, smooth, planar to undulating, tight			
			2	132.0' - Mechanical break 133.3, 133.7' - Fracture or mechanical break (2), <10 deg, rough, undulating, tight 133.9-134.0' - Fracture zone, fragments to 1" diameter			
			NR	133.9, 134.0' - Bedding plane (2), horizontal, smooth, planar to undulating, tight			
140 -98.7	R16-NQ 5 ft 89%	68	2	134.05' - Mechanical break or fracture, vertical, rough, undulating, tight			Driller's Remark: All fairly hard this run (R16) R16: 9 minutes
			1	134.5' - Bedding plane, horizontal, smooth, planar to undulating, tight			
			1	134.65' - Mechanical break or bedding plane, 10 deg, smooth, undulating, tight to 1/2" open			
			10	136.65' - Fracture, 30 deg, smooth, undulating, tight			
			NR	136.8' - Fracture, 80 deg, smooth, undulating, tight			
141.5			1	137.45' - Fracture or mechanical break, 60 deg, rough, undulating, associated with cavities			
			1	138.15' - Fracture or mechanical break, 15 deg, rough, undulating, associated with cavities, tight to 1/2" open			
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-19

SHEET 9 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 4.25 ft bgs on 5/22/07

START : 5/21/2007

END : 5/23/2007

LOGGER : C. Wallestad

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			
145 -103.7	R17-NQ 5 ft 74%	54	0	139.1' - Fracture or mechanical break, <10 deg, rough, undulating, associated with cavity, tight to 1/4" open		123.5-124.0' - grayish orange, (10YR 7/4), fine grained, strong HCl reaction, very weak (R1), voids to 1/16" over 25% of rock, no visible cavities, trace fossil casts and molds to 3/16"x1/8"	SC-5 collected at 142.7-143.85'
			1	139.6' - Fracture, horizontal, rough, undulating, dark stain, fracture associated with cavity, tight		126.5-127.4' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids to 3/16" over 15-25% of rock, no visible cavities, fossil casts and molds to 3/16"x3/8" over 0-20% of rock (variable)	
			10	139.63' - Fracture, vertical, smooth, undulating, tight		127.4-127.7' - Same as	
			2	139.65-139.9' - Fracture zone, associated with cavities, fragments to 1" diameter		121.5-122.25'	
			NR	140.7' - Bedding plane, horizontal, smooth, undulating, tight to 1/4" open		127.7-129.6' - Same as 126.5-127.4'	Driller's Remark: Soft at 144.5-145.0'
146.5				142.7' - Bedding plane, horizontal, smooth, undulating, tight to 1/4" open		129.6-130.35' - Same as	
			10	143.85-143.95' - Fracture zone, fragments to 1/2" diameter		121.5-122.25'	
			4	143.9, 143.95, 144.0, 144.1, 144.3, 144.4, 144.85, 145.05' - Bedding plane (8), horizontal, smooth, undulating, tight to 1/4" open		No Recovery 130.35-131.5'	
	R18-NQ 5 ft 80%	35	3	146.6' - Bedding plane, horizontal, smooth, planar, tight		Limestone	Driller's Remark: Soft at 149.5-151.5'
			10	146.75-146.8' - Fracture zone, fragments to 1/2" x 1-1/2"		131.5-131.7' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), trace voids to 1/16", no visible cavities or fossils	
			NR	146.8' - Bedding plane, horizontal, smooth, planar, tight		131.7-134.35' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, extremely weak to medium strong (R0 to R3), voids to 1/16" over 5-15% of rock, no visible cavities, fossil casts to 3/4"x3/8" (trace), trace laminations	
150 -108.7				147.0' - Fracture, 70 deg, smooth, undulating, tight		134.35-134.5' - Same as	
				147.4' - Fracture, 70-80 deg, smooth, undulating, tight		131.5-131.7'	Driller's Remark: 5/23/07 at 09:00, total depth at 151.5'
				147.5' - Bedding plane, 10 deg, smooth, undulating, tight		134.5-135.5' - pale yellowish brown, (10YR 6/2), fine to medium grained, moderate HCl reaction, weak (R2), voids to 1/8" over 15-25% of rock, no visible cavities, fossil casts to 9/16"x3/16"	
				147.7' - Fracture, 70-80 deg, smooth, undulating, tight		No Recovery 135.5-136.5'	
				148.0' - Fracture, 70-80 deg, smooth, undulating, tight		Limestone	
				148.4' - Bedding plane, horizontal, smooth, planar, tight		136.5-139.9' - yellowish gray with light olive gray mottling, (5Y 8/1 with 5Y 6/1), fine grained, moderate to strong HCl reaction, medium strong (R3), voids to 1/16" over 5-10% of rock, fossil casts to 3/4" diameter over 5-10% of rock, cavities to 2-3/4" x 1-9/16" over 5% of rock, some with coating of dark mineral with sulfur scent (possibly pyrite), most cavities with infill that is grayish orange with voids to 1/8" over 30-40% of infill area	Driller's Remark: 5/23/07 at 14:40, water level is 3.25'
				148.8' - Fracture, 75 deg, smooth, undulating, tight			
				149.0' - Fracture, 50 deg, smooth, undulating, tight			
				149.2' - Fracture, 75 deg, rough, undulating, tight			
				149.5' - Bedding plane, horizontal, rough, undulating, tight to 1/4" open			
				150.25-150.5' - Fracture zone, fragments to 2" diameter			

338884.FL

BORING NUMBER:

B-19

SHEET 10 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723369.6 N, 458134.0 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 4.25 ft bgs on 5/22/07

START : 5/21/2007

END : 5/23/2007

LOGGER : C. Wallestad

WATER LEVELS : 4.25 ft bgs on 5/22/07		START : 5/21/2007		END : 5/23/2007		LOGGERS : C. Waitestad	
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		
					139.9-140.95' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), trace voids to 1/8", no visible cavities, trace fossil casts to 3/16"x3/8" No Recovery 140.95-141.5' Limestone 141.5-143.85' - pale yellowish brown, (10YR 6/2), fine to medium grained, moderate HCl reaction, medium strong (R3), voids to 1/16" over 0-20% of rock, one cavity 1-9/16" in diameter at 142.8' with medium to coarse grained infill, trace fossil casts to 1"x3/16", banding of fine to medium grained rock throughout 143.85-145.2' - moderate yellowish brown, (10YR 5/4), medium grained, moderate HCl reaction, weak (R2), voids to 1/8" over 30-40% of rock, trace fossil casts to 3/16"x3/8", no visible cavities No Recovery 145.2-146.5' Limestone 146.5-147.5' - Same as 143.85-145.2' 147.5-150.5' - Same as 141.5-143.85' except trace fossil casts to 3/16" diameter No Recovery 150.5-151.5' Bottom of Boring at 151.5 ft bgs on 5/23/2007		



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-20
SHEET 1 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723468.6 N, 458221.5 E (NAD83)
 ELEVATION : 40.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0 ft bgs on 5/30/07 START : 5/30/2007 END : 6/3/2007 LOGGER : J. Burkard

WATER LEVELS : 0.0 fgs on 9/30/07		START : 9/30/2007		END : 9/3/2007		LOGGER : J. Burkard	
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
40.4	0.0				No Recovery 0.0-2.0'		13:45 Start drilling
	0.0	0.0	SS-1	1 (1/24")			Surface consists of grassy wetland material that is 100% saturated.
	2.0						
5							
35.4	5.0						
		1.1	SS-2	3-4-6 (10)	Silty Sand (SM) 5.0-6.1' - light olive gray, (5Y 5/2), wet, loose, 14% low plastic fines, very fine to fine silica sand		Lean clay at bottom of split spoon sample
	6.5						
10							
30.4	10.0						
		0.8	SS-3	0-0-1 (1)	Silty Sand (SM) 10.0-10.75' - light olive gray, (5Y 5/2), wet, very loose, 14% low plastic fines, organics in last 1" of sample, very fine to fine silica sand		
	11.5						
15							
25.4	15.0						
		1.1	SS-4	5-6-5 (11)	Silt (ML) 15.0-16.1' - grayish yellow, (5Y 8/4), wet, soft, nonplastic, rapid dilatancy, moderate to strong HCl reaction, all carbonate		
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-20
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723468.6 N, 458221.5 E (NAD83)
 ELEVATION : 40.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0 ft bgs on 5/30/07 START : 5/30/2007 END : 6/3/2007 LOGGER : J. Burkard

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)				
		#TYPE				
20.4	20.0	1.1	SS-5	5-6-13 (19)		
	21.5					
25	25.0					
15.4	26.5	1.2	SS-6	14-15-10 (25)		
30	30.0					
10.4	31.5	1.4	SS-7	3-2-10 (12)		
35	35.0					
5.4	35.8	0.8	SS-8	15-50/3 (65/9")		
40						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-20

SHEET 3 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723468.6 N, 458221.5 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 0 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : J. Burkard

WATER LEVELS : 0.10 fgs on 9/30/07			START : 9/30/2007			END : 9/30/2007			LOGGER : J. Burkard		
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					
0.4	40.0	1.5	SS-9	20-18-22 (40)	Silt With Sand (ML) 40.0-41.5' - yellowish gray, (5Y 7/2), moist, hard, low plasticity, rapid dilatancy, moderate to strong HCl reaction, 15-20% fine to coarse sand-sized, all carbonate						
	41.5										
45	45.0										
-4.6	45.6	0.6	SS-10	41-50/1 (100")	Silt With Sand (ML) 45.0-45.6' - dusky yellow, (5Y 6/4), moist, hard, low plasticity, rapid dilatancy, moderate to strong HCl reaction, 20% fine to coarse sand-sized, one 1/8" limestone lens, thin organic layer, all carbonate						
50	50.0										
-9.6		0.9	SS-11	24-33-50/4.5 (83/10.5)	Sandy Silt (ML) 50.0-51.4' - moderate yellowish brown, (10YR 5/4), moist, hard, low plasticity, rapid dilatancy, moderate to strong HCl reaction, 25-30% fine to coarse sand-sized, trace organics, all carbonate						
	51.4										
55	55.0										
-14.6	55.3	0.3	SS-12	50/3 (50/3")	Silt With Sand (ML) 55.0-55.3' - moderate yellowish brown, (10YR 5/4), wet, hard, low plasticity, rapid dilatancy, moderate to strong HCl reaction, 20% fine to coarse sand-sized, trace organics, all carbonate						
								End drilling for the day 05/30/07			
60											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-20

SHEET 4 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723468.6 N, 458221.5 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 0 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : J. Burkard

WATER LEVELS : 0.11 bgs on 9/30/07			START : 9/30/2007			END : 9/3/2007			LOGGER : J. Burkard		
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				
-19.6	60.0 60.8	0.6	SS-13	32-50/4 (82/10")	Silt With Sand (ML) 60.0-60.6' - Same as 55.0-55.3'		05/31/07 Start drilling at 07:35				
65 -24.6	65.0 65.2	0.0	SS-14	50/2 (50/2")	No Recovery 65.0-65.2'		Driller's Remark: Rock at 64.5'				
70 -29.6	70.0	1.2	SS-15	55-25-12 (37)	Silty Gravel (GM) 70.0-71.2' - dusky yellow, (5Y 6/4), moist to wet, dense, mild to moderate HCl reaction, fine to coarse sand-sized, 31% low plastic fines, 40% fine to coarse gravel-sized limestone, all carbonate Begin Rock Coring at 71.5 ft bgs See the next sheet for the rock core log						
75 -34.6											
80											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-20

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723468.6 N, 458221.5 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

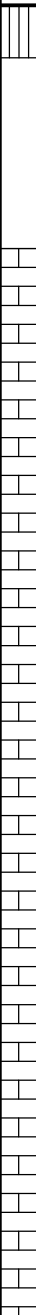
ORIENTATION : Vertical

WATER LEVELS : 0 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : J. Burkard

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		
71.5 73.0 75 -34.6 76.5 80 -39.6 81.5 85 -44.6 86.5 90 -49.6 91.5	R1A-NQ 1.5 ft 88%	88	0		Silt (ML) 71.5-72.3' - yellowish gray, (5Y 7/2), moist, soft, loose, moderate HCl reaction No Recovery 72.3-75.2'	13:45 Start drilling on 05/31/07 Driller's Remark: Broke drill rod (outer) 1.5' of core sample in outer rod R1A: 11 minutes 10:55 Start drilling on 06/01/07	
	R1B-NQ 3.5 ft 37%	37	NR		75.4' - Joint, 10 deg, rough, undulating 75.6, 76.1' - Mechanical break (2), <75 deg	Limestone 75.2-76.5' - pale olive, (10Y 6/2), medium grained, moderate HCl reaction, medium strong to strong (R3 to R4), 1/16-1/8" voids over 25-40% of surface, fossil casts and molds 76.5-79.3' - light olive gray, (5Y 5/2), medium grained, moderate to strong HCl reaction, medium strong (R3), 1/16" voids over 20-40% of surface, fossil casts and molds No Recovery 79.3-81.5'	R1B: 3 minutes
			1				11:30 Driller's Remark: Drillers run out of water
			0				
	R2-NQ 5 ft 56%	16	0		76.9, 77.2, 77.6, 77.9, 78.0, 78.2' - Mechanical break (6), 50-90 deg 77.5' - Joint, >5 deg, rough, undulating 78.5-78.9' - Fracture zone, 50-90 deg	No Recovery 79.3-81.5'	R2: 8 minutes
			1				
			0				
			NR				
	R3-NQ 5 ft 82%	50	>10		81.5-82.2' - Fracture zone, 60-70 deg, rough, non-planar, fragments from 3/4-3" 82.7, 83.2' - Mechanical break (2) 83.9, 84.9' - Mechanical break (2) 85.4' - Mechanical break	Limestone 81.5-85.6' - light olive gray (5Y 5/2) from 81.5-82.7', dusky yellow (5Y 6/4) from 82.7-85.2', light olive gray (5Y 5/2) from 85.2-85.6', mild HCl reaction, medium strong (R3), small (1/16-1/8") voids over 30-40% of surface, several large surface cavities up to 1/2" in diameter, organic stains and thin lenses throughout section No Recovery 85.6-86.5'	R3: 4 minutes
			0				
			0				
			0				
			NR				
	R4-NQ 5 ft 92%	78	0		88.0' - Mechanical break 89.9-90.3' - Fracture zone, 1/2"-1-1/2" fragments, highly fossiliferous, large cavities and molds 90.9' - Mechanical break	Limestone 86.5-91.1' - light olive gray, (5Y 6/1), medium to fine grained, moderate to strong HCl reaction, medium strong (R3), small (1/16-1/8") voids over 25-30% of surface, highly fossiliferous with molds and casts 1/4-3/4" comprising up to 30% of rock No Recovery 91.1-91.5'	SC-1 collected at 88.0-89.0' R4: 6 minutes
			0				
0							
<10							
0							
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-20

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723468.6 N, 458221.5 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : J. Burkard

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				
95 -54.6 <								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-20

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723468.6 N, 458221.5 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

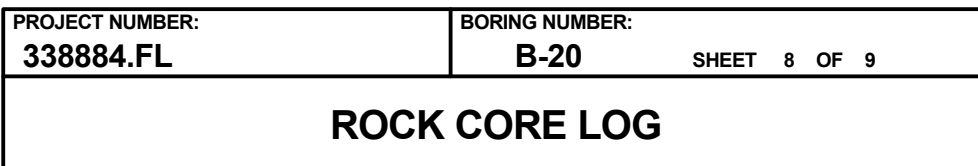
WATER LEVELS : 0 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : J. Burkard

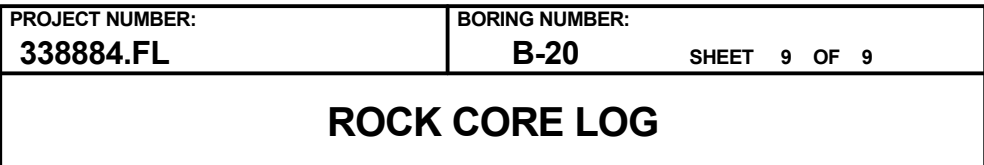
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, 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.
115 -74.6	R9-NQ 5 ft 62%	25	<10	111.5-112.2' - Fracture zone, 3/4"-1-1/2" fragments		Limestone 111.5-112.8' - dusky yellow, (5Y 6/4), moderate HCl reaction, very weak (R1), 1/16-1/8" voids over 25% of surface	R9: 2 minutes
			1	112.2, 112.4' - Fractures or mechanical break (2), 10-15 deg, rough, undulating to semi-planar		112.8-114.6' - grayish yellow, (5Y 8/4), medium grained, extremely strong HCl reaction, very weak (R1), 1/16-1/8" voids over 20% of surface, cavities/fossil molds and casts	
			0	112.6' - Fracture, horizontal, rough, planar, open		1/8-1/2" in diameter over 5-10% of surface	
			NR	112.65' - Mechanical break, non-planar, irregular		No Recovery 114.6-116.5'	
				112.9, 113.1, 113.2, 113.7, 114.4' - Fractures (5), horizontal, rough, undulating			
116.5							
			0			Limestone 116.5-118.1' - Same as 112.8-114.6'	SC-3 collected at 116.5-117.5'
			0	117.5, 118.1' - Fractures (2), horizontal, rough, undulating, open			
			0			118.1-120.0' - pale greenish yellow, (10Y 8/2), medium to fine grained, extremely strong HCl reaction, very weak (R1)	
120 -79.6	R10-NQ 5 ft 96%	60	0	118.4' - Fracture, 60 deg, non-planar			R10: 1 minute
			<10	118.5' - Fracture, 5 deg, smooth, planar			
			4	118.9' - Fracture, 15 deg, rough, undulating			
			NR	119.0' - Fracture, 15 deg, rough, undulating		120.0-121.3' - Same as 118.1-120.0' except extremely weak to weak (R0 to R2)	
			0	119.1' - Fracture, vertical, irregular, tight		No Recovery 121.3-121.5'	
				119.2' - Fracture, 20 deg, rough, undulating		Limestone 121.5-122.5' - dusky yellow, (5Y 6/4), medium to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), fossil casts and molds 1/2-1" in diameter over 10-15% of surface, trace voids	
				119.7' - Fracture or mechanical break, horizontal, rough, undulating		122.5-123.5' - dusky yellow, (5Y 6/4), medium grained, strong HCl reaction, very weak (R1), trace voids	
				120.0-121.3' - Fracture zone, very soft, friable, 1-4" with rough, undulating, irregular fracture surfaces		123.5-124.0' - Same as 121.5-122.5' except no fossil molds and casts	
			0			124.0-126.4' - dusky yellow, (5Y 6/4), medium grained, strong HCl reaction, weak (R2), fossil casts and molds up to 1/2" in diameter over 5-10% of surface, 1/16-1/8" voids over 15-25% of surface	
			>10	122.5-126.4' - Fracture zone, fragments 1-4", rough, undulating, irregular fracture surfaces, vertical fractures intersected by irregular, non-planar, low angle fracture, non-planar		No Recovery 126.4-126.5'	
			0			Limestone 126.5-128.0' - dusky yellow, (5Y 6/4), medium to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), fossil casts and molds, 1/16-1/8" voids over 50-70% of surface	
125 -84.6	R11-NQ 5 ft 98%	43	3			No Recovery 128.0-131.5'	R11: 4 minutes
			5				
			NR				
			0	126.65' - Fracture, horizontal, rough			
			<10	127.1' - Fracture, 15 deg, semi-planar to undulating			
				127.1-128.0' - Fracture zone, fragments 3/4-2", bedding plane			
130 -89.6	R12-NQ 5 ft 30%	8					R12: 4 minutes
			NR				
131.5							



ORIENTATION : Vertical

LOGGER : J. Burkard

Rev. 4



ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 0 ft bqs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : J. Burkard

APPENDIX 2BB-573



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-21
SHEET 1 OF 8	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723224.9 N, 458119.4 E (NAD83)
 ELEVATION : 41.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" drag bit and 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 6/03/07 START : 5/30/2007 END : 6/4/2007 LOGGER : C. Dellaria, P. De Sa'rego

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
41.8	0.0	1.5	SS-1	0-2-3 (5)	Top Soil 0.0-0.5' - brownish black, (5YR 2/1), moist, organic roots Poorly Graded Sand (SP) 0.5-1.5' - light gray, (N7), moist, loose, very fine to fine grained, 5% fines, nonplastic, organics decreasing with depth, sand is silica		Split spoon sampling begins at 15:13 Driller's Remark: Spade bit used to 15.0'
	1.5						
5	5.0						
36.8	6.5	0.7	SS-2	1-2-1 (3)	Silty Sand (SM) 5.0-5.7' - moderate brown to pale yellowish brown, (5YR 4/4 to 10YR 6/2), moist, very loose, very fine to fine grained, 20% fines, low plasticity, sand is silica		
10	10.0						Driller's Remark: Switch to 4-7/8" roller cone bit
31.8	11.5	0.8	SS-3	3-16-10 (26)	Limestone Fragments 10.0-10.3' - pale yellowish brown, (10YR 6/2), strong HCl reaction, angular limestone rock fragments to 3/8" Silt (ML) 10.3-10.8' - grayish orange, (10YR 7/4), wet, very stiff, nonplastic, very rapid dilatancy, moderate HCl reaction, limestone fragments in shoe, all carbonate derived		
15	15.0						
26.8	15.8	0.8	SS-4	30-50/3 (80/9")	Limestone Fragments 15.0-15.3' - Same as 10.0-10.3' except fragments up to 1/2" Silt With Sand (ML) 15.3-15.75' - very pale orange, (10YR 8/2), moist, hard, nonplastic, very rapid dilatancy, moderate to strong HCl reaction, 20% fine grained sand, all carbonate derived		
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-21
SHEET 2 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723224.9 N, 458119.4 E (NAD83)
 ELEVATION : 41.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" drag bit and 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 6/03/07 START : 5/30/2007 END : 6/4/2007 LOGGER : C. Dellaria, P. De Sa'rego

WATER LEVELS : 3.51 RDS on 9/30/07			START : 9/30/2007			END : 9/4/2007			LOGGERS : G. Deliana, P. De Saeghe		
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						
21.8	20.0	1.3	SS-5	36-30-8 (38)	Silty Sand With Limestone Fragments (SM) 20.0-21.25' - very pale orange, (10YR 8/2), moist, dense, fine to coarse grained, 37% fines, low plasticity, moderate HCl reaction, 30% fine gravel-sized limestone fragments, all carbonate derived		End drilling on 5/30/07 Begin drilling on 5/31/07 at 07:45				
	21.5										
25	25.0										
16.8		0.9	SS-6	15-22-18 (40)	Silt With Sand (ML) 25.0-25.9' - grayish orange, (10YR 7/4), moist, hard, trace% gravel, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 15% fine to medium grained sand, trace fine grained gravel, all carbonate derived		Driller's Remark: Harder material at 34.5', drill chatter				
	26.5										
30	30.0										
11.8		1.0	SS-7	10-19-20 (39)	Silt With Sand (ML) 30.0-31.0' - Same as 25.0-25.9'						
	31.5										
35	35.0										
6.8	35.2	0.2	SS-8	50/2 (50/2")	Limestone Fragments 35.0-35.2' - pale yellowish brown, (10YR 6/2), moderate to strong HCl reaction, angular fragments to 1/4"		Driller's Remark: Hard material Casing set to 35.0'				



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-21
SHEET 3 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723224.9 N, 458119.4 E (NAD83)
 ELEVATION : 41.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" drag bit and 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 6/03/07 START : 5/30/2007 END : 6/4/2007 LOGGER : C. Dellaria, P. De Sa'rego

WATER LEVELS : 3.5 TUBS ON 9/30/07			START : 3/30/2007		END : 3/4/2007		LOGGERS : G. Deliana, P. De Saeghe		
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					
1.8	40.0	1.4	SS-9	21-21-21 (42)	Silt (ML) 40.0-41.4' - pale yellowish brown, (10YR 6/2), moist, hard, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 10-15% fine to medium grained sand, all carbonate derived				
	41.5								
45	45.0	0.8	SS-10	61-50/3 (111/9")	Silty Sand With Limestone Fragments (SM) 45.0-45.8' - pale yellowish brown, (10YR 6/2), moist, very dense, fine to coarse grained, 35% fines, low plasticity, moderate HCl reaction, 15% fine to coarse grained gravel, all carbonate derived			End drilling on 5/31/07 Begin drilling on 6/1/07 at 07:30	
-3.2	45.8								
50	50.0	1.2	SS-11	1-2-50/4 (52/10")	Sandy Silt With Limestone Fragments (ML) 50.0-51.2' - pale yellowish brown, (10YR 6/2), moist, hard, nonplastic to low plasticity, rapid dilatancy, mild to moderate HCl reaction, 30% fine to coarse grained sand, 35% fine grained gravel, all carbonate derived				
-8.2	51.3								
55	55.0	1.4	SS-12	19-31-39 (70)	Sandy Silt With Limestone Fragments (ML) 55.0-56.4' - pale yellowish brown, (10YR 6/2), moist, hard, low plasticity, rapid dilatancy, 35% fine to coarse grained sand, laminated black organic layers at 55.3-55.5', fine to coarse gravel-sized limestone fragments in last 0.25', mild to moderate HCl reaction in all materials (except organics)				
-13.2	56.5								
60									



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-21
SHEET 4 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723224.9 N, 458119.4 E (NAD83)
 ELEVATION : 41.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" drag bit and 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 6/03/07 START : 5/30/2007 END : 6/4/2007 LOGGER : C. Dellaria, P. De Sa'rego

WATER LEVELS : 3.5 ft bgs on 9/30/07		START : 9/30/2007		END : 9/4/2007		LOGGERS : G. Deliana, 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			
-18.2	60.0	1.2	SS-13	19-35-28 (63)	Silty Sand (SM) 60.0-61.2' - pale yellowish brown, (10YR 6/2), moist, hard, medium plasticity, rapid dilatancy, moderate to mild HCl reaction, limestone from 60.0-60.7' and 61.1-61.2', elastic silt lens from 60.7-61.1' (dark yellowish brown [10YR 4/2]), all carbonate derived			Driller's Remark: Harder material at 62.0-63.0'	
	61.5								
65	65.0								
-23.2	65.3	0.3	SS-14	50/4 (50/4")	Limestone And Sandy Silt (ML) 65.0-65.3' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, 60% of sample is fine to coarse grained limestone gravel, 40% is carbonate derived sandy silt similar to previous samples				
70	70.0								
-28.2		0.8	SS-15	17-6-9 (15)	Sandy Silt (ML) 70.0-70.4' - pale yellowish brown, (10YR 6/2), moist, hard, low plasticity, rapid dilatancy, moderate HCl reaction, 25-30% fine to coarse grained sand, all carbonate derived Limestone Fragments 70.4-70.8' - pale yellowish brown, (10YR 6/2), mild to moderate HCl reaction, fine to coarse grained angular limestone rock fragments, trace organics				
	71.5								
75	75								
-33.2		1.5	SS-16	21-2-3 (5)	Limestone Fragments And Silty Sand (SM) 75.0-76.5' - Same as 70.0-70.8' except limestone fragments from coarse sand to coarse gravel mixed with carbonate derived silts and sands			Driller's Remark: 100% water loss 75.0-76.5' at 6 blow count level, very soft material	
	76.5				Begin Rock Coring at 75.0 ft bgs See the next sheet for the rock core log				
80									

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723224.9 N, 458119.4 E (NAD83)

ELEVATION : 41.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437. mud rotary. NQ tools. HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bqs on 6/03/07

START : 5/30/2007

END : 6/4/2007

LOGGER : C. Dellaria, P. De Sa'rego

DEPTH BELOW WATER 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		
-33.2	75.0					No Recovery 75.0-77.0'	
	R1-NQ 2 ft 0%	0	NR				R1: Run time not recorded
	77.0					Limestone 77.0-77.3' - Fracture zone, limestone rock fragments from 3/4"-1.5" 77.5-78.5' - Fracture zone, limestone rock fragments from 3/4"-1.5"	
			>10				
			>10			78.55-78.75' - Fracture, vertical, rough, undulating, moderately tight	
	R2-NQ 5 ft 35%	35					
80 -38.2			NR				R2: 9 minutes
	82.0					Limestone 82.0-82.4' - Fracture zone, limestone rock fragments from 3/4"-1.5" 82.75-82.9' - Fracture zone, limestone rock fragments from 3/4"-2" 83.1, 83.7, 84.15' - Mechanical break (3)	
			>10				
			0				
	R3-NQ 5 ft 64%	51				84.35-84.5' - Fracture, 30 deg, rough, undulating, open 84.4-84.45' - Fracture, 30 deg, rough, undulating, open	
85 -43.2			2				
			0				
			NR			No Recovery 85.2-87.0'	Driller's Remark: Casing advanced to 85.0' Driller's Remark: Using polymer EZ mud (not bentonite quick gel) R3: 18 minutes
	87.0					Limestone 87.0-89.9' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, medium strong (R3), small voids (1/16"-1/8") over 5-15% of rock surface increasing with depth. At 87.0-88.0': 25% cavities/casts up to 1" x 1-3/16", highly fossiliferous. At 88.0-89.9 trace cavities up to 3/4"x3/8", partially infilled with recrystallized carbonate, some with black staining, moderate HCl reaction 88.0-89.9' - voids (1/16"-1/8") over 5-15% of rock surface (increasing with depth) No Recovery 89.9-92.0' Limestone 92.0-93.0' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, medium strong (R3), cavities (1" x 1-3/16") over 25% of rock surface, highly fossiliferous	Drilling ends on 6/01/2007, no drilling on 6/02/07 due to rain Drilling begins on 6/03/07 at 07:35 SC-1 collected at 88.0-89.1' Driller's Remark: Circulation loss at 89.0'
			>10				
			1				
	R4-NQ 5 ft 58%	25					
90 -48.2			2				
			NR				R4: 18 minutes
	92.0						
			>10			92.0-93.0' - Fracture zone, limestone rock fragments from 1/2"-3/4"	
			1			93.25' - Fracture, horizontal, rough, undulating, open	
	R5-NQ 5 ft 44%	15				94.0' - Fracture, 60 deg, rough, undulating, open	
95			2				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-21

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723224.9 N, 458119.4 E (NAD83)

ELEVATION : 41.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 6/03/07

START : 5/30/2007

END : 6/4/2007

LOGGER : C. Dellaria, 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.
-53.2			NR	94.1' - Fracture, horizontal, rough, undulating, open		93.0-93.2' - pale yellowish brown, (10YR 6/2), fine grained, medium strong (R3), voids over 0-3% of rock surface, no cavities	Driller's Remark: No circulation
97.0						93.2-94.2' - voids (1/16-1/8") over 5-15% of rock surface (increasing with depth), trace cavities up to 3/4"x3/8", partially infilled with recrystallized carbonate, some with black staining, moderate HCl reaction	R5: 22 minutes
100	R6-NQ 5 ft 41%	23	>10	97.0-97.1' - Fracture zone, limestone rock fragments from 3/4"-1.5"		No Recovery 94.2-97.0' Limestone	
-58.2			2	97.8-97.95' - Fracture zone, limestone rock fragments from 1/2"-1"		97.0-99.05' - Same as 88.0-88.9' except cavities 1-3/16" x 2" infilled with fine grained material, voids over 3% of rock surface, medium light gray (N6) to grayish orange (10YR 7/4) infilling increases with depth from 5% at 97.0' to 40% at 99.05'	Driller's Remark: Cavity at 100.5-104.0'
			NR	98.4-98.5' - Fracture or mechanical break, 30 deg, rough, stepped		No Recovery 99.05-102.0' Limestone	R6: 21 minutes
				98.75' - Fracture, <10 deg, rough, undulating, open		No Recovery 102.0-104.0' Cavity	
105	R7-NQ 5 ft 2%	0	0			Limestone	
-63.2			NR			104.0-104.1' - Same as 88.0-88.9' except no infilling, voids over 10% of rock surface, no cavities	
						No Recovery 104.1-107.0'	R7: 4 minutes
107.0				107.0-107.3' - Fracture zone		Limestone	
			>10	107.6' - Fracture or mechanical break, 45 deg, rough, undulating, open		107.0-107.3' - pale yellowish brown, (10YR 6/2), fine grained, weak to medium strong (R2 to R3), voids over 10% of rock surface, 10% cavities 3/16"-3/4"	
			2	107.85' - Fracture or mechanical break, horizontal, rough, undulating, 2 inch open		107.3-109.25' - pale yellowish brown, (10YR 6/2), fine grained, weak to medium strong (R2 to R3), voids over 10% of rock surface, no cavities	
110	R8-NQ 5 ft 74%	23	>10	108.0' - Fracture or mechanical break, 45 deg, rough, undulating, open		109.25-110.7' - pale yellowish brown, (10YR 6/2), fine grained, weak to medium strong (R2 to R3), voids over 10% of rock surface, 10% cavities 3/16"-3/4"	R8: 15 minutes
-68.2			>10	108.4' - Fracture or mechanical break, horizontal, rough, undulating, open		No Recovery 110.7-112.0' Limestone	Driller's Remark: Water level at 3.5'
			NR	108.5' - Fracture or mechanical break, 45 deg, rough, undulating, open		112.0-112.85' - pale yellowish brown, (10YR 6/2), fine to medium grained, mild HCl reaction, weak (R2), voids (1/16") over 5-10% of rock surface, no visible cavities	Driller's Remark: Hole collapse, advanced NW casing to 106.0', end drilling on 6/03/07 at 17:00
				109.25-110.7' - Fracture zone, 60 deg and 80 deg, limestone rock fragments from 3/4"-2"			Driller's Remark: Circulation loss at 113.0', drilling soft, not like a cavity
112.0							
			>10	112.25, 112.3' - Fracture (2), horizontal, rough, undulating, open			
			>10	112.4-113.0' - Fracture zone, limestone rock fragments from 1"-1.5"			
				113.55' - Fracture, 60 deg, rough, planar, open, black staining			
115	R9-NQ 5 ft 55%	22	1	113.7-114.0' - Fracture zone, limestone rock fragments from 1.5"-3"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-21

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723224.9 N, 458119.4 E (NAD83)

ELEVATION : 41.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 6/03/07

START : 5/30/2007

END : 6/4/2007

LOGGER : C. Dellaria, 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	
-73.2			NR	114.2' - Fracture, horizontal, rough, undulating, open 114.5' - Mechanical break		112.85-113.45' - Same as 112.0-112.85' except pale yellowish brown, (10YR 7/4), trace cavities up to 3/8"x3/8"	Drilling resumes on 6/04/07 at 07:20
117.0			4	117.1' - Fracture, horizontal, rough, undulating, open		113.45-114.75' - medium gray to grayish orange, (N5 to 10YR 7/4), cavities (up to 3/8") over less than 5% of rock surface	R9: 15 minutes
			3	117.5' - Fracture, horizontal, rough, undulating, open		No Recovery 114.75-117.0'	Driller's Remark: Soft zones at 117.5-118.5, 119.0-120.0'
				117.9-117.9' - Fracture, horizontal and 60 deg, rough, undulating, open		Limestone 117.0-117.7' - medium gray, (N5), fine to medium grained, mild HCl reaction, weak to medium strong (R2 to R3), voids (up to 3/16") over 10% of rock surface, trace cavities up to 3/8"	
120	R10-NQ 5 ft 31%	8	NR	118.1' - Fracture, 45 deg, rough, undulating, open 118.3, 118.4' - Fractures (2), horizontal, rough, undulating, open		117.7-118.55' - Same as 112.0-112.85'	R10: 10 minutes
-78.2						No Recovery 118.55-122.0'	
122.0			>10	122.0-122.15' - Fracture zone 122.3' - Mechanical break		Limestone 122.0-123.1' - grayish orange, (10YR 7/4), fine to medium grained, mild HCl reaction, weak (R2), voids (up to 1/16") over 10% of rock surface, trace cavities up to 3/8"x3/16"	Driller's Remark: Numerous 3"-6" soft zones in R11
				122.85' - Fracture, horizontal, rough, undulating, open 123.0' - Mechanical break		No Recovery 123.1-127.0'	
125	R11-NQ 5 ft 22%	14	NR				Driller's Remark: Cavity from 125.5-128' R11: 6 minutes
-83.2							
127.0			>10	127.0-127.45' - Fracture zone		Limestone 127.0-127.1' - pale yellowish brown, (10YR 6/2), fine to medium grained, mild HCl reaction, weak (R2), voids (1/16") over 5-10% of rock surface	Driller's Remark: Several soft zones, probably not cavities
			2	127.6' - Fracture, horizontal, rough, undulating, open 127.8' - Mechanical break		127.1-128.35' - grayish orange, (10YR 7/4), fine to medium grained, mild HCl reaction, weak (R2), voids (up to 1/16") over 10% of rock surface, trace cavities up to 3/8"x3/16"	
				128.0-128.1' - Fracture, horizontal, rough, undulating, open 128.3' - Mechanical break		No Recovery 128.35-132.0'	R12: 12 minutes
130	R12-NQ 5 ft 27%	7	NR	130.3' - Mechanical break			
-88.2							
132.0			1	132.2' - Mechanical break 132.4' - Fracture, horizontal, rough, undulating, open		Limestone 132.0-132.6' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), fine to medium grained, mild HCl reaction, weak to medium strong (R2 to R3), voids (1/16") over 15% of rock surface, cavities (3/8"x1/16") over 5-10%	Driller's Remark: Cavities from 133.5-135.0' and 135.5-136.0'
						No Recovery 132.6-137.0'	
135	R13-NQ 5 ft 12%	8	NR				

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723224.9 N, 458119.4 E (NAD83)

ELEVATION : 41.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

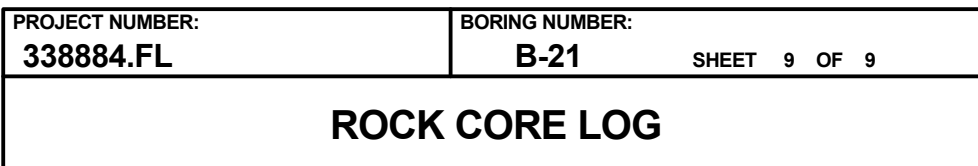
WATER LEVELS : 3.5 ft bqs on 6/03/07

START : 5/30/2007

END : 6/4/2007

LOGGER : C. Dellaria, P. De Sa'rego

WATER LEVEL: 63.88 ft on 08/07 START: 08/26/07 END: 08/28/07 LOGGERS: G. Deland, T. DeGuzog									
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					
-93.2									
	137.0								R13: 9 minutes
140									
-98.2									



ELEVATION : 41.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 6/03/07

START : 5/30/2007

END : 6/4/2007





LOGGER : C. Dellaria, P. De Sa'rego

APPENDIX 2BB-582



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-22
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723410.3 N, 458287.4 E (NAD83)
 ELEVATION : 40.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 5/19/2007 END : 5/21/2007 LOGGER : R. Gomez

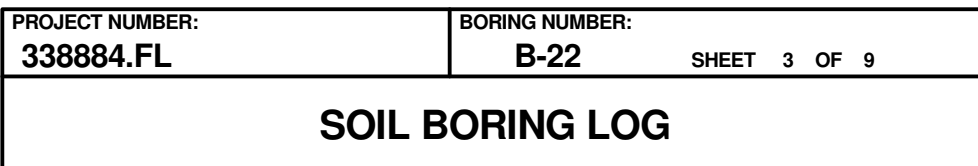
WATER LEVELS : 1.61 ft bgs on 6/14/07		START : 3/19/2007		END : 3/21/2007		LOGGERS : R. Gomez	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION		
40.5	0.0	0.7	SS-1	0-0-1 (1)	Topsoil 0 to 0.7' - dusky brown, (5YR 2/2), wet, very soft		Boring drilled in wetlands area
	1.5						
							Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" Water levels not recorded during drilling
5	5.0						
35.5		0.9	SS-2	4-3-5 (8)	Poorly Graded Sand (SP) 5.0-5.9' - moderate brown to grayish orange pink, (5YR 4/4 to 5YR 7/2), mottled, wet, loose, fine grained, trace non-plastic fines, grading into clayey sand (SC) with 30% low to medium plasticity fines		5/19/07, 15:00, set 6" casing to 9.5'
	6.5						
10	10.0						
30.5		1.0	SS-3	3-4-7 (11)	Silt (ML) 10.0-11.0' - grayish orange, (10YR 7/4), wet, stiff, very rapid dilatancy, strong HCl reaction, trace sand, carbonate, sands are fine to grained		
	11.5						
15	15.0						
25.5		1.2	SS-4	13-13-10 (23)	Silt (ML) 15.0-16.2' - very pale orange, (10YR 8/2), wet, very stiff, 10 to 15% sand, very rapid dilatancy, strong HCl reaction, carbonate, 10-15% fine gravel-sized limestone fragments		
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-22
SHEET 2 OF 9	
SOIL BORING LOG	

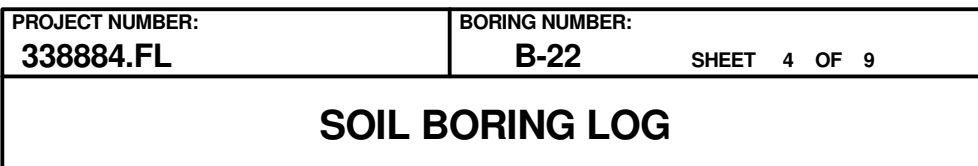
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723410.3 N, 458287.4 E (NAD83)
 ELEVATION : 40.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 5/19/2007 END : 5/21/2007 LOGGER : R. Gomez

WATER LEVELS : 1.61 ft bgs on 6/14/07		START : 3/19/2007		END : 3/21/2007		LOGGER : R. Gomez	
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		
20.5	20.0	0.8	SS-5	18-5-4 (9)	Silt With Sand (ML) 20.0-20.8' - very pale orange, (10YR 8/2), wet, stiff, 15 to 20% sand, nonplastic, very rapid dilatancy, strong HCl reaction, carbonate, sand is fine to medium grained		
	21.5						
25	25.0						
15.5		1.0	SS-6	6-6-4 (10)	Silt With Sand (ML) 25.0-26.0' - grayish orange, (10YR 7/4), wet, stiff, 10 to 15% gravel, 25% sand, nonplastic, rapid dilatancy, mild to moderate HCl reaction, carbonate, sand is fine to coarse grained, gravel is fine grained		
	26.5						
30	30.0						
10.5		1.5	SS-7	32-28-50 (78)	Silt With Sand (ML) 30.0-31.5' - grayish orange, (10YR 7/4), wet, hard, 27% sand, nonplastic, very rapid dilatancy, moderate HCl reaction, carbonate, sand is fine to medium grained		Heavy chattering at 30.0' 15 minutes to drill to 35.0'
	31.5						
35	35.0						
5.5		0.5	SS-8	15-50/6 (65/12")	Sandy Silt With Limestone Fragments (ML) 35.0-35.5' - pale yellowish orange, (10YR 6/2), gray mottling, moist, hard, 25 to 30% sand, low plasticity, rapid dilatancy, 40% moderate yellowish brown limestone fragments, HCl reaction strong for silt, mild for limestone fragments		Hard and soft drilling 35- 40'
	36.0						
40							



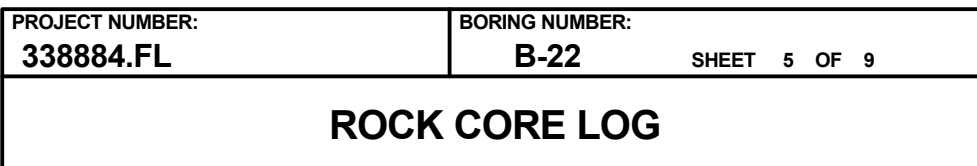
LOGGER : R. Gomez

Rev. 4



LOGGER : R. Gomez

Rev. 4



ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bqs on 6/14/07

START : 5/19/2007

END : 5/21/2007

LOGGER : R. Gomez

APPENDIX 2BB-587



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-22

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723410.3 N, 458287.4 E (NAD83)

ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 5/19/2007

END : 5/21/2007

LOGGER : R. Gomez

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.
-54.5	R5-HQ 5 ft 26%	0	>10	95.0-96.3' - Fracture zone, multiple fractures and mechanical breaks, fragments range from 0.05' in length to 0.4' in length		Limestone 95.0-96.3' - pale yellowish brown, (10YR 6/2), very strong HCl reaction, very weak to weak (R1 to R2), 30% voids up to 1/4", 20-30% silt No Recovery 96.3-100.0'	R5: 3 minutes
100			>10				
-59.5	R6-HQ 5 ft 30%	0	>10	100.0-101.0' - Fracture zone, irregular fragments		Silty Clay (CL) 100.0-100.5' - pale yellowish brown, (10YR 6/2), stiff to very stiff, moderate plasticity, strong HCl reaction, carbonate Limestone 100.5-101.5' - light brown, (5YR 6/4), strong HCl reaction, extremely weak to very weak (R0 to R1), 10-20% voids up to 1/16", poorly fossiliferous No Recovery 101.5-105.0'	R6: 3 minutes
105			1	101.2' - Fracture, 50-60 deg, rough, planar, open			
-64.5	R7-HQ 5 ft 78%	22	>10	105.0-105.6' - Fracture zone, irregular pieces up to 3/4"		Limestone 105.0-108.9' - grayish orange, (10YR 7/4), strong HCl reaction, extremely weak to very weak (R0 to R1), trace voids, poorly fossiliferous, silty No Recovery 108.9-110.0'	SC-2 collected at 105.7-106.8' Driller's Remark: Hard at 109.0' R7: 5 minutes
110			2	106.8' - Fracture, rough, stepped, 3/8" relief on face of fracture			
-69.5			>10	106.9' - Fracture, smooth, stepped, 5/16" relief			
115			>10	107.0-108.0' - Fracture zone, rough, planar, less than 1/8" infilling			
	R8-HQ 5 ft 28%	7	NR	108.0-108.9' - Fracture zone, rough, planar, fractures and mechanical breaks		Limestone 110.0-110.2' - Fractures (2), horizontal and vertical, rough, undulating 110.8-111.0' - Fractures, multiple, irregular gravel-size pieces, 0.1' to 0.2' in size No Recovery 111.4-115.0'	R8: 2 minutes
			>10	110.0-110.2' - Fractures (2), horizontal and vertical, rough, undulating			
			0	110.8-111.0' - Fractures, multiple, irregular gravel-size pieces, 0.1' to 0.2' in size			
115							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-22

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723410.3 N, 458287.4 E (NAD83)

ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 5/19/2007

END : 5/21/2007

LOGGER : R. Gomez

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			
-74.5	R9-HQ 5 ft 30%	17	>10	115.0-115.2' - Mechanical break, multiple irregular breaks, gravel-size pieces, 0.05'-0.15' in size		Limestone 115.0-115.35' - pale yellowish brown, (10YR 6/2), strong HCl reaction, extremely weak (R0), 20-30% voids <1/16" 115.35-116.0' - Same as 115.0-115.35' except grayish orange, (10YR 7/4) Silt And Sand-Sized Carbonate Grains With Clay 116.0-116.5' - medium gray, (N5), nonplastic to low plasticity, trace solution cavities up to 3/8", unconsolidated No Recovery 116.5-120.0' Silt And Sand-Sized Carbonate Grains With Clay 120.0-120.4' - Same as 116.0-116.5'	Disaggregated limestone
120			3	115.7, 116.0' - Fractures (2), horizontal, rough, planar, horizontal			
-79.5	R10-HQ 5 ft 42%	20	2	120.45' - Fracture, 30 deg, rough, planar, lithologic contact		Limestone 120.4-121.0' - pale yellowish brown, (10YR 6/2), strong HCl reaction, extremely weak (R0), 20-30% voids up to 1/16" 121.0-121.65' - pale yellowish brown, (10YR 6/2), medium grained, 10-20% fines, strong HCl reaction, very weak to weak (R1 to R2), 20-30% voids up to 1/16", poorly fossiliferous, cyclic bedding 121.65-122.1' - coarse grained, weak HCl reaction, very weak (R1), 5-10% solution cavities, 20-30% voids, highly fossiliferous No Recovery 122.1-125.0' Limestone 125.0-125.25' - yellowish gray, (15Y 7/2), coarse grained, mild to moderate HCl reaction, very weak (R1), trace solution cavities up to 1/4", 10-20% voids up to 3/16" 125.25-125.5' - Same as 125.0-125.25' except pale yellowish brown, (10YR 6/2) 125.5-125.9' - Same as 125.0-125.25'	R9: 2 minutes
120			6	120.6' - Fracture, 30 deg, rough, planar			
125			1	121.0, 121.3, 121.45, 121.5, 121.55, 121.6,' - Fractures (6), horizontal, smooth, planar			
-84.5	R11-HQ 5 ft 18%	12	3	125.1' - Fracture, horizontal, rough, planar, 1/16" thick infilling, open			R10: 3 minutes
125			NR	125.25' - Fracture, horizontal, rough, undulating, 1/16" thick infilling, open			
130	R12-HQ 5 ft 60%	0	>10	130.0-132.0' - Mechanical break, multiple		No Recovery 125.9-130.0' Silty Clay (CL) 130.0-103.3' - dark yellowish orange, (10YR 6/6), stiff, mild to moderate HCl reaction Poorly Graded Sand (SP) 130.3-131.6' - grayish orange to moderate yellowish brown, (10YR 7/4 to 10YR 5/4), fine to coarse grained, slow HCl reaction	R11: 2 minutes
-89.5			>10				
			>10				
			>10	132.1' - Fracture, horizontal, rough, undulating			
135			NR	132.5-132.8' - Fracture zone, multiple breaks, infilling			R12: 5 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-22

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723410.3 N, 458287.4 E (NAD83)

ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

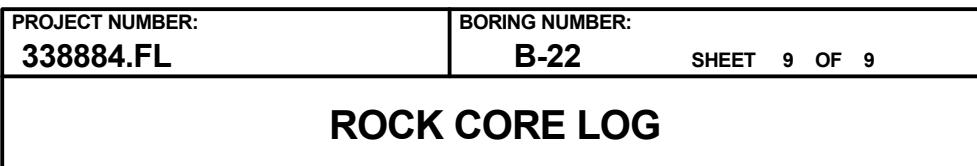
WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 5/19/2007

END : 5/21/2007

LOGGER : R. Gomez

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			
-94.5	R13-HQ 5 ft 66%	0	>10	135.0-138.3' - Mechanical break, multiple		Limestone 131.6-133.0' - grayish orange, (10YR 7/4), moderate to strong HCl reaction, very weak to weak (R1 to R2), trace solution cavities up to 5/16", 20-30% voids up to 1/16", poorly to moderately fossiliferous, 20-30% silt	R13: 8 minutes
			>10			No Recovery 133.0-135.0' Limestone 135.0-135.3' - grayish orange, (10YR 7/4), moderate to strong HCl reaction, very weak to weak (R1 to R2), trace solution cavities up to 5/16", 20-30% voids up to 1/16", poorly to moderately fossiliferous, 20-30% silt	
			>10				
			1				
	R14-HQ 5 ft 94%	28	NR				R14: 5 minutes
140			3	140.2, 140.4, 140.75' - Fractures (3), rough, planar, along weak contact		135.3-137.5' - very light gray, (N8), very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), solution cavities up to 3/4" in diameter, 5-10% voids, moderately fossiliferous	
-99.5			1	141.2' - Fracture, 60-70 deg, smooth, planar		137.5-138.3' - pale yellowish brown, (10YR 6/2), medium to coarse grained, moderate HCl reaction, very weak to weak (R1 to R2), solution cavities up to 3/16", 10-15% voids <1/16", silt, moderately fossiliferous	
			2	141.8' - Fracture, horizontal, rough, planar, infilling		No Recovery 138.3-140.0' Limestone 140.0-140.5' - grayish orange and pale yellowish brown, (10YR 7/4 and 10YR 6/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), laminated bedding	
			>10	142.6' - Fracture, 60-70 deg, smooth, planar		140.5-140.8' - dark yellowish brown, (10YR 4/2), no HCl reaction, extremely weak to very weak (R0 to R1), laminated bedding, 10-15% small (<1/16") voids, 30-40% cavities (<3/8"), moderately fossiliferous, silty	
	R15-HQ 5 ft 84%	53	5	142.9' - Mechanical break, rough, along weak contact		140.8-143.0' - Same as 140-140.5'	SC-3 collected at 148.15-149.05' (SC-3 depth adjusted from 148.5-149.05' due to change in accounting for core loss) R15: 5 minutes
			NR	143.1-144.7' - Fracture zone, possible mechanical breaks		143.0-144.7' - dark yellowish brown, (10YR 4/2), mild to moderate HCl reaction, extremely weak to very weak (R0 to R1), 20-30% voids <1/16", moderately fossiliferous, silty	
145			>10	145.2-145.4' - Fractures, gravel-sized pieces		No Recovery 144.7-145.0' Limestone 145.0-146.05' - moderate yellowish brown, (10YR 5/4), medium to coarse grained, moderate HCl reaction, very weak (R1), 5-10% solution cavities up to 1/4", 20-25% voids	
-104.5			0	145.85-145.95' - Fractures, horizontal, rough, planar, open		146.05-148.8' - pale yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), trace cavities and voids	
			0	146.4-146.5' - Mechanical break, multiple			
	150	NR	>10	147.15' - Mechanical break			Total depth of boring 150.0'
			0	148.4-148.75' - Mechanical break			
-109.5			NR	148.9' - Fracture, horizontal, rough, planar, open, fragments don't fit together			



LOGGER : R. Gomez

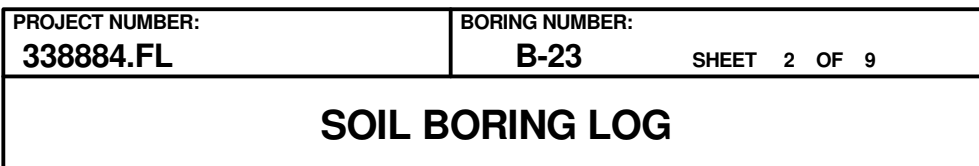
Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-23
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.7 N, 458210.1 E (NAD83)
 ELEVATION : 40.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240, mud rotary, cathead, AWJ/NWJ rods, 3-15/16" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.3 ft bgs on 4/18/07 START : 4/11/2007 END : 4/19/2007 LOGGER : J. Schaeffer, D. Roraback

WATER LEVELS : 2.5 TUBS ON 4/18/07		START : 4/19/2007		END : 4/19/2007		LOGGERS : J. Schaeffer, D. Horabach	
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		
40.7	0.0	1.0	SS-1	2-2-5 (7)	Fill 0.0-0.3' - Fill material, road import fill 0.3-0.5' wood fragments Poorly Graded Sand With Silt (SP-SM) 0.5-1.0' - brownish black, (5YR 2/1), moist, loose, fine grained, no HCl reaction, lighter color with depth, 5-10% nonplastic fines, some fines may be organics, silica sand		Driller use 10' section of NWJ rod then AWJ rods for SPT sampling. S. Hutchinson performed cathead hammer work for all samples drilling with 3-15/16" tricone bit.
	1.5						
5	5.0						
35.7		1.5	SS-2	4-4-3 (7)	Poorly Graded Sand With Sand (SP-SM) 5.0-6.5' - moderate yellowish brown, (10YR 5/4), wet, loose, fine grained, no HCl reaction, 5% nonplastic fines, trace organics, silica sand		
	6.5						
10	10.0						
30.7		1.2	SS-3	6-13-14 (27)	Silty Sand (SM) 10.0-11.2' - light olive gray, (5Y 6/1), wet, medium dense, fine grained, no HCl reaction, 25-30% low to nonplastic fines, silica sand		Material in shoe was more fines with higher plasticity
	11.5						
15	15.0						
25.7		0.7	SS-4	5-14-16 (30)	Interbedded Silty Sands And Sandy Clay (SM-CL) 15.0-15.3' - white to medium light gray to greenish gray, (N9 to N7 to 5G 6/1), wet, medium dense, fine grained, moderate to strong HCl reaction, low to nonplastic fines in silty sands, medium to high plastic fines in sandy clay, beds 1/4" thick, (2) 1"-2" limestone pieces embedded in material, both carbonate material Silt (ML) 15.3-15.5' - yellowish gray, (5Y 6/1), wet, hard to stiff, low plasticity, moderate HCl reaction, carbonate material Limestone Fragments 15.5-15.7' - moderate to strong HCl reaction, mottled appearance		
	16.5						
20							



LOGGER : J. Schaeffer, D. Roraback

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-23
SHEET 3 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.7 N, 458210.1 E (NAD83)
 ELEVATION : 40.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240, mud rotary, cathead, AWJ/NWJ rods, 3-15/16" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.3 ft bgs on 4/18/07 START : 4/11/2007 END : 4/19/2007 LOGGER : J. Schaeffer, D. Roraback

WATER LEVELS : 2.5 TUBS ON 4/18/07			START : 4/11/2007			END : 4/19/2007			LOGGERS : J. Schaefer, D. Horaback		
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					
0.7	40.0	0.7	SS-9	44-50/6 (94/12")	Sandy Silt (ML) 40.0-40.7' - moderate yellowish brown, (10YR 5/4), wet, hard, low plasticity, mild to moderate HCl reaction, 25-30% sand-sized particles to 1/8", carbonate materials						
	41.0										
45	45.0	0.9	SS-10	42-50/5 (92/11")	Silt With Sand (ML) 45.0-45.9' - Same as 40.0-40.7' except 29% sand; trace black particles and streaks; trace green streaks						
-4.3	45.9										
50	50.0	0.1	SS-11	50/2.5 (50/2.5")	Limestone Fragments 50.0-50.05' - pale yellowish brown, (10YR 6/2), mild to moderate HCl reaction, fragments to 1/2", poor recovery						
-9.3	50.2										
55	55.0	0.4	SS-12	50/5 (50/5")	Silt With Sand (ML) 55.0-55.4' - moderate yellowish brown, (10YR 5/4), wet, hard, nonplastic, mild to moderate HCl reaction, 10-15% sand-sized particles to 1/16", carbonate materials, trace black organic lenses						
-14.3	55.4										
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-23
SHEET 4 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.7 N, 458210.1 E (NAD83)
 ELEVATION : 40.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240, mud rotary, cathead, AWJ/NWJ rods, 3-15/16" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.3 ft bgs on 4/18/07 START : 4/11/2007 END : 4/19/2007 LOGGER : J. Schaeffer, D. Roraback

WATER LEVELS : 2.51 TDS ON 4/10/07			START : 4/11/2007			END : 4/19/2007			LOGGERS : J. Schaefer, D. Horaback		
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				
-19.3	60.0 60.2	0.0	SS-13	50/2 (50/2")	Limestone Fragments With Silt And Sand 60.0-60.2' - limestone fragments, silt and sand-sized particles, poor recovery		More chatter from 60'-65'				
65 -24.3	65.0 66.0	0.9	SS-14	50-50 (100/12")	Silt (ML) 65.0-65.9' - moderate yellowish brown, (10YR 5/4), moist to wet, hard, nonplastic to low plasticity, moderate to strong HCl reaction, 5-10% fine sand size particles, carbonate materials		Driller's Remark: 65.0'-70.0' drilled similar to 60.0'-65.0', more rock chips in cuttings				
70 -29.3	70.0 70.1	0.0	SS-15	50/1 (50/1")	Limestone Fragments 70.0-70.1' - 3 fragments to 1/2x1/8", mild to moderate HCl reaction, poor recovery Begin Rock Coring at 70.0 ft bgs See the next sheet for the rock core log		Driller's Remark: Bouncing on SPT, will switch to rock coring at 70.0' Finish soil drilling at 17:00 on 4/11/07; setting HW casing to 70' End day at 18:00 on 4/11/07, set 35.0' of HW casing Start at 8:00 on 4/12/07, set remainder of casing and clean out hole Cannot take water levels due to tooling in hole Finish setting casing to 70', clean and flush hole at 11:00 on 4/12/07				
75 -34.3											
80											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-23	SHEET 5 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.7 N, 458210.1 E (NAD83)
ELEVATION : 40.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
WATER LEVELS : 2.3 ft bgs on 4/18/07 START : 4/11/2007 END : 4/19/2007 LOGGER : J. Schaeffer, D. Roraback

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.
-29.3	70.0	R1-NQ	NR			No Recovery 70.0-70.5'	
	70.5	0.5 ft	3	70.7, 70.85, 71.4, 71.6, 72.0' - Fractures (5), 0-10 deg, rough, undulating, tight to open with some fragmenting at fractures		Limestone 70.5-75.2' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, medium strong to strong (R3 to R4), small (up to 1/16") voids cover 30% of surface, many 1/4" to 1/2" cavities some with fossil casts, and a 1" elongated cavity at 92.5', small voids decrease to <5% at 72.5-73.0', trace organic fossil infills and increased fossil molds and casts at 73.0-73.9', extremely weak (R1) rock at 94.0-94.6'	R1: 1 minute
			3				
		R2-NQ	0	72.35' - Fracture, horizontal, rough, undulating 72.95' - Mechanical break			
		5 ft	3				
		94%	1	73.9, 74.0' - Fractures (2), horizontal, rough, undulating, tight, join a vertical rough undulating fracture at 73.95'			
75			NR	74.4, 74.6' - Fractures (2), horizontal, rough, undulating, two horizontal fractures bound a vertical fracture at 74.5'		No Recovery 75.2-75.5'	R2: 13 minutes
-34.3	75.5		4	75.5-75.6' - Fracture zone, subangular 3/4" to 1" fragments		Limestone 75.5-78.6' - Same as 70.5-75.2' except medium strong (R3), small (up to 1/16") voids cover 30% of surface at 75.5-77.2', increased cavities up to 1/4" (elongated) at 76.4-77.2', very weak (R1) between fractures at 77.1' and 77.2', weak (R2) at 77.2-78.6'	
			3	75.6' - Fracture, termination of fracture zone at a stepped 30 deg face			
		R3-NQ	4	76.2' - Fracture, 70 deg, rough, undulating, 0.4' long cleave		No Recovery 78.6-80.5'	
		5 ft	NR	76.4' - Fracture, rough, undulating, 10 deg and 45 deg fractures terminate above 70 deg fracture, and 76 deg before fracture, appears weathered with cavities			
		62%		76.6' - Fracture, 70 deg, rough, undulating, missing side of core, fracture terminated above horizontal fracture			R3: 14 minutes
80				77.1, 77.2' - Fractures (2), horizontal, rough, undulating, open, friable, voids decrease with depth		Limestone 80.5-85.0' - moderate yellowish brown to dark yellowish orange, (10YR 5/4 to 10YR 6/6), fine grained, moderate HCl reaction, medium strong to weak (R3 to R2), fossiliferous with 25% small voids and several fossil cavities (up to 1" long), trace 1/4" organic fragments and several organic laminations, weaker with depth	
-39.3	80.5		1	77.8-77.9' - Fracture zone, rock crush			Fractures tend to occur at weaker (R2) sections that are friable
			3	78.4' - Fracture, horizontal, rough, undulating, open			
				78.5' - Fracture, 15 deg, rough, planar			
		R4-NQ	>10	81.1' - Fracture, horizontal, with fragmentation			
		5 ft	1	81.8-81.95' - Fracture, vertical, rough, undulating, bonded by horizontal to 10 deg rough, undulating fracture			
		90%	5	82.6' - Fracture, 70 deg, rough, undulating, leading to underlying fracture zone		No Recovery 85.0-85.5'	R4: 12 minutes
85			NR	82.8-83.0' - Fracture zone, rock crush leading to a 10 deg rough stepped fracture at 83.0'		Limestone 85.5-90.5' - Same as 80.5-85.0' except weak to medium strong (R2 to R3), fossiliferous voids cover 30% of surface (10% minimum, 40% maximum), occasional fine laminations	
-44.3	85.5		2	83.4' - Fracture, 60 deg, rough, undulating, with fragmentation, friable			
			2	84.2' - Fracture, 80 deg, rough, undulating, with fragmentation, friable			
			5	84.7' - Fracture, 70-90 deg, rough, undulating, leading into fracture zone with organics			
		R5-NQ	2	85.5' - Fracture, 30 deg, smooth, planar			
		5 ft		86.2' - Fracture, horizontal, rough, stepped, fracture terminates underlying vertical fracture			
		100%					SC-1 collected at 89.3-90.5'
90							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-23

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.7 N, 458210.1 E (NAD83)

ELEVATION : 40.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.3 ft bgs on 4/18/07

START : 4/11/2007

END : 4/19/2007

LOGGER : J. Schaeffer, D. Roraback

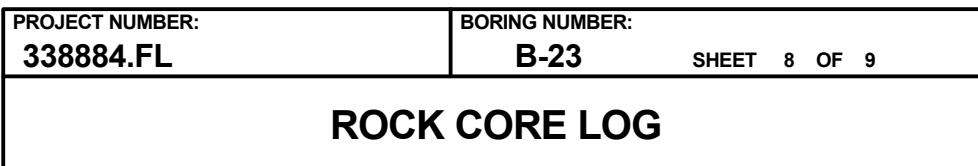
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, 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.
-49.3	90.5		0	86.7' - Fracture, 70 deg and vertical, rough, undulating, tight to open, 5/16" relief, extends 86.2-87.4'		Limestone 90.5-91.7' - Same as 85.5-90.5' except moderate yellowish brown, (10YR 5/4), medium strong (R3), fossiliferous, many cavities up to 1/2" 91.7-92.1' - light olive gray, (5Y 5/2), fine grained, moderate to strong HCl reaction, strong (R4), increasing voids with depth from 5-15%, elongated cavities near 94.8', large 1"x1"x1/2" cavity at 95.1'	R5: 14 minutes Based on overlying and underlying rock in the rock crush zone; picked 91.7' as contact End of core from R6-NQ matches top of R7-NQ core, therefore core loss interpreted to be from middle of core run Core loss assumed to be from 92.1-94.6'
			3	87.15' - Fracture, 40 deg, rough, undulating, extends through half core joining vertical fracture			
			>10	88.0-88.7' - Fracture zone, several horizontal fractures with a 70 deg fracture crossing all horizontal fractures, clean large (2"-3") fragments, bounded by 30 deg fractures rough to undulating on top and bottom			
	R6-NQ 5 ft 50%	28	NR	89.0, 89.25' - Fractures (2), horizontal, rough, undulating 91.0' - Fracture, 70 deg, rough, undulating, 4" long, weathered edges, tight 91.4-92.1' - Fracture zone 94.8' - Fracture, 80 deg, rough, undulating, tight, 4" long 95.5' - Fracture, 45 deg, rough, planar, tight to healed, joints with R7 core		No Recovery 92.1-94.6' Limestone 94.6-95.5' - Same as 91.7-92.1' 95.5-99.3' - Same as 94.6-95.5' except voids increasing to 20-25%, weak (R2) at 97.9-98.85'	R6: 14 minutes
95 -54.3	95.5		2				
			0				
			0				
	R7-NQ 5 ft 92%	42	>10	97.7, 97.9' - Fractures (2), 20 deg, rough, undulating, open, fragmented beneath 97.9'			
			8	98.25, 98.55, 98.65' - Fractures (3), 10 deg, somewhat fragmented			
			8	98.4' - Fracture, vertical, rough, undulating, open and somewhat fragmented, bounded by 10 deg fractures at 98.25' and 98.55'		99.3-100.1' - yellowish gray, (5Y 7/2), moderate HCl reaction, strong (R4), voids decreasing to 5-10%, transition from above is irregular with infilling of cavities, 1/2"x3/4" deep spiral fossil at 99.5'	R7: 14 minutes
100 -59.3	100.5		NR	99.1' - Fracture or mechanical break, 10 deg, rough, undulating, tight to healed 99.3' - Fracture, horizontal, rough, undulating, open at contact 99.5' - Fracture, vertical, rough, undulating, bounded at 99.3' and 99.75'		No Recovery 100.1-100.5' Limestone 100.5-104.0' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, strong (R4), 1/16" voids varying from 5-30%, few 1/2" elongated fossils, few cavities, mostly shallow and <1/2", trace organics laminations and inclusions No Recovery 104.0-105.5'	Water level at 2.3 below ground surface SC-2 collected at 103.25-103.95'
			5	99.75-100.1' - Fracture zone, angular block with horizontal and vertical breaks 1"-2" in size			
			2				
	R8-NQ 5 ft 70%	52	1	101.15' - Fracture, rough, undulating to planar, open			
			1	101.4-101.5' - Fracture zone, bounded by <5 deg, rough, undulating, very open fracture			
			NR	101.8, 102.1' - Fractures (2), 50 deg, rough, undulating 103.25' - Mechanical break 103.9' - Mechanical break 105.5-106.2' - Fracture zone, angular rock fragments and nearly fractures at 106.0'			R8: 20 minutes
105 -64.3	105.5		>10	106.2' - Fracture, 10 deg, rough, stepped		Limestone 105.5-108.0' - Same as 100.5-104.0' except light olive gray to moderate olive brown, (5Y 5/2 to 5Y 4/4), 10-20% voids, fragmented at 105.5-106.2'	
			0				
			0				
	R9-NQ 5 ft 50%	33	NR	107.9' - Mechanical break		No Recovery 108.0-110.5'	
110							R9: 19 minutes



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-23	SHEET 7 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.7 N, 458210.1 E (NAD83)
ELEVATION : 40.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
WATER LEVELS : 2.3 ft bgs on 4/18/07 START : 4/11/2007 END : 4/19/2007 LOGGER : J. Schaeffer, D. Roraback

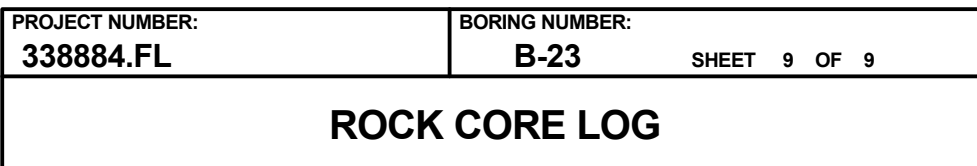
WATER LEVELS : 2.31 ft bgs on 4/18/07		START : 4/11/2007		END : 4/19/2007		LOGGER : J. Schaefer, D. Kulaback			
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES				SYMBOLIC LOG	LITHOLOGY	COMMENTS	
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, 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	
-69.3	110.5						Limestone 110.5-115.5' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, very weak to strong (R1 to R4), small (1/16") voids 10-20%, minimal cavities, strong (R4) rock at 110.5-113.0', medium strong (R3) rock 113.0-113.5', intermingled zones of very weak and weak (R1 and R2) rock at 113.5-115.2', medium strong to strong (R3 to R4) at 115.1-155.5', intermittent zones of solid core and rock fragments 112.25-115.5'	R10: 17 minutes	
115 -74.3	R10-NQ 5 ft 100%	53	0	111.7, 111.9' - Fractures (2), 50 deg, rough, undulating, tight 112.25' - Fracture zone, horizontal, stepped, 1"-2" angular fragments 113.1' - Fractures, vertical, rough, moderately open, bounded by similar horizontal fractures at 113.0' and 113.25' 113.5' - Fracture, vertical, rough, undulating, open, bounded at 113.1' by horizontal fracture 114.25, 114.6' - Fractures (2), 40 deg, rough, undulating, between fractures are columnar vertical fragments and fractures that are rough, undulating, tight to open 115.1-115.5' - Fracture zone, angular, columnar 115.5-116.1' - Fracture, vertical, rough, undulating, half core intact, the other half multiple fragments 116.1' - Fracture, horizontal, rough, undulating, open 116.7' - Fracture, horizontal, rough, undulating to stepped, open 116.7-117.5' - Fracture zone, angular 1-3" fragments					
			8						
			8						
			3						
			>10						
120 -79.3	R11-NQ 5 ft 40%	14	2	115.5-117.5' - Same as 110.5-115.5' except moderate yellowish brown, (10YR 5/4), medium strong to strong (R3 to R4), with intermittent core and fracture zones similar to 112.25-115.5' No Recovery 117.5-120.5'			Sand on outside of core from 115.5'-116.0', chatter started about 6-7 minutes into run		
			>10						
			NR						
125 -84.3	R12-NQ 5 ft 46%	8	>10	Limestone 120.5-120.8' - Same as 115.5-117.5' except moderate HCl reaction, medium strong to strong (R3 to R4), fine grained, slightly banded with beige and gray 120.8-121.3' - Same as 120.5-120.8' except mild HCl reaction, very weak (R1), end of weaker rock in fracture zone No Recovery 122.8-125.5'			R12: 12 minutes		
			3						
			>10						
			NR						
130	R13-NQ 5 ft 46%	28	>10	Limestone 125.5-125.8' - Same as 120.5-122.8' except light olive gray to moderate yellowish brown, (5Y 5/2, 10Y 5/4), mild to moderate HCl reaction, very weak to weak (R1 to R2), rounded 3/4" to 1-1/2" spherical fragments 125.8-126.9' - Same as 125.5-125.8' except very weak to weak (R1 to R2), intact core 126.9-127.8' - Same as 125.5-125.8' except very weak (R1), friable No Recovery 127.8-130.5'			SC-3 collected at 125.8-126.6'		
			2						
			2						
			NR						



ORIENTATION : Vertical

LOGGER : J. Schaeffer, D. Roraback

Rev. 4



ELEVATION : 40.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.3 ft bgs on 4/18/07

START : 4/11/2007

END : 4/19/2007

LOGGER : J. Schaeffer, D. Roraback

APPENDIX 2BB-600



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-23A

SHEET 1 OF 4

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723147.5 N, 458207.7 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550, S/N 186073, mud rotary, cathead, AWJ rods, 2-7/8" drag bit





ORIENTATION : Vertical

WATER LEVELS : 5.0 ft bgs on 6/30/07

START : 11/28/2007

END : 11/28/2007

LOGGER : D. Whitaker

WATER LEVELS : 3.0 (RDS) 01/03/07			START : 11/20/2007			END : 11/20/2007			LOGGERS : D. Whitaker		
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					
42.4	0.0	1.1	SS-1	1-2-5 (7)	Topsoil (ML) 0.0-0.45' - grayish brown, (5YR 3/2), very loose, little organics, 0.3-0.45' wood and roots		Boring conducted for hammer testing purposes only; 2-7/8" drag bit				
	1.5				Poorly Graded Sand With Organics (SP) 0.45-1.1' - brownish black to light brownish gray, (5YR 2/1 to 5YR 6/1), moist, loose, very fine to fine grained, no HCl reaction, 30% organic fines, decreasing with depth						
5	5.0										
37.4		0.9	SS-2	5-8-12 (20)	Silty Sand (SM) 5.0-5.9' - moderate yellowish brown, (10YR 5/4), wet, medium dense, very fine to fine grained, no HCl reaction, 25% nonplastic fines, slight orange staining at 5.0-5.3', trace organics and black staining.						
	6.5										
10	10.0										
32.4		1.1	SS-3	2-2-2 (4)	Silty Sand (SM) 10.0-10.75' - dark yellowish orange, (10YR 6/6), wet, very loose, very fine to fine grained, no HCl reaction, 25-30% nonplastic fines						
	11.5				Sandy Silt (ML) 10.75-11.1' - moderate yellowish brown, (10YR 5/4), wet, nonplastic, rapid dilatancy, no HCl reaction, 40% fine silica sand						
15	15.0										
27.4		1.0	SS-4	3-7-15 (22)	Silt (ML) 15.0-16.0' - dark yellowish orange, (10YR 6/6), wet, very stiff, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 5-10% very fine sand sized, carbonate material		Driller's Remark: Becomes harder-rocky at 14'				
	16.5										
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-23A
SHEET 2 OF 4	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723147.5 N, 458207.7 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: Mark Boatright; Cathead Operator: M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550, S/N 186073, mud rotary, cathead, AWJ rods, 2-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 5.0 ft bgs on 6/30/07 START : 11/28/2007 END : 11/28/2007 LOGGER : D. Whitaker

WATER LEVELS : 3.0 (bgs) 01/03/07			START : 11/20/2007			END : 11/20/2007			LOGGERS : D. Whitaker		
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			
22.4	20.0	1.4	SS-5	12-42-50 (92)		Silt (ML) 20.0-21.35' - Same as 15.0-16.0' except hard					
	21.5										
25	25.0										
17.4		0.9	SS-6	20-20-24 (44)		Sandy Silt And Limestone (ML) 25.0-25.9' - yellowish gray and dusky yellow, (5Y 7/2 and 5Y 6/4), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 35% fine to coarse sand sized, 10-15% fine gravel-sized limestone fragments, carbonate materials					Driller's Remark: Hard drilling from 26.5-30.0'
	26.5										
30	30.0										
12.4		1.1	SS-7	45-26-33 (59)		Sandy Silt And Limestone (ML) 30.0-31.05' - Same as 25.0-25.9 except dusky yellow, (5Y 6/4), moderate HCl reaction					
	31.5										
35	35.0										
7.4		0.7	SS-8	9-4-2 (6)		Silty Sand (SM) 35.0-35.65' - light olive gray, (5Y 2/2), wet, very loose, fine to coarse grained, moderate HCl reaction, 10% fine to gravel-sized limestone fragments, 20-25% nonplastic fines, carbonate materials					Driller's Remark: Hard at 37'; change to 2-7/8" tricone bit
	36.5										
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-23A
SHEET 3 OF 4	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723147.5 N, 458207.7 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: Mark Boatright; Cathead Operator: M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550, S/N 186073, mud rotary, cathead, AWJ rods, 2-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 5.0 ft bgs on 6/30/07 START : 11/28/2007 END : 11/28/2007 LOGGER : D. Whitaker

WATER LEVELS : 3.0 TDS ON 9/30/07		START : 11/20/2007		END : 11/20/2007		LOGGER : D. Whitaker	
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
2.4	40.0	0.0	SS-9	50/1.5 (50/1.5")	No Recovery 40.0-40.1'		Driller's Remark: Medium hard drilling from 41-62'
45 -2.6	45.0						
	46.0	0.0	SS-10	46-50/5.5 (96/11.5")	No Recovery 45.0-46.0'		
50 -7.6	50.0						
	50.8	0.3	SS-11	33-50/3.5 (83/9.5")	Limestone Fragments 50.0-50.25' - light olive gray, (5Y 5/2), mild HCl reaction, fine gravel-sized fragments		
		</					



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-23A
SHEET 4 OF 4	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723147.5 N, 458207.7 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: Mark Boatright; Cathead Operator: M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550, S/N 186073, mud rotary, cathead, AWJ rods, 2-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 5.0 ft bgs on 6/30/07 START : 11/28/2007 END : 11/28/2007 LOGGER : D. Whitaker

WATER LEVELS : 5.0 ft bgs on 11/28/2007			START : 11/28/2007			END : 11/28/2007			LOGGER : D. Whitaker		
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				
-17.6	60.0 60.8	0.0	SS-13	50-50/4 (100/10")	No Recovery 60.0-60.8'		Driller's Remark: Hard at 62' Driller's Remark: Soft from 62.5-64.5'				
65 -22.6	65.0 65.9	0.0	SS-14	50/1 (50/1")	No Recovery 65.0-65.1'		Driller's Remark: Hard from 64.5-66.5'				
							Driller's Remark: Soft from 66.5-67.5'				
							Driller's Remark: Hard from 67.5-70.0'				
70 -27.6	70.0 70.9	0.0	SS-15	50/1 (50/1")	No Recovery 70.0-70.1' Bottom of Boring at 70.1 ft bgs on 11/28/2007		Boring completed at 16:55 on 11/28/2007 Water level at 5.0' below ground surface Driller's Remark: 25% loss of circulation throughout entire boring				
75 -32.6											
80											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-24
SHEET 1 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723356.3 N, 458351.5 E (NAD83)
 ELEVATION : 40.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 5/15/2007 END : 5/17/2007 LOGGER : R. Gomez

WATER LEVELS : 1.01 ft bgs on 6/14/07			START : 9/15/2007			END : 9/17/2007			LOGGERS : R. Gomez		
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						
40.9	0.0	0.4	SS-1	0-4-4 (8)	Silty Sand With Organics (SM) 0.0-0.4' - grayish brown to dusky brown, (5YR 2/3 to 5Y 2/2), moist to wet, loose, fine sand, 16% fines, 12% organic matter		"Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)"				
1.5											
5	5.0						Begin drilling with 3-7/8" tri-cone bit at 2.0'				
35.9	6.5	1.0	SS-2	2-3-4 (7)	Poorly Graded Sand With Silt (SP-SM) 5.0-5.95' - moderate yellowish brown, (10YR 5/4), wet, loose, very fine to fine grained, no HCl reaction, 11% low plasticity fines, trace roots, trace coarse gravel, sand is silica						
10	10.0						Driller's Remark: Surface around borehole sinking slightly				
30.9	11.5	1.1	SS-3	4-5-10 (15)	Silt (ML) 10.0-11.05' - grayish orange, (10YR 7/4), wet, stiff, nonplastic, rapid dilatancy, moderate HCl reaction, trace fine grained sand, all carbonate derived						
15	15.0										
25.9	15.8	0.6	SS-4	47-50/3 (97/9")	Limestone Fragments And Silt (ML) 15.0-15.6' - silt is grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, 60% of sample is limestone, pale yellowish brown, (10YR 6/2), fine grained sand to coarse grained gravel-sized fragments, moderate HCl reaction						
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-24
SHEET 2 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723356.3 N, 458351.5 E (NAD83)
 ELEVATION : 40.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 5/15/2007 END : 5/17/2007 LOGGER : R. Gomez

WATER LEVELS : 1.01 ft bgs on 6/14/07			START : 3/13/2007			END : 3/17/2007			LOGGERS : R. Gomez		
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						
20.9	20.0	1.3	SS-5	13-47-18 (65)	Silt With Sand (ML) 21.0-21.25' - grayish orange to moderate yellowish brown, (10YR 7/4 to 10YR 6/2), moist to wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 5-10% sand-sized grains, 5-10% medium to coarse grained material			Driller's Remark: Harder drilling at 22.5'			
	21.5										
25	25.0										
15.9		1.5	SS-6	8-8-6 (14)	Sandy Silt (ML) 25.0-26.5' - Same as 20.0-21.25' except 27% fine grained sand, 13% medium to coarse grained sand			Driller's Remark: Hard drilling at 28', 20% circulation loss			
	26.5										
30	30.0										
10.9	30.2	0.2	SS-7	50/2 (50/2")	Limestone Fragments 30.0-30.15' - light brown, (5YR 5/6), mild to moderate HCl reaction, moderately fossiliferous			4" casing set at 30'			
35	35.0										
5.9		1.5	SS-8	6-10-19 (29)	Silty Sand (SM) 35.0-36.5' - dark yellowish brown, (10YR 4/2), moist to wet, medium dense, fine to coarse grained, mild HCl reaction, 30% nonplastic fines, all carbonate derived						
	36.5										
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-24

SHEET 3 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723356.3 N, 458351.5 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Gomez

DEPTH BELOW SURFACE AND ELEVATION (ft)			SAMPLE INTERVAL (ft)		RECOVERY (ft)		#TYPE		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG		COMMENTS	

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723356.3 N, 458351.5 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing




ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Gomez

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				
-14.1	55.0	45	>10	55.1' - Fracture, horizontal, rough, planar, open		Limestone 55.0-57.0' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), medium grained, mild to moderate HCl reaction, weak (R2), voids (1/16-3/16") over 20-30% of surface, moderately fossiliferous (shell fragments), black organic lenses 3/16-3/8" at 55.6-55.9' and 56.8-57.0'	R1: 11 minutes	
	0		55.4-55.6' - Fracture zone, multiple fractures, gravel-sized rock fragments					
	2		55.9' - Fracture or mechanical break, horizontal, rough, planar, tight					
	>10		57.0-57.2' - Clay seam, 0.2' thick					
	0		57.9-58.4' - Fracture zone, multiple fractures					
60	60.0	33	NR			Fat Clay (CH) 57.0-57.2' - moderate brown, (5YR 4/4), high plasticity		
-19.1			2	60.3' - Fracture or mechanical break, 60 deg		Limestone 57.2-58.0' - Same as 55.0-57.0'		
			0	60.6' - Fracture, rough, stepped, open 1/8-5/16"		Fat Clay (CH) 58.0-58.4' - grayish brown to dusky yellowish brown, (5YR 3/2 to 10YR 2/2), medium to high plasticity		
			5	62.1, 62.5, 62.7, 62.8, 63.0, 63.3, 63.4, 63.7, 64.1, 64.4' - Fractures (10), rough, planar, <1/16" clay infilling		Limestone 58.4-59.1' - Same as 55.0-57.0' except cavities (3/16-9/16") over 40% of surface	R2: 12 minutes	
			3			No Recovery 59.1-60.0'		
		2		Limestone 60.0-61.2' - Same as 55.0-57.0' except pale yellowish brown, (10YR 6/2), medium to coarse grained				
65	65.0	NR	65.0-66.2' - Fracture zone, rough to smooth, planar, <1/16" silt and/or clay sized infilling	61.2-64.8' - pale yellowish brown to dark yellowish brown, (10YR 6/2 to 10YR 4/2), fine to coarse grained, moderate HCl reaction, very weak (R1), weak rock (R2) at 63.7', 63.8' and 64.0', friable, poorly fossiliferous				
-24.1		38	>10			No Recovery 64.8-65.0'		SC-1 collected at 66.5-67.25'
			2	66.35, 66.5' - Fractures (2), rough, stepped, open 1/8"	Limestone 65.0-66.2' - Same as 61.2-64.8' except increase in weak rock (R2), rock chips			
			1	67.2' - Fracture, rough, stepped, open 3/16-1/4"	66.2-69.7' - dark yellowish brown, (10YR 4/2), moderate HCl reaction, very weak to weak (R1 to R2), voids (up to 3/16") over 30% of surface, solution cavities (up to 3/4") over 10% of surface, intervals of fine grained limestone with no voids or solution cavities from 69.0-69.7'			
			2	68.5, 68.7' - Fractures (2), rough, stepped, open 1/16-3/16"	No Recovery 69.7-70.0'			
			<10		Limestone 70.0-72.4' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (<1/8") over 5-10% of surface, silt-like matrix over 5% of surface, poorly fossiliferous			
70	70.0	0	NR	70.0-74.0' - Fracture zone, vertical, multiple fractures, mostly vertical along weak joints, slight infilling		Fat Clay (CH) 72.4-72.6' - light brown, (5YR 5/6), medium to high plasticity, no HCl reaction, with black, friable organics	R4: 8 minutes	
-29.1			10					
			10					
			10					
			10					
75	75.0		NR					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-24

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723356.3 N, 458351.5 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Gomez

WATER LEVEL - 101 RGS SH 1487		START TIME 07:00		END TIME 07:00		EQUIPMENT CODE		DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		SYMBOLIC LOG	LITHOLOGY	COMMENTS							
				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.					
-34.1	R5-HQ 5 ft 92%	72	0				Limestone 72.6-73.8' - moderate yellowish brown, (10YR 5/4), very weak (R1), voids (up to 1/16") over 10-20% of surface, moderately fossiliferous No Recovery 73.8-75.0' Limestone 75.0-79.6' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), moderate HCl reaction, very weak to weak (R1 to R2), voids (up to 1/16") over 30-40% of surface, solution cavities at 76.4-77.3', highly fossiliferous No Recovery 79.6-80.0'	R5: 7 minutes							
1			76.6' - Fracture, horizontal, rough, stepped, open 3/16-5/16", fracture along cavity												
3			77.5-77.8' - Fractures, irregular fractures along solution cavities												
2			78.6' - Fracture, 60 deg, rough, planar												
1															
80	R6-HQ 5 ft 68%	37	NR	79.6' - Fracture, horizontal, rough, stepped, open 1/16-1/8"			Limestone 80.0-83.4' - pale yellowish brown to dark yellowish brown, (10YR 6/2 to 10YR 4/2), weak to medium strong (R2 to R3), voids (1/16") over 20-30% of surface, solutions cavities (<3/4") over 10-15% of surface No Recovery 83.4-85.0'	R6: 7 minutes							
-39.1			2	80.5, 80.8' - Fractures (2), horizontal, rough, planar, some silt and sand infilling											
			>10	81.6, 82.0' - Fracture zone, multiple fractures along solution cavities											
			3	82.2' - Fracture or mechanical break, vertical											
			1	82.4' - Fracture, 3-5 deg, rough, stepped, trace infilling, open 1/8-1/4"											
			NR	83.1' - Fracture, 15 deg, rough, planar											
85	R7-HQ 5 ft 58%	35					Limestone 85.0-87.3' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), fine grained, strong HCl reaction, weak (R2), trace voids, trace fossils, 20-30% silt sized matrix material 87.3-87.9' - Same as 85.0-87.3' except extremely weak to very weak (R0 to R1), silty matrix increases to 40-50% No Recovery 87.9-90.0'	Driller's Remark: 90% circulation loss at 88' R7: 8 minutes							
-44.1			4	85.0-85.2' - Fracture zone, irregular fractures along solution cavities											
			1	85.5' - Fracture, horizontal, smooth, undulating											
			1	86.2' - Fracture, horizontal, smooth, stepped, infilling											
			NR	87.1, 87.4' - Mechanical break (2), horizontal, rough, planar											
				87.9' - Fracture, smooth, planar, irregular pieces											
90	R8-HQ 5 ft 100%	52					Limestone 90.0-94.3' - grayish orange, (10YR 7/4), medium to coarse grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), voids (up to 1/8") over 20-30% of surface, moderately fossiliferous, silty matrix up to 40-50%	R8: 7 minutes							
-49.1			2	90.6' - Fracture, 7-10 deg, rough, planar											
			3	90.9' - Fracture, 0-1 deg, rough, planar											
			10	91.7, 91.8, 91.9' - Fractures (3), 2-4 deg, rough, planar											
			1	92.0-92.2' - Fractures or mechanical break, irregular fractures											
			10	92.4' - Fracture, horizontal, rough, planar, trace infilling											
				92.7' - Fracture, 40-50 deg, rough, planar, to undulating											
				93.9' - Fracture, 5-10 deg, rough, stepped, <3/16" infilling											
95															



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-24	SHEET 6 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723356.3 N, 458351.5 E (NAD83)

ELEVATION : 40.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Gomez

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.
-54.1	R9-HQ 5 ft 100%	78	1	94.3-95.0' - Fracture zone, multiple fractures, very soft material		Limestone 94.3-95.0' - Same as 90.0-94.3' except strong HCl reaction, silty matrix increases to 60-70% 95.0-100.0' - pale yellowish brown, (10YR 6/2), strong HCl reaction, very weak (R1), voids (up to 1/16") over 10-20% of surface, solution cavities (up to 3/8") over 5-10% of surface, moderately fossiliferous, 5-10% silty matrix (chalk-like)	SC-2 collected at 95.2- 96.4'
			2	95.2' - Fracture, horizontal, smooth, planar			
			3	96.4, 96.85' - Fractures (2), 1 deg, rough, stepped, open 1/8-5/16"			
			3	97.2, 97.8, 97.9, 98.0, 98.15, 98.9' - Fractures (6), rough, stepped, open 3/16"			
			2				
100	R10-HQ 5 ft 28%	0	10	99.6, 99.7' - Fractures (2), horizontal, smooth, planar		100.0-101.4' - grayish orange, (10YR 7/4), medium to coarse grained, strong HCl reaction, very weak (R1), voids (up to 1/16") over 5-10% of surface, poorly to moderately fossiliferous No Recovery 101.4-105.0'	R9: 6 minutes
-59.1			1	100.0-100.35' - Fracture zone, irregular pieces			
			NR	101.0, 101.3' - Fractures (2), 60 deg, rough, planar, tight			
105	R11-HQ 5 ft 100%	52	0			Limestone 105.0-108.5' - Same as 100.0-101.4' except pale yellowish brown, (10YR 6/2)	R10: 4 minutes
-64.1			1				
			4	106.75, 107.2' - Fractures (2), horizontal, smooth, planar, tight			
			10	107.4, 107.7, 107.9' - Fractures (3), horizontal, rough, planar, open			
			3	108.3-108.7' - Fracture zone, irregular breaks along weak fractures			
110	R12-HQ 5 ft 78%	23	4	109.3, 109.5, 109.9' - Fractures (3), rough, stepped, open 1/8-3/16"		108.5-110.0' - pale yellowish brown, (10YR 6/2), strong HCl reaction, extremely weak (R0), poorly fossiliferous, no voids	R11: 5 minutes
-69.1			4	110.1, 110.2, 110.3' - Fractures (3), smooth, breaks along smooth fractures			
			4	110.8' - Fracture, rough, undulating 111.1, 111.6' - Fractures (2), rough, planar			
			>10	111.9, 111.98' - Fractures (2), 5 deg, smooth, planar			
			>10	112.1-112.6' - Fracture zone, multiple irregular breaks, some gravel sized rock fragments			
115			NR	113.0-113.9' - Fracture zone, multiple irregular breaks along weak fractures		No Recovery 113.9-115.0'	R12: 4 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-24

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723356.3 N, 458351.5 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Gomez

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.
-74.1	R13-HQ 5 ft 100%	62	1	115.3' - Fracture, horizontal, rough, planar		Limestone 115.0-120.0' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), strong HCl reaction, very weak (R1), voids over 20-30% of surface, solution cavities (9/16") over 15-20% of surface from 116.5-118.0', silty laminations (pale yellowish brown) with no voids/cavities at 118.7' and 118.9'	SC-3 collected at 115.3-116.15'
			2	116.25' - Fracture, rough, stepped, open 1/16-1/8"			
			1	116.45' - Fracture, rough, planar			
			6	117.7' - Fracture, smooth, undulating			
			2	118.1' - Fracture, horizontal, smooth, planar, open 1/16"			
			2	118.6' - Fracture, 60 deg, rough, undulating			
120	R14-HQ 5 ft 86%	58	4	118.7-118.9' - Fracture zone, regular breaks along weak fractures		120.0-124.3' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), strong HCl reaction, very weak to weak (R1 to R2), voids (up to 1/16") over 20-25% of surface, 10-15% silty matrix, silty laminations at 123.5-123.6', fine grained carbonate laminations (very pale orange [10YR 8/2], weak to medium strong [R2 to R3]) at 123.8' and 123.9'	R13: 7 minutes
-79.1			0	119.2, 119.4' - Fractures (2), irregular breaks			
			4	120.2, 120.3, 120.5, 120.8' - Fractures, smooth, stepped, open 1/8-3/16"			
			4	122.1, 122.2, 122.6, 122.95' - Fractures (4), horizontal, rough, stepped			
			0	123.1, 128.2, 123.35, 123.5' - Fractures (4), 0-1 deg, smooth, planar			
			NR				
125	R15-HQ 5 ft 100%	70	2	125.1' - Fracture, rough, undulating		Limestone 125.0-130.0' - pale yellowish brown, (10YR 6/2), moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (up to 1/16") over 15-20% of surface, solution cavities (up to 3/4") over 20-30% of surface at 125.0-126.7', moderately fossiliferous, fine grained at 128.8-129.5', 15-20% silty matrix	R14: 6 minutes
-84.1			0	125.5' - Fracture, 2 deg, rough, planar			
			0	126.6, 127.7' - Mechanical break (2)			
			5	128.2, 128.3, 128.4, 128.6, 128.8, 129.0' - Fractures (6), smooth, planar, breaks along weak fractures			
			2	129.1, 129.3' - Fractures (2), 0-2 deg, rough, planar			
			NR				
130	R16-HQ 5 ft 92%	70	4	130.0-132.5' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, very weak (R1), solution cavities (up to 9/16") over 5-10% of surface, moderately fossiliferous		130.0-132.5' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, very weak (R1), solution cavities (up to 9/16") over 5-10% of surface, moderately fossiliferous	R15: 6 minutes
-89.1			1	130.7, 130.8, 130.9, 130.95' - Fractures (4), smooth, planar, breaks along weak fractures			
			0	131.3' - Fracture, rough, stepped, open 1/8-3/16"			
			0	132.2, 132.4, 132.5, 134.6' - Mechanical break (4), irregular breaks			
			0				
			NR				
135	135.0					132.5-134.6' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), fine grained, strong to moderate HCl reaction, medium strong to strong (R3 to R4), solution cavities (up to 3/4") over 5% of surface, moderately fossiliferous	R16: 7 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-24

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723356.3 N, 458351.5 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing


ORIENTATION : Vertical

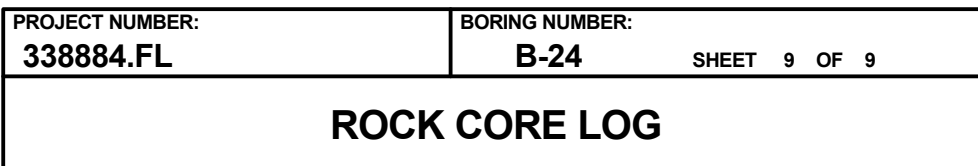
WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Gomez

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS		
		R Q D (%)	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.		
-94.1	R17-HQ 5 ft 88%	47	4	135.1, 135.4, 135.7, 135.9' - Fractures (4), horizontal, rough, undulating, open, dark yellowish brown staining		No Recovery 134.5-135.0' Limestone 135.0-136.0' - pale yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), fine grained, moderate HCl reaction, weak (R2), voids (up to 3/16") over 10-20% of surface, cavities (up to 1-3/16"x3/8") over 15-25% of surface, some fossil casts/molds 136.0-136.4' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak (R1), voids (up to 3/16") over 30-40% of surface, trace cavities (3/8"x3/16"), moderately fossiliferous 136.4-138.6' - pale yellowish brown interlaminated with moderate yellowish brown, (10YR 6/2 with 10YR 5/4), fine to medium grained, moderate HCl reaction, weak (R2), trace voids (up to 1/16"), trace fossils (casts/molds), laminated 138.6-139.4' - pale yellowish brown, (10YR 6/2), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), trace voids (up to 1/16"), some fossils No Recovery 139.4-140' Limestone 140.0-142.5' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids (up to 1/16") over 5-10% of surface, trace fossils 142.5-142.8' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild HCl reaction, very weak to weak (R1 to R2), voids (up to 1/16") over 10-20% of surface, trace fossils 142.8-145.0' - pale yellowish brown, (10YR 6/2), fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), voids (up to 1/8") over 10% of surface, fossils (molds/casts) over 10% of surface 145.0-146.0' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, very weak (R1), voids (up to 1/8") over 30-35% of surface, laminated, 20% silty matrix, friable 146.0-149.4' - moderate yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), fine to medium grained, moderate HCl reaction, very weak to weak (R1 to R2), solution cavities (up to 3/4") at 147.8-148.2', laminated	SC-4 collected at 137.75-138.6'		
			10	136.0-136.5' - Fracture zone, some gravel sized rock fragments					
			0	136.6' - Fracture zone or mechanical break, 60 deg, tight					
			0	137.2' - Fracture or mechanical break, 40 deg, smooth, planar, tight					
			0	137.6' - Fracture or mechanical break, rough, planar, tight					
			0	138.6, 138.9' - Mechanical break (2), rough, stepped, open 3/16-5/16"					
140	R18-HQ 5 ft 100%	93	NR	139.3, 139.8' - Mechanical break (2), rough, planar				R17: 9 minutes	
-99.1			0						
			0						
			4	142.3, 142.35, 142.4, 142.5' - Fractures (4), horizontal, smooth, planar, breaks along weak fractures					R18: 5 minutes
			0						
			0						
145	R19-HQ 5 ft 88%	67	5	145.1, 145.3, 145.4, 145.5, 145.8' - Fractures (5), horizontal, rough, planar, open 3/16"				R19: 5 minutes	
-104.1			0						
			0						
			0						
			0						
			NR						
150						Total depth 150.0'			
-109.1									



LOGGER : R. Gomez

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-25

SHEET 1 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722845.8 N, 458024.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson





DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240; CME 55 S/N 299205, mud rotary, cathead, AWJ/NWJ rods, 3-15/16" tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 2.3 ft bgs on 6/30/07

START : 4/19/2007

END : 4/23/2007

LOGGER : D. Roraback

WATER LEVELS : 2.51005 ON 0/30/07			START : 4/19/2007		END : 4/23/2007		LOGGER : D. Roraback	
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			
42.5	0.0	1.1	SS-1	2-2-4 (6)	Topsoil 0-0.2' - roots Poorly Graded Sand With Organics (SP) 0.2-1.1' - light gray, (N7), moist, loose, fine grained, no HCl reaction, silica sand, trace nonplastic fines, roots and organics decreasing with depth		Limited space in header: 3-15/16" tri-cone bit Soils logged by D. Roraback and J. Schaeffer Note: D50 S/N 240 (with cathead) started boring; due to mechanical issues, rig swapped to CME-55 S/N 299205 at 60 feet below ground surface. Soils drilled with D50.	
5	1.5							
37.5	5.0							
	6.5	1.2	SS-2	2-3-4 (7)	Poorly Graded Sand (SP) 5.0-6.2' - moderate yellowish brown, (10YR 5/4), wet, loose, very fine to fine grained, no HCl reaction, silica sand, trace nonplastic fines, trace roots/organics.			
10	10.0							
32.5		1.2	SS-3	4-4-5 (9)	Poorly Graded Sand With Silt (SP-SM) 10.0-11.2' - pale yellowish brown, (10YR 6/2), wet, loose, very fine to fine grained, no HCl reaction, silica sand, 5% nonplastic fines, trace very fine sand-sized black minerals or organics			
	11.5							
15	15.0							
27.5		1.0	SS-4	6-6-5 (11)	Clayey Sand (SC) 15.0-16.0' - mottled yellowish gray, (5YR 8/1), wet, very fine to fine grained, no HCl reaction, silica sand, 21% medium plastic fines			
	16.5							
20								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-25

SHEET 2 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722845.8 N, 458024.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson





DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240; CME 55 S/N 299205, mud rotary, cathead, AWJ/NWJ rods, 3-15/16" tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 2.3 ft bgs on 6/30/07

START : 4/19/2007

END : 4/23/2007

LOGGER : D. Roraback

WATER LEVELS : 2.5 TUBES ON 9/30/07			START : 4/19/2007			END : 4/23/2007			LOGGER : D. Koraback		
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						
22.5	20.0	1.1	SS-5	2-5-5 (10)	Clayey Sand (SC) 20.0-21.1' - yellowish gray, (5YR 8/1), moist, stiff, high plasticity, no dilatancy, no HCl reaction, 68% fine silica sand						
	21.5										
25	25.0										
17.5		1.0	SS-6	5-5-5 (10)	Silty Sand (SM) 25.0-26.0' - pale yellowish brown, (10YR 6/4), wet, loose, very fine to fine grained, no HCl reaction, silica sand, 20% low to medium plasticity fines						
	26.5										
30	30.0										
12.5		0.7	SS-7	3-3-4 (7)	Clayey Sand (SC) 30.0-30.7' - pale yellowish brown, (10YR 6/2), wet, loose, very fine to fine grained, no HCl reaction, silica sand, 25-30% medium to high plastic fines, clay lenses throughout						
	31.5										
35	35.0										
7.5		1.4	SS-8	22-44-41 (85)	Sandy Silt (ML) 35.0-36.4' - light olive gray, (5Y 5/2), wet, very hard, nonplastic to low plasticity, rapid dilatancy, mild to moderate HCl reaction, 20-35% very fine to coarse sand-sized particles, carbonate materials						
	36.5										
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-25
SHEET 3 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722845.8 N, 458024.3 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240; CME 55 S/N 299205, mud rotary, cathead, AWJ/NWJ rods, 3-15/16" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.3 ft bgs on 6/30/07 START : 4/19/2007 END : 4/23/2007 LOGGER : D. Roraback

WATER LEVEL: 2.04 BGS OF GROUND SURFACE		START: 4/19/2007		END: 4/20/2007		EQUIPMENT: KERRISON	
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		
2.5	40.0	1.0	SS-9	17-47-43 (90)	Sandy Silt (ML) 40.0-41.0' - Same as 35.0-36.4'		Driller's Remark: Hitting hard material
	41.5						
45	45.0	0.0	SS-10	50/0.5 (50/0.5")	Slough And Limestone Fragments 45.0-45.05' - very poor recovery		Driller's Remark: 45.5-46' softer
-2.5							
50	49.9	0.0	SS-11	50/0.5 (50/0.5")	Slough And Limestone Fragments 50.0-50.05' - Same as 45.0-45.05' Begin Rock Coring at 50.0 ft bgs See the next sheet for the rock core log		
-7.5							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-25	SHEET 4 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722845.8 N, 458024.3 E (NAD83)
ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240; CME 55 S/N 299205, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
WATER LEVELS : 2.3 ft bgs on 6/30/07 START : 4/19/2007 END : 4/23/2007 LOGGER : D. Roraback

WATER LEVELS : 2.3' LOSS OF 0.50/0.07		START : 4/19/2007		END : 4/20/2007		LOGGERS : D. Roraback		
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				
-7.5	50.0						No Recovery 50.0-55.0'	Rock core logged by D. Roraback and P. De Sa'Rego
	R1-NQ 5 ft 0%	0	NR					Driller's Remark: Possible sand layer; tagged bottom at 55' below ground surface
55	55.0							R1: 16 minutes
-12.5							Limestone 55.0-59.75' - pale yellowish brown, (10YR 6/4), fine to medium grained, mild delayed HCl reaction, extremely weak to very weak (R0 to R1), variable 10-20% voids to 1/16", trace casts/cavities up to 3/8"x3/8" throughout run, 30-40% cavities at 56.0-56.15'	
	R2-NQ 5 ft 94%	0	4	55.3' - Fracture, 20 deg, rough, undulating, open				
			4	55.55' - Fracture, 10 deg, rough, undulating, open				
			7	55.7-55.75' - Fracture, 30 deg, rough, planar				
				55.8' - Fracture, horizontal, rough, undulating, lenticular				
				55.95-56.0' - Fracture, 20 deg, rough, undulating, open				
			>10	56.15' - Fracture, 20 deg, rough, undulating, open				R2: 11 minutes
			5	56.4-56.7' - Fracture zone				
60	60.0		NR	56.8, 56.85, 56.95, 57.05, 57.2, 57.3, 57.5' - Fractures (7), <10 deg, rough, undulating, open				
-17.5				57.7-57.8' - Fracture zone			No Recovery 59.75-60.0'	Rig switched out partway through boring due to mechanical issues -- change to CME 55 rig SN 299705 at 60'
	R3-NQ 5 ft 52%	9	1	57.9, 58.1' - Fractures (2), horizontal, rough, undulating, open			Limestone 60.0-62.6' - yellowish gray, (5Y 7/2), fine to medium grained, mild delayed HCl reaction, weak (R2), 15-20% voids up to 1/16", trace voids up to 1-3/16" by 3/8", thread-like black mottling up to 1-9/16" by 1/32" at 62.4'-62.8'	Driller's Remark: Water level at 2.3' below ground surface
			2	58.15-58.3' - Fracture zone				SC-1 collected at 60.15-61.20'
			1	58.5, 58.6, 58.8' - Fractures (3), 10 deg, rough, undulating, open				
				59.1-59.3' - Fracture zone			No Recovery 62.6-65.0'	
				59.6, 59.75' - Fractures (2), 10 deg, rough, undulating, open				
			NR	60.1, 61.5' - Fractures (2), horizontal, rough, undulating, open				
				61.85-62.1' - Fracture, 60 deg, rough, undulating				
				62.5' - Mechanical break				R3: 5 minutes
65	65.0			65.1, 65.2, 65.35, 65.5, 65.7, 66.3' - Fractures (6), <10 deg, rough, undulating, open			Limestone 65.0-68.9' - moderate yellowish brown, (10 YR 5/4), mild delayed HCl reaction, weak (R2), 25-30% voids up to 3/16", no visible cavities except 67.75-67.95': large 3-1/8" by 2" infilled with medium gray (N5), medium strong (R3) fine grained carbonate	
-22.5								
	R4-NQ 5 ft 78%	42	5	67.15, 67.5' - Mechanical break (2)				
			1	67.7' - Fracture, horizontal, rough, undulating, open				
			3	68.2' - Mechanical break				
			2	68.7' - Fracture, horizontal, rough, undulating, open				
			NR				No Recovery 68.9-70.0'	R4: 4 minutes
70	70.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-25

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722845.8 N, 458024.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240; CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.3 ft bgs on 6/30/07

START : 4/19/2007

END : 4/23/2007

LOGGER : D. Roraback

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.
-27.5	R5-NQ 5 ft 86%	50	2	70.35' - Fracture, horizontal, rough, undulating, open 70.95' - Mechanical break		Limestone 70.0-72.5' - Same as 65.0-68.9' except black (organic) 1/8" thick irregular laminae at 72.3' and moderately fossiliferous at 72.35-72.5'	R5: 8 minutes
			0			72.5-74.3' - pale yellowish brown mottled with dark yellowish brown, (10YR 6/2 and 10YR 4/2), fine to medium grained, mild delayed HCl reaction, weak (R2), 10% voids up to 1/16", trace cavities to 3/4" x 3/8", trace black (organic) thread-like mottles at 73.6'	
			3	72.35, 72.5' - Fractures (2), horizontal, rough, undulating, open 72.8, 73.0-73.05' - Fractures (2), 30 deg, rough, undulating, open 73.4' - Fracture, <10 deg, rough, undulating, open		No Recovery 74.3-75.0'	
			3	73.6' - Mechanical break 74.2' - Fracture, horizontal, rough, undulating, open		Limestone 75.0-76.9' - Same as 72.5-74.3' except very weak to weak (R1 to R2), 80% dark yellowish brown mottled from 75.6-76.15'	
75			NR	75.1' - Fracture, horizontal, rough, undulating, open 75.25, 75.8' - Mechanical break (2) 75.6' - Fracture, horizontal, smooth, planar, open 76.2, 76.45' - Fractures (2), horizontal, rough, undulating, open 76.7-77.5' - Fracture, 85 deg, rough, undulating, tight to open over depth 77.1-77.5' - Fracture, 85 deg, parallel to above 77.5, 77.6' - Mechanical break (2) 77.6-77.7' - Fracture, vertical, rough, undulating, open		76.4-76.9' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), 15-20% voids up to 3/16", no visible casts/cavities 76.9-78.7' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, mild HCl reaction, medium strong (R3), no visible voids, 10% casts/cavities up to 2-3/8" by 9/16", infilled with material similar to 76.4-76.9'	
-32.5	R6-NQ 5 ft 100%	69	2	77.75' - Fracture, vertical, rough, stepped 78.15' - Fracture, <10 deg, smooth, planar 79.75-79.8' - Fracture, 30 deg, rough, undulating, open		80.0-83.05' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild HCl reaction, weak to medium strong (R2 to R3), 15% voids up to 3/16", 10% casts/cavities up to 1-3/16" by 3/4", poorly fossiliferous 83.05-83.6' - yellowish gray to very pale orange, (5Y 7/2 to 10YR 8/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), trace voids to 1/16", 15-20% casts/cavities up to 1-9/16" x 3/4", infilled with material similar to 80.0-83.5'	R6: 12 minutes
			2	80.6-80.7' - Fracture, 45 deg, rough, undulating, open 80.8-81.2' - Fracture, 60 deg, rough, undulating, open 82.5' - Mechanical break		No Recovery 83.6-85.0'	
			5	82.95-83.15' - Fracture zone 83.3-83.6' - Fracture, 60 deg, rough, undulating, open 83.5-83.6' - Fracture zone		Limestone 85.0-87.4' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild HCl reaction, extremely weak to very weak (R0 to R1), 10-15% voids up to 1/16", trace casts/cavities up to 3/8" x 9/16" at 85.5-85.7'	
			1				
80			1				
-37.5	R7-NQ 5 ft 72%	40	2	85.2, 85.25, 87.0' - Mechanical break (3) 85.45-85.5' - Fracture, 30 deg, rough, undulating, open 85.7-85.85' - Fracture, 60 deg, rough, undulating, open 86.35' - Fracture, horizontal, rough, undulating, open 86.6' - Mechanical break 87.2-87.5' - Fracture, 60 deg, rough, undulating 87.75-87.8' - Fracture, 30 deg, smooth, undulating, black (organic?) clay infill up to 1/16" thick, open			R7: 8 minutes
			1				
			2				
			<10				
			NR				
85	R8-NQ 5 ft 75%	38	2				R8: 9 minutes
-42.5			2				
			2				
			1				
			NR				
90							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-25	SHEET 6 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722845.8 N, 458024.3 E (NAD83)
ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240; CME 55 S/N 299205, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
WATER LEVELS : 2.3 ft bgs on 6/30/07 START : 4/19/2007 END : 4/23/2007 LOGGER : D. Roraback

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-47.5	R9-NQ 5 ft 95%	72	1 88.6' - Fracture, horizontal, rough, undulating, open		87.4-88.75' - Same as 85.0-87.4' except very weak to weak (R1 to R2), and at 87.7-88.2' trace voids up to 1/16"	R9: 9 minutes
			1 90.6-90.65' - Fracture or mechanical break, 30 deg, rough, undulating, open		No Recovery 88.75-90.0' Limestone	
			4 91.1-91.2' - Fracture or mechanical break, 60 deg, rough, undulating, open		90.0-92.3' - pale yellowish brown, (10YR 6/2), fine to medium grained, mild HCl reaction, medium strong (R3), 5-10% voids up to 1/8" in size, casts/cavities up to 9/16"x3/8"	
			>10 92.05-92.15' - Fracture, horizontal, rough, undulating, open		92.3-92.5' - Same as 90.0-92.3' except 20% thin (1/16") organic (dark brown to black) laminae	
			1 92.5' - Fracture, horizontal, rough, undulating, open		92.5-94.75' - Same as 90.0-92.3' except single cavity at 93.5': 2"x1-3/16"	
95	95.0	57	NR 93.0' - Mechanical break		No Recovery 94.75-95.0' Limestone	R10: 12 minutes
-52.5			2 93.7-94.2' - Fracture zone		95.0-97.3' - Same as 90.0-94.75' except pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4)	
			0 94.2-94.3' - Fracture, 45 deg, rough, undulating, open		97.3-98.15' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, mild HCl reaction, medium strong (R3), 10-15% voids up to 3/16", 10% cavities up to 9/16"x3/8", trace black pyrite infilling of cavities	
			5 95.1-95.3' - Fracture, 60 deg, smooth, undulating		98.15-99.0' - Same as 90.0-94.75' except no visible cavities	
			>10 95.75' - Fracture, horizontal, rough, undulating, open		No Recovery 99.0-100.0' Limestone	
100	100.0	20	NR 97.05' - Fracture, horizontal, rough, undulating, tight		100.0-103.75' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), 10% voids up to 1/8", 10% casts/cavities up to 3/8"x3/4" at 100.36-100.65', 101.7-101.9', and 103.2-103.75'	SC-2 collected at 102.0-103.0'
-57.5			>10 97.5, 97.5-97.6, 97.6' - Mechanical break (3)		No Recovery 103.75-105.0'	
			NR 97.85' - Fracture, horizontal, rough, undulating, open		Limestone	
			0 98.25' - Fracture, 5 deg, smooth, planar, open, 25% black staining on surface		105.0-109.5' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), 10% voids to 1/16" throughout run, 25% casts/cavities up to 9/16"x3/8" at 105.0-105.2', trace casts/cavities, up to 9/16"x3/8" throughout entire run.	
			>10 98.4' - Fracture, horizontal, smooth, planar, open			
105	105.0	43	>10 98.6-98.7' - Fracture, 45 deg, rough, undulating, open			Driller's Remark: 106-107' Soft drilling "Pushed right through"
-62.5			>10 98.7-99.0' - Fracture zone			
			0 100.0-100.3' - Fracture zone			
			7 100.3' - Fracture, 10 deg, rough, undulating, open			
			NR 100.55, 100.65' - Fractures (2 parallel), 20 deg, rough, undulating, open			
105	105.0	43	5 100.55-100.65' - Fracture, 40 deg, rough, undulating, open, running between above fractures			R12: 9 minutes
-62.5			9 100.65-100.9, 100.9-101.1, 101.1-101.3' - Fractures (3), 60 deg, rough, undulating, open, some fragments associated with fractures			
			>10 101.3-101.4' - Fracture, 50 deg, rough, planar, open			
			4 101.55-101.7' - Fracture zone			
			5 102.0, 103.0' - Fractures (2), horizontal, rough, undulating, open			
110	110.0	NR	9 103.2-103.3' - Fracture, 45 deg, rough, undulating, open			R12: 9 minutes
			4 103.65-103.75' - Fracture zone			
			9 105.35-105.85' - Fracture zone			
			4 105.85-105.95' - Mechanical break, vertical			
			NR 105.85, 105.95, 106.1, 106.35' - Mechanical break (4)			
					No Recovery 109.5-110.0'	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-25

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722845.8 N, 458024.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240; CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.3 ft bgs on 6/30/07

START : 4/19/2007

END : 4/23/2007





LOGGER : D. Roraback

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					
-67.5	R13-NQ 5 ft 66%	50	>10	106.75' - Fracture or mechanical break, 40 deg, rough, undulating, open 107.5' - Mechanical break 107.6' - Fracture, horizontal, rough, undulating, open 107.6-108.05' - Fracture zone 107.6-108.1' - Mechanical break, >80 deg, one face fractured as described above 108.25' - Mechanical break 108.8' - Fracture, 20 deg, smooth, undulating, open 108.8-109.2, 109.1-109.5' - Fractures (2), 70 deg, rough, undulating, open 109.05, 109.25' - Fractures (2), horizontal, rough, undulating, open 110.0-110.5' - Fracture zone	Limestone 110.0-113.3' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, very weak (R1) from 110.0-110.5', weak (R2) from 110.5-113.5', 10% voids up to 1/16", trace casts/cavities up to 9/16"x2", trace thin dark organic inclusions (3/4" x 1-3/16") at 112.6' No Recovery 113.3-115.0'	R13: 6 minutes			
115			3	111.1' - Fracture or mechanical break, horizontal, rough, undulating, open 111.7-111.85, 111.95-112.05' - Mechanical break (2) 112.5' - Fracture, 10 deg, rough, undulating, open 113.1' - Fractures (2 separated by 1/4"), 15 deg, rough, undulating, open 115.1-115.45' - Fracture, 75 deg, rough, undulating, open, trace black (pyrite) staining <1/16" thick on surface 116.4' - Fracture, horizontal, smooth, undulating, open 117.75, 118.05' - Mechanical break (2) 118.5, 118.6' - Fractures (2), horizontal, rough, undulating, open, some fragments 118.55, 118.65' - Mechanical break (2) 118.8, 118.95' - Fractures (2), horizontal, rough, undulating, open 119.35-119.65' - Fracture zone 120.4' - Mechanical break 120.6' - Fracture, horizontal, rough, undulating, open 120.85-120.95' - Fracture zone, 4 fragments 121.2-121.3' - Fracture zone 121.5' - Fracture, 5 deg, rough, undulating, open, associated with large cavity 121.7' - Fracture, horizontal, rough, undulating, open 121.9-122.4' - Fracture or mechanical break, 60 deg 125.0-125.3' - Fracture zone 125.4' - Mechanical break 125.65, 125.9' - Fractures (2), horizontal, rough, undulating, open 126.1-126.15' - Fracture, 25 deg, rough, undulating, tight 126.25-126.3' - Mechanical break, 25 deg, healed 127.225, 127.25, 127.5' - Fractures (3), horizontal, rough, undulating, open 127.6' - Fracture, horizontal, rough, planar, open to tight 127.85' - Fracture, horizontal, rough, planar, open					
-72.5			1	116.4-117.7' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, very weak (R1), trace voids up to 1/16", no visible casts/cavities 117.7-118.4' - Same as 110.0-113.3' except very weak (R1) at 118.0-118.15' and trace voids up to 1/16", no visible casts/cavities throughout 118.4-118.95' - Same as 116.4-117.7' 118.95-119.85' - Same as 116.4-117.7' except very weak (R1) at 119.33-119.65' No Recovery 119.85-120.0' Limestone 120.0-122.4' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine to medium (coarser with depth) grained, mild HCl reaction, medium strong (R3), trace voids to 1/16", trace casts/cavities to 3/8"x3/8" except at 120.5-120.7' and 121-121.7': with 15-20% casts/cavities, up to 2" x 3/4" x 3/4" "deep", partially infilled with recrystallized carbonate material moderate yellowish brown (10YR 5/4), weak, poorly fossiliferous, trace dark gray pyrite or organic material mottling at 121.9-122.0' No Recovery 122.4-125.0'					
			1						
			1						
120	R14-NQ 5 ft 97%	58	7						
-77.5			>10						
			NR						
			5						
			>10						
	R15-NQ 5 ft 48%	11	1						
			NR						
125	R16-NQ 5 ft 76%	30	>10						
-82.5			2						
			4						
			3						
			NR						
130									



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-25	SHEET 8 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722845.8 N, 458024.3 E (NAD83)
ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240; CME 55 S/N 299205, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
WATER LEVELS : 2.3 ft bgs on 6/30/07 START : 4/19/2007 END : 4/23/2007 LOGGER : D. Roraback

WATER LEVELS : 2.3 ft bgs on 01/30/07		START : 4/19/2007		END : 4/20/2007		LOGGER : D. Kuraadaka				
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						
-87.5	R17-NQ 5 ft 61%	23	1	128.2' - Fracture, 20 deg, rough, undulating, open		Limestone 125.0-128.8' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), 20% voids <1/32", trace voids to 1/16", trace spherical casts 3/16"-1/4", 3/8" spherical casts at 126.0, 126.8, 127.1', larger (2"x3/4") cavities at 127.8' and 130.1', moderately fossiliferous, partial infilling (carbonate, very weak to weak, medium grained) with recrystallized material No Recovery 128.8-130.0'	SC-4 collected at 130.3-131.4'			
1			128.3-128.45' - Mechanical break, 45 deg, tight							
>10			128.45-128.5' - Mechanical break, 30 deg, tight							
1			130.3' - Fracture, horizontal, rough, undulating, open							
NR			131.4' - Fracture, 25 deg, rough, undulating, open							
135	R18-NQ 5 ft 44%	7	NR	131.7' - Fracture, horizontal, rough, undulating, open				Limestone 130.0-133.05' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, mild HCl reaction, weak (R2), trace voids up to 1/16", trace cavities up to 1-3/16" by 3/16", well-formed casts to 3/4" x 3/4" x 3/8" "deep" at 132.8' No Recovery 133.05-135.0'	R17: 11 minutes	
-92.5				>10						131.95-132.05' - Fracture, 45 deg, rough, undulating, open, likely due to cavity
				>10						132.2, 132.4, 132.5' - Fractures (3), horizontal, rough, undulating, open
										132.5-132.7' - Fracture, vertical, rough, undulating, open
										132.6-132.65' - Fracture, 30 deg, rough, undulating, open
					132.9-133.05' - Fracture zone					
					135.15-135.35' - Fracture zone					
					135.45' - Fracture, horizontal, smooth, planar to undulating, open					
					135.65, 135.7, 135.75, 135.85, 136.05, 136.2, 136.4, 136.45, 136.5' - Fractures (9), horizontal, rough, planar to undulating, open					
					136.7-136.8' - Fractured rock fragments (3), horizontal, rough, planar to undulating, open					
140	R19-NQ 5 ft 76%	48	1	140.8' - Fracture, <10 deg, rough, undulating, open		135.65-137.2' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids (1/16") over 10% of surface, scattered (<5%) larger voids up to 3/16", trace cast/cavities up to 9/16"x3/16", 5-10% gray shell fragments inclusions at 136.85-137.2', mottled dark brown at 136.4-136.45' No Recovery 137.2-140.0'	R18: 7 minutes			
-97.5			1	141.6' - Fracture, horizontal, rough, undulating, open						
			8	142.4-142.5' - Fracture zone						
			1	142.65-142.75' - Fracture zone						
			NR	143.6' - Fracture, 10 deg, rough, planar, open						
145	R20-NQ 5 ft 82%	60	2	145.45' - Fracture, horizontal, rough, undulating, open				Limestone 140.0-141.3' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine to medium grained, mild HCl reaction, weak to medium strong (R2 to R3), voids (1/16") over 10% of surface, trace casts/cavities up to 1-3/16" by 3/8", partially infilled with similar material to matrix, black pyrite staining at 141.15-141.2' and 142.3-142.35' 141.3-141.6' - light gray, (N7), fine grained, moderate HCl reaction, medium strong (R3) 141.6-142.4' - Same as 140.0-141.3'	R19: 14 minutes	
-102.5			>10	145.7' - Mechanical break						
			5	146.15-146.3' - Fracture zone, 50% dark brown staining on surfaces						
			1	146.95' - Mechanical break						
				147.5-147.6' - Fracture, 70 deg, rough, undulating, open						
				148.2-149.1' - Mechanical break, 80 deg						
150			NR	149.1-150.0' - Mechanical break					R20: 17 minutes	



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-25	SHEET 9 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722845.8 N, 458024.3 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani; Cathead Operator: S. Hutchinson
 CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 240; CME 55 S/N 299205, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 2.3 ft bgs on 6/30/07 START : 4/19/2007 END : 4/23/2007 LOGGER : D. Roraback

WATER LEVELS : 2.31 bgs on 4/23/07		START : 4/19/2007		END : 4/23/2007		LOGGER : D. Kurlack	
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			
						142.4-143.8' - very pale orange, (10YR 8/2), very fine grained, mild HCl reaction, medium strong to strong (R3 to R4), trace voids to 1/16", trace casts up to 1"x3/16" across unit; large (50% volume of core) cavity at 143.15-143.2', mottled light gray (N7) at 142.8-143.3' No Recovery 143.8-145.0' Limestone 145.0-145.7' - very pale orange, (10YR 5/2), fine grained, mild HCl reaction, medium strong (R3), poorly fossiliferous, 5% voids up to 1/16", trace casts/cavities up to 1"x3/16", poorly infilled with black fine grained "powdery" material 145.7-146.3' - Same as 145.0-145.7' except mottled yellowish gray, (5Y 7/2) 146.3-146.45' - moderate yellowish brown, (10YR 5/4), medium grained, mild HCl reaction, weak to medium strong (R2 to R3), 25-30% voids up to 1/16", moderately fossiliferous, sharp contacts above and below 146.45-147.5' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, thin (<1/8") planar to irregular dark brown laminae, no voids, trace casts 147.5-147.8' - moderate yellowish brown, (10YR 5/4), medium grained, moderate HCl reaction, medium strong (R3), trace voids up to 1/16", no casts, poorly fossiliferous 147.8-148.2' - Same as 146.45-147.5' except grades into unit below 148.2-149.1' - Same as 147.5-147.8' except highly fossiliferous and 25% casts up to 9/16"x9/16" at 148.8-149.2' No Recovery 149.1-150.0' Bottom of Boring at 150.0 ft bgs on 4/23/2007	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-25A

SHEET 1 OF 3

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.0 N, 458017.4 E (NAD83)

ELEVATION : 42.2 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

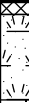



ORIENTATION : Vertical

WATER LEVELS : 4.5 ft bgs on 11/27/08

START : 11/27/2007

END : 11/27/2007

LOGGER : D. Thomas

WATER LEVELS : 4.5 (RDS) ON 11/27/00			START : 11/27/2007		END : 11/27/2007		LOGGER : D. Thomas	
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			
42.2	0.0	1.5	SS-1	3-5-7 (12)	Limestone Fill 0.0-0.2' - dark yellowish orange, (10YR 6/6), strong HCl reaction Topsoil 0.2-1.5' - grayish black, (N2), moist, medium stiff, nonplastic, no HCl reaction, trace very fine sand increasing to 10% with depth, wood at 1.3'		2-7/8" tricone bit This boring is being drilled for hammer test purposes only.	
5	1.5							
37.2	5.0							
	6.5	0.4	SS-2	3-2-3 (5)	Lean Clay (CL) 5.0-5.1' - grayish black, (N2), wet, medium plasticity, no HCl reaction, trace very fine sand Silty Sand (SM) 5.1-5.4' - dark yellowish orange, (10YR 6/6), wet, loose, very fine to fine grained, 15% nonplastic fines, 5% fine organic particles		5.0-5.1' May be slough	
10	10.0							
32.2	11.5	1.0	SS-3	1-1-2 (3)	Fat Clay (CH) 10.0-10.1' - light greenish gray, (5G 8/1), moist to wet, soft, high plasticity, no dilatancy, no HCl reaction, trace very fine silica sand Silty Sand (SM) 10.1-10.3' - light olive gray, (5Y 6/1), wet, very loose, very fine to fine grained, no HCl reaction, 20% low plastic fines Fat Clay With Sand (CH) 10.3-10.95' - Same as 10.0-10.1' except 15% very fine silica sand			
15	15.0							
27.2	16.5	1.3	SS-4	3-5-5 (10)	Fat Clay (CH) 15.0-15.3' - light greenish gray, (5G 8/1), wet, stiff, high plasticity, no dilatancy, trace fine to coarse sand that can be crushed, no HCl reaction with silty/clay matrix, strong HCl reaction for sand material Silty Sand (SM) 15.3-15.4' - light olive gray, (5Y 6/1), wet, loose, no HCl reaction, 20-25% low plastic fines Fat Clay (CH) 15.4-15.9' - Same as 15.0-15.3' Silty Sand (SM) 15.9-16.25' - Same as 15.3-15.4'		Changed to 2-7/8" drag bit Driller's Remark: Losing water while drilling	
20								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-25A

SHEET 2 OF 3

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.0 N, 458017.4 E (NAD83)

ELEVATION : 42.2 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

ORIENTATION : Vertical

WATER LEVELS : 4.5 ft bgs on 11/27/08

START : 11/27/2007

END : 11/27/2007

LOGGER : D. Thomas

WATER LEVELS : 4.5 TDS @ 11/27/00			START : 11/27/2007		END : 11/27/2007		LOGGER : D. Thomas	
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			
22.2	20.0	1.1	SS-5	3-4-4 (8)	Fat Clay (CH) 20.0-20.4' - Same as 15.0-15.3'		Driller's Remark: Continue to lose circulation	
	21.5				Silty Sand (SM) 20.4-20.7' - Same as 15.3-15.4'			Fat clay and silty sand alternating from 10' (if not from 5')
					Fat Clay (CH) 20.7-21.1" - Same as 15.0-15.3' and 20.0-20.4'			
25	25.0							
17.2		1.3	SS-6	4-3-2 (5)	Fat Clay (CH) 25.0-25.3' - light greenish gray, (5G 8/1), wet, soft, high plasticity, no dilatancy, mild HCl reaction, trace fine to coarse carbonate sand/fragments with strong HCl reaction, (predominantly carbonate fragments)			
	26.5				Silty Sand (SM) 25.3-26.0' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), wet, loose, very fine grained, no HCl reaction, 25-30% low plastic fines			
					Clayey Sand (SC) 26.0-26.3' - light greenish gray to light olive gray, (5G 8/1 to 5Y 5/2), wet, loose, very fine to fine grained, 35% low to medium plastic fines			
30	30.0							
12.2		1.5	SS-7	5-7-8 (15)	Fat Clay With Sand (CH) 30.0-30.4' - light greenish gray to light bluish gray, (6G 8/1 to 5B 7/1), moist, soft, medium plasticity, no HCl reaction, 20% very fine silica sand			
	31.5				Silty Sand (SM) 30.4-31.5' - yellowish gray, (5Y 7/2), wet, medium dense, very fine grained, no HCl reaction, 25% nonplastic fines, irregular shaped lens of fat clay (CH) from 31.0-31.5'			
35	35.0							
7.2		1.5	SS-8	5-4-4 (8)	Fat Clay (CH) 35.0-35.4' - Same as 30.0-30.4'		Driller's Remark: Continuing to lose circulation/ water since 15-20' bgs (about 25 gallons per 5 foot run)	
	36.5				Silty Sand (SM) 35.4-36.5' - Same as 30.4-31.0 except loose			
40								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-25A

SHEET 3 OF 3

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.0 N, 458017.4 E (NAD83)

ELEVATION : 42.2 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




ORIENTATION : Vertical

WATER LEVELS : 4.5 ft bgs on 11/27/08

START : 11/27/2007

END : 11/27/2007

LOGGER : D. Thomas

WATER LEVELS : 4.5 bgs on 11/27/07			START : 11/27/2007			END : 11/27/2007			LOGGERS : D. Thomas		
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						
2.2	40.0	1.3	SS-9	4-2-4 (6)	Silt With Sand (ML) 40.0-40.4' - light olive gray, (5Y 5/2), moist, medium stiff, low plasticity, rapid dilatancy, no HCl reaction, 20% very fine silica sand		SS-9 has an organic rich appearance				
	41.5				Silt With Sand (ML) 40.4-41.3' - light olive gray transitioning to olive gray, (5Y 5/2 to 5Y 3/2), moist to wet, medium stiff, low to medium plasticity, 25% very fine silica sand, organic soil (OL/OH) seams 1/4" thick						
45	45.0						Driller's Remark: Rocky, chatter at 44'				
-2.8	45.4	0.4	SS-10	50/4.5 (50/4.5")	Silt (ML) 45.0-45.4' - dusky yellow, (5Y 6/4), moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, trace limestone fragments up to 1/8", carbonate material		Driller's Remark: Changed back to tricone bit				
							For SS-10, 0.7' of soil in spoon; top 0.3' apparently slough. Material appears to be organic soil (OL), olive gray (5Y 3/2), wet, soft, low to medium plasticity, rapid dilatancy, no HCl reaction, 10% fine silica sand				
50	50.0						Driller's Remark: Firm drilling from 44-49', soft again from 49-50'				
-7.8		1.5	SS-11	15-25-36 (61)	Silty Sand And Limestone (SM) 50.0-51.5' - light olive gray, dusky yellow, and moderate olive brown, (5Y 5/2, 5Y 6/4, and 5Y 4/4), fine to coarse grained, mild HCl reaction, 20-30% low plastic fines (varies in sample), fine to coarse gravel-sized limestone fragments, carbonate materials Bottom of Boring at 51.5 ft bgs on 11/27/2007		For SS-11, 2.1' of soil in spoon; top 0.6' apparently slough				
	51.5						11/27/2007 at 17:00 water level = 4.5' bgs 11/28/2007 at 08:00 water level = 4.0' bgs				
55											
-12.8											
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-26
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723010.2 N, 458111.7 E (NAD83)
 ELEVATION : 42.4 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" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/21/2007 END : 2/23/2007 LOGGER : C. LeBlanc

WATER LEVELS : 4.41 ft bgs on 3/09/07			START : 2/21/2007		END : 2/23/2007		LOGGERS : G. LeBlanc		
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			
42.4								Start drilling at 15:00 on 2/21/07 "Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" 18" of topsoil at ground surface	
5	5.0								
37.4									
	6.5	0.5	SS-1	3-2-2 (4)	Poorly Graded Sand (SP) 5.0-5.5' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), wet, very loose, fine grained, no HCl reaction, silica sand, trace nonplastic fines, trace fine organics			SS-1 sampled at 15:10	
10	10.0								
32.4									
	11.5	1.4	SS-2	2-2-8 (10)	Silty Sand With Limestone Fragments (SM) 10.0-11.4' - yellowish gray, (5Y 8/1), wet, loose, fine to coarse grained, strong HCl reaction, 26% nonplastic to low plasticity fines, 15-20% gravel-sized fossiliferous limestone fragments, all carbonate			SS-2 sampled at 15:25	
15	15.0								
27.4									
	16.5	1.0	SS-3	17-19-5 (24)	Silty Sand With Limestone Fragments (SM) 15.0-16.0' - Same as 10.0-11.4'				
20									



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-26
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723010.2 N, 458111.7 E (NAD83)
 ELEVATION : 42.4 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" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/21/2007 END : 2/23/2007 LOGGER : C. LeBlanc

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
		RECOVERY (ft)					
22.4	20.0	0.4	SS-4	6"-6"-6" (N)	Silt (ML) 20.0-20.4' - yellowish gray, (5Y 8/1), wet, hard, nonplastic, very rapid dilatancy, mild HCl reaction, all carbonate, 5-10% fine to medium sand-sized		
	20.8			50/6 (50/6")			
25	25.0				Silty Sand (SM) 25.0-26.4' - grayish orange, (10YR 7/4), moist to wet, very dense, fine to coarse grained, moderate HCl reaction, all carbonate, 35-40% nonplastic fines		SS-5 sampled at 16:00
17.4	26.5	1.4	SS-5	40-47-44 (91)			
30	30.0				Silt (ML) 30.0-31.0' - dark yellowish orange, (10YR 6/6), moist to wet, hard, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, 10-15% very fine grained sand-sized, carbonate materials		
12.4	31.0	1.0	SS-6	47-50/6 (97/12")			
35	35.0				Sandy Silt (ML) 35.0-36.3' - moderate yellowish brown, (10YR 5/4), moist, hard, nonplastic, very rapid dilatancy, mild HCl reaction, 40% fine to medium grained sand-sized, carbonate materials		
7.4	36.5	1.3	SS-7	23-33-50 (83)			
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-26
SHEET 3 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723010.2 N, 458111.7 E (NAD83)
 ELEVATION : 42.4 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" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/21/2007 END : 2/23/2007 LOGGER : C. LeBlanc

WATER LEVELS : 4.41 ft bgs on 3/6/07			START : 2/21/2007			END : 2/23/2007			LOGGERS : G. LeBlanc		
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				
2.4	40.0 40.6	0.3	SS-8	46-50/1 (96/7")	Silty Sand And Limestone Fragments (SM) 40.0-40.25' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), wet, very dense, fine to coarse grained, mild HCl reaction, 20% nonplastic fines, 50% fossiliferous limestone fragments		SS-8 sampled at 16:41				
							Driller's Remark: Rig chatter at 43.0' Driller's Remark: Lost circulation at 43.0'				
45	45.0										
-2.6	45.9	0.7	SS-9	36-50/5 (86/11")	Sandy Silt (ML) 45.0-45.7' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), wet, hard, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, all carbonate, 35-40% fine to medium sand-sized		SS-9 sampled at 17:05				
50	50.0										
-7.6	50.3	0.3	SS-10	50/4 (50/4")	Sandy Silt (ML) 50.0-50.25' - Same as 45.0-45.7'		SS-10 sampled at 17:30				
55	55.0										
-12.6	55.3	0.1	SS-11	50/4 (50/4")	Limestone Fragments 55.0-55.1' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), mild HCl reaction, fossiliferous						
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-26
SHEET 4 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723010.2 N, 458111.7 E (NAD83)
 ELEVATION : 42.4 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" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/21/2007 END : 2/23/2007 LOGGER : C. LeBlanc

WATER LEVELS : 4.41 ft bgs on 3/29/07			START : 2/21/2007			END : 2/23/2007			LOGGERS : G. LeBlanc		
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				
-17.6	60.4	0.3	SS-12	50/5 (50/5")	Silty Sand (SM) 60.0-60.3' - moderate yellowish brown, (10YR 5/4), wet, very dense, fine to coarse grained, mild HCl reaction, 20% nonplastic fines, 15% organics, all carbonate except organics		SS-12 sampled at 08:00 on 2/22/07				
65	65.0										
-22.6		1.5	SS-13	15-29-47 (76)	Sandy Silt (ML) 65.0-66.5' - Same as 45.0-45.7'		SS-13 sampled at 08:20				
	66.5										
70	70.0										
-27.6		1.0	SS-14	19-50/6 (69/12")	Silt With Sand (ML) 70.0-71.0' - Same as 65.0-66.5' except mild to moderate HCl reaction, 20% fine to medium sand-sized						
	71.0										
75	75.0						SS-15 sampled at 08:50 Switch to rock coring at 75.0'				
-32.6	75.1	0.0	SS-15	50/1 (50/1")	Limestone Fragments 75.0-75.1' - few limestone fragments recovered, mild HCl reaction Begin Rock Coring at 75.0 ft bgs See the next sheet for the rock core log						
80											

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723010.2 N, 458111.7 E (NAD83)

ELEVATION : 42.4 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 : 4.41 ft bgs on 3/06/07

START : 2/21/2007

END : 2/23/2007

LOGGER : C. LeBlanc

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				
-32.6	75.0 R1-NQ 1.5 ft 73%	73	0	76.15' - Fracture or bedding plane, horizontal, rough, undulating, open, loose		Limestone 75.0-76.3' - dusky yellow, (5Y 6/4), very fine to fine grained, moderate to strong HCl reaction, weak (R2), voids (1/16") over 15% of surface, <1/16" thick laminations at 76.0-76.1', oval 3/8" fossil at 75.1' No Recovery 76.3-76.5' No Recovery 76.5-81.5'	R1: Run time not recorded Driller's Remark: Rig chatter at 76.0' Driller's Remark: Soft drilling, possible unconsolidated material		
76.5			1					NR	
80									
-37.6									



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-26	SHEET 6 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723010.2 N, 458111.7 E (NAD83)

ELEVATION : 42.4 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 : 4.41 ft bgs on 3/06/07 START : 2/21/2007 END : 2/23/2007 LOGGER : C. LeBlanc

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	
-52.6	R4-NQ 2 ft 85%	50	>10	94.8, 94.9' - Fracture, 10 deg, rough, undulating, open		Limestone 94.5-94.9' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), no voids	Resume rock coring at 94.5'
			NR	94.9-95.85' - Fracture zone, angular to subangular fragments			R4: 4 minutes
96.5			1	96.5' - Mechanical break, 50 deg		No Recovery 94.9-95.2' Limestone 95.2-96.5' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, weak to medium strong (R2 to R3), begins in fracture zone with many deep cavities, below 95.8' voids increase from 0% to 20%, cavities up to 1" at 95.2'	Because of fracture surface at bottom end of core R4 matching top end of core R5, core loss for R4 is interpreted to be within fracture zone at 94.9'
			1	96.95' - Mechanical break			
			1	97.3' - Fracture, 65 deg, smooth, undulating, tight			
			3	98.15' - Fracture, 50 deg, rough, undulating			
	R5-NQ 5 ft 94%	24	2	98.8, 99.3, 99.8, 100.4, 100.7, 101.1' - Fractures (6), 60-80 deg, rough, undulating, significant fragmentation throughout, fragments 1/2"-3", elongate to angular		96.5-98.4' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), 15-20% fine voids (1/16"), few small (1/4") cavities/fossils	
100			2	99.4' - Fracture, horizontal, rough, stepped, open			
-57.6			NR	101.5-102.0' - Fracture zone, subangular rock fragments 1/2"-2"			R5: Run time not recorded
			>10	102.35' - Fracture, 80 deg, smooth, undulating, terminates above at fracture zone		98.4-99.3' - moderate yellowish brown interbedded with yellowish gray, (10YR 5/4 with 5Y 7/2), moderate to strong HCl reaction, very weak to medium strong (R1 to R3)	
			>10	102.8' - Fracture, 30 deg, smooth, undulating			
			>10	103.0-103.3' - Fractures (3), vertical, rough, undulating, fragmented		99.3-99.5' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1)	
			>10	103.3-104.5' - Fracture zone, rock fragments from silt-size to 2", friable		99.5-101.2' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, strong (R4), voids (<1/16") 0-10% (intermittently), several 1/4"-1/2" cavities and spiral fossil molds	
105	R6-NQ 5 ft 60%	7	NR			No Recovery 101.2-101.5' Limestone 101.5-102.0' - Same as 99.5-101.2' except fragmented	R6: 8 minutes
-62.6			2	106.85' - Fracture, 55 deg, rough, stepped, open with small fragments		102.0-103.3' - Same as 99.5-101.2' except medium strong (R3), core intact until 102.8', several 1/4"-1/2" cavities and molds	
			3	107.15, 107.7' - Fractures (2), 25 deg, rough, undulating, fragmented, particularly at 107.15'		103.3-104.5' - Same as 99.5-101.2' except extremely weak to very weak (R0 to R1), friable	
			2	107.85, 107.95' - Fractures, 10 deg, rough, undulating, tight to open		No Recovery 104.5-106.5' Limestone 106.5-106.8' - moderate yellowish brown to moderate olive brown, (10YR 5/4 to 5Y 4/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), fine (1/16") voids over 10-25% (variably), many 1/4" elongated cavities	
			2	108.75' - Fracture or mechanical break, 50 deg, healed		106.8-107.3' - Same as 106.5-106.8' except extremely weak to very weak (R0 to R1), friable	
			1	109.25' - Fracture, horizontal, rough, undulating to planar, open		107.3-109.25' - Same as 106.5-106.8'	
			NR	109.7' - Fracture, 30 deg, smooth, undulating, tight with missing fragments		109.25-109.7' - Same as 106.5-106.8' except very weak (R1)	
			3	109.95' - Fracture, 75 deg, rough, undulating, weathered, with slight infill			R7: 5 minutes
			2	110.7' - Fracture, horizontal, rough, stepped to undulating			
			2	111.75' - Fracture, 80 deg, rough, stepped, second half of fracture is fragmented into angular 1"-2" pieces			
			3	112.0' - Fracture, 50 deg, smooth, undulating			
			3	112.95' - Fracture, horizontal, rough, planar			
			3	113.15' - Fracture, 60 deg, smooth, stepped, tight, with weathered edges			
115	R8-NQ 5 ft 100%	64					SC-1 collected 112.0- 112.95'



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-26

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723010.2 N, 458111.7 E (NAD83)

ELEVATION : 42.4 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

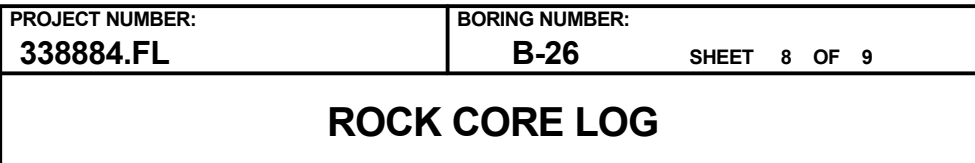
WATER LEVELS : 4.41 ft bgs on 3/06/07

START : 2/21/2007

END : 2/23/2007

LOGGER : C. LeBlanc

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.
-72.6			1	113.7' - Fracture, horizontal, rough, planar, tight, with weathered edges		109.7-110.95' - Same as 106.5-106.8'	R8: 5 minutes
	116.5		3	113.9' - Fracture or mechanical break, 70 deg, rough, undulating, healed		No Recovery 110.95-111.5' Limestone	
			>10	114.35' - Fracture, horizontal, planar to slightly undulating		111.5-116.5' - dusky yellow to moderate yellowish brown, (5Y 6/4 to 10YR 5/4), fine grained, moderate HCl reaction, weak (R2), 20% fine (1/16") voids, few cavities up to 1/4"	
			1	115.3' - Fracture, 70 deg, rough, undulating, 5/16" relief, terminates at a rough stepped fracture at 115.65', tight		116.5-116.7' - Same as 111.5-116.5' except medium strong (R3), with some weaker zones and rock fragments	SC-2 collected 118.0-118.97'
		19	2	115.9' - Fracture, 70 deg, rough, undulating, tight, weathered		116.7-117.0' - Same as 111.5-116.5' except fragmented	
			1	116.45' - Fracture, horizontal, rough, undulating, 1/8" relief		117.0-119.2' - Same as 111.5-116.5' except medium strong (R3), with some weaker zones and rock fragments	R9: 5 minutes
			NR	116.7-117.0' - Fracture zone, subrounded rock fragments 1/2"-2"		119.2-120.1' - Same as 111.5-116.5' except no to mild HCl reaction, very weak to weak (R1 to R2), sections of increased voids	
				117.45' - Fracture, 10 deg, rough, undulating, tight, cuts across 80 deg fracture at 117.65'		No Recovery 120.1-121.5' Limestone	
				117.65' - Fracture, 80 deg, rough, undulating, 10 inches long, black staining (pyrite), tight, weathered		121.5-122.5' - dusky yellow to moderate yellowish brown, (5Y 6/4 to 10YR 5/4), fine grained, moderate to strong HCl reaction, medium strong (R3), small (1/16") voids over 20-25%, fossiliferous (numerous molds/casts, small [1/4"] circular/oval voids, larger [1"] thin elongate cavities)	R10: Run time not recorded
			0	118.0' - Fracture, 25 deg, smooth, stepped, voids and molds on fracture surface		122.5-122.85' - Same as 121.5-122.5' except very weak to weak (R1 to R2), secondary infilling of cavities, more friable	
			>10	118.97' - Fracture, 10 deg, rough, undulating, white crystalline infill, trace 1/16" voids on surface		122.85-123.7' - Same as 121.5-122.5' except 5% coverage of voids (1/16"), no fossils or cavities, elongate molds 1/16" wide, sharp angular breaks	
			>10	119.20' - Fracture, 10 deg, rough, stepped, open, friable, infilling, increased voids		Silty Sand (SM)	
		19	>10	120.8' - Fracture, horizontal, rough, undulating		123.7-124.15' - dark yellowish orange, (10YR 6/6), wet, fine grained, nonplastic, mild HCl reaction, 10% coarse sand-sized, 30% nonplastic fines, 10% fine gravel-size material, small fossil fragments, all calcareous material	SC-3 collected 128.9-129.92'
			NR	122.5' - Fracture, 15 deg, rough, undulating, tight but weathered and friable		Limestone	
				122.7' - Fracture, 25 deg, smooth, stepped, top of fracture zone		124.15-124.4' - Same as 122.85-123.7' except weak (R2)	
				122.7-122.9' - Fracture zone, subangular 1" fragments		No Recovery 124.4-126.5'	
			>10	123.15, 123.4' - Fractures or bedding plane, 0-10 deg, rough, planar, tight, some fragmentation			
			>10	123.25' - Fracture, 80 deg, rough, planar, tight, angular			
			1	123.66' - Fracture, 20 deg, rough, undulating, top of unconsolidated zone			
		42	1	124.15' - Fracture, 10 deg, rough, undulating, bottom of unconsolidated zone			
			0	124.25' - Fracture, 70 deg, rough, undulating			
			NR	126.8' - Fracture, 10 deg, rough, stepped, infilled			
				126.8-127.9' - Fracture zone, no clear contacts, some vertical fractures at depth within zone			
			>10	127.9' - Fracture, horizontal, rough, undulating, open			
			>10	128.05' - Fractures (2), horizontal and 30 deg, rough, undulating, tight to open, fit together, weathered, slight infill			
				128.50' - Fracture, 20 deg, rough, undulating			
				128.92' - Fracture, 10 deg, smooth, undulating			
		8		131.6-131.8' - Fracture zone, with angular fragments 1/2"-2" in size, bounded by rough and undulating horizontal fractures			
135							



WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/21/2007 END : 2/23/2007 LOGGER : C. LeBlanc

Rev. 4

338884.FL

BORING NUMBER:

B-26

SHEET 9 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723010.2 N, 458111.7 E (NAD83)

ELEVATION : 42.4 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 : 4.41 ft bgs on 3/06/07

START : 2/21/2007

END : 2/23/2007

LOGGER : C. LeBlanc

WATER LEVEL: 141.1 RGS ON 8/20/07		START: 2/27/07		END: 2/27/07		LOGGER: S. EDDINS	
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		
					141.95-144.95' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, strong (R4), 5-15% fine (1/16") voids, many 1/4"-1/2" cavities, often infilled with weaker rock, increased voids and more resemblance to rock at 141.5-141.95' at 144.8-144.9' (possible start of transition sequence) No Recovery 144.95-146.5' Limestone 146.5-148.6' - repeated transitions from dusky yellow to light olive gray or light olive brown, (5Y 6/4 to 5Y 5/2 or 5Y 5/6), very fine to fine grained, moderate to strong HCl reaction, strong (R4), <3% voids (1/16") but with increased voids at 146.5-146.6' (5%), 148.1-148.2' (10%), and 148.6-148.9' (40%) 148.6-148.9' - Same as 141.5-141.95' except darker brown color, increased voids No Recovery 148.9-151.5' Bottom of Boring at 151.5 ft bgs on 2/23/2007		



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-27
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722971.1 N, 458154.7 E (NAD83)
 ELEVATION : 42.4 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" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/8/2007 END : 2/10/2007 LOGGER : A. Teal

WATER LEVELS : 4.41 ft bgs on 3/09/07			START : 2/8/2007		END : 2/10/2007		LOGGERS : A. Earl	
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	
42.4							"Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)"	
							Water levels not recorded during drilling	
	4.5							
5								
37.4		1.0	SS-1	1-1-0 (1)	Poorly Graded Sand With Silt (SP-SM) 4.5-5.5' - moderate yellowish brown, (10YR 5/4), wet, very loose, very fine to fine grained, 10-15% nonplastic fines, silica sand, 10-12% organics		SS-1: Weight of hammer drove split spoon the last 6"	
	6.0							
	9.5							
10								
32.4		0.3	SS-2	0-0-0 (0)	Silty Sand (SM) 9.5-9.8' - very pale orange, (10YR 8/2), very wet, very soft, very fine to medium grained, strong HCl reaction, 30% low to medium plastic fines, silica and carbonate sands, 5-10% organics		SS-2: Weight of hammer drove split spoon 18", sample may be slough	
	11.0							
	14.5							
15								
27.4		1.0	SS-3	10-17-9 (26)	Silty Sand With Limestone Fragments (SM) 14.4-15.5' - white to yellowish gray, (N9 to 5GY 8/2), wet, medium dense, very strong HCl reaction, 40% fine to coarse gravel, 20% low to medium plastic fines, all carbonate materials			
	16.0							
	19.5							
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-27
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722971.1 N, 458154.7 E (NAD83)
 ELEVATION : 42.4 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" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/8/2007 END : 2/10/2007 LOGGER : A. Teal

WATER LEVELS : 4.41 ft bgs on 3/30/07			START : 2/8/2007			END : 2/10/2007			LOGGERS : A. Earl		
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					
22.4		0.8	SS-4	11-7-20 (27)	Silt (ML) 19.5-20.25' - very pale orange, (10YR 8/2), wet, very stiff, nonplastic, very rapid dilatancy, moderate HCl reaction, 5-10% very fine to fine grained sand						
	21.0										
	24.5										
25		0.8	SS-5	39-18-14 (32)	Silt With Sand And Limestone Fragments (ML) 24.5-25.3' - Same as 19.5-20.25' except 15% very fine to medium grained, 20% fine gravel-sized limestone fragments						
17.4	26.0										
	29.5										
30		1.3	SS-6	18-29-50/3 (79/9")	Silt With Sand (ML) 29.5-30.8' - Same as 24.5-25.3' except moderate yellowish brown, (10YR 5/4), moist to wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, trace fine gravel, 20-25% very fine to medium grained sand, all carbonate materials						
12.4	30.8										
	34.5										
35		1.1	SS-7	31-18-22 (40)	Silty Sand (SM) 34.5-35.6' - moderate olive brown, (5Y 4/4), wet, dense, very fine to coarse grained, mild HCl reaction, 10-15% fine gravel, 20-25% low plastic fines, all carbonate materials						
7.4	36.0										
	39.5										
40	39.8	0.1	SS-8	50/3							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-27
SHEET 3 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722971.1 N, 458154.7 E (NAD83)
 ELEVATION : 42.4 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" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/8/2007 END : 2/10/2007 LOGGER : A. Teal

WATER LEVELS : 4.41 ft bgs on 3/6/07			START : 2/9/2007			END : 2/10/2007			LOGGER : A. Earl		
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				
2.4			(50/3")	Limestone Fragments 39.5-39.6' - light olive gray, (5Y 5/2), mild HCl reaction, poor recovery							
44.5											
44.6	0.0	SS-9	50/1 (50/1")	Limestone Fragments 44.5-44.6' - Same as 39.5-39.6' except poor recovery Begin Rock Coring at 44.0 ft bgs See the next sheet for the rock core log			Encountered rock from 37.0-46.0' switched to NQ coring Terminate soil sampling at 44.6' Set 35.0' NW casing				
45 -2.6											
50 -7.6											
55 -12.6											
60											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-27

SHEET 4 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722971.1 N, 458154.7 E (NAD83)

ELEVATION : 42.4 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 : 4.41 ft bgs on 3/06/07

START : 2/8/2007

END : 2/10/2007

LOGGER : A. Teal

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				
45 -2.6	R1-NQ 2 ft 85%	45	2	44.1' - Fracture, 10 deg, smooth, undulating, open		44.0-45.1' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak (R2), voids <1/16" on 50% of surface, trace voids to 3/16"	R1: 13 minutes 18:06 End day 2/8/07 at 46.0'	
			1	44.2' - Fracture, 20 deg, smooth, undulating, open				45.1-45.7' - moderate olive brown, (5Y 4/4), wet, stiff, moderate HCl reaction, trace fine sand No Recovery 45.7-46.0'
			NR	45.1' - Fracture, 5 deg, smooth, undulating, sandy infilling, open				
	R2-NQ 5 ft 66%	0	2	46.25' - Fracture, 50 deg, rough, planar		46.0-46.5' - moderate olive brown, (5Y 4/4), fine grained, moderate to strong HCl reaction, weak (R2), voids <1/16" on 40% of surface, moderately fossiliferous (molds to 3/16")	R2: 7 minutes	
			0	46.5' - Fracture, 20 deg, rough, undulating				
			0					
			0					
			NR					
	R3-NQ 5 ft 97%	43	5	51.25' - Fracture, 5 deg, smooth, undulating		51.0-52.5' - moderate olive brown, (5Y 4/4), fine grained, strong HCl reaction, extremely weak (R0), trace organics, friable 52.5-54.7' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids <1/16" on 40% of surface, trace voids to 3/16" (fossils) on <5% of surface, trace organics	Section appears competent but breaks into sandy silt sized particles when pushed on with 2 fingers R3: 4 minutes	
			1	51.3' - Fracture, 15 deg, smooth, undulating				
0			51.8' - Fracture, 10 deg, rough, undulating					
0			52.0' - Fracture, 25 deg, smooth, undulating, tight					
0			53.35, 53.8' - Mechanical break (2)					
55 -12.6	R4-NQ 5 ft 100%	46	>10	56.9, 57.3, 57.4' - Mechanical break	54.7-55.85' - moderate yellowish brown, (10YR 5/4), moderate to strong HCl reaction, trace limestone fragments to 1/16" No Recovery 55.85-56.0'	R4: 5 minutes		
			>10					
			1	58.75' - Fracture, 60 deg, rough, undulating, 1/8" clay infilling				
	R5-NQ 5 ft 88%	71	5	59.1' - Fracture, horizontal, smooth, undulating, 1/8" clay infilling	56.0-56.7' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), 56.4-56.7' extremely weak (R0) zone 56.7-61.0' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), voids <1/16" on 50% of surface in two zones from 58.2-61.0', trace voids to 3/8" are <5% of surface on 58.2-61.0', zones of very weak rock 57.3-57.8' and 58.8-59.3', moderately fossiliferous (molds) below 60.0'			
			0	59.1-59.5' - Fracture, 80 deg, rough, planar, open				
			4	59.3' - Fracture, 10 deg, smooth, undulating, open				
			1	59.5' - Fracture, 5 deg, smooth, undulating, open				
			1	59.6' - Fracture, 50 deg, rough, undulating, open				
					60.35' - Mechanical break			
					60.8' - Mechanical break			
				61.5' - Fracture, 10 deg, rough, undulating, 20% coverage clay infilling, tight				



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-27	SHEET 5 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722971.1 N, 458154.7 E (NAD83)

ELEVATION : 42.4 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 : 4.41 ft bgs on 3/06/07 START : 2/8/2007 END : 2/10/2007 LOGGER : A. Teal

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.
65 -22.6	66.0	NR	2	61.75, 62.0' - Mechanical break		Limestone 61.0-65.4' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), very fossiliferous on 61.0-63.0', voids <1/16" over 40% of same surface and over 10% of surface elsewhere, from 61.0-63.0' extremely fossiliferous zones with voids <1/16" on 40% of surface, molds and casts up to 3/8"x3/4" on 5% of surface, trace organics No Recovery 65.4-66.0'	R5: 12 minutes
			1	62.3' - Fracture, 20 deg, smooth, undulating, 15% coverage clay infilling, open to 3/8"			
			NR	63.9' - Fracture, 5 deg, smooth, undulating, 10% coverage clay infilling, open			
	R6-NQ 5 ft 34%	16	4	64.3' - Mechanical break		Limestone 66.0-67.7' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak (R1), voids <1/16" on 40% of surface, trace voids to 3/16", trace organics, 67.2-67.7' rock appears brecciated and more fossiliferous fewer voids and medium strong to strong rock (R3 to R4) No Recovery 67.7-71.0'	R6: 12 minutes
			2	64.5' - Fracture, 40 deg, rough, undulating, tight			
			NR	64.7' - Fracture, 60 deg, rough, undulating, 10% coverage clay infilling, tight			
			NR	65.2' - Fracture, 20 deg, smooth, planar, clay infilling			
			NR	66.1' - Fracture, 10 deg, smooth, undulating, open			
70 -27.6	71.0	29	2	66.5' - Fracture, 15 deg, smooth, undulating, open		Limestone 71.0-74.1' - Same as 66.0-67.7' except voids <1/16" below 72.0' on 25% of surface, moderately fossiliferous No Recovery 74.1-76.0'	R7: 8 minutes
			>10	66.65' - Fracture, 5 deg, smooth, undulating, open			
			>10	66.8' - Fracture, 15 deg, smooth, undulating, open			
			NR	67.2' - Fracture, 25 deg, smooth, undulating, open			
			NR	67.75' - Fracture, 10 deg, smooth, undulating, open			
75 -32.6	76.0	48	>10	71.6' - Fracture, 20 deg, rough, undulating, 20% coverage clay infilling, open to 3/8"		Limestone 76.0-79.8' - moderate yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), fine grained, moderate HCl reaction, medium strong (R3), voids <1/16" on 50% of surface decreasing with depth to 25% by 79.0', trace voids to 3/16", moderately fossiliferous No Recovery 79.8-81.0'	R8: Run time not recorded
			1	72.1' - Fracture, 15 deg, rough, undulating, open			
			1	72.1-73.3' - Fracture zone, horizontal and vertical, rough, undulating, open, fragments from 3/8" to 4"			
			0	73.3' - Fracture, 30 deg, rough, undulating, open			
			NR	73.75' - Fracture, 10 deg, rough, undulating, tight to open up to 9/16"			
80 -37.6	81.0	40	1	74.1' - Fracture, 30 deg, rough, undulating, open		Limestone 81.0-85.4' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids <1/16" on 20% of surface, trace voids and fossil molds to 3/16"x3/8", trace organics	SC-1 collected at 81.0-82.0'
			4	76.0-76.6' - Fracture zone, rough, undulating, fragments 3/16" to 1-1/2"			
			NR	76.8' - Fracture, 10 deg, rough, undulating, 30% coverage clay infilling, open			
	R8-NQ 5 ft 76%	NR	1	77.1' - Fracture, 30 deg, rough, undulating, 30% coverage clay infilling, open			
			0	78.5' - Fracture, 10 deg, rough, undulating, 20-25% coverage clay infilling			
			NR				
	R9-NQ 5 ft 88%	NR	0				
			1	82.4' - Mechanical break			
			4	83.25' - Fracture, 60 deg, rough, planar, tight to open up to 3/16"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-27

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722971.1 N, 458154.7 E (NAD83)

ELEVATION : 42.4 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 : 4.41 ft bgs on 3/06/07

START : 2/8/2007

END : 2/10/2007

LOGGER : A. Teal

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.
85 -42.6			4	83.4' - Fracture, 20 deg, smooth, undulating, tight		No Recovery 85.4-86.0' Limestone 86.0-86.8' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), trace voids <1/16", laminated subhorizontal bedding from 86.0-86.4'	R9: Run time not recorded
			2	83.65' - Fracture, 30 deg, rough, undulating, open			
			NR	83.8' - Fracture, 20 deg, rough, undulating, open			
				84.0' - Fracture, 70 deg, rough, planar, tight			
			>10	84.1' - Fracture, 10 deg, rough, undulating, open			
			>10	84.5' - Fracture, 10 deg, rough, undulating, tight to open up to 3/16"			
				84.75' - Fracture, 50 deg, rough, undulating, open			
			>10	85.0' - Fracture, 50 deg, rough, planar, tight			
				85.3' - Fracture, 50 deg, smooth, planar, open			
			0	86.65' - Fracture, 20 deg, rough, undulating, open			
90 -47.6			>10	86.85-87.05, 87.4-87.5, 88.0-88.3, 90.4-90.7' - Fracture zone (4), rough, undulating, fine gravel sized limestone fragments		87.0-90.7' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), zone of weak (R2) rock from 87.5-88.5', voids <1/16" on 25% of surface, trace voids to 3/16"x3/8", moderately fossiliferous No Recovery 90.7-91.0' Limestone 91.0-93.5' - Same as 87.0-90.7' No Recovery 93.5-96.0'	R10: Run time not recorded
			NR	87.05-87.5' - Fracture (2), 45 deg and 80 deg, rough, undulating, open, tight-open respectively			
				91.0-92.2' - Fracture zone, 0-75 deg, rough, undulating, fragments 1/2"-2", trace bi-directional drill marks			
			1	92.4, 92.6' - Mechanical break (2)			
			0				
			NR				
95 -52.6						Limestone 96.0-99.3' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids <1/16" on 40% of surface, voids to 3/16" on 5% of surface, cavities to 3/8"x3/4" from 96.0-97.3', moderately fossiliferous (casts, molds) No Recovery 99.3-101.0'	R11: Run time not recorded
			>10	96.0-96.3' - limestone fragments gravel to cobble sized			
				96.4' - Fracture, 10 deg, rough, undulating, open			
			3	96.7' - Fracture, 15 deg, rough, undulating, open			
				97.0' - Fracture, 25 deg, rough, undulating, open			
			2	97.5' - Fracture, 10 deg, smooth, undulating, open			
			0	97.6' - Fracture, 50 deg, smooth, planar, tight			
				98.0' - Fracture, 15 deg, rough, undulating, open			
			NR	98.2' - Fracture, 20 deg, rough, undulating, open			
				99.3' - Fracture, 40 deg, smooth, planar			
100 -57.6						Limestone 101.0-104.5' - Same as 96.0-99.3' except weak (R2)	R12: Run time not recorded
			3	101.05' - Fracture, 40 deg, smooth, undulating, tight			
				101.3' - Fracture, 40 deg, smooth, planar, charcoal gray staining, tight			
			2	101.8' - Fracture, 35 deg, rough, undulating, open			
				102.4, 102.65' - Fracture (2), 40 deg, rough, undulating, tight			
			1	103.0' - Mechanical break			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-27	SHEET 7 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722971.1 N, 458154.7 E (NAD83)

ELEVATION : 42.4 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 : 4.41 ft bgs on 3/06/07 START : 2/8/2007 END : 2/10/2007 LOGGER : A. Teal

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 -62.6			4	103.5' - Fracture, 30 deg, rough, undulating, yellowish brown staining on 20% of surface, tight		Limestone 104.5-106.0' - pale yellowish brown, (10YR 6/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), voids <1/16" on 15% of surface, trace fossil molds and casts to 3/16"	SC-2 collected at 104.5-105.45' R13: 10 minutes
			2	103.6-103.9' - Fracture, 60 deg, rough, undulating, tight			
	106.0		>10	104.1' - Fracture, 25 deg, rough, undulating, charcoal gray staining, open to 3/16"			
			6	104.15' - Fracture, 60 deg, rough, planar, open to 1/16"			
			>10	104.4' - Fracture, 15 deg, rough, undulating, charcoal gray staining, open to 3/8"			
	R14-NQ 5 ft 60%	24		104.5' - Fracture, 50 deg, rough, planar, charcoal gray staining, tight		107.3 -109.0' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak (R2), voids <1/16" on 25-30% of surface, trace fossil molds and casts to 3/8"x3/8" on <5% of surface	
			NR	105.45, 105.7' - Fracture (2), 70 deg, rough, planar, charcoal gray staining, open		No Recovery 109.0-111.0'	R14: 7 minutes
				106.15' - Fracture, 50 deg, rough, planar, charcoal gray staining			
110 -67.6				106.15-106.5' - Fracture, 30 deg, rough, undulating, tight			
				106.15-106.5' - limestone fragments 2"x2"			
				107.0' - Fracture, 15 deg, rough, undulating, open			
			1	107.2' - Fracture, 30 deg, rough, undulating, open		Limestone 111.0-111.9' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, medium strong (R3), voids <1/16" on 20% of surface, voids and fossil (casts, molds) to 3/8"x1" on 15% of surface, trace organics, at 111.3' clasts of gray limestone 1/4"x1"	Recovery loss assumed to be from bottom of run
			1	107.6' - Fracture, 30 deg, rough, undulating, open			
	R15-NQ 5 ft 55%	45		108.3-108.8' - limestone fragments from 3/16" to 1"x2"		111.9-113.75' - moderate olive brown with very pale orange and olive gray, (5Y 4/4 with 10YR 8/2 and 5Y 4/1), fine grained, moderate HCl reaction, weak (R2), voids <1/16" on 15% of surface, fossil molds	
			2	111.9' - Fracture, horizontal, rough, stepped		1/16"x3/16"x3/4" 10% of surface, 2" band of olive gray (5Y 4/1) mottling at 113.2'	
			NR	113.0' - Fracture, 5 deg, smooth, undulating, brown staining, tight		No Recovery 113.75-116.0'	R15: Run time not recorded
				113.4-113.8' - Fracture zone, fragments to 1-1/2" subangular to subround		Limestone 116.0-117.1' - dusky yellow, (5Y 6/4), fine grained, mild HCl reaction, weak (R2), voids <1/16" on 15% of surface, at 116.1' rock fragment dusky yellow with light olive gray (5Y 6/4 with 5Y 6/1) material	
115 -72.6						117.1-119.8' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over 25% of surface, trace voids (fossil molds) from 3/16"-3/8" <5%, very weak to weak (R1 to R2) rock zone from 117.9-118.3'	
			5	116.1, 116.35, 116.85, 117.0, 117.1' - Fracture (5), horizontal and 5 deg, rough, undulating		No Recovery 119.8-121.0'	
			2			Limestone 121.0-122.1' - Same as 117.1-119.8'	
	R16-NQ 5 ft 76%	42		118.0-119.5' - Fracture zone or mechanical break (5)		No Recovery 122.1-126.0'	
			3				
			2				
			NR				R16: Run time not recorded
120 -77.6							
			>10	121.0-126.0' - recovery too low to accurately identify fracture depths			Low recovery
	R17-NQ 5 ft 22%	0					
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

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SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722971.1 N, 458154.7 E (NAD83)

ELEVATION : 42.4 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 : 4.41 ft bgs on 3/06/07

START : 2/8/2007

END : 2/10/2007

LOGGER : A. Teal

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			
125 -82.6			NR				R17: Run time not recorded
	126.0						
	R18-NQ 5 ft 94%	32	2	126.0-126.5' - Fracture zone		Limestone 126.0-126.8' - pale yellowish brown, (10YR 6/2), fine grained, mild HCl reaction, medium strong (R3), voids <1/16" over 10% of surface, trace voids to 3/16" 126.8-127.7' - moderate yellowish brown, (10YR 5/4), fine grained, weak (R2), voids <1/16" over 20% of core, predominately oriented along laminated bedding planes, trace voids to 3/16" 127.7-130.7' - dusky yellow, (5Y 6/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids <1/16" on 25% of core, voids and fossil molds to 3/16"x3/8" on 5%, zone of very weak rock (R1) with laminar bedding from 129.1-129.8' No Recovery 130.7-131.0' Limestone 131.0-131.5' - Same as 127.7-130.7' except more fossiliferous with both gray and brown limestone fragments to 3/8"x3/4" 131.5-134.1' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, strong (R4), voids <1/16" on 10% of core, voids 3/8"x3/4" on 5%, light olive gray (5Y 6/1) mottling, moderately fossiliferous No Recovery 134.1-136.0' Silty Sand (SM) 136.0-136.5' - pale yellowish brown, (10YR 6/2), fine grained, 20% silt, poorly graded Limestone 136.5-138.0' - yellowish gray to pale yellowish brown with yellowish brown, (5Y 7/2 to 10YR 6/2), fine grained, mild HCl reaction, strong (R4), laminated bedding, at 136.8' and 137.2', 136.8-137.2' moderate yellowish brown (10YR 5/4), voids <1/16" over 20% of surface 138.0-138.5' - moderate olive brown, (5Y 4/4), fine grained, mild to moderate HCl reaction, weak (R2), trace voids <1/16" over <25% of surface No Recovery 138.5-141.0'	Weaker rock at 129.0'
			3	126.8' - Fracture, horizontal, rough, stepped, tight			
			0	127.1' - Fracture, 5 deg, rough, undulating, open			
			2	127.4-127.9' - Fracture zone			
			0				
130 -87.6			NR	129.4-130.2' - Fracture zone			R18: Run time not recorded
	131.0						
	R19-NQ 5 ft 62%	26	3	131.5' - Fracture, 10 deg, rough, undulating, open		No Recovery 130.7-131.0' Limestone 131.0-131.5' - Same as 127.7-130.7' except more fossiliferous with both gray and brown limestone fragments to 3/8"x3/4" 131.5-134.1' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, strong (R4), voids <1/16" on 10% of core, voids 3/8"x3/4" on 5%, light olive gray (5Y 6/1) mottling, moderately fossiliferous No Recovery 134.1-136.0' Silty Sand (SM) 136.0-136.5' - pale yellowish brown, (10YR 6/2), fine grained, 20% silt, poorly graded Limestone 136.5-138.0' - yellowish gray to pale yellowish brown with yellowish brown, (5Y 7/2 to 10YR 6/2), fine grained, mild HCl reaction, strong (R4), laminated bedding, at 136.8' and 137.2', 136.8-137.2' moderate yellowish brown (10YR 5/4), voids <1/16" over 20% of surface 138.0-138.5' - moderate olive brown, (5Y 4/4), fine grained, mild to moderate HCl reaction, weak (R2), trace voids <1/16" over <25% of surface No Recovery 138.5-141.0'	R19: Run time not recorded
			4	131.7' - Fracture, 45 deg, rough, planar, open			
			>10	131.75' - Fracture, 30 deg, rough, undulating, tight			
			NR	132.2, 132.5, 133.4' - Fracture, 20 deg, rough, undulating, open			
			NR	132.4, 132.75, 133.2' - Fracture, 10 deg, rough, undulating, open			
135 -92.6			NR	133.7' - Fracture, 30 deg, rough, undulating			
				133.8-134.0' - Fracture zone, rough, undulating, fragments 3/16"-1"			
	136.0						
	R20-NQ 5 ft 50%	16	2	136.5' - Fracture, horizontal, smooth, planar, tight		No Recovery 134.1-136.0' Silty Sand (SM) 136.0-136.5' - pale yellowish brown, (10YR 6/2), fine grained, 20% silt, poorly graded Limestone 136.5-138.0' - yellowish gray to pale yellowish brown with yellowish brown, (5Y 7/2 to 10YR 6/2), fine grained, mild HCl reaction, strong (R4), laminated bedding, at 136.8' and 137.2', 136.8-137.2' moderate yellowish brown (10YR 5/4), voids <1/16" over 20% of surface 138.0-138.5' - moderate olive brown, (5Y 4/4), fine grained, mild to moderate HCl reaction, weak (R2), trace voids <1/16" over <25% of surface No Recovery 138.5-141.0'	SC-3 collected at 137.15-138.0'
			0	136.7' - rough, undulating, open			
			>10	136.8, 137.05, 137.37' - Mechanical break (3)			
			NR	138.0-138.3' - Fracture zone			
			NR				
140 -97.6			NR				R20: 46 minutes
	141.0						
	R21-NQ 5 ft 86%	60	3	141.15' - Fracture, 5 deg, rough, undulating, open to 3/16"		No Recovery 134.1-136.0' Silty Sand (SM) 136.0-136.5' - pale yellowish brown, (10YR 6/2), fine grained, 20% silt, poorly graded Limestone 136.5-138.0' - yellowish gray to pale yellowish brown with yellowish brown, (5Y 7/2 to 10YR 6/2), fine grained, mild HCl reaction, strong (R4), laminated bedding, at 136.8' and 137.2', 136.8-137.2' moderate yellowish brown (10YR 5/4), voids <1/16" over 20% of surface 138.0-138.5' - moderate olive brown, (5Y 4/4), fine grained, mild to moderate HCl reaction, weak (R2), trace voids <1/16" over <25% of surface No Recovery 138.5-141.0'	
			2	141.5' - Fracture, 10 deg, rough, undulating, open to 1/4"			
			1	141.9' - Fracture, 15 deg, rough, undulating, open			
			1	142.0' - Fracture, 10 deg, rough, undulating, open to 1/8"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-27

SHEET 9 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722971.1 N, 458154.7 E (NAD83)

ELEVATION : 42.4 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 : 4.41 ft bgs on 3/06/07

START : 2/8/2007

END : 2/10/2007

LOGGER : A. Teal

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.
145 -102.6			5	142.55' - Fracture, 30 deg, smooth, planar, open to 3/16"		Limestone 141.0-142.2' - Same as 138.0-138.5' except voids <1/16" increase to 40%, laminated bedding on last 4" of run	R21: 20 minutes
			2	143.3' - Fracture, 65 deg, rough, planar, 30% coverage brown staining, open to 3/16"		142.2-145.3' - pale yellowish brown transitions to yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, moderate to mild HCl reaction, medium strong (R3), laminated bedding below 143.5' increasing crenulations with depth, bedding angles up to 10 deg, voids <1/16" over 5% coverage except zone at 20% from 143.5-145.0' trace voids to 3/16", color changes to moderate yellowish brown (10YR 5/4) at 144.8'	
			NR	143.7, 144.0' - Mechanical break		No Recovery 145.3-146.0'	
				144.4' - Fracture, 5 deg, rough, planar, tight		Limestone 146.0-148.0' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), trace faint laminated bedding from 146.0-147.0', voids <1/16" over 1-10% increasing with depth	
			2	144.6, 144.7' - Fracture, horizontal, rough, undulating, open		148.0-148.4' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak (R1), thin laminated bedding, voids <1/16" over 25% of surface	
				144.9, 144.95, 145.0' - Bedding plane, horizontal, smooth, planar, tight to open up to 1/8"		148.4-149.5' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), thin laminated bedding, 5 deg angle bedding, trace voids <1/16", trace fossil casts, molds	
			1	146.3' - Fracture, 75 deg, rough, undulating, tight to open up to 3/16", gray staining on 20% at surface		No Recovery 149.5-150.0' Bottom of Boring at 150.0 ft bgs on 2/10/2007	
			5	146.5' - Fracture, 5 deg, rough, undulating, tight			
			0	147.1' - Fracture, 15 deg, rough, undulating, open			
			NR	147.2' - Fracture, 25 deg, rough, undulating, tight to open 1/8"			
				147.7' - Fracture, 10 deg, rough, undulating, tight			
				148.0' - Fracture, 10 deg, rough, undulating, open			
				148.2' - Bedding plane, 10 deg, smooth, undulating, tight			
				148.3' - Fracture, 10 deg, rough, undulating, open			
				148.9, 148.95' - Fractures, horizontal, smooth, planar, open up to 1/16"			
150 -107.6							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-28

SHEET 1 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723060.1 N, 458242.6 E (NAD83)

ELEVATION : 41.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

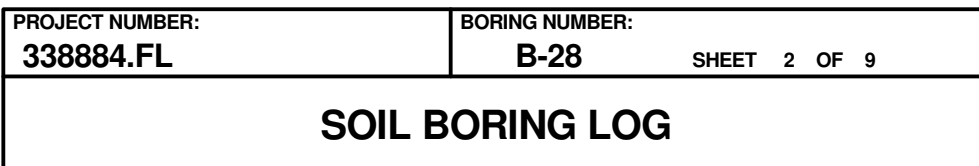
WATER LEVELS : 2 ft bgs on 4/25/07

START : 4/25/2007

END : 5/1/2007

LOGGER : D. Roraback

WATER LEVELS : 2 HUBS ON 4/23/07				START : 4/23/2007		END : 5/1/2007		LOGGERS : D. Norback	
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				
41.5	0.0	1.5	SS-1	2-2-3 (5)	Top Soil 0-0.5' - roots Poorly Graded Sand (SP) 0.5-0.9' - yellowish gray, (5Y 7/2), moist to wet, loose, fine grained, no HCl reaction, trace nonplastic fines, trace organics decreasing with depth Poorly Graded Sand With Silt (SP-SM) 0.9-1.5' - moderate yellowish brown, (10YR 5/4), moist to wet, loose, fine grained, no HCl reaction, 10-15% nonplastic fines, trace roots				
5 36.5	5.0	6.5	SS-2	0-0-1 (1)	Silty Sand (SM) 5.0-6.2' - yellowish gray, (5Y 7/2), wet, very loose, fine grained, no HCl reaction, 25-30% nonplastic fines, trace roots				
10 31.5	10.0	11.5	SS-3	1-2-3 (5)	Silty Sand (SM) 10.0-10.7' - pale yellowish brown to dark yellowish brown, (10YR 6/2 to 10YR 4/2), wet, loose, fine grained, no HCl reaction, 15-20% nonplastic fines, 10% organics		Organic odor		
15 26.5	15.0	16.5	SS-4	2-4-10 (14)	Silty Sand (SM) 15.0-15.35' - light olive gray, (5Y 5/2), wet, very loose, fine grained, mild HCl reaction, 25-30% low to medium plasticity fines Silt (ML) 15.35-15.55' - grayish orange, (10YR 7/4), wet, soft to medium stiff, fine grained, nonplastic, very rapid dilatancy, mild HCl reaction, 5-10% very fine sand Silty Sand (SM) 15.55-16.1' - yellowish gray, (5Y 8/1), moist, medium dense, fine to medium grained, strong HCl reaction, 25% low to medium plasticity fines, two gravel-sized pieces up to 1"				
20									



LOGGER : D. Roraback

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-28
SHEET 3 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723060.1 N, 458242.6 E (NAD83)
 ELEVATION : 41.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2 ft bgs on 4/25/07 START : 4/25/2007 END : 5/1/2007 LOGGER : D. Roraback

WATER LEVELS : 2 HUBS ON 4/23/07		START : 4/23/2007		END : 5/17/2007		LOGGERS : D. Noraback	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
			RECOVERY (ft)		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
	#TYPE	6"-6"-6" (N)					
1.5	40.4	0.4	SS-9	50/5 (50/5")	Silty Sand With Limestone Fragments (SM) 40.0-40.4' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), wet, very dense, mild to moderate HCl reaction, 28% fines, 20% limestone fragments in lenticular shapes		
45	45.0						
-3.5		1.0	SS-10	23-30-17 (47)	Silt With Sand (ML) 45.0-46.0' - moderate yellowish brown, (10YR 5/4), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 10-15% fine sand-sized, 5-10% organics in <1/16" thick lenses		
	46.5						
50	50.0						
-8.5		1.3	SS-11	13-24-50/5 (74/11")	Silt With Sand (ML) 50.0-51.3' - Same as 45.0-46.0' except 25% fine to medium sand-sized, trace organics		
	51.4						
55	55.0						
-13.5		0.8	SS-12	32-50/3 (82/9")	Silt (ML) 55.0-55.8' - Same as 50.0-51.3' except 10-15% fine sand-sized, trace organics in thin threads and chunks		
	55.8						
60							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-28

SHEET 4 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723060.1 N, 458242.6 E (NAD83)

ELEVATION : 41.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 4/25/07

START : 4/25/2007

END : 5/1/2007

LOGGER : D. Roraback

WATER LEVELS : 2 Hubs on 4/25/07			START : 4/25/2007			END : 5/17/2007			LOGGER : D. Noraback		
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				
-18.5	60.0	0.3	SS-13	50/4 (50/4")	Silt With Sand And Limestone Fragments (ML) 60.0-60.3' - Same as 55.0-56.0' except 20% fine to medium sand-sized, 20% coarse sand to fine gravel-sized limestone fragments						
65	65.0										
-23.5	65.1	0.0	SS-14	50/1 (50/1")	Limestone Fragments 65.0-65.1' - light gray, (N7), moderate to strong HCl reaction, fragments about 3/8"x3/4" in size Begin Rock Coring at 65.0 ft bgs See the next sheet for the rock core log		Complete soil sampling at 11:45 on 4/25/07				
70											
-28.5											
75											
-33.5											
80											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-28	SHEET 5 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723060.1 N, 458242.6 E (NAD83)

ELEVATION : 41.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing







ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 4/25/07

START : 4/25/2007

END : 5/1/2007

LOGGER : D. Roraback

WATER LEVELS : 21.00g ON 4/23/07		START : 4/23/2007		END : 5/17/2007		LOGGER : D. Rudaack		
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
-23.5	65.0	32	1	65.15' - Fracture, horizontal, rough, undulating, faces do not join together		Limestone Fragments 65.0-66.2' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, medium strong (R3), large infilled cavities 1"-2", trace organic inclusions No Recovery 66.2-68.2'	Start rock coring at 65.0'	
	2		66.1' - Fracture, 10 deg, rough, undulating, open, weathered faces, shell like fossil imprint on both sides of fracture			Water level approximately 2.0' (very muddy, may not be accurate, 4/25/07, 15:00)		
	NR		66.15' - Fracture, horizontal, rough, undulating			Driller's Remark: Rods dropped at 66.0-68.0', interpret lost recovery to be from 66.2-68.2'		
	3		68.15' - Fracture, horizontal, smooth, rounded face					
	3		68.35, 68.75' - Fractures (2), horizontal, smooth, undulating, tight					
70	70.0	65	NR	69.15, 69.3, 69.55' - Fractures (3), 0-20 deg, rough, undulating, slightly weathered, open			R1: 5 minutes	
-28.5			8	70.0-70.4' - Fracture zone, five 1-2" angular fragments				
			1	70.4' - Fracture, horizontal, rough, stepped, terminates fracture zone above			SC-1 collected at 71.5-72.5'	
			2	70.9' - Fracture, horizontal, rough, planar, open				
			2	71.5' - Fracture, 5 deg, rough, undulating				
		0	3	72.8, 73.1' - Fractures (2), 10 deg, rough, stepped, some fragmentation			R2: 7 minutes	
			2	73.0' - Fracture, 70 deg, rough, planar, tight, some fragmentation				
			3	73.85, 74.2, 74.45' - Fractures (3), 10 deg, rough, planar, open				
			>10	74.8' - Fracture, 60 deg, rough, undulating, terminates with some rock fragments at end of core (75.0')				
			>10	75.0-75.4' - Fracture zone, 1-2" fragments				
		NR	>10	75.4' - Fracture, 10 deg, rough, planar, tight				
			>10	75.65, 75.7, 75.9, 76.1, 76.25, 76.27' - Fractures (6), horizontal, smooth to rough, planar, open				
			>10	76.25-76.4' - Fracture zone, fragments up to 3/4"				
			3	76.6' - Fracture, 45 deg, smooth, planar, slightly weathered, open				
			NR	76.8, 77.15' - Fractures (2), 10 deg, rough, undulating, open, with rock fragments between				
80	80.0	28	2	77.5-78.1' - Fracture zone			R3: 4 minutes	
-38.5			2	78.1' - Bedding plane, horizontal, rough, stepped, open			Drilling ended at 80.0' on 4/25/07	
			2	78.3' - Fracture, 20 deg, rough, stepped, open			Drilling resumed on 4/26/07	
			>10	78.65' - Fracture, horizontal, rough, stepped, open			Rock varies from competent to friable intermittently with no clear contacts, but on the whole described as friable	
			>10	80.1' - Fracture, 20 deg, rough, undulating, open			SC-2 collected at 80.5-81.6'	
		NR	>10	80.4' - Fracture, 10 deg, rough, undulating, open				
			>10	81.6' - Mechanical break				
			NR	82.3' - Fracture, 60 deg, rough, undulating, open with lots of associated rock fragments				
			NR	82.3-83.5' - Fracture zone, angular 3/4"-2" fragments				
85	85.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-28

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723060.1 N, 458242.6 E (NAD83)

ELEVATION : 41.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 4/25/07

START : 4/25/2007

END : 5/1/2007

LOGGER : D. Roraback

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.
-43.5	R5-HQ 5 ft 100%	65	2	83.5, 83.7' - Fractures (2), 20 deg, rough, undulating, slightly weathered		Limestone 85.0-89.05' - Same as 68.2-69.7' except moderate yellowish brown, (10YR 5/4), very weak to medium strong (R1 to R3), 10-25% fine (<1/16") voids (fewer voids at 85.0-85.5', 88.1-88.2'), many 1/4" fossil molds/casts, some gray or beige infill in cavities, trace organics	R5: 5 minutes
			1	85.45' - Fracture, 15 deg, rough, undulating, slightly weathered, open			
			1	85.6' - Fracture, 10 deg, rough, planar, weathered but tight			
			1	86.7' - Fracture, 40 deg, rough, undulating, tight			
			2	87.05' - Fracture, vertical, rough, undulating, tight			
	R6-HQ 5 ft 92%	72	2	87.25' - Fracture, 30 deg, rough, undulating, tight, half of core is missing from 87.2-87.35'		89.05-89.6' - Same as 85.0-89.05' except interbedded zones of very weak (R1) rock with few voids and medium strong (R3) rock with 20% voids 89.6-93.4' - Same as 85.0-89.05'	R6: 15 minutes
90			2	88.1, 88.45' - Fractures (2), 10 deg, rough, undulating, tight			
-48.5			1	89.25' - 10 deg, rough, undulating, tight to healed			
			2	89.8' - Fracture, horizontal, rough, undulating to stepped, open			
			2	90.8, 91.3' - Fractures (2), 30 deg, rough, planar, opposing, tight			
	R7-HQ 5 ft 90%	52	2	91.9, 92.1' - Mechanical break (2), 60 deg, rough, planar to undulating		93.4-94.6' - moderate olive brown to moderate yellowish brown, (5Y 4/4 to 10YR 5/4), very fine grained, mild to moderate HCl reaction, strong (R4), no small (1/16") voids at top, increase with depth to 5% at bottom, a few 1/4" round cavities No Recovery 94.6-95.0' Limestone 95.0-98.3' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), 10-20% fine voids, small cavities up to 1/4" and larger and sometime elongated cavities contain light colored infill, trace organics 98.3-99.5' - Same as 95.0-98.3' except 3% fine voids, cavities up to 1" in size No Recovery 99.5-100.0' Limestone 100.0-104.6' - Same as 95.0-98.3' except sequence of rock with voids and rocks without, with cavities present at at transitions, maximum of 35% fine voids	R7: 15 minutes
95			6	92.9' - Fracture, 10 deg, rough, planar, fine organic lamination			
-53.5			1	93.25' - Fracture, 60 deg, rough, stepped, beginning of fracture zone			
			NR	93.3-93.5' - Fracture zone			
			NR	93.5, 93.8, 94.2' - Fractures (3), horizontal, smooth, planar			
	R8-HQ 5 ft 92%	43	5	95.5, 95.9' - Fractures (2), rough, stepped, silty sand infilling, open		No Recovery 104.6-105.0'	R8: 10 minutes
			1	96.75' - Fracture, 40 deg, rough, stepped, tight			
			0	97.5' - Mechanical break			
			3	98.2' - Fracture, 10 deg, smooth, planar, open to tight			
			4	98.6, 99.5' - Fracture, vertical, rough, stepped, some fragmentation, some crystallization on surfaces			
100	R8-HQ 5 ft 92%	43	NR	100.0-100.9' - Fracture zone, several horizontal and vertical fractures			
-58.5			>10	100.9, 101.15, 101.4, 101.9, 102.25' - Fractures (5), 20-40 deg, rough, undulating, open			
			3	102.25' - Fracture, vertical, rough, undulating, some fragmentation			
			3	102.9' - Fractures (2), horizontal and 60 deg, rough, undulating, open			
			1	103.6' - Fracture, 20 deg, rough, undulating			
	R8-HQ 5 ft 92%	43	2				
105			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-28

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723060.1 N, 458242.6 E (NAD83)

ELEVATION : 41.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

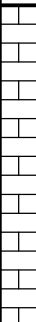
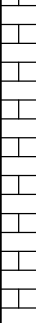

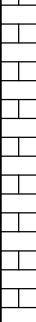
ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 4/25/07

START : 4/25/2007

END : 5/1/2007

LOGGER : D. Roraback

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			
-63.5	R9-HQ 5 ft 78%	37	6	104.45' - Fracture, horizontal, rough, stepped, beige-colored infill		Limestone 105.0-108.4' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), small (1/4") fossil cavities often with cast, 10-25% fine (1/16") voids	R9: 8 minutes
1			105.0-105.2' - Fracture zone, 1/2"-1" angular fragments				
>10			105.3' - Fracture, 50 deg, rough, stepped, open				
>10			105.9' - Fracture, 20 deg, rough, stepped, open				
NR			106.3' - Fracture, 45 deg, rough, planar, tight but weathered				
110	R10-HQ 5 ft 100%	93	0	107.1' - Fracture, 25 deg, rough, stepped, very open and weathered with dissolution and fragmentation		108.4-108.9' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, 20% gravel, 30% sand, 50% silt-sized particles, very friable No Recovery 108.9-110.0' Limestone 110.0-114.4' - Same as 105.0-108.4'	Driller's Remark: Hit silt layer at 112.0' about 4" thick; not evident in core
-68.5			0	107.7-108.0' - Fracture zone, with angular rock fragments up to 2"			
			1	108.15' - Fracture, 60 deg, rough, undulating, open			
			0	108.4' - Fracture, 10 deg, rough, stepped, open			
			1	112.3' - Fracture, 45 deg, rough, undulating, tight to open			
115	R11-HQ 5 ft 70%	47	1	114.9' - Fracture, horizontal, rough, undulating		114.4-115.0' - Same as 110.0-114.4' except very weak (R1) 115.0-117.5' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak (R1), 5-10% fine voids, few elongated 1/4"-1/2" fossil molds	R10: 13 minutes
-73.5			2	115.1' - Fracture, horizontal, rough, undulating			
			1	116.5' - Fracture, 40 deg, rough, undulating, open			
			2	116.6' - Fracture, 5 deg, rough, undulating, slightly weathered, open			
			NR	117.1' - Fracture, horizontal, rough, undulating, open			
120	R12-HQ 5 ft 24%	8	>10	118.05' - Fracture, 30 deg, rough, undulating, tight		117.5-117.95' - Same as 115.0-117.5' except medium strong to strong (R3 to R4), 0-10% fine voids, few elongated 1/4"-1/2" cavities/molds 117.95-118.2' - Same as 115.0-117.5' except very weak (R1), with increased voids to 15% 118.2-118.5' - Same as 115.0-117.5' except weak (R2), 10-15% fine voids No Recovery 118.5-120.0' Limestone 120.0-121.2' - moderate yellowish brown to dusky yellow, (10YR 5/4 to 5Y 6/4), fine grained, moderate HCl reaction, medium strong (R3), fine voids (<1/16"), fossiliferous with voids and cavities primarily elongated up to 1/4"-1/2" No Recovery 121.2-125.0'	R11: 6 minutes
-78.5			2	118.3' - Fracture, rough, undulating, tight to open, 3" side fracture			
			NR	120.0-120.2' - Fracture zone, subangular rock fragments 1/2"-1" in size			
			NR	120.2' - Fracture, 5 deg, rough, undulating			
			NR	120.4, 121.0' - Fractures (2), 25 deg, rough, stepped to undulating, open with subangular fragments			
125							R12: Run time not recorded



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-28

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723060.1 N, 458242.6 E (NAD83)

ELEVATION : 41.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 4/25/07

START : 4/25/2007

END : 5/1/2007

LOGGER : D. Roraback

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.
-83.5	R13-HQ 5 ft 84%	22	3	125.35' - Fracture, 80 deg, smooth, undulating, tight		Limestone 125.0-126.25' - moderate yellowish brown to light olive brown, (10YR 5/4 to 5Y 5/6), fine grained, moderate HCl reaction, medium strong (R3), 10-20% small (1/16") voids, some 1/4" cavities 126.25-127.0' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, strong (R4), 0-10% fine (1/16") voids, very fine horizontal laminations No Recovery 127.0-127.8' Limestone 127.8-130.3' - Same as 125.0-126.25' except alternating very weak (R1) and medium strong (R3) zones below 128.8' 130.3-131.3' - moderate yellowish brown to moderate olive brown, (10YR 5/4 to 5Y 4/4), fine grained, moderate HCl reaction, medium strong (R3), 20% voids <1/16", several 1/4" cavities and few larger elongated cavities No Recovery 131.3-135.0'	Driller's Remark: Rods dropped at 127.0-127.5', interpret lost recovery to be from 127.0-127.8' R13: 9 minutes
			8	125.45' - Fracture, 20 deg, rough, planar, tight but weathered			
			NR	125.85' - Fracture, 0-70 deg, rough, stepped, tight, some minor fragmentation			
			1	126.1' - Fracture, 10 deg, rough, undulating, minor fragmentation			
			1	126.35, 126.4, 126.45, 126.6, 126.75, 126.85' - Bedding plane (6), horizontal, smooth, planar, tight to open			
			>10	126.95' - Fracture, vertical, rough, planar			
130	R14-HQ 5 ft 26%	7	>10	127.8' - Fracture, 10 deg, open, weathered		Limestone 135.0-135.3' - Same as 130.3-131.3' except moderate olive brown to light olive gray, (5Y 4/4 to 5Y 5/2) 135.3-136.45' - moderate olive brown, (5Y 4/4), moderate HCl reaction, strong (R4), 0-3% fine (1/16") voids, horizontal bedding planes 1/8"-1/2" thick, trace organics 136.45-137.1' - alternating intervals of material same as 135.0-135.3' and same as 135.3-136.45' 137.1-137.6' - Same as 135.0-135.3' No Recovery 137.6-140.0'	R14: 6 minutes
-88.5			>10	128.9' - Fracture, 10 deg, rough, undulating, tight, weathered			
			1	129.4' - Fractures (2), 20 deg and 70 deg, rough, undulating to planar, tight, friable			
			NR	129.4-130.0' - Fracture zone, 1/2"-1" angular fragments			
			NR	130.0-130.3' - Fracture zone, 1/2"-1" subangular rock fragments			
			NR	130.3' - Fracture, horizontal, rough, planar			
	R15-HQ 5 ft 52%	13	>10	130.6' - Fracture, 70 deg, rough, undulating, trace iron oxide infill of 1/4" cavity on fracture face		Limestone 140.0-140.15' - light olive brown, (5Y 5/6), fine grained, moderate HCl reaction, medium strong (R3), 20% small (1/16") voids 140.15-143.2' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), very fine to fine grained, moderate HCl reaction, strong (R4), 3-10% small (<1/16") voids, several 1/4" to 1/2" cavities, some molds/cast, several up to 1" cavities, some with infill No Recovery 143.2-145.0'	Driller's Remark: 134.0-135.0' soft drilling Driller's Remark: Drilling rod sank approximately 2" during lunch break R15: 7 minutes
135			>10	131.0' - Fracture, horizontal, rough, undulating, tight			
-93.5			8	135.0-135.3' - Fracture zone, 1/2"-1" subangular rock fragments			
			>10	135.3' - Fracture, 10 deg, rough, undulating, open			
			NR	135.45' - Fracture, 5 deg, smooth, planar, open			
			NR	135.5, 135.65, 135.75, 135.77' - Fractures (4), 10 deg, smooth, planar, tight but weathered			
	R16-HQ 5 ft 64%	22	>10	136.45' - Fracture, 0-40 deg, rough, stepped, open		Limestone 140.0-140.15' - light olive brown, (5Y 5/6), fine grained, moderate HCl reaction, medium strong (R3), 20% small (1/16") voids 140.15-143.2' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), very fine to fine grained, moderate HCl reaction, strong (R4), 3-10% small (<1/16") voids, several 1/4" to 1/2" cavities, some molds/cast, several up to 1" cavities, some with infill No Recovery 143.2-145.0'	R16: 12 minutes
			4	136.5' - Fracture, horizontal, rough, planar			
			2	136.6, 136.75, 136.85, 135.88, 136.95' - Fractures (5), horizontal, rough, planar, tight to open			
			>10	136.7' - Fracture, horizontal, rough, planar, healed			
			0	137.1' - Fracture, 20 deg, rough, stepped, open, weathered			
			NR	137.1-137.6' - Fracture zone, rock fragments 1/2"-2"			
140	R16-HQ 5 ft 64%	22	>10	140.15' - Bedding plane, horizontal, rough, stepped, open		Limestone 140.0-140.15' - light olive brown, (5Y 5/6), fine grained, moderate HCl reaction, medium strong (R3), 20% small (1/16") voids 140.15-143.2' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), very fine to fine grained, moderate HCl reaction, strong (R4), 3-10% small (<1/16") voids, several 1/4" to 1/2" cavities, some molds/cast, several up to 1" cavities, some with infill No Recovery 143.2-145.0'	R16: 12 minutes
-98.5			>10	140.6, 140.8, 141.0, 141.25' - Fractures (4), 0-20 deg, rough, stepped, 1/8" infilling, open, breaks typically occur at large cavities			
			0	140.8-141.0' - Fracture, vertical, 1" fragments			
			NR	141.95' - Fracture, 10 deg, rough, undulating, highly weathered, tight, black organics on fracture face			
			NR				
145			NR				



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-28
SHEET 9 OF 9	
ROCK CORE LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723060.1 N, 458242.6 E (NAD83)

ELEVATION : 41.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2 ft bgs on 4/25/07 START : 4/25/2007 END : 5/1/2007 LOGGER : D. Roraback

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.
-103.5	R17-HQ 5 ft 58%	0	>10	142.3' - Fracture, 40 deg, rough, undulating		Limestone 145.0-145.55' - light olive gray, (5Y 5/2), mottled appearance, fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), 5% fine (<1/16") voids, many 3/16" voids, irregular laminations, trace organics 145.55-146.8' - grayish orange, (10YR 7/4), very fine to fine grained, strong HCl reaction, strong (R4), no voids, no cavities 146.8-147.9' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, mild to strong HCl reaction, weak to strong (R2 to R4), strength decreasing with depth, 5% fine (<1/16") voids at top, increasing to 20% fine voids with depth No Recovery 147.9-150.0' Bottom of Boring at 150.0 ft bgs on 5/1/2007	Driller's Remark: 147.0-150.0' soft drilling R17: 12 minutes
			3	142.4-142.65' - Fracture zone, very angular 1"-2" rock fragments			
			8	142.65' - Fracture, 0-30 deg, rough, stepped			
			NR	142.8' - Fracture, horizontal, rough, stepped, underlain by angular 1"-2" rock fragments			
				143.05' - Fracture, 20 deg, rough, undulating			
				145.0-145.4' - Fracture zone, red staining on fracture faces, angular to subangular rock fragments, 1/2"-2"			
				145.4' - Fracture, 30 deg, rough, stepped, trace infill, weathered			
				145.55' - Fracture, 10 deg, smooth, undulating, open			
				145.7' - Fracture, 10 deg, rough, stepped, tight			
				145.9' - Fracture, 70 deg, smooth, undulating, tight, fracture extends from 145.55-146.2'			
				146.5, 146.8' - Fracture (2), 85 deg, rough, undulating, tight, 1/16" relief			
				146.8, 146.9' - Fractures (2), horizontal, weathered zone			
				147.5-147.9' - Fracture zone, angular to subangular 1/2"-1-1/2" fragments			
150	150.0						
-108.5							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-29

SHEET 1 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723157.5 N, 458338.8 E (NAD83)

ELEVATION : 41.7 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, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.2 ft bgs on 5/30/07

START : 5/23/2007

END : 5/31/2007

LOGGER : T. Stewart, P. De Sa'rego

WATER LEVELS : 4.2 TDS ON 9/30/07		START : 9/29/2007		END : 9/31/2007		LOGGER : T. Stewart, P. De Satego	
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		
41.7	0.0	1.5	SS-1	1-2-4 (6)	Poorly Graded Sand With Silt (SP-SM) 0.0-1.5' - very light gray to yellowish gray, (N8 to 5Y 8/1), moist, loose, fine grained, 5% nonplastic fines, 10% organics, trace very fine sand-sized particles at the bottom		Installed 6" SW casing to approximately 5' below ground surface Using 24" split spoon (SS)
	1.5						
5	5.0						
36.7		0.8	SS-2	0-1-2 (3)	Clayey Sand (SC) 5.0-5.4' - pale green, (10G 6/2), wet, very loose, very fine to fine grained, medium to high plasticity Silt (ML) 5.4-5.7' - grayish yellow, (5Y 8/4), wet, soft, nonplastic, very rapid dilatancy, moderate HCl reaction, carbonate derived		Water level assumed at 3.0' below ground surface due to wet sample at 5.0' (SS-2) and increasing moisture content in SS-1 SS-2 taken at 14:36
	6.5						
10	10.0						
31.7		1.4	SS-3	8-25-50/5 (75/11")	Silt (ML) 10.0-11.4' - grayish yellow mottled with moderate yellow, (5Y 8/4 with 5Y 7/6), moist, hard, nonplastic, very rapid dilatancy, moderate HCl reaction, trace very fine sand, trace black fragments, carbonate derived		
	11.4						
15	15.0						
26.7		1.0	SS-4	21-11-17 (28)	Silt (ML) 15.0-16.0' - grayish yellow, (5Y 8/4), moist, very stiff, nonplastic, rapid dilatancy, moderate HCl reaction, trace very fine to medium grained sand, carbonate derived		SS-4 taken at 14:50
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-29
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723157.5 N, 458338.8 E (NAD83)
 ELEVATION : 41.7 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, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.2 ft bgs on 5/30/07 START : 5/23/2007 END : 5/31/2007 LOGGER : T. Stewart, P. De Sa'rego

WATER LEVELS : 4.2 (lbs) on 9/30/07		START : 9/29/2007		END : 9/31/2007		LOGGERS : T. Stewart, 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		
21.7	20.0	1.5	SS-5	16-12-14 (26)	Silty Sand (SM) 20.0-21.5' - grayish yellow, (5Y 8/4), wet, medium dense, fine to coarse grained, moderate HCl reaction, trace fine gravel-sized, 30-40% nonplastic fines, carbonate derived		SS-5 taken at 14:56
	21.5						
25	25.0						
16.7	25.5	0.5	SS-6	50/5.5 (50/5.5")	Silty Sand (SM) 25.0-25.5' - grayish yellow, (5Y 8/4), wet, very dense, fine to coarse grained, moderate HCl reaction, 15% gravel-sized, 25-30% nonplastic fines, carbonate derived		SS-6 taken at 15:02
30	30.0						
11.7		1.2	SS-7	10-6-2 (8)	Silt (ML) 30.0-31.15' - light olive brown, (5Y 5/6), wet, loose, fine to medium grained, mild to moderate HCl reaction, 62% nonplastic fines, carbonate derived		SS-7 taken at 15:10
	31.5						
							Driller's Remark: Hard at 32.8'
35	35.9	0.1	SS-8	50/1.5 (50/1.5")	Limestone Fragments And Silt 35.0-35.1' - light olive grey, (5Y 5/2), mild to moderate HCl reaction		SS-8 taken at 15:22
6.7							
							Driller's Remark: Drilled into softer zone after 37.0'
40							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-29

SHEET 3 OF 9

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723157.5 N, 458338.8 E (NAD83)

ELEVATION : 41.7 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, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.2 ft bgs on 5/30/07

START : 5/23/2007

END : 5/31/2007

LOGGER : T. Stewart, P. De Sa'rego

WATER LEVELS : 4.2 TDS on 9/30/07			START : 9/29/2007		END : 9/31/2007		LOGGERS : J. Stewart, P. De Saeghe		
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			
1.7	40.0	1.0	SS-9	35-50/5.5 (85/11.5")	Silt With Sand (ML) 40.0-41.0' - moderate olive brown to light olive brown, (5Y 4/4 to 5Y 5/6), moist to wet, hard, low plasticity, rapid dilatancy, moderate to strong HCl reaction, 25% fine to medium sand-sized, carbonate derived, trace very fine sand-sized black particles			Drill time from 37.0-40.0' approximately 1-1/2 minutes	
	41.0								
45	45.0								
-3.3		1.3	SS-10	35-48-50/4 (98/10")	Silt (ML) 45.0-46.3' - Same as 40.0-41.0' except trace medium sand-sized gray particles			SS-10 taken at 15:51	
	46.3								
50	50.0								
-8.3		1.4	SS-11	34-27-30 (57)	Silty Sand With Limestone Fragments (SM) 50.0-51.4' - light olive gray, (5Y 5/2), wet, very dense, fine to coarse grained, moderate HCl reaction, 40% of sample is fine to coarse gravel-sized limestone, 30-35% low plastic fines, all carbonate derived			SS-11 taken at 16:00	
	51.5								
55	55.0								
-13.3		0.7	SS-12	39-50/3.5 (89/9.5")	Silty Sand (SM) 55.0-55.7' - moderate olive brown, (5Y 4/4), wet, dense, fine to coarse grained, moderate HCl reaction, 10% fine gravel-sized limestone, 40% low plastic fines, 5% organics, carbonate derived			SS-12 taken at 16:10	
	55.8								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-29
SHEET 4 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723157.5 N, 458338.8 E (NAD83)
 ELEVATION : 41.7 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, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.2 ft bgs on 5/30/07 START : 5/23/2007 END : 5/31/2007 LOGGER : T. Stewart, P. De Sa'rego

WATER LEVELS: 4.24 RBQS ON 5/23/07		START: 5/23/2007		END: 5/27/2007		EQUIP: 4" Casing, 4" DS Casing	
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
-18.3	60.0	0.0	SS-13	50/2 (50/2")	No Recovery 60.0-60.2'		Driller's Remark: Will add 60.0' of 4" HW casing before continuing SPTs Last SPT taken on 5/23/07 at 60.0' (SS-13) Deviated hole during 4" HW casing installation
					Begin Rock Coring at 61.0 ft bgs See the next sheet for the rock core log		
65 -23.3							
70 -28.3							
75 -33.3							
80							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-29

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723157.5 N, 458338.8 E (NAD83)

ELEVATION : 41.7 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 : 4.2 ft bgs on 5/30/07

START : 5/23/2007

END : 5/31/2007

LOGGER : T. Stewart, 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.
61.0	R1-NQ 5 ft 52%	42	1	61.5' - Fracture, horizontal, rough, undulating, possible contact between limestone and sand lens 62.0, 62.4' - Mechanical break (2) 62.6-63.0' - Fracture zone		Limestone 61.0-63.6' - moderate yellowish brown, (10YR 5/4), medium grained, mild HCl reaction, weak (R2), 30% surface coverage of voids up to 1/8" at 61.0-61.5', increasing to 40-50% coverage from 61.5-63.6', 10% dark (possibly organics) clasts up to 1/8" size, increasing to 3/8" size at 62.6-63.0' No Recovery 63.6-66.0'	Borehole construction is 5.0' of 6" SW casing installed to 5.0' below ground surface with 62.0' of 4" HW casing installed to approximately 60.0' P. De Sa'rego begins logging Water level: 4.2' below ground surface on 5/30/07 Driller's Remark: Possible sand lense at 61.5-63.0'; driller will advance casing R1: 5 minutes 11:55 Advancing HW casing to 65.0'
65 -23.3			7				
			0				
			NR				
66.0	R2-NQ 5 ft 64%	42	1	66.6, 67.05, 67.25, 67.95' - Fractures (4), horizontal, smooth to rough, planar to undulating, 1/8" relief 68.65' - Fracture, horizontal, rough, undulating, 1/4" relief 69.05' - Fracture, <10 deg, rough, undulating		Limestone 66.0-67.95' - Same as 61.0-63.6' except trace cavities/fossil clasts up to 1-9/16"x3/8" at 66.7- 67.3' 67.95-69.2' - Same as 61.0-63.6' except very weak to weak (R1 to R2), 10-15 fossil casts/cavities up to 1-3/16"x3/8" No Recovery 69.2-71.0'	R2: 6 minutes
			3				
			>10				
			1				
70 -28.3			NR				
71.0	R3-NQ 5 ft 48%	28	0	72.0-72.4' - Fracture zone 72.6' - Mechanical break 72.9-73.4' - Fracture zone		Limestone 71.0-71.95' - Same as 61.0-63.6' except 20-40% surface coverage of voids up to 3/16" (percentage increasing with depth), 10-20%, cavities up to 1-3/16"x3/8", large (3-7/8"x3-1/8") cavity infilled with fine grained, weak (R2) carbonate material at 71.2-71.6', 20% of core contains black organic thread-like inclusions up to 1-9/16"x1/8" long 71.95-72.4' - Same as 61.0-63.6' except fine grained, very weak (R1), trace voids 72.4-73.4' - Same as 71.0-71.95' except very weak (R1) No Recovery 73.4-76.0' Limestone 76.0-76.7' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, very weak to weak (R1 to R2), 10-15% surface coverage of voids up to 1/8", trace infilled cavities up to 1-3/16"x3/8", infilled with fossiliferous limestone	SC-1 collected at 71.0- 71.95'
			>10				
			>10				
			NR				
75 -33.3			NR				R3: 7 minutes
76.0	R4-NQ 5 ft 40%	20	>10	76.0-76.1' - Fracture zone 76.1-76.4' - Mechanical break 76.4-76.7' - Fracture zone 77.25, 77.7' - Fracture or mechanical break, rough, undulating, tight			R4: 9 minutes
			2				
			NR				
80 -38.3			NR				
81.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-29	SHEET 6 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723157.5 N, 458338.8 E (NAD83)

ELEVATION : 41.7 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 : 4.2 ft bgs on 5/30/07 START : 5/23/2007 END : 5/31/2007 LOGGER : T. Stewart, P. De Sa'rego

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
85 -43.3	R5-NQ 5 ft 88%	75	2		Limestone 76.7-78.0' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, very weak to weak (R1 to R2), 30-40% surface coverage of voids up to 1/8", 10-15% casts/cavities up to 1"x2" infilled with very soft black (possible organic) material No Recovery 78.0-81.0' Limestone 81.0-83.4' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild HCl reaction, very weak (R1), 20-30% surface coverage of voids up to 1/16", 10% casts and cavities up to 1-9/16"x1-3/16", partially infilled with soft black (possible organic) material 83.4-85.1' - Same as 81.0-83.4' except weak to medium strong (R2 to R3) 85.1-85.4' - Same as 81.0-83.4' No Recovery 85.4-86.0' Limestone 86.0-87.6' - moderate yellowish brown, (10YR 5/4), medium grained, mild HCl reaction, very weak to weak (R1 to R2), 10-15% voids up to 3/16", trace casts/cavities up to 3/8"x3/8" 87.6-88.8' - Same as 86.0-87.6' except medium strong (R3), trace dark (organic) clasts, 15% casts/cavities up to 3/8"x3/8" No Recovery 88.8-91.0' Limestone 91.0-91.7' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild HCl reaction, medium strong (R3), 10-15% surface coverage of voids up to 1-3/16" 91.7-92.3' - Same as 91.0-91.7' except 30-40% casts/cavities up to 2"x1" 92.3-94.5' - Same as 91.0-91.7' except trace casts/cavities up to 9/16"x3/8", trace dark organic matter, large (2"x1") cavity at 93.8' No Recovery 94.5-96.0' Silty Sand (SM) 96.0-96.4' - carbonate derived, 30% nonplastic fines	R5: 6 minutes
			3			
			1			
			1			
			3			
			NR			
90 -48.3	R6-NQ 5 ft 56%	22	1			R6: 9 minutes
			>10			
			>10			
			NR			
95 -53.3	R7-NQ 5 ft 70%	42	6			R7: 6 minutes
			4			
			1			
			0			
			NR			
			NR			
100 -58.3	R8-NQ 5 ft 98%	38	2			R8: 5 minutes
			>10			
			4			
			3			
			6			
			6			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-29

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723157.5 N, 458338.8 E (NAD83)

ELEVATION : 41.7 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 : 4.2 ft bgs on 5/30/07

START : 5/23/2007

END : 5/31/2007

LOGGER : T. Stewart, 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			
105 -63.3	R9-NQ 5 ft 44%	31	NR >10 4 >10 NR	101.5-102.1' - Fracture zone 102.5' - Fracture, 0-30 deg, rough, undulating, 1/8" relief 103.0-103.2' - Fracture zone, <3/16" relief		Limestone 96.4-100.9' - moderate yellowish brown, (10YR 5/4), medium grained, mild HCl reaction, very weak to weak (R1 to R2), extremely weak (R0) at 97.6', 15-20% surface coverage of voids up to 1/8", 10% casts/cavities up to 2"x3/8", partial recrystallization of carbonate material in voids No Recovery 100.9-101.0' Limestone 101.0-102.1' - moderate yellowish brown, (10YR 5/4), medium grained, mild HCl reaction, weak (R2), 5-10% surface coverage of voids up to 1/16", trace cavities up to 3/4"x3/8" 102.1-103.2' - Same as 101.0-102.1' except very weak (R1) No Recovery 103.2-106.0' Limestone 106.0-109.4' - Same as 101.0-102.1' except very weak (R1) from 106.0-107.9' and 108.2-109.4' No Recovery 109.4-111.0'	R9: 3 minutes Driller's Remark: Fluid loss at 105.0' below ground surface
110 -68.3	R10-NQ 5 ft 68%	46	>10 1 2 1 NR	106.0-106.3' - Fracture zone 106.5, 106.95' - Fractures (2), <10 deg, rough, undulating 107.7' - Fracture, <10 deg, rough, undulating 108.0' - Fracture, 30 deg, rough, undulating 108.5' - Fracture or mechanical break, <15 deg, rough, stepped, tight, <1/16" relief 109.3' - Fracture, horizontal, rough, undulating, 3/16" relief		No Recovery 109.4-111.0'	R10: 3 minutes
115 -73.3	R11-NQ 5 ft 14%	0	3 NR	111.0-111.3' - Fracture zone 111.4, 111.7' - Fractures (2), horizontal, rough, undulating		Limestone 111.0-111.7' - Same as 101.0-102.1' No Recovery 111.7-116.0'	Driller's Remark: No circulation
120 -78.3	R12-NQ 5 ft 56%	27	>10 2 4 NR	116.0-116.2' - Fracture zone 116.5-116.85' - Fracture zone 117.5' - Fracture, horizontal, rough, planar to stepped, 1/8" relief 117.6-117.85' - Fracture, 50 deg, rough, undulating, 1/8" relief 118.05' - Fracture, horizontal, rough, undulating, tight, 1/16" relief 118.4-118.8' - Fracture zone		Limestone 116.0-116.5' - Same as 101.0-102.1' 116.5-118.8' - pale yellowish orange to light gray, (10YR 8/6 to N7), coarse grained, strong HCl reaction, extremely weak to very weak (R0 to R1), trace voids (<3/16"), trace cavities to 1"x1/8", highly friable, fossiliferous, "coquina" appearance, increase in gray color (fossils) corresponds to increase in HCl reaction and decrease in hardness No Recovery 118.8-121.0'	Water level: 4.4' below ground surface on 5/31/07 Driller's Remark: Still no circulation R12: 4 minutes



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-29	SHEET 8 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723157.5 N, 458338.8 E (NAD83)

ELEVATION : 41.7 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 : 4.2 ft bgs on 5/30/07

START : 5/23/2007

END : 5/31/2007

LOGGER : T. Stewart, 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			
125 -83.3	R13-NQ 5 ft 92%	36	2	121.85, 121.9' - Mechanical break (2)		Limestone 121.0-121.55' - moderate yellowish brown, (10YR 5/4), medium grained, mild HCl reaction, weak (R2), 10-15% surface coverage of voids up to 1/8", trace casts/cavities up to 1-3/16"x3/8" 121.55-124.7' - Same as 121.0-121.55' except 10-20% surface coverage of casts/cavities up to 1-3/16"x3/8", with trace carbonate infill/recrystallization 124.7-125.6' - Same as 121.0-121.55' No Recovery 125.6-126.0'	SC-2 collected at 121.0-121.9' Driller's Remark: No fluid circulation
			>10	121.5-123.0' - Fracture zone			
			3	123.3' - Fracture, horizontal, rough, undulating, 3/16" relief			
			3	123.95' - Fracture, 20 deg, rough, undulating, 1/8" relief			
			2	124.35' - Fracture, <10 deg, rough, undulating			
126.0	R14-NQ 5 ft 2%	0	NR	124.45-124.7' - Fracture, 60 deg, rough, undulating		Limestone 126.0-126.1' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, medium strong (R3), no visible voids, 10% fossil casts up to 9/16"x9/16" No Recovery 126.1-131.0'	R13: 5 minutes
			0	124.85' - Fracture, 60 deg, rough, undulating, 3/16" relief			
			NR	124.85-125.2' - Mechanical break, 60 deg			
			NR	125.25' - Mechanical break			
			NR				
130 -88.3	R15-NQ 5 ft 58%	7	8	131.1, 131.2, 131.25, 131.45, 131.6' - Fractures (5), horizontal, smooth to rough, planar		Limestone 131.0-133.9' - Same as 121.0-121.55' except coarse grained, 50-60% surface coverage of voids up to 3/16" at 132.1-132.3', and medium gray (N5) mottling at 133.2-133.9' No Recovery 133.9-136.0'	Driller's Remark: No fluid circulation
			5	131.7, 131.75, 131.95' - Fractures (3), <5 deg, rough, undulating			
			4	132.1, 132.2, 132.25, 132.55, 132.95' - Fractures (5), <10 deg, rough, undulating			
			NR	133.2, 133.4, 133.6, 133.65' - Fractures (4), <10 deg, rough, undulating			
			NR				
135 -93.3	R16-NQ 5 ft 82%	28	4	136.1, 136.9' - Fractures (2), <5 deg, rough, undulating, 1/8" relief		Limestone 136.0-136.9' - Same as 121.0-121.55' 136.9-140.1' - medium light gray and very pale orange, (N6 and 10YR 8/2), fine grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), trace voids up to 3/16", 20-30% casts/cavities up to 2-3/8"x1-3/16" at 138.3-140.1', black organic infill at 139.4-140.1' No Recovery 140.1-141.0'	Driller's Remark: No fluid circulation
			>10	137.25- 137.5' - Fracture zone, <10 deg, rough, undulating, 4 fractures			
			3	137.6-138.15' - Fracture zone			
			5	139.05, 139.1, 139.4, 139.7, 139.9' - Fractures (5), <10 deg, rough, undulating, <1/16" relief, black stains on 80% of surface			
			0				
140 -98.3	R16-NQ 5 ft 82%	28	NR				SC-3 collected at 138.15-139.05'
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-29

SHEET 9 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723157.5 N, 458338.8 E (NAD83)

ELEVATION : 41.7 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 : 4.2 ft bgs on 5/30/07

START : 5/23/2007

END : 5/31/2007






LOGGER : T. Stewart, 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			
145 -103.3	R17-NQ 5 ft 40%	33	2	141.1' - Fracture, horizontal, rough, undulating, 3/8" relief		Limestone 141.0-141.9' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), fine grained, mild HCl reaction, medium strong (R3), trace (<5%) surface coverage of voids up to 1/16", trace cavities up to 9/16"x3/8" 141.9-142.05' - Same as 121.0-121.55' 142.05-142.8' - Same as 141.0-141.9' 142.8-143.0' - moderate yellowish brown, (10YR 5/4), medium grained, mild HCl reaction, weak (R2), 60-70% surface coverage of voids up to 3/16", 10-15% casts/cavities up to 3/4"x3/8" No Recovery 143.0-146.0' Limestone 146.0-146.55' - Same as 142.8-143.0' 146.55-148.5' - Same as 141.0-141.9' 148.5-149.2' - Same as 142.8-143.0' No Recovery 149.2-151.0'	Driller's Remark: Very soft at 143.3-145.0' R17: 7 minutes
			1	141.85' - Fracture, 15 deg, rough, undulating, 1/8" relief			
				142.05' - Fracture, horizontal, rough, undulating			
		NR					
146.0			2	146.35, 146.55' - Fractures (2), horizontal, rough, planar			
			3	147.05, 147.25' - Fractures (2), <15 deg, rough, undulating, tight			
			3	147.75' - Fracture, <15 deg, rough, undulating, tight			
			1	148.65-149.05' - Fracture zone			
				148.65' - Fracture, <15 deg, rough, undulating, tight			
		NR					
150 -108.3	R18-NQ 5 ft 64%	42				Bottom of Boring at 151.0 ft bgs on 5/31/2007	SC-4 collected at 147.75-148.60' R18: 7 minutes Total depth of boring at 151.0' below ground surface 10:19, 5/31/07
151.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-30
SHEET 1 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.1 N, 458444.8 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.4 ft bgs on 5/03/07 START : 5/2/2007 END : 5/6/2007 LOGGER : D. Roraback

WATER LEVELS : 2.4' bgs on 5/03/07			START : 5/2/2007		END : 5/9/2007		LOGGERS : D. Noraback	
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			
42.2	0.0	1.4	SS-1	2-4-4 (8)	Poorly Graded Sand With Silt (SP-SM) 0.0-0.45" - dark gray, (N3), moist, loose, fine grained, no HCl reaction, silica sand to 1/32", 15% fines, predominately organics, roots		Water level 2.4' below ground surface on 5/03/07	
	1.5				Poorly Graded Sand (SP) 0.45 -1.4' - very light gray to light gray, (N8 to N7), moist, loose, very fine grained, no HCl reaction, silica sand to <1/32", trace nonplastic fines			
5	5.0							
37.2		0.4	SS-2	2-5-3 (8)	Silty Sand (SM) 5.0-5.9' - light brownish gray with medium gray mottling, (5YR 6/1 with N4), wet, loose, very fine grained, medium to high plasticity, no HCl reaction, silica sand to <1/32", 30-40% fines, trace roots			
	6.5							
10	10.0							
32.2		1.2	SS-3	1-6-6 (12)	Silt (ML) 10.0-11.2' - yellowish gray, (5Y 7/2), wet, medium stiff, nonplastic, very rapid dilatancy, moderate to strong HCl reaction, trace very fine sand-sized, carbonate			
	11.5							
15	15.0							
27.2		1.5	SS-4	0-21-35 (56)	Sandy Silt (ML) 15.0-16.5' - yellowish gray, (5Y 5/2), wet, hard, medium dense, nonplastic, very rapid dilatancy, moderate HCl reaction, 25-30% fine to coarse sand-sized, 2-3 limestone lenses to 1" thick, carbonate derived			
	16.5							
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-30
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.1 N, 458444.8 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.4 ft bgs on 5/03/07 START : 5/2/2007 END : 5/6/2007 LOGGER : D. Roraback

WATER LEVELS : 2.411055 ft 9/5/07			START : 9/2/2007			END : 9/9/2007			LOGGERS : D. Morabak		
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					
22.2	20.0	0.4	SS-5	6-6-6 (12)	Silty Sand With Limestone Fragments (SM) 20.0-20.9' - light olive gray, (5Y 5/2), wet, medium dense, fine to coarse grained, moderate HCl reaction, 35% fine to coarse gravel-sized limestone fragments, 30% plastic fines, all carbonate						
	21.5										
25	25.0										
17.2		0.6	SS-6	4-2-8 (10)	Sandy Silt (ML) 25.0-25.6' - dusky yellow, (5Y 6/4), wet, stiff, medium dense, fine to medium grained, low plasticity, rapid dilatancy, moderate to strong HCl reaction, 35-40% fine to medium sand, 10-15% fine gravel-sized limestone fragments, all carbonate						
	26.5										
30	30.0										
12.2		0.9	SS-7	12-8-15 (23)	Sandy Silt With Limestone Fragments (SM) 30.0-30.85' - Same as 25.0-25.6' except very stiff, 15% fine to coarse gravel-sized limestone fragments						
	31.5										
35	35.0	0.2	SS-8	50/2 (50/2")	Limestone Fragments 35.0-35.2' - light olive gray, (5Y 5/2), mild to moderate HCl reaction, very poor recovery, two limestone fragments, to 1/2"						
7.2	35.2										
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-30
SHEET 3 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.1 N, 458444.8 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.4 ft bgs on 5/03/07 START : 5/2/2007 END : 5/6/2007 LOGGER : D. Roraback

WATER LEVELS : 2.4 ft bgs on 9/30/07			START : 9/2/2007		END : 9/9/2007		LOGGERS : D. Noraback	
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	
2.2	40.0	0.2	SS-9	50/2 (50/2")	Limestone Fragments 40.0-40.2' - light olive gray, (5Y 5/2), mild to moderate HCl reaction, wafer-shaped limestone fragments to 1/4" thick, fine to coarse sand-sized fragments			
45.0 -2.8	45.0 45.2	0.2	SS-10	50/2.5 (50/2.5")	Limestone Fragments And Silty Sand (SM) 45.0-45.2' - light olive gray, (5Y 5/2), wet, very dense, low plasticity, moderate HCl reaction, fine to medium sand-sized with 15-25% fines, 70% limestone fragments, 30% sand, all carbonate Begin Rock Coring at 45.0 ft bgs See the next sheet for the rock core log			
50 -7.8								
55 -12.8								
60								



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-30	SHEET 4 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.1 N, 458444.8 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.4 ft bgs on 5/03/07

START : 5/2/2007

END : 5/6/2007

LOGGER : D. Roraback

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.
-2.8	45.0	33	1	45.0-45.5' - Fracture, 85 deg, rough, undulating		Limestone 45.0-48.5' - moderate olive brown, (5Y 4/4), mild to moderate HCl reaction, extremely weak to very weak (R0 to R1), very fine to medium grained voids to 1/16", 25-30% casts/molds up to 3/8" over 5-10% of surface, trace black (N1) carbonaceous inclusions No Recovery 48.5-50.0'	Begin rock coring at 45' R1: 4 minutes
			>10	46.6' - Fracture, horizontal, rough, undulating, open			
			3	46.7-46.9' - Fracture zone, <5-90 deg, rough, undulating, open			
			2	47.1' - Fracture, horizontal, rough, undulating, open			
			NR	47.5' - Fracture, 15-25 deg, rough, undulating, tight			
50	50.0	23	>10	47.8-48.4' - Fracture, 85-90 deg, rough, undulating, tight		Limestone 50.0-51.4' - moderate olive brown, (5Y 4/4), moderate HCl reaction, weak to medium strong (R2 to R3), very fine to fine grained, carbonate, voids to 1/16" over 20-25%, cavities to 3/8" over <5%, sparsely fossiliferous 51.4-54.5' - moderate olive brown, (5Y 4/4), fine to medium grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), friable, becoming very weak (R1) at 54.0' and below, black carbonaceous/organic lenses/laminae (1/16") very abundant at 53.5', voids (<1/16") over 20-25%, cavities (<3/8") over 5% of surface, poorly fossiliferous No Recovery 54.5-55.0' Limestone 55.0-56.8' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, weak (R2), low density, thin black carbonaceous laminae at 55.0-55.2' with discontinuous carbonaceous laminae below, voids (generally <1/16") over 15-20% of surface, some cavities (<1/16"), fossil mold/casts sparse 56.8-57.7' - yellowish gray, (5Y 7/2), dense, mild HCl reaction, medium strong (R3), voids (1/16" or less) unevenly distributed across 10-15% of rock surface, cavities rare, fossil molds/casts sparse No Recovery 57.7-60.0' Limestone 60.0-60.45' - yellowish gray, (5Y 7/2), dense, mild to moderate HCl reaction, medium strong to strong (R3 to R4), black, thin, carbonaceous laminae common, voids/cavities <1% surface, fossil molds/casts sparse to absent	R2: 6 minutes
-7.8			3	48.1' - Fracture, horizontal, rough, stepped, tight			
			3	48.4' - Fracture, 10 deg, rough, undulating, tight			
			>10	50.0-50.2' - Fracture zone, angular gravel-sized limestone fragments			
			1	50.55-50.8' - Fracture, 45 deg, rough, undulating, tight			
55	55.0	17	>10	51.0-51.35' - Fracture, 80-85 deg, rough, undulating, open			R3: 9 minutes
-12.8			3	51.7' - Fracture, horizontal, rough, undulating, open			
			4	51.9-52.1' - Fracture, 70-75 deg, rough, undulating, open			
			3	52.3' - Fracture, 20 deg, rough, undulating, semi-tight			
			4	52.6, 52.8, 53.1, 53.3' - Fractures (4), horizontal, rough, undulating, semi-tight			
60	60.0	0	NR	53.4-53.8' - Fracture zone, horizontal			Hit pocket at 60' Losing sample core kicked over sideways, no way of knowing orientation of core Rock re-ordered rock into more logical sequence during field review
-17.8			NR	54.0' - Fracture, 50 deg, rough, undulating, open			
			NR	55.25' - Fracture, <5-70 deg, rough, stepped, open			
			NR	55.42' - Fracture, <5 deg, rough, stepped, open, black carbonaceous stain over 30% of surface			
			NR	55.54' - Fracture, 10 deg, smooth, planar to stepped, open, black carbonaceous film over 20%			
65	65.0		NR	55.68' - Fracture, <5 deg, rough, stepped, open, black carbonaceous film over 5%			No recovery due to blocked core barrel R4: 16 minutes
			NR	56.0' - Fracture, <5 deg, rough, undulating, tight			
			NR	56.52' - Fracture, horizontal, rough, planar, tight			
			NR	56.82' - Fracture, 0-60 deg, rough, stepped, open			
			NR	57.25' - Fracture, <5 deg, smooth, undulating, open			
			NR	57.35' - Fracture, <5 deg, smooth, planar, open, carbonaceous staining/film over 10%			
			NR	57.5-57.6' - Fracture zone, gravel-sized rock fragments, rounded to angular			
			NR	60.25' - Fracture, horizontal, smooth, undulating, tight, black carbonaceous film covering 20% of rock surface			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-30	SHEET 5 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.1 N, 458444.8 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.4 ft bgs on 5/03/07

START : 5/2/2007

END : 5/6/2007

LOGGER : D. Roraback

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.
-22.8	R5-NQ 5 ft 96%	13	2	65.1' - Fracture, horizontal, rough, undulating, open		No Recovery 60.45-65.0' Limestone 65.0-68.8' - light olive gray, (5Y 5/2), very fine to fine grained, mild HCl reaction, extremely weak (R0), friable, nonplastic silt along fractures, voids to 1/16" over 10%, casts/molds up to 3/8" over <5% of surface	R5: 10 minutes
			4	65.9, 66.1, 66.2' - Mechanical break (3)			
			3	66.5' - Fracture, 5-10 deg, smooth, undulating, tight			
			3	66.7' - Fracture, 10 deg, rough, undulating, tight			
			1	67.1' - Fracture, horizontal, rough, undulating, open			
			NR	67.3' - Fracture, 45-50 deg, smooth, stepped, open			
70	R6-NQ 5 ft 94%	53	2	67.6' - Fracture, 45 deg, rough, undulating to stepped, open		68.8-69.8' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids to 1/16", molds/casts to 3/8", on 5-10% of surface, occasional carbonaceous laminae on 1-3% of surface No Recovery 69.8-70.0' Limestone 70.0-70.7' - moderate olive brown, (5Y 4/4), fine to medium grained, moderate to strong HCl reaction, medium strong (R3), voids to 1/16" on 35-40% of surface, casts/molds to 3/8" over 5%, fossiliferous (molds/casts) 70.7-73.6' - light olive gray, (5Y 5/2), moderate to strong HCl reaction, medium strong (R3), voids to 1/16" over 3-5% of surface, sparsely distributed throughout interval and concentrated in possible cavity infillings, fossils rare to absent, casts/molds to 3" on 10% of surface, silty sand along fractures 73.6-74.3' - Same as 70.7-73.6' except yellowish gray, (5Y 7/2), extremely weak (R0), becoming coarser grained, with very soft clay along fractures, friable, sandy texture 74.3-74.7' - Same as 70.7-73.6' except yellowish gray, (5Y 7/2) No Recovery 74.7-75.0' Limestone 75.0-77.2' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids to 1/4" over 3-5%, cavities to 3/8" over <1% of surface, poorly fossiliferous 77.2-77.7' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, extremely weak (R0), nonfossiliferous, very thin discontinuous black carbonaceous laminae, rounded to subrounded clast-like inclusions (3/8"-3/4") of moderate olive brown (5Y 4/4), extremely weak (R0) limestone	R6: 10 minutes
-27.8			0	68.3' - Fracture, 0-5 deg, rough, undulating, open			
			3	68.4' - Fracture, 0-5 deg, rough, undulating, open			
			>10	68.8' - Fracture, 0-5 deg, rough, undulating, tight			
			2	69.5' - Fracture, horizontal, rough, undulating, open			
			NR	70.7' - Fracture, 0-5 deg, rough, undulating, open			
75	R7-NQ 5 ft 94%	48	3	70.75' - Fracture, horizontal, rough, undulating, open			SC-1 collected at 75.8-76.7'
-32.8			0	72.2' - Fracture, 10 deg, rough, stepped, open			
			>10	72.6-72.8' - Fracture, 60-65 deg, rough, undulating, open			
			0	72.8-73.6' - Fracture, 85-90 deg, rough, undulating, tight			
			3	73.6-73.9' - Fracture zone, 0-90 deg, rough, stepped to undulating, open			
			NR	74.2, 74.3' - Fractures (2), horizontal, smooth, planar, open			
80	R8-NQ 5 ft 58%	30	1	75.1' - Fracture, 0-10 deg, rough, stepped, open			R7: 9 minutes
-37.8			3	75.2-75.3, 75.4-75.5' - Fractures (4), 30 deg, rough, undulating, tight			
			NR	77.2' - Fracture, 0-5 deg, smooth, stepped, open			
			NR	77.4' - Fracture, 0-15 deg, smooth, stepped, open			
			NR	77.5-78.0' - Fracture zone, 0-70 deg, rough, stepped to undulating, open, gravel sized limestone rock fragments			
			NR	78.6-78.7' - Mechanical break			
85			1	79.0-79.3' - Fracture, 50-60 deg, rough, undulating, tight			R8: 7 minutes
			3	79.45' - Fracture, horizontal, rough, undulating, tight			
			NR	79.6' - Fracture, 50 deg, rough, stepped, open			
			NR	80.0-80.2' - Fracture zone, gravel-sized limestone rock fragments			
			NR	80.35-80.5' - Fracture, 70-80 deg, rough, undulating, open			
			NR	80.5-80.7' - Fracture zone, rough, planar to stepped, horizontal to high angle, open			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-30

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.1 N, 458444.8 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.4 ft bgs on 5/03/07

START : 5/2/2007

END : 5/6/2007

LOGGER : D. Roraback

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.
-42.8	R9-NQ 5 ft 88%	37	2	81.3-81.6' - Fracture, 30-80 deg, rough, undulating, orientation angle increasing with depth		Limestone 77.7-79.7' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, medium strong (R3), voids to 1/16" on 20-25%, cavities to 3/4" on 1-2%, occasional hair-line incipient fracture traces No Recovery 79.7-80.0' Limestone 80.0-82.9' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, medium strong (R3), voids to 1/16" on 20-25%, cavities 1-3/16"-3/4" except at 80.9-81.0', larger cavities 1-3/16x1-3/16x3/8" on >5% , trace fossil molds/casts No Recovery 82.9-85.0' Limestone 85.0-86.6' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids to 1/16" on 15-18%, cavities to 3/4" on <5%, fossiliferous (molds and casts) 86.6-88.1' - pale olive brown, (5Y 5/6), fine grained, weak to medium strong (R2 to R3), void spaces over 25% of surface, solution cavities over 15-20%, trace organics, iron oxide patina on some cavities, fossiliferous (molds/casts) No Recovery 88.1-103.0'	Driller's Remark: (87.0-90.0') open hole in rock, rods dropped one more foot when released 87-88' void 88-89.5' solid 89.5-91' void Driller's Remark: Lost circulation at 87.0' R9: 9 minutes
			>10	82.0' - Fracture, horizontal, rough, undulating, tight			
			1	82.35-82.5' - Fracture, 20-30 deg, rough, undulating, tight			
			0	82.8' - Fracture, 0-5 deg, rough, undulating, open			
			NR	85.1' - Fracture, 0-10 deg, rough, undulating, open			
90	R10-NQ 5 ft 0%	0	NR	85.35-85.4' - Fracture, 5-10 deg, rough, undulating, open			Driller's Remark: 91.0-95.0' open, minimal resistance as sporadic stringers of rock, or small breccia clasts, yield rig chatter R10: 2 minutes
-47.8				86.1' - Fracture, horizontal, rough, undulating, tight			
	R11-NQ 5 ft 0%	0	NR	86.5-87.2' - Fracture zone			Driller's Remark: 95.0-103.0', rods were apparently sitting on a small piece of rock; when connection was made the rods free fell to 103.0' with no recovery R11: Run time not recorded
95				87.5' - Fracture, 5 deg, rough, undulating, open			
-52.8							
	R12-NQ 5 ft 14%	0	NR				Actual recovery was from 103.0-103.7' R12: 3 minutes
100							
-57.8							
105							
105.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-30

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.1 N, 458444.8 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.4 ft bgs on 5/03/07

START : 5/2/2007

END : 5/6/2007

LOGGER : D. Roraback

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.
-62.8	R13-NQ 5 ft 64%	27	0	105.1' - Fracture, horizontal, rough, undulating, open		Limestone 103.0-103.7' - yellowish gray, (5Y 7/2), strong HCl reaction, extremely weak to very weak (R0 to R1), medium grained, sandy texture, voids (<1/16") over 1-2% of surface, fossils absent No Recovery 103.7-105.0' Limestone 105.0-105.6' - Same as 103.0-103.7' 105.6-108.2' - light olive gray to pale yellowish brown, (5Y 5/2 to 10YR 6/2), mild to moderate HCl reaction, weak (R2), voids (<1/16") over 5% of surface, cavities (3/8" to 3/16") <1%, trace fossil molds/casts No Recovery 108.2-120.0'	SC-2 collected at 105.9-107.2'
			0	105.25' - Fracture, 0-5 deg, rough, undulating, open			
			5	105.5' - Fracture, horizontal, rough, undulating, open			
			1	105.6-105.8' - Fracture zone			
			NR	107.05' - Fracture, 5 deg, rough, undulating, tight			
110	R14-NQ 5 ft 0%	0	NR	107.4' - Fracture, 40 deg, rough, undulating, open			R13: 12 minutes
-67.8				107.5' - Fracture, 0-5 deg, rough, undulating, open			
				107.7' - Fracture, 0-2 deg, rough, undulating, open			
				108.0' - Fracture, 0-2 deg, rough, undulating, open			
115	R15-NQ 5 ft 0%	0	NR				Water level 1.9' below ground surface 5/5/07
-72.8							
120	R16-NQ 5 ft 20%	0	NR				R14: 4 minutes
-77.8							
125				120.2' - Fracture, 0-80 deg, smooth, stepped, open		Limestone 120.0-120.5' - light olive gray, (5Y 5/2), very fine to fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), voids to 1/16" over <5% of surface, casts to 3/16" over <5%, fossils absent 120.5-121.0' - yellowish gray, (5Y 7/2), medium grained, strong HCl reaction, extremely weak to very weak (R0 to R1), sandy texture, very similar to 103.0-103.7' No Recovery 121.0-125.0'	No recovery, pulled cutter casing and found core fragment which may have been blocking inner core barrel; problem may be due to inner barrel not locking properly Solution: Lift outer barrel off bottom of hole before locking in inner barrel
				120.3' - Fracture, horizontal, rough, stepped, open			
				120.3-120.5' - Fracture zone, angular to subrounded gravel-sized rock fragments			
				120.5-120.75' - Fracture zone, 80 deg, rough, undulating, tight, fracture plane bounded on either end by horizontal, stepped to undulating, rough, open bedding planes			
				120.75-121.0' - Fracture zone, subrounded gravel-sized rock fragments			
125							R15: 5 minutes
							R16: 4 minutes



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-30	SHEET 8 OF 9
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.1 N, 458444.8 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

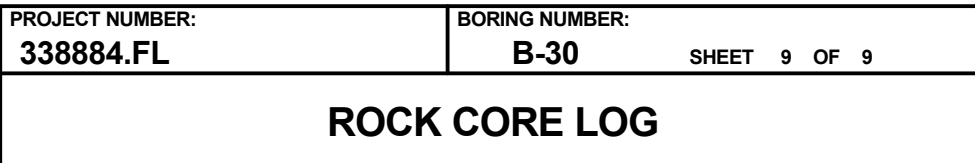
WATER LEVELS : 2.4 ft bgs on 5/03/07

START : 5/2/2007

END : 5/6/2007

LOGGER : D. Roraback

WATER LEVELS : 2.4 ft bgs on 5/6/07		START : 5/22/2007		END : 5/22/2007		LOGGER : D. Roldark	
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			
-82.8	R17-NQ 5 ft 58%	42	2	125.25' - Fracture, 0-5 deg, rough, stepped, tight		Limestone 125.0-126.7' - dusky yellow to yellowish gray, (5Y 6/4 to 5Y 7/2), fine to very fine grained, strong HCl reaction, extremely weak to weak (R0 to R2), fossiliferous 126.7-127.9' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (1/16") over 1-2% of surface, cavities sparse from 126.7-127.5', becoming more common with depth No Recovery 127.9-130.0'	Water level 2' below ground surface on 5/6/07
3			125.6' - Fracture, 0-5 deg, rough, undulating, open	R17: 6 minutes			
3			126.3' - Fracture, horizontal, rough, undulating, open 126.4, 126.5' - Fractures (2), horizontal, smooth, planar, open				
NR			127.2' - Fracture, 5-10 deg, rough, undulating, tight 127.7' - Fracture, 0-5 deg, rough, stepped, semi tight 127.75-127.9' - Fracture, 45-50 deg, rough, undulating, semi tight				
130	R18-NQ 5 ft 84%	45	4	130.1' - Fracture, 10-15 deg, rough, undulating, open		Limestone 130.0-131.2' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids (1/16") over 5-10% of surface, cavities to 3/8" <5%, fossiliferous (predominantly micro-fossils), very irregular, undulatory surface 131.2-131.85' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids <1%, cavities (<1/8") over 1% surface, rock surface generally uniform (slightly undulatory), fossils absent, "silty textured" 131.85-132.2' - light olive gray, (5Y 5/2), dense, fine grained, moderate to strong HCl reaction, medium strong (R3), voids (<1/16") over 1-2% surface, cavities (3/8"x1/32") rare, fossils trace to absent 132.2-134.2' - moderate yellowish brown, (10YR 5/4), dense, moderate to strong HCl reaction, weak (R2), voids (1/16-1/8") over 5-10% of surface, cavities up to 3/8" over 2-3% of surface, fossils rare to absent, trace very dark or black carbonaceous laminae seen at 133.0-134.2' No Recovery 134.2-135.0'	SC-3 collected at 132.7-133.5'
-87.8			3	130.2' - Fracture, 5-10 deg, rough, undulating, open			R18: 5 minutes
			4	130.4-130.5' - Fracture, 30-35 deg, rough, undulating, open			
			3	130.8' - Fracture, 0-5 deg, rough, undulating, open			
			NR	131.2' - Fracture, 5-10 deg, rough, undulating, open 131.5' - Fracture, 0-5 deg, smooth, undulating, semi tight 131.9' - Fracture, horizontal, smooth, stepped 132.1' - Fracture, horizontal, rough, planar, open			
135			R19-NQ 5 ft 76%	22			
-92.8	3	132.3' - Fracture, 0-5 deg, rough, undulating, open					
	3	132.7' - Mechanical break					
	3	133.5' - Fracture, 10 deg, rough, undulating, tight					
	5	133.6-133.75' - Fracture zone, 0-50 deg, smooth to rough, planar to stepped					
	NR	133.75' - Fracture, 0-5 deg, rough, undulating, open 135.1' - Fracture, 0-60 deg, rough, stepped, open					
140	R20-NQ 5 ft 58%	20	4	135.4' - Fracture, 10 deg, smooth, stepped, open		R20: 11 minutes	
-97.8			4	135.9' - Fracture, 5 deg, smooth, stepped, tight			
			4	136.3-136.7' - Fracture, 70-75 deg, rough, undulating, tight			
			>10	136.4' - Fracture, 5-10 deg, rough, undulating, tight			
			NR	136.8' - Fracture, horizontal, rough, undulating, open 137.0' - Fracture, horizontal, rough, stepped to undulating to planar, open 137.2' - Fracture, 20 deg, rough, stepped, tight			
			NR	137.4-137.55' - Fracture, 60 deg, rough, undulating, open			
145	145.0						



ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deqhetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.4 ft bgs on 5/03/07

START : 5/2/2007

END : 5/6/2007

LOGGER : D. Roraback

APPENDIX 2BB-670



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-30A
SHEET 1 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.4 N, 458440.3 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 5-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 6.0 ft bgs on 6/12/07 START : 6/12/2007 END : 6/13/2007 LOGGER : D. Thomas

WATER LEVEL: 10.64 RESS ON 12.0'		START: 10/12/2007		END: 10/12/2007		LOGGERS: B. THOMAS	
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
42.5					See B-30 for shallow soils; no logging/coring until 25.0'		0.0-10.0': Drilled with 5-7/8" tricone bit with no sampling or coring (EZ Mud)
5							Driller's Remark: Encountered water at 6.0'
37.5							
10							Driller's Remark: Hole has deviated at 10.0'
32.5							10.0-25.0': 5" (PW) surface casing installed with rock devil bit and cleaned out with 3-7/8" tricone bit 10.0-15.0': 30 minutes to drill
15							15.0-20.0': 14 minutes to drill
27.5							
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-30A
SHEET 2 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.4 N, 458440.3 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 5-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 6.0 ft bgs on 6/12/07 START : 6/12/2007 END : 6/13/2007 LOGGER : D. Thomas

WATER LEVELS : 0.0 TDS 01/01/2007			START : 01/12/2007			END : 01/13/2007			LOGGER : D. Thomas		
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				
22.5							20.0-25.0': 4 minutes to drill				
25	25.0										
17.5		1.2	SS-1	9-19-22 (41)	Sandy Silt (ML) 25.0-26.2' - grayish orange, (10YR 7/4), moist, hard, very fine to coarse grained, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 35% very fine to coarse sand-sized, 10% fine gravel-sized, all carbonate						
	26.5										
30	30.0										
12.5		1.0	SS-2	22-16-27 (43)	Sandy Silt (ML) 30.0-31.0' - Same as 25.0-26.2'						
	31.5										
							Driller's Remark: Firm drilling, no chatter				
							Driller's Remark: Easier drilling, no chatter				
							Driller's Remark: Trip out to begin HQ rock coring				
35					Begin Rock Coring at 34.0 ft bgs See the next sheet for the rock core log						
7.5											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-30A

SHEET 3 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.4 N, 458440.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, PW casing

ORIENTATION : Vertical

WATER LEVELS : 6.0 ft bgs on 6/12/07

START : 6/12/2007

END : 6/13/2007

LOGGER : D. Thomas

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.
35 7.5	R1-HQ 3.5 ft 100%	90	1	34.05' - Fracture, <5 deg, rough, undulating, tight		Limestone 34.0-37.5' - moderate yellowish brown, with lineations of gray to dark yellowish brown, (10YR 5/4, 10YR 4/2), fine grained, mild HCl reaction, weak (R2), 1/16-1/8" pebbles in matrix where gray, 20% 1/16" voids, crumbles to silt to sand-sized particles from 34.1-34.3', cavities up to 3/4" from 35.9-37.5'	Rock coring begins at 34'
			0	34.1-34.3' - Fracture, sandy silt			
			0				
			1	36.5' - Fracture, 0-20 deg, rough, undulating			R1: 13 minutes
37.5			0			37.5-40.8' - Same as 34.0-37.5' except dark yellowish brown, (10YR 4/2), 30% voids up to 1/16" and 2" x 1" cavities at 37.7', extremely weak (R0) at 38.5-39.3', voids up to 3/16" from 40.3-40.8'	
			2	38.5-39.3' - Fracture zone, bounded by horizontal to 20 deg rough and undulating surfaces			
			2	39.4' - Fracture, rough, undulating, tight			
			0	40.2' - Fracture, 30 deg, rough, undulating			
			NR			No Recovery 40.8-42.5'	R2: 2 minutes
42.5			0			Limestone 42.5-46.5' - dusky yellow, (5YR 6/4), fine grained, mild HCl reaction, very weak (R1), 10% gray pebbles up to 1/4", 30% voids 1/16" with voids up to 3/16", many large voids are linear	
			0				
45 -2.5	R3-HQ 5 ft 80%	65	0	45.0' - Mechanical break			
			2	45.8' - Fracture, 50 deg, rough, undulating, tight to healed			
			NR	46.1' - Fracture, 50 deg, rough, undulating, tight to healed		No Recovery 46.5-47.5'	R3: 7 minutes
47.5			1	47.8' - Fracture, 75 deg, rough, undulating, stepped		Limestone 47.5-51.7' - dusky yellow to moderate yellowish brown, (5YR 6/4 to 10YR 5/4), fine grained, moderate HCl reaction, strong (R4), very weak (R1) from 48.5-48.3', 15-25% 1/16" voids decreasing to 5-10% below 49.5'	
			3	48.5, 48.8' - Fractures (2), horizontal, smooth, undulating, open			
			0	49.45' - Fracture, horizontal, smooth, undulating, open			
			1	50.6' - Mechanical break, 10 deg, rough, undulating, tight			SC-1 collected at 50.6-51.7'
			NR			No Recovery 51.7-52.5'	R4: 8 minutes
52.5			3	53.0-54.4' - Fracture or bedding plane, horizontal, rough, undulating, multiple fractures		Limestone 52.5-53.0' - Same as 47.5-51.7' except with 1/16" voids increasing to 25%	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-30A

SHEET 4 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.4 N, 458440.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, PW casing

ORIENTATION : Vertical

WATER LEVELS : 6.0 ft bgs on 6/12/07

START : 6/12/2007

END : 6/13/2007

LOGGER : D. Thomas

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.
55 -12.5	R5-HQ 5 ft 80%	50	6			Limestone 53.0-54.1' - dusky yellow to moderate yellowish brown, (5YR 6/4 to 10YR 5/4), extremely weak (R0), increasing to very weak (R1) with depth, horizontal laminations/bedding planes 1/16" thick, often fractured along organic rich zones, some infilled with silts and clays	Driller's Remark: Softer drilling at 52.5-57.5' compared to previous
			0	55.65' - Mechanical break, 10 deg, smooth, planar		54.1-56.5' - Same as 52.5-53.0' except with increasing voids to 30-40% with depth	R5: 3 minutes
			1	56.4' - Mechanical break, 60 deg			
			NR			No Recovery 56.5-57.5'	
57.5			2	57.6-57.9' - Fracture or bedding plane, horizontal, multiple fractures/bedding planes, infill of clay along one fracture		Limestone 57.5-60.3' - Same as 52.5-53.0' except strong HCl reaction, few organic laminations (minor)	
			3	58.5' - Fracture, 40 deg, rough, undulating, low angle, fracture through undulating wavy zone (3/4") of dark black organics (lignite) organics clayey and "forky" on fracture surface		throughout, extremely weak to very weak (R0 to R1) and easily broken at 59.1-60.2,	
60 -17.5	R6-HQ 5 ft 92%	47	5	59.3-60.1' - Bedding plane, multiple fractures 60.1' - sharp discontinuity between silty limestone material with organic and medium dark gray dense limestone		60.3-61.0' - light olive gray, (5YR 5/2), very fine grained, strong HCl reaction, strong (R4), 1-2" angular fragments, 5% voids (1/16")	Driller's Remark: Loss of water at 61.0' R6: 13 minutes
			2	60.4-60.9' - Fracture, limestone fragments		61.0-62.1' - yellowish gray, (5Y 7/2), very fine grained, strong HCl reaction, strong (R4), 5% voids (1/16") increasing with depth to 25% with depth, several 1/4" voids	
			1	60.9' - Fracture or mechanical break, 75 deg, rough, undulating, semi-planar		No Recovery 62.1-62.5'	
			NR	61.0' - Fracture, 60 deg, rough, undulating		Limestone 62.5-67.5' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, medium strong (R3), shallow 1/16" voids over 5%, some irregular black laminations, dark yellowish brown (10YR 4/2) and extremely weak (R0) at 65.8-65.9', extremely weak (R0) to weak (R1) from 65.9-67.5', increasingly competent with depth	SC-2 collected at 63.6- 64.9'
65 -22.5	R7-HQ 5 ft 100%	43	1	63.0' - Mechanical break, vertical, rough, non planar			
			2	63.6' - Fracture, 35 deg, rough, undulating, semi-planar			
			0	63.7' - Mechanical break, horizontal, rough, undulating			
			0	65.8' - Fracture, horizontal, carbonate silt, friable			R7: 4 minutes
			1	66.8' - Fracture, 50 deg, rough, undulating, semi-planar fracture			
67.5			2	67.5-67.7' - Fracture zone, horizontal, rough, undulating		67.5-71.5' - dark yellowish brown, (10YR 4/2), fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), friable, increasing % of 1/16" voids (up to 40%) at 68.7-71.7', fine organic laminations at 69.4' and 70.3'	
			3	68.3' - Fracture, horizontal			
			1	68.8, 68.95, 69.3, 70.0' - Bedding plane, horizontal, organics			
70 -27.5	R8-HQ 5 ft 100%	70	1	69.9' - Fracture, 10 deg, rough, undulating, open			
			1	70.9' - Fracture, friable, open			
			2	71.5-71.7' - Fracture zone, friable			R8: 10 minutes
72.5			1	72.9' - Fracture, 30 deg, rough, undulating, includes several 1/2 to 1" elongated cavities			



PROJECT NUMBER: 338884.FL	BORING NUMBER: B-30A	SHEET 5 OF 6
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.4 N, 458440.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, PW casing

ORIENTATION : Vertical

WATER LEVELS : 6.0 ft bgs on 6/12/07

START : 6/12/2007

END : 6/13/2007

LOGGER : D. Thomas

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.
75 -32.5	R9-HQ 5 ft 100%	70	0			Limestone 72.5-78.0' - light olive gray, (5Y 5/2), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), shallow 1/16" voids over 5%, 1/2" to 1" cavities, numerous small (1/8") casts/molds, extremely weak (R0) silt-sized carbonate material and trace organics at 74.6-75.3', fewer large cavities at 75.3-77.5'	R9: 9 minutes
			4	74.6, 74.8, 75.1, 75.3' - Fractures (4), horizontal, rough, undulating, open			
			2	75.7-75.9' - Fractures (2), horizontal and vertical, rough, undulating to stepped, silt-sized infilling			
			3	76.6' - Fracture, 50 deg, rough, undulating			
77.5							
			3	77.3' - Fracture, horizontal and 60 deg, rough, stepped			
			1	77.5' - Fracture, horizontal, smooth, undulating			
			0	77.6' - Fracture, horizontal, smooth, undulating, tight			
80 -37.5	R10-HQ 5 ft 92%	53	0	78.0-78.5' - angular fragment 1/2" with fines infilled		78.0-78.5' - moderate yellowish brown, (10YR 5/4), moist, mild HCl reaction	
			2	79.2' - Fracture, 30 deg, rough, undulating, tight, 1/16" relief		78.5-82.1' - moderate yellowish brown, (10YR 5/4), fine grained, strong HCl reaction, medium strong (R3), 20% 1/16" voids, fossiliferous with some cavities up to 1/2"	
			1	80.0-80.2' - Mechanical break			
			NR	80.9' - Fracture, 20 deg, rough, undulating, 3/8" relief			
82.5				81.4, 81.9' - Fractures (2), horizontal and 40 deg, rough, angular fragments to 1-1/2", open			R10: 6 minutes
			2			No Recovery 82.1-82.5'	
			0			Limestone 82.5-86.6' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), 25% 1/16" voids, many up to 1/4" cavities and 1" cavities with mold at 83.8'	Driller's Remark: Rods dropped at 84.5-85.5'
85 -42.5	R11-HQ 5 ft 82%	53	3	83.1' - Fracture, 75 deg, rough, undulating			
			3	83.2' - Fracture, 10 deg, rough, undulating, organics			
			NR	84.8, 85.1' - Fractures (3), rough, undulating, 1/16" thick, organic laminations			
				84.9' - Fracture, 30 deg			
				86.0' - Fracture, 75 deg, rough, undulating, minor black/gray staining on fracture surface			Driller's Remark: Losing fluid at 86.0-87.5'
				86.3, 86.4' - Fractures (2), horizontal, rough, undulating		No Recovery 86.6-87.5'	R11: 10 minutes Driller's Remark: Rods dropped at 87.5-87.9', rods dropped before drilling
87.5			1	87.7' - Fracture, horizontal, rough, undulating			
			2	88.5' - Fracture, horizontal, rough, undulating, iron staining		Limestone 87.5-88.7' - Same as 82.5-86.6' except yellowish gray, (5Y 7/2), with voids up to 1/4" diameter over 10% and many up to 3/4" cavities (still 10% small voids), rock becomes fractured at 88.5', fragments covered with fine grained material, no sediment infilling in molds/cavities	
90 -47.5	R12-HQ 5 ft 24%	13	NR	88.6' - Fracture, horizontal, rough, undulating		No Recovery 88.7-93.5'	Driller's Remark: Rods dropped at 90.5-92.5'
							R12: 2 minutes Driller's Remark: Difficulty setting core barrel due to sediment in drill pipe
92.5			NR				
				93.5-94.5' - Fracture, traces of lignite			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

B-30A

SHEET 6 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723272.4 N, 458440.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, PW casing

ORIENTATION : Vertical

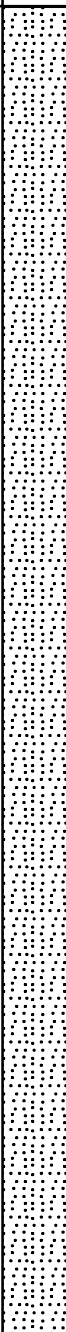
WATER LEVELS : 6.0 ft bgs on 6/12/07

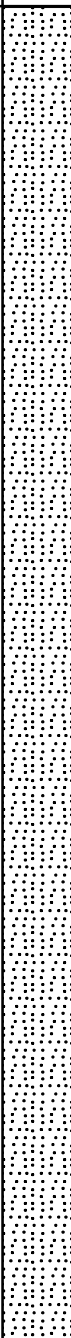
START : 6/12/2007

END : 6/13/2007

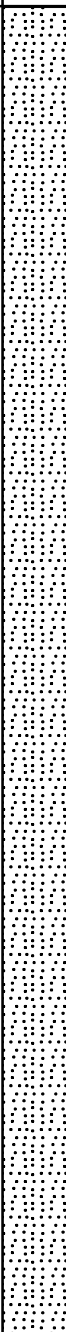
LOGGER : D. Thomas

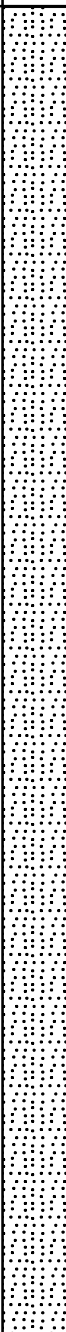
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, 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.
95 -52.5	R13-HQ 5 ft 80%	45	>10			Limestone 93.5-97.5' - yellowish gray, (5Y 5/2), fine grained, strong HCl reaction, very weak (R1), weakly cemented, friable, voids 1/16" over 10%, fossiliferous with voids/cavities from 1/4" to 1/2"	Driller's Remark: Logged hole before starting at 93.5' (6 inches past where previous run ended)
			0	94.7' - Fracture, 10 deg, rough, undulating, open			
			3	96.0, 96.2, 96.3' - Fractures (3), horizontal and 50 deg, rough, undulating, open			
			1	97.0' - Fracture, 45 deg, rough, undulating, open			R13: 1 minute
97.5			1	97.5-97.8' - Fracture, angular 1"-2" fragment		97.5-100.2' - Same as 93.5-97.5' except 1/16" voids increase to 15%, unconsolidated, silt-sized, carbonate material at 100.0-100.2'	
			2	98.9' - Fracture (2), 40 deg and vertical, rough, undulating			
100 -57.5	R14-HQ 5 ft 54%	28	5	99.4-100.0' - Fracture zone, horizontal and vertical, non planar, friable		No Recovery 100.2-105.1'	
			NR				R14: 1 minute
102.5			NR				
105 -62.5	R15-HQ 5 ft 48%	22	>10	105.1-105.8' - Fracture zone		Limestone 105.1-108.7' - pale greenish yellow, yellowish gray, (10Y 8/2, 5Y 7/2), strong HCl reaction, no voids except for one 1/16" fossil mold, extremely weak (R0) and friable at 105.8-106.3', very weak (R1) and friable with several elongate fossil molds at 106.3-108.7'	R15: 2 minutes
			>10	105.7' - Fracture, horizontal, rough, undulating, tight			
			0	106.3' - Fracture, horizontal, open, does not fit together			
107.5			2			108.7-110.8' - light olive gray, (5Y 5/2), fine grained, no to mild HCl reaction, medium strong (R3), 5% voids (1/16" in size), less consolidated (R1) at fractures from 110.0-110.4' at fractures	
			2			110.8-112.3' - Same as 108.7-110.8' except friable and broken	
110 -67.5	R16-HQ 5 ft 100%	38	4			112.3-112.5' - Same as 108.7-110.8' except with several elongate fossils	R16: 6 minutes
			>10				
			>10				
112.5						Bottom of Boring at 112.5 ft bgs on 6/13/2007	


LNP- Offest Boring Program						PROJECT NO. 07-3935		
LOG OF BORING NO. B-31								
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4	USCS SYMBOL	REMARKS
						DESCRIPTION		
	0	S-1	1-2 2 (4)	0.9		0-1.5' POORLY GRADED SAND (sp), rounded, spherical, no plasticity, no dry strength, no dilatancy, no toughness, minor amount of organics (black), no odor, no reaction to 1N HCl, fine grained, wet, pale brown (5YR 5/2), very loose.	sp	Drillers using NWJ rods. Picture mislabeled: Labeled S-2 in pictures instead of S-3.
	2	S-2	1-2 4 (6)	0.9		1.5-3.0' POORLY GRADED SAND (sp), grayish orange (10YR 7/4), rounded, spherical, fine grained, no plasticity, no dry strength, no dilatancy, no cementation, homogeneous sand, very loose, no toughness, wet, no reaction to 1N HCl.	sp	
	4	S-3	3-5 3 (8)	0.8		3.0-4.5' As above except with a root (organic), loose.	sp	
	6	S-4	3-3 6 (9)	1.0		4.5-6.0' As above except moderate brown (5YR 3/4) with a root (organic), loose.	sp	
	8	S-5	3-3 4 (7)	0.7		6.0-7.5' As above except grayish brown (5YR 3/2), loose.	sp	
	10	S-6	4-4 6 (10)	0.8		7.5-9.0' As above except grayish orange pink (5YR 7/2), loose.	sp	
	12	S-7	4-6 7 (13)	0.9		9.0-13.5' As above except medium dense.	sp	
	14	S-8	6-7 8 (15)	0.9			sp	
		S-9	5-8 8 (16)	1.0			sp	
		S-10	5-7 7 (14)	1.0		13.5-16.5' As above except grayish orange pink (5YR 7/2), weak reaction to 1N HCl.	sp	
DATE STARTED: 10/15/09					GWL: DEPTH: 6.1' DATE/TIME: 10/16/09 @ 0800		NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.	
DATE COMPLETED: 10/18/09					GWL: DEPTH: 4.9' DATE/TIME: 10/18/09 @ 1300			
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring			
CHECKED BY: JLO					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offest Boring Program						LOG OF BORING NO. B-31		PROJECT NO. 07-3935			
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4	USCS SYMBOL	REMARKS			
						DESCRIPTION					
	16	S-11	4-6 8 (14)	0.9		16.5-21.0' As above except pale yellowish brown (10YR 6/2), weak reaction to 1N HCl.	sp				
		S-12	4-8 7 (15)	0.9			sp				
	18						sp				
		S-13	7-8 9 (17)	0.9			sp				
	20	S-14	8-9 12 (21)	0.9			sp				
						21.0-25.5' As above except no reaction to 1N HCl.	sp				
	22	S-15	6-7 7 (14)	1.1			sp				
		S-16	6-6 6 (12)	0.9			sp				
	24					25.5-27.0' As above except grayish brown (5YR 3/2) changing to pale yellowish brown (10YR 6/2) at bottom, weak reaction to 1N HCl.	sp				
		S-17	8-6 7 (13)	1.0			sp				
	26	S-18	8-8 9 (17)	0.9			sp				
						27.0-30.0' As above except pale yellowish brown (10YR 6/2), no reaction to 1N HCl.	sp				
	28	S-19	7-7 9 (16)	1.3			sp				
							sp				
			8-10								
DATE STARTED: 10/15/09						GWL: DEPTH: 6.1'			NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.		
DATE COMPLETED: 10/18/09						DATE/TIME: 10/16/09 @ 0800					
FIELD GEOLOGIST: WDS						DATE/TIME: 10/18/09 @ 1300					
CHECKED BY: JLO						DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring			RIG: Failing 1500		
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody						
DRILLING CO.: HUSS											

LNP- Offest Boring Program						PROJECT NO. 07-3935		
LOG OF BORING NO. B-31								
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4	USCS SYMBOL	REMARKS
						DESCRIPTION		
	30	S-20	9 (19)	1.1		30.0-31.5' As above except pale yellowish brown (10YR 6/2) to light gray (N7).	sp	Driller switches to AWJ rods.
		S-21	7-9 9 (18)	1.4		31.5-33.0' As above except very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2), no reaction to 1N HCl.	sp	
	32	S-22	8-9 10 (19)	1.0		33.0-34.5' As above except pale yellowish brown (10YR 6/2), no reaction to 1N HCl.	sp	
	34	S-23	8-9 11 (20)	1.3		34.5-37.5' As above except very pale orange (10YR 8/2) to grayish orange (10YR 7/4), no reaction to 1N HCl.	sp	
	36	S-24	6-6 3 (9)	1.0			sp	
		S-25	4-2 3 (5)	1.4			sp	
	38	S-26	3-3 3 (6)	1.3		37.5-39.0' POORLY GRADED SAND (sp), very fine grained with very fine grain black grains, rounded, spherical, non-plastic, no dry strength, slow dilatancy, no toughness, no odor, wet, no reaction to 1N HCl, homogeneous, no cementation, very pale orange (10YR 8/2) with medium gray (N5), very loose to loose.	sp	
	40	S-27	3-2 2 (4)	1.5		39.0-40.5' Same as 34.5-37.5', very pale orange (10YR 8/2), no reaction to 1N HCl	sp	
		S-28	4-4 3 (7)	1.2		40.5-42.0' As above except with medium dark gray (N4).	sp	
	42	S-29	4-3 5 (8)	1.5		42.0-43.5' As above except very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2), loose.	sp	
						43.5-45.0' As above except very pale orange (10YR 8/2) with medium	sp	
DATE STARTED: 10/15/09						GWL: DEPTH: 6.1'		
DATE COMPLETED: 10/18/09					GWL: DEPTH: 4.9'		DATE/TIME: 10/18/09 @ 1300	
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring			NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.
CHECKED BY: JLO								
APPROVED BY:					DRILLER: Eddie Palmer		HELPER: Chad/Cody	RIG: Failing 1500
DRILLING CO.: HUSS								

LNP- Offest Boring Program						LOG OF BORING NO. B-31		PROJECT NO. 07-3935				
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4	USCS SYMBOL	REMARKS				
						DESCRIPTION						
	44	S-30	4-4 5 (9)	1.4		dark gray (N4), weak reaction to 1N HCl.						
	46	S-31	5-6 6 (12)	1.2		45.0-46.5' As above except pale yellowish brown (10YR 6/2) with medium gray (N5), weak reaction to 1N HCl, medium dense.			sp			
		48	S-32	5-5 5 (10)		1.2			46.5-48.0' As above except grayish orange (10YR 7/4) with some medium gray (N5), no reaction to 1N HCl, loose.	sp		
	50		S-33	5-5 6 (11)		0.8			48.0-54.0' As above except pale yellowish brown (10YR 6/2), medium dense.	sp		
		52	S-34	5-7 7 (14)		0.9				sp		
	54		S-35	5-6 6 (12)		0.8				sp		
		56	S-36	5-5 7 (12)		1.0				sp		
	58		S-37	6-6 5 (11)		1.5			54.0-55.5' As above except grayish orange (10YR 7/4) with medium light gray (N6) bands, no reaction to 1N HCl, medium dense.	sp		
			S-38	4-5 5 (10)		1.5			55.5-58.5' As above except with medium dark gray (N4).	sp		
			S-39	4-5 5 (10)		1.5				sp		
	DATE STARTED: 10/15/09					GWL: DEPTH: 6.1' DATE/TIME: 10/16/09 @ 0800			NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.			
	DATE COMPLETED: 10/18/09					GWL: DEPTH: 4.9' DATE/TIME: 10/18/09 @ 1300						
	FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring						
CHECKED BY: JLO												
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500					
DRILLING CO.: HUSS												

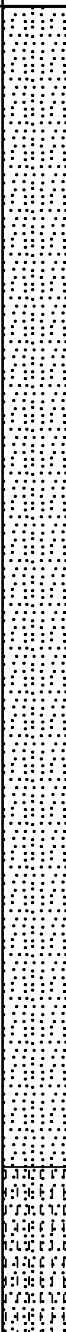
LNP- Offest Boring Program						LOG OF BORING NO. B-31		PROJECT NO. 07-3935	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4	USCS SYMBOL	REMARKS	
						DESCRIPTION			
		S-40	5-5 6 (11)	1.3		58.5-61.5' As above except very pale orange (10YR 8/2) to grayish orange (10YR 7/4).	sp	Water level 10/16/09 @ 0800 6.1'.	
	60	S-41	4-5 5 (10)	1.3			sp		
		S-42	4-5 5 (10)	1.1		61.5-63.0' As above except grayish orange (10YR 7/4) with light gray (N7) bands.	sp		
	62	S-43	5-5 6 (11)	1.1		63.0-66.0' POORLY GRADED SAND (sp), fine grained, subrounded to rounded, spherical, non-plastic, no dry strength, no dilatancy, no toughness, no odor, wet, no reaction to 1N HCl, no cementation, homogeneous, very pale orange (10YR 8/2) to grayish orange (10YR 7/4), medium dense.	sp		
	64	S-44	5-5 6 (11)	1.0			sp		
	66	S-45	4-4 5 (9)	1.2		66.0-67.5' As above except with medium light gray (N6) bands.	sp		
		S-46	3-3 2 (5)	1.4		67.5-69.0' As above except very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2).	sp		
	68	S-47	3-3 3 (6)	1.5		69.0-70.5' As above except with medium gray (N5) bands.	sp		
	70	S-48	3-3 4 (7)	1.2		70.5-72.0' As above except very pale orange (10YR 8/2) with medium gray (N5) bands.	sp		
	72	S-49	2-3 2 (5)	1.5		72.0-73.5' As above except with fine black (N1) grains.	sp		
DATE STARTED: 10/15/09					GWL: DEPTH: 6.1' DATE/TIME: 10/16/09 @ 0800		NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.		
DATE COMPLETED: 10/18/09					GWL: DEPTH: 4.9' DATE/TIME: 10/18/09 @ 1300				
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring				
CHECKED BY: JLO									
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500		
DRILLING CO.: HUSS									

LNP- Offest Boring Program						LOG OF BORING NO. B-31		PROJECT NO. 07-3935		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4		USCS SYMBOL	REMARKS	
						DESCRIPTION				
-30.1	74	S-50	2-1 1 (2)	0.1		73.5-75.0' FAT CLAY (ch), very soft, high plasticity, slow dilatancy, medium toughness, high dry strength, wet, no reaction to 1N HCl, homogeneous, with fine sand and coarse gravel, moderate yellowish brown (10YR 5/4), very soft.		ch		
-31.6	76	S-51	1-1 1 (2)	1.3		75.0-76.5' POORLY GRADED SAND (sp), as at 72.0-73.5', very loose.		sp		
	78	S-52	2-3 3 (6)	1.5	76.5-79.5' As above except very pale orange (10YR 8/2) to pale yellowish orange (10YR 6/2).		sp			
		S-53	1-2 2 (4)	1.5			sp			
	80	S-54	1-1 1 (2)	1.3	79.5-84.0' As above except moderate yellowish brown (10YR 5/4), trace silt.		sp			
	82	S-55	2-2 1 (3)	1.5			sp			
		S-56	2-2 1 (3)	1.5			sp			
	84	S-57	1-1 2 (3)	1.5	84.0-85.5' As above except moderate yellowish brown (10YR 5/4) with medium gray (N5) bands, trace silt.		sp			
	86	S-58	WOR-1 1 (2)	1.5	85.5-87.0' As above except moderate yellowish brown (10YR 5/4), trace silt.		sp			
			WOR- WOR		87.0-88.5' As above except with medium gray (N5) bands.		sp			
DATE STARTED: 10/15/09					GWL: DEPTH: 6.1' DATE/TIME: 10/16/09 @ 0800			NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.		
DATE COMPLETED: 10/18/09					GWL: DEPTH: 4.9' DATE/TIME: 10/18/09 @ 1300					
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring			RIG: Failing 1500		
CHECKED BY: JLO					DRILLER: Eddie Palmer HELPER: Chad/Cody					
APPROVED BY:										
DRILLING CO.: HUSS										

LNP- Offest Boring Program

LOG OF BORING NO. B-31


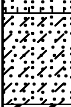


PROJECT NO. 07-3935














ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4	USCS SYMBOL	REMARKS	
						DESCRIPTION			
-57.1	88	S-59	1 (1)	1.5		88.5-90.0' As above except moderate yellowish brown (10YR 5/4).	sp	Rod advanced additional 8" before helper could stop it.	
		S-60	WOH- WOH WOH (0)	1.5					
	90					90.0-91.5' As above except pale yellowish brown (10YR 6/2), trace silt.	sp		
		S-61	1-2 2 (4)	1.3					
						91.5-93.0' As above except moderate yellowish brown (10YR 5/4) to pale yellowish brown (10YR 6/2) and medium gray (N5) bands, trace silt.	sp		
	92	S-62	1-1 2 (3)	1.2					
						93.0-94.5' As above except moderate yellowish brown (10YR 5/4), trace silt, loose.	sp		
	94	S-63	3-3 4 (7)	1.5					
		S-64	WOH- WOH WOH (0)	1.5		94.5-96.0' As above except moderate yellowish brown (10YR 5/4), with trace of medium gray (N5), very loose.	sp		
	96					96.0-99.0' As above except with medium dark gray (N4) bands, trace silt and coarse gravel (angular, hard), no reaction to 1N HCl, dark gray (N3).	sp		
		S-65	WOH- WOH WOH (0)	0.9			sp		
	98	S-66	WOH- WOH 1 (1)	1.0					
				99.0-100.5' As above except moderate yellowish brown (10YR 5/4) and medium light gray (N6), trace silt, medium dense.	sp				
100	S-67	5-7 8 (15)	1.5						
				100.5-103.5' POORLY GRADED SAND with SILT (sp-sm), fine grained sand, subrounded, spherical, low plasticity, low dry strength, no dilatancy, low toughness, no odor, wet, no reaction with 1N HCl, soft, laminated, weak cementation, olive gray (5Y 4/1) and moderate yellowish brown (10YR 5/4), medium dense.	sp-sm	Water level 10/17/09 @ 0750 0.0'			
102	S-68	1-4 6 (10)	1.1		sp-				
DATE STARTED: 10/15/09					GWL: DEPTH: 6.1' DATE/TIME: 10/16/09 @ 0800		NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.		
DATE COMPLETED: 10/18/09					GWL: DEPTH: 4.9' DATE/TIME: 10/18/09 @ 1300				
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring			RIG: Failing 1500	
CHECKED BY: JLO									
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody				
DRILLING CO.: HUSS									

LNP- Offest Boring Program

LOG OF BORING NO. B-31

PROJECT NO. 07-3935




ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4	USCS SYMBOL	REMARKS	
						DESCRIPTION			
-65.1 -66.1	104	S-69	2-2 5 (7)	1.0		103.5-108.5' As above except moderate yellowish brown (10YR 5/4).	sm		
		S-70	3-5 6 (11)	1.0			sp-sm		
	106	S-71	3-7 8 (15)	0.9		sp-sm			
		S-72	3-6 5 (11)	0.9		sp-sm			
	108	S-73	1-2 3 (5)	1.2			108.5'-109.5' POORLY GRADED SAND with CLAY (sp-sc), fine grained sand, subrounded to rounded, high plasticity, high dry strength, slow dilatancy, medium toughness, no odor, no reaction with 1N HCl, no cementation, homogeneous, dark greenish gray (5GY 4/1) and moderate yellowish brown (10YR 5/4), soft.		sp-sc
							109.5'-114.0' FAT CLAY with SAND (ch), high plasticity, high dry strength, slow dilatancy, high toughness, no odor, wet, mottled, dark greenish gray (5GY 4/1), sand- subrounded, spherical, moderate yellowish brown (10YR 5/4), very soft.		ch
	112	S-74	1-2 2 (4)	1.2			ch		
		S-75	WOH-2 2 (4)	1.5			ch		
	114	S-76	WOH- WOH WOH (0)	1.5			ch		
		S-77	WOR- WOR WOR (0)	1.5			ch		
116	S-78	WOR- WOR WOR (0)	1.5		ch	Advanced another 6" before helper stopped rod. Shortened sampled due to previous test. Driller sets casing to 115.0'.			
DATE STARTED: 10/15/09 DATE COMPLETED: 10/18/09 FIELD GEOLOGIST: WDS CHECKED BY: JLO APPROVED BY:					GWL: DEPTH: 6.1' DATE/TIME: 10/16/09 @ 0800 GWL: DEPTH: 4.9' DATE/TIME: 10/18/09 @ 1300 DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring		NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.		
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500		

LNP- Offest Boring Program						LOG OF BORING NO. B-31			PROJECT NO. 07-3935	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4	USCS SYMBOL	REMARKS		
						DESCRIPTION				
-74.6	118	S-79	WOR- WOR (0)	1.3		118.0-118.5' POORLY GRADED SAND with SILT (sp-sm), subrounded to rounded, spherical, fine grained, non-plastic, no dry strength to low dry strength, no dilatancy, low toughness, no odor, wet, no reaction to 1N HCl, homogeneous, no cementation, pale yellowish brown (10YR 6/2), very loose.	ch			
		S-80	WOR- WOR (0)	1.3		118.5-120.0' As above except moderate yellowish brown (10YR 5/4).	sp-sm			
	120	S-81	WOR- WOR (0)	1.5		120.0-123.0' As above except with medium dark gray (N5) bands.	sp-sm			
	122	S-82	WOR- WOR (0)	0.4			sp-sm			
		S-83	WOR- WOR (0)	1.0		123.0-124.5' As above except moderate yellowish brown (10YR 5/4).	sp-sm			
	124	S-84	WOR- WOR (0)	0.5		124.5-127.0' As above except very pale orange (10YR 8/2).	sp-sm			
	126	S-85	WOR- WOR (0)	0.9			sp-sm			
-83.6						127.0-127.5' SILT (ml), low to medium plasticity, medium dry strength, slow dilatancy, medium toughness, organics but no odor, wet, no reaction to 1N HCl, mottled, grayish black (N2), very soft.	ml			
-84.1		S-86	WOR- WOR (0)	0.6		127.5-129.0' POORLY GRADED SAND with SILT as at 124.5-127.0'.				
						129.0-130.5' As above except with light gray (N7) bands.	sp-sm			
	130	S-87	WOR- WOR (0)	0.7						
						130.5-132.0' As above except with trace organics-brownish black (5YR 2/1).	sp-sm			
		S-88	WOR- WOR 12 (12)	0.4						
DATE STARTED: 10/15/09					GWL: DEPTH: 6.1' DATE/TIME: 10/16/09 @ 0800			NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.		
DATE COMPLETED: 10/18/09					GWL: DEPTH: 4.9' DATE/TIME: 10/18/09 @ 1300					
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring					
CHECKED BY: JLO										
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500		
DRILLING CO.: HUSS										

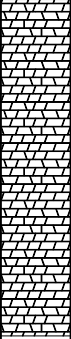
LNP- Offest Boring Program

LOG OF BORING NO. B-31

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4	USCS SYMBOL	REMARKS
						DESCRIPTION		
-89.0	132	S-89	40-50/2 (50)	0.5		132.0-132.4' As above except dark yellowish brown (10YR 4/2).	sp-sm	Run-1 Drilling Pressure: 350 psi Kelly Bar RPM: 200 Engine RPM: 1200-1300 Drill Time: 5min 22sec Circulation loss: none 0.3' of fall-in material at top of core. Water level 10/18/09 @ 0800 1.5'. 10-18-09, GWL at 1.5 bgs at 0800. Run-2: Drilling Pressure: 400-350 psi Kelly Bar RPM: 198 Engine RPM: 1200-1300 Drill Time: 3min 44sec (135.0-135.5') Driller pulls out due to jammed core barrel 4.5' of lose sand in core, above 135', due to fall in. Drill Time: 27min 46sec (135.5-140') Driller Notes: circulation loss at 137.0'. Run-3: Drilling Pressure: 350-300 psi Kelly Bar RPM: 203 Engine RPM: 1200-1300 Drill Time: 8min 29sec (140.0-141.3') Drill Time: 8min 34sec (141.3-144.0') Drill Time: 5min 18sec (144-145') Circulation loss: 100% Run-4: Drilling Pressure: 350 psi Kelly Bar RPM: 197 Engine RPM: 1200-1300 Drill Time: 11min 9sec
						TOP OF AVON PARK FORMATION 132.4-132.7' DOLOMITE, degraded, fine grained, medium to high plasticity, slow dilatancy, low toughness, no odor, moist, strong reaction to 1N HCl, firm consistency, homogeneous, weak cementation.		
	134	R-1	78% (39%)	1.8		132.7-133.8' DOLOMITE, soft, moderately weathered, unfractured, yellowish gray (5Y 8/1), thick bedded, strong reaction to 1N HCl. 133.8-135.0' DOLOMITE, moderately hard, very slightly weathered, laminated, strong reaction to 1N HCl when powdered, yellowish gray (5Y 8/1), very slightly fractured (bedding planes).		
						135.0-135.5' DOLOMITE, soft to moderately soft, severely weathered, homogeneous, weak reaction to 1N HCl, yellowish gray (5Y 8/1), intensely fractured.		
	136					135.5-137.2' DOLOMITE, moderately hard, slightly weathered, slightly pitted (pits filled with medium gray (N5) dolomite), slightly fractured (135.8', 136.6', 136.8' horizontal), yellowish gray (5Y 8/1).		
		R-2	100% (36%)	5.0		137.2-140.2' DOLOMITE, moderately hard, moderately weathered, pitted, vuggy (vugs filled with severely weathered dolomite-yellowish gray (5Y 7/2)), moderately to intensely fractured, light gray (N7), thinly laminated.		
	138					140.2-141.2' DOLOMITE, hard, fresh, strong reaction to 1N HCl, very light gray (N8), very slightly fractured, thinly laminated.		
						141.2-143.2' DOLOMITE, soft, moderately weathered, stains in fractures, intensely fractured (possible vertical fracture from, 141.2-142.5'), strong reaction to 1N HCl when powdered, thinly laminated, yellowish gray (5Y 7/2).		
	140					143.2-145.5' DOLOMITE, hard, very slightly fractured (horizontal fracture at 143.9'), weak reaction to 1N HCl, moderate reaction when powdered, laminated, yellowish gray (5Y 8/1).		
						145.5-147.8' DOLOMITE, soft to moderately soft, slightly fractured (horizontal), weak reaction to 1N HCl, moderate to strong reaction when powdered, very thinly laminated, light olive gray (5Y 6/1) with		

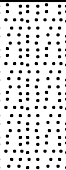

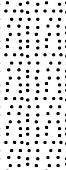
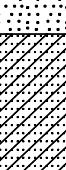


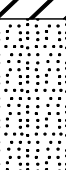
DATE STARTED: 10/15/09		GWL: DEPTH: 6.1'		DATE/TIME: 10/16/09 @ 0800		NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/09.
DATE COMPLETED: 10/18/09		GWL: DEPTH: 4.9'		DATE/TIME: 10/18/09 @ 1300		
FIELD GEOLOGIST: WDS		DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring				
CHECKED BY: JLO		DRILLER: Eddie Palmer HELPER: Chad/Cody				RIG: Failing 1500
APPROVED BY:						
DRILLING CO.: HUSS						

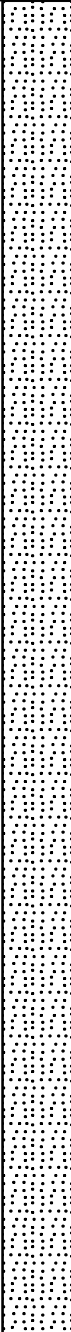
LNP- Offest Boring Program						LOG OF BORING NO. B-31		PROJECT NO. 07-3935		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724391.9 E 457978.0 SURFACE EL: 43.4		USCS SYMBOL	REMARKS	
						DESCRIPTION				
-106.6	148	R-4	100% (86%)	5.0		yellowish gray (5Y 8/1) layers. 147.8-150.0' DOLOMITE, moderately hard to hard, slightly fractured (horizontal at 148.1' and 148.3'), thick bedded, yellowish gray (5Y 8/ 1).			Circulation loss: 100% Final water level 10/18/ 09 @ 1300 4.9'.	
	150					BOTTOM OF BORING 150'				
	152									
	154									
	156									
	158									
	160									
DATE STARTED: 10/15/09 DATE COMPLETED: 10/18/09 FIELD GEOLOGIST: WDS CHECKED BY: JLO APPROVED BY:					GWL: DEPTH: 6.1' DATE/TIME: 10/16/09 @ 0800 GWL: DEPTH: 4.9' DATE/TIME: 10/18/09 @ 1300 DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3Coring				NOTES: Energy Testing completed with NWJ and AWJ rods on 10/15/ 09.	
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody RIG: Failing 1500					

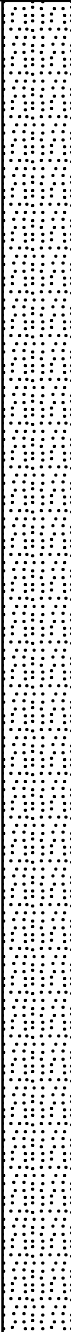
LNP- Offset Boring Program

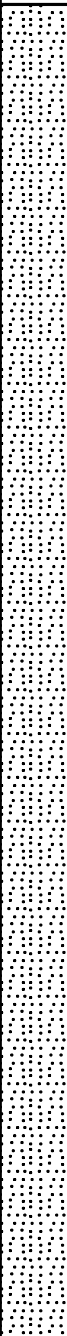
LOG OF BORING NO. B-33

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0	USCS SYMBOL	REMARKS
						DESCRIPTION		
38.3 37.0 34.0	0	S-1	2-2 6 (8)	0.7		0.0-1.5' POORLY GRADED SAND (sp), fine grained, no plasticity, no dry strength, rapid dilatancy, low toughness, medium light gray (N6) to medium dark gray (N4), weak reaction to 1N HCl, loose.	sp	
	1.5					1.5-4.7' Same as above except dark yellowish orange (10YR 6/6) to very pale orange (10YR 8/2), subangular to rounded grains.	sp	
	3	S-2	5-6 9 (15)	0.9			sp	
	4.5							
	4.5	S-3	5-7 6 (13)	0.8				
	6							
	6	S-4	3-2 2 (4)	1.2		4.7-6.0' CLAYEY SAND (sc), 60% sand, 40% silt, sand-fine grained, subrounded to rounded grains, low plasticity, medium dry strength, slow dilatancy, low toughness, light gray (N7), with dark greenish gray (5G 4/1) to greenish black (5GY 2/1)-possible lignite pocket, no odor, no reaction to 1N HCl, soft.	sp sc	
	7.5							
7.5	S-5	3-4 5 (9)	1.0		6.0-7.5' FAT CLAY with SAND (ch), 80% clay, 20% fine grained sand, medium to high plasticity, medium to high dry strength, medium toughness, light gray (N7) to light bluish gray (5B 7/1), weak to moderate reaction to 1N HCl, medium stiff.	ch		
9								
9	S-6	2-3 4 (7)	1.0		7.5-9.0' FAT CLAY (ch), high plasticity, high dry strength, slow to no dilatancy, medium toughness, light bluish gray (5B 7/1) to greenish gray (5G 6/1), weak reaction to 1N HCl (mainly few calcareous pieces, coarse sand size), medium stiff.	ch		
10.5								
		S-7	6-7 10 (17)	0.8		9.0' POORLY GRADED SAND (sp), fine grained, subrounded to rounded grains, no plasticity, no dry strength, rapid dilatancy, low toughness, yellowish gray (5Y 8/1) to white (N9), weak to moderate reaction to 1N HCl, medium dense.	sp	
						Same as above.	sp	
DATE STARTED: 11/3/09					GWL: DEPTH: 6.5' DATE/TIME: 11/4/09 @ 0745		NOTES: Used NWJ rods for SPT sampling.	
DATE COMPLETED: 11/5/09					GWL: DEPTH: 8.7' DATE/TIME: 11/5/09 @ 0745			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offset Boring Program						LOG OF BORING NO. B-33			PROJECT NO. 07-3935	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0		USCS SYMBOL	REMARKS	
						DESCRIPTION				
		S-8	4-6 6 (12)	0.8						
	12					Same as above.		sp		
		S-9	3-6 7 (13)	0.9						
	13.5					Same as above.		sp		
		S-10	4-5 7 (12)	1.1						
	15					Same as above.		sp		
		S-11	4-5 7 (12)	1.0						
	16.5					Same as above except with very fine grained black grains, loose.		sp		
		S-12	3-6 4 (10)	1.1						
	18					POORLY GRADED SAND (sp), fine grained, subangular to rounded grains, well sorted, no plasticity, no dry strength, rapid dilatancy, low toughness, yellowish gray (5Y 8/1), weak reaction to 1N HCl, loose.		sp		
		S-13	3-4 6 (10)	0.9						
	19.5					Same as above except medium dense.		sp		
		S-14	2-5 8 (13)	1.0						
	21					Same as above except yellowish gray (5Y 8/1) to pale yellowish brown (10YR 6/2).		sp		
		S-15	4-5 8 (13)	0.9						
DATE STARTED: 11/3/09					GWL: DEPTH: 6.5' DATE/TIME: 11/4/09 @ 0745			NOTES: Used NWJ rods for SPT sampling.		
DATE COMPLETED: 11/5/09					GWL: DEPTH: 8.7' DATE/TIME: 11/5/09 @ 0745					
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring					
CHECKED BY: WDS										
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500		
DRILLING CO.: HUSS										

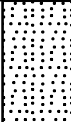
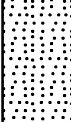










LNP- Offset Boring Program						LOG OF BORING NO. B-33		PROJECT NO. 07-3935		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0	USCS SYMBOL	REMARKS		
						DESCRIPTION				
	22.5	S-16	4-4 7 (11)	1.2		Same as above.	sp			
	24	S-17	4-5 7 (12)	1.1		Same as above.	sp			
	25.5	S-18	7-6 5 (11)	1.5		Same as above except light brownish gray (5YR 6/1).	sp			
	27	S-19	3-2 2 (4)	1.5		POORLY GRADED SAND (sp), fine grained, well sorted, no plasticity, no dry strength, rapid dilatancy, low toughness, yellowish gray (5Y 8/1), no reaction to 1N HCl, very loose.	sp			
	28.5	S-20	2-3 2 (5)	1.4		Same as above except yellowish gray (5Y 8/1) to light brownish gray (5YR 6/1).	sp			
	30	S-21	2-2 1 (3)	1.4		Same as above.	sp			
	31.5	S-22	1-1 1 (2)	1.4		Color change at 31.3' to yellowish gray (5Y 8/1), moist, not saturated as above. Same as above.	sp			
DATE STARTED: 11/3/09 DATE COMPLETED: 11/5/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:						GWL: DEPTH: 6.5' DATE/TIME: 11/4/09 @ 0745 GWL: DEPTH: 8.7' DATE/TIME: 11/5/09 @ 0745 DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			NOTES: Used NWJ rods for SPT sampling.	
DRILLING CO.: HUSS						DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500	

LNP- Offset Boring Program						LOG OF BORING NO. B-33		PROJECT NO. 07-3935	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0	USCS SYMBOL	REMARKS	
						DESCRIPTION			
	33	S-23	1-1 1 (2)	1.3		Same as above.	sp	Water level 11/4/09 @ 0745 6.5'.	
	34.5					Same as above.	sp		
		S-24	1-1 WOR (1)	1.4					
	36					POORLY GRADED SAND (sp), fine grained, well sorted, subangular to rounded grains, no plasticity, no dry strength, rapid dilatancy, low toughness, yellowish gray (5Y 8/1), weak to moderate reaction to 1N HCl, very loose.	sp		
		S-25	2-1 1 (2)	1.5					
	37.5					Same as above except no reaction to 1N HCl.	sp		
		S-26	1-1 1 (2)	1.5					
	39					Same as above.	sp		
		S-27	2-1 1 (2)	1.3					
	40.5				Same as above except with very fine grained black grains (10-15%).	sp			
		S-28	WOH- WOH 1 (1)	1.5					
	42				Same as above.	sp			
		S-29	1-WOH WOH (0)	1.5					
	43.5				Same as above.	sp			
DATE STARTED: 11/3/09					GWL: DEPTH: 6.5'		DATE/TIME: 11/4/09 @ 0745		NOTES: Used NWJ rods for SPT sampling.
DATE COMPLETED: 11/5/09					GWL: DEPTH: 8.7'		DATE/TIME: 11/5/09 @ 0745		
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring				
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody				RIG: Failing 1500
APPROVED BY:									
DRILLING CO.: HUSS									

LNP- Offset Boring Program

LOG OF BORING NO. B-33

PROJECT NO. 07-3935

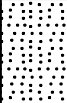







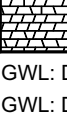
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0	USCS SYMBOL	REMARKS	
						DESCRIPTION			
		S-30	WOR- WOR WOR (0)	1.0					
	45								
		S-31	WOR- WOR WOR (0)	1.3		POORLY GRADED SAND (sp), fine grained, well sorted, subrounded to rounded grains, no plasticity, no dry strength, rapid dilatancy, low toughness, yellowish gray (5Y 8/1), very loose, trace (5-10%) very fine black grains, no reaction to 1N HCl.	sp		
-3.5	46.5					46.5-46.8' FAT CLAY (ch), high plasticity, high dry strength, no dilatancy, medium to high toughness, light gray (N7) to medium light gray (N6), no reaction to 1N HCl, medium stiff, trace fine grained calcareous grains.	ch		
-3.8		S-32	3-5 5 (10)	1.3		46.8-47.5' POORLY GRADED SAND with CLAY (sp-sc), 90% fine grained sand, 10% fat clay, subangular to rounded grains, medium plasticity, medium to high dry strength, slow dilatancy, medium toughness, no reaction to 1N HCl, dark yellowish orange (10YR 6/6) to dusky yellowish brown (10YR 2/2), medium stiff.	sp-sc		
-4.5						47.5-47.8' FAT CLAY (ch) as at 46.5-46.8'.	ch		
-4.8	48					47.8-48.0' POORLY GRADED SAND with CLAY (sp-sc) as above except pale yellowish brown (10YR 6/2) to light olive gray (5Y 6/1).	sp-sc		
-5.7		S-33	5-5 5 (10)	1.5		48.0-48.7' POORLY GRADED SAND with CLAY (sp-sc) as above except light gray (N7) to greenish gray (5G 6/1).			
	49.5					48.7-51.0' POORLY GRADED SAND (sp), fine grained, subrounded to rounded grains, well sorted, no plasticity, no dry strength, rapid dilatancy, low toughness, very light gray (N8) to light greenish gray (5G 8/1), no reaction to 1N HCl, loose, trace very fine grained black grains.			
-8.0	51		2-6 2 (8)	1.5		51-51.9' CLAYEY SAND (sc), 60% fine grained sand, subrounded to rounded grains, 40% clay, medium to high plasticity, medium to high dry strength, slow to no dilatancy, low toughness, light gray (N7) to light bluish gray (5B 7/1), no reaction to 1N HCl, stiff.	sc		
-8.9		S-35	3-6 9 (15)	1.4		51.9-53.2' POORLY GRADED SAND (sp), fine grained, subrounded to rounded grains, no plasticity, no dry strength, rapid dilatancy, low toughness, medium light gray (N6) to greenish gray (5G 6/1), no reaction to 1N HCl, medium dense.	sp		
	52.5								
-10.2		S-36	3-4 8 (12)	1.5		53.2-54.9' CLAYEY SAND (sc) as at 51-51.9'.	sc		
	54								
		S-37	6-7 7	1.3					
DATE STARTED: 11/3/09					GWL: DEPTH: 6.5' DATE/TIME: 11/4/09 @ 0745			NOTES: Used NWJ rods for SPT sampling.	
DATE COMPLETED: 11/5/09					GWL: DEPTH: 8.7' DATE/TIME: 11/5/09 @ 0745				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring				
CHECKED BY: WDS									
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500	
DRILLING CO.: HUSS									

LNP- Offset Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. B-33

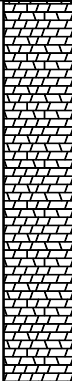
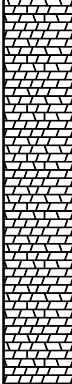
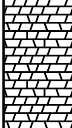
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0	USCS SYMBOL	REMARKS	
						DESCRIPTION			
-11.9			(14)			54.9-55.5' POORLY GRADED SAND (sp), trace clay, subrounded to rounded grains, fine grained, low plasticity, low dry strength, rapid dilatancy, low toughness, light olive gray (5Y 6/1) to medium bluish gray (5B 5/1), no reaction to 1N HCl, medium dense, well sorted. Same as above except loose.	sp		
	55.5	S-38	2-3 5 (8)	1.5			sp		
	57					Same as above.	sp		
		S-39	1-2 3 (5)	1.2					
	58.5					Same as above except medium bluish gray (5B 5/1) to greenish gray (5G 6/1).	sp		
		S-40	1-5 4 (9)	1.4					
	60					Same as above.	sp		
		S-41	1-5 7 (12)	1.0					
	61.5					Same as above except light olive gray (5Y 6/1).	sp		
		S-42	3-7 9 (16)	1.0					
	63					POORLY GRADED SAND (sp), fined grained, subrounded to rounded grains, well sorted, no plasticity, no dry strength, rapid dilatancy, low toughness, medium gray (N5) and dark yellowish orange (10YR 6/6) to moderate yellowish brown (10RY 5/4), no reaction to 1N HCl, medium dense.	sp		
		S-43	2-6 6 (12)	0.8					
	64.5					Same as above except yellowish gray (5Y 8/1) to light olive gray (5Y 6/1), loose.	sp		
		S-44	2-3 4 (7)	1.3					
DATE STARTED: 11/3/09					GWL: DEPTH: 6.5' DATE/TIME: 11/4/09 @ 0745			NOTES: Used NWJ rods for SPT sampling.	
DATE COMPLETED: 11/5/09					GWL: DEPTH: 8.7' DATE/TIME: 11/5/09 @ 0745				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring				
CHECKED BY: WDS									
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500	
DRILLING CO.: HUSS									

LNP- Offset Boring Program						PROJECT NO. 07-3935			
LOG OF BORING NO. B-33									
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0	USCS SYMBOL	REMARKS	
						DESCRIPTION			
-23.7 -24.1 -24.5 -26.7 70.5 -29.3	66	S-45	5-10 15 (25)	1.3		66.0-66.7' Same as above.	sp		
						66.7'-	sc		
						66.7-67.1' CLAYEY SAND (sc), 20% high plasticity clay, 80% fine grained sand, subrounded to rounded grains, low to medium dry strength, slow dilatancy, low toughness, medium gray (N5), no reaction to 1N HCl, medium dense.	sp		
		67.1'-	sc						
	67.5	S-46	14-23 33 (56)	0.6		67.1-67.5' POORLY GRADED SAND (sp) as above.			
						67.5-69.7' CLAYEY SAND (sc) as above except yellowish gray (5Y 8/1) to light olive gray (5Y 6/1).			
	69								
			S-47	13-9 7 (16)	1.5		69.7-70.5' FAT CLAY (ch), medium to high plasticity, high dry strength, no dilatancy, medium toughness, olive black (5Y 2/1), no reaction to 1N HCl, stiff.		ch
		70.5	S-48	13-50/3 (50)	0.75		Same as above.		ch
	72	S-49	21-10 2 (12)	0.5		72.0-72.3' FAT CLAY (ch) as above.	ch		
	73.5	S-50	50/1 (50)	0.0		72.3-75.0' Degraded DOLOMITE, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), severely weathered, soft to very soft, moderate to strong reaction to 1N HCl, silty texture.			
	75					75.0-75.5' DOLOMITE, hard, very pale orange (10YR 8/2) to grayish orange (10YR 7/4), moderately fractured, thin to medium bedded, weak reaction to 1N HCl, fresh to slightly weathered, some pits, few vugs, some very thin possibly healed fractures infilled with black material.			
	76.5					75.5-76.1' DOLOMITE, severely weathered to degraded, very soft, 40% dolomite gravel, 60% silt (totally weathered dolomite), moderate yellowish brown (10YR 5/4), no plasticity, low dry strength, low toughness.			
						76.1-80.0' DOLOMITE, moderately hard, slightly weathered.			
DATE STARTED: 11/3/09					GWL: DEPTH: 6.5' DATE/TIME: 11/4/09 @ 0745		NOTES: Used NWJ rods for SPT sampling.		
DATE COMPLETED: 11/5/09					GWL: DEPTH: 8.7' DATE/TIME: 11/5/09 @ 0745				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring		RIG: Failing 1500		
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody				
APPROVED BY:									
DRILLING CO.: HUSS									

LNP- Offset Boring Program

LOG OF BORING NO. B-33

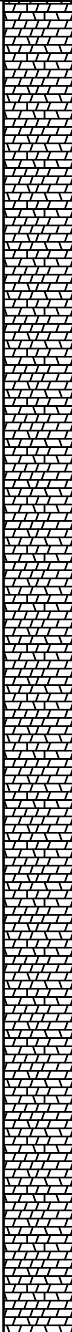
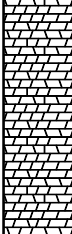
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0	USCS SYMBOL	REMARKS	
						DESCRIPTION			
	78	R-1	98% (16%)	4.9		moderately fractured (vertical fracture 77-79.5'), pitted, few vugs, thick bedded, no fossils, weak reaction to 1N HCl when powdered, pale yellowish brown (10YR 6/2).			
	79.5								
	81					80.0-85.0' DOLOMITE, as above except unfractured.		Run-2: Drilling Pressure: 200 psi Kelly Bar RPM: 221 Engine RPM: 1400-1500 Drill Time: 20min 9sec Circ. Loss: None	
	82.5	R-2	90% (78%)	4.5		83.5-84.4' Soft zone, intensely fractured.			
	84								
	85.5					85.0-87.7' DOLOMITE, moderately hard, strong reaction to 1N HCl when powdered, medium bedded, slightly to moderately weathered in zones/bands, pitted, some vugs, moderately fractured (horizontal-bedding planes only), medium light gray (N6).		Run-3: Drilling Pressure: 150 psi Kelly Bar RPM: 222 Engine RPM: 1400-1500 Drill Time: 50min 6sec Circ. Loss: None Water Level 11/5/09 @ 0745 8.7' NOTE: Added extra core from R-4 to R-3, recalculated recovery and RQD.	
	87	R-3	100% (70%)	5.0					
DATE STARTED: 11/3/09					GWL: DEPTH: 6.5' DATE/TIME: 11/4/09 @ 0745			NOTES: Used NWJ rods for SPT sampling.	
DATE COMPLETED: 11/5/09					GWL: DEPTH: 8.7' DATE/TIME: 11/5/09 @ 0745				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring				
CHECKED BY: WDS									
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500	
DRILLING CO.: HUSS									

LNP- Offset Boring Program

LOG OF BORING NO. B-33


PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0	USCS SYMBOL	REMARKS
						DESCRIPTION		
	88.5	R-4	100% (54%)	5.0		87.7-91.0' DOLOMITE, moderately hard to hard, moderate to strong reaction to 1N HCl when powdered, thick bedded, fresh to slightly weathered, slightly fractured (1 horizontal fracture at 88'), some fossils, fine grained, some pits (decreasing abundance with depth), yellowish gray (5Y 8/1).		Run-4: Drilling Pressure: 250 psi Kelly Bar RPM: 204 Engine RPM: 1200-1300 Drill Time: 17min 8sec Circ. Loss: None
	90					91.0-95.0' DOLOMITE, moderately hard to moderately soft, strong reaction to 1N HCl, when powdered, thick bedded, slightly weathered, pitted/porous, slightly fractured, some fossils, yellowish gray (5Y 8/1) to light olive gray (5Y 6/1), few vugs (weathered-out fossils).		
	91.5							
	93							
	94.5		94.5-95.0' Friable with very thin black organic lenses.	Run-5: Drilling Pressure: 250-300 psi Kelly Bar RPM: 213 Engine RPM: 1300-1400 Drill Time: 10min 55sec Circ. Loss: None				
			95.0-100.0' DOLOMITE same as 91.0-95.0'. 95.0-96.2' Vertical fracture, intensely fractured.					
	96							
	97.5	R-5	100% (68%)	5.0				
DATE STARTED: 11/3/09					GWL: DEPTH: 6.5' DATE/TIME: 11/4/09 @ 0745		NOTES: Used NWJ rods for SPT sampling.	
DATE COMPLETED: 11/5/09					GWL: DEPTH: 8.7' DATE/TIME: 11/5/09 @ 0745			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring		RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody			
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offset Boring Program

PROJECT NO. 07-3935





LOG OF BORING NO. B-33

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724328.8 E 457955.2 SURFACE EL: 43.0	USCS SYMBOL	REMARKS
						DESCRIPTION		
-57.0	99					98.7-99.4' Intensely fractured.		
						BOTTOM OF BORING 100'		
	100.5							
	102							
	103.5							
	105							
	106.5							
	108							
	109.5							
DATE STARTED: 11/3/09					GWL: DEPTH: 6.5' DATE/TIME: 11/4/09 @ 0745			NOTES: Used NWJ rods for SPT sampling.
DATE COMPLETED: 11/5/09					GWL: DEPTH: 8.7' DATE/TIME: 11/5/09 @ 0745			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500
DRILLING CO.: HUSS								



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-01
SHEET 1 OF 7	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724860.4 N, 455975.6 E (NAD83)
 ELEVATION : 43.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 9.5 ft bgs on 12/3/07 START : 12/2/2007 END : 12/3/2007 LOGGER : T. Borton, J. Schaeffer

WATER LEVELS : 9.510050 ft 12/3/07		START : 12/2/2007		END : 12/3/2007		LOGGERS : 1. Dutton, J. Schaefer	
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)						
43.4	0.0	1.1	SS-1	1-1-2 (3)	Topsoil 0.0-0.25' - 80-90% organics Poorly Graded Sand (SP) 0.25-1.1' - very light gray, white and light brownish gray, (N8, N9 and 5YR 6/1), dry to moist, very loose, very fine to fine grained, silica sand, 15% organics, trace nonplastic fines		
	1.5						
5	5.0						
38.4		1.0	SS-2	2-3-4 (7)	Sandy Lean Clay (CL) 5.0-5.3' - mottled very light gray, grayish yellow, and dark yellowish orange, (N8, 5Y 8/4, and 10YR 6/6), moist, medium stiff, medium plasticity, slow dilatancy, 25-30% very fine silica sand Silty Sand (SM) 5.3-6.0' - pale yellowish brown to dark yellowish brown, (10YR 6/2 to 10YR 9/2), wet, loose, very fine to fine grained, 20% nonplastic fines		
	6.5						
10	10.0						
33.4		0.9	SS-3	3-5-6 (11)	Interbedded Poorly Graded Sand And Silt (SP-SM) 10.0-10.85' - very pale orange, pale yellowish brown, dark yellowish brown, (10YR 8/2, 10YR 6/2, 10YR 4/2), wet, medium dense, very fine to fine grained, 5-15% nonplastic fines, varies in beds		
	11.5						
15	15.0						
28.4		1.0	SS-4	3-4-5 (9)	Poorly Graded Sand With Silt (SP-SM) 15.0-16.0' - pale yellowish brown, (10YR 6/2), wet, loose, very fine to fine grained, silica sand, 10% nonplastic fines		
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-01
SHEET 2 OF 7	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724860.4 N, 455975.6 E (NAD83)
 ELEVATION : 43.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 9.5 ft bgs on 12/3/07 START : 12/2/2007 END : 12/3/2007 LOGGER : T. Borton, J. Schaeffer

WATER LEVELS : 9.5 TDS ON 12/3/07		START : 12/2/2007		END : 12/3/2007		LOGGERS : T. Dutton, J. Schaefer	
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		
23.4	20.0	1.1	SS-5	6-5-5 (10)	Silty Sand (SM) 20.0-21.05' - Same as 15.0-16.0' except 15-20% nonplastic fines		
	21.5						
25	25.0						
18.4		0.9	SS-6	3-4-6 (10)	Poorly Graded Sand With Silt (SP-SM) 25.0-25.9' - very pale orange, pale yellowish brown, (10YR 8/2, 10YR 6/2), wet, loose, very fine to fine grained, silica sand, 7% nonplastic fines		
	26.5						
30	30.0						
13.4		1.1	SS-7	4-4-6 (10)	Silty Sand (SM) 30.0-31.05' - very light gray, (N8), moist to wet, loose, very fine to fine grained, silica sand, 15-20% nonplastic fines, trace organics		
	31.5						
35	35.0						
8.4		1.2	SS-8	2-2-2 (4)	Silty Sand (SM) 35.0-36.2' - Same as 30.0-31.05' except very loose		
	36.5						
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-01
SHEET 3 OF 7	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	



PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724860.4 N, 455975.6 E (NAD83)
 ELEVATION : 43.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 9.5 ft bgs on 12/3/07 START : 12/2/2007 END : 12/3/2007 LOGGER : T. Borton, J. Schaeffer

WATER LEVELS : 9.5 ft bgs on 12/3/07		START : 12/2/2007		END : 12/3/2007		LOGGERS : T. Burton, J. Schaefer	
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
3.4	40.0	1.5	SS-9	3-5-5 (10)	Sandy Fat Clay (CH) 40.0-41.5' - very light gray to medium light gray, (N8 to N6), wet, medium stiff, medium to high plasticity, slow dilatancy, 40-45% very fine to fine silica sand		Driller's Remark: Change in drilling at 44.5' (stiffer)
	41.5						
45	45.0						
-1.6		1.5	SS-10	5-8-9 (17)	Fat Clay (CH) 45.0-45.3' - yellowish gray, (5Y 8/1), moist, medium stiff, high plasticity, no to slow dilatancy, no HCl reaction		
	46.5						
					Fat Clay With Sand (CH) 45.3-46.3' - mottled very light gray and light bluish gray, (N8 and 5B 7/1), moist, medium stiff, high plasticity, no to slow dilatancy, mild HCl reaction, fine to coarse grained particles are both angular carbonate grains and rounded black and brown grains		
					Fat Clay With Poorly Graded Sand (CH) 46.3-46.4' - light greenish gray, (5 G 8/1), moist, medium stiff, high plasticity, no dilatancy, no HCl reaction, 1/2" lens of very fine fine silica sand at 46.5'		
50	50.0				Fat Clay (CH) 46.4-46.5' - brownish gray, (5Y 8/1), moist to wet, medium stiff, high plasticity, no dilatancy, no HCl reaction		
-6.6		1.5	SS-11	4-4-3 (7)	Silty Sand With Fat Clay (SM) 50.0-51.5' - yellowish gray, (5Y 7/2), wet, loose, very fine to fine grained, no HCl reaction, silica sand, 20-25% nonplastic to low plastic fines (amount and plasticity vary with depth), fat clay (CH) lenses occur up to 1/4" thick from 50.0-51.3' light bluish gray (5B 7/1), highly plastic, no HCl reaction		
	51.5						
55	55.0						
-11.6		1.5	SS-12	1-2-4 (6)	Silty Sand With Clay (SM) 55.0-56.5' - yellowish gray, (10YR), wet, loose, very fine to fine grained, 20-30% nonplastic to low plastic fines, 15% of sample consists of 1/2" to 1", sandy fat clay (CH) lenses, same as 50.0-51.5', no HCl reaction in clay materials		
	56.5						
60							



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-01
SHEET 4 OF 7	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724860.4 N, 455975.6 E (NAD83)
 ELEVATION : 43.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 9.5 ft bgs on 12/3/07 START : 12/2/2007 END : 12/3/2007 LOGGER : T. Borton, J. Schaeffer

WATER LEVELS : 9.5 ft bgs on 12/3/07			START : 12/2/2007			END : 12/3/2007			LOGGERS : T. Dutton, J. Schaefer		
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)							
-16.6	60.0	1.4	SS-13	3-4-6 (10)	Interbedded Clayey Sand And Fat Clay (SC-CH) 60.0-60.6' - Same as 50.0-51.5 and 55.0-56.5' except 60% clayey sand (SC), mottled yellowish gray and light olive gray (5YR 7/2 and 5Y 5/2), moist, loose, very fine to fine grained, 35% medium plastic fines, 40% fat clay (CH), pale green (10G 6/2), moist, medium stiff, highly plastic, no dilatancy, no HCl reaction Organic Soil (OL) 60.6-61.0' - dusky brown, (5YR 2/2), moist, medium stiff, medium plasticity, slow dilatancy, shiny, flaky appearance, 1/4" sand lens at 60.9' Silty Sand With Organics (SM) 61.0-61.4' - light olive gray, (5Y 5/2), wet, loose, fine grained, 20% nonplastic fine organics, 1/2" lens of sandy organic soil (OL) at 61.3-61.4' 25% fine silica sand, no HCl reaction No Recovery At 65.0'			Driller's Remark: Hard at 64.0'			
	61.5										
65	65.0	0.0	SS-14	50/0 (50/0")				Switch to 2-7/8" tricone bit at 65.0'			
-21.6	65.0										
70	70.0	1.5	SS-15	22-16-19 (35)	Silty Sand And Limestone Fragments (SM) 70.0-71.5' - yellowish gray, (5Y 7/2), wet, dense, fine to coarse grained, 25% low plastic fines, 40-45% fine gravel-sized limestone fragments, strong HCl reaction						
-26.6	71.5										
75	75.0	0.0	SS-16	50/0 (50/0")	No Recovery At 75.0' few limestone fragments						
-31.6	75.0										
80											



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-01
SHEET 5 OF 7	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724860.4 N, 455975.6 E (NAD83)
 ELEVATION : 43.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 9.5 ft bgs on 12/3/07 START : 12/2/2007 END : 12/3/2007 LOGGER : T. Borton, J. Schaeffer

WATER LEVELS : 9.51 RDS ON 12/3/07		START : 12/2/2007		END : 12/3/2007		LOGGER : T. Dutton, J. Schaefer	
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		
-36.6	80.0	1.1	SS-17	4-46-50/1 (96/7")	Sandy Silt And Limestone Fragments (ML) 80.0-81.1' - grayish yellow, (5Y 8/4), wet, fine to coarse grained, rapid dilatancy, strong to very strong HCl reaction, 20-25% fine to coarse carbonate sand, 45-55% limestone fragments to 1" subangular, strong to very strong HCl reaction Begin Rock Coring at 81.0 ft bgs See the next sheet for the rock core log		Switch to rock coring at 81.0'
	81.1						
			</				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

CT-01

SHEET 6 OF 7

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724860.4 N, 455975.6 E (NAD83)

ELEVATION : 43.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, NQ tools, NW casing




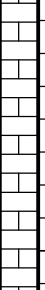
ORIENTATION : Vertical

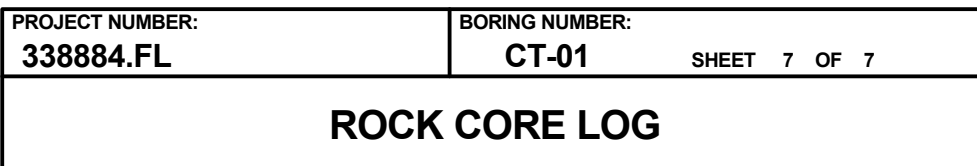
WATER LEVELS : 9.5 ft bgs on 12/3/07

START : 12/2/2007

END : 12/3/2007

LOGGER : T. Borton, J. Schaeffer

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 -41.6	81.0	R1-NQ 5 ft 66%	17	3		Limestone 81.0-84.3' - yellowish gray, (5Y 7/2), fine to coarse grained, strong HCl reaction, very weak (R1), voids to 1" (predominately <1/16") approximately 20% of core, fossiliferous (casts and molds)	Begin rock coring at 81.0'	
				>10				
				>10				
				1				
				NR				
	86.0	R2-NQ 5 ft 100%	78	>10		No Recovery 84.3-86.0'		
				2				
				1				
				0				
				3				
90 -46.6	91.0	R3-NQ 5 ft 92%	35	5		91.0-92.35' - grayish yellow, (5Y 8/4), fine to coarse grained, strong HCl reaction, very weak to weak (R1 to R2), voids to <1/6", 5-15% of core		
				3				
				1				
				>10				
				>10				
	96.0	NR	92.35-92.5' - Fracture or bedding plane, <5 deg, smooth, planar, fine infilling 93.75, 94.1' - Mechanical break (2), <5 deg, rough, undulating, tight 94.5-95.6' - Fracture zone, no visible orientation, fragments to 2" angular, dark gray to black staining on some fragments	Sandy Fat Clay (CH) 92.35-92.5' - light olive gray, (5Y 5/2), moist, high plasticity, no dilatancy				
			Limestone 92.5-93.5' - Same as 91.0-92.35' 93.5-95.6' - Same as 91.0-92.35' except medium to coarse grained, voids to <1/16" approximately 15-25% of core					
95 -51.6	R4-NQ 5 ft 100%	33	1		No Recovery 95.6-96.0' Limestone 96.0-101.0' - yellowish gray to grayish yellow, (5Y 7/2 to 5Y 8/4), fine to coarse grained, strong HCl reaction, very weak to medium strong (R1 to R3), fining with depth, voids to <1/16" 5-10% of core			
			2					
			2					
			2					
			2					
100 -56.6	101.0							



ELEVATION : 43.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

WATER LEVELS : 9.5 ft bgs on 12/3/07

START : 12/2/2007

END : 12/3/2007

LOGGER : T. Borton, J. Schaeffer

APPENDIX 2BB-704



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-02	SHEET 1 OF 4
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724719.3 N, 456342.2 E (NAD83)

ELEVATION : 42.3 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 : 6.1 ft bgs on 11/30/07

START : 11/29/2007

END : 12/1/2007

LOGGER : D. Whitaker

WATER LEVELS : 6.11 bgs on 11/30/07			START : 11/29/2007		END : 12/1/2007		LOGGERS : D. Whitaker	
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			
42.3	0.0	1.2	SS-1	2-3-3 (6)	Topsoil 0.0-0.15' - Poorly graded sand with organics Poorly Graded Sand With Silt (SP-SM) 0.15-1.15' - pale yellowish brown grading to dark yellowish brown, (10YR 6/2 to 10YR 4/2), moist, loose, fine grained, no HCl reaction, silica sand, trace to 10% nonplastic fines			
	1.5							
5	5.0							
37.3	6.5	1.3	SS-2	4-3-32 (35)	Clayey Sand (SC) 5.0-5.75' - moderate yellowish brown to light greenish gray, (10YR 5/4 to 5G 8/1), moist, dense, fine grained, slow dilatancy, no HCl reaction, 30% medium to high plasticity fines, some organics Silt (ML) 5.75-6.3' - grayish orange to moderate yellowish brown, (10YR 7/4 to 10YR 5/4), moist, hard, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, 5-10% very fine sand, carbonate materials, trace organics		Driller's Remark: Hard drilling at 6.0'	
10	10.0							
32.3	11.3	0.9	SS-3	3-4-50/3.5 (54/9.5")	Silt With Limestone Fragments (ML) 10.0-10.85' - grayish orange to dark yellowish orange, (10YR 7/4 to 10YR 6/6), wet, hard, nonplastic, high dilatancy, mild to moderate HCl reaction, 10% very fine sand, 50% limestone lenses (angular limestone fragments up to 1" diameter), trace black organic staining		Driller's Remark: Lost 50% circulation at 10.0'	
							Driller's Remark: Hard drilling at 12.0'	
15	15.0						Driller's Remark: Losing circulation, soft, possible void space at 14-14.5'	
27.3	15.4	0.3	SS-4	50/4.5 (50/4.5")	Silty Sand With Limestone Fragments (SM) 15.0-15.3' - Same as 10.0-10.85' except 34% nonplastic fines, 66% limestone fragments, no organics		Driller's Remark: Hard drilling, 100% circulation loss at 15.0'	
							Driller's Remark: Regaining some circulation at 17.5'	
							Driller's Remark: Soft at 17.9-18.5', lost all circulation	
							Driller's Remark: Light drill chatter at 18.0'	
							Driller's Remark: Hard drilling at 19.0'	
	20.0							
	20.1	0.0	SS-5	50/1.5 (50/1.5")	No Recovery 20.0-20.1'			
20								
					Begin Rock Coring at 20.0 ft bgs See the next sheet for the rock core log			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

CT-02

SHEET 2 OF 4

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724719.3 N, 456342.2 E (NAD83)

ELEVATION : 42.3 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 : 6.1 ft bgs on 11/30/07

START : 11/29/2007

END : 12/1/2007

LOGGER : D. Whitaker

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			
22.3	20.0	R1-NQ 1.5 ft 73%	1	20.1' - Fracture, horizontal, rough, undulating, bedding plane fracture, half of fracture surface open, <1/16" silt infill		Limestone 20.0-21.1' - grayish orange to dark yellowish orange, (10YR 7/4 to 10YR 6/6), fine grained, mild HCl reaction, weak (R2), voids to 1/16" diameter over 30% of rock, 5-10% cavities up to 1/4" diameter, poorly fossiliferous, trace recrystallization in pore space No Recovery 21.1-21.5'	Water level is 6.1' below ground surface on 11/30/07 at 07:50 Begin rock coring at 20' R1: 8 minutes 08:50-10:15 Changing out damaged drill bit
	21.5		2	20.85' - Fracture, 10 deg, smooth to rough, undulating, open, <1/16" fine sand and silt infill			
			NR	20.91' - Fracture, 65 deg, rough, undulating, trace of fine sand infill, open		Limestone 21.5-24.75' - dark yellowish orange, (10YR 6/6), fine grained, moderate HCl reaction, weak (R2), voids to 1/16" diameter over 40% of core surface, 5-10% spherical and elongated cavities up to 1/4" diameter, highly fossiliferous (molds/casts) No Recovery 24.75-26.5'	Driller's Remark: Soft drilling at 23.0', hard at 24.0'
			>10	21.65' - Fracture, 75 deg, rough, undulating, open			
			4	22.1-23.0' - Fracture zone, horizontal, angular limestone fragments with trace of silt infill		Limestone 26.5-27.15' - dark yellowish orange to moderate yellowish brown, (10YR 6/6 to 10YR 5/4), fine to medium grained, mild HCl reaction, extremely weak (R0), voids to 1/16" cover 40% of core surface, 5-10% cavities up to 1/4" diameter, possible bioturbation at 26.9'; trace silt infill, trace recrystallization in void space, poorly fossiliferous Silt (ML) 27.15-27.9' - grayish orange, (10YR 7/4), wet, soft, nonplastic, very rapid dilatancy, moderate HCl reaction, with 10% fine to coarse sand-sized limestone fragments	R2: 23 minutes
			1	22.6' - Fracture, 5 deg, rough, undulating, tight			
25		R2-NQ 5 ft 65%	0	22.75' - Fracture, 75 deg, smooth, undulating, open to tight (other surface in fragments but fits tight on surface)		Limestone 27.9-28.75' - Same as 26.5-27.15' 28.75-28.9' - pale yellowish brown to dark yellowish orange, (10YR 6/2 to 10YR 6/6), very fine to fine grained, strong HCl reaction, weak (R2), voids (1/16") over 1% of core surface, poorly fossiliferous No Recovery 28.9-31.5'	Driller's Remark: Soft drilling at 27-28'
17.3			NR	22.85' - Fracture, 20 deg, rough, undulating to stepped, open			
	26.5		>10	23.5' - Fracture, 20 deg, rough, undulating, tight		Limestone 31.5-32.15' - yellowish gray to moderate yellow, (5Y 7/2 to 5Y 7/6), very fine to fine grained, mild HCl reaction, very weak (R1), small voids (1/16") over 2% of core surface, 2 possible cavities up to 3/4" diameter, very poorly fossiliferous, black staining covers 40% of surface, also trace iron staining orange-red yellow color	R3: 8 minutes
			>10	24.15' - Fracture, 70 deg, rough, undulating, 1/4" open			
			>10	26.75' - Fracture, 10 deg, rough, undulating, open		Limestone 32.9' - Fracture, 20 deg, rough, undulating, 1/2" open	Driller's Remark: Soft at 32.0-32.5', hard at 32.5'
			>10	26.9-27.15' - Fracture zone, subangular limestone rock fragments up to 1-1/2" diameter			
30		R3-NQ 5 ft 48%	NR	27.9-28.4' - Fracture zone, fragments from coarse sand size to 3/4" diameter, subangular to angular		Limestone 33.7, 34.0' - Fractures (2), 20 deg, rough, undulating to stepped, open up to 1/2", <1/16" sand infill	R4: 21 minutes
12.3				28.5' - Fracture, vertical, rough, undulating, tight			
	31.5		1	28.6-28.7' - Fracture zone, rock fragments		Limestone 36.0' - Fracture, 70 deg, rough, undulating, open (missing half of fracture surface)	Driller's Remark: Soft drilling from 36.5-38', hard at 38.0', soft at 38-38.5', hard at 38.5'
			1	28.8' - Fracture, 85 deg, rough, undulating			
			3	31.9' - Fracture, 20 deg, smooth to rough, undulating, open		Limestone 36.65-36.85' - Fracture zone, subangular to subrounded rock fragments with rough to smooth and undulating surfaces	
			1	32.9' - Fracture, 20 deg, rough, undulating, 1/2" open			
			1	33.7, 34.0' - Fractures (2), 20 deg, rough, undulating to stepped, open up to 1/2", <1/16" sand infill		Limestone 37.3' - Fracture, 20 deg, rough, undulating, up to 1/4" open	
			1	34.45' - Fracture, 10 deg, smooth, planar, tight			
			NR	35.6' - Fracture, horizontal, rough, undulating, open up to 1"		Limestone 37.35, 37.5, 37.7' - Fractures (3), 25 deg, rough, undulating, open up to 1/2", trace sand infill	
			>10	36.0' - Fracture, 70 deg, rough, undulating, open (missing half of fracture surface)			
			>10	36.65-36.85' - Fracture zone, subangular to subrounded rock fragments with rough to smooth and undulating surfaces		Limestone 37.85' - Fracture zone, rock fragments	
			0	37.3' - Fracture, 20 deg, rough, undulating, up to 1/4" open			
			NR	37.35, 37.5, 37.7' - Fractures (3), 25 deg, rough, undulating, open up to 1/2", trace sand infill			
			NR	37.85' - Fracture zone, rock fragments			
40		R5-NQ 5 ft 42%					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

CT-02

SHEET 3 OF 4

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724719.3 N, 456342.2 E (NAD83)

ELEVATION : 42.3 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

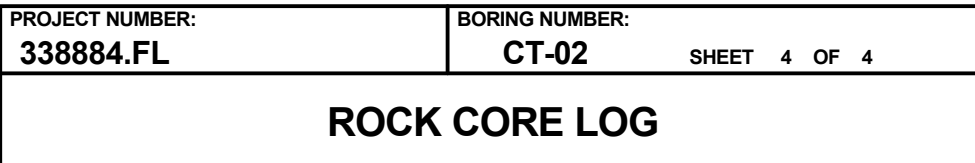
WATER LEVELS : 6.1 ft bgs on 11/30/07

START : 11/29/2007

END : 12/1/2007

LOGGER : D. Whitaker

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.
2.3			NR	38.0' - Fracture, 20 deg, rough, undulating, up to 1/2" open		Limestone 32.15-36.05' - light olive gray, (5Y 2/2), fine to medium grained, moderate HCl reaction, weak (R2), voids 1/16" diameter cover 10% of core surface, 5-10% cavities up to 1" diameter, highly fossiliferous (molds/casts)	R5: 7 minutes
41.5			2	38.15' - Fracture, 20 deg, rough, undulating		No Recovery 36.05-36.5' Limestone	
			>10	38.2' - Fracture, 10 deg, rough, undulating		36.5-38.6' - moderate olive brown, (5Y 4/4), fine to medium grained, mild HCl reaction, extremely weak (R0), voids up to 1/16" diameter over 50% of core surface, 10% cavities up to 1/4", moderately fossiliferous (fossils), trace molds and casts, 5% silt infill in void space, 5% recrystallization, trace black material (possible fossils or organics)	R6: 7 minutes
45 -2.7	R6-NQ 5 ft 40%	25	NR	42.25' - Fracture, 20 deg, rough, undulating, tight		No Recovery 38.6-41.5' Limestone	
			2	42.35' - Fracture, horizontal, rough, undulating, up to 1" open		41.5-43.5' - Same as 36.5-38.6'	
			4	42.9' - Fracture, 20 deg, rough, undulating, trace sand infill		No Recovery 43.5-46.5' Limestone	
			>10	43.15-43.5' - Fracture zone, fine to coarse gravel-sized subangular to subrounded rock fragments		46.5-47.65' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, weak (R2), voids (1/16") over up to 30% of core surface, 10% cavities up to 1/2" size, highly fossiliferous (molds)	
46.5			NR			Silty Sand (SP) 47.65-48.0' - moderate yellowish brown, (10YR 5/4), wet, fine to coarse grained, medium plasticity	R7: 11 minutes
			2	46.8' - Fracture, horizontal, rough, undulating, tight to 1/4" open, trace black staining on surfaces		Limestone 48.0-49.1' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, extremely weak (R0), voids (1/16") over 5% of core surface, mostly poorly competent with silt infill	Driller's Remark: Hard drilling at 52'
			4	47.5, 47.65' - Fracture (2), horizontal, rough, undulating, tight to 1/4" open, black organic staining covers 5% fracture surfaces		49.1-51.1' - moderate yellowish brown, (10YR 5/4), fine grained, mild HCl reaction, very weak (R1), small (1/16") voids over 2% of core surface, many cavities up to 3/4", moderately fossiliferous (molds)	R8: 16 minutes
			>10	47.95' - Fracture, 40 deg, rough, undulating to stepped, eroding fracture surface		No Recovery 51.1-51.5' Limestone	
			>10	47.95-48.7' - Fracture zone, horizontal, many bedding plane fractures, fissile/easily broken material		51.5-52.2' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, mild HCl reaction, extremely weak to very weak (R0 to R1), voids (1/16") over 5% of core surface, cavities up to 3/4"x1/2", fossiliferous, trace molds, trace organic staining (2% coverage)	
50 -7.7	R7-NQ 5 ft 92%	40	1	48.7' - Fracture, 70 deg, smooth to rough, undulating, eroding fracture surface			
			NR	48.7-49.25' - Fracture zone, sand to coarse gravel-sized rock fragments			
			>10	49.15' - Fracture, vertical, rough, stepped, open			
			0	49.8' - Fracture, 80 deg, rough, stepped, open			
			3	49.8-50.2' - Fracture zone, silt to fine gravel-sized rock fragments			
			0	50.2' - Fracture, 80 deg, rough, stepped, open			
			NR	50.6' - Fracture, 10 deg, rough, stepped, tight to 1/4" open, <1/16" silt infill			
55 -12.7	R8-NQ 5 ft 62%	38		51.5-52.2' - Fracture zone, rock fragments from fine to coarse gravel-sized, subangular to subrounded			
				52.2' - Fracture, 0-10 deg, rough, undulating, open			
			0	53.7' - Fracture, horizontal, smooth to rough, planar, tight			
			1	54.05' - Fracture, 10 deg, rough, undulating, tight			
			3	54.25' - Fracture, horizontal, rough, undulating, fossil prints in black staining on fracture surface			
				58.4' - Fracture, horizontal, rough, undulating, open, 1" sand and silt infill, black staining on 1% of fracture surface			
60	R9-NQ 5 ft 98%	70					



WATER LEVELS : 6.1 ft bgs on 11/30/07 START : 11/29/2007 END : 12/1/2007 LOGGER : D. Whitaker

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-03
SHEET 1 OF 4	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724626.2 N, 456581.9 E (NAD83)
 ELEVATION : 40.8 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" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 12/03/07 START : 12/2/2007 END : 12/5/2007 LOGGER : D. Whitaker, T. Borton

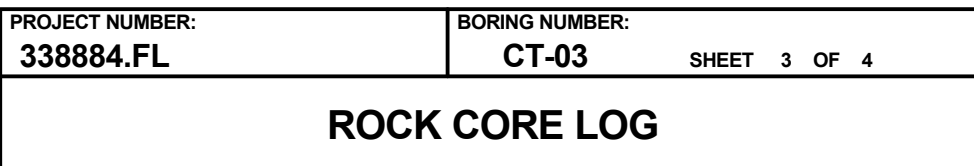
WATER LEVELS : 3.0 TDS ON 12/03/07		START : 12/2/2007		END : 12/3/2007		LOGGERS : D. Whitaker, T. Burton	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
			RECOVERY (ft)	#TYPE	6"-6"-6" (N)		SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
40.8	0.0	1.2	SS-1	1-2-2 (4)	Topsoil 0.0-0.4' - brownish black, (5YR 2/1), organics		
	1.5				Poorly Graded Sand (SP) 0.4-1.15' - yellowish gray, (5Y 7/2), moist, very loose, very fine to fine grained, no HCl reaction, silica sand, 5% organics, trace nonplastic fines		
5	5.0						
35.8		0.0	SS-2	3-2-3 (5)	No Recovery 5.0-6.5'		
	6.5						
		0.4	SS-3	NA (NA")	Fat Clay With Sand (CH) 6.5-6.9' - light olive gray, (5Y 6/1), wet, very soft, high plasticity, slow dilatancy, no HCl reaction, 15% fine silica sand		Driller's Remark: Medium chatter at 6.5' Due to no recovery at previous interval, another sample was collected at 6.5-8.0' SPT results not recorded
	8.0						
10	10.0						
30.8	10.5	0.2	SS-4	50/5.5 (50/5.5")	Silt (ML) 10.0-10.2' - moderate yellow to dusky yellow, (5Y 7/6 to 5Y 6/4), mild to moderate HCl reaction, 70% nonplastic fines		Driller's Remark: Moderate chatter and hard at 10.0'
15	15.0						
25.8		1.2	SS-5	27-13-14 (27)	Sandy Silt And Limestone Fragments (ML) 15.0-16.15' - pale yellowish orange to dark yellowish orange, (10YR 8/6 to 10YR 6/6), wet, very stiff, high dilatancy, moderate HCl reaction, 15-20% fine to coarse grained sand and gravel size limestone fragments		
	16.5						
20							Driller's Remark: 19.5-20.0' soft



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-03
SHEET 2 OF 4	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724626.2 N, 456581.9 E (NAD83)
 ELEVATION : 40.8 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" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 12/03/07 START : 12/2/2007 END : 12/5/2007 LOGGER : D. Whitaker, T. Borton

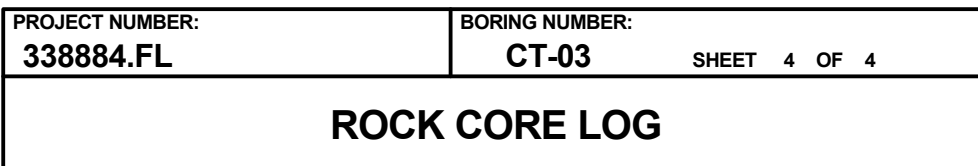
WATER LEVELS : 3.0 fbs on 12/3/07						START : 12/3/2007		END : 12/3/2007		LOGGERS : D. Whitaker, T. Burton	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS			
			RECOVERY (ft)		SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY			DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION			
	#TYPE	6"-6"-6" (N)									
20.8	20.0	0.7	SS-6	3-50/3.5 (53/9.5")	Silty Sand And Limestone Fragments (SM) 20.0-20.7' - dusky yellow, (5Y 6/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 30% nonplastic fines; 40% fine gravel-sized limestone fragments, carbonate sand			Driller's Remark: Very hard at 20.5'			
20.8											
								Driller's Remark: Heavy chatter at 22.0'			
								Driller's Remark: 22.0-23.0' 100% loss of circulation			
								Driller's Remark: Regain circulation after mixing more mud at 23.5'			
25	25.0										
15.8		0.7	SS-7	9-30-50/1.5 (80/7.5")	Silty Gravels (GM) 25.0-25.7' - dark yellowish orange, (10YR 6/6), wet, very dense, fine to coarse grained, moderate HCl reaction, carbonate sand, 24% nonplastic fines, 20% gravel-sized limestone fragments			Driller's Remark: Dropped 3 inches from 25.5-25.75' (soft or possible void)			
	26.1										



ORIENTATION : Vertical

LOGGER : D. Whitaker, T. Borton

Rev. 4



ORIENTATION : Vertical





LOGGER : D. Whitaker, T. Borton

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-04
SHEET 1 OF 3	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724456.6 N, 456923.6 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 11/30/07 START : 11/29/2007 END : 11/30/2007 LOGGER : T. Borton

WATER LEVELS : 4.0 TUBS ON 11/30/07		START : 11/29/2007		END : 11/30/2007		LOGGERS : T. BORRITT	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
			RECOVERY (ft)				
	#TYPE	6"-6"-6" (N)					
40.8	0.0	0.8	SS-1	0-2-2 (4)	Topsoil 0.0-0.2' - brownish black, (5YR 2/1), organics (roots, wood)		
	1.5				Poorly Graded Sand (SP) 0.2-0.55' - very light gray to yellowish gray, (N8 to 5Y 8/4), moist, very loose, very fine to fine grained silica sand, trace nonplastic fines, 30% organics (wood and rootlets) Poorly Graded Sand With Silt (SP-SM) 0.55-0.75' - dark yellowish orange, (10YR 6/6), moist, very loose, very fine to fine grained, silica sand, 15% nonplastic fines, trace organic particles		
5	5.0						
35.8	6.5	0.9	SS-2	1-2-3 (5)	Lean Clay With Sand (CL) 5.0-5.6' - greenish gray and light olive gray, (5G 6/1 and 5Y 6/1), mottled, moist, firm, low to medium plasticity, slow dilatancy, 15-20% very fine to fine silica sand, trace rootlets		
					Silty Gravel (limestone) With Sand (GM) 5.6-5.85' - white to yellowish gray, (N9 to 5Y 8/1), wet, loose, strong HCl reaction, very fine to coarse gravel, 25-30% fine to coarse sand sized, 15% nonplastic fines, appears to be fossiliferous		
10	10.0						
30.8	11.5	1.3	SS-3	14-34-50 (84)	Silty Sand And Limestone (SM) 10.0-11.3' - yellowish gray, (5Y 8/1), moist, very dense, fine to coarse grained, strong HCl reaction, 15-20% nonplastic fines, 40-50% fine to coarse limestone fragments, 50-60% SM, all carbonate		Driller's Remark: 50% water loss at 10'
15	15.0						
25.8	16.5	1.3	SS-4	13-30-33 (63)	Silt (ML) 15.0-16.3' - grayish yellow, (5Y 8/4), moist to wet, hard, nonplastic, slow dilatancy, mild HCl reaction, 10% fine to medium sand-sized, <5% limestone fragments to 1/2", all carbonate materials		
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-04
SHEET 2 OF 3	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724456.6 N, 456923.6 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.0 ft bgs on 11/30/07 START : 11/29/2007 END : 11/30/2007 LOGGER : T. Borton

WATER LEVELS : 4.0 fbs on 11/30/07			START : 11/29/2007			END : 11/30/2007			LOGGER : T. BORUM		
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						
20.8	20.0	1.2	SS-5	24-32-30 (62)	Silt With Sand And Limestone (ML) 20.0-21.2' - grayish yellow, (5Y 8/4), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 15% fine to medium sand-sized, 15-20% fine rounded limestone grains, some are knobby connections, carbonate materials						
	21.5										
25	25.0	0.0	SS-6	50/3 (50/3")	No Recovery 25.0-25.3'						
15.8	25.3										
30	30.0	1.3	SS-7	38-51-45 (96)	Silty Sand (SM) 30.0-31.3' - grayish yellow, (5Y 8/4), wet, very dense, fine to coarse grained, moderate HCl reaction, 30% nonplastic fines, 10-15% fine limestone fragments and grains, carbonate materials						
10.8	31.5										
35	35.0	0.0	SS-8	50/1.5 (50/1.5")	No Recovery 35.0-35.1'						
35	35.1										
5.8					Begin Rock Coring at 35.0 ft bgs See the next sheet for the rock core log		11/30/07 08:00 continue drilling Water level 4.0' below ground surface				
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

CT-04

SHEET 3 OF 3

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724456.6 N, 456923.6 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

WATER LEVELS : 4.0 ft bgs on 11/30/07

START : 11/29/2007

END : 11/30/2007






LOGGER : T. Borton

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			
5.8	35.0 R1-NQ 1 ft 90%	42	>10	35.45-35.65' - Fracture zone, fine infilling (20-30% of zone)		Limestone 35.0-35.45' - yellowish gray, (5Y 7/2), fine to coarse grained, mild HCl reaction, very weak to weak (R1 to R2), voids to 1/8" (predominantly <1/16") over 20-30% of surface, fossiliferous (casts/molds)	Begin rock coring at 35.0'
	36.0		3	35.7' - Bedding plane, <5 deg, <1/16" open			R1: 2 minutes
			2	35.8' - Bedding plane, <5 deg, <1/16" open			
			3	36.2' - Fracture, <5 deg, rough, undulating, open to 1/4"		35.45-35.9' - Same as 35.0-35.45' except extremely weak (R0)	
	R2-NQ 5 ft 78%	28	3	36.6' - Bedding plane, <5 deg, rough, undulating, tight		No Recovery 35.9-36.0'	
			0	36.75' - Fracture, 70-75 deg, rough, undulating, tight		Limestone 36.0-39.9' - yellowish gray, (5Y 7/2), fine to coarse grained, mild HCl reaction, very weak to weak (R1 to R2), with zones of extremely weak (R0) rock at 36.5-36.6' and 37.5-38.15', voids to <1/16" over 15-25% of surface, fossiliferous (casts/molds), <5% possible laminar bedding planes	R2: 8 minutes
40			NR	36.9' - Mechanical break or fracture, <5 deg, rough, undulating, tight		No Recovery 39.9-41.0'	
0.8	41.0		>10	37.25' - Bedding plane, <5 deg, rough, undulating, fine to coarse sand sized infill, no opening, open 1/8"-1/2"		Limestone 41.0-41.55' - Same as 36.0-39.9' except moderately fossiliferous	Driller's Remark: 100% water loss at 42'
			2	37.7' - Bedding plane, <5 deg, rough, undulating, tight		41.55-45.2' - yellowish gray transitioning to pale olive with depth, (5Y 7/2 to 10YR 6/2), very fine to fine grained, strong to moderate HCl reaction, weak to medium strong (R2 to R3), trace voids (<1/16"), fossiliferous (casts and molds), burrow or solution cavity (3/16" diameter) at 42.28'	
			0	38.2' - Bedding plane, <5 deg, rough, undulating, open 3/16", fine to coarse sand-sized infill, 100% of opening filled		No Recovery 45.2-46.0'	
	R3-NQ 5 ft 84%	53	0	38.55' - Fracture, 60-70 deg, rough, undulating, open		Limestone 46.0-50.0' - Same as 41.55-45.2' except zone of weak (R2) rock from 46.8-46.95', voids (<1/16") increasing with depth, 1" solution cavities at 47.35' and 47.7', trace irregular bedding planes	R3: Run time not recorded
			0	38.9' - Mechanical break			
45			1	41.15' - Bedding plane, <5 deg, rough, undulating, open <1/16"			
-4.2	46.0		NR	41.3-41.55' - Fracture zone, fragments to 1" (predominately <1/2")			
			2	42.1' - Fracture, 65-70 deg, smooth, planar			
			3	42.3' - Mechanical break or bedding plane, <5 deg, rough, undulating, open to 1/16", trace fine infilling			
			0	45.1' - Mechanical break, 65-75 deg, rough, undulating, tight			
			1	45.2' - Fracture, 5 hairline fractures from 45.2' to end of core			
	R4-NQ 5 ft 94%	62	0	46.85' - Bedding plane, <5 deg, rough, planar, trace fine infilling, open 1/4"			
			1	46.95' - Mechanical break, <5 deg, rough, undulating, tight			
			2	47.45' - Fracture, 5-15 deg, rough, undulating, open			
50			NR	47.75' - Fracture, <5 deg, closed, does not go all the way through			
-9.2	51.0			47.85' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight		50.0-50.7' - yellowish gray, (5Y 7/2), medium to coarse grained, mild HCl reaction, very weak to weak (R1 to R2), voids <1/16" over 30-40% of surface, fossiliferous (casts and molds)	R4: Run time not recorded
				49.55' - Mechanical break or bedding plane, <5 deg, rough, undulating, open <1/16"		No Recovery 50.7-51.0' Bottom of Boring at 51.0 ft bgs on 11/30/2007	Total depth of boring is 51.0'
				50.0-50.1' - Fracture or bedding plane, <5 deg, rough, undulating, open, one large 0.1' angular fragment			Driller's Remark: Water level is 3.5' below ground surface
				50.5' - Mechanical break or bedding plane, <5 deg, rough, undulating, open <1/16"			



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-05
SHEET 1 OF 5	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723052.6 N, 456340.9 E (NAD83)
 ELEVATION : 41.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.4 ft bgs on 11/14/07 START : 11/12/2007 END : 11/14/2007 LOGGER : J. Schaeffer, T. Borton

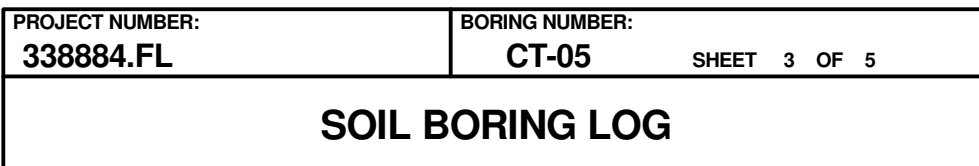
WATER LEVELS : 4.4 TDS ON 11/14/07		START : 11/12/2007		END : 11/14/2007		LOGGERS : J. Schaefer, T. Boron	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE		6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		
41.5	0.0	0.9	SS-1	1-1-2 (3)	Poorly Graded Sand With Organics (SP) 0.0-0.9' - pale yellowish brown, (10YR 6/2), moist, very loose, very fine to fine grained, no HCl reaction, silica sand, trace nonplastic fines, 5-10% organics and roots		Begin drilling on 11/12/07 at 16:00 Surface is recently cleared tree plantation
	1.5						
5	5.0						
36.5		1.0	SS-2	2-2-2 (4)	Poorly Graded Sand With Clay (SP-SC) 5.0-5.5' - dark yellowish orange, (10YR 6/6), moist to wet, very loose, fine grained, 9% moderate plasticity fines, silica sand Fat Clay (CH) 5.5-6.0' - grayish blue green, (5BG 5/2), moist, soft, high plasticity, no dilatancy, no HCl reaction, 5-10% very fine to fine silica sand, trace rootlets	 	5.0-5.5' SS-2A 5.5-6.0' SS-2B
	6.5						
10	10.0						
31.5		0.9	SS-3	2-3-5 (8)	Silty Sand (SM) 10.0-10.2' - light greenish gray, (5GY 8/1), wet, loose, fine to coarse grained, strong HCl reaction, sand is predominately fossil fragments, 20% nonplastic fines Silty Sand (SM) 10.2-10.9' - yellowish gray, light greenish gray, and light bluish gray, (5Y 8/1, 5GY 8/1, and 5B 7/1), wet, loose, irregularly bedded sands, predominately very fine to fine silica sands, up to 25% fine to coarse sand as in 10.0-10.2' (fossils), 15% nonplastic fines, strong HCl reaction in fossil materials	 	10.0-10.2 SS-3A 10.2-10.9 SS-3B
	11.5						
15	15.0						
26.5		0.7	SS-4	34-50/2 (84/8")	Silt And Limestone (ML) 15.0-15.7' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 49% coarse sand-sized and fine gravel-sized limestone fragments, strong HCl reaction in the limestone, all carbonate materials		
	15.7						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-05	SHEET 2 OF 5
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723052.6 N, 456340.9 E (NAD83)
ELEVATION : 41.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
WATER LEVELS : 4.4 ft bgs on 11/14/07 START : 11/12/2007 END : 11/14/2007 LOGGER : J. Schaeffer, T. Borton

WATER LEVELS : 4.4 RODS UP 11/14/07		START : 11/12/2007		END : 11/14/2007		LOGGERS : J. Schaefer, T. Burton				
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		RECOVERY (ft)	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
				#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			
	21.5	20.0 20.3	0.4	SS-5	26-50/0.5 (76/6.5")	Silt And Limestone (ML) 20.0-20.4' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 60% silt and 40% limestone, limestone is fine to coarse sand-sized fragments, friable, mild HCl reaction, one 1/2" iron concretion				Resume drilling at 08:12 on 11/13/07 Driller's Remark: 100% circulation loss 08:47 3" NW casing installed to 20.0'
25 16.5	25.0	1.2	SS-6	29-45-27 (72)	Silt With Sand And Limestone (ML) 25.0-26.2' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 15-25% fine to medium sand-sized varies throughout sample, 25% fine gravel-sized limestone fragments, carbonate materials				Possible slough top of sample, 3 angular to subangular fragments up to 1.0", strong HCl reaction	
30 11.5	30.0	0.5	SS-7	20-0-4 (4)	Limestone Fragments And Silt (ML) 30.0-30.4' - grayish orange, (10YR 7/4), 75% limestone in fine to coarse gravel-sized fragments, mild HCl reaction, 25% silt which is wet, soft, nonplastic, rapid dilatancy, mild HCl reaction, carbonate Assumed Cavity 30.4-31.4' Sandy Silt (ML) 31.4-31.5' - grayish orange, (10YR 7/4), wet, soft, nonplastic, rapid dilatancy, mild HCl reaction, 35% fine to coarse sand-sized, carbonate materials				20 blows first 6.0" then rods fell 11.0", 4 blows last inch Driller's Remark: Cavity in rod drop zone Soil descriptions for sample SS-7 assumes cavity at 30.4-31.4' based on soil sample appearance and driller's note 10:03 Casing advanced to 30'	
35 6.5	35.0	1.2	SS-8	23-51-50/2.5 (101/8.5)	Silty Sand With Limestone (SM) 35.0-35.5' - grayish orange, (10YR 7/4), wet, very dense, fine to coarse grained, moderate HCl reaction, 26% nonplastic fines, 32% fine to coarse gravel-sized limestone fragments, all carbonate materials Silty Sand (SM) 35.5-36.2' - dark yellowish orange, (10YR 6/6), wet, very dense, fine to coarse grained, moderate HCl reaction, 30-35% nonplastic fines, 5-10% fine gravel-sized limestone fragments, all carbonate materials				10:35 Casing advanced to 35.0' 35.0-35.5' SS-8A 35.5-36.2' SS-8B Driller's Remark: 100% water loss at 38.0'	
40										



LOGGER : J. Schaeffer, T. Borton

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-05	SHEET 4 OF 5
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723052.6 N, 456340.9 E (NAD83)

ELEVATION : 41.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, NQ tools, NW casing


ORIENTATION : Vertical

WATER LEVELS : 4.4 ft bgs on 11/14/07

START : 11/12/2007

END : 11/14/2007

LOGGER : J. Schaeffer, T. Borton

WATER LEVELS : 4.4' (BGS OF 174707)		START : 11/14/2007		END : 11/14/2007		LOGGER : J. Schaefer, T. Bolton		
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
-3.5	45.0 R1-NQ 1 ft 100%	33	3	45.35, 45.58' - Mechanical break (2), 10-15 deg, rough, undulating, tight		Limestone 45.0-46.5' - light olive gray, (5Y 6/1), fine to medium grained, moderate HCl reaction, weak (R2), strong HCl reaction where pulverized, highly fossiliferous (casts/molds over 40-50% of sample), voids (up to 1/16") over 10-15% of surface, trace voids up to 1/2"	Casing set at 45.0' Begin coring with NQ, hard formation bit Driller's Remark: Water level approximately 7.0' below ground surface 08:11 Begin drilling first run on 11/14/07 First run only 1 foot to set stroke R1: 4 minutes	
46.0	R2-NQ 5 ft 90%	>10	45.76' - Bedding plane, <5 deg, rough, planar, open <1/16"	46.5-46.3' - Fracture zone, subangular limestone fragments (up to 1-1/2")		46.5-50.5' - Same as 45.0-46.5' except fine grained, very weak (R1), transitions to yellowish gray (5Y 5/2) with depth (by 48.9'), 15-25% fossils (casts/molds), voids (up to 1/16") over 5-10% of surface increasing to 15-25% with depth	Driller's Remark: Softer at 49.5' R2: 27 minutes	
		1	46.45' - Bedding plane, <5 deg, rough, undulating	46.8' - Fracture, 80-90 deg, rough, undulating				
		2	47.1' - Mechanical break or bedding plane, <5 deg, smooth, stepped	47.1' - Mechanical break or bedding plane, <5 deg, smooth, stepped				
		3	48.1, 48.5, 48.85' - Mechanical break (3), <10 deg, rough, undulating	48.1, 48.5, 48.85' - Mechanical break (3), <10 deg, rough, undulating				
		2	49.0' - Mechanical break or bedding plane, <10 deg, rough, undulating	49.0' - Mechanical break or bedding plane, <10 deg, rough, undulating				
		NR	49.5, 49.6' - Mechanical break or bedding plane (2), <10 deg, rough, undulating	49.5, 49.6' - Mechanical break or bedding plane (2), <10 deg, rough, undulating				
50 -8.5	51.0	0	50.0' - Fracture, 5-15 deg, rough, undulating	50.0' - Fracture, 5-15 deg, rough, undulating		No Recovery 50.5-51.0'		
	R3-NQ 5 ft 57%	2	50.4' - Mechanical break, 5-10 deg, rough, undulating	50.4' - Mechanical break, 5-10 deg, rough, undulating		Limestone 51.0-53.85' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to medium grained, mild to moderate HCl reaction, very weak (R1), fossiliferous (casts/molds), voids (up to 1/16") over 15-25% of surface	Driller's Remark: Soft at 52.0'	
		>10	52.5' - Mechanical break, <5 deg, rough, undulating, tight	52.5' - Mechanical break, <5 deg, rough, undulating, tight		No Recovery 53.85-56.0'		
		NR	52.75' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight	52.75' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight				
		NR	53.15-53.75' - Fracture zone, general orientation 75-85 deg with multiple breaks <5 deg, possibly many mechanical breaks or bedding planes along a long fracture, limestone fragments up to 2-1/2"	53.15-53.75' - Fracture zone, general orientation 75-85 deg with multiple breaks <5 deg, possibly many mechanical breaks or bedding planes along a long fracture, limestone fragments up to 2-1/2"				R3: 9 minutes Driller's Remark: Harder at 55.0', no circulation
55 -13.5		56.0	2	56.1, 56.5' - Bedding plane (2), <5 deg, rough, undulating, tight to open <1/16"		56.1, 56.5' - Bedding plane (2), <5 deg, rough, undulating, tight to open <1/16"	Limestone 56.0-61.0' - yellowish gray, (5Y 7/2), fine to medium grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), weak (R1) rock at 58.5-58.8', fossiliferous (casts and trace molds), voids (up to 1/16") over 5-15% of surface decreasing with depth	
		R4-NQ 5 ft 100%	2	57.7' - Mechanical break, 1-5 deg, rough, undulating, tight		57.7' - Mechanical break, 1-5 deg, rough, undulating, tight		
	2		57.9' - Bedding plane, <5 deg, rough, planar, tight	57.9' - Bedding plane, <5 deg, rough, planar, tight				
	2		58.3' - Fracture, 5-10 deg, smooth, planar, open <1/16", trace infill (fines)	58.3' - Fracture, 5-10 deg, smooth, planar, open <1/16", trace infill (fines)				
	2		58.9' - Mechanical break, <5 deg, rough, undulating, tight	58.9' - Mechanical break, <5 deg, rough, undulating, tight				
	3		59.55' - Bedding plane, 5-10 deg, rough, undulating, open 1/8"	59.55' - Bedding plane, 5-10 deg, rough, undulating, open 1/8"				
	2		59.75' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight	59.75' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight		61.0-66.0' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to medium grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), very weak (R1) rock transitions with depth to weak (R2) rock, voids (up to 1/16") over 5-15% of surface decreasing with depth, trace fossils (casts/molds)	R4: 11 minutes	
60 -18.5	61.0	5	60.1' - Fracture, <5 deg, rough, undulating, open 1/8"	60.1' - Fracture, <5 deg, rough, undulating, open 1/8"				
	R5-NQ 5 ft 100%	2	60.3' - Mechanical break, <5 deg, rough, undulating, tight	60.3' - Mechanical break, <5 deg, rough, undulating, tight				
		2	60.8' - Fracture or bedding plane, <5 deg, rough, undulating, open 1/4"-1/2", less than 1/2" fragment in opening	60.8' - Fracture or bedding plane, <5 deg, rough, undulating, open 1/4"-1/2", less than 1/2" fragment in opening				
		>10	61.07' - Mechanical break or bedding plane, 1-5 deg, rough, undulating, open <1/16"	61.07' - Mechanical break or bedding plane, 1-5 deg, rough, undulating, open <1/16"			Driller's Remark: Water level at 4.4'	
65								



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-05	SHEET 5 OF 5
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723052.6 N, 456340.9 E (NAD83)

ELEVATION : 41.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, NQ tools, NW casing ORIENTATION : Vertical

WATER LEVELS : 4.4 ft bgs on 11/14/07 START : 11/12/2007 END : 11/14/2007 LOGGER : J. Schaeffer, T. Borton

WATER LEVELS : 4-4 ft bgs on 11/14/07							
START : 11/12/2007							
END : 11/14/2007							
LOGGER : J. Schaefer, T. Bolton							
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		
-23.5			0	61.8' - Mechanical break, <5 deg, rough, undulating, tight		R5: 10 minutes	
	66.0			62.1' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight		Total depth of boring 66.0', work plan criteria met	
				62.25' - Mechanical break, <5 deg, rough, undulating, tight			
				62.9, 63.0' - Mechanical break or bedding plane (2), <5 deg, rough, undulating, tight			
				63.15' - Bedding plane, <5 deg, rough, undulating, tight			
				63.7, 64.1' - Mechanical break (2), <5 deg, rough, undulating, tight			
				64.43' - Mechanical break or bedding plane, <5 deg, rough, undulating, open 1/8"			
				64.72-65.05' - Fracture zone, no orientation, limestone fragments up to 1/2"			
					Bottom of Boring at 66.0 ft bgs on 11/14/2007		
						Total 20 bags Portland Type I/II coated bentonite chips from 23.0-16.0' below ground surface	
						3/4 bag bentonite, 100 gallons of water	
						17:11 Grout to surface	



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 : 0.5 TDS 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		
41.4	0.0	1.5	SS-1	3-4-6 (10)	Topsoil 0.0-0.2' - wood chips, no roots, silica sand 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'		
	1.5						
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							



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-06
SHEET 2 OF 7	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

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 : 0.5 TDS 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)								
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 Resume SPT on 11/13/07 at 08:00 Water level 0.5' below ground surface				
	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							
25	25.0							Weight of hammer drove SS-6 (25.0-25.6') through all 18" for SPT				
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							
	26.5											
								Driller's Remark: 25% loss of circulation at 27.5', some drill chatter				
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											
								End SPT soil sampling Switching to rock coring at 09:20 (refusal blow count, limestone fragments)				
	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"							
40												
					Begin Rock Coring at 40.0 ft bgs See the next sheet for the rock core log							



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-06	SHEET 3 OF 7
ROCK CORE LOG		

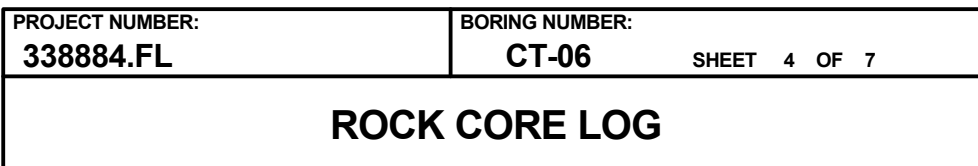
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722977.3 N, 456619.7 E (NAD83)

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
		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.
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"	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
41.5			NR			No Recovery 40.8-46.5'	
45 -3.6	R2-NQ 5 ft 0%	0	NR				R2: 3 minutes
46.5							
50 -8.6	R3-NQ 5 ft 40%	13	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	Driller's Remark: Soft at 47.0-48.5', 100% circulation lost at 47.0'
			4	47.1-47.2' - Fracture (3), horizontal, rough, undulating, loose fragments 1" in size, open		No Recovery 48.5-56.5'	
				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'			
			NR	47.9' - Fracture, horizontal, rough, undulating, open			R3: 16 minutes
				47.9-48.1' - Fracture, 60 deg, rough, undulating, 1/8" relief			
				48.4' - Fault, horizontal, smooth, planar to undulating, <1/8" relief			Driller's Remark: Soft throughout run R4, still no circulation
55 -13.6	R4-NQ 5 ft 0%	0	NR				R4: 4 minutes
56.5							
			3	56.65' - Fracture, horizontal, rough, undulating, 1/8" open		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'	
				56.9' - Fracture, 10 deg, rough, undulating, 1/8" open		No Recovery 57.4-61.5'	
				57.0' - Mechanical break			
				57.1-57.3' - Fracture, 60 deg, rough, undulating to planar, black staining over 80% of surface			
60	R5-NQ 5 ft 18%	0	NR				



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

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

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

CT-06

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		83.0' - Mechanical break			
85			NR				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			
90			0	89.1-89.4' - Fracture zone, medium to coarse gravel-sized fragments		No Recovery 90.2-91.5'	Driller's Remark: Hard at 88.0-91.5'
-48.6			NR				R11: 15 minutes
			>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					
95			NR				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							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

CT-06

SHEET 6 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

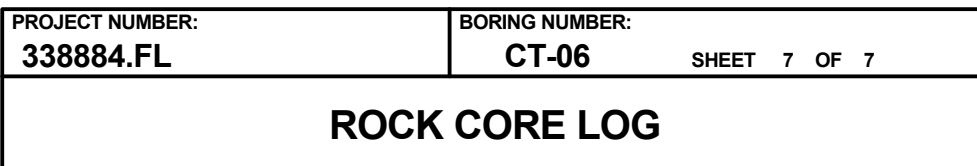
WATER LEVELS : 0.5 ft bgs on 11/13/07

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.
-58.6			>10	99.1-99.3' - Fracture zone, fine to large gravel-sized fragments		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"	R13: 15 minutes
	101.5		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			
	R14-NQ 5 ft 80%	28	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			
			>10	103.4' - Fracture, horizontal, rough, undulating, 1/4" open			
			NR	103.8' - Fracture, 40 deg, rough, undulating, 1/8" open		No Recovery 105.5-106.5'	R14: 9 minutes
			NR	104.0' - Fracture, 40 deg, rough, undulating, 1/8" open			
			>10	104.2' - Mechanical break			
			2	104.5' - Fracture, 10 deg, rough, undulating, 1/8" open		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"	
	R15-NQ 5 ft 54%	17	>10	104.8-105.0' - Fracture zone, coarse gravel-sized fragments			
			>10	105.1-105.3' - Fracture, 60 deg, rough, undulating, tight		No Recovery 109.2-111.5'	
			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			
			>10	111.6-111.7' - Fracture zone		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'	
			0	112.1-112.2' - Fracture zone		No Recovery 112.6-116.5'	
	R16-NQ 5 ft 22%	15	NR				
			NR				
			0	116.5-117.5' - unconsolidated silts/sands		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	
			>10	117.8' - Fracture, 80 deg, rough, undulating, tight			
	R17-NQ 5 ft 64%	0	>10	118.0-119.5' - Fracture zone or mechanical break		Limestone 117.5-118.1' - grayish orange, (10YR 7/4), fine grained, mild HCl reaction, weak (R2), trace voids to 1/16"	
			1				
120							



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

APPENDIX 2BB-727



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-07
SHEET 1 OF 5	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722823.9 N, 456814.3 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 11/27/07 START : 11/16/2007 END : 11/27/2007 LOGGER : P. De Sa'rego, T. Borton

WATER LEVELS : 3.5' BGS ON 11/27/07			START : 11/19/2007		END : 11/27/2007		LOGGERS : P. De Santiago, T. Burton	
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			
42.0	0.0	1.4	SS-1	1-1-2 (3)	Poorly Graded Sand With Organics (SP) 0.0-1.4' - moist, very loose, brownish gray (5YR 8/1) from 0.0-0.5', very light gray (N5) from 0.5-1.4', fine silica sand, trace nonplastic fines, 20% roots/organic matter over 0.0-0.5'			
	1.5							
5	5.0							
37.0		0.8	SS-2	2-1-1 (2)	Poorly Graded Sand With Silt (SP-SM) 5.0-5.8' - grayish orange, (10YR 7/4), wet, very loose, no HCl reaction, fine silica sand, 5-10% nonplastic fines			
	6.5							
10	10.0							
32.0		1.3	SS-3	8-3-6 (9)	Limestone Fragments With Silty Sand 10.0-11.3' - very pale orange, (10YR 7/4), silty sand is wet, loose, moderate HCl reaction, fine to coarse sand-sized, 35-40% low plastic fines, all carbonate, 70% fine to coarse gravel-sized limestone fragments, 30% silty sand		Advanced 15.0' NW casing	
	11.5							
15	15.0							
27.0		1.0	SS-4	2-2-2 (4)	Silty Sand (SM) 15.0-16.0' - yellowish gray, (5Y 8/1), wet, very loose, strong HCl reaction, 20% fines, fine to coarse sand-sized grains, all carbonate materials including one limestone fragment (1") subrounded to subangular		Continue drilling 11/27/07 Driller's Remark: 10:08 water level at 3.5' below ground surface	
	16.5							
20								



PROJECT NUMBER: <div style="font-size: 1.2em; font-weight: bold;">338884.FL</div>	BORING NUMBER: <div style="font-size: 1.2em; font-weight: bold;">CT-07</div>
SHEET 2 OF 5	
<div style="font-size: 1.5em; font-weight: bold;">SOIL BORING LOG</div>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722823.9 N, 456814.3 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 11/27/07 START : 11/16/2007 END : 11/27/2007 LOGGER : P. De Sa'rego, T. Borton

WATER LEVELS : 3.510050 ft 11/27/07		START : 11/10/2007		END : 11/27/2007		LOGGERS : P. De Saeghe, T. Burton	
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		
22.0	20.0	1.4	SS-5	2-3-50/5.5 (53/11.5)	Sandy Clay (CH) 20.0-20.85' - transitions from light bluish gray to light gray, (5B 7/1 to N7), moist, medium stiff, medium to high plasticity, moderate HCl reaction, 20-25% very fine to fine silica sand		Tricone bit (3-7/8") SS-5A from 20.0-20.85' SS-5B from 20.85-21.35'
	21.5				Silt (ML) 20.85-21.35' - grayish yellow, (5Y 8/4), moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, trace fine to medium sand-sized grains, carbonate materials		
25	25.0	1.5	SS-6	2-15-31 (46)	Sandy Lean Clay (CL) 25.0-25.4' - mottled light bluish gray and grayish yellow, (5B 7/1 and 5Y 8/4), wet, stiff, medium plasticity, slow dilatancy, mild to moderate HCl reaction in grayish yellow areas, 20% very fine to fine silica sand, 10% fine to medium carbonate sands		SS-6A from 25.0-25.4' SS-6B from 25.4-26.45'
17.0	26.5				Silt (ML) 25.4-26.45' - grayish yellow, (5Y 8/4), moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, 5-10% fine to medium sand-sized grains, all carbonate materials		
30	30.0	1.0	SS-7	7-12-22 (34)	Silty Sand (SM) 30.0-31.0' - grayish yellow, (5Y 8/4), moist, dense, mild HCl reaction, fine to coarse sand-sized, 30-35% nonplastic fines, 10-15% fine gravel-sized limestone fragments, all carbonate materials		
12.0	31.5						
35	35.0	0.7	SS-8	18-50/3 (68/9")	Sandy Silt (ML) 35.0-35.7' - Same as 30.0-31.0' except nonplastic, rapid dilatancy, 35-40% fine to coarse sand-sized		
7.0	35.8						
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-07
SHEET 3 OF 5	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722823.9 N, 456814.3 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 11/27/07 START : 11/16/2007 END : 11/27/2007 LOGGER : P. De Sa'rego, T. Borton

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		RECOVERY (ft)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
						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
2.0	40.0		1.4	SS-9	19-26-50/5 (76/11)	Sandy Silt (ML) 40.0-41.4' - grayish yellow, (5Y 8/4), moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, 40-45% fine to coarse sand-sized, 5% fine gravel-sized limestone fragments, carbonate materials		
	41.4							
45	45.0							
-3.0	45.0	0.0		SS-10	50/0.5 (50/0.5")	Limestone Fragments 45.0-45.05' - about ten limestone fragments (<1/4") recovered Begin Rock Coring at 45.0 ft bgs See the next sheet for the rock core log		Driller's Remark: Hard at 44.5' Switch to rock coring at 45.0'
50								
-8.0								
55								
-13.0								
60								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

CT-07

SHEET 4 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722823.9 N, 456814.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, NQ tools, NW casing


ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 11/27/07

START : 11/16/2007

END : 11/27/2007

LOGGER : P. De Sa'rego, T. Borton

WATER LEVELS : 3.31005 GIP 1/12/2007		START : 11/10/2007		END : 11/27/2007		LOGGER : P. De Saeghe, T. Dutoit				
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						
-3.0	45.0	R1-NQ 1.5 ft 67%	67	0	46.55' - Fracture, <5 deg, rough, undulating, open 1/8" 46.8' - Fracture, 10-15 deg, rough, undulating, tight 47.4' - Fracture, 0-10 deg, rough, undulating, open 1/2" with fragments up to 1/2", subrounded to subangular 48.1' - Bedding plane or mechanical break, <5 deg, rough, undulating, open <1/16" 48.25' - Mechanical break, <5 deg, rough, undulating, tight 49.1' - Bedding plane, <5 deg, rough, planar, tight		Limestone 45.0-46.0' - light olive gray, (5Y 4/4), fine to medium grained, moderate HCl reaction, weak (R2), fossiliferous (10-20%) casts and molds, voids up to 1/8" (predominantly <1/16") over 5-15% of surface, one void at 45.2' (1"x1/8") No Recovery 46.0-46.5' Limestone 46.5-49.25' - light olive gray with zones of yellowish gray from 47.25-47.4' and from 48.9-49.4', (5Y 5/2 with 5Y 8/4), fine to coarse grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 10-20% of core, moderately fossiliferous (casts and molds) No Recovery 49.25-56.5'	13:45 Begin rock coring R1: 7 minutes		
46.5	R2-NQ 5 ft 55%	55	NR	50 -8.0				NR	R2: 7 minutes	
			3							
			2							
			1							
		R3-NQ 5 ft 0%	0	NR				55 -13.0	NR	Driller's Remark: 51.5-56.5' soft Started to get soft at 50.0'
		R4-NQ 5 ft 72%	32	1				56.5	1	R3: 2 minutes
				2						
				1						
				0						
				NR	60 -18.0	NR	R4: 4 minutes			
		R5-NQ 5 ft 94%	18	3						
				2						
				1						
65					61.5		Limestone 56.5-58.1' - yellowish gray to grayish yellow, (5Y 7/2 to 5Y8/4), fine to medium grained, mild to moderate HCl reaction, extremely weak to weak (R0 to R2), highly fossiliferous (90% casts and molds <1/16"-3/16"), voids (<1/16") over 20-30% of surface Sand With Silt (SM) 58.1-59.0' - yellowish gray to grayish yellow, (5Y 7/2 to 5Y8/4), fine to coarse grained, nonplastic, mild HCl reaction No Description 59.0-59.6' Sand With Silt (SM) 59.6-59.8' - Same as 58.1-59.0' Limestone 59.8-60.1' - Same as 56.5-58.1' except very weak (R1) No Recovery 60.1-61.5' Sandy Silt (ML) 61.5-62.2' - yellowish gray, (5Y 7/2), moist, nonplastic, mild HCl reaction			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

CT-07

SHEET 5 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722823.9 N, 456814.3 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 11/27/07

START : 11/16/2007

END : 11/27/2007

LOGGER : P. De Sa'rego, T. Borton

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.
-23.0			3	64.3' - Mechanical break or bedding plane, <5 deg, rough, undulating, open 1/2"		Limestone 62.2-63.3' - yellowish gray, (5Y 7/2), fine to medium grained, mild HCl reaction, very weak (R1), fossiliferous (casts and molds), voids (up to <1/16") over 5-10% of surface Sandy Silt (ML) 63.3-64.0' - Same as 61.5-62.2'	R5: 9 minutes
	66.5		0	64.8' - Mechanical break, 70-80 deg, rough, undulating, tight			
			NR	65.0' - Bedding plane or mechanical break, <5 deg, rough, undulating, tight			
			2	65.5' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight		Limestone 64.0-66.2' - Same as 62.2-63.3' except transitions from extremely weak to very weak (R0 to R1) at 64.3' No Recovery 66.2-66.5'	R6: 8 minutes
			3	66.7' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight			
			1	67.15' - Mechanical break or bedding plane, <5 deg, rough, planar, tight			
			1	67.8' - Bedding plane, <5 deg, rough, undulating, tight		Limestone 66.5-71.3' - yellowish gray, (5Y 7/2), fine to medium grained, mild HCl reaction, very weak (R1) with zones of weak (R2) rock from 67.1-67.6', 68.1-69.25', and 70.35-71.3', variable voids (<1/16"-3/16") over 10-20% of surface, fossiliferous casts and molds (10-15%), trace organics No Recovery 71.3-71.5'	R7: 11 minutes Total depth is 76.5'
			1	68.0' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight			
			1	68.15' - Fracture, 5-10 deg, rough, undulating, tight			
	71.5		NR	69.3, 70.2' - Bedding plane (2), <5 deg, rough, planar, tight		Limestone 71.5-76.25' - yellowish gray to grayish yellow, (5Y 7/2 to 5Y 8/4), very fine to medium grained, mild HCl reaction, very weak (R1), voids (up to <1/16") over 5-10% of surface, fossiliferous (casts and molds) <5%, extremely weak (R0) from 72.5-73.1' with a trace of fines No Recovery 76.25-76.5'	
			0	70.8' - Fracture, 20-30 deg, rough, undulating, tight			
			1	72.95' - Bedding plane, <5 deg, rough, undulating, tight			
			>10	73.75-73.95' - Fracture zone, one large fragment 2-1/2" with small fragments <3/4", subrounded to subangular		Bottom of Boring at 76.5 ft bgs on 11/27/2007	
			1	74.15' - Bedding plane, <5 deg, rough, undulating, tight			
			2	74.4' - Bedding plane or mechanical break, <5 deg, rough, undulating, tight			
	76.5		NR	75.15' - Bedding plane or mechanical break, <5 deg, rough, undulating, open <1/16"			
				75.5-75.6' - Fracture, <5 deg, rough, undulating, open 1.0" with one large fragment			
				75.95' - Mechanical break or bedding plane, <5 deg, rough, undulating, open <1/16"			



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-08
SHEET 1 OF 4	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722706.4 N, 457111.8 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.0 ft bgs on 11/16/07 START : 11/15/2007 END : 11/15/2007 LOGGER : T. Borton, P. De Sa'rego

WATER LEVELS : 3.0 TDS ON 11/15/07			START : 11/15/2007			END : 11/15/2007			LOGGERS : J. BORCH, F. 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					
42.2 											



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-08
SHEET 2 OF 4	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722706.4 N, 457111.8 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.0 ft bgs on 11/16/07 START : 11/15/2007 END : 11/15/2007 LOGGER : T. Borton, P. De Sa'rego

WATER LEVELS : 3.0 TUBES ON 11/10/07		START : 11/13/2007		END : 11/13/2007		LOGGERS : J. BORCHERT, F. 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		
22.2	20.0	1.3	SS-5	26-33-50/4 (83/10")	Silt (ML) 20.0-21.25' - Same as 15.0-15.42' except grayish yellow to yellowish gray, (5Y 8/4 to 5Y 8/1)		09:44 Installing casing to 20.0'
	21.3						
25	25.0						
17.2	25.6	0.4	SS-6	24-50/1.5 (74/7.5")	Silt With Sand (ML) 25.0-25.4' - grayish yellow to yellowish gray, (5Y 8/4 to 5Y 8/1), moist, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 17% fine sand-sized grains, all carbonate materials		
30	30.0						
12.2		1.5	SS-7	17-34-51 (85)	Sandy Silt (ML) 30.0-31.5' - dark yellowish orange, (10YR 6/6), moist, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 35% fine to coarse sand-sized, trace fine gravel-sized limestone fragments, moderate to strong HCl reaction in fragments, all carbonate materials		
	31.5						
35	35.0						Driller's Remark: Hard drilling at 34.0'; alternating hard/soft zones similar to elsewhere on site
7.2	35.3	0.0	SS-8	50/3 (50/3")	No Recovery 35.0-35.3' few limestone fragments <1/4", subangular, moderate to strong HCl reaction		



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-08
SHEET 3 OF 4	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722706.4 N, 457111.8 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.0 ft bgs on 11/16/07 START : 11/15/2007 END : 11/15/2007 LOGGER : T. Borton, P. De Sa'rego

WATER LEVELS : 3.6 TUBS ON 11/10/07			START : 11/13/2007		END : 11/13/2007		LOGGER : T. BORICH, 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			
2.2	40.0	1.2	SS-9	23-29-50 (79)	Sandy Silt (ML) 40.0-41.2' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), moist, hard, low plasticity, moderate HCl reaction, 39% fine to coarse grained sand, 6% gravel, trace of gravel-sized limestone fragments, wavy laminar bedding (grayish yellow [5Y 8/4]), all carbonate materials Begin Rock Coring at 41.5 ft bgs See the next sheet for the rock core log			Stop SPT sampling at 41.5' Changing to rock coring	
45 -2.8									
50 -7.8									
55 -12.8									
60									



PROJECT NUMBER: 338884.FL	BORING NUMBER: CT-08
SHEET 4 OF 4	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

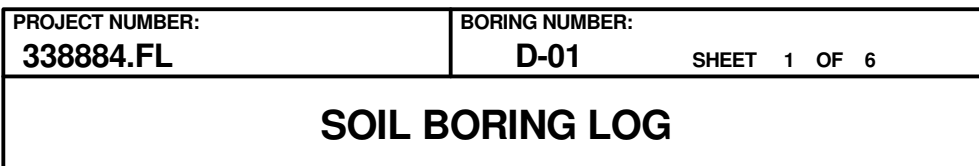
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722706.4 N, 457111.8 E (NAD83)

ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 45B S/N 351574, mud rotary, NQ tools, NW casing ORIENTATION : Vertical

WATER LEVELS : 5.0 ft bgs on 11/16/07 START : 11/15/2007 END : 11/15/2007 LOGGER : T. Borton, 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.
41.5	R1-NQ 5 ft 82%	68	0			Limestone 41.5-45.6' - pale yellowish brown, (10YR 6/2), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), very weak (R1) at 45.1-45.6', trace voids up to 1/16", a 3/8"x3/8" cavity is at 43.3' and a 2"x1-3/16" cavity is at 44.9'	Begin rock coring at 41.5' R1: 40 minutes
			1	43.05' - Fracture or mechanical break, horizontal, rough, undulating, <1/8" open			
			1	43.9' - Fracture, 30 deg, rough, undulating, black staining over 100% of surface, open			
45 -2.8			2	45.1-45.2' - Fracture, 45 deg, rough, undulating, 1/8" open			
			NR	45.4' - Fracture, 30 deg, rough, undulating, 1/8" open			
46.5	R2-NQ 5 ft 90%	58	3	46.6' - Fracture, 10 deg, rough, undulating, open		Limestone 46.5-51.0' - pale yellowish brown, (10YR 6/2), fine grained, mild HCl reaction, weak (R2), becoming very weak to weak rock at 49.8-51.5', trace voids up to 3/16" throughout run, 15% voids to 1/8" from 49.4-49.8', 10% cavities up to 1"x3/8" from 49.4-49.8'	R2: 12 minutes Total depth of boring 51.5', on 11/15/07 at 16:00 Recovery and RQD criteria met 11/16/07 at 08:15, water level is 5.0' below ground surface
			>10	47.05' - Fracture, 30 deg, rough, undulating, 1/8" open			
			0	47.2' - Fracture, 30 deg, 1/8" open, fine gravel-sized fragments			
			2	47.55' - Fracture, 10 deg, rough, undulating, tight			
50 -7.8			0	47.55-47.95' - Fracture, vertical, rough, undulating, 1/8" open			
			2	47.95-48.35' - Fracture zone, fine gravel-sized fragments			
			NR	49.8' - Fracture or mechanical break, horizontal, rough, undulating, tight			
51.5				50.5' - Mechanical break		No Recovery 51.0-51.5' Bottom of Boring at 51.5 ft bgs on 11/15/2007	



LOGGER : R. Bitely

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: D-01
SHEET 2 OF 6	
SOIL BORING LOG	






PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724095.5 N, 457510.2 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 5/22/07 START : 5/22/2007 END : 5/23/2007 LOGGER : R. Bitely

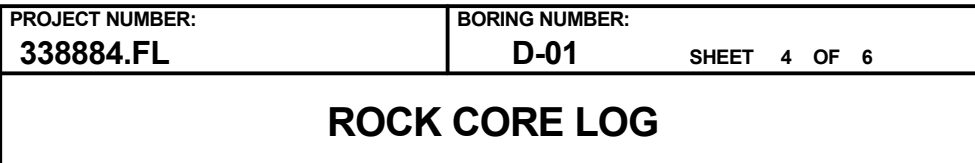
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
20.8	20.0	0.4	SS-5	4-4-5 (9)	Clayey Sand (SC) 20.0-20.45' - light olive green, (5Y 6/1), wet, loose, very fine to fine grained, 40% low to moderate plasticity fines, silica sand	[Symbolic Log Pattern]	Rapid, easy drilling. SS-5 is less plastic than SS-3 and SS-4
	21.5						
25	25.0						
15.8		1.3	SS-6	5-5-6 (11)	Silty Sand (SM) 25.0-26.3' - Same as 20.0-20.45' except 25-30% low plastic fines	[Symbolic Log Pattern]	
	26.5						
30	30.0						
10.8		1.2	SS-7	3-4-4 (8)	Silty Sand (SM) 30.0-31.2' - Same as 25.0-26.3' except 40-45% nonplastic to low plastic fines	[Symbolic Log Pattern]	
	31.5						
35	35.0						
5.8		0.4	SS-8	5-3-4 (7)	Organic Soil With Sand (OH) 35.0-35.2' - grayish black, (N2), moist, firm, high plasticity, slow dilatancy, 20% very fine to fine silica sand, trace limestone rounded pebbles Silty Sand (SM) 35.2-35.4' - light olive gray, (5Y 6/1), wet, loose, very fine to fine grained, 30% low plastic fines, silica sand, <1/2" thick organic clay (OH) seam at 35.35'	[Symbolic Log Pattern]	Slightly slower drilling.
	36.5						
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: D-01
SHEET 3 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724095.5 N, 457510.2 E (NAD83)
 ELEVATION : 40.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 5/22/07 START : 5/22/2007 END : 5/23/2007 LOGGER : R. Bitely

WATER LEVELS : 3.6 RODS ON 5/22/07							START : 5/22/2007		END : 5/23/2007		LOGGERS : T. Bailey	
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)										
0.8	40.0	0.9	SS-9	48-48-50/4 (100)	Silt With Sand (ML) 40.0-40.9' - olive gray, (5Y 3/2), moist, hard, low plasticity, rapid dilatancy, moderate HCl reaction, <20% fine to medium-sized limestone fragments, trace fine gravel-sized limestone			Hard, slow drilling. No chatter.				
	41.3											
45	45.0	0.7	SS-10	50-50/3 (100")	Sandy Silt (ML) 45.0-45.65' - olive gray, (5Y 3/2), moist, hard, low to moderate plasticity, rapid dilatancy, moderate HCl reaction, 25-30% fine sand-sized limestone fragments			Very light, intermittent chatter.				
-4.2	45.8											
50	50.0	0.5	SS-11	48-50/2 (100")	Sandy Silt And Limestone Lenses (ML) 50.0-50.5' - olive gray, (5Y 3/2), wet, hard, low to moderate plasticity, moderate HCl reaction, <30% limestone lenses, 35% fine to coarse sand-sized limestone fragments							
-9.2	50.7											
55	55.0	0.8	SS-12	48-50/5.5 (100")	Silt With Sand (ML) 55.0-55.8' - light olive gray, (5Y 5/2), moist to wet, hard, low plasticity, rapid dilatancy, moderate HCl reaction, 20% fine to medium sand sized, 40% organics as seams <1/4" thick and laminations, black (N1)			100% circulation loss. Removed NWJ rod and 6" tri-cone, set HW casing to 59.0' below ground surface. Regain 100% circulation at 57.5' below ground surface with HW casing. Stop drilling at 17:30 5/22/07 after setting the casing				
-14.2	56.0											
	60.0	0.1	SS-13	50/1.5 (50/1.5")	Limestone Fragments 60.0-60.1' - light olive gray, (5Y 5/2), moderate HCl reaction, fragments <1" diameter, voids <1/16" over 40% of surface							
	60.1											
60					Begin Rock Coring at 60.0 ft bgs See the next sheet for the rock core log							



ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bqs on 5/22/07

START : 5/22/2007

END : 5/23/2007

LOGGER : R. Bitely

APPENDIX 2BB-740



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-01

SHEET 5 OF 6

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724095.5 N, 457510.2 E (NAD83)

ELEVATION : 40.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

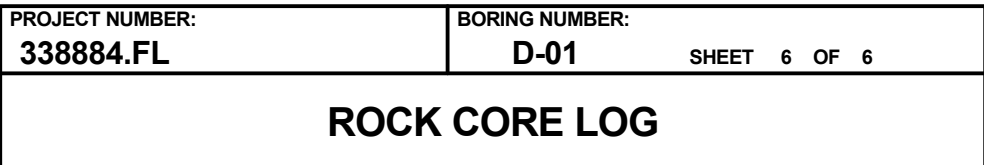
WATER LEVELS : 3.0 ft bgs on 5/22/07

START : 5/22/2007

END : 5/23/2007

LOGGER : R. Bitely

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			
-39.2			NA			Fat Clay (CH) 80.0-80.3' - high plasticity, no to slow dilatancy, strong HCl reaction, <10% limestone fragments of medium sand-sized, calcareous clay	R5: 4 minutes
81.0			5				
			>10	80.9-81.0' - Fracture zone, rough, undulating, gravel sized fragments <1" diameter			
			0	81-81.1' - Fracture zone, rough, undulating, gravel sized fragments <1-1/2" diameter			
			0	81.45' - Fracture or mechanical break, <10 deg, rough, undulating, 3+ gravel sized fragments <1/2" diameter, open <1/2"			
			0	81.75' - Fracture or mechanical break, 40 deg, rough, undulating, open <1/2"			
	R6-NQ 5 ft 94%	70	1			Limestone 80.3-81.0' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids <1/16" over <10-30% of surface, increasing with depth, no cavities <1/2" diameter, poorly fossiliferous	
85			1	84.95' - Mechanical break or fracture, <10 deg, rough, undulating, tight			
-44.2			NR	85.15' - Fracture or mechanical break, <10 deg, rough, undulating, open <1/4"			R6: 5 minutes
86.0			>10			81.0-83.25' - very light gray to moderate yellowish brown, (N8 to 10YR 5/4), very fine to fine grained, medium strong to strong (R3 to R4), voids <1/16" over <5-30% of surface, variable, many cavities <1/2"x1-1/2" diameter, 80% (with secondary recrystallized infill), trace organics, poorly fossiliferous	
			>10	86.8' - Fracture or mechanical break, <10 deg, rough, undulating, open <1/2"			
			1	86.9-87.05' - Fracture zone, rough, undulating, gravel sized fragments <1-1/2" diameter			
			3	87.45, 87.8, 88.05, 89.2' - Fracture or mechanical break, <10 deg, rough, undulating, 1/2" silt lens at 87.8', <1/4" gaps			
			2	88.5' - Mechanical break, for hardness test			
90			NR	89.55, 90.0, 90.2, 90.35' - Mechanical break or fractures, <10 deg, rough, undulating, fractures through cavities, open <1"			
-49.2			0			Carbonate Silt (ML) 83.25-83.35' - very light gray to moderate yellowish brown, (N8 to 10YR 5/4), very fine to fine grained, low to moderate plasticity, rapid to moderate dilatancy, strong HCl reaction	
			0			Limestone 83.35-85.7' - very light gray to moderate yellowish brown, (N8 to 10YR 5/4), very fine to fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), strengthening with depth, voids <1/16" over 15-30% of surface, few cavities <1"x1/2" diameter, with partial secondary recrystallized infill, poorly fossiliferous, trace laminated organics	R7: 4 minutes
			0	92.35, 92.55' - Mechanical break or fractures, <10 deg, rough, undulating, tight, open <1/4"			
			0			No Recovery 85.7-86.0'	
			1			Limestone 86.0-90.6' - yellowish gray to dark yellowish brown, (5Y 7/2 to 10YR 4/2), 5b 7/1, fine to medium grained, moderate to weak HCl reaction, weak to strong (R2 to R4), mottled light bluish gray (5B 7/1) at	
			3	94.95, 95.05, 95.1, 95.65' - Bedding plane or mechanical break, <10 deg, smooth, undulating, tight			R8: 5 minutes
95						86.0-87.8', voids <1/16" over 20-30% of surface, many cavities, <2" diameter, poorly to moderately fossiliferous, 1/2" carbonate silt lens at 87.8', trace laminated organics	
-54.2						No Recovery 90.6-91.0'	
96.0							



ORIENTATION : Vertical

LOGGER : R. Bitely

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: D-02
SHEET 1 OF 3	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724164.5 N, 457585.0 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 04/20/07 START : 4/20/2007 END : 4/20/2007 LOGGER : T. Stewart

WATER LEVELS : 1.01005 ON 4/20/07			START : 4/20/2007		END : 4/20/2007		LOGGERS : J. Stewart	
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			
41.3	0.0	1.2	SS-1	1-2-2 (4)	Topsoil (OL/OH) 0.0-0.2' - grayish black, (N2), moist			
	1.5				Poorly Graded Sand With Organics (SP) 0.2-0.6' - medium gray, (N5), moist, very loose, very fine to fine grained, 5% nonplastic fines, 10% organics, roots, sand is silica			
					Silty Sand (SM) 0.6-1.2' - dark yellowish orange, (10YR 6/6), moist to wet, very loose, fine grained, 15-20% nonplastic fines, sand is silica			
5	5.0							
36.3		0.8	SS-2	6-7-7 (14)	Poorly Graded Sand (SP) 5.0-5.8' - white, (N9), wet, medium dense, very fine to fine grained, trace nonplastic fines, trace black particles, sand is silica			
	6.5							
10	10.0							
31.3		1.2	SS-3	5-4-4 (8)	Sandy Lean Clay (CL) 10.0-11.2' - greenish gray w/ pale green and olive gray with pale green and olive gray mottling, (5GY 6/1, 10G 6/2, and 5Y 3/2), wet to moist, stiff, low to medium plasticity, slow dilatancy, 40% very fine silica sand		Driller's Remark: Hard drilling at 12.0'	
	11.5							
15	15.0							
26.3		1.3	SS-4	7-4-15 (19)	Sandy Silt And Limestone (ML) 15.0-16.3' - grayish yellow, (5Y 8/4), wet, very stiff, low plasticity, rapid dilatancy, mild to moderate HCl reaction, 35-40% fine to coarse sand, 20% fine to coarse gravel-sized limestone fragments; carbonate, all carbonate			
	16.5							
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: D-02
SHEET 2 OF 3	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724164.5 N, 457585.0 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 04/20/07 START : 4/20/2007 END : 4/20/2007 LOGGER : T. Stewart

WATER LEVELS : 1.0 ft bgs on 04/20/07			START : 4/20/2007			END : 4/20/2007			LOGGERS : J. Stewart		
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					
21.3	20.0	1.2	SS-5	42-50-38 (88)	Sandy Silt And Limestone (ML) 20.0-21.2' - grayish yellow, (5Y 5/4), moist, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 35% fine to coarse sand, 20% fine to coarse gravel-sized limestone fragments, all carbonate, similar to 15.0-16.3'			Driller's Remark: 22.5' got hard, then began soft drilling within next few inches			
	21.5										
25	25.0										
16.3	25.2	0.0	SS-6	50/2 (50/2")	No Recovery 25.0-25.2'						
30	30.0							Driller's Remark: 27.5' soft drilling to 30.0'			
11.3		1.3	SS-7	22-22-12 (34)	Sandy Silt (ML) 30.0-31.3' - dark yellowish orange, (10YR 6/6), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 35% fine to coarse sand, 10% fine gravel-sized limestone fragments, all carbonate						
	31.5										
								Driller's Remark: Hard again at 34.5'			
35	35.0										
6.3	35.1	0.1	SS-8	50/1.5 (50/1.5")	Limestone Fragments 35.0-35.1' - light olive gray to moderate olive brown and gray yellowish fragments, (5Y 5/2 to 5Y 4/4 and 5Y 8/4), olive colored fragments have 10-15% black particles, disc shaped Begin Rock Coring at 35.0 ft bgs See the next sheet for the rock core log						
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-02

SHEET 3 OF 3

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724164.5 N, 457585.0 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

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

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

ORIENTATION : Vertical

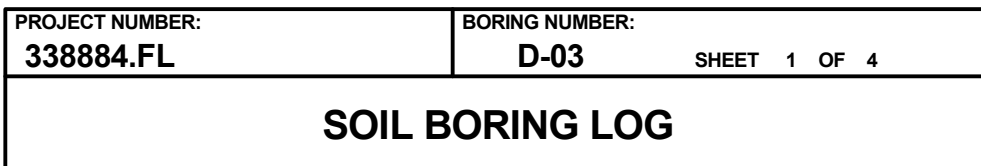
WATER LEVELS : 1.0 ft bgs on 04/20/07

START : 4/20/2007

END : 4/20/2007

LOGGER : T. Stewart

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.
6.3	35.0	96	1	35.95' - Fracture, 60 deg, rough, undulating, tight 36.6' - Mechanical break, horizontal, rough, undulating, tight		Limestone 35.0-39.8' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), decreasing to very weak (R1) below 38.5'. 5-20% voids <1/16", poorly fossiliferous (clasts up to 3/16"), trace yellowish gray (5Y 7/2) mottling, secondary recrystallization	Driller's Remark: 100% circulation R1: 6 minutes
			0				
			0				
			0				
			0				
40	40.0	86	NR	40.5' - Fracture or mechanical break, 60 deg, rough, undulating, tight 40.6' - Fracture or mechanical break, 70 deg, rough, undulating, tight 41.4' - Fracture or mechanical break, 0-10 deg, rough, planar, tight 42.0-42.2' - Fracture zone 42.4' - Mechanical break, horizontal, rough, undulating, tight		No Recovery 39.8-40.0' Limestone 40.0-41.5' - light olive gray, (5Y 5/2), moderate to strong HCl reaction, very weak (R1), 5-10% voids <1/16", non-fossiliferous, transitional to 41.0-44.5' 41.0-44.5' - light olive gray, (5Y 5/2), fine grained, moderate to strong HCl reaction, very weak (R1), 15-40% voids <1/16" and increasing to <3/16" with depth, poorly fossiliferous with increasing cavities with depth (up to 1/2" elongate), secondary recrystallization No Recovery 44.5-45.0' Bottom of Boring at 45.0 ft bgs on 4/20/2007	Driller's Remark: Maintained full circulation R2: 4 minutes Total Depth at 45.0' on 4/20/07
1.3			2				
			1				
			>10				
			0				
			0				
45	45.0		NR				
-3.7							



WATER LEVELS : 1.5 ft bgs on 3/24/07 START : 3/24/2007 END : 3/26/2007 LOGGER : T. Stewart

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-03

SHEET 2 OF 4

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724234.5 N, 457645.5 E (NAD83)

ELEVATION : 42.0 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, NW rods, 4-7/8" and 6" tri-cone bits

ORIENTATION : Vertical

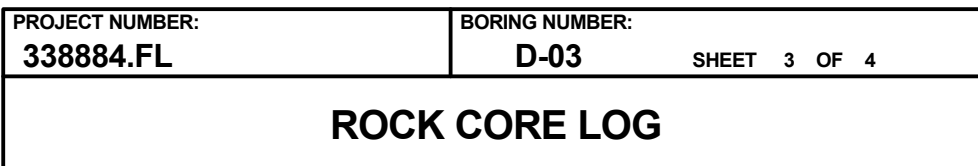
WATER LEVELS : 1.5 ft bgs on 3/24/07

START : 3/24/2007

END : 3/26/2007

LOGGER : T. Stewart

WATER LEVELS : 1.51 bgs on 3/24/07			START : 3/24/2007		END : 3/20/2007		LOGGER : T. Stewart	
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			
22.0	20.0	0.1	SS-5	50/1 (50/1")	Limestone Fragments 20.0-20.1' - grayish yellow to moderate yellow, (5Y 8/4 to 5Y 7/6), moderate HCl reaction, poorly fossiliferous (molds), trace (1/2") dusky yellowish brown (10YR 2/2) concretions		11:57 at 20.0' currently 15' 6" diameter casing in place, using 5.0' N-rod lengths to advance a 4-7/8" tricone roller drill bit Driller's Remark: Very hard drilling	
25	25.0							
17.0	25.4	0.4	SS-6	50/5 (50/5")	Limestone Fragments 25.0-25.4' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, fine to coarse gravel-sized limestone fragments, poorly fossiliferous (casts and molds)			
30	30.0							
12.0	30.4	0.4	SS-7	50/5 (50/5")	Silt With Sand (ML) 30.0-30.4' - dark yellowish orange, (10YR 6/6), wet, nonplastic, rapid dilatancy, moderate HCl reaction, 20-25% fine to medium sand-sized material, all carbonate Begin Rock Coring at 31.0 ft bgs See the next sheet for the rock core log		Driller's Remark: Hard drilling and a lot of chatter, very slow drilling advancement Driller's Remark: 15:25, set 3' NW casing to 30' then switch to core runs Driller's Remark: 15:33 tape measured depth of boring is 31.0' NQ core barrel assembly NQ drill bit is a hard rock formation drill bit NW casing advancer w/ retractable tricone roller drill bit accessory (serial # 83963-CN) Switch to rock coring at 31.0'	
35								
7.0								
40								



ORIENTATION : Vertical

LOGGER : T. Stewart

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: D-03	SHEET 4 OF 4
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724234.5 N, 457645.5 E (NAD83)

ELEVATION : 42.0 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 : 1.5 ft bgs on 3/24/07 START : 3/24/2007 END : 3/26/2007 LOGGER : T. Stewart

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.
55 -13.0	51.5		>10	49.20' - Fracture or mechanical break, horizontal, rough, undulating, tight		Limestone 47.0-51.5' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, weak (R2), very weak (R1) zone at 50.0', spherical voids (1/16") over 20-30% of surface, poorly fossiliferous, casts/molds (up to 1/2"), up to 15% brownish black particles as laminations (up to 1/16" thick) 51.5-56.5' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), mild to moderate HCl reaction, weak to medium strong (R2 to R3), spherical voids (up to 1/16") over 5-10% of surface, black laminations (<1/16" thick) across entire interval, trace coarse grained black particles (possible organics) 56.5-57.0' - Same as 51.5-56.5' 57.0-61.35' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 20-30% of surface, few fossil molds and casts up to 1/2" elongate	R7: 16 minutes
			0	49.25' - Fracture, horizontal and 60-70 deg, rough, undulating, tight			
			4	49.9-50.3' - Fracture zone			
				50.65' - Fracture, 80-90 deg, rough, undulating, tight			
			0	50.95-51.5' - Fracture zone or mechanical break, vertical, tight			
				52.3, 53.0' - Mechanical break (2)			
				53.15-53.35' - Fracture zone			
			2	54.9' - Fracture or mechanical break, 40-50 deg, rough, undulating, tight			
			0				
60 -18.0	56.5						
	57.0		0				
			2	57.5, 57.8, 59.0' - Fracture (3), <10 deg, rough, undulating, open 1/4"-1/2"			
			0				
			2	59.5, 59.6' - Mechanical break (2)			
			2	59.95' - Fracture or mechanical break, 25-35 deg, rough, undulating, open 1/2"			
				60.35' - Fracture, 20-30 deg, rough, undulating, open 1/8"			
			0	60.8' - Fracture or mechanical break, horizontal, smooth, undulating			
			NR				
	62.0						
						Bottom of Boring at 62.0 ft bgs on 3/26/2007	08:03 3/26/07 water level 2.5' below ground surface to top of mud surface level
							10:00 3/26/2007 finished abandonment Grout seeping up out of ground surface 3' away from hole



PROJECT NUMBER: 338884.FL	BORING NUMBER: D-04
SHEET 1 OF 5	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.5 N, 457831.9 E (NAD83)
 ELEVATION : 41.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/28/07 START : 3/28/2007 END : 4/4/2007 LOGGER : R. McComb

WATER LEVELS : 2.0' below ground surface		START : 3/20/2007		END : 4/4/2007		LOGGER : T. McCOMB	
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		
41.9	0.0	0.8	SS-1	2-3-2 (5)	Topsoil (OL) 0.0-0.2' - black, (N1), moist, roots, wood debris		Water level: 2.0' below ground surface
	1.5				Poorly Graded Sand (SP) 0.2-0.8' - medium dark gray, (N4), moist, loose, fine grained, silica sand, 10-15% organic material, roots		
5	5.0						
36.9		1.0	SS-2	4-4-4 (8)	Poorly Graded Sand (SP) 5.0-5.95' - very light gray grading to light gray, (N8 to N7), wet, loose, fine grained, silica sand, trace nonplastic fines gradually increasing to silty sand (SM) with 25% low plasticity fines		
	6.5						
10	10.0						
31.9		1.3	SS-3	5-22-28 (50)	Sand With Limestone (SP) 10.0-10.2' - pale greenish yellow, (10Y 8/2), wet, loose, fine to coarse grained, strong HCl reaction, gravel-sized limestone fragments, 25% fine to coarse sand-sized grains, 15% nonplastic fines		
	11.5				Clayey Sand (SC) 10.2-10.35' - pale olive, (10Y 6/2), wet, medium dense, fine to medium grained, strong HCl reaction, 25-30% low plastic fines, carbonate Silt (ML) 10.35-11.3' - moderate yellow and grayish yellow, (5Y 7/6 and 5Y 8/4), wet, nonplastic, rapid dilatancy, mild HCl reaction, carbonate		
15	15.0						
26.9		1.2	SS-4	23-33-26 (59)	Silt (ML) 15.0-16.2' - Same as 10.35-11.3' except 5-10% very fine sand-sized grains		
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: D-04
SHEET 2 OF 5	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.5 N, 457831.9 E (NAD83)
 ELEVATION : 41.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/28/07 START : 3/28/2007 END : 4/4/2007 LOGGER : R. McComb

WATER LEVELS : 2.0 TUBS ON 9/20/07				START : 9/20/2007		END : 4/4/2007		LOGGER : T. MCCOMB	
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		
			50/3.5 (50/3.5")					Silt (ML) 20.0-20.3' - Same as 15.0-16.2' except 5-10% very fine sand-sized grains, trace medium to coarse sand-sized grains	
21.9	20.8	0.3	SS-5	50/3.5 (50/3.5")	Silt (ML) 20.0-20.3' - Same as 15.0-16.2' except 5-10% very fine sand-sized grains, trace medium to coarse sand-sized grains				
25	25.0								
16.9		1.2	SS-6	10-13-21 (34)	Silt With Sand And Limestone (ML) 25.0-26.2' - grayish yellow, (5Y 7/2), nonplastic, rapid dilatancy, mild to moderate HCl reaction, 20% fine to coarse sand-sized grains, 15% fine to coarse gravel-sized limestone, carbonate				
	26.5								
								Driller's Remark: Chatter at 27.5'	
30	30.0								
11.9		1.5	SS-7	24-32-38 (70)	Silt With Sand (ML) 30.0-31.45' - Same as 25.0-26.2' except 20-25% very fine to fine sand-sized grains, no gravel-sized fragments				
	31.5								
35	35.0								
6.9		1.3	SS-8	13-19-14 (33)	Sandy Silt (ML) 35.0-36.3' - light olive brown to moderate olive brown, (5Y 5/6 to 5Y 4/4), wet, low plasticity, rapid dilatancy, mild HCl reaction, 25-30% fine to coarse sand-sized grains, trace fine gravel-sized limestone, carbonate materials				
	36.5								
	40.0								
	40.1	0.1	SS-9	50/1 (50/1")	Limestone Fragments 40.0-40.1' - moderate olive brown to olive brown, (5Y 4/4 to 5Y 3/2), mild HCl reaction, fine gravel-sized fragments			Driller's Remark: Chatter at 38.5'	
40								40.0' switch over to HQ rock coring	
					Begin Rock Coring at 40.0 ft bgs See the next sheet for the rock core log				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-04

SHEET 3 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.5 N, 457831.9 E (NAD83)

ELEVATION : 41.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/28/07

START : 3/28/2007

END : 4/4/2007

LOGGER : R. McComb

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.
1.9	40.0		>10	40.0-41.0' - Fracture zone		Limestone Fragments 40.0-40.4' - grayish yellow, (5Y 7/2), very fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over 10-15% of surface No Recovery 40.4-41.0' Limestone 41.0-45.0' - light olive gray, (5Y 5/2), moderate HCl reaction, medium strong (R3), voids covering 10-15% of surface increasing to 20-30% below 42.5', partially infilled voids (1/4") from 42.2-42.4', 1-3% cavities (up to 1-9/16"), trace fossils 45.0-45.8' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, extremely weak (R0), voids covering 5-10% of surface, many cavities up to 3/8" long, very friable No Recovery 45.8-52.0'	Driller's Remark: Very hard drilling from 40.0-41.5', 42.5'
45 -3.1	45.0	40	NR	41.05' - Fracture, 40-60 deg, rough, planar, open 41.15' - Fracture, rough, planar and undulating, open 41.4, 41.5' - Fractures (2), 0-60 deg, rough, undulating, open 41.3' - Fracture, 0-<5 deg, rough, undulating, open 42.45' - Fracture, 0-60 deg, rough, undulating, open 42.8' - Fracture, rough, planar to undulating, tight 43.3' - Fracture, horizontal, rough, undulating, open 43.65' - Fracture, <5 deg, rough, undulating, open 1/2"-3/4" 43.9, 44.05, 44.7' - Fractures (3), <5-60 deg, rough, undulating, open 44.8, 44.95' - Fractures (2), <5 deg, rough, undulating, open 45.8' - Fracture, horizontal, rough, undulating			R1: 29 minutes
50 -8.1	50.0	0	NR				45.8-50.0' core fell back into borehole, upon recovering there was no core retrieved because of poor quality of rock and being very friable
55 -13.1	55.0	0	NR				R2: 3 minutes
			NR				End 4/3/07 at 50.0' Begin 4/4/07
		0	NA			Poorly Graded Sand (SP) 52.0-53.0' - moderate yellow to dusky yellow, (5Y 7/6 to 5Y 6/4), wet, loose, very fine to fine grained, strong HCl reaction, 10% silica, 90% carbonate Limestone Fragments 53.0-54.0' - moderate olive brown, (5Y 4/4), mild HCl reaction, very fine to fine gravel, silt to fine sand-sized with up to 1/8" limestone fragments Limestone 54.0-55.0' - moderate olive brown to light olive brown, (5Y 4/4 to 5Y 4/6), mild HCl reaction, extremely weak to very weak (R0 to R1), carbonaceous material covering some surfaces, voids covering 30-40% of surface, infilling with sandy texture, fine gravel-sized rock fragments No Recovery 55.0-58.8'	R5: 6 minutes
60	60.0	0	NR	58.8' - Fracture, rough, undulating, open 59.1' - Fracture, 0-60 deg, rough, undulating, open			Driller's Remark: Harder drilling at 54.0' bgs
			>10				Driller's Remark: Hard drilling 57.9 - 60.0'
							R4: 10 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-04

SHEET 4 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.5 N, 457831.9 E (NAD83)

ELEVATION : 41.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/28/07

START : 3/28/2007

END : 4/4/2007

LOGGER : R. McComb

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.
-18.1	R5-NQ 5 ft 74%	28	4	59.4' - Fracture, 0-40 deg, rough, undulating, open		Limestone 58.8-59.6' - light olive brown, (5Y 5/6), very fine grained, mild HCl reaction, weak (R2), voids over 1-5% of surface, rare 1/16"-1/8" cavities 59.6-60.0' - Same as 58.8-59.6' except very weak (R1), gravel-sized limestone fragments, with carbonaceous material on 30% of surface 60.0-62.0' - light olive brown, (5Y 5/6), mild HCl reaction, extremely weak (R0), friable, voids over 5% of surface 62.0-63.7' - Same as 60.0-62.0' except moderate HCl reaction, very weak to weak (R1 to R2), thin carbonaceous laminae at 62.4', rare elongated cavities (up to 3/8"x3/16"), trace organics, trace fossils, voids increase from 5-20% where rock is stronger No Recovery 63.7-65.0 Limestone 65.0-67.8' - dusky yellow, (5Y 6/4), fine to very fine grained, voids covering up to 15% surface, rare cavities (up to 1-1/4"), thin discontinuous carbonaceous laminae from 65.0-66.0', variable strength increasing with depth from weak (R2) to medium strong (R3) except extremely weak (R0) from 66.1-66.4', trace organic material No Recovery 67.8-70.0' Limestone 70.0-70.15' - Same as 65.0-67.8' No Recovery 70.15-71.75' Limestone 71.75-75.0' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, strong HCl reaction, medium strong (R3), voids (up to 1/16") over 20-40% of surface, several cavities (up to 3/4") covering 1-3% of surface predominantly at 73.6' 75.0-78.2' - Same as 71.75-75.0' except voids below 77.0' decreasing to 18-20% of surface, few elongated cavities (1/4"x1/2"), most with secondary infill, gradual transition to 78.2-79.5'	R5: 5 minutes
			2	59.6' - Fracture, horizontal, smooth, planar, open			
			2	60.1' - Fracture, horizontal, rough, planar, open			
			2	60.2' - Fracture, 40 deg, rough, undulating, open			
			2	60.65' - Fracture, rough, undulating, open			
	R6-NQ 5 ft 56%	17	NR	60.9, 61.7' - Fractures (2), <5 deg, rough, undulating, open		R6: 8 minutes	
			NR	61.9' - Fracture, vertical, rough, tight			
			NR	62.1' - Fracture, <5 deg, rough, undulating, open			
			NR	62.8, 63.2' - Fractures (2), <5 deg, rough, undulating, open			
			NR	63.7' - Fracture, <5 deg, rough, stepped, open			
65 -23.1	R7-NQ 5 ft 69%	40	4	65.25' - Fracture, <5 deg, rough, undulating, open		R7: 7 minutes	
			4	65.35' - Fracture, horizontal, rough, undulating, open			
			1	65.4-65.7' - Fracture, vertical, rough, undulating, open			
			NR	65.8' - Fracture, 40 deg, rough, undulating, tight			
			NR	66.0-66.4' - Fracture zone			
	R8-NQ 5 ft 100%	86	NR	66.4-66.8' - Fracture, 70 deg, rough, stepped, tight		R8: 5 minutes	
			NR	66.9' - Fracture, <5 deg, rough, stepped, tight			
			NR	67.8' - Fracture, horizontal, rough, stepped, open			
			NR				
			NR				
70 -28.1	R8-NQ 5 ft 100%	86	0				
			NR				
			NR				
			NR				
			NR				
75 -33.1	R8-NQ 5 ft 100%	86	1	72.4' - Fracture, horizontal, rough, undulating, open			
			1	72.4-72.9' - Fracture, 80 deg, rough, stepped, tight			
			1	72.9, 73.4' - Fractures (2), 0-10 deg, rough, undulating, tight to open			
			2	74.1-74.6' - Fracture, 70 deg, rough, stepped, tight			
			2	75.0' - Fracture, 45 deg, rough, undulating			
	R8-NQ 5 ft 100%	86	1	75.7' - Fracture, <5 deg, rough, stepped, open			
			1				
			0	76.6' - Fracture, horizontal, rough, stepped, tight			
			3				
			1	78.45, 78.55' - Bedding plane (2), horizontal, smooth, undulating to planar, open			
80				78.9, 79.1' - Fractures (2), 10 deg, rough, undulating, open			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-04

SHEET 5 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723150.5 N, 457831.9 E (NAD83)

ELEVATION : 41.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/28/07

START : 3/28/2007

END : 4/4/2007

LOGGER : R. McComb

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			
-38.1	R9-NQ 5 ft 46%	0	>10	80.0-81.1' - Fractures, 0-90 deg, rough, undulating and stepped, open		78.2 - 79.5' - pale yellowish orange to moderate yellow, (10YR 8/6 to 5Y 7/6), fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), dark gray 1/8" gravel in matrix from 78.5-79.0', 5-10% voids from 78.5-79.0' declining to 0% at 79.0', gradual transition to 79.5-80.0'	R9: 7 minutes
			0			79.5-80.0' - pale yellowish orange, (10YR 8/6), fine grained, strong HCl reaction, very weak (R1), voids (1/16") over 18% of surface, homogeneous appearance	
			NR			80.0-80.9' - light olive brown, (5Y 5/6), very fine to fine grained, mild HCl reaction, extremely weak (R0), voids over 30-40% of surface grading into cavities up to 3/8", gravel-sized material	
85 -43.1	R10-NQ 5 ft 98%	59	1	85.95' - Fracture, <5 deg, rough, undulating, open		Limey Clay (CL) 80.9-81.1' - moderate olive brown, (5Y 4/4), moist, soft, low plasticity, black carbonaceous staining, silty	Driller's Remark: Lost circulation at 87.0'
			1	86.6' - Fracture, <5 deg, rough, undulating, tight		Limestone 81.1-82.3' - Same as 80.0-80.9' except weak (R2), not broken into gravel-sized rock fragments	
			2	87.2' - Fracture, 30-40 deg, rough, undulating, open		No Recovery 82.3-85.0' Limestone	
			2	87.4-87.7' - Fracture zone, 60 deg, rough, undulating, tight		85.0-89.9' - moderate yellowish brown to yellowish gray with depth, (10Y 5/4 to 5Y 7/2), mild to strong HCl reaction, weak to medium strong (R2 to R3), voids covering 15-40% of surface grading into cavities (up to 1-3/16") with depth, mottled with zones of light limestone becoming more fossiliferous with depth	
			2	88.45-88.7' - Fracture zone, <5-60 deg, rough, undulating, open		No Recovery 89.9-90.0' Limestone	
90 -48.1	R11-NQ 5 ft 16%	0	NR	89.55' - Fracture, horizontal, rough, stepped, open		90.0-90.8' - light olive brown to dusky yellow, (5Y 5/6 to 5Y 6/4), strong HCl reaction, weak (R2), voids over 20-30% of surface, gravel-sized rock fragments (1/4"-2"), highly fossiliferous, black carbonaceous material up to 15-20% of surface	R11: 5 minutes
			>10	89.7' - Fracture, 80-90 deg, rough, undulating, open		No Recovery 90.8-98.5'	
			NR	90.0-90.8' - Fracture zone, various orientations		Limestone 98.5-100.0' - dusky yellow, (5Y 6/4), strong HCl reaction, weak (R2), gravel-sized rock fragments, voids covering 25-40% of surface, highly fossiliferous	
95 -53.1	R12-NQ 5 ft 30%	6	NR				Driller's Remark: Possible void 95.0 - 96.0'; very soft drilling 96.0 - 98.5', firmer drilling at 98.5'
			>10				
			>10	99.0-100.0' - Fracture zone, 0-90 deg, rough, undulating, open			
100	100.0					Bottom of Boring at 100.0 ft bgs on 4/4/2007	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-05

SHEET 1 OF 5

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723221.4 N, 457903.2 E (NAD83)

ELEVATION : 41.8 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, 3-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/04/07

START : 4/4/2007

END : 4/4/2007

LOGGER : A. Teal

WATER LEVELS : 2.0' below ground surface			START : 4/4/2007			END : 4/4/2007			LOGGER : A. Earl		
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						
41.8	0.0	0.8	SS-1	0-0-2 (2)	Topsoil (OL) 0.0-0.3' - black, (N1), organics Poorly Graded Sand With Organics (SP) 0.3-0.8' - brownish gray, (5YR 4/1), moist, very loose, very fine to fine grained, no HCl reaction, silica sand, trace nonplastic fines, 20% organics as fines and roots		Water level: 2.0' below ground surface				
	1.5										
5	5.0										
36.8	6.5	1.3	SS-2	1-0-0 (0)	Sandy Lean Clay (CL) 5.0-6.25' - greenish gray, (5G 6/1), moist to wet, very soft, low to medium plasticity, slow to rapid dilatancy, 35-40% very fine silica sand		Weight of hammer for last 12"				
10	10.0										
31.8	11.5	1.4	SS-3	13-14-22 (36)	Silty Sand (SM) 10.0-11.4' - yellowish gray, (5Y 8/1), moist to wet, dense, very fine to coarse grained, low plasticity, very rapid dilatancy, strong HCl reaction, 20-25% low plastic trace fines gravel-sized		Appears to have fossil fragments Driller's Remark: Lost circulation at 12'				
15	15.0										
26.8	16.5	1.0	SS-4	1-4-26 (30)	Silt (ML) 15.0-15.8' - moderate yellow, (5Y 7/6), wet, very stiff, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 10-15% very fine sand-sized, carbonate materials Limestone Fragments 15.8-16.0' - moderate olive brown, (5Y 4/4), strong HCl reaction, fine to coarse gravel-sized		Set 20' HW casing				
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: D-05
SHEET 2 OF 5	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723221.4 N, 457903.2 E (NAD83)
 ELEVATION : 41.8 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, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 04/04/07 START : 4/4/2007 END : 4/4/2007 LOGGER : A. Teal

WATER LEVELS : 2.0 (RDS) 01/04/07			START : 4/4/2007			END : 4/4/2007			LOGGER : A. Earl		
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				
21.8	20.0	0.1	SS-5	50/3 (50/3")	Limestone Fragments 20.0-20.3' - grayish yellow, (5Y 8/4), fine to coarse grained, mild HCl reaction, fine gravel-sized fragments						
25	25.0										
16.8		1.1	SS-6	17-26-31 (57)	Sandy Silt With Limestone (ML) 25.0-26.1' - grayish yellow, (5Y 8/4), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 10% fine to coarse limestone fragments, 35-40% fine to coarse sand-sized, carbonate materials						
	26.5										
30	30.0										
11.8		1.5	SS-7	15-17-47 (64)	Sandy Silt (ML) 30.0-31.5' - Same as 25.0-26.1' except mild to moderate HCl reaction, 30% fine to coarse sand-sized, trace gravel-sized						
	31.5										
35	35.0										
6.8		1.1	SS-8	34-24-50/2.5 (74/8.5")	Sandy Silt With Limestone (ML) 35.0-36.1' - light olive gray, (5Y 5/2), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 40% fine to coarse sand-sized, 10% fine to coarse gravel-sized limestone fragments, carbonate materials						
	36.2										
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: D-05
SHEET 3 OF 5	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723221.4 N, 457903.2 E (NAD83)
 ELEVATION : 41.8 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, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 04/04/07 START : 4/4/2007 END : 4/4/2007 LOGGER : A. Teal

WATER LEVELS : 2.01 bgs on 4/4/07			START : 4/4/2007			END : 4/4/2007			LOGGER : A. Earl		
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				
1.8	40.0	0.3	SS-9	50/4 (50/4")	Limestone Fragments 40.0-40.3' - light olive gray, (5Y 5/2), fine to coarse grained, mild HCl reaction Begin Rock Coring at 40.7 ft bgs See the next sheet for the rock core log						
45 -3.2											
50 -8.2											
55 -13.2											
60											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-05

SHEET 4 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723221.4 N, 457903.2 E (NAD83)

ELEVATION : 41.8 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

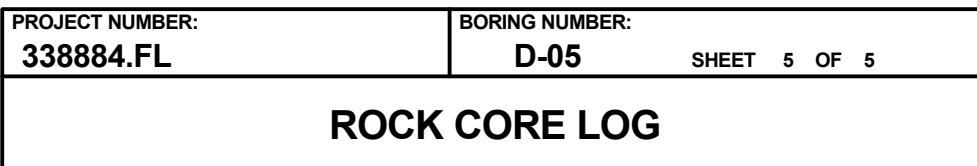
WATER LEVELS : 2.0 ft bgs on 04/04/07

START : 4/4/2007

END : 4/4/2007

LOGGER : A. Teal

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.
40.7	R1-NQ 1 ft 85%	50	3	40.9' - Fracture, 10 deg, smooth, undulating, tight		Limestone 40.7-41.7' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, weak (R2), 10-20% void space up to 1/8", trace cavities up to 1/4", moderately fossiliferous (casts/molds)	R1: 1 minute
41.7			0	41.0' - Fracture, 50 deg, smooth, planar, tight			
			5	41.05' - Fracture, 10 deg, smooth, undulating, loose			
	R2-NQ 5 ft 88%	35	>10	43.2' - Mechanical break		41.7-43.5' - pale yellowish brown, (10YR 6/2), fine grained, delayed moderate HCl reaction, weak to medium strong (R2 to R3), 15-20% voids up to 1/8", trace cavities up to 3/16", moderately fossiliferous (molds/casts)	
45			>10	43.5-44.5' - Fracture zone (at least 7), tight but weathered fractures with fragmentation			
-3.2			>10	44.5-45.7' - Fracture zone, fragments from 1/8" to 1", subrounded			
			NR	45.7-46.1' - Fractures (at least 4), 10 deg, open, weathered, with vertical fractures and fragmentation		43.5-46.1' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), 10% void space up to 1/8", poorly fossiliferous	R2: 2 minutes
			>10	46.7-50.3' - Fracture zone, very soft material		No Recovery 46.1-46.7'	
			>10			Limestone 46.7-50.3' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), 20-30% voids, trace up to 1/3" long fossil cavities and casts	
50	R3-NQ 5 ft 70%	45	>10				
-8.2			NR			No Recovery 50.5-51.7'	R3: 1 minute
			>10	52.0' - Fracture, 10 deg, rough, undulating, tight		Limestone 51.7-53.8' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), 10-20% voids up to 1/16"	
			>10	52.3-53.0' - Fracture zone, limestone fragments from silt to cobble-sized fragments			
	R4-NQ 5 ft 86%	75	>10	53.8' - Fracture, 20 deg, rough, undulating, loose		53.8-56.0' - Same as 51.7-53.8' except moderate yellowish brown, (10YR 5/4)	
			0	54.1' - Fracture, 25 deg, rough, undulating, tight			
55			0	54.2-54.7' - Fracture zone, 20 deg, same as 52.3-53.0'			
-13.2			NR	55.5' - Mechanical break		No Recovery 56.0-56.7'	R4: 2 minutes
			0			Limestone 56.7-61.3' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), 20-25% voids up to 1/8", some laminations	
			1	57.9' - Fracture, 30 deg, rough, undulating, tight			
	R5-NQ 5 ft 92%	68	>10	59.2' - Fracture, 70 deg, rough, undulating, tight			
60			>10	59.5-60.3' - Fracture zone, gravel-sized fragments			
-18.2							



ELEVATION : 41.8 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 : 2.0 ft bgs on 04/04/07

START : 4/4/2007

END : 4/4/2007

LOGGER : A. Teal

APPENDIX 2BB-759



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-06

SHEET 1 OF 4

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723292.3 N, 457976.6 E (NAD83)

ELEVATION : 41.6 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, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.1 ft bgs on 4/23/07

START : 4/23/2007

END : 4/24/2007

LOGGER : N. Jarzyniecki

WATER LEVELS : 2.11055014/23/07			START : 4/23/2007			END : 4/24/2007			LOGGER : N. JaiZyineck		
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				
41.6	0.0	0.5	SS-1	1-1-1 (2)	Silty Sand (SM) 0.0-0.5' - moderate yellowish brown to olive gray, (10YR 5/4 to 5Y 3/2), moist to wet, very loose, fine grained, no HCl reaction, silica sand, 15% nonplastic fines, mostly organic fines						
	1.5										
5	5.0										
36.6		1.1	SS-2	2-2-1 (3)	Sandy Fat Clay (CH) 5.0-6.1' - pale blue, (5PB 7/2), moist, soft, medium to high plasticity, no dilatancy, no HCl reaction, 35-40% very fine to fine silica sand						
	6.5										
10	10.0										
31.6		1.1	SS-3	11-24-40 (64)	Limestone Fragments 10.0-10.2' - dusky yellow, (5Y 6/4), fine to coarse grained, strong HCl reaction, gravel-sized fragments Silt (ML) 10.2-11.1' - dusky yellow, (5Y 6/4), moist, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 5-10% very fine carbonate sand		Driller's Remark: Stiff at 9.0'				
	11.5										
15	15.0										
26.6		1.5	SS-4	22-50/5.75 (72/11.75")	Sandy Silt (ML) 15.0-16.0' - pale yellowish brown, (10YR 6/2), moist, very stiff, low plasticity, rapid dilatancy, moderate HCl reaction, 25% fine grained sand, some appears as silica, (possibly slough), trace fine gravel-sized limestone at 16.0', trace organics, primarily carbonate Silt (ML) 16.0-16.5' - yellowish gray, (5Y 5/2), moist, hard, nonplastic, very rapid dilatancy, moderate HCl reaction, 5-10% very fine grained sand		07:38 water level at 2.1' below ground surface Driller's Remark: 08:00 borehole caved in over night; 15.0-16.0' may include slough accounting for the discrepancy between depth of penetration and recovery length				
	16.5										
20											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-06

SHEET 2 OF 4

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723292.3 N, 457976.6 E (NAD83)

ELEVATION : 41.6 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, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.1 ft bgs on 4/23/07

START : 4/23/2007

END : 4/24/2007

LOGGER : N. Jarzyniecki

WATER LEVELS : 2. PROBS ON 4/23/07			START : 4/23/2007			END : 4/24/2007			LOGGER : N. JaiZyineck		
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			
21.6	20.0	0.8	SS-5	21-29-3 (32)	Silty Sand And Limestone (SM) 20.0-20.8' - very pale orange, (10YR 8/2), moist, dense, fine to coarse grained, moderate HCl reaction, 60% silty sand and 40% limestone, 30% nonplastic fines, carbonate						
	21.5										
25	25.0										
16.6		0.6	SS-6	20-8-1 (9)	Silty Sand With Limestone (SM) 25.0-25.6' - grayish orange, (10YR 6/4), moist, loose, fine to coarse grained, moderate HCl reaction, similar to 20.0-20.8', 25% fine to coarse gravel-sized limestone fragments, 35% nonplastic fines, carbonate materials						
	26.5										
30	30.0										
11.6		1.4	SS-7	6-9-15 (24)	Sandy Silt (ML) 30.0-31.4' - dusky yellow, (5Y 6/4), wet, very stiff, low plasticity, rapid dilatancy, mild to moderate HCl reaction, 35-40% fine to coarse sand, carbonate materials			08:15 Begin drilling to 35.0' During drilling to 35.0' lost circulation at 8:21 - lots of chatter during drilling			
	31.5										
35	35.0										
6.6	35.2	0.0	SS-8	50/2 (50/2")	No Recovery 35.0-35.2'			Casing advanced to 35.0' below ground surface			
					Begin Rock Coring at 36.0 ft bgs See the next sheet for the rock core log						
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-06

SHEET 3 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723292.3 N, 457976.6 E (NAD83)

ELEVATION : 41.6 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 : 2.1 ft bgs on 4/23/07

START : 4/23/2007

END : 4/24/2007

LOGGER : N. Jarzyniecki

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.
36.0	R1-NQ 5 ft 84%	47	1	36.7, 37.7' - Mechanical break (2)		Limestone 36.0-39.15' - pale olive to light olive gray, (10Y 6/2 to 5Y 5/2), very fine to fine grained, strong HCl reaction, fossiliferous, fossil casts, voids over 20% of surface, up to 1/16" trace dissolution, trace organic features, at 36.7' weak (R2), at 37.7' very weak to weak (R1-R2) 39.15-40.2' - moderate olive brown, (5Y 4/4), moderate HCl reaction, extremely weak (R0), laminar features of olive gray (5Y3/2) No Recovery 40.2-41.0'	10:04 Begin coring R1-NQ
			2	36.9' - Bedding plane, <10 deg, rough, undulating, tight			
			5	37.0' - Fracture, 50 deg, rough, undulating, tight			
			0	37.05' - Fracture, 10-25 deg, rough, undulating, tight			
40 1.6			NR	38.0-38.3' - Fracture zone, rough, undulating, intersecting bedding plane and high angle fractures, tight 38.5' - Bedding plane, same as 36.9' except open up to 1/2"			R1: 9 minutes
41.0	R2-NQ 5 ft 73%	47	0			Limestone 41.0-41.85' - Same as 39.15-40.2' except strong HCl reaction 41.85-44.6' - light olive gray to dusky yellow with pale olive infill, (5Y 5/2 to 5Y 6/4 with 10Y 6/2), strong HCl reaction, very weak to weak (R1 to R2), voids (up to 1/16") over 30% of surface, moderately fossiliferous, fossil casts up to 1/8" to 1/2", trace organics, very similar to 36.0-39.15' 44.6-44.65' - Same as 39.15-40.2' except strong HCl reaction No Recovery 44.65-46.0'	
			1	42.3' - Fracture, 80 deg, rough, undulating, tight			
			1	43.5-43.8' - Mechanical break			
			1	43.8, 44.1' - Bedding plane (2), 30 deg, rough, undulating, tight			
45 -3.4			NR				R2: 6 minutes
46.0	R3-NQ 5 ft 90%	43	0			Limestone 46.0-46.3' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 4/4), fine grained, mild HCl reaction, extremely weak (R0), voids (<1/16") over <5% of surface, trace very fine organics, few organic inclusions up to 1/2", very similar to overlying extremely weak rock (39.15'-40.2') 46.3-48.15' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 4/4), moderate to strong HCl reaction, medium strong (R3), 25% fine voids predominantly <1/16", moderately fossiliferous, no longer cavities, trace organics 48.15-49.0' - Same as 46.0-46.3' 49.0-50.35' - Same as 46.3-48.15' 50.35-50.5' - Same as 46.0-46.3' No Recovery 50.5-51.0' Limestone 51.0-52.1' - Same as 46.0-46.3'	
			2	47.15' - Fracture, 50 deg, rough, undulating, tight			
			1	47.55' - Bedding plane, <10 deg, rough, undulating, open 1/4"			
			2	48.15' - Bedding plane, <5 deg, rough, undulating, tight			
50 -8.4			NR	49.0' - Fracture, 75 deg, rough, undulating, tight 49.7' - Fracture, 50 deg, rough, undulating, tight 50.25' - Fracture, same as 49.0'			R3: 3 minutes
51.0	R4-NQ 5 ft 100%	17	0				
			2	52.5' - Bedding plane, <5 deg, smooth, undulating, tight			
			1	52.6' - Fracture, 70 deg, rough, undulating, open 1/8"			
			1	53.4' - Fracture, 50 deg, same as 52.6'			
55 -13.4			0	53.5' - same as 47.55' 54.35' - Mechanical break, same as 48.15'			R4: 26 minutes
56.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

D-06

SHEET 4 OF 5

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723292.3 N, 457976.6 E (NAD83)

ELEVATION : 41.6 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

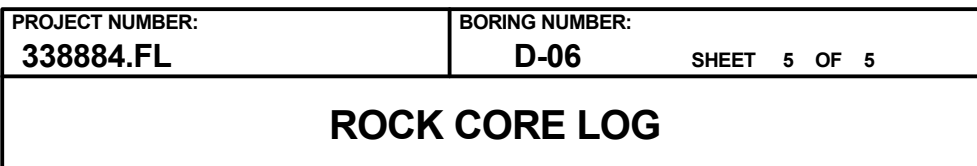
WATER LEVELS : 2.1 ft bgs on 4/23/07

START : 4/23/2007

END : 4/24/2007

LOGGER : N. Jarzyniecki

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.
60 -18.4	R5-NQ 5 ft 92%	48	2	56.4' - Fracture, 50 deg, undulating, tight		52.1-54.3' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, strong HCl reaction, medium strong (R3), but weaker near transitions to over and underlying rock, voids (1/16") over 15-25% of surface, moderately fossiliferous with casts and molds up to 1/4", trace organics	R5: 18 minutes
			1	56.8' - Bedding plane, <5 deg, 4" infilling of silt, tight		54.3-56.0' - Same as 46.0-46.3'	
			1	57.5' - Fracture, same as 56.4'		56.0-56.2' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 4/4), fine grained, mild HCl reaction, extremely weak (R0), voids over <5% of surface, non-fossiliferous, gradual transitions to over and underlying layers	
			0	58.8' - Bedding plane, same as 56.8, except 6" thick silt infill		56.2-56.6' - Same as 52.1-54.3' except a couple of 1/2" cavities	
			1	60.3' - Bedding plane, smooth, planar, open up to 1/8"		56.6-57.0' - Same as 56.0-56.2'	
61.0			NR	61.2' - Mechanical break		57.0-58.5' - Same as 52.1-54.3'	R6: 14 minutes
			0	62.0, 62.25' - Bedding plane (2), <5 deg, smooth, undulating		58.5-59.1' - Same as 56.0-56.2'	
			3	62.6' - same as 62.0', except 10 deg		59.1-60.6' - light olive gray to dusky yellow, (5Y 5/2 to 5Y 6/4), very fine grained, strong HCl reaction, strong (R4), voids over <5% of surface, few infilled cavities (1/16") that are only visible because of increased voids (10%) in infill	
			1	62.9' - same as 62.0'		No Recovery 60.6-61.0'	
			>10	63.5' - Bedding plane, 5 deg, smooth, undulating, open up to 1/4"		Limestone	
65 -23.4	R6-NQ 5 ft 99%	50	2	64.1-64.4' - Fracture zone		61.0-61.2' - Same as 56.0-56.2'	R7: 9 minutes
			NR	65.0, 65.55' - Fractures (2), 80 deg, rough to smooth, undulating		61.2-62.0' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), very fine grained, moderate HCl reaction, strong to very strong (R4 to R5), voids (1/16") over 5% of surface, no cavities, 1/2" thick laminations / infill of light olive gray (5Y 5/2) with no voids	
			0	65.8, 66.9' - Mechanical break (2)		62.0-62.9' - Same as 56.0-56.2'	
			1	67.45' - Bedding plane, 30 deg, open up to 1"		62.9-64.1' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, moderate to strong HCl reaction, weak to strong (R2 to R4), gradual transition from bounding weak (R2) rock, voids (1/16") over 10-30% of surface	
			1	68.4' - Bedding plane, smooth, undulating, open <1/8", associated with organic lamination		64.1-64.8' - Same as 56.0-56.2'	
70 -28.4	R7-NQ 5 ft 96%	92	0	68.5, 69.4, 70.6' - Mechanical break (3)		64.8-65.95' - Same as 62.9-64.1'	13:15 Total depth of hole at 71.0' Note: Used 9 bags of cement (47-lb bags) and 40 gallons of water
			1	70.3' - Bedding plane, 10 deg		No Recovery 65.95-66.0'	
			NR			Limestone	
						66.0-67.7' - dark yellowish orange to yellowish gray, (10YR 6/6 to 5Y 7/2), swirled / mottled, very fine grained, strong HCl reaction, very strong (R5), voids (1/16") over 0-10% of surface	



ELEVATION : 41.6 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

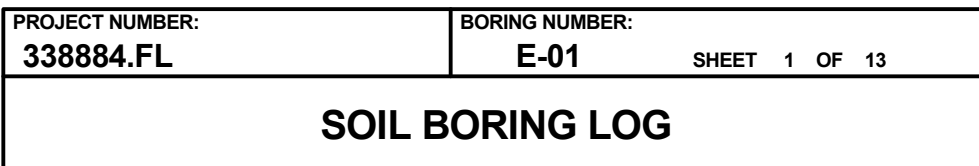
WATER LEVELS : 2.1 ft bgs on 4/23/07

START : 4/23/2007

END : 4/24/2007

LOGGER : N. Jarzyniecki

APPENDIX 2BB-764



LOGGER : B. Ellis

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-01

SHEET 2 OF 13

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723795.0 N, 457523.7 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit





ORIENTATION : Vertical

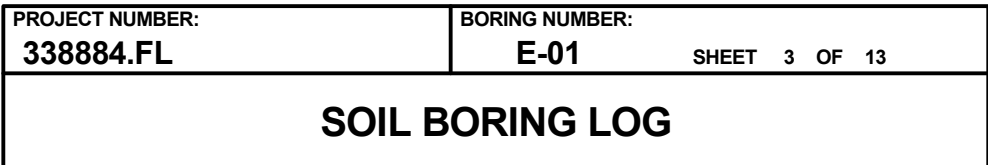
WATER LEVELS : 3.2 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : B. Ellis

WATER LEVELS : 3.2 ft bgs on 9/30/07			START : 9/30/2007			END : 9/30/2007			LOGGER : D. Ellis		
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						
20.9	20.0	1.4	SS-5	6-9-13 (22)	Silt With Sand (ML) 20.0-21.4' - grayish orange, (10YR 7/4), wet, very stiff, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 20-25% fine to coarse sand-sized, 5-10% fine gravel-sized limestone		Carbonate material				
	21.5										
25	25.0	1.4	SS-6	6-11-15 (26)	Silty Sand (SM) 25.0-26.4' - grayish orange, (10YR 7/4), wet, medium dense, fine to coarse grained, mild to moderate HCl reaction, 42% nonplastic fines, 12% fine to coarse gravel-sized limestone		Carbonate material				
15.9	26.5										
30	30.0	1.1	SS-7	1-0-9 (9)	Silty Sand With Limestone (SM) 30.0-31.2' - Same as 25.0-26.4'						
10.9	31.5										
35	35.0	0.5	SS-8	2-10-8 (18)	Silty Sand With Limestone (SM) 35.0-35.5' - moderate yellowish brown, (10YR 5/4), wet, medium dense, fine to coarse grained, mild to moderate HCl reaction in all materials, 27% nonplastic fines, 36% fine to coarse gravel-sized limestone fragments		Carbonate material				
5.9	36.5										
40							Driller's Remark: Lost circulation at 37.0'				



LOGGER : B. Ellis

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-01

SHEET 4 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723795.0 N, 457523.7 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

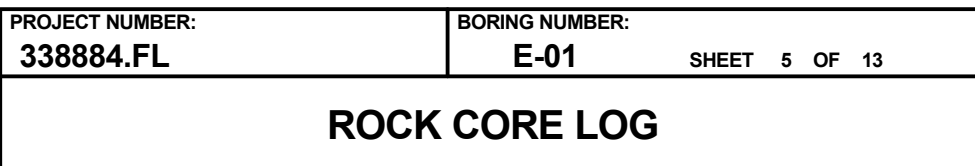
WATER LEVELS : 3.2 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : B. Ellis

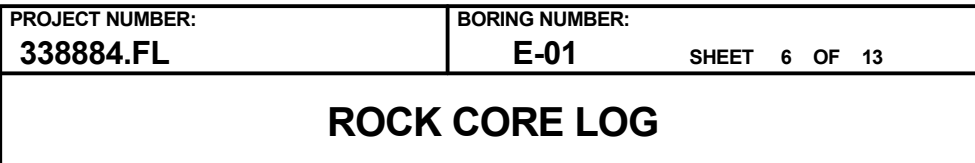
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS				
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.				
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS							
45 -4.1	41.0	R1-HQ 5 ft 70%	63	>10		Limestone 41.0-41.4' - coarse gravel (limestone and chert) 41.4-43.0' - pale yellowish brown, (10YR 6/2), dense, very fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), cavities up to 2-3/8"-2-3/4"x3/4"-1-3/16", infilled with medium grained vesicular-textured limestone, voids up to 1/16" or less over 1-2% of surface, fossils rare to absent, possibly bioturbated 43.0-44.5' - pale yellowish brown, (10YR 6/2), dense, fine to medium grained, mild to moderate HCl reaction, medium strong to weak (R3 to R2), voids (generally <1/16") over 3-5% of surface grading to 10% with depth, fossils (molds/casts) rare to absent No Recovery 44.5-46.0' Limestone 46.0-48.5' - Same as 43.0-44.5' except voids increase to 5-8%, cavities common (typically 1/16"x3/16"), fossiliferous (molds/casts) Silty Sand (SM) 48.5-51.0' - grayish orange to dark yellowish brown, (10YR 7/4 to 10YR 6/6), mild HCl reaction, interbedded with clay, carbonate-derived silts/clays/sand-size fragments (cohesive), with some black (N1) carbonaceous/organic laminae/deposits, fossils absent Limestone 51.0-53.8' - moderate yellowish brown, (10YR 5/4), mottled yellowish gray (5y 7/2), fine grained, mild HCl reaction, very weak (R1), voids (up to 1/16"-1/8") over 15-20% of surface, some cavities up to 3/8", some fossil molds/casts, occasionally thinly laminated with black (N1) organic/carbonaceous material No Recovery 53.8-56.0' Silty Sand (SM) 56.0-56.6' - Same as 48.5-51.0'	Casing depth 41.0'				
	1			41.3' - Fracture, 40 deg, rough, undulating, open			NR = No Recovery				
	1			42.35' - Fracture, horizontal, rough, planar, 3/4" boring in fracture, tight							
	2			43.9' - Fracture, 80 deg, rough, planar, 80% of surface covered by black organic coating <1/16" thick, fracture plane extends from 43.6-44.5'							
	50 -9.1	46.0	R2-HQ 5 ft 100%	57		NR		44.3' - Fracture, 20-30 deg, rough, stepped, open 44.3-44.5' - Fracture, 80 deg, rough, stepped, open 46.2' - Fracture, 80 deg, rough, planar, thin (<1/16") layer of black (N1) carbonaceous material, open 46.6' - Fracture zone, 40 deg, very rough, planar, open 46.7' - Fracture, horizontal, rough, planar, open 46.9' - Fracture, horizontal, smooth, planar, open 48.7' - Fracture, 10 deg, smooth, undulating, open 48.9' - Fracture, 20 deg, smooth, undulating	R1: 14 minutes		
		4				49.3, 49.7' - Fractures (2), horizontal, smooth, undulating, tight					
		0				50.7' - Fracture, horizontal, smooth, undulating, open					
		2				51.0-51.3' - Fracture zone, rough, stepped, various orientation of fractures, open, gravel to cobble sized limestone rock fragments					
		55 -14.1	51.0	R3-HQ 5 ft 56%		42		1		52.2-52.9' - Fracture, 80 deg, rough, undulating, tight 52.4-53.8' - Fracture zone, intersecting fractures from 50 deg to 90 deg, rough, stepped to undulating, tight to open	
			10					56.3' - Fracture, 10 deg, very smooth, undulating			
10			56.6-57.0' - Fracture zone, rough, planar to undulating, large coarse gravel to cobble size, low to high angle fracture planes, open								
NR			57.2' - Fracture, 10 deg, rough, stepped, open								
60 -19.1			56.0	R4-HQ 5 ft 80%	42	2				57.5-58.0' - Fracture zone, rough, planar to undulating, large coarse gravel to cobble size, low to high angle fracture planes, open	
			2			58.0' - Fracture, horizontal, smooth, planar, tight, black (N1) carbonaceous film/coating over 90-95% of surface					
	1										
	1										
	61.0				NR						



ORIENTATION : Vertical

LOGGER : B. Ellis

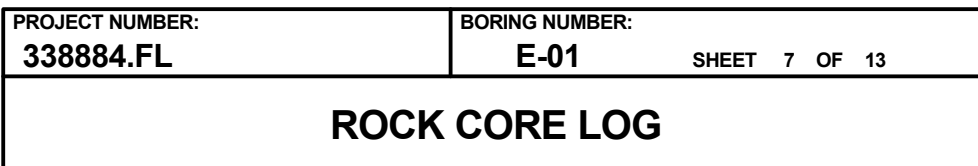
Rev. 4



ORIENTATION : Vertical

LOGGER : B. Ellis

Rev. 4



ORIENTATION : Vertical

LOGGER : B. Ellis

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-01

SHEET 8 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723795.0 N, 457523.7 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.2 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : B. Ellis

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				
125 -84.1	R17-HQ 5 ft 40%	0	>10	108.5-109.0' - Fracture zone, horizontal, smooth, planar, open		Limestone 91.0-92.0' - very light gray, (N8), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids 1/16" or less over 10-15% of rock surface, several cavities typically 3/8"x3/16", trace fossil molds/casts with occasional echinoderm fossils 92.0-93.5' - Same as 88.6-90.3' except trace black carbonaceous/organic discontinuous laminae/cavity infilling, intraclasts (up to 1-9/16"-2", subrounded) common 93.2-93.5' 93.5-95.45' - yellowish gray to very light gray, (5Y 8/1 to N8), fine to medium grained, strong HCl reaction, very weak (R1) rock from 93.5-94.3', becoming weak rock (R2) from 94.3-95.2' and returning to very weak rock (R1) from 95.2-95.45', voids (1/16" or less) over 3-5% of rock surface and unevenly distributed, some cavities up to 1-3/16"-1-9/16"x3/8" over 2-3% of rock surface, chalk-like texture when scraped with pocket knife, fossil molds/casts rare to absent Peat 95.45-95.7' - black to grayish black, (N1 to N2), no HCl reaction, firm to stiff, interlaminated with some very weak limestone Limestone 95.7-95.8' - Same as 93.5-95.45' except very weak (R1), friable No Recovery 95.8-96.0' Limestone 96.0-100.4' - yellowish gray, (5Y 8/1), strong HCl reaction, weak to medium strong (R2 to R3), voids 1/16" or less over 5-10% of rock surface, cavities typically 3/8" in diameter over 3-4%, trace fossil molds/casts No Recovery 100.4-101.0' Limestone 101.0-106.0' - very pale orange to yellowish gray, (10YR 8/2 to 5Y 7/2), fine to medium grained, strong HCl reaction, weak (R2), chalky texture when scraped with pocket knife, voids up to 1/16" over 10% or less of rock surface, some cavities up to 3/8" in diameter, some echinoid fossils in addition to sparse occurrences of molds/casts 106.0-110.6' - Same as 101.0-106.0' except echinoderm fossils common from 106.0-107.4' No Recovery 110.6-111.0'	R17: 4 minutes	
			>10	109.05' - Bedding plane, horizontal, rough, planar to stepped, open 109.5, 109.85, 109.98' - Bedding plane (3), horizontal, rough, undulating, open 111.0-112.55' - Bedding plane, horizontal, rough, planar to undulating, open, 0.1' thick or less throughout interval, multiple breaks 112.3-113.7' - Fracture zone, smooth to rough, planar to undulating, coarse gravel to cobble size fragments, various fracture plane orientations, open 114.4-114.8' - Fracture zone, smooth to rough, planar to undulating, coarse gravel to cobble size fragments, various fracture plane orientations, open 116.15' - Fracture, horizontal, rough, stepped, open 116.27' - Fracture, 10 deg, rough, undulating, open 116.57' - Fracture, horizontal, rough, planar, open 116.68' - Fracture, horizontal, rough, planar to undulating, open 117.02' - Fracture, horizontal, rough, stepped, open 117.07' - Fracture, vertical, rough, stepped, open 117.1' - Fracture, 20 deg, rough, stepped, conical, open 117.32' - Fracture, horizontal, rough, undulating, open 117.9' - Mechanical break 118.5' - Mechanical break 119.3' - Fracture, horizontal, rough, undulating, open 119.4' - Fracture, horizontal, rough, stepped, open 119.72' - Fracture, horizontal, rough, stepped, open 119.8' - Fracture, horizontal, rough, planar, open 120.05, 120.12, 125.25, 120.45, 120.65' - Fractures (5), horizontal, rough, planar to undulating, open 120.75' - Fracture, 0-60 deg, rough, stepped, open 121.0' - Fracture zone, unconsolidated, 1/2"-4" fragments 131.1, 131.3, 131.35, 131.4, 131.45, 131.55, 131.7, 131.8' - Fractures (8), horizontal, rough, planar to undulating, open 132.25, 132.3, 132.38, 132.8, 132.9' - Fractures (5), horizontal, rough, planar to undulating, open 133.1, 133.25, 133.4, 133.5, 133.6, 133.7, 133.8, 133.85' - Fractures (8), horizontal, rough, planar to undulating, open 133.85-134.15' - Fracture zone, 0-90 deg, rough, undulating to stepped, open				
			NR					
			126.0					0
130 -89.1	R18-HQ 5 ft 4%	0	NR			Driller's Remark: Large rock fragment jammed in tip of core barrel. 10:30 drilling suspended to fix wireline spool One rock fragment 2.4" long was all that was recovered during coring. No void reported. Driller's Remark: Strong chatter		
131.0						R18: 3 minutes		
135 -94.1	R19-HQ 5 ft 92%	22	8			Driller's Remark: Strong chatter from 133.0-136.0'		
			5					
			>10					
			6					
136.0			NR			Many fractures resulted from breakage along weak bedding planes when removing sample from core barrel R19: 5 minutes		
140 -99.1	R20-HQ 5 ft 66%	0	10			R20: 4 minutes		
			10					
			7					
			0					
141.0			NR					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-01

SHEET 9 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723795.0 N, 457523.7 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.2 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : B. Ellis

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.
145 -104.1	R21-HQ 5 ft 88%	62	1	134.15, 134.25, 134.4, 134.5, 134.6, 134.8, 135.85' - Fractures (7), horizontal, rough, planar to stepped, open		Limestone 111.0-113.7' - Same as 101.0-106.0' except echinoid fossils rare to absent 113.7-114.45' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, extremely weak (R0), voids/cavities absent, fossils absent 114.45-114.8' - Same as 111.0-113.7' No Recovery 114.8-116.0' Limestone 116.0-119.7' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), chalky texture when scraped with knife, voids (<1/16" over 1-2% of surface, few cavities (generally 3/8" in diameter or less), fossils rare to absent (trace echinoderms) 119.7-120.8' - yellowish gray, (5Y 7/2), medium to coarse grained, strong HCl reaction, very weak (R1), voids <10%, some cavities (typically <3/8" in diameter), fossiliferous (molds/casts), pelecypods, gastropods, some echinoderms (fossil hash) No Recovery 120.8-121.0' 121.0-123.0' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, extremely weak (R0), very friable, 40-50% fine to medium sand-sized grains grading to gravel-sized carbonate No Recovery 123.0-126.0' Limestone 126.0-126.2' - yellowish gray, (5Y 7/2), medium to coarse grained, strong HCl reaction, very weak to weak (R1 to R2), fossiliferous (echinoderms, fossil hash) No Recovery 126.2-131.0' Limestone 131.0-135.6' - Same as 111.0-113.7' No Recovery 135.6-136.0' Limestone 136.0-137.9' - Same as 131.0-136.0' 137.9-138.2' - olive gray, (5Y 3/2), fine to medium grained, strong HCl reaction, very weak (R1), thinly laminated 138.2-138.5' - Same as 136.0-137.9' 138.5-138.7' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), laminated, voids (<1/16") 5-8% irregularly distributed over core surface, few cavities <1/16" in diameter, fossils (casts/molds) rare to absent 138.7-139.3' - Same as 121.0-123.0' No Recovery 139.3-141.0'	SC-5 collected at 144.5-145.4' R21: 5 minutes
			4	135.07' - Fracture, horizontal, rough, planar, open			
			4	135.07-135.7' - Fracture zone, multiple coarse gravel to cobble-sized fragments, various fracture plane orientations			
			2	135.7' - Fracture, horizontal, rough, stepped, open			
			0	135.85' - Fracture, horizontal, rough, planar, open			
			NR	136.1, 136.2, 136.3' - Fractures (3), horizontal, rough, planar, open			
150 -109.1	R22-HQ 5 ft 88%	68	>10	136.4-136.6' - Fracture zone, bounded by planar to undulating, rough, open bedding planes			R22: 7 minutes
			2	136.8, 136.9' - Fractures (2), horizontal, rough, undulating, open			
			2	137.05, 137.2, 137.35, 137.6, 137.75, 137.8, 137.85, 138.0, 138.1, 138.2, 138.25, 138.35, 138.5, 138.55' - Fractures (14), horizontal, rough to smooth, planar to undulating, open			
			2	138.5' - Mechanical break			
			0	138.85' - Fracture, horizontal, rough, planar			
			NR	141.4' - Fracture or mechanical break, horizontal, rough, planar			
155 -114.1	R23-HQ 5 ft 96%	80	2	142.0' - Fracture, horizontal, rough, planar			Start drill at 12:15 Add 1/2 bag mud SC-6 collected at 151.3-152.35'
			3	142.12' - Fracture, horizontal, rough, planar, open			
			0	142.0-142.12' - Fracture zone			
			0	142.33, 142.40' - Fracture or mechanical break (2), horizontal, rough, planar			
			0	142.9' - Fracture or mechanical break, horizontal, rough, planar			
			NR	143.0' - Fracture, horizontal, rough, undulating, coarse gravel-sized rock fragments on bottom face			
160 -119.1	R24-HQ 5 ft 80%	55	1	143.3' - Fracture, vertical, rough, stepped, tight			Driller's Remark: Drilling in fourth gear, consistent chatter throughout run Large cast/void at 154.85', 155.2', 155.8' R23: No time recorded Lost 2.0' due to having to break 2.9' long piece to box SC-7 collected at 158.3-159.1' R24: 4 minutes
			1	143.4' - Fracture, horizontal, rough, stepped, open			
			1	143.7' - Fracture, 80 deg, rough, planar, tight			
			1	144.1' - Fracture, 80 deg, rough, stepped, (intersects fracture at 143.7')			
			1	144.50' - Fracture or mechanical break, horizontal, rough, undulating			
			NR	146.4' - Fracture, horizontal, rough, undulating, organic staining on bottom face			
161.0	R24-HQ 5 ft 80%	55	1	146.4-146.6' - Fracture zone, smooth, planar, coarse gravel to cobble-sized fragments			
			1	146.6' - Fracture, horizontal, rough, undulating, tight			
			2	146.6' - Fracture, vertical, rough, planar, tight, fracture plane extends from			
			NR	146.6-147.0'			
161.0	R24-HQ 5 ft 80%	55	1	147.0' - Fracture or mechanical break, horizontal, smooth, planar, open			
			NR	147.0-147.2' - Fracture zone, rough, planar to stepped, multiple fractures, open, angular gravel size fragments			



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-01	SHEET 10 OF 13
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723795.0 N, 457523.7 E (NAD83)

ELEVATION : 40.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.2 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : B. Ellis

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			
165 -124.1	R25-HQ 5 ft 96%	75	3	147.7' - Fracture or mechanical break, horizontal, smooth, planar, tight		Limestone 141.0-141.35' - yellowish gray to pale yellowish brown, (5Y 7/2 to 10YR 6/2), medium to coarse grained, strong HCl reaction, very weak (R1), voids (1/16") over 5-7% of surface, some cavities up to 3/8" in diameter, fossiliferous (echinoderm parts), molds/casts sparse 141.35-142.0' - pale yellowish brown, (10YR 6/2), fine to medium grained, strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/16" over 10% of surface, few cavities generally 3/8" or less in diameter, fossiliferous (echinoids), thinly laminated with wispy, discontinuous, black (N1) carbonaceous/organic material 142.0-143.05' - yellowish gray, (5Y 7/2), medium grained, strong HCl reaction, weak (R2), chalk-like texture when scraped with knife, irregular to undulating core surface, voids (<1/16" or less) over 1-2%, cavities rare, fossils (molds/casts) difficult to discern 143.05-145.4' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, medium strong to strong (R3 to R4), voids (1/16" or less) over 3% or less of rock surface, cavities common up to a few inches in length (possibly bioturbated), fossiliferous (mostly casts), some pelecypod molds/casts No Recovery 145.4-146.0' Limestone 146.0-146.4' - Same as 143.05-145.4' 146.4-148.1' - yellowish gray to pale yellowish brown, (5Y 7/2 to 10YR 6/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), thin black wispy organic/carbonaceous laminations, voids (<1/16") over 1-3% of surface non-uniformly distributed, few cavities, fossil molds/casts rare to absent 148.1-149.0' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, medium strong to strong (R3 to R4), voids (<1/16") over <1% of surface, cavities (<3/16") rare to absent, fossils absent	R25: 4 minutes
			3	148.4' - Fracture or mechanical break, 0-50 deg, smooth, planar, tight			
			3	148.9' - Fracture, 70 deg, smooth, undulating, tight, fracture plane extends from 148.5-149.5'			
			1	149.3' - Fracture, horizontal, very rough, undulating, tight			
			2	149.55' - Fracture, vertical, rough, undulating to stepped, tight			
			3	149.8' - Fracture, 0-90 deg, rough, stepped, tight			
			NR	151.2' - Fracture, 10 deg, rough, stepped, tight			
			8	151.3' - Fracture, 10 deg, smooth, undulating, tight			
			6	152.6' - Fracture, horizontal, smooth, undulating, tight			
			9	152.9' - Fracture, horizontal, smooth, undulating, open			
170 -129.1	R26-HQ 5 ft 68%	18	2	152.97' - Fracture, horizontal, rough, undulating		R26: 4 minutes	Loud drill chatter throughout, especially at 167.0' Large cavity >3/4" at 168.0', 169.2'
			NR	156.35' - Fracture, 10 deg, rough, undulating, open			
			NR	157.9' - Fracture, horizontal, smooth, undulating, open			
			NR	158.0' - Fracture, 10 deg, smooth, planar			
			NR	158.3' - Mechanical break			
			NR	159.4, 159.7' - Fractures (2), horizontal, rough, planar, open			
			2	161.35' - Fracture, horizontal, rough, undulating, tight			
			5	161.6' - Fracture or mechanical break, horizontal, smooth, planar, open			
			10	161.95' - Fracture or mechanical break, horizontal, rough, planar, open			
			>10	162.2' - Fracture, horizontal, rough, undulating, open			
175 -134.1	R27-HQ 5 ft 96%	57	10	162.45, 162.55' - Fracture or mechanical break (2), horizontal, rough, planar, open		R27: 4 minutes	R27: 4 minutes
			10	163.5' - Mechanical break			
			10	163.65' - Fracture or mechanical break, horizontal, smooth, planar, open			
			NR	164.0' - Fracture or mechanical break, horizontal, smooth, planar, open			
			NR	164.0-164.1' - Fracture zone			
			3	164.1' - Fracture, 10 deg, rough, planar			
			NR	165.15, 165.2, 165.25' - Fractures (3), horizontal, smooth, planar, open			
			NR	166.10, 166.4, 166.42, 166.45, 166.55, 166.6, 166.7, 166.8' - Bedding plane (8), horizontal, rough, planar, open			
			NR	167.15, 167.2, 167.25, 167.3, 167.35, 167.95' - Bedding plane (6), horizontal, smooth, planar to stepped			
			NR	168.0' - Fracture, 10 deg, rough, undulating, open			
180 -139.1	R28-HQ 5 ft 16%	0	NR	168.2, 168.25, 168.3, 168.35, 168.4, 168.5, 168.6, 168.9' - Mechanical break (8), horizontal, smooth, planar		R28: 4 minutes	Drill chatter at 178.0'
			NR				



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-01
SHEET 11 OF 13	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723795.0 N, 457523.7 E (NAD83)
 ELEVATION : 40.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 3.2 ft bgs on 5/30/07 START : 5/30/2007 END : 6/3/2007 LOGGER : B. Ellis

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			
185 -144.1	R29-HQ 5 ft 26%	15	2	168.5-168.6' - Fracture zone		149.0-150.0' - yellowish gray mottled with pale yellowish brown (<1% of rock surface), (5Y 7/2 mottled with 10YR 6/2), coarse grained, strong HCl reaction, weak to medium strong (R2 to R3), voids and cavities absent, abundant rip up/lithoclasts (subrounded to rounded), fossil casts/molds rare, echinoids rare	Extensive drill chatter throughout run
			2	169.0, 169.1' - Fracture or mechanical break (2), horizontal, smooth, planar, along bedding planes			
			NR	171.35' - Fracture, 80 deg, smooth, planar, tight		No Recovery 150.4-151.0' Limestone	R29: 7 minutes
				171.8' - Fracture, 80 deg, rough, planar, tight		151.0-153.0' - Same as 150.0-150.4' except with some intraclasts between 151.5' and 151.9'	
				172.0' - Fracture or mechanical break, horizontal, rough, undulating to stepped, tight		153.0-155.8' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), voids up to 1/16" over 3-5% becoming more common (up to 10% below 154.5'), some cavities up to 3/4"-1-3/16" in diameter/length over 1-2% becoming more common below 154.5', some dark yellowish orange banding from 154.9-155.8', fossil (molds/casts), echinoderms rare	
				172.2' - Fracture, 80 deg, rough, planar, (possible continuation of 171.8' fracture)		No Recovery 155.8-156.0' Limestone	
				172.62' - Fracture or mechanical break, horizontal, smooth, planar		156.0-156.3' - variegated yellowish gray to pale brown, (5Y 7/2 to 5YR 5/2), fine grained, moderate HCl reaction, voids (1/16" or less) over 1-2% surface, cavities	
				172.80' - Fractures (2), 70 deg, rough, planar, tight, parallel		3/8"-3/4"x3/16" at base of interval (elongated), very thinly laminated (argillaceous laminae), fossils rare to absent	
				172.92' - Fracture, 30-60 deg, rough, stepped, tight		156.3-159.1' - Same as 153.0-155.8' except lacking dark yellowish orange banding	
				173.45' - Fracture, horizontal, rough, planar, open		159.1-159.25' - dark yellowish orange, (10YR 6/6), medium to coarse grained, strong HCl reaction, weak (R2), hummocky/irregular surface with 4% voids, cavities absent, fossil hash, contact sharp with undulating limestone	
				173.9-174.3' - Fracture zone, 0-60 deg, rough, undulating, open		159.25-160.0' - very pale orange, (10YR 8/2), medium grained, strong HCl reaction, weak (R2), voids over <1%, cavities (<3/16") rare, some rip up/intraclast-like grain, fossil casts and molds rare	
				174.3' - Fracture, horizontal, rough, planar, open		No Recovery 160.0-161.0'	
				174.5-174.8' - Fracture zone, various fracture plane orientations producing angular gravel-sized limestone rock fragments			
				174.85' - Fracture, horizontal, rough, planar, open			
				175.2' - Fracture, horizontal, rough, planar, open			
				175.75-175.8' - Fracture zone, 0-90 deg, rough, undulating, open			
				176.0-176.1' - Fracture zone, multiple irregular sized, very angular cobble-sized fragments			
				176.35, 176.5' - Fractures or mechanical break (2), horizontal, rough, planar, open			
				181.25, 181.7' - Fractures or mechanical break (2), horizontal, smooth, planar			
				182.05' - Fracture or mechanical break, horizontal, smooth, planar			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-01

SHEET 12 OF 13

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723795.0 N, 457523.7 E (NAD83)

ELEVATION : 40.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

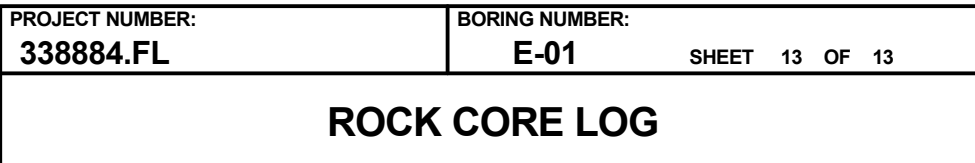
WATER LEVELS : 3.2 ft bgs on 5/30/07

START : 5/30/2007

END : 6/3/2007

LOGGER : B. Ellis

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	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 161.0-161.6' - Same as 159.25-160.0' 161.6-162.5' - very pale orange, (10YR 8/2), coarse grained, strong HCl reaction, weak to medium strong (R2 to R3), fossil hash, voids (<1/16" or less) over 3-5% of rock surface, cavities rare, fossils common (echinoids, pelecypods, casts/molds), rip up/intraclasts common in base of interval 162.5-164.1' - yellowish gray mottled with moderate yellowish brown, (5Y 7/2 mottled with 10YR 5/4), medium grained, strong HCl reaction, weak to medium strong (R2 to R3), becoming finer grained with depth, voids (1/16" or less) over 3-5% of rock surface (irregularly distributed), brown mottling is wavy and discontinuous, some echinoids and fossil molds/casts 164.1-165.8' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, weak (R2), voids (1/16") over 1% or less of rock, cavities rare (1/8"-3/16" over <1%), echinoids rare, fossil molds/casts rare to absent No Recovery 165.8-166.0' Limestone 166.0-166.6' - Same as 159.25-160.0' 166.6-169.4' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong (R3), voids (1/16" or less) over 3-5% of rock surface, few cavities (typically 3/16" or less in diameter), voids and cavities becoming more common below 168.5' up to 20-25% voids, fossils (casts/molds) and echinoids rare to absent to 168.5', some fossil molds/casts and few echinoids below 168.5-169.4' No Recovery 169.4-171.0' Limestone 171.0-175.8' - yellowish gray, (5Y 7/2), fine to medium grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), voids (1/16" or less) over 5-10% of rock surface, cavities (generally 3/16" or less in diameter) over 2-3% of surface, fossil (casts/molds) rare, medium to coarse grained from 174.5-175.3' No Recovery 175.8-176.0'	



LOGGER : B. Ellis

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-02

SHEET 1 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724255.5 N, 457486.3 E (NAD83)

ELEVATION : 39.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" and 6" tri-cone bits





ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 5/18/07

START : 5/18/2007

END : 5/21/2007

LOGGER : P. De Sa'rego, R. Bitely

WATER LEVELS : 1.5-5.0' bgs on 9/18/07			START : 9/18/2007		END : 9/21/2007		LOGGERS : P. De Santiago, R. Biley		
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			
39.8	0.0	1.0	SS-1	1-3-6 (9)	Topsoil (OL) 0.0-0.3' - grayish brown to brownish black, (5YR 3/2 to 5YR 2/1), wood debris and organics			Water level: 1.5-5.0'	
	1.5				Poorly Graded Sand (SP) 0.3-1.0' - grayish orange, (10YR 7/4), moist, loose, nonplastic, very fine to fine grained silica sand, trace nonplastic fines, trace fine organics and roots				
5	5.0								
34.8		0.9	SS-2	5-6-5 (11)	Wood Debris And Silty Sand (SM) 5.0-5.95' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), wet, medium dense, 30% nonplastic fines, very fine to fine grained silica sand				
	6.5								
10	10.0								
29.8	10.3	0.3	SS-3	50/3.5 (50/3.5")	Silty Sand (SM) 10.0-10.3' - dark yellowish brown, (10YR 6/6), moist, very dense, fine to coarse grained, mild to moderate HCl reaction, carbonate, 48% nonplastic fines, rapid dilatancy, bottom 1" contains fine gravel-sized limestone fragments				
15	15.0								
24.8		0.8	SS-4	4-4-5 (9)	Limestone 15.0-15.2' - dark yellowish orange, (10YR 6/6), mild HCl reaction, carbonate materials			Driller's Remark: 100% fluid loss, no circulation	
	16.5				Silt With Sand (ML) 15.2-15.85' - dark yellowish orange, (10YR 6/1), wet, stiff, nonplastic, rapid dilatancy, mild to moderate HCl reaction, carbonate materials, 20-25% fine-grained silica sand				
20									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-02

SHEET 2 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724255.5 N, 457486.3 E (NAD83)

ELEVATION : 39.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" and 6" tri-cone bits

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 5/18/07

START : 5/18/2007

END : 5/21/2007

LOGGER : P. De Sa'rego, R. Bitely

WATER LEVELS : 1.5 ft bgs on 5/19/07			START : 5/19/2007		END : 5/21/2007		LOGGERS : P. De Saizago, R. Bilely		
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			
19.8								Install 15' HW casing to seal off flow zone after collecting SS-5: 20.0-21.5' SPT	
	21.0							Water level surface	
	21.9	0.9	SS-5	20-50/5 (70/11")	Sandy Silt (ML) 21.0-21.9' - grayish yellow to grayish orange, (5Y 8/4 to 10YR 7/4), moist, hard, nonplastic, moderate HCl reaction, 38% fine to coarse grained gravel-sized, rapid dilatancy, carbonate materials			05/19/07 07:30 Drilling from 20.0', advance HW casing to 20.0', using 3-7/8" tricone roller and AWJ rod beyond 30.0' inside HW casing	
								Driller's Remark: Smooth, moderate to rapid drilling rate, intermittent light chatter	
25	25.0								
14.8	25.4	0.3	SS-6	50/5 (50/5")	Silty Sand (SM) 25.0-25.3' - grayish orange, (10YR 7/4), wet, very dense, very fine to coarse grained, mild to moderate HCl reaction, 30% nonplastic fines, trace iron cemented sands, carbonate materials				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-02

SHEET 3 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724255.5 N, 457486.3 E (NAD83)

ELEVATION : 39.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" and 6" tri-cone bits

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 5/18/07

START : 5/18/2007

END : 5/21/2007

LOGGER : P. De Sa'rego, R. Bitely

WATER LEVEL: 1.00 (BGS) ON 01/01/2007		START: 01/01/2007		END: 02/12/2007		EQUIP: P. DE CHARGE, R. BERRY	
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		
-0.2	40.0	0.2	SS-9	50/4 (50/4")	Limestone 40.0-40.2' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, coarse sand-sized and fine gravel-sized		
45	45.0						
-5.2	45.4	0.4	SS-10	50/5 (50/5")	Sandy Silt (ML) 45.0-45.4' - moderate yellowish brown, (10YR 5/4), wet, low plasticity, mild HCl reaction, 44% very fine to medium sand-sized, carbonate materials		
50	50.0						
-10.2	50.3	0.3	SS-11	50/4 (50/4")	Limestone 50.0-50.3' - pale yellowish brown, (10YR 6/2), mild HCl reaction, fine gravel-sized Begin Rock Coring at 51.0 ft bgs See the next sheet for the rock core log		Advance HW casing from 20.0-50.0' below ground surface to prevent circulation blow out around pit neck Begin rock coring with NQ wireline tooling from 51' below ground surface
55							
-15.2							
60							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-02

SHEET 4 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724255.5 N, 457486.3 E (NAD83)

ELEVATION : 39.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 5/18/07

START : 5/18/2007

END : 5/21/2007

LOGGER : P. De Sa'rego, R. Bitely

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.
51.0	R1-NQ 5 ft 96%	69	3	51.05, 51.2, 51.4, 52.85, 53.3' - Fractures (5), <10 deg, rough, undulating, no staining or infill, open <1/4"-<1/2"		Limestone 51.0-55.8' - moderate yellowish brown, (10YR 5/4), very fine to medium grained, 51.0-53.5' extremely weak to weak rock (R0 to R2) weakest at 51.0-51.5' and 53.3-53.5', voids <1/16" over 50-60% of surface, highly fossiliferous with many fossil molds/casts <1/2" diameter, few cavities <1/2" diameter 53.5-54.5' extremely weak to very weak (R0 to R1) with depth, voids <1/16" over <20% of surface, no fossils 54.5-55.8' weak to medium strong rock (R2 to R3), voids <1/16" over 40-50% of surface, secondary recrystallized infill over 50% of core zone 53.5-54.5' - extremely weak to very weak (R0 to R1), weaker with depth, voids <1/16" over <20% of surface, no fossils 54.5-55.8' weak to medium strong rock (R2 to R3), voids <1/16" over 40-50% of surface, secondary recrystallized infill over 50% of core zone 54.5-55.8' - weak to medium strong (R2 to R3), voids <1/16" over 40-50% of surface, secondary recrystallized infill over 50% of core zone	Begin rock coring at 16:00 with NQ wireline tooling from 51.0' using water only SC-1 collected at 51.85-52.85'
			1				
			10	53.5-53.55' - Soil Seam 53.7, 53.8, 54.05, 54.15, 54.6, 55.15' - Fractures (6), <10 deg, rough, undulating, open <1/4"- <3/4"			
			3				
			1				
55 -15.2			NR				R1: 4 minutes
56.0	R2-NQ 5 ft 90%	50	10	56.15, 56.3, 56.43, 56.55, 56.7, 56.9' - Fractures (6), <10 deg, rough, undulating, open <1/2"		54.5-55.8' weak to medium strong rock (R2 to R3), voids <1/16" over 40-50% of surface, secondary recrystallized infill over 50% of core zone 53.5-54.5' - extremely weak to very weak (R0 to R1), weaker with depth, voids <1/16" over <20% of surface, no fossils 54.5-55.8' weak to medium strong rock (R2 to R3), voids <1/16" over 40-50% of surface, secondary recrystallized infill over 50% of core zone 54.5-55.8' - weak to medium strong (R2 to R3), voids <1/16" over 40-50% of surface, secondary recrystallized infill over 50% of core zone	R2: 3 minutes
			>5	57.40-57.55' - Fracture zone, rough, undulating			
			2	58.2, 58.45, 59.65' - Mechanical break (3), <10 deg, rough, undulating, tight to open <1/2"			
			1				
			>10	60.3-60.45' - Fracture zone, rough, undulating, gravel sized fragments <3/4" diameter			
60 -20.2			NR				
61.0	R3-NQ 5 ft 78%	58	>10	61.0-61.1' - Fracture zone, rough, undulating, gravel sized fragments <1" diameter		No Recovery 55.8-56.0' Limestone 56.0-60.5' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), strong HCl reaction, extremely weak to medium strong (R0 to R3), fine to medium grained, silts increasing with depth, voids 1/16" over 40% of surface, moderately fossiliferous with fossil casts/molds <3/4" diameter, many cavities <1" diameter, 20% of cavities with secondary recrystallized infill	SC-2 collected at 62.65-63.65'
			0				
			0				
			4	64.05, 64.3, 64.5, 64.7' - Fractures (4), 40 deg, rough, undulating, tight, open <1/2"			
			NR				
65 -25.2							R3: 5 minutes
66.0	R4-NQ 5 ft 95%	85	1	66.2, 63.25, 65.1, 65.15, 65.55' - Fractures (5), <10 deg, undulating, smooth to rough, open <1/4"		No Recovery 60.5-61.0' Limestone 61.0-64.9' - dark yellowish brown to yellowish gray, (10YR 4/2 to 5Y 7/2), very fine to medium grained, moderate to strong HCl reaction, strong (R4) 61.1-64'. At 61.0-61.1' and 64.0-64.9' extremely weak to very weak (R0 to R1), voids <1/16" over 30% of surface, trace fossil molds/casts <1/2, cavities with secondary recrystallized in fill up to 2" diameter; trace organics	R4: 3 minutes
			0				
			1				
			0				
			2				
70 -30.2							
71.0						No Recovery 64.9-66.0'	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-02

SHEET 5 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724255.5 N, 457486.3 E (NAD83)

ELEVATION : 39.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

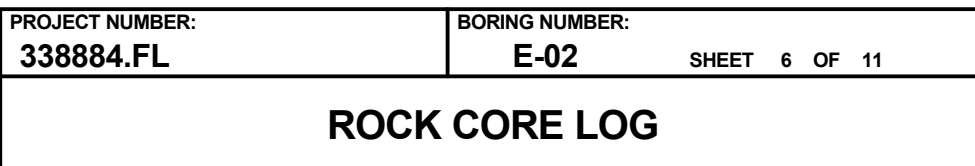
WATER LEVELS : 1.5 ft bgs on 5/18/07

START : 5/18/2007

END : 5/21/2007

LOGGER : P. De Sa'rego, R. Bitely

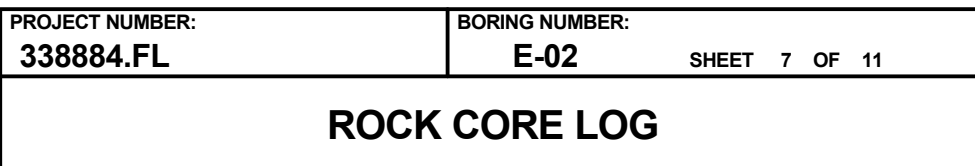
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, 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.
75 -35.2	R5-NQ 5 ft 90%	48	NR	71.05, 71.2, 71.65, 71.7' - Fractures (4), <10 deg, rough, undulating, open <1/4"-1/2", few intersecting fractures, 71.65-71.7'		Limestone 66.0-70.75' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, weak rock (R2) with extremely weak rock (R0) lenses <0.1' thick rock at 66.2', 67.0', 67.45', 67.65', voids <1/16" over 30% of surface, few cavities <1" diameter, poorly fossiliferous No Recovery 70.75-71.0' Limestone 71.0-75.5' - moderate yellowish brown, (10YR 5/4), very fine to medium grained, moderate to strong HCl reaction, interbedded extremely weak to very weak rock (R0 to R1), with weak to medium strong rock (R2 to R3), voids <1/16" over 0-30% of surface, variable, trace fossil molds, few cavities <1/2" diameter, trace secondary recrystallized infill No Recovery 75.5-76.0' Limestone 76.0-79.9' - moderate yellowish brown to medium light gray, (10YR 5/4 to N6), very fine to medium grained, 76.0-78.3' medium strong to strong rock (R3-R4), void <1/16" over <10-20% of surface increasing with depth, poorly fossiliferous, no cavities, 78.3-78.45' Fat Clay (OH), dark gray (N3), high plasticity, high organic content, no HCl reaction, 78.45-79.9' weak to medium strong rock (R2-R3), fine to medium grained, voids <1/16" over <10-40% of surface, poorly fossiliferous, secondary recrystallized infill of cavities over 40% of surface, strong HCl reaction No Recovery 79.9-81.0' Limestone 81.0-85.8' - pale yellowish brown, (10YR 6/2), very fine to medium grained, weak to medium strong rock (R2 to R3) except 83.4-83.85', grayish black, (N2), extremely weak to very weak rock (R0 to R1) with interbedded organic fat clay seams and laminations, 81.0-83.4' and 83.85-85.8' voids <1/16" over 30-50% of surface, few cavities with secondary recrystallized infill, 2" diameter at 81.9 to 82.0', poorly to moderately fossiliferous with molds <1/2" diameter, trace organics, strong to moderate HCl reaction No Recovery 85.8-86.0'	NQ wireline lowered in boring at 76.0', backhammer 5/19/07 17:15 76.0' Water level at surface R5: 3 minutes 05/20/07 08:00 Continue advancing HW casing from 50.0 to 65.0' 10:30 NQ tooling freed at 76.0' with HW casing at 65.0', continue rock coring from 76.0' SC-3 collected at 77.15-78.3' R6: 4 minutes R7: 5 minutes
			1	72.4, 73.05, 73.25, 73.65' - Fractures (4), <10 deg, rough, undulating, open <1/4"			
			>10	73.8-73.9' - Fracture zone, rough, undulating, gravel-sized fragments, <1" diameter 74.3, 74.4, 74.55, 74.7, 74.8, 75.15' - Fractures (6), <10 deg, rough, undulating, except 74.7-70.0' deg intersecting, tight, open <1/4"			
			5	74.3, 74.4, 74.55, 74.7, 74.8, 75.15' - Fractures (6), <10 deg, rough, undulating, except 74.7-70.0' deg intersecting, tight, open <1/4"			
			1	75.3' - Clay seam			
80 -40.2	R6-NQ 5 ft 78%	63	NR	75.3' - Clay seam			
			>10	76.4, 76.9' - Fracture (2), <10 deg, undulating, smooth to rough, tight, open <1/2"			
			10	76.9-77.15' - Fracture zone, rough, undulating, gravel-sized fragments, <1-1/2" diameter			
			4	78.45-78.5' - Fractures (3+), rough, undulating, intersecting			
			3	78.9, 79.35, 79.45' - Fractures (3), <10 deg, rough, undulating, tight, open <1/4"			
85 -45.2	R7-NQ 5 ft 96%	65	NR	78.9, 79.35, 79.45' - Fractures (3), <10 deg, rough, undulating, tight, open <1/4"			
			>10	81.3-81.45' - Fracture zone (5+ intersecting), rough, undulating 82.0-82.1' - Fracture zone (3+ intersecting), rough, undulating			
			10	82.9' - Fracture, 20 deg and 50 deg, rough, undulating, tight			
			3	83.4, 83.5, 83.6, 83.65, 83.85' - Fractures, <10 deg, undulating, organic staining, smooth to rough, <1/2" organic clay infill, tight, open <1/2"			
			4	84.4-84.7' - Fracture zone, rough, undulating, gravel-sized fragments <1" diameter			
90 -50.2	R8-NQ 5 ft 72%	6	NR	85.7-85.8' - Fractures (3+), rough, undulating, open <1/2"			
			6	86.3, 86.45, 86.55, 86.6' - Fractures, 40 deg and 60 deg, rough, undulating, open <1/2"			
			6	86.8, 86.85, 87.0, 87.2, 87.4, 87.65' - Fractures, <10 deg, rough, undulating, open <1/2"			
			>10	87.8, 87.95' - Fractures (2), 40 deg and 60 deg, rough, undulating, open <1/4"			
			2	88.25-88.65' - Fracture zone, rough, undulating, gravel-sized fragments, <1" diameter			
			NR	88.85, 89.1, 89.4' - Fractures, 10 deg and 40 deg, rough, undulating, open <1/4"			R8: 4 minutes



ORIENTATION : Vertical

LOGGER : P. De Sa'rego, R. Bitely

Rev. 4



ELEVATION : 39.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bqs on 5/18/07

START : 5/18/2007

END : 5/21/2007

LOGGER : P. De Sa'rego, R. Bitely

APPENDIX 2BB-784



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-02

SHEET 8 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724255.5 N, 457486.3 E (NAD83)

ELEVATION : 39.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 5/18/07

START : 5/18/2007

END : 5/21/2007

LOGGER : P. De Sa'rego, R. Bitely

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.
135 -95.2	R17-NQ 5 ft 92%	22	NR	131.1, 131.4, 131.5, 131.85, 132.3, 132.4, 132.55, 132.6, 132.75, 132.85, 133.25, 133.55, 133.75, 133.9, 134.0, 134.3, 134.35, 134.45, 134.5, 134.7, 134.85, 134.9, 140.15, 140.45' - Bedding plane (24), 40 deg, undulating, smooth to rough, tight, open <1/2"		Limestone 131.0-135.6' - yellowish gray, (5Y 7/2), very fine to medium grained, strong HCl reaction, extremely weak to weak (R0 to R2), voids <1/16" over <20% of surface, poorly to moderately fossiliferous with fossil molds, <1" diameter, few cavities with secondary infill <2" diameter, trace laminated bedding	R17: 4 minutes
			6				
			6				
			5				
			7				
140 -100.2	R18-NQ 5 ft 95%	60	2	136.1, 136.4, 136.6, 137.0, 137.05, 138.5, 139.65, 139.75, 139.8, 139.85, 139.95, 140.2' - Bedding plane (12), <10 deg, rough, undulating, tight, open <1/4"		No Recovery 135.6-136.0' Limestone 136.0-140.75' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), very fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), 140.0-140.75' medium strong to strong rock (R3 to R4), voids <1/16" over <10% of surface, poorly to moderately fossiliferous, laminated bedding 136.1-136.6', trace secondary infill, 140.2-140.75' cavities over 30% of surface (50% of which have secondary recrystallized infill) <1-1/2" diameter	R18: 5 minutes
			NR				
			4				
			2				
			2				
145 -105.2	R19-NQ 5 ft 95%	70	5	137.7, 138.25' - Fracture (2), 30 deg, rough, undulating, tight, open <1/4"		No Recovery 140.75-141.0' Limestone 141.0-145.75' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), very fine to medium grained, strong HCl reaction, medium strong to strong (R3 to R4), very weak rock (R1) 145.55-145.75', voids <1/16" over <20-40% of surface, many cavities <1" diameter, highly fossiliferous, trace laminated bedding, <30% cavities with secondary recrystallized infill	R19: 6 minutes
			1				
			NR				
			0				
			2				
150 -110.2	R20-NQ 5 ft 88%	80	3	142.65, 142.95, 143.3, 143.5, 143.9, 145.45' - Fractures (6), <10 deg, rough, undulating, open <1/4" to 1/2"		No Recovery 145.75-146.0' Limestone 146.0-150.4' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, weak (R2), moderately fossiliferous with molds <1/2" diameter, sandy silt (ML) lenses 146.0-146.1' and 1/2" at 150.25'	SC-7 collected at 147.35-148.55'
			10				
			2				
			NR				
			2				
151.0			1	146.1, 146.2, 147.35, 149.25' - Bedding plane (4), <10 deg, rough, undulating, tight, open <1"		No Recovery 150.4-151.0'	R20: 5 minutes
			0				
			1				
			>10				
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-02

SHEET 9 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724255.5 N, 457486.3 E (NAD83)

ELEVATION : 39.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.5 ft bgs on 5/18/07

START : 5/18/2007

END : 5/21/2007

LOGGER : P. De Sa'rego, R. Bitely

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.
155 -115.2	R21-NQ 5 ft 86%	48	1	150.25-150.35' - Fracture zone, rough, undulating, gravel-sized fragments <1" diameter		Limestone 151.0-155.3' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to medium grained, very weak to medium strong (R1 to R3), rock strength weakening with depth, 151.0-153.5' voids <1/16" over <10% of surface, few cavities with secondary recrystallized infill, poorly to moderately fossiliferous with fossil molds <1/2" diameter, very fine to fine grained, 153.5-154.0' laminated with organics, recrystallized fine to medium grained texture, 154.0-155.3' fine to medium grained, <10% voids, no cavities, very weak rock (R1), 151.0-153.0' mild HCl reaction, 153.5-155.3' strong HCl reaction	R21: 7 minutes
			1	151.3, 152.4, 153.2, 153.3, 153.35, 153.5, 153.85' - Bedding plane (7), <10 deg, undulating, rough to smooth, tight, open to <1/4"			
			5				
			>10	154.0-155.3' - Bedding plane, rough, undulating, intersecting vertical fractures, tight, open <1/2"			
			>10				
			NR				
160 -120.2	R22-NQ 5 ft 100%	70	1	156.1, 157.75, 158.0, 158.05, 158.1, 158.15, 158.2, 158.6, 158.7, 158.75, 158.95, 159.05, 159.2, 159.35, 159.7, 159.8' - Bedding plane (16), <10 deg, undulating, rough to smooth, tight, open <1/4"		No Recovery 155.3-156.0' Limestone 156.0-161.0' - very pale brown to yellowish gray, (10YR 6/2 to 5Y 7/2), fine to medium grained, extremely weak to weak rock (R0 to R2) weakening with depth, 156.0-158.0' fine to medium-grained, voids <1/16" over <10% of surface, poorly to moderately fossiliferous, molds <1/2" diameter, trace secondary infill of very fine-grained material, 158.0-161.0' fine grained, trace voids, poorly to moderately fossiliferous with fossil molds <1/4" diameter, trace secondary infill, strong HCl reaction	R22: 5 minutes
			2				
			9				
			5				
			2				
			>10	160.6' - Fractures (2), 20 deg and 50 deg, rough, undulating, intersecting, open <1/4" 161.0-164.7' - Bedding plane, <10 to 90 deg, undulating, intersecting vertical fractures, rough to smooth			
			>10				
			>10				
			>10				
165 -125.2	R23-NQ 5 ft 98%	0	10	164.95, 165.2, 165.55, 165.7, 165.75, 165.35, 165.9' - Bedding plane (7), undulating, rough to smooth, tight, open <1/4"		Limestone 161.0-165.9' - yellowish gray to yellowish gray, (5Y 7/2 to 5Y 8/1), fine to medium grained, extremely weak to weak (R0 to R2), trace voids, no cavities, trace laminate at 165.4-165.5', poorly fossiliferous with fossil molds <1/2" diameter, strong HCl reaction, hardness strengthens with depth, trace medium strong lenses <1/2" thick	SC-8 collected at 163.15- 164.05'
			NR	166.0-166.2' - Fracture zone, undulating, vertical, smooth to rough, tight			
			>10	166.6, 166.65, 167.3, 167.35, 167.5, 168.15, 169.05, 169.2, 170.05, 170.15, 170.5, 170.35, 170.4' - Bedding plane (13), undulating, <1/4" silt and/or clay sized infilling, rough to smooth, tight, open <1/2"			
			>10				
			1	167.05-167.15, 167.5-167.6' - Fracture zone (2), rough, undulating, gravel-sized fragments <1", no stain or infill		No Recovery 165.9-166.0'	R23: 5 minutes
			>10	169.4-169.7' - silt lens to extremely friable			
170 -130.2	R24-NQ 5 ft 89%	53	5				
			NR				
							R24: 10 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-02

SHEET 10 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724255.5 N, 457486.3 E (NAD83)

ELEVATION : 39.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

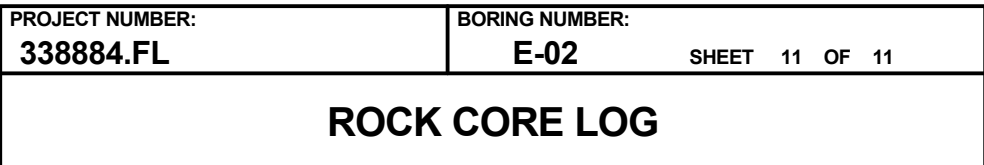
WATER LEVELS : 1.5 ft bgs on 5/18/07

START : 5/18/2007

END : 5/21/2007

LOGGER : P. De Sa'rego, R. Bitely

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			
175 -135.2	R25-NQ 5 ft 86%	47	0	171.2-171.3' - silt lens		Limestone 166.0-170.45' - dark yellowish brown to pale yellowish brown, (10YR 4/2 to 10YR 6/2), very fine to fine grained, grains becoming more coarse with depth 166.0-169.4' very fine to fine-grained, becoming more coarse with depth, weak to strong rock (R2 to R4) interbedded, <1/2" thick silt/sand (carbonate) at 166.65', <10% voids, few cavities/recrystallized cavities <1" diameter, gradational contact to extremely weak rock (R0) at 169.3-169.4' laminated, 169.3-169.7' extremely weak rock (R0) to poorly competent silts/sand (carbonate), laminated, friable, 169.7-170.45' very fine to fine-grained, medium strong to strong rock (R3 to R4), trace voids, no cavities, trace fossils, moderate HCl reaction No Recovery 170.45-171.0' Limestone 171.0-175.3' - pale yellowish brown, (10YR 6/2), very fine to fine grained, 171.0-173.6' weak to strong rock (R2 to R4), 1" silt (ML) lens at 171.2-171.3' - voids <1/16" over <20% of surface, variable, poorly fossiliferous, moderate odor, laminated organics in silt lens, moderate HCl reaction, 173.6-174.1' - interbedded silt (ML) lenses, extremely weak rock (R0), strong odor, strong HCl reaction, 174.1-175.35' - medium strong to strong rock (R3 to R4), <10% voids <1/16", few cavities with secondary recrystallized infill <1" diameter, moderate odor, moderate to strong HCl reaction No Recovery 175.3-176.0' Limestone 176.0-180.2' - light olive gray, (5Y 5/2), very fine to fine grained, medium strong to strong except soil seams (R4 to R5), voids <1/16" over 0-15% of surface, variable, poorly fossiliferous, few cavities <1/2" diameter, moderate to strong HCl reaction, moderate odor, 176.7-176.8', 177.6-177.9' - sandy silt (ML), extremely weak rock (R0) interbedded, laminated with organics, strong odor, moderate HCl reaction No Recovery 180.2-181.0'	R25: 11 minutes
			4	172.1, 172.35, 172.6, 173.15, 173.35, 173.4, 173.6, 174.1' - Bedding plane (8), <10 deg, rough, undulating, tight, open <1/2"			
			10	172.75, 174.5' - Fractures (2), 50 deg and 40 deg, rough, undulating, tight, open <1/4"			
			10	173.6-173.65, 173.8-173.85, 174.0-174.1' - silt/sand silt (ML) lenses			
			NR				
180 -140.2	R26-NQ 5 ft 84%	16	10	176.2, 176.25, 176.4, 176.9, 176.98, 177.1, 177.3, 178.55, 178.9, 179.25, 179.4, 179.5, 179.6, 179.8' - Bedding plane, <10 deg, rough, undulating, tight, open <1/2"		R26:9 minutes	SC-9 collected at 181.0-181.8'
			10	176.7-176.8', 177.6-177.9' - silt seams			
			10	178.25-178.35, 179.6-179.7' - Fracture zone (2), rough, undulating, gravel-sized fragments <1" diameter			
			>10	179.35' - Fractures (2+), vertical, smooth, undulating, vertical, tight			
			NR	179.95' - Fractures (2+), <10 deg and 40 deg, rough, undulating, intersecting, open <1/2"			
185 -145.2	R27-NQ 5 ft 84%	16	2	181.8, 181.95, 182.1, 182.25, 182.5, 182.8, 182.9, 183.1, 183.25, 183.4, 183.8, 184.0, 184.3, 184.4, 184.45' - Bedding plane (15), <10 deg, rough, undulating, tight, <1/2"		R27: 8 minutes	
			>10	182.05, 182.2, 182.4, 182.7, 182.85' - Fractures (5), rough, undulating, open <1/2"			
			>10	184.1-185.0' - Fracture zone, rough, undulating, gravel-sized fragments <1" diameter			
			1	185.05' - Fractures, 40 deg, rough, undulating, open <1/4"			
			NR				



ORIENTATION : Vertical

LOGGER : P. De Sa'rego, R. Bitely

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03
SHEET 1 OF 10	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724208.2 N, 457932.6 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.9 ft bgs on 5/07/07 START : 5/7/2007 END : 5/8/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 2.9 TUBS ON 5/7/07			START : 5/7/2007			END : 5/9/2007			LOGGERS : N. Salzman		
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				
42.0	0.0	1.0	SS-1	1-2-3 (5)	Topsoil 0.0-0.1' Silty Sand (SM) 0.1-1.0' - dusky yellowish brown to dark yellowish brown, (10YR 2/2, 10YR 4/2), moist, loose, fine grained, 15-20% non plastic fines, silica sand		Begin E-03 at 11:27 05/07/2007; HW surface casing used in boring				
	1.5										
5	5.0										
37.0		0.5	SS-2	1-2-2 (4)	Clayey Sand (SC) 5.0-5.5' - greenish gray, (5G 6/1), moist, very loose, 21% fines, 1/2" limestone fragments between 5.3' and 5.6' with mild HCl reaction, no HCl reaction in clay						
	6.5										
10	10.0										
32.0		1.0	SS-3	5-18-30 (48)	Silt With Sand (ML) 10.0-10.95' - pale yellowish orange, (10YR 8/6), moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, 20% very fine to medium sand, carbonate materials						
	11.5										
15	15.0										
27.0	15.3	0.1	SS-4	50/3 (50/3")	Limestone Fragments 15.0-15.1' - grayish orange, (10YR 7/4), mild to moderate HCl reaction, fragments to 1/2"						
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03
SHEET 2 OF 10	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724208.2 N, 457932.6 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.9 ft bgs on 5/07/07 START : 5/7/2007 END : 5/8/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 2.9 TUBS ON 9/7/07				START : 9/7/2007		END : 9/9/2007		LOGGERS : N. Salzman	
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		
22.0	20.0	0.0	SS-5	50/3 (50/3")	No Recovery 20.0-20.3'				
25	25.0								
17.0	25.5	0.4	SS-6	50/5.5 (50/5.5")	Sandy Silt (ML) 25.0-25.4' - pale yellowish orange, (10YR 8/6), wet, hard, low plasticity, rapid dilatancy, mild HCl reaction, 49% fine to medium grained sand				
30	30.0								
12.0	30.5	0.3	SS-7	50/5.5 (50/5.5")	Sandy Silt (ML) 30.0-30.25' - Same as 25.0-25.4'				
35	35.0								
7.0	35.8	0.2	SS-8	26-50/3 (76/9")	Limestone Fragments 35.0-35.15' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, sand with limestone fragments				
40									



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03
SHEET 3 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724208.2 N, 457932.6 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.9 ft bgs on 5/07/07 START : 5/7/2007 END : 5/8/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 2.9' bgs on 9/9/07			START : 9/7/2007		END : 9/9/2007		LOGGERS : N. J. J. J. J. J.	
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	
2.0	40.4	0.4	SS-9	50/5 (50/5")	Sandy Silt (ML) 40.0-40.4' - moderate olive brown, (5Y 4/4), wet, hard, low plasticity, rapid dilatancy, mild HCl reaction, 49% fine to coarse grained sand, carbonate material			
45	45.0							
-3.0	45.8	0.6	SS-10	42-50/3 (92/9")	Sandy Silt (ML) 45.0-45.6' - Same as 40.0-40.4' except 5-10% fine gravel-sized limestone fragments			
50	50.0							
-8.0	50.3	0.0	SS-11	50/3 (50/3")	No Recovery 50.0-50.3'		Driller's Remark: Drill chatter	
55	55.0							
-13.0	55.3	0.0	SS-13	50/2 (50/2")	Limestone Fragments 55.0-55.05' - moderate olive brown, (5Y 4/4), mild HCl reaction, fragments to 1/4"			
	60.0							
	60.1	0.1	SS-12	50/3 (50/3")	No Recovery 60.0-60.1' one 1/2" limestone fragment			
60							Water level at 2.9' below ground surface at 17:31	
					Begin Rock Coring at 60.0 ft bgs See the next sheet for the rock core log			



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03	SHEET 4 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724208.2 N, 457932.6 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.9 ft bgs on 5/07/07 START : 5/7/2007 END : 5/8/2007 LOGGER : N. Jarzyniecki

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			
-18.0	60.0 R1-NQ 1 ft 100%	100	1	60.45' - Bedding plane, 15 deg, rough, undulating		Limestone 60.0-60.7' - light olive gray, mottled moderate olive brown, (5Y 5/2, mottled 5Y 4/4), very fine to fine grained, weak to medium strong (R2 to R3), poorly fossiliferous, voids <1/16", 15-25% coverage	Begin rock coring at 07:47 05/08/2007; water level at 3.9' below ground surface R1: 2 minutes
			1	61.2, 63.95' - Mechanical break			
			2	61.7, 62.2' - Fracture, 75 deg, rough, undulating			
			3	62.8' - Bedding plane, <5 deg, rough, undulating			
			3	63.0' - Bedding plane, 35 deg, rough, undulating, open up to 1/4"			
			3	63.15' - Bedding plane, <5 deg, smooth, planar			
65			0	63.25' - Bedding plane, <5 deg, rough, undulating			
-23.0			NR	64.25' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"			R2: 3 minutes
			1	64.65' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"			
			>10	64.8' - Fracture, 80 deg, rough, undulating, open			
			>10	66.9' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"			
			>10	67.3-67.5' - Fracture zone, up to 1-1/2" fragments, intersecting fractures			
			3	67.95' - Bedding plane, 30 deg, rough, undulating, open up to 1/2"			
70			1	68.5' - Bedding plane, <5 deg, smooth to rough, undulating, open up to 1/4"			
-28.0			NR	68.6' - Bedding plane, <5 deg, smooth to rough, undulating			R3: 5 minutes
			3	68.85-69.15' - Fracture zone, fragments to 2", intersecting fractures			
			5	69.35, 69.7, 69.95' - Fracture, vertical, rough, undulating			
			>10	70.1' - Bedding plane, <5 deg, smooth to rough, undulating, open up to 1/4"			
			>10	71.1' - Fracture, 60 deg, rough, stepped to undulating, open up to 1/8"			
			>10	71.3, 71.6' - Bedding plane, 25 deg, rough, undulating, open to 1/8", 1/2" at 71.6'			
75			NR	72.1, 72.35, 72.7' - Bedding plane, <5 deg, rough to smooth, planar, along abrupt lithology change, open up to 1/8" at 72.1', no gap at 72.7			
-33.0			2	72.15-72.4' - Fracture zone, 70-80 deg, multiple hairline fractures, branch-like appearance			R4: 10 minutes
			1	72.8' - Bedding plane, 60 deg, rough to smooth, undulating			
			1	73.1-73.3' - Fracture zone, fragments to 2", intersecting fractures			
			1	73.5' - Bedding plane, 60 deg, rough to smooth, undulating			
			5	73.7-74.2, 74.35, 74.6' - Fracture zone, fragments to 2", intersecting fractures, open up to 1/4" at 74.35' and 74.6'			
80							

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724208.2 N, 457932.6 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing


ORIENTATION : Vertical

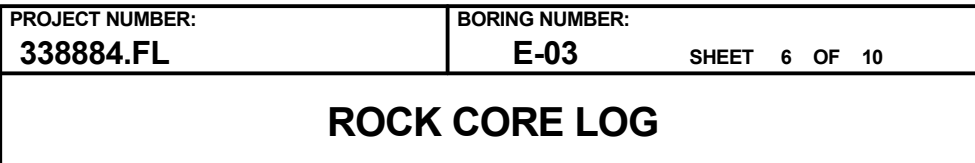
WATER LEVELS : 2.9 ft bgs on 5/07/07

START : 5/7/2007

END : 5/8/2007

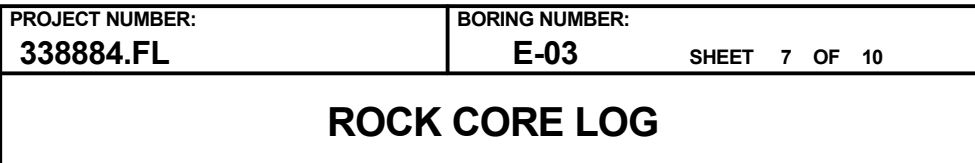
LOGGER : N. Jarzyniecki

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			
-38.0			NR	74.8-74.9' - Bedding plane, 60 deg, rough to smooth, undulating, intersects high angle fracture, fragments to 2", predominantly 1/4"		No Recovery 80.0-81.0'	R5: 3 minutes
81.0			2	76.4, 76.6' - Bedding plane, 20 deg, open up to 1/2" at 76.4'; up to 1/8" gap at 76.6'		Limestone 81.0-85.7' - Same as 76.0-80.0' except yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), trace cavities to 1"	
			1	77.1' - Bedding plane, 30 deg, open up to 1/2"			
			>10	78.6' - Bedding plane, 20 deg, tight			
			>10	79.1, 79.3' - Bedding plane, 20 deg, open up to 1/2" at 79.1'			
			0	79.6, 79.7' - Bedding plane, 20 deg, open up to 1/2"			
85 -43.0			NR	79.9' - Fracture, 85 deg, rough, undulating		No Recovery 85.7-86.0' Limestone 86.0-88.1' - very light gray, (N8), very fine to fine grained, mild HCl reaction, medium strong (R3), voids <1/16" with <2% coverage on surface	SC-2 collected at 84.7-85.7'
			>10	81.2' - Bedding plane or mechanical break, 40 deg, rough, undulating			R6: 3 minutes
			1	81.9' - Bedding plane or mechanical break, <5 deg, rough to smooth, undulating to planar			
			>10	82.8' - Fracture, 75 deg, rough, undulating			
			1	83.8-84.1' - Fracture zone, fragments to 1"			
			1	84.75' - Fracture, 75 deg, rough, undulating, open up to 1/4"			
			>10	86.4' - Bedding plane, <5 deg, smooth to rough, planar, open to <1/8" gap, organic stain			
			1	86.6, 87.5, 88.5, 88.6' - Mechanical break			
			1	86.9-87.2' - Fracture zone, fragments to 3 1/2"			
			1	88.4' - Fracture, 80 deg, rough, undulating, open 1/8"			
			NR	89.1' - Bedding plane, 30 deg, rough, undulating			
90 -48.0			1	90.2' - Bedding plane, 40 deg, rough, undulating			R7: 6 minutes
			1	91.7' - Fracture, 75 deg, associated with dissolution features or very extensive breaks in softer area, open up to 2"		No Recovery 90.9-91.0' Limestone 91.0-96.0' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, weak to medium strong (R2 to R3), laminated bedding 91.0-92.5', trace voids <1/6" and cavities to 1/4", trace fossil casts	
			0	93.1-93.35' - Fracture zone, intersecting fractures, fragments to 2"			
			>10	94.0' - Fractures (2), 65 deg, rough, undulating, open up to 1/2", organic features on fracture surface			
			3	94.6, 95.7' - Bedding plane, <5 deg, smooth to rough, undulating, open up to 1/2", organic features on fracture surface; no organics at 95.7'			
95 -53.0			1	96.2' - Fracture, 80 deg, rough, undulating, open			
			1	96.7' - Bedding plane (2), 10 deg and 60 deg, rough to smooth, undulating			
			1	97.5' - Bedding plane, <5 deg, rough to smooth, undulating			
			0	97.6-97.7' - Fracture (3), 0-10 deg, open to 1/4", 1/4" organic infill			
				98.5' - Bedding plane (2), 10 deg and 60 deg, rough to smooth, undulating			
100				99.3, 97.6, 99.85' - Mechanical break		96.0-100.6' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), mottled from 96.6-97.5', trace voids from <1/16" to 1/8", organic layers from 97.6-97.7' (black), trace fossil casts	SC-3 collected at 99.1-99.85'



WATER LEVELS : 2.9 ft bgs on 5/07/07 START : 5/7/2007 END : 5/8/2007 LOGGER : N. Jarzyniecki

Rev. 4



ORIENTATION : Vertical

LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-03

SHEET 8 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724208.2 N, 457932.6 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.9 ft bgs on 5/07/07

START : 5/7/2007

END : 5/8/2007

LOGGER : N. Jarzyniecki

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		
-98.0				NR	137.8' - Bedding plane, <5 deg, rough, undulating, open up to 3/4"	Limestone 141.0-143.5' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak (R1), voids <1/16" with 30% coverage, wavy bedding planes to 1/2"	R17: 5 minutes	
	141.0		>10	138.1-138.5' - Fracture zone, fragments to 1-1/2"				
			>10	138.8, 139.1' - Bedding plane, <5 deg, rough, undulating, open up to 1/2", associated with dissolution				
				139.5' - Fracture, 60 deg, rough to smooth, undulating, open to <1/8"				
	R18-NQ 5 ft 74%	15	2	141.2-141.7' - Fracture zone or bedding plane, <10 deg, rough, undulating, open to <1/2" (most <1/8")		143.5-144.7' - yellowish gray, (5Y 8/1), very fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), voids <1/16" with 10-20% coverage, 1/4" zone at 143.75' of weak to medium strong rock (R2 to R3) with voids <1/16" covering 30-40% of the surface and slightly darker color	R18: 3 minutes	
			1	141.75-142.2' - Fracture zone, intersecting fractures, fragments to 1/2"				
			NR	142.25, 142.3' - Bedding plane, <5 deg, rough, planar				
				142.4-143.0' - Fracture zone, fragments to 1-1/2"				
	146.0		1	143.1, 143.3' - Bedding plane, open to 1/4"		No Recovery 144.7-146.0' Limestone 146.0-147.0' - grayish yellow to yellowish gray, (5Y 8/4 to 5Y 7/2), very fine to fine grained, strong HCl reaction, strong to weak (R4 to R2), trace organics and voids <1/16"	SC-5 collected at 148.95-150.80'	
			1	143.5' - Mechanical break				
			3	144.1' - Fracture, 75-80 deg, rough, undulating, organic stain or mineralization, open				
			0	144.3' - Mechanical break				
	R19-NQ 5 ft 98%	58		146.85' - Fracture, 70 deg, rough, undulating		147.0-147.9' - yellowish gray, light olive gray, and grayish yellow, (5Y 7/2, 5Y 5/2 and 5Y 8/4), fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids <1/16" with 10% coverage, trace organics, wavy laminated bedding, possible cross bedding	R19: 4 minutes	
				147.75' - Bedding plane, <5 deg, rough, undulating				
				148.0, 148.6, 148.65, 150.8, 150.9' - Bedding plane, <5 deg, rough, undulating, 1/4" open				
				148.1, 148.5, 149.95' - Mechanical break				
	151.0		NR	151.0-151.35' - Fracture zone, intersecting fractures, fragments to 1-1/4", some organic staining		147.9-150.9' - grayish yellow, (5Y 8/1), fine to medium grained, strong HCl reaction, weak to medium strong (R2 to R3), voids <1/16" with 10% coverage, trace cavities to 1/4"	R20: 2 minutes	
			>10	151.6' - Bedding plane, 15-40 deg, open up to 1"				
			2	152.15, 152.45' - Bedding plane, <5 deg, rough, undulating, open to <1/8"				
			3	153.15' - Fracture, 40-45 deg, rough, undulating, open <1/8" to 1/2"				
			3	153.3, 153.9, 154.9' - Bedding plane, <5 deg, rough, planar, open to 1/4" at 154.9'		No Recovery 150.9-151.0' Limestone 151.0-152.15' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), trace voids <1/16", poorly fossiliferous		
			1	154.6' - Fracture (2), 65 deg and <5 deg, intersected with bedding fracture, open up to 1/8"				
			NR	155.8' - Bedding plane, <5 deg, rough, undulating, open to <1/8"				
			2	156.15' - Bedding plane, <5 deg, smooth to rough, planar to undulating, trace organics, open to <1/4"				
	156.0		>10	156.7' - Bedding plane, 10 deg, rough, undulating, open up to 1"		No Recovery 155.85-156.0 Limestone 156.0-160.4' - yellowish gray to mottled yellowish gray, and dusky yellow, (5Y 7/2 to mottled 5Y 6/4 and 5Y 6/2), fine to medium grained, strong HCl reaction, medium strong (R3), trace voids, trace fossils (casts)		
			>10	157.1' - Bedding plane, <5-35 deg, rough, undulating, open up to 1"				
				157.2' - Bedding plane, 35 deg, rough, undulating, open up to 1/8"				
			4					
160								




PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03	SHEET 9 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724208.2 N, 457932.6 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.9 ft bgs on 5/07/07 START : 5/7/2007 END : 5/8/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 2.31 FGS ON 3/6/07		START : 3/7/2007		END : 3/22/2007		LOGGER : N. JARZYNECKI		
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
-118.0			>10	157.35' - Bedding plane, <5 deg, rough, undulating, open up to 1/8"		No Recovery 160.4-161.0' Limestone 161.0-162.6' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, medium strong (R3), <1/16" voids with 5-10% coverage, trace cavities to 1/4", poorly fossiliferous 162.6-165.25' - alternating dusky yellow to light olive gray, (5Y 6/4 to 5Y 5/2), medium to very fine grained, strong to moderate HCl reaction, 15-20% coverage of voids <1/16" and fossiliferous in dusky yellow zones; trace voids <1/16" and no visible fossils in light olive gray zones No Recovery 165.25-166.0' Limestone 166.0-170.6' - light olive gray and dusky yellow, (5Y 5/2 and 5Y 6/4), fine to medium grained, moderate HCl reaction, medium strong to strong (R3 to R4), voids to 1/16" with 30-40% coverage and cavities up to 1/4"x1/2", color transitions to moderate yellowish brown (10YR 5/4) at 169.7' with interbeds of light olive gray material up to 2"	Driller's Remark: 100% loss of circulation at 159.5' R21: 3 minutes	
161.0		NR	157.45-157.7' - Fracture zone, intersecting fractures, fragments to 1"					
	R22-NQ 5 ft 85%	28	4	157.8, 157.9, 158.5' - Bedding plane, <5 deg, rough, undulating, open up to 1/8"				
			3	158.6-158.8' - Fracture zone, intersecting fractures, fragments to 1-1/2"				
			8	158.9, 159.05, 159.15, 159.3' - Bedding plane, <5 deg, rough, undulating, open 1/8-1/4"				
			5	159.6' - Bedding plane, 10-30 deg, rough, undulating, open up to 1/8"				
165			>10	160.05' - Bedding plane, 35 deg, rough, undulating, open up to 1/8"			R22: 3 minutes	
-123.0			NR	160.1-160.2' - Fracture zone				
	R23-NQ 5 ft 92%	29		161.05, 161.5, 161.6' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"				
			1	161.75' - Bedding plane, <5 deg, rough, undulating, open up to 1"				
			2	162.6' - Bedding plane, <5 deg, rough, undulating, open to <1/8"				
			>10	162.8, 162.9' - Bedding plane, <5 deg, rough, planar, open up to 1/4"				
			4	163.1' - Fracture, 60 deg, rough, undulating, open to 1/8"				
170			1	163.3, 163.4' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"		No Recovery 170.6-171.0' Limestone 171.0-174.3' - Same as 166.0-170.6' except light olive gray to dusky yellow, (5Y 5/2 to 5Y 6/4)		SC-6 collected at 166.0-166.85'
-128.0			NR	163.45' - Fracture, 85 deg, rough to smooth, planar to undulating, intersects bedding plane fracture				
	R24-NQ 5 ft 66%	33		163.55, 163.6, 163.65' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"				
			4	163.9' - Bedding plane, horizontal and 35 deg, open				
			>10	164.3, 164.4, 164.6, 164.75, 164.8' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"				
			>10	165.0-165.2' - Fracture zone, fragments to 1", most to 1/4", intersecting fractures				
			1	166.85, 167.4, 167.5' - Bedding plane, <15 deg, rough, undulating, open to 1/8"				
175			NR	168.0' - Fracture, 75 deg, rough, undulating, open up to 1/8"			No Recovery 174.3-176.0'	R23: 3 minutes
-133.0				168.25, 168.35, 168.5' - Bedding plane, <15 deg, rough, undulating, open up to 1/8"				
	R25-NQ 5 ft 95%	18		168.7, 168.85' - Bedding plane, <5 deg, rough, undulating, open to 1/8"				
			3	169.1, 169.7, 169.75' - Bedding plane, <5 deg, smooth to rough, planar, open to 1/8"				
			3	169.85, 170.35' - Fracture, 55-60 deg, rough, undulating, open to 1/2"				
			3	171.2, 171.45, 171.55, 171.95' - Bedding plane, <5 deg, rough to smooth, planar, open up to 1/4", open to 1/2" at 171.95				
			6	172.8-178.4' - Fracture zone, intersecting fractures, fragments to 1-1/2"				
180				173.5, 174.05' - Bedding plane, <5 deg, rough to smooth, planar, open up to 1/4", gray staining at 173.5'		R24: 4 minutes		



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03
SHEET 10 OF 10	
ROCK CORE LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724208.2 N, 457932.6 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 2.9 ft bgs on 5/07/07 START : 5/7/2007 END : 5/8/2007 LOGGER : N. Jarzyniecki

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.
-138.0			5	176.35, 176.5, 176.8, 177.3' - Bedding plane, <10 deg, rough, undulating, open to <1/8", organic stains or thin laminae at 177.3'		177.3-178.3' - yellowish gray to dusky yellow, (5Y 8/4 to 5Y 6/4), fine to medium grained, moderate HCl reaction, medium strong to weak (R3 to R2), voids to 1/8" with 10-20% coverage increasing with depth	R25: 4 minutes
	181.0		NR	177.5' - Bedding plane, <5 deg, rough, planar to undulating, open to <1/8"		178.3-180.75' - Same as 176.0-177.3' except poorly fossiliferous and trace voids <1/16", laminated bedding	
			4	177.7' - Bedding plane, 35 deg, rough, undulating, open to <1/2"		No Recovery 180.75-181.0' Limestone	
			>10	178.15, 178.5' - Mechanical break		181.0-182.5' - Same as 177.3-178.3' except mild to moderate HCl reaction	
			>10	178.65, 178.75, 178.9, 179.0, 179.15, 179.3, 179.5' - Bedding plane, <5 deg, rough, planar to undulating, open to <1/8"		182.5-185.25' - alternating yellowish gray, (alternating 5Y 8/1 and 5Y 7/2), very fine to medium grained, strong to moderate HCl reaction, strong to medium strong (R4 to R3), alternating beds, trace voids <1/16" and cavities to 1", voids <1/16" with 20-30% coverage, cavities to 1/4" with 10% coverage, 1/16" laminated bedding only visible in finer grained beds	
	R26-NQ 5 ft 85%	20	4	179.75' - Bedding plane, <5 deg, rough, planar to undulating, open to 1/8"		No Recovery 185.25-186.0'	R26: 3 minutes
			1	179.8, 180.2, 180.3' - Bedding plane, <5 deg, rough, planar to undulating, open to <1/8"		Bottom of Boring at 186.0 ft bgs on 5/8/2007	
185			NR	180.1' - Fracture, 60 deg, rough, undulating			
-143.0				180.4' - Fracture, 85-90 deg, rough, undulating			
	186.0			180.65' - Bedding plane, <5 deg, rough, stepped, open up to 1/4"			
				181.2, 181.5, 181.7, 181.9' - Bedding plane, <10 deg, stain on some fracture planes, open up to 1/8"			
				182.3' - Bedding plane, 15 deg, organic stain, open to <1/8"			
				182.5' - Bedding plane, <10 deg, open to 1/8"			
				182.85-183.0' - Fracture zone, fragments to 1", intersecting fractures			
				183.1' - Bedding plane, 15 deg, organic stain, open to <1/8"			
				183.4-183.5' - Fracture zone, fragments to 1", intersecting fractures			
				183.6, 183.9, 184.2, 184.8, 184.4, 185.0, 185.2' - Bedding plane, <10 deg, open to 1/8"			
				183.65, 184.25' - Fracture, 55-60 deg, rough, undulating, open to <1/8"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-04

SHEET 1 OF 12

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/03/07

START : 5/2/2007

END : 5/3/2007

LOGGER : M. Faurete, N. Jarzyniecki

WATER LEVELS : 3.5 ft bgs on 9/30/07			START : 9/2/2007			END : 9/3/2007			LOGGERS : M. Gaudette, N. Salzman		
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					
43.1	0.0	1.4	SS-1	1-2-2 (4)	Topsoil 0.0-0.3' Poorly Graded Sand With Organics (SP) 0.3-1.4' - medium light gray grading to medium gray and greenish black, (N6 to N5 and 5GY 2/1), moist, very loose, fine grained, 20-25% organic fines, decreasing with depth, sand is silica			No water level - start hole Cathead operator: Paul Buchler			
	1.5										
5	5.0										
38.1	6.5	1.0	SS-2	1-2-2 (4)	Clayey Sand (SC) 5.0-5.35' - light greenish gray, (5GY 8/1), wet, very loose, very fine to fine grained, 35% low to medium plasticity fines, sand is silica Silty Sand (SM) 5.35-6.0' - grayish orange, (10YR 7/4), wet, very loose, very fine to fine grained, 25% nonplastic fines, sand is silica						
	10.0										
10	11.4	1.2	SS-3	22-40-50/5 (90/11")	Silt With Sand (ML) 10.0-11.2' - dark yellowish orange, (10YR 6/6), moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, 16% of sand-sized, carbonate material						
	15.0										
15	15.8	0.7	SS-4	40-50/4 (90/10")	Silt With Sand (ML) 15.0-15.7' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 15% fine to medium sand-sized, carbonate material						
20											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-04

SHEET 2 OF 12

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/03/07

START : 5/2/2007

END : 5/3/2007

LOGGER : M. Faurete, N. Jarzyniecki

WATER LEVELS : 3.510 bgs on 9/25/07			START : 9/22/07		END : 9/22/07		LOGGER : M. LaRue, IV. Salzman	
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			
23.1	20.0	0.1	SS-5	50/2 (50/2")	Limestone Fragments 20.0-20.1' - grayish orange, (10YR 7/4), mild HCl reaction, coarse sand-sized fragments, very poor recovery			
25	25.0							
18.1		1.0	SS-6	13-20-25 (45)	Silty Sand (SM) 25.0-26.0' - grayish orange, (10YR 7/4), wet, dense, fine to coarse grained, mild HCl reaction, 30% nonplastic fines, 13% gravel-sized limestone fragments with many fossil molds/casts, all carbonate material			
	26.5							
30	30.0							
13.1		1.1	SS-7	5-17-14 (31)	Sandy Silt (ML) 30.0-31.1' - dusky yellow, (5Y 6/4), wet, hard, fine to coarse grained, fine% gravel, nonplastic, rapid dilatancy, mild HCl reaction, 30% fine to coarse sand-sized, 10% fine gravel-sized limestone fragments, carbonate material			
	31.5							
35	35.0							
8.1	35.3	0.3	SS-8	50/4 (50/4")	Limestone Fragments 35.0-35.3' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, coarse sand to fine gravel sized fragments, poor recovery			
40								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-04

SHEET 3 OF 12

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/03/07

START : 5/2/2007

END : 5/3/2007

LOGGER : M. Faurote, N. Jarzyniecki

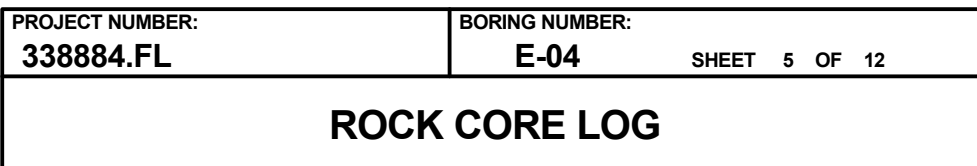
WATER LEVELS : 3.5 ft bgs on 9/3/07			START : 9/2/2007			END : 9/3/2007			LOGGER : M. Gaudin, IV. JaiZymieck		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS				
	RECOVERY (ft)	#TYPE		6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION				
3.1	40.0	0.1	SS-9	50/4 (50/4")	Limestone Fragments 40.0-41.0' - pale olive, (10Y 6/2), mild HCl reaction, poor recovery		Very hard rock, a lot of bit chatter - if continues will start coring at 45.0'				
45	45.0										
-1.9	45.8	0.6	SS-10	30-50/4 (80/10")	Silty Sand With Limestone (SM) 45.0-45.6' - light olive, (10Y 5/4), wet, very dense, fine to coarse grained, mild HCl reaction, 40% low plastic fines, 15% fine gravel-sized, carbonate material		Continue drilling soils based on drillers log of nearby boring GSC-6 where they went through a tough rock layer, then about 5.0' of sand from about 48.0-53.0', the driller wants to make sure they case deep enough at the start of the hole				
50	50.0										
-6.9	50.4	0.3	SS-11	50/5 (50/5")	Silty Gravel With Sand (GM) 50.0-50.3' - moderate olive brown, (5Y 4/4), wet, very dense, fine to coarse grained, mild HCl reaction, 22% low plastic fines, 38% fine to coarse sand, carbonate material						
55	55.0										
-11.9	56.5	1.4	SS-12	22-35-35 (70)	Silty Sand With Limestone (SM) 55.0-56.4' - moderate olive brown, (5Y 4/4), wet, very dense, fine to coarse grained, mild HCl reaction, 20-25% low plastic fines, 20% fine to coarse gravel-sized, carbonate materials						
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-04
SHEET 4 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.5 ft bgs on 5/03/07 START : 5/2/2007 END : 5/3/2007 LOGGER : M. Faurote, N. Jarzyniecki

WATER LEVELS : 3.5 ft bgs on 9/30/07			START : 9/2/2007		END : 9/3/2007		LOGGER : M. Fauriol, IV. Joly/Symeon	
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			
-16.9	60.0	1.3	SS-13	33-42-50/5 (92/11")	Silty Sand With Gravel (SM) 60.0-61.3' - moderate olive brown, (5Y 4/4), moist, very dense, fine to coarse grained, rapid dilatancy, mild to moderate HCl reaction, 40% nonplastic fines, 17% gravel-sized limestone fragments Begin Rock Coring at 61.5 ft bgs See the next sheet for the rock core log			
	61.4							
65 -21.9								
70 -26.9								
75 -31.9								
80								



ORIENTATION : Vertical

LOGGER : M. Faurote, N. Jarzyniecki

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-04

SHEET 6 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/03/07

START : 5/2/2007

END : 5/3/2007

LOGGER : M. Fauroute, N. Jarzyniecki

WATER LEVEL: 5.5' below ground on 5/3/07		STATION: 72.9-73.5'		END: 90.3-91.0'		COLUMBIA RIVER, GARZYNOK		
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 -41.9	R5-NQ 5 ft 84%	27	>10	81-81.7' - Fracture zone, rock fragments from 1/4'-1/2", no visible orientation, angular to subangular fragments	75.0-75.75' - Same as 72.9-73.5' except trace organics 75.75-77.6' - light brown, (5Y 6/4), fine grained, weak to medium strong (R2 to R3), 15-30% void space (fossil casts), mild HCl reaction unless pulverized 77.6-79.65' - light olive gray with pale olive alteration bands, (5Y 5/2 with 10Y 6/2), very fine to medium grained, moderate to strong HCl reaction, strong (R4) No Recovery 79.65-81.0' Limestone 81.0-82.2' - light bluish gray grading to light olive gray, (5B 7/1 to 5Y 6/1), very fine to fine grained, mild HCl reaction, strong to very strong (R4 to R5), delayed reaction to HCl, voids <1/16" over 20% of surface, trace cavities to 1/8", trace organics, poorly fossiliferous 82.2-83.1' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to medium grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), voids to 1/16" 5% coverage, trace organics 83.1-85.2' - dusky yellow transitioning to yellowish gray, (5Y 6/4 to 5Y 8/1), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), voids <1/16" 30-40% coverage No Recovery 85.2-86.0' Limestone 86.0-90.3' - Same as 83.1-85.2' except moderately fossiliferous, with 5-10% coverage of cavities to 1/2" No Recovery 90.3-91.0' Limestone 91.0-93.5' - yellowish gray and light olive gray, (5Y 7/2 and 5Y 8/1), fine to medium grained, mild to moderate HCl reaction, medium strong (R3), voids <1/16" 25-35% of surface, trace cavities to 1/2", trace organics 93.5-95.8' - yellowish gray, (5Y 8/1), very fine to fine grained, moderate HCl reaction, voids <1/16" predominately from 93.8-94.1', 10-20% of surface, <1% cavities to 1/2", trace fossil casts No Recovery 95.8-96.0' Limestone 96.0-100.9' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, weak to medium strong (R2 to R3), 10-20% voids (<1/16") over surface, trace cavities up to 1/2", moderately fossiliferous (casts/molds)	R5: 4 minutes		
			7	81.9' - Fracture, undulating, generally horizontal, irregular				
			5	82.2' - Bedding plane, <5 deg, open 82.6-83.0' - Fractures, 0-90 deg, open, fragments vary in shape and size				
			>5	83.0-83.5' - Fractures, 0-90 deg, open, fragments vary in shape and size				
			1	85.7' - Fracture, fracture from 85.7-85.9' does not extend across the core				
	90 -46.9	R6-NQ 5 ft 86%	63	NR				
				0	86.5-86.9' - Fracture zone, fragments <1" x 1" average at 1/2" x 1/2"			
				1				
				0	87.75' - Fracture or bedding plane, 0-20 deg, rough, undulating, 1" open, 88.3' - Mechanical break 88.5' - Mechanical break			
				>10	89.35' - Fracture, 80 deg, rough, undulating, 1/8" open			
R7-NQ 5 ft 96%		67	>10	89.7-90.15' - Fracture zone, intersecting fractures, up to 1" x 1/2" fragments, some silt with organics from 89.7-89.8'				
			NR					
			0	91.85' - Mechanical break				
			>10	92.6-93.05' - Fracture zone, with some clay infill				
			3	93.4, 93.75' - Fracture or bedding plane (2), horizontal, rough, undulating, 5% organics on bottom surface of fracture, up to 1/4" open				
95 -51.9	R8-NQ 5 ft 98%	83	2	93.6' - Fracture, 80 deg, rough, undulating, organics on 5% of fracture				
			0	94.2' - Mechanical break				
			0	94.45' - Fracture, 5 deg, smooth, planar, tight, slight organics on fracture surface (5-10%)				
			NR					
			1	94.9' - Bedding plane, 5 deg, rough, undulating, organic staining, open 2", clay infill with limestone fragments				
	R5-NQ 5 ft 84%	27	3	95.25' - Mechanical break				
			0	96.3' - Mechanical break				
			2	96.8' - Fracture, 5 deg, organic staining, bedding plane fracture, open 3", infill fines				
			0	97.0, 97.05' - Bedding plane (2), smooth, undulating, organics (5-10%) of surface of fracture, up to 1/8" open				
			0	97.8' - Fracture, 80 deg, rough, undulating, organic staining				
R6-NQ 5 ft 86%	63	0	98.5' - Mechanical break					
		0	99.1' - Mechanical break					
		NR						
		NR						
		NR						
100 -56.9	R7-NQ 5 ft 96%	67	1	94.9' - Bedding plane, 5 deg, rough, undulating, organic staining, open 2", clay infill with limestone fragments				
			3	95.25' - Mechanical break				
			0	96.3' - Mechanical break				
			2	96.8' - Fracture, 5 deg, organic staining, bedding plane fracture, open 3", infill fines				
			0	97.0, 97.05' - Bedding plane (2), smooth, undulating, organics (5-10%) of surface of fracture, up to 1/8" open				
	R8-NQ 5 ft 98%	83	0	97.8' - Fracture, 80 deg, rough, undulating, organic staining				
			0	98.5' - Mechanical break				
			0	99.1' - Mechanical break				
			NR					
			NR					
	R5-NQ 5 ft 84%	27	>10	81-81.7' - Fracture zone, rock fragments from 1/4'-1/2", no visible orientation, angular to subangular fragments				
			7	81.9' - Fracture, undulating, generally horizontal, irregular				
			5	82.2' - Bedding plane, <5 deg, open 82.6-83.0' - Fractures, 0-90 deg, open, fragments vary in shape and size				
			>5	83.0-83.5' - Fractures, 0-90 deg, open, fragments vary in shape and size				
			1	85.7' - Fracture, fracture from 85.7-85.9' does not extend across the core				
	R6-NQ 5 ft 86%	63	NR					
			0	86.5-86.9' - Fracture zone, fragments <1" x 1" average at 1/2" x 1/2"				
			1					
			0	87.75' - Fracture or bedding plane, 0-20 deg, rough, undulating, 1" open, 88.3' - Mechanical break 88.5' - Mechanical break				
			>10	89.35' - Fracture, 80 deg, rough, undulating, 1/8" open				
	R7-NQ 5 ft 96%	67	>10	89.7-90.15' - Fracture zone, intersecting fractures, up to 1" x 1/2" fragments, some silt with organics from 89.7-89.8'				
			NR					
			0	91.85' - Mechanical break				
			>10	92.6-93.05' - Fracture zone, with some clay infill				
			3	93.4, 93.75' - Fracture or bedding plane (2), horizontal, rough, undulating, 5% organics on bottom surface of fracture, up to 1/4" open				
	R8-NQ 5 ft 98%	83	2	93.6' - Fracture, 80 deg, rough, undulating, organics on 5% of fracture				
			0	94.2' - Mechanical break				
			0	94.45' - Fracture, 5 deg, smooth, planar, tight, slight organics on fracture surface (5-10%)				
			NR					
			1	94.9' - Bedding plane, 5 deg, rough, undulating, organic staining, open 2", clay infill with limestone fragments				
R5-NQ 5 ft 84%	27	3	95.25' - Mechanical break					
		0	96.3' - Mechanical break					
		2	96.8' - Fracture, 5 deg, organic staining, bedding plane fracture, open 3", infill fines					
		0	97.0, 97.05' - Bedding plane (2), smooth, undulating, organics (5-10%) of surface of fracture, up to 1/8" open					
		0	97.8' - Fracture, 80 deg, rough, undulating, organic staining					
R6-NQ 5 ft 86%	63	0	98.5' - Mechanical break					
		0	99.1' - Mechanical break					
		NR						
		NR						
		NR						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-04

SHEET 7 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/03/07

START : 5/2/2007

END : 5/3/2007

LOGGER : M. Fauroute, N. Jarzyniecki

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 -61.9	R9-NQ 5 ft 100%	85	3	101.2' - Fracture, 5 deg, rough, undulating, bedding plane fracture, up to 1/8" open		No Recovery 100.9-101.0' Limestone 101.0-106.0' - yellowish gray, (5Y 8/1), very fine to fine grained, strong to very strong HCl reaction, very weak to weak (R1 to R2), voids <1/16" 5-10%, trace cavities to 1/4", moderately fossiliferous (casts/molds), <1% oval to circular, calcite filled voids	SC-1 collected at 103.5- 104.45'
			0	101.7, 101.9' - Mechanical break (2), high angle, tight			
			1	103.25, 103.5, 104.45' - Mechanical break (3)			
			0				
			>5				
110 -66.9	R10-NQ 5 ft 100%	68		105.5' - Fractures or mechanical break, multiple fractures intersecting		106.0-111.0' - Same as 101.0-106.0' except yellowish gray, (5Y 8/1 to 5Y 7/2), trace planar bedding of variable widths, trace cavities to 1"	R9: 4 minutes
			3	106.1' - Fracture, 5 deg, smooth, undulating, bedding plane fracture, up to 1/4" open			
			1	106.25' - Fracture, 5 deg, smooth, undulating, bedding plane fracture, up to 1/2" open			
			1	106.5' - Fracture, 10 deg, smooth, undulating, bedding plane fracture, up to 1/4" open			
			4	107.4' - Mechanical break			
115 -71.9	R11-NQ 5 ft 96%	57	3	108.85' - Mechanical break or bedding plane, 5 deg, tight		111.0-115.8' - white to yellowish gray, (N9 to 5Y 8/1), very strong HCl reaction, extremely weak to weak (R0 to R2), trace organics, <2% voids to 1/16", trace wavy bedding, poorly fossiliferous (casts)	R10: 3 minutes
			>10	109.15' - Fracture, 5 deg, smooth, undulating, bedding plane fracture, up to 1/4" open			
			>10	109.35' - Fracture, 5 deg, smooth, undulating, bedding plane fracture, up to 1/4" open			
			0	109.55' - Fracture, 30 deg, smooth, undulating, bedding plane fracture, except 1" open			
			1	109.8' - Fracture, 5 deg, smooth, undulating, bedding plane fracture, up to 1/4" open			
120 -76.9	R12-NQ 5 ft 99%	80	1	110.05' - Fracture, high angle		No Recovery 115.8-116.0' Limestone 116.0-120.95' - Same as 111.0-115.8' except fine to medium grained, 20-30% voids to 1/16", trace cavities to 1/2", moderately fossiliferous	R11: 5 minutes
			0	110.45' - Mechanical break, 5 deg, tight			
			0	110.5' - Mechanical break, 65 deg, rough, undulating, dark (possibly organic)			
			2	111.2' - Fracture zone, intersecting fractures up to 1/2" fragments			
			4	111.6, 111.95, 112.02, 112.25, 112.4, 112.6, 112.7, 112.8' - Fracture (9), 0-5 deg, smooth, undulating, bedding plane fracture, easily separates			
			NR	112.85-113.2' - Fracture zone, intersecting fractures up to 1/2" fragments		No Recovery 120.95-121.0'	R12: 3 minutes
			1				
			0	116.95, 119.75, 119.8, 120.1, 120.8' - Fracture (5), smooth, undulating, bedding plane fracture, easily separates			
			0				
			2				
			4				
			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-04

SHEET 9 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/03/07

START : 5/2/2007

END : 5/3/2007

LOGGER : M. Fauroute, N. Jarzyniecki

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.
145 -101.9	R17-NQ 5 ft 88%	45	>10	135.65' - Fracture, <5 deg, rough, undulating, bedding plane fracture		Limestone 141.0-145.4' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 8/1), very fine to fine grained, mild to moderate HCl reaction, strong (R4), trace organics, voids to <1/16" over 5-10% of surface, trace cavities to 1", highly to moderately fossiliferous decreasing with depth, trace laminar bedding	R17: 7 minutes
			>10	136.9' - Mechanical break			
			>10	137.75' - Fracture, 5-10 deg, rough, undulating, bedding plane fracture, up to 1/4" open			
			3	138.2' - Mechanical break			
			1	138.5' - Mechanical break			
146.0			NR	138.55' - Bedding plane, 5 deg, rough, undulating		No Recovery 145.4-146.0'	R18: 3 minutes
				138.75, 139.1' - Bedding plane (2), 0-5 deg, rough, planar			
				140.15, 140.35' - Bedding plane (2), 0-5 deg, rough, planar, up to 1/2" open			
				140.2' - Bedding plane, 5 deg, rough, undulating			
				141.5' - Fracture, 30 deg, up to 1/4" open			
150 -106.9	R18-NQ 5 ft 80%	53	2	142.2-142.3' - Fracture zone, intersecting fractures, up to 1/2" fragments		Limestone 146.0-146.5' - Same as 141.0-145.4' except only trace voids to 1/8" size	R19: 4 minutes
			2	142.4' - Fracture, 0-5 deg, bedding plane fracture, olive gray (5Y 3/2) organic staining, up to 1/4" open		146.5-149.4' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 4/4), medium to coarse grained, mild HCl reaction, medium strong to strong (R3 to R4), porous, voids <1/16" 20-30% of surface, cavities to 1/4" 10% of surface, moderately fossiliferous (casts/molds)	
			4	142.6' - Fracture, 0-5 deg, organic staining, up to 1/4" open		149.4-150.0' - Same as 146.0-146.5'	
			NR	142.85-142.45' - Fracture zone, intersecting fractures, up to 1/2" fragments		No Recovery 150.0-151.0'	
				143.95-143.6' - Fracture zone, intersecting fractures, up to 1/2" fragments			
155 -111.9	R19-NQ 5 ft 80%	23	2	143.7' - Fracture, 0-5 deg, organic staining, tight		Limestone 151.0-155.0' - yellowish gray, (5Y 8/1 to 5Y 7/2), fine to medium grained, mild HCl reaction, medium strong to strong (R3 to R4), 10% black/olive gray organic staining, voids to 1/16" over 5-10% of surface, zone of moderately competent rock with wavy laminar bedding planes at 153.0-153.5'	R20: 6 minutes
			>10	143.9' - Fracture, 0-5 deg, organic staining, up to 1/8" open			
			5	144.0' - Fracture, 0-5 deg, organic staining, up to 1/8" open			
			4	144.3' - Fracture, 0-5 deg, organic staining, up to 1/4" open			
			NR	144.5' - Fracture, 15 deg, organic staining, tight		No Recovery 155.0-156.0'	
156.0				144.8' - Mechanical break			SC-2 collected at 156.3-157.23'
				145.0' - Fracture, 15 deg, possible organic stain on 50% of surface, up to 1/4" open			
				146.0-146.3' - Fracture zone, intersecting fractures, fragments up to 1/2"			
			3	146.9, 146.95' - Fracture (2), 0-5 deg, rough, undulating, bedding plane fractures, up to 1/8" open		Limestone 156.0-157.2' - dusky yellow, (5Y 8/1), medium grained, mild HCl reaction, weak (R2), voids to 1/16" 20-30%, cavity to 1/2" 5-10%, moderately fossiliferous (casts/molds)	
			1	147.1' - Fracture, 20 deg, rough, undulating, up to 1/4" open		157.2-158.1' - yellowish gray, (5Y 8/1), fine to medium grained, moderate to strong HCl reaction, voids to <1/16" 5-10% of surface, trace cavities to 1/4", trace organics, trace fossils (casts)	
160 -116.9	R20-NQ 5 ft 42%	37	0	147.95' - Fracture, 5 deg, rough, undulating, up to 1/4" open		No Recovery 158.1-161.0'	R20: 6 minutes
				148.1, 149.1' - Fracture (2), 5 deg, rough, undulating, up to 1/8" open			
				148.3' - Fracture, 20 deg, rough, undulating, up to 1/2" open			
				148.5' - Fracture, 50-60 deg, undeveloped or healed			
				149.3, 149.4, 149.8' - Fracture (3), 5 deg, rough, undulating, 1/8"-1/4" open			
161.0				151.6' - Fracture, 70-80 deg, rough, undulating, organic stain on 95% of fracture surface, up to 1/4" open			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-04

SHEET 10 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/03/07

START : 5/2/2007

END : 5/3/2007

LOGGER : M. Fauroute, N. Jarzyniecki

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.
165 -121.9	R21-NQ 5 ft 72%	16	3	151.65' - Fracture, 5 deg, rough, undulating, organic staining, bedding plane fracture, intersecting, <1/8" open, olive gray (5 Y 3/2)		Limestone 161.0-164.6' - yellowish gray with light olive gray mottling, (5Y 7/2 with 5Y 5/2), fine to medium grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), 5-10% voids to <1/16" decreasing with depth, <1% cavities to 1/4", mildly fossiliferous, trace planar bedding	R21: 7 minutes
			4	152.0-152.2' - Fracture zone, fragments up to 1", intersecting fractures			
			>10	152.25' - Fracture, <5 deg, rough, undulating, bedding plane fracture, <1/8" open			
			4	152.4' - Fracture, <5 deg, rough, undulating, bedding plane fracture, up to <1/4" open			
166.0			NR	152.45' - Fracture or mechanical break, <5 deg, rough, undulating, bedding plane fracture, up to <1/4" open		No Recovery 164.6-166.0'	
				152.55' - Fracture, <5 deg, rough, undulating, bedding plane fracture, tight			
			5	152.9' - Fracture zone, fragments up to 1", intersecting fractures		Limestone 166.0-170.8' - yellowish gray and dusky yellow in alternating zones of variable widths (3"-8"), (5Y 7/2 and 5Y 6/4), moderate HCl reaction, medium strong to strong (R3 to R4), medium strong (R3) zone from 166.5-167.2', voids to <1/16" 10-20% decreasing with depth, trace cavities to 1/2", mild to moderately fossiliferous decreasing with depth, planar bedding of variable widths	R22: 7 minutes
			1	153' - Fracture zone, fragments up to 1", intersecting fractures			
170 -126.9	R22-NQ 5 ft 96%	62	2	153.05, 153.15, 153.3' - Fracture (3), <5 deg, rough, undulating, bedding plane fracture, <1/8" open			
			3	153.4' - Fracture, <5 deg, rough, undulating, bedding plane fracture, up to 1/2" open			
			0	153.5' - Mechanical break			
			NR	153.6' - Fracture, 10 deg, rough, undulating, bedding plane fracture, up to 1/2" open			
				154.2, 154.3' - Fracture (2), 10 deg, rough, undulating, bedding plane fracture, up to 1/4" open		No Recovery 170.8-171.0'	
			>5	154.45' - Fracture, 85 deg, rough, undulating, remineralization, olive gray (5Y 3/2) organic staining		Limestone 171.0-176.0' - yellowish gray and dusky yellow in alternating zones of variable widths (<4"-6"), (5Y 7/2 and 5Y 6/4), fine to medium grained, moderate HCl reaction, medium strong to strong (R3 to R4), voids <1/16" 10-20% of surface, trace organics, poorly to moderately fossiliferous (casts/molds)	R23: 5 minutes
			>10	154.65' - Fracture or bedding plane, 30 deg, smooth to rough, undulating, up to 1" open			
			3	156.05' - Fracture, 5-10 deg, up to 1/4" open			
			3	156.15, 156.3' - Fracture (2), 5-10 deg, up to 1/2" open			
175 -131.9	R23-NQ 5 ft 100%	45	3	157.25' - Fracture, 5 deg, smooth, undulating, bedding plane fracture along abrupt bedding, up to 1/4" open			
			3	157.4' - Fracture, healed or undeveloped, olive gray (5Y 3/2) organic staining			
			1	161.3' - Fracture, 10 deg, rough, undulating, bedding plane, up to 2/3" open			
			2	161.55' - Fracture, 40 deg, rough, undulating, up to 1/2" open		176.0-180.7' - Same as 171.0-176.0' except trace cavities to 1/2", trace light olive gray (5Y 5/2) laminae, zone of wavy bedding with possible cross bedding from 176.5-176.95'	R24: 6 minutes
			2	161.8' - Fracture or bedding plane, up to 1/2" open			
			1	162.2, 162.45' - Fracture (2), <5 deg, rough, undulating, bedding planes, up to <1/2" open			
			2	162.3' - Fracture, 80-90 deg, partially healed			
			1	162.75' - Fracture, 10 deg, rough, undulating, bedding plane			
			2	163.15' - Fracture, 10 deg, rough, undulating, bedding plane			
			2	163.35-163.5' - Fracture zone, fractures intersecting, up to 1" fragments			
180 -136.9	R24-NQ 5 ft 94%	73	2	163.8' - Fracture, 10 deg, rough, undulating, bedding plane, up to 2/3" open			
			NR	163.9' - Fracture, 40 deg, rough, undulating, up to 1/2" open		No Recovery 180.7-181.0'	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-04

SHEET 11 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/03/07

START : 5/2/2007

END : 5/3/2007

LOGGER : M. Faurote, N. Jarzyniecki

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.
185 -141.9	R25-NQ 5 ft 92%	37	9	163.95' - Fracture, 10 deg, rough, undulating, along bedding plane, <1/8" open		Limestone 181.0-185.6' - dusky yellow transitioning with depth to yellowish gray, (5Y 6/4 to 5Y 7/2), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), weak (R2) zone from 181.9-182.9', voids <1/16" 10-20% increasing with depth, highly fossiliferous from 183.2-184.8', casts/molds up to 1/2", zones of planar bedding with variable thickness from 181.0-181.25', 182.9-183.2', and 184.7-185.6' No Recovery 185.6-186.0' Bottom of Boring at 186.0 ft bgs on 5/3/2007	R25: 5 minutes
			2	164.05' - Fracture, 80-90 deg			
			2	164.2, 164.25' - Fracture (2), 10 deg, rough, undulating, bedding plane			
			2	164.35' - Fracture, 80-90 deg			
			5	166.1, 166.15, 166.25' - Mechanical break (3), <5 deg, smooth, planar, bedding plane			
			>10	166.5' - Fracture, <5 deg, rough, undulating, bedding plane, 1/4" open			
			NR	116.7, 167.1, 169.1' - Mechanical break (3), <5 deg, smooth, planar, bedding plane, up to 1/8" open			
				167.15-167.7' - Fracture, 80-90 deg, smooth, planar, bedding plane, up to 1/8" open			
				168.15' - Fracture, <5 deg, rough, undulating, bedding plane, 1/4" open			
				168.5' - Mechanical break			
				168.7' - Mechanical break, <5 deg, smooth, planar, bedding plane			
				169.45, 107.35' - Fracture (2), <5 deg, rough, undulating, undeveloped or healed, bedding plane fractures			
				169.5' - Mechanical break, 10 deg, bedding plane			
				169.6' - Fracture, 10 deg, rough, undulating, bedding plane			
				169.8' - Mechanical break, <5 deg, smooth, planar, bedding plane			
				171.45-171.55' - Fracture zone, intersecting fractures, up to 1/2" fragments			
				171.85' - Fracture, <5 deg, rough, undulating, olive gray (5Y 3/2) organic staining on bottom surface, up to 1/2" open			
				172.15' - Fracture, <5 deg, rough, undulating to planar, bedding plane, possible remineralization			
				172.4' - Fracture, 10 deg, rough, undulating, bedding plane, possible remineralization			
				172.5-172.6' - Fracture zone, intersecting fractures, up to 1/2" fragments			
				172.8, 174.1' - Fracture (2), <5 deg, rough, undulating, bedding plane, possible remineralization, up to 1/8" open			
				173.0' - Fracture, 50 deg, rough, undulating, less than 1/8" open			
				173.1' - Fracture, 80-90 deg, rough, undulating, tight			
				173.2' - Fracture, <5 deg, rough, undulating, bedding plane			
				173.5' - Mechanical break			
				174.75, 174.8' - Fracture (2), <5 deg, rough, undulating, bedding plane, possible remineralization, up to 1/4" open			
				175.7-175.75' - Fracture, intersecting fractures, up to 1/4" fragments			
				176.15' - Fracture, <5 deg, smooth, undulating, bedding plane, up to 1/8" open			
				176.7, 177.4, 179.15' - Fracture (3), <5 deg, smooth, undulating, bedding plane, up to 1/4" open			

338884.FL

BORING NUMBER:

E-04

SHEET 12 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723843.2 N, 457904.3 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bqs on 5/03/07

START : 5/2/2007

END : 5/3/2007

LOGGER : M. Faurote, N. Jarzyniecki

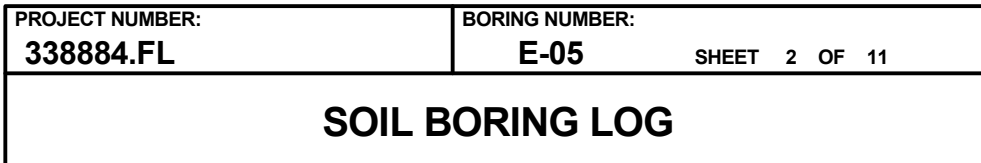
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
				177.25' - Fracture, vertical, rough, undulating 178.05' - Mechanical break 178.4' - Mechanical break 178.5' - Mechanical break 178.6, 179.35, 180.55' - Fracture (3), <5 deg, smooth, undulating, bedding plane, up to 1/8" open 179.25' - Fracture, <5 deg, smooth, undulating, bedding plane, tight 180.25' - Fracture, 50 deg, rough, undulating 181.05, 181.15, 181.6, 181.7, 181.9, 182.95' - Fracture (6), <5 deg, rough to smooth, undulating 181.4' - Fracture, 65-75 deg, rough, undulating 181.65' - Fracture, 85 deg, rough, undulating 181.8' - Fracture, 85 deg, rough, undulating, open up to 1/4" 182.4, 183.1, 184.1, 184.5' - Fracture (4), <5 deg, rough to smooth, undulating 183.05' - Fracture, 75-85 deg, rough, undulating 183.5' - Mechanical break 184.6' - Fracture, 60 deg, rough, undulating 184.85-185.6' - Fracture zone, <10 deg, rough to smooth, undulating, bedding plane fractures			



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-05
SHEET 1 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.5 N, 457850.2 E (NAD83)
 ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/10/2007 END : 4/18/2007 LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

WATER LEVELS : 1.01 ft bgs on 14/07			START : 4/10/2007		END : 4/10/2007		LOGGER : K. Biley, R. Cooke, 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			
42.6	0.0	1.3	SS-1	0-2-3 (5)	Poorly Graded Sand With Organics (SP) 0-1.3' - grayish black grading to medium light gray, (N2 to N6), moist, loose, very fine to fine grained, 20-30% organics, fines decreasing with depth, silica sand, roots		SS-1: First 6" was weight of hammer	
	1.5						Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)	
5	5.0							
37.6		1.0	SS-2	2-3-3 (6)	Poorly Graded Sand (SP) 5.0-5.75' - pale yellowish brown, (10YR 6/2), moist to wet, loose, very fine to fine grained, 3% medium plastic fines, silica sand Fat Clay With Sand (CH) 5.75-6.0' - pale blue to pale olive, (5B 6/2 to 10Y 6/2), moist, medium stiff, high plasticity, no dilatancy, 20% very fine silica sand			
	6.5							
10	10.0							
32.6		1.2	SS-3	5-7-8 (15)	Clayey Sand (SC) 10-10.25' - pale blue to pale olive, (5B 6/2 to 10Y 6/2), moist, medium dense, fine to medium grained, 24% medium plasticity fines, iron cemented sand Poorly Graded Sand (SP) 10.25-11.2' - very pale orange, (10YR 8/2), wet, medium dense, very fine to fine grained, trace nonplastic fines, trace black mineral grains			
	11.5							
15	15.0							
27.6		1.0	SS-4	6-9-9 (18)	Poorly Graded Sand With Silt (SP-SM) 15.0-15.55' - very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), wet, medium dense, very fine to fine grained, 6% nonplastic fines, silica sand Sandy Lean Clay (CL) 15.55-16.0' - pale yellowish brown, (10YR 6/2), wet, very stiff, low to medium plasticity, slow dilatancy, 40-45% very fine to fine silica sand			
	16.5							
20								



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

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-05

SHEET 3 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.5 N, 457850.2 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" drag bit

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/10/2007

END : 4/18/2007


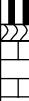


LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

WATER LEVELS : 1.01 ft bgs on 4/7/07		START : 4/10/2007		END : 4/10/2007		LOGGERS : K. Biley, K. 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		
2.6	40.0	1.5	SS-9	2-4-5 (9)	Lean Clay (CL) 40.0-41.5' - dark gray, (N3), moist, stiff, medium plasticity, no dilatancy, 40.7-40.8' organic soil (OH) seam, light olive gray (5Y 6/1), brittle organic layer 40.45- 40.65'		
	41.5						
45	45.0						
-2.4		1.5	SS-10	0-1-2 (3)	Lean Clay (CL) 45.0-46.5' - Same as 40.0-41.5' except 45.2-45.6' seam of silty sand (SM), light olive gray (5Y 6/1), very fine to fine silica sands, 20% nonplastic fines		
	46.5						
50	50.0						
-7.4		1.5	SS-11	3-4-7 (11)	Silty Sand (SM) 50.0-50.65' - dark gray, (N3), moist to wet, medium dense, very fine to fine grained, 17% low plastic fines, possible organics, 1/4" clayey organic seam, silica sand Organic Soil (OL) 50.65-50.85' - dusky yellowish brown, (10YR 2/2), moist, stiff, low to medium plasticity, rapid dilatancy Elastic Silt (MH) 50.85-51.4' - yellowish gray, (5Y 7/2), moist, stiff, low to medium plasticity, rapid dilatancy, mild to moderate HCl reaction, carbonate Organic Soil (OL) 51.4-51.5' - Same as 50.65-50.85' except olive black, (5Y 2/1)		
	51.5						
55	55.0						
-12.4		1.5	SS-12	14-27-36 (63)	Silt With Sand (ML) 55.0-56.5' - light olive gray, (5Y 5/2), moist, hard, low plasticity, rapid dilatancy, mild HCl reaction, 20% very fine to fine sand, trace organics		
	56.5						
60							Driller's Remark: Harder drilling at 59.0'



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-05
SHEET 4 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.5 N, 457850.2 E (NAD83)
 ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/10/2007 END : 4/18/2007 LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

WATER LEVELS : 1.01 ft bgs on 14/07			START : 4/10/2007			END : 4/10/2007			LOGGERS : K. Biley, R. Gore, 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						
-17.4	60.0	1.5	SS-13	26-29-30 (59)	Silty Sand And Limestone (SM) 60.0-61.5' - moderate yellowish brown, (10YR 5/4), wet, very dense, fine to coarse grained, mild HCl reaction, 25-30% low plastic fines, 30-40% gravel-sized lime stone, 1/4" organic layer at 61.3'			Driller's Remark: Reports clay at 63.0'			
	61.5										
65	65.0										
-22.4		1.5	SS-14	2-10-10 (20)	Elastic Silt (MH) 65.0-65.4' - moderate yellowish brown, (10YR 5/4), wet, very stiff, low to medium plasticity, rapid dilatancy, moderate HCl reaction, carbonate material Organic Soil (OH) 65.4-65.65' - brownish black, (5YR 2/1), moist, soft, high plasticity, slow dilatancy, no HCl reaction Limestone Fragments 65.65-66.50' - yellowish brown, (10YR 5/4), fine grained, mild HCl reaction						
	66.5										
70	70.0										
-27.4		1.0	SS-15	11-16-7 (23)	Silt With Sand (ML) 70.0-71.0' - moderate yellowish brown, (10YR 5/4), wet, very stiff, low plasticity, rapid dilatancy, moderate HCl reaction, 15-20% fine to coarse sand-sized, trace fine gravel-sized limestone fragments, carbonate material			Driller's Remark: Lost circulation at 73.5'			
	71.5										
75	75.0										
-32.4		1.1	SS-16	1-3-2 (5)	Silt With Sand (ML) 75.0-76.1' - moderate yellowish brown to dusky yellowish brown, (10YR 5/4 to 10YR 2/2), wet, medium stiff, fine to medium grained, low plasticity, rapid dilatancy, mild HCl reaction, trace fine gravel-sized limestone; organic seam at 75.85-76.0'			Driller's Remark: Hard zone 79.0-80.0'			
	76.5										
80											



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-05
SHEET 5 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.5 N, 457850.2 E (NAD83)
 ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/10/2007 END : 4/18/2007 LOGGER : R. Bitely, K. Coke, A. Erickson, W. Elliott

WATER LEVELS : 1.01 ft bgs on 4/10/2007			START : 4/10/2007		END : 4/10/2007		LOGGER : R. Birely, R. Cook, 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			
-37.4	80.0	0.9	SS-17	41-50-50 (100)	Silty Sand And Limestone (SM) 80.0-80.9' - moderate yellowish brown, (10YR 5/4), wet, very dense, fine to coarse grained, mild HCl reaction, 25% low plastic fines, 35% of sample is fine to coarse gravel-sized limestone fragments Begin Rock Coring at 81.5 ft bgs See the next sheet for the rock core log		Break for evening 17:30 on 4/10/2007	
	80.8							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-05

SHEET 6 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.5 N, 457850.2 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/10/2007

END : 4/18/2007

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.
81.5	R1-NQ 4 ft 45%	13	>10	81.6' - Mechanical break, 75 deg, smooth, undulating		Limestone 81.5-83.3' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild HCl reaction, very weak to weak (R1 to R2), voids increasing with depth along the surface 83.0-83.3' - yellowish gray, (5Y 7/2) No Recovery 83.3-85.5'	Continue drilling, switch to rock coring 04/11/07 at 08:00 R1: 8 minutes
85			>10	82.1-82.5' - Fracture zone (>5), rough, undulating, 2" gravel-sized fragments, angular			
85			NR	82.5-82.8' - Fracture or mechanical break, smooth, undulating, open with 1/2"-2" opening 83.0-83.2' - Fracture or mechanical break, very fine to fine grained			
85.5	R2-NQ 5 ft 8%	0	>10	85.5-85.9' - Fracture zone, rough, undulating, 1-1/2" gravel-sized fragments, mostly <1"		Limestone 85.5-85.9' - moderate yellowish brown, (10YR 5/4), fine to medium grained, mild HCl reaction, very weak to weak (R1 to R2), voids cover 5% surface area No Recovery 85.9-90.5'	R2: 2 minutes
90							
90.5							
90.5	R3-NQ 5 ft 54%	24	>5	90.5-91.0' - Fracture zone (>5), smooth, undulating, 2" gravel-sized fragments, angular		Limestone 90.5-92.5' - Same as 85.5-85.9' except moderately fossiliferous (molds and casts) 92.5-93.2' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), small (1/16") voids over 5% of the surface, trace silt No Recovery 93.2-95.5'	R3: 8 minutes
95			>10	91.5, 91.7, 92.4' - Fracture or mechanical break (3), smooth, undulating			
95			0	93.0' - Mechanical break			
95.5	R4-NQ 5 ft 100%	88	1	95.7' - Mechanical break		Limestone 95.5-95.9' - light olive gray, (5Y 5/2), very fine to medium grained, moderate HCl reaction, very weak (R1), trace organics 95.9-100.3' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, weak (R2), small (1/16") voids cover 15% of the surface, large voids (3/16") cover less than 5% of the surface, trace organics	SC-1 collected at 95.9-96.7' SC-2 collected at 99.1-100.3' R4: 11 minutes
100			>2	95.9, 96.8, 97.25, 97.6, 97.7, 98.1, 98.4, 98.5, 99.2, 100.3' - Fracture or mechanical break (10), 40 deg and 45 deg, rough, undulating, healed			
100			4				
100			2				
100			>10				
100.5			6	100.3-100.5' - Fracture zone (>10), 45 deg, rough, undulating, 2" diameter gravel fragments			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-05

SHEET 7 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.5 N, 457850.2 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/10/2007

END : 4/18/2007

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			
105 -62.4	R5-NQ 5 ft 64%	30	6	101.5-101.7, 102.2- 102.6, 102.7- 103.0, 103.4-103.7' - Fracture (>10), rough, undulating, gravel fragments with <1" in size, angular		Limestone 100.3-100.5' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak (R1), trace organics, trace silt	R5: 8 minutes
			>10	101.5, 101.7, 101.9, 102.3, 103.0, 103.4' - Fracture or mechanical break (6), rough, undulating, open (3/4")			
			NR			100.5-103.7' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), zone of breccia fragments pale yellowish brown ([10YR 6/2], weak [R2], moderate HCl reaction) within 10YR 5/4 matrix from 100.5-101.4', trace organics, small (<1/16") voids cover 15-25%, few large (3/16") voids, weak zone (R1) at 102.6-102.7'	
110 -67.4	R6-NQ 5 ft 85%	75	>10	106.6, 107.1' - Mechanical break, tight		No Recovery 103.7-105.5'	
			1			Limestone 105.5-109.8' - pale yellowish brown to moderate yellowish brown, (10YR 6/2, 10YR 5/4), fine grained, moderate HCl reaction, weak (R2), trace organics, small voids (<1/16") cover 25% of the surface, larger voids (3/8"x3/4") cover 10% of the surface fossiliferous (molds and casts), trace organics	SC-3 collected at 108.3-109.8'
			3	107.4-107.6' - Fracture (4), horizontal, rough, undulating, small (1/2") fragments		No Recovery 109.8-110.5'	
			0	108.0' - Fracture (2), 50 deg and 50 deg, rough, undulating, tight to open up to 3/16"		Limestone 110.5-112.4' - moderate yellowish brown, (10YR 6/4), very fine to fine grained, moderate HCl reaction, very weak to weak (R1 to R2), 1/16" voids cover 20-30% of the surface, larger voids (3/16") cover less than 5%, fossil molds and casts	R6: 10 minutes
			NR			112.4-114.3' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak (R1), small voids (1/16") cover 35% of the surface up to 3/16" size voids cover about 5% of the surface	
115 -72.4	R7-NQ 5 ft 76%	38	>10	110.7-110.9, 111.4-111.7' - Fracture zone, horizontal and vertical, rough, undulating, 3/8" and larger size rock fragments		No Recovery 114.3-115.5'	
			>5	111.1' - Fracture, 60 deg, rough, undulating, tight to open up to 1/16"		Limestone 115.5-118.9' - moderate yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), very fine to fine grained, moderate HCl reaction, very weak to weak (R1 to R2), 3/16" sized voids cover 20-30% of the surface area, fossil molds cast up to 3/16" cover 5% of the surface area, some mottling with grayish orange (10YR 7/4) below 117.0'	Driller's Remark: Water loss at 113.0'
			1	111.2' - Fracture, horizontal, smooth, undulating, open		No Recovery 118.9-120.5'	
			2	112.0' - Fracture, 70 deg, rough, undulating, intersecting, one is tight and other is open up to 1/16"			R7: 6 minutes
			NR	112.4' - Fracture, horizontal, rough and undulating on one face, smooth and undulating on the other, open			
				113.4' - Fracture, 65 deg, rough, undulating, open up to 1/16"			
			0	114.0, 114.1' - Fracture, horizontal, rough, undulating, open, possible bedding plane			
			2				
			1	117.2, 117.4' - Fracture zone (>2), rough, undulating, up to 1/2" gravel-sized fragments, angular			
			0	118.1' - Fracture, horizontal, rough, undulating, tight to open up to 3/16"			
			NR				R8: 6 minutes
120 -77.4	R8-NQ 5 ft 68%	64	2	120.8, 121.0, 121.6, 121.9, 122.0, 122.3' - Mechanical break (6), rough, undulating			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-05

SHEET 8 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.5 N, 457850.2 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/10/2007

END : 4/18/2007

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			
125 -82.4	R9-NQ 5 ft 42%	24	4	120.8-120.9' - Fracture zone, rough, undulating, gravel-sized fragments <1/4" diameter, angular, no openings >1/4"		Limestone 120.5-121.0' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), small voids (1/16") cover 15% of the surface 121.0-122.6' - light olive gray, (5Y 5/2), fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), small voids (1/16") cover 10-25% of the surface, moderately fossiliferous with fossil casts and molds about 5% of the surface No Recovery 122.6-125.5'	R9: 5 minutes
125.5			NR	121.9, 122.0' - fit tightly with opening up to 1/16"			
130 -87.4	R10-NQ 5 ft 70%	34	>10	125.5-126.4' - Fracture zone, horizontal and 70 deg, rough and smooth, undulating, rock fragments from 3/16"-1-1/2" in size, few fragment faces match together		Limestone 125.5-126.4' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), few small voids (1/16"), 3/4" thick of light olive gray 5Y 5/2 limestone (slow HCl, medium strong (R3)) is present (interval unknown due to fractured nature of the interval) 126.4-129.0' - light olive gray and grayish orange, (5Y 5/2 and 10YR 7/4), mottled, fine grained, mild HCl reaction, weak to moderately strong (R2 to), moderately fossiliferous, few small voids (1/16") cover about 20% of the area, large voids and fossil molds/casts up to 3/8"x9/16" cover 5% at 127.2-127.4' is a zone of light olive grey (5Y 5/2) limestone, slow HCl reaction, medium strong to strong (R3 to R4), no small voids as fossil molds/casts, another 1" thick zone is present at about 129.0'	Driller's Remark: Hard material at 128.0'
130.5			>3	126.8' - Fracture, 20 deg, rough, undulating, tight and open(1/8")			
			1	127.1-127.2' - Fracture, horizontal, rough, undulating, open, some small (1/2") fragments		No Recovery 129.0-130.5'	R10: 8 minutes
			>5	127.4' - Fracture, horizontal, smooth, planar and undulating, open			
			NR	127.6' - Fracture, horizontal, rough, undulating, tight with some openings up to 1/16"		Limestone 130.5-131.0' - pale yellowish brown and grayish orange, (10YR 6/2 and 10YR 7/4), mottled, fine grained, moderate to strong HCl reaction, very weak (R1), small voids (1/16") cover about 10%, 3/16" size cavities No Recovery 131.0-135.5'	Driller's Remark: Soft material throughout the run
			1	128' - Fracture, horizontal, rough, undulating, tight with some openings up to 1/16"			
135 -92.4	R11-NQ 5 ft 8%	7	NR	128.7-129.0' - Fracture zone, horizontal, rough and smooth, undulating to planar, fragment faces do not fit together		Limestone 135.5-136.0' - yellowish gray and grayish orange, (5Y 7/2 and 10YR 7/4), mottled, fine grained, mild HCl reaction, strong (R4), some thinly laminated bedding at 135.5-135.7', bedding angle 0-5 deg 136.0-136.2' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, extremely weak (R0), very fossiliferous	R11: 1 minutes
135.5				130.55' - Fracture, horizontal, rough, undulating, open			
140 -97.4	R12-NQ 5 ft 22%	0	7	135.55' - Fracture, horizontal, smooth, planar and undulating, open			R12: 4 minutes
140.5			1	135.65, 135.75, 136.3, 136.35' - Fracture, horizontal, smooth, planar, tight to open up to 1/8", appear to be bedding plane			
			NR	135.7-136.1' - Bedding plane			
				136.0, 136.2' - Fracture, horizontal, smooth, planar and undulating, open			
				136.1-136.7' - rock fragments			
				136.5' - Fracture, horizontal, smooth, planar and undulating, open			
			>10	140.5-140.7' - Fracture zone, smooth, undulating, 1/2" fragments			



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-05	SHEET 9 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.5 N, 457850.2 E (NAD83)

ELEVATION : 42.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/10/2007 END : 4/18/2007 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	
145 -102.4	R13-NQ 5 ft 44%	12	>10 2 NR	141.3-142.0' - Fracture zone, horizontal and vertical, rough and smooth, undulating, numerous fragments from 3/16"-2" in size 142.4-142.7' - Fracture, horizontal and 60 deg, rough, undulating, open, both fractures have several small (about 3/16") fragments		Limestone 136.2-136.6' - Same as 135.5-136.0' except thinly laminated bedding, bedding angle about 5 deg No Recovery 136.6-140.5 140.5-141.2' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, weak (R2), fossiliferous, small voids (1/16") cover about 25% of the surface, large voids (up to 3/16"x3/8") cover about 5% of the surface area 141.2-142.7' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, medium strong (R3), small voids (<1/16") cover 10% of the surface area, large voids (3/16"x3/4") cover about 5%, fossiliferous No Recovery 142.7-145.5' Limestone 145.5-146.2' - Same as 141.2-142.7' 146.2-148.6' - yellowish gray to grayish orange, (5Y 7/2 to 10YR 7/4), fine grained, moderate HCl reaction, medium strong (R3), thinly laminated bedding from 146.4-147.0' and 148.2-148.6', trace voids (1/16") 148.6-149.5' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), very fossiliferous (mold and casts), less than 1/16" size voids cover about 25% of the surface area. voids and fossil molds (up to 3/8"x3/4") cover 15% of the surface area, trace organics No Recovery 149.5-150.5' Limestone 150.5-151.7' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), small voids (up to 1/16") cover about 15% surface, few large voids 151.7-153.8' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, strong (R4), fossiliferous, 2-13/32 zone of light olive gray (5Y 5/2) mottling at about 151.5', small voids (<1/16") cover 5% of surface, few larger voids (fossil molds) No Recovery 153.8-155.5' Limestone 155.5-155.6' - dark yellowish brown, (10YR 4/2), fine grained, strong to moderate HCl reaction, very weak (R1), laminated bedding, trace voids (<1/16")	Driller's Remark: Become harder at 143.0' R13: 11 minutes
150 -107.4	R14-NQ 5 ft 80%	20	>10 5 >10 2 NR	145.7' - Fracture, 10 deg, rough, undulating, tight with some open up to 3/16" 146.0-146.4' - Fracture zone, rough and smooth, undulating, Numerous small fragments 3/16"-1" 146.4-147.0' - Fracture, 80 deg, smooth, undulating, tight 146.7' - Fracture, 5 deg, smooth, undulating, tight, appears to be along bedding plane 147' - Fracture, 10 deg, rough, undulating, open, few fragments 147.1' - Fracture or mechanical break, 45 deg, rough, undulating, open 147.4-148.2' - Fracture zone, horizontal and 70 deg, rough, undulating, several fragments 1"-3" in size, undulating, many fragments fit together, fragments at 148.0' shows coring marks in 2 directions 148.2' - Fracture, horizontal, smooth, planar, open 148.7' - Fracture or mechanical break, 10 deg, rough, undulating, tight to open up to 3/8" 149.5-149.7' - Fracture, 65 deg, rough, undulating, tight to open up to 3/8" 149.7' - Fracture, horizontal, rough, undulating, open up to 3/8" 150.0-151.2' - Fracture zone, rough, undulating, some dark staining, gravel-sized fragments 151.2-151.4' - Fracture (2), vertical and 70 deg, rough, undulating, dark, tight to open up to 3/16", 10% stain coverage on both surface 151.5-151.9' - Fracture zone, horizontal and 60 deg, rough, undulating, several fragments up to 1-1/2", few pieces fit together 152.3, 152.4, 152.6, 152.9' - Fracture (4), 40 deg and 50 deg, rough, undulating, fracture in alternating direction, tight, some open up to 3/16" 152.6-152.9' - Fracture, 70 deg, rough, undulating, tight to open up to 1/16" 153.2' - Fracture, 55 deg, rough, undulating, dark, tight, 10% dark staining 153.3, 153.4' - Fracture (2), horizontal, smooth, undulating, open 153.4-153.55' - Fracture zone			Driller's Remark: Piece stuck in core, pullout, clean and then run last 2.0' R14: 22 minutes
155 -112.4	R15-NQ 5 ft 66%	16	>10 >10 6 2 NR				R15: 8 minutes
160 -117.4	R16-NQ 5 ft 46%	30	2 4 1 NR				R16: 5 minutes
			1				SC-4 collected at 160.5-161.4'



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-05

SHEET 10 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722853.5 N, 457850.2 E (NAD83)

ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

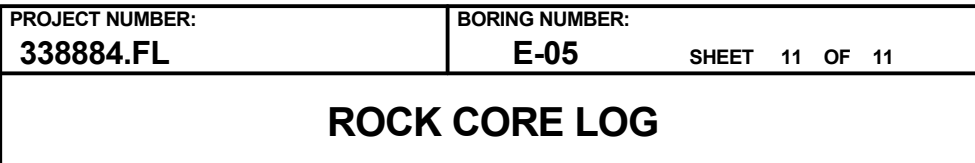
WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/10/2007

END : 4/18/2007

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			
165 -122.4	R17-NQ 5 ft 32%	28	6	153.7, 153.75' - Fracture (2), horizontal, smooth and undulating, rough and undulating, moderately tight		Limestone 155.6-156.7' - light olive gray, (5Y 5/2), fine grained, mild HCl reaction, medium strong to strong (R3 to R4), small voids (<1/16") cover about 15% surface, moderately fossiliferous, few 3/16" fossil molds and casts 156.7-157.8' - dusky yellow, (5Y 6/4), fine grained, mild to moderate HCl reaction, very weak (R1), becoming weak to moderately strong (R2 to R3) by 157.6', laminated bedding 156.7-157.2', moderately fossiliferous, small voids (<1/16") cover about 5% surface area, few large voids No Recovery 157.8-160.5'	R17: 4 minutes
165.5			NR	155.6' - Fracture, rough, planar, open 155.7-156.2' - Fracture, 70 deg, rough, undulating, tight and open (1/16") 156.7, 156.8' - Fracture, horizontal, rough, planar, open 157.2' - Fracture, 20 deg, rough, undulating, tight 157.4' - Fracture, 50 deg, rough, undulating, tight 157.6' - Fracture, 30 deg, rough, undulating, tight			
170 -127.4	R18-NQ 5 ft 64%	17	7	161.4' - Bedding plane, smooth, planar 161.8-162.1' - Bedding plane, horizontal, smooth, planar, open 165.5-165.9, 166.6' - Bedding plane (3), smooth, planar		Limestone 160.5-162.1' - dusky yellow to light olive gray, (5Y 6/4 to 5Y 5/2), fine grained, moderate HCl reaction, medium strong (R3), small voids (<12/16") cover 15% of the surface area, few large voids (3/16") No Recovery 162.1-165.5'	R18: 12 minutes
170.5			4	166.2' - Fracture, horizontal, rough, undulating, open 166.4' - Fracture, horizontal, rough, undulating, open 166.7' - Fracture, 5 deg, smooth, undulating, open 167.1' - Fracture, 5 deg, rough, undulating, tight with open up to 3/16"			
175 -132.4	R19-NQ 5 ft 84%	45	4	167.4, 167.9' - Fracture (2), horizontal, rough, undulating, open 167.7' - Fracture, 30 deg, rough, undulating, tight with open up to 1/16"		Limestone 165.5-166.3' - Same as 160.5-162.1' 166.3-167.2' - moderate olive brown, (5Y 4/4), fine grained, mild HCl reaction, medium strong (R3), small voids (<1/16") cover 50% of the surface area, few larger voids (3/16"), moderately fossiliferous, fragments of gray limestone (up to 3/8") inclusion from 167.0-167.2' 167.2-168.7' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, medium strong (R3), laminated bedding 168.0-168.2', small voids (1/16") cover 5% of the surface area No Recovery 168.7-170.5'	R19: 13 minutes
175.5			4	168.1, 168.7' - Fracture (2), horizontal, rough, undulating, open 170.5-170.8' - Fracture, 80 deg, closed 170.8, 171.2, 172.0, 172.2' - Fracture (4), horizontal, rough, undulating 170.8-171.2' - Fracture, 80 deg, open up to 3/16"			
180 -137.4	R20-NQ 5 ft 30%	7	>10	171.7' - Fracture, horizontal and 40 deg, rough, undulating, dark 172.5' - Fracture, 50 deg, dark gray, tight with open up to 3/16"		Limestone 170.5-174.7' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), mild to moderate HCl reaction, strong (R4), voids (up to 1/16") cover 10% surface area, zone of increased small voids (20%) from 173.4-173.6', fewer larger voids (3/16") No Recovery 174.7-175.5'	R20: 6 minutes
180.5			4	172.7' - Fracture, horizontal, smooth, undulating, open 173.0-173.8' - Fracture zone, horizontal and vertical, rough, undulating, dark, many 3/16"-2" size fragments, some faces are smooth and planar 174.0, 174.1, 174.2' - Fracture (3), 5 deg, rough, undulating, open 174.4' - Fracture, 60 deg, smooth, undulating, tight			
			NR	175.8, 175.9' - Fracture or mechanical break, 20 deg and 30 deg, rough, undulating, tight 175.8-176.0' - Fracture, vertical, rough, undulating, open 176.1-176.3' - Fracture zone, rough, undulating, several 1" size fragments, no identifiable fracture angle 176.3, 176.4, 176.5, 176.55, 176.65' - Fracture, horizontal, rough, undulating, open			
			5				



ELEVATION : 42.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/10/2007

END : 4/18/2007

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

APPENDIX 2BB-821



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-06

SHEET 1 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723312.3 N, 457814.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 2-15/16" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/02/07

START : 5/2/2007

END : 5/4/2007

LOGGER : C. Sump

WATER LEVELS : 3.51045 on 9/22/07			START : 9/22/2007			END : 9/22/2007			LOGGER : G. Gump		
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						
42.8	0.0	1.1	SS-1	1-1-2 (3)	Poorly Graded Sand With Silt (SP-SM) 0.0-1.1' - brownish black, (5YR 2/1), moist, very loose, very fine to fine grained, color grades to light gray (N7) below 0.6', 6% nonplastic fines, organics decreasing with depth, silica sand						
	1.5										
5	5.0										
37.8		1.0	SS-2	1-3-4 (7)	Sandy Fat Clay (CH) 5.0-6.0' - very light gray, (N8), moist, medium stiff, high plasticity, no dilatancy, with iron oxide staining (5.0-5.3'), 25-30% very fine grained, trace organic particles, silica sand						
	6.5										
10	10.0										
32.8		1.5	SS-3	1-2-3 (5)	Sandy Lean Clay (CL) 10.0-11.5' - Same as 5.0-6.0' except thin light gray, (N7), medium plasticity, 41% fine sand, sandy seams						
	11.5										
15	15.0										
27.8		1.1	SS-4	1-4-7 (11)	Sandy Fat Clay (CH) 15.0-15.2' - Same as 5.0-6.0' Silt (ML) 15.2-16.1' - grayish orange, (10YR 7/4), moist, soft, nonplastic, very rapid dilatancy, mild to moderate HCl reaction, 5% very fine sand-sized, carbonate material		First reaction to HCl				
	16.5										
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-06
SHEET 2 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723312.3 N, 457814.1 E (NAD83)
 ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 2-15/16" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.5 ft bgs on 5/02/07 START : 5/2/2007 END : 5/4/2007 LOGGER : C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
22.8	20.0	1.3	SS-5	3-4-5 (9)	Clayey Sand (SC) 20.0-21.3' - yellowish gray, (5Y 8/1), moist to wet, loose, very fine to fine grained, no HCl reaction, 18% medium to high plastic fines, silica sand		
	21.5						
25	25.0						
17.8		1.3	SS-6	8-20-49 (69)	Clayey Sand (SC) 25.0-25.2' - Same as 20.0-21.3' except dark yellowish brown, (10YR 4/2), clay lens Silty Sand With Limestone (SM) 25.2-26.3' - grayish orange to dark yellowish orange, (10YR 7/4 to 10YR 6/6), moist to wet, very dense, low plasticity, moderate HCl reaction, 15-20% low plastic fines, fine gravel-sized limestone, fine to coarse sand-sized, carbonate materials		
	26.5						
30	30.0						
12.8		1.5	SS-7	31-31-55 (86)	Silty Sand With Limestone (SM) 30.0-31.1' - Same as 25.2-26.3' Silt (ML) 31.1-31.5' - light brown, (5YR 6/4), moist, hard, low plasticity, rapid dilatancy, mild HCl reaction, trace very fine sand-sized, carbonate material		
	31.5						
35	35.0						
7.8		1.3	SS-8	39-47-45 (92)	Silty Sand (SM) 35.0-36.3' - dark yellowish brown, (10YR 4/2), moist, very dense, fine to coarse grained, mild to moderate HCl reaction, 30% nonplastic fines, trace to 10% fine gravel-sized limestone, carbonate material		
	36.5						
40							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-06

SHEET 3 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723312.3 N, 457814.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 2-15/16" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/02/07

START : 5/2/2007

END : 5/4/2007

LOGGER : C. Sump

WATER LEVELS : 3.51065019/2007							START : 3/2/2007		END : 3/4/2007		LOGGER : G. Sump	
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				
2.8	40.0 40.6	0.6	SS-9	56-50/1 (106/7")	Sandy Silt (ML) 40.0-40.6' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), mottled, moist, hard, fine to coarse grained, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 38% fine to coarse sand-sized, trace fine gravel-sized, carbonate material							
45 -2.2	45.0 45.8	0.3	SS-10	36-50/4 (86/10")	Sandy Silt (ML) 45.0-45.8' - Same as 40.0-40.6' except 1/4" thick vertically extended black organic seam from 45.4-45.8'							
50 -7.2	50.0 51.5	0.2	SS-11	25-43-45 (88)	Sandy Silt (ML) 50.0-51.2' - yellowish gray, (5Y 7/2), moist, hard, fine to coarse grained, nonplastic, rapid dilatancy, mild HCl reaction, 33% fine to coarse sand-sized, trace gravel-sized, carbonate material, trace organics							
55 -12.2	55.0 55.8	0.8	SS-12	43-50/4 (93/10")	Silt With Sand (ML) 55.0-55.8' - Same as 50.0-51.2' except grading to moderate brown, (5YR 4/4), 10-15% sand-sized and thin organic lenses							
60												



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-06

SHEET 5 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723312.3 N, 457814.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/02/07

START : 5/2/2007

END : 5/4/2007

LOGGER : C. Sump

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.
66.0 70 -27.2	R1-NQ 5 ft 78%	8	5	66.0' - Fracture, horizontal, rough		Limestone 66.0-69.9' - pale yellowish brown, (10YR 6/2), fine to medium grained, strong HCl reaction, weak (R2), dissolution along bedding plane lamination, spaced (1/16"-1/4"), voids (1/16"-3/16") cover 10% surface	Numerous low angle to vertical healed fractures
			1	66.2' - Fracture, horizontal, rough			
			4	66.4' - Fracture, 45 deg, rough, semi planar			
			>10	66.6, 66.8, 67.3' - Fracture, 45 deg and 60 deg, non-planar			
			NR	68.1-68.2' - sandy interbed			
71.0 75 -32.2	R2-NQ 5 ft 72%	23	>10	68.1, 68.5, 68.8, 68.9' - Fracture (4), rough, undulating, irregular, non-planar		No Recovery 69.9-71.0'	R1: 5 minutes
			>10	69.0-69.9' - Fracture zone (>10)			
			1	71.0-72.0' - Fracture zone, fragments			
			7	72.0-73.0' - Fracture zone, fragments			
			2	73.1' - Fracture, vertical, rough, undulating			
76.0 80 -37.2	R3-NQ 5 ft 46%	33	NR	74.1, 74.2, 74.4, 74.5, 74.6, 74.8, 74.9' - Bedding plane or mechanical break (8), <5 deg, rough, planar, open <1/16"		Limestone 71.0-72.3' - Same as 66.0-69.9' except very weak (R1), increasing percent small voids, friable 72.3-75.6' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, very weak to weak (R1 to R2), finely laminated, trace voids/cavities, dissolution texture along the bedding plane (1/4" thick)	0.5" organic seam
			0	75.1-75.2' - Fracture or mechanical break, 80 deg and vertical, rough, planar, tight			
			>10				
			0				
			NR	77.7-78.1' - Fracture zone, <1/2" fragments			
81.0 85 -42.2	R4-NQ 5 ft 60%	37	4			No Recovery 75.6-76.0' Limestone 76.0-78.3' - grayish yellow to orangish gray, (5Y 8/4 to 10YR 7/4), strong HCl reaction, weak (R2), voids (up to 1/16") cover 15-20% of the surface, cavities up to 3/4" diameter (10-20 per foot), fossil molds and solution cavities, dark brown /black staining on some larger cavities, light to dark gray fine grained inclusions, rip up clasts between 77.0-77.5', needle-like organic imprints on fracture surface, dark brown layering visible over 3/4" zone	Intact core 19.2" (76.1-77.7') break to reduce size SC-1 collected at 76.1-76.9'
			2	81.1, 81.2, 81.4, 81.5' - Fracture or mechanical break (4), rough, irregular			
			>10	82.1' - Fracture, rough, planar, dark gray/black, possible organic pyrite			
			NR	82.4' - Fracture, rough, undulating			
				82.9-83.3' - Fracture zone, percent of large cavities (>1/2") increasing in this zone			
86.0						No Recovery 84.0-86.0'	R4: 4 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-06

SHEET 6 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723312.3 N, 457814.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

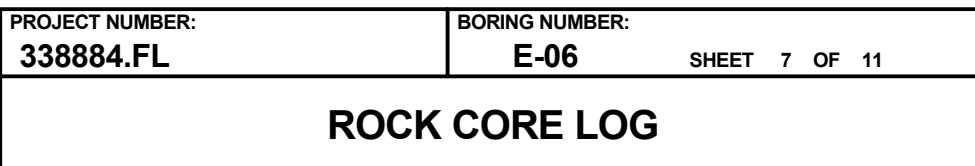
WATER LEVELS : 5.5 ft bgs on 5/02/07

START : 5/2/2007

END : 5/4/2007

LOGGER : C. Sump

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.
90 -47.2	R5-NQ 5 ft 26%	7	NR			No Recovery 86.0-89.7'	Driller's Remark: 86.0-89.5' very soft; possible void, lost 20 % circulation, no recovery likely in this zone
91.0			>10	89.9' - Discontinuity (sharp) between moderately dense limestone and limestone with large percent voids, possible missing material		Limestone 89.7-89.9' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, medium strong (R3), fossiliferous, voids (1/16"-1/8") cover 15-20% of the surface, trace oval cavities (up to 1/2") (possible fossil molds) molds and casts, black infilling in some voids, sharp contact with below	R5: 3 minutes
95 -52.2	R6-NQ 5 ft 70%	15	2	89.9-91.0' - Fracture, rough, irregular fractures on 2-4" core pieces, 1"-2" zone of fragments 1/2"-1-1/2" in size (upper weathered/bleached)		89.9-91.2' - yellowish gray to pale olive, (5Y 7/2 to 10 Y 6/2), medium strong (R3), fossiliferous, voids (1/4"-3/4" solution cavities) cover 25-30% of the surface, smaller fragments appear weathered or bleached possible void related, dark black (possible lignite) and light gray fine (silt sized) infilling in some voids	Clay interbed 91.7-92.2'
96.0			2	91.0-91.2' - Fracture zone, 3/4"-1-3/45" size fragments		91.2-91.7' - Same as 89.9-91.2' except yellowish gray, (5Y 7/2), very fine to fine grained, 1/16"-1/8" voids cover the surface	SC-2 collected at 92.6- 93.4'
			1	91.6' - Fracture or mechanical break, rough, undulating		Lean Clay (CL) 91.7-92.2' - yellowish gray, (5Y 7/2), medium plasticity, strong HCl reaction, few gravel-sized (1/4"-3/4") limestone fragments at 91.7-91.8', 25% fine silt	R6: 8 minutes Steady drill rate across run
			NR	91.7, 92.2' - Fracture, sharp contact between limestone and gravelly lean clay (CL) interbed		92.6-93.5' - yellowish gray, (5Y 7/2), strong HCl reaction, medium strong to strong (R3 to R4), fine grained silt	Driller's Remark: 100% loss of circulation at 97.0' below ground surface
			0	92.7' - Fracture, planar and stepped, parting surface on end of core piece, fine laminations		Limestone 92.2-92.6' - yellowish gray, (5Y 7/2), fine grained, weak (R2), finely laminated (1/10"-1/4")	
			NR	93.5' - silt interbed (nonplastic)		Silt (ML) 93.5-93.9' - moderate yellowish brown, (10YR 5/4), nonplastic, few gravel-sized (1/16-3/16") limestone fragments (<10%)	R7: 3 minutes Driller's Remark: Possible void 100.0-102.0'
100 -57.2	R7-NQ 5 ft 14%	11	NR	93.9' - sharp contact with limestone		Limestone 93.9-94.5' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, weak (R2), small voids cover 20-30% of surface	Driller's Remark: Void at 100.0-102.0' based on barrel advancement ("fell"), setting temporary casing at 106.0'
101.0			NR	94.1' - Fracture or mechanical break, vertical, rough, undulating		No Recovery 94.5-96.0'	
105 -62.2	R8-NQ 5 ft 20%	0	NR				R8: 4 minutes
106.0							



ORIENTATION : Vertical

LOGGER : C. Sump

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-06

SHEET 8 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723312.3 N, 457814.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/02/07

START : 5/2/2007

END : 5/4/2007

LOGGER : C. Sump

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.
130 -87.2	R13-NQ 5 ft 88%	45	1	126.5' - Fracture, 45 deg, rough, undulating, non planar, irregular		Limestone 126.0-130.4' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), small voids (1/16-1/8") cover variable percent of surface area, cavities up to 1/2" cover less than 5% of surface, easily broken by hand, fossil molds filled with white chalk carbonate material, at 129.9' abrupt color change to very light yellowish gray (5Y 8/1)	SC-3 collected at 126.6-127.6'
			3	127.6, 127.8' - Fracture (2), horizontal, rough, irregular			
			3	127.9' - Fracture, 60 deg, rough, semi planar, dark gray thin coating on surface (possible pyrite)			
			3	128.1, 128.3, 128.4' - Fracture (3), rough, undulating, semi planar parting			
			3	129.0-130.0' - Fractures, vertical, undulating, dark gray coating, 1.3' length			
135 -92.2	R14-NQ 5 ft 66%	33	NR	131.0		No Recovery 130.4-131.0' Limestone 131.0-133.3' - Same as 126.0-130.4'	R13: 5 minutes
			>10	131.0-131.3' - Fracture, limestone fragments			
			1				
			>10	132.9' - Fracture, horizontal, smooth			
			0	133.2' - Fracture, horizontal, smooth, limestone fragments			
140 -97.2	R15-NQ 5 ft 40%	0	NR			133.3-134.3' - pale olive gray to dusky yellow, (10Y 6/2 to 5Y 6/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), trace fine lamination (<1/16") No Recovery 134.3-136.0' Limestone 136.0-138.0' - very light gray, (N8), strong HCl reaction, weak to medium strong (R2 to R3), cavities lenticular in shape up to 3/4", fossil casts and molds up to 1/2" (gastropod) No Recovery 138.0-141.0'	R14: 6 minutes
			>10	136.0' - Dark gray/black fine grained particulate staining/coating on some fracture faces (possible pyrite)			
			>10	136.4' - Fracture, <10 deg, rough, undulating, open			
			NR	136.55' - Fracture or mechanical break, 60 deg and 70 deg, rough, undulating, tight			
			NR	136.7' - Mechanical break, 10 deg and 20 deg, rough, undulating, tight			
145 -102.2	R16-NQ 5 ft 60%	15	NR	137.2-137.4' - Fracture zone, no visible orientation, 1/2" width total core diameter fragments		141.0-143.6' - yellowish gray to olive gray, (5Y 7/2 to 5Y 5/2), strong HCl reaction, medium strong (R3), variable zones of voids/cavities (up to 1/2") 143.6-144.0' - moderate olive brown, (5Y 4/4), strong HCl reaction, weak (R2), porous limestone, numerous voids (1/16"-1/8") and cavities (1/4"-3/4"), weak slightly friable medium coarse sand-sized particles No Recovery 144.0-146.0'	R15: 5 minutes
			>10	141.35-141.7' - Fracture zone, fragments to 2" angular to sub angular, fine black particles on fracture faces (possibly pyrite or organics)			
			>10	141.7-142.3' - Fracture (3), 45 deg and 60 deg, rough, planar, healed			
			>10	141.8, 142.3' - Fracture (2), 50 deg, rough, planar, open 1/8"			
			NR	142.4, 142.55' - Mechanical break (2), <5 deg, rough, planar, open			
146.0				142.55-143.8' - Fracture zone, 40 deg and 60 deg, fragments to 3" angular			R16: 12 minutes
				143.9' - Mechanical break, <5 deg, rough, planar, open (1/4")			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-06

SHEET 9 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723312.3 N, 457814.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/02/07

START : 5/2/2007

END : 5/4/2007

LOGGER : C. Sump

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.
150 -107.2	R17-NQ 5 ft 74%	29	>10	146.0-147.0' - Bedding plane, horizontal, planar, numerous partings spaced at 1/2"-1-1/2" apart		Limestone 146.0-147.0' - dark yellowish orange, (10YR 8/6), coarse grained, strong HCl reaction, weak (R2), friable disaggregates into medium sand-sized particles, numerous small voids over 30% of surface	SC-4 collected at 148.3-149.4'
			2	147.3' - Fracture, 60 deg, rough, undulating, semi planar fracture		147.0-149.4' - medium gray to yellowish gray, (N5 to 5Y 7/2), very fine to fine grained, mild HCl reaction, medium strong (R3), 1/16"-3/16" size voids concentrated in thin (<1/10") horizontal zones spaced at 6"-1.2' apart	R17: 7 minutes
			2	147.6' - Fracture, 30 deg, rough, semi planar		149.4-149.7' - moderate yellow brown and yellowish gray, (10YR 5/4), laminated, contorted wavy bedding planes	
			2	148.2' - Fracture, 10 deg, rough, planar		No Recovery 149.7-151.0'	
			3	148.3' - Fracture, 50 deg, slightly rough, semi planar		Limestone 151.0-155.5' - light olive gray to yellow gray, (5Y 5/2 to 5Y 7/2), moderate HCl reaction, very weak to weak (R1 to R2), sparse voids (1/16"-1/8"), and cavities (up to 1/2") above 152.5', percent of voids increase beyond 152.5', 25-30% porous by volume, somewhat friable disaggregates into medium sand-sized particles, voids/cavities oriented horizontally, cavities increase in size (up to 1-1/4") with depth	R18: 5 minutes
			NR	149.4-149.7' - Bedding plane, horizontal, planar		No Recovery 155.5-156.0'	
155 -112.2	R18-NQ 5 ft 90%	33	2	151.1' - Fracture, horizontal, rough, undulating		Limestone Fragments 156.0-156.4' - Same as 151.0-155.0' except slough	Redox changes possibly
			3	151.3' - Fracture, vertical, rough, undulating to non planar, 3" long		Limestone 156.4-157.7' - very pale orange, (10YR 8/2), fine to medium grained, strong HCl reaction, weak (R2), very small voids (1/16"), fossiliferous (1/16"-1/8")	R19: 7 minutes
			9	152.1' - Fracture or mechanical break, 60 deg, rough, undulating		157.7-159.0' - yellowish gray to grayish yellow, mottled with light gray, (5Y 7/2 to 5Y 8/2 mottled with N7), very fine to medium grained, strong HCl reaction, medium strong (R3), sharp contact	
			4	152.1, 152.5' - Fracture, horizontal, rough		No Recovery 159.0-161.0'	
			NR	153.0, 155.5' - Fractures (2), horizontal, rough, planar to undulating		Limestone 161.0-162.4' - medium gray, (N 5), moderate HCl reaction, medium strong (R3), with thin yellowish gray lamination zones of small cavities (<3/4"), 6"-8" spacing otherwise tight and dense, sharp contact	Change in redox conditions
160 -117.2	R19-NQ 5 ft 60%	35	2	156.0-156.4' - Fracture zone, limestone fragments			
			1	156.4, 156.7' - Bedding plane, horizontal, smooth, planar			
			1	157.5' - Fracture or mechanical break, 15 deg, rough, undulating			
			NR	157.7' - Fracture, sharp contact with grayish yellow limestone (surfaces do not match)			
			NR	158.9' - Fracture, horizontal, smooth, planar			
165 -122.2	R20-NQ 5 ft 88%	0	4	161.3, 161.4, 161.5' - Bedding plane (3), horizontal, smooth, planar			
			3	161.9' - Fracture, horizontal, rough, planar			
			>10	162.5-162.6' - Fracture zone, contact with olive brown limestone, limestone fragments			
			>10	162.7' - Fracture or mechanical break, vertical			
			NR	162.9' - Fracture, horizontal, rough, non planar			
			NR	163.3, 163.4, 163.5, 163.6' - Fracture (4), horizontal, smooth, planar			
			NR	163.5-163.8' - Fracture zone, limestone fragments			
166.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-06	SHEET 10 OF 11
ROCK CORE LOG		

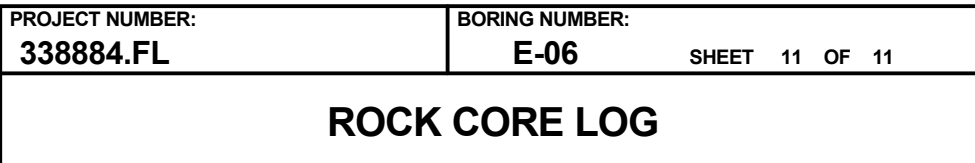
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723312.3 N, 457814.1 E (NAD83)

ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.5 ft bgs on 5/02/07 START : 5/2/2007 END : 5/4/2007 LOGGER : C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		R Q D (%)	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	
170 -127.2	R21-NQ 5 ft 88%	40	>10	164.2-165.4' - Fracture, <25 deg and >70 deg, non planar		Limestone 162.4-163.4' - moderate olive brown, (5Y 4/4), medium strong to strong (R3 to R4), voids (1/16-1/8") cover 20-30% of surface, horizontally oriented cavities (up to 1") in zones, thin medium gray limestone fragments	R21: 10 minutes
			>10	166.0-166.5' - Fracture zone, limestone fragments		163.4-163.6' - medium strong to strong (R3 to R4)	
			4	166.5' - Fracture or mechanical break, horizontal, rough, undulating		163.6-165.4' - moderate olive brown, (5Y 4/4), coarse grained, moderate HCl reaction, medium strong (R3), fossiliferous, voids (1/16-1/4") cover 5-25% of surface	
			>10	167.1-167.4' - Bedding plane, horizontal, smooth, 3/4" thick limestone fragments		No Recovery 165.4-166.0' Limestone	
			2	167.7' - Bedding plane, horizontal		166.0-170.4' - grayish yellow, (5Y 8/4), fine grained, weak (R2), poorly fossiliferous, 1/16"-1/8" voids over less than 10% of surface in thin zones (1/2"-1-1/2" thick) on 1.0-1.5' spacing, cavities (up to 1/2") sparse and occur in zones with higher void content, thinly bedded zones 4"-6" thick on 2.0-3.0' intervals, with fine grained zones rock is weak (R2) to medium strong (R3)	
175 -132.2	R22-NQ 5 ft 68%	0	NR	168.4, 168.5' - Fracture (2), horizontal, rough		No Recovery 170.4-171.0' Limestone	R22: 10 minutes Start of shift 5/4/07
			>10	168.5' - Fracture or mechanical break, 45 deg, smooth		171.0-174.4' - grayish yellow grading to yellowish gray, (5Y 8/4 to 5Y 7/2), fine grained, moderate to strong HCl reaction, weak (R2), finer grained than above, voids (1/16"-1/8") concentrated in thin horizontal zones along bedding plane/lamination (1/16"-1/4") and very thin beds (1/2"-1-1/2") void rich zones, fine grained laminated zones, high void zones spaced at 1.0'	
			>10	168.9' - Fracture, horizontal, rough, undulating		No Recovery 174.4-176.0' Limestone	
			>10	169.1' - Bedding plane, horizontal, smooth		176.0-178.3' - moderate olive brown, (5Y 4/4), weak (R2), cavities ranging in size from 1/4"-1" cover 5-8% of surface, cavities elongated in horizontal direction, horizontal partings 1"-2" spacing in 177.3-178.3'	
			NR	169.4' - Fracture, horizontal, fine grained limestone		178.3-178.6' - moderate yellowish gray, (5Y 7/2), very fine to fine grained, mild HCl reaction, medium strong to strong (R3 to R4), sharp contact with the above, interbed	
180 -137.2	R23-NQ 5 ft 88%	42	1	169.4-169.7' - Bedding plane, horizontal, smooth, planar, limestone fragments		178.6-180.4' - Same as 178.3-178.6' except olive brown, (5Y 4/4), strong HCl reaction, weak (R2), 1/16"-1/8" size voids cover 20-30% of surface, porous, laminated	R23: 12 minutes
			3	170.1-170.4' - Fracture, horizontal, slightly rough, fracture faces indicate partial recrystallization		No Recovery 180.4-181.0' Limestone	
			>10	171.0-171.2' - Fracture zone, angular limestone fragments			
			NR	171.2, 171.4' - Fracture or mechanical break, horizontal, smooth, 45 deg fracture on 3" core piece			
			1	171.4-171.8' - Mechanical break, 80 deg, rough, undulating, fracture is on a 5" core piece			
185 -142.2	R24-NQ 5 ft 100%	30	3	171.8' - Fracture, horizontal, rough			
			5	171.9' - Mechanical break, 45 deg, rough			
			4	172.1-172.2' - Fracture zone, limestone fragments			
			2	172.2-172.4' - Bedding plane, horizontal, smooth, planar, numerous partings across the zone, parting interval range from 1/4"-4" with most between 1/2"-2", laminated to very thinly bedded limestone			
			NR	176.3' - Fracture, horizontal, rough, undulating			
			1	177.6, 177.7, 177.8' - Bedding plane (3), horizontal, smooth			
			2	178.0, 178.1, 178.15' - Bedding plane (3), horizontal, smooth			
			9	178.3' - Fracture, horizontal, smooth, planar, contact with fine grained limestone			
			2	178.8' - Fracture, horizontal, smooth, planar, contact with void rich limestone below			
			3	178.8-179.0' - Fracture zone, limestone fragments			
			2	179.1' - Fracture or mechanical break, 75 deg, rough			
			3	179.6, 179.7' - Fracture, rough, non planar and undulating			
			2	179.95' - Bedding plane, horizontal, smooth			
			3	180.15' - Bedding plane, horizontal, smooth, planar			
			3	180.4' - Bedding plane, horizontal, smooth, planar			



LOGGER : C. Sump

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-07
SHEET 1 OF 10	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723243.7 N, 458250.5 E (NAD83)
 ELEVATION : 41.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 6/06/07 START : 6/5/2007 END : 6/7/2007 LOGGER : J. Burkard, C. Dellaria, B. Ellis

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
41.7	0.0	1.1	SS-1	1-2-2 (4)	Organic Material (OL) 0.0-0.1' - plant roots Poorly Graded Sand (SP) 0.1-1.1' - olive gray to light olive gray, (5Y 3/2 to 5Y 5/2), moist, loose, no HCl reaction, silica present		
	1.5						
5	5.0						
36.7		1.0	SS-2	8-8-6 (14)	Poorly Graded Sand With Silt (SP-SM) 5.0-6.0' - dusky yellow to yellowish gray, (5Y 6/4 to 5Y 7/2), wet, loose, no HCl reaction, mottling at 5.6-5.7'		
	6.5						
10	10.0						
31.7		0.9	SS-3	25-50/5 (75/11")	Lean Clay (CL) 10.0-10.1' - pale blue, (5BP 6/2), low plasticity Organic Material (OL) 10.1-10.3' - brownish black, (5YR 2/1), contains roots Silt (ML) 10.3-10.9' - grayish yellow, (5Y 8/4), wet, soft, moderate to strong HCl reaction		
	10.9						
15	15.0						
26.7	15.4	0.4	SS-4	50/4.5 (50/4.5")	Silt (ML) 15.0-15.4' - grayish yellow, (5Y 8/4), wet, soft to medium stiff, moderate to strong HCl reaction		
20							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-07

SHEET 2 OF 10

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723243.7 N, 458250.5 E (NAD83)

ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

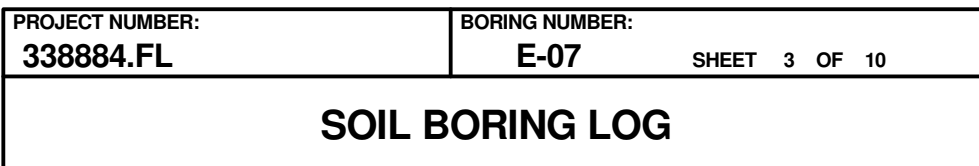
WATER LEVELS : 3.0 ft bgs on 6/06/07

START : 6/5/2007

END : 6/7/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

WATER LEVELS : 3.61 fbs on 9/30/07			START : 9/3/2007			END : 9/7/2007			LOGGER : J. Burkard, C. Delaria, D. Ellis		
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				
21.7	20.8	0.0	SS-5	50/3 (50/3")	Limestone Fragments 20.0' - grayish yellow, (5Y 8/4), mild HCl reaction, trace voids on fragment surfaces, trace fossil casts and molds, very little recovery						
25	25.0										
16.7		1.0	SS-6	18-25-35 (60)	Silt With Sand (ML) 25.0-26.0' - grayish orange, (10YR 7/4), wet to moist, soft to medium stiff, delayed moderate HCl reaction						
	26.5										
30	30.0										
11.7		0.9	SS-7	4-13-6 (19)	Silty Sand (SM) 30.0-30.9' - dark yellowish orange, (10YR 6/6), wet, soft, delayed moderate HCl reaction						
	31.5										
35	35.0										
6.7	35.2	0.0	SS-8	50/2 (50/2")	Limestone Fragments 35.0' - few limestone chips recovered in split spoon, chips too small to assess						
40											



WATER LEVELS : 3.0 ft bgs on 6/06/07 START : 6/5/2007 END : 6/7/2007 LOGGER : J. Burkard, C. Dellaria, B. Ellis

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-07
SHEET 4 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723243.7 N, 458250.5 E (NAD83)
 ELEVATION : 41.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 6/06/07 START : 6/5/2007 END : 6/7/2007 LOGGER : J. Burkard, C. Dellaria, B. Ellis

WATER LEVELS : 3.0 TUBS ON 6/6/07			START : 6/3/2007		END : 6/7/2007		LOGGERS : J. Burkard, C. Delaria, D. Ellis	
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			
-18.3	60.0	1.1	SS-13	9-5-5 (10)	Silt With Limestone Fragments (ML) 60.0-61.1' - moderate yellowish brown, (10YR 5/4), wet, soft, delayed strong HCl reaction, organic black (N1) limestone fragments up to 3/4"		Driller's Remark: Keep losing circulation, now advancing casing to 60'	
	61.5							
65	65.0							
-23.3		0.9	SS-14	3-10-11 (21)	Silty Limestone Fragments (GM) 65.0-65.9' - yellowish brown, (10YR 5/4), wet, medium dense, strong HCl reaction, limestone fragments up to 1"			
	66.5							
70	70.0							
-28.3	70.1	0.0	SS-15	50/0.75 (50/0.75")	Limestone Fragments 70.0' - yellowish gray, (5Y 7/2), delayed mild to moderate HCl reaction, trace fossil casts/molds, few thin fragments 3/4"-1" Begin Rock Coring at 70.0 ft bgs See the next sheet for the rock core log		Driller's Remark: Casing set to 70.0', will begin rock coring on 6/6/07	
75								
-33.3								
80								



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-07	SHEET 5 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723243.7 N, 458250.5 E (NAD83)

ELEVATION : 41.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 6/06/07 START : 6/5/2007 END : 6/7/2007 LOGGER : J. Burkard, C. Dellaria, B. Ellis

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.
-28.3	70.0	33	0	70.5, 70.8' - Mechanical break (2), <5 deg and 10-20 deg, rough, undulating, open 1/16" and tight, respectively		Limestone 70.0-70.9' - pale yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), fine grained, strong HCl reaction, medium strong (R3), voids (<1/16") over 5-10% of surface No Recovery 70.9-71.5'	Start coring at 08:00 on 6/6/07 Water level at 3.0' below ground surface R1: 1 minute Driller's Remark: Possible sand at bottom of run, could have resulted in loss of recovery SC-1 collected at 72.9- 74.0'
	71.5		NR				
		28	0	71.7, 72.0, 72.4-72.8' - Mechanical break (3)		Limestone 71.5-74.5' - pale yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), medium to fine grained, strong HCl reaction, medium strong (R3), voids (<1/16") over 5-10% of surface, 10% cavities up to 5/8", black organic infill No Recovery 74.5-76.5'	R2: 4 minutes
			1	73.0' - Fracture, 5 deg, smooth, undulating			
			0	74.0, 74.2' - Mechanical break (2), <10 deg, rough, undulating, open 1/8"			
			NR				
75 -33.3		87	>10	76.5-76.7' - Fracture zone, rough, undulating, no visible orientation		Limestone 76.5-79.5' - dusky yellow, (5Y 6/4), medium grained, mild to moderate HCl reaction, medium strong (R3), fossil casts and molds, voids (<1/16") over 25-50% of surface, cavities up to 3/8"	R3: 5 minutes
			0	78.1' - Mechanical break			
			0	79.4, 79.6' - Mechanical break (2), <5 deg deg, rough, undulating, open			
			1	80.1' - Fracture, 5 deg, smooth, undulating			
			0				
			NR				
80 -38.3		8	4	81.6, 81.8, 82.0, 82.3' - Bedding plane or mechanical break (4), <10 deg, rough, undulating, tight to <1/16" open		No Recovery 81.3-81.5' Limestone 81.5-82.6' - dusky yellow, (5Y 6/4), medium grained, mild HCl reaction, weak to medium strong (R2 to R3), surface cavities up to 1/2", fossil casts and molds 82.6-83.5' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very strong (R5), trace surface voids No Recovery 83.5-86.5'	Core barrel got rock sample jammed in the barrel causing the lost recovery
			>10	82.5-83.0' - Fracture zone, rough, undulating, angles undeterminable			
			NR	83.4' - Mechanical break or bedding plane, <5 deg, rough, undulating, tight			
			NR				
85 -43.3		48	>10	86.7' - Mechanical break, 5-10 deg, rough, undulating, tight		Limestone 86.5-90.6' - dusky yellow, (5Y 6/4), medium grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 80-75% of surface, surface cavities up to 1", trace amount of fossil casts and molds	R4: 3 minutes
			>10	87.2-88.1' - Fracture zone, rough, undulating, angles between 70-90 degrees			
			0	88.4' - Mechanical break, <5 deg, rough, stepped, open 1/8"			
90							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-07

SHEET 6 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723243.7 N, 458250.5 E (NAD83)

ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 6/06/07

START : 6/5/2007

END : 6/7/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

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.
-48.3			0				
	91.5		NR	90.4' - Fracture or mechanical break, <5 deg, rough, undulating, open		No Recovery 90.6-91.5'	R5: 5 minutes
			0			Limestone 91.5-94.8' - Same as 86.5-90.6'	
			0	92.7' - Fracture or mechanical break, 5-10 deg, rough, planar, open			
			0	93.3' - Fracture or mechanical break, 10 deg, rough, undulating, tight			
95 -53.3	R6-NQ 5 ft 82%	68	1	94.5' - Fracture or bedding plane, 5 deg, rough, undulating, open		94.8-95.6' - dusky yellow, (5Y 6/4), medium to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), trace surface voids, organic staining	R6: 6 minutes
			NR	95.2' - Fracture, 10 deg, smooth, undulating, trace clay infilling			
				95.4' - Mechanical break or fracture			
			4	96.5-96.7' - Fracture zone		No Recovery 95.6-96.5'	
			0	97.0' - Fracture or mechanical break		Limestone 96.5-98.4' - pale yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), fine grained, moderate HCl reaction, medium strong (R3), 15% surface voids	SC-2 collected at 97.0-98.0'
			0	98.4' - Bedding plane, <5 deg, rough, undulating, tight		98.4-99.6' - pale yellowish brown to very pale orange, (10YR 6/2 to 10YR 8/2), medium grained, strong HCl reaction, medium strong to strong (R3 to R4), voids (<1/16") over 20-40% of surface, cavities up to 1/2", fossil casts and molds	
100 -58.3	R7-NQ 5 ft 62%	48	NR			No Recovery 99.6-101.5'	R7: 5 minutes
			0	102.3-102.4' - Fracture, <5 deg, rough, undulating, open 1" with 1" fragment		Limestone 101.5-102.7' - Same as 98.4-99.6' except increase in the number of surface cavities	
						No Recovery 102.7-106.5'	
			15				
105 -63.3	R8-NQ 5 ft 24%		NR				R8: 3 minutes
			0	106.9' - Mechanical break, 10-20 deg, rough, undulating, tight		Limestone 106.5-108.5' - grayish orange, (10YR 7/4), medium grained, strong HCl reaction, weak (R2), 15-20% surface voids	SC-3 collected at 106.9-107.9'
			0	107.9' - Mechanical break, <5 deg, rough, planar, tight			
			1	108.5' - Fracture, 5-10 deg, rough to smooth, undulating			
110	R9-NQ 5 ft 56%	40					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-07

SHEET 7 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723243.7 N, 458250.5 E (NAD83)

ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

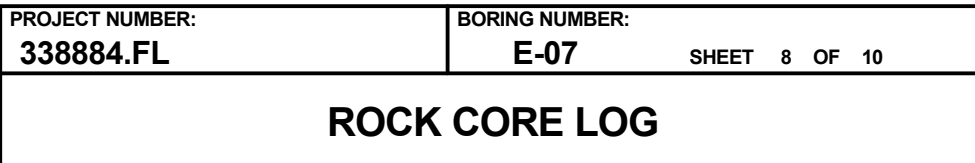
WATER LEVELS : 3.0 ft bgs on 6/06/07

START : 6/5/2007

END : 6/7/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-68.3			NR		Limestone 108.5-109.3' - pale yellowish brown, (10YR 6/2), medium grained, mild HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 20-40% of surface, no surface cavities	R9: 2 minutes
111.5			>10		No Recovery 109.3-111.5'	
			0		Limestone 111.5-115.0' - Same as 108.5-109.3'	
	R10-NQ 5 ft 70%	43	>10			
115			2		No Recovery 115.0-116.5'	
-73.3			NR			R10: 3 minutes
			1		Limestone 116.5-117.5' - Same as 108.5-109.3'	
			NR		No Recovery 117.5-121.5'	
	R11-NQ 5 ft 20%	13				
120			0		Limestone 121.5-123.4' - grayish orange, (10YR 7/4), medium grained, mild HCl reaction, weak to medium strong (R2 to R3), trace fossil casts and molds, voids (<1/16") over 15-20% of surface, cavities up to 1/4"	R11: 3 minutes
-78.3			2		123.4-123.7' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, strong (R4), fragmented	
			2		123.7-125.0' - Same as 121.5-123.4'	
	R12-NQ 5 ft 70%	48	1		No Recovery 125.0-126.5'	
125			NR			R12: 3 minutes
-83.3			0		Limestone 126.5-127.9' - yellowish gray, (5Y 7/2), medium grained, mild HCl reaction, medium strong (R3), fossil casts and molds, voids (<1/16") over 20-30% of surface	
			0		No Recovery 127.9-131.5'	
	R13-NQ 5 ft 28%	13				
130			NR			



ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 6/06/07

START : 6/5/2007

END : 6/7/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

APPENDIX 2BB-840



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-07

SHEET 9 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723243.7 N, 458250.5 E (NAD83)

ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 6/06/07

START : 6/5/2007

END : 6/7/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

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.
-108.3			0	150.2' - Mechanical break, <5 deg, rough, undulating		148.1-150.5' - pale yellowish brown, (10YR 6/2), fine grained, moderate to strong HCl reaction, medium strong (R3), 10-15% voids, 10% cavities	SC-5 collected at 149.4-150.3' R17: 5 minutes
	151.5		1	150.4' - Fracture, 50-60 deg, rough, undulating, tight		150.5-151.5' - Same as 148.1-150.5' except yellowish gray, (5Y 7/2), 20-30% voids	
			2	151.1' - Bedding plane or fracture, 5 deg, smooth, undulating, trace silica sand infill		151.5-154.0' - Same as 148.1-150.5'	
			0	151.6' - Bedding plane or fracture, 5 deg, rough, undulating			
			0	151.7' - Fracture, <5 deg, rough, undulating			
			0	152.2' - Bedding plane, <5 deg, rough, undulating to planar, tight			
			0	152.7-153.2' - Fractures, 55-65 deg, rough, undulating, open <1/16" to partially healed			
			>10	154.7' - Mechanical break, 5-10 deg, rough, undulating		154.0-155.4' - light olive gray, (5Y 5/2), fine grained, mild to moderate HCl reaction, weak (R2), 10-30% voids, trace cavities	
			3	155.0-155.9' - Fracture zone, possibly mechanical breaks		155.4-155.9' - moderate yellowish brown, (10YR 5/4), medium grained, mild HCl reaction, weak to medium strong (R2 to R3), 20-40% voids	R18: 5 minutes
			NR			155.9-156.2' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), no voids	
			>10	156.5-157.7' - Fracture zone, dominantly <10 deg, angular to subangular fragments 1"-3-1/2"		No Recovery 156.2-156.5' Limestone	
			0	157.7-158.2' - Mechanical break (3), rough, undulating, open <1/8"		156.5-156.8' - Same as 155.9-156.2'	
			0	158.7, 159.0' - Mechanical break (2), <10 deg, rough, undulating to planar, open		156.8-159.5' - light olive gray, (5Y 5/2), fine to medium grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4)	
			NR			No Recovery 159.5-161.5'	R19: 4 minutes
			0	161.5-161.6' - Mechanical break, multiple breaks, no visible orientation, limestone fragments to 1"		Limestone	
			>10	161.9' - Mechanical break or fracture		161.5-165.2' - Same as 156.8-159.5' except medium grained, mild HCl reaction, 20-40% voids	
			0	162.3-163.2' - Fracture zone, rough, undulating, angles undeterminable			SC-6 collected at 163.4-164.5'
			0	163.4, 164.5' - Mechanical break (2)			
			NR			No Recovery 165.2-166.5'	
			0	167.0, 167.4' - Mechanical break or fractures (2)		Limestone	
			0	167.8, 167.9, 168.3' - Mechanical break or fractures (3)		166.5-175.5' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, moderate to strong HCl reaction, weak (R2), 10-20% voids, fossiliferous zone from 167.3-167.6' (molds and casts)	
			4	168.7-169.0' - Fracture, 10-30 deg, rough, undulating			
				169.3, 169.6, 170.0' - Mechanical break (3)			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-07

SHEET 10 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723243.7 N, 458250.5 E (NAD83)

ELEVATION : 41.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 6/06/07

START : 6/5/2007

END : 6/7/2007

LOGGER : J. Burkard, C. Dellaria, B. Ellis

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.
-128.3			1				
			0	170.6' - Fracture, 5 deg, rough, undulating 170.9' - Mechanical break			R21: 5 minutes
171.5			>10	171.7' - Mechanical break 172.1-172.9' - Fracture zone			
			>10				
	R22-NQ 5 ft 80%	7	>10	173.3' - Mechanical break 173.6-175.5' - Fracture zone			
175			>10				
-133.3			NR			No Recovery 175.5-176.5'	R22: 5 minutes
			3	176.5-176.7' - Fracture zone, irregular, angular rock fragments to 1"			
			2	177.3' - Fracture, 30 deg, rough, planar 177.4' - Fracture, horizontal, rough, planar 177.8-178.1' - Fracture zone, irregular angular rock fragments, top and bottom fractures are horizontal, rough, planar		Limestone 176.5-177.5' - light olive gray, (5Y 5/2), fine grained, moderate to strong HCl reaction, extremely weak to weak (R0 to R2), 10-30% voids, 10% cavities 177.5-181.0' - moderate yellowish brown, (10YR 5/4), fine grained, weak to medium strong (R2 to R3), 10-20% voids	
	R23-NQ 5 ft 90%	37	3	178.6, 179.1, 179.4' - Fractures (3), 0-5 deg, rough, planar 179.5' - Fracture, 50 deg, rough, undulating			
180			1				
-138.3			4	180.5, 180.6, 180.85, 180.9' - 0-10 deg, rough, planar		No Recovery 181.0-181.5'	R23: 5 minutes
			NR				
			1	182.3' - Fracture, 30 deg, rough, undulating, possible mechanical break 182.9' - Fracture, 20 deg, smooth, planar		Limestone 181.5-182.5' - moderate yellowish brown, (10YR 5/4), fine to medium grained, weak to medium strong (R2 to R3), 10-30% voids 182.5-185.0' - pale yellowish brown, (10YR 6/2), fine grained, medium strong (R3), 10-20% voids, trace cavities	
			1				
	R24-NQ 5 ft 94%	72	4	183.75' - Fracture, 60 deg, rough, undulating 184.1' - Fracture, horizontal, rough, undulating 184.3' - Fracture, 10 deg, smooth, planar 184.4' - Fracture, horizontal, smooth, planar 184.8' - Fracture, horizontal, smooth, undulating 185.7' - Fracture, 50 deg, rough, undulating 186.4' - Fracture, 5 deg, rough, undulating		185.0-186.2' - pale yellowish brown, (10YR 6/2), fine to medium grained, weak to medium strong (R2 to R3), 20-40% voids, 20-30% cavities up to 5/8", fossil casts and molds No Recovery 186.2-186.5' Bottom of Boring at 186.5 ft bgs on 6/7/2007	Used natural break at 183.75' to box to preserve specimen R24: 7 minutes
185			1				
-143.3			2				
			NR				
							Bottom of hole at 186.5', end of boring at 09:53, 6/7/07



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-08
SHEET 1 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722897.6 N, 458228.0 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten, T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/15/2007 END : 2/23/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.41 ft bgs on 3/26/07							START : 2/15/2007		END : 2/23/2007		LOGGERS : R. Gomez, R. Birely, T. Stewart	
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						
42.4								Start drilling at 10:57 AM using 3-7/8" drag bit				
	3.5							Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)				
5		1.0	SS-1	3-3-4 (7)	Silty Sand (SM) 3.5-4.5' - dark yellow, (10YR 6/6), wet, loose, fine grained silica sand, 15% nonplastic fines, trace organics							
37.4	5.0											
	8.5							Driller's Remark: Silts and sands at 7.0', harder drilling				
10		1.5	SS-2	4-7-6 (13)	Silty Sand With Limestone Fragments (SM) 8.5-10.0' - yellowish gray mottled with light brown, (5Y 8/1 with 5YR 5/6), wet, medium dense, fine to coarse grained, strong HCl reaction, 20% nonplastic fines, 15% fine to coarse gravel sized limestone fragments, carbonate material			Driller's Remark: Switch to 3-7/8" tri-cone roller drill bit				
32.4	10.0											
	13.5							Driller's Remark: Hard drilling at 11'				
15		1.5	SS-3	10-5-6 (11)	Silty Sand (SM) 13.5-15.0' - Same as 8.5-10.0' except 40-45% fine to coarse gravel sized, 35% fine to coarse sand sized, 15-20% nonplastic fines							
27.4	15.0											
	18.5											
20		1.5	SS-4	4-6-6 (12)	Silty Sand With Limestone Gravel (SM) 18.5-20.0' - Same as 8.5-10.0'							
	20.0											



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-08
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722897.6 N, 458228.0 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten, T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/15/2007 END : 2/23/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.41 ft bgs on 3/6/07							START : 2/19/2007		END : 2/23/2007		LOGGERS : R. Gomez, R. Birely, T. Stewart	
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				
22.4												
	23.5											
25	25.0	1.5	SS-5	4-21-29 (50)	Silt (ML) 23.5-25.0' - grayish orange, (10YR 7/4), moist, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 5% very fine grained sand-sized, carbonate material			Driller's Remark: Lost 40% circulation				
17.4												
	28.5											
30	30.0	1.0	SS-6	8-12-11 (23)	Silt (ML) 28.5-29.5' - Same as 23.5-25.0' except 15-20% fine to coarse sand-sized							
12.4												
	33.5											
35	35.0	1.0	SS-7	21-18-21 (39)	Silt With Sand (ML) 33.5-34.5' - pale brown to pale yellowish brown, (5YR 5/2 to 10YR 6/2), dry to moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, 20-25% fine to coarse sand-sized, trace fine gravel-sized			Set 4" HW casing to 35.0'				
7.4								Stopped at 12:45 PM after setting casing to 35.0'				
								Leave casing in at 35.0' until next shift				
								Start drilling 02/20/2007, continue with 3-7/8" tri-cone from 35.0' below ground surface				
								4" HW casing at 35.0' below ground surface				
	38.5											
		1.4	SS-8	20-23-19 (42)								
40	40.0											



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-08
SHEET 3 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722897.6 N, 458228.0 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten, T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/15/2007 END : 2/23/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.41 ft bgs on 3/26/07 START : 2/13/2007 END : 2/23/2007 LOGGERS : R. Gomez, R. Birely, T. Stewart							
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		
2.4					Silt With Sand (ML) 38.5-39.9' - moderate yellowish brown, (10YR 5/4), moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, 15-20% fine to coarse sand-sized, carbonate material		Driller's Remark: Slow drilling through dense zone, light chatter



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-08
SHEET 4 OF 10	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722897.6 N, 458228.0 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten, T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/15/2007 END : 2/23/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.41 ft bgs on 3/09/07			START : 2/19/2007		END : 2/23/2007		LOGGERS : R. Gomez, R. Birely, T. Stewart	
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	
-17.6							Light chatter to 61.0'	
	63.5						Driller's Remark: Rapid advancement, no chatter, few cemented silt grains (coarse to fine gravel size) in cuttings	
65	65.0	1.3	SS-13	28-33-21 (54)	Sandy Silt And Limestone (ML) 63.5-64.8' - Same as 58.5-59.7' except 35-40% of sample is limestone fragments			
-22.6							Driller's Remark: Light to moderate chatter Steady advancement, cemented silt to limestone fragments in cuttings Slow advancement from 66.0'-68.0'	
	68.5						Driller's Remark: Light to no chatter	
	68.6	0.0	SS-14	50/1 (50/1")	No Recovery 68.5-68.6' Begin Rock Coring at 68.5 ft bgs See the next sheet for the rock core log		Moderate chatter	
70							Switch to NQ tooling at 68.5' 16:20 PM begin cleaning boring with NQ tooling	
-27.6								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-08

SHEET 5 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722897.6 N, 458228.0 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten, T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.41 ft bgs on 3/06/07

START : 2/15/2007

END : 2/23/2007

LOGGER : R. Gomez, R. Bitely, T. Stewart

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.
70 -27.6	68.5 R1-NQ 1.5 ft 47%	0	4	68.75' - Mechanical break, 10 deg, smooth, undulating		Limestone 68.5-69.2' - light olive gray, (5Y 5/2), very fine grained, mild HCl reaction, weak to medium strong (R2 to R3), fossiliferous, trace 15% organics No Recovery 69.2-70.0'	68-70' advancement slow with heavy chatter 68.5-69', little to no chatter 69.0-70.0' R1: No time recorded
	70.0		NR	68.85, 69.0, 69.1, 69.2' - Mechanical break (4), 10 deg, smooth, undulating			
			>10	70.55- 70.8' - Fracture zone, rough, stepped, no visible orientation		Limestone 70.0-73.3' - light olive gray, (5Y 5/2), very fine grained, mild HCl reaction, very weak to weak (R1 to R2), fossiliferous, voids up to 3/16" cover 50% of surface No Recovery 73.3-75.0'	R2: 6 minutes 2/20/07 Stop drilling for the day Resume drilling 2/21/07 at 08:13 SC-1 collected at 76.3-77.4'
			5	70.8-71.15' - Mechanical break, vertical, smooth, undulating			
			1	71.15' - Mechanical break, 25 deg, rough, undulating			
			1	71.3-71.45' - Mechanical break, vertical, smooth, undulating			
			NR	71.5' - Mechanical break		Limestone 75.0-78.3' - light olive gray, (5Y 5/2), very fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), bedding plane laminations, some with organics (black laminations), voids up to 3/16" cover 25-50% of the surface No Recovery 78.3-80.0'	R3: 6 minutes
			NR	71.75' - Mechanical break, <10 deg, rough, undulating			
			NR	72.5' - Fracture, 50 deg, smooth, undulating			
			NR	75.1' - Mechanical break, <10 deg, smooth, undulating			
			1	76.35' - Fracture, 20 deg, smooth, undulating		Limestone 80.0-82.8' - light olive gray, (5Y 5/2), very fine grained, mild to moderate HCl reaction, very weak to medium strong (R1 to R3), moderately competent at 80.0-80.55' and 81.2-82.8', voids up to 3/16" over 50% of surface, fossiliferous, trace bedding plane laminations, very weak rock (R1) with very fine granular surface at 80.55-81.2' No Recovery 82.8-85.0'	Driller's Remark: Lost up to 80% circulation at 82.0' R4: 6 minutes
			1	77.4' - Fracture, 20 deg, smooth, undulating			
			1	78.05' - Mechanical break, 30 deg, smooth, undulating			
			NR	78.15' - Bedding plane, 10 deg, smooth, undulating, intersecting a vertical fracture			
			NR	78.35' - Bedding plane, <10 deg, smooth, undulating		Limestone 85.0-88.8' - dark yellowish brown to light olive gray, (10YR 4/2 to 5Y 5/2), very fine grained, mild to moderate HCl reaction, very weak to medium strong (R1 to R3), voids up to 1/2" cover 20-30% of the surface, small voids (<3/16") cover 60-80% of surface, fossiliferous (molds/casts)	
			NR	80.1' - Mechanical break, 80 deg, rough, undulating			
			NR	80.3' - Bedding plane, <10 deg, smooth, undulating			
			NR	80.55' - Bedding plane, <10 deg, smooth, undulating			
			NR	80.9-81.0' - Fracture zone, <10 deg, rough, undulating, multiple fractures		Limestone 85.0-88.8' - dark yellowish brown to light olive gray, (10YR 4/2 to 5Y 5/2), very fine grained, mild to moderate HCl reaction, very weak to medium strong (R1 to R3), voids up to 1/2" cover 20-30% of the surface, small voids (<3/16") cover 60-80% of surface, fossiliferous (molds/casts)	
			NR	81.2' - Fracture, 15 deg, smooth, undulating			
			NR	82.5' - Mechanical break, <45 deg, rough, undulating			
			NR	82.7' - Fracture, 65 deg, smooth, undulating			
			NR	85.0-85.45' - Fracture zone, rough, undulating, multiple fractures, multiple angles		Limestone 85.0-88.8' - dark yellowish brown to light olive gray, (10YR 4/2 to 5Y 5/2), very fine grained, mild to moderate HCl reaction, very weak to medium strong (R1 to R3), voids up to 1/2" cover 20-30% of the surface, small voids (<3/16") cover 60-80% of surface, fossiliferous (molds/casts)	
			NR	85.45' - Mechanical break, 20 deg, rough, undulating			
			NR	85.75' - Fracture, 60 deg, smooth, undulating			
			NR	86.0' - Mechanical break, 25 deg, rough, undulating			
			NR	86.0-86.3' - Fracture zone, <20->70 deg, multiple fractures, rock fragments		Limestone 85.0-88.8' - dark yellowish brown to light olive gray, (10YR 4/2 to 5Y 5/2), very fine grained, mild to moderate HCl reaction, very weak to medium strong (R1 to R3), voids up to 1/2" cover 20-30% of the surface, small voids (<3/16") cover 60-80% of surface, fossiliferous (molds/casts)	
			NR	86.0-86.3' - Fracture zone, <20->70 deg, multiple fractures, rock fragments			
			NR	86.0-86.3' - Fracture zone, <20->70 deg, multiple fractures, rock fragments			
			NR	86.0-86.3' - Fracture zone, <20->70 deg, multiple fractures, rock fragments			



PROJECT NUMBER: <div style="font-size: 1.2em; font-weight: bold;">338884.FL</div>	BORING NUMBER: <div style="font-size: 1.2em; font-weight: bold;">E-08</div>
SHEET 6 OF 10	
<div style="font-size: 1.5em; font-weight: bold;">ROCK CORE LOG</div>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722897.6 N, 458228.0 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten, T. Williams
 CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/15/2007 END : 2/23/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.4 ft Rods on 3/6/07			START : 2/13/2007			END : 2/23/2007			LOGGER : R. Gomez, R. Biley, T. Stewart		
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							
90 -47.6 											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-08

SHEET 7 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722897.6 N, 458228.0 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten, T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.41 ft bgs on 3/06/07

START : 2/15/2007

END : 2/23/2007

LOGGER : R. Gomez, R. Bitely, T. Stewart

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.
110 -67.6	110.0		NR	106.9-107.4' - Fracture zone, rough, stepped, multiple intersecting fractures 107.4, 107.7' - Fractures, 60 deg and 70 deg, rough, undulating 107.7-108.0' - Fracture zone, rough, stepped, gravel-sized rock fragments 108.35-108.7' - Fracture zone, rough, stepped		Limestone 105.0-108.7' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 3/2), very fine grained, moderate HCl reaction, extremely weak to weak (R0 to R2), rock strength varies along length of core, voids up to 3/16" cover 30-60% of the surface, cavities up to 1/4" rare, fossiliferous, few macrofossil casts and molds, trace bioturbation and organics	R9: 5 minutes
	R10-NQ 5 ft 48%	20	7	110.0-110.65' - Fracture zone, smooth, undulating, bedding plane and other intersecting fractures		No Recovery 108.7-110.0' Limestone 110.0-112.4' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 3/2), very fine grained, moderate HCl reaction, extremely weak to weak (R0 to R2), rock strength variable with depth, voids up to 1/2" rare, decreasing with depth, voids up to 3/16" over 80% of surface, fossiliferous with few macrofossils (casts/molds), trace organics	
			3	111.25' - Fracture, 60 deg, smooth, undulating		No Recovery 112.4-115.0' Limestone 115.0-118.7' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 3/2), very fine grained, mild HCl reaction, very weak to weak (R1 to R2), voids up to 1/2" is rare, voids up to 3/16" cover 70% of surface, fossiliferous with minor macro fossils (casts/molds), variable competence with rock weakness at breaks/ discontinuities	R10: 5 minutes
			1	111.5' - Fracture, 60 deg, smooth, undulating 111.75' - Bedding plane, <10 deg, smooth, undulating		No Recovery 118.7-120.0' Limestone 120.0-121.2' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 3/2), very fine grained, mild HCl reaction, very weak to weak (R1 to R2), cavities up to 1/2", voids up to 3/16" cover 30-80% of surface, fossiliferous, with macrofossils prevalent at 120.35-121.2'	
			NR	112.0' - Fracture, 70 deg, smooth, undulating		No Recovery 121.2-125.0' Limestone 125.0-126.1' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 3/2), very fine grained, mild HCl reaction, weak to medium strong (R2 to R3), cavities up to 1" cover 10-15% of surface, voids up to 3/16" cover 60-90% of surface, macrofossils (molds/casts)	
115 -72.6	115.0		5	115.1, 115.3, 115.45, 115.6' - Bedding plane (4), <10 deg, smooth, stepped		No Recovery 126.1-130.0' Limestone	
	R11-NQ 5 ft 74%	38	3	116.0' - Fracture, 50 deg, smooth, stepped 116.3, 116.45, 116.9, 117.05' - Bedding plane (4), <10 deg, smooth, undulating			
			4	117.2' - Mechanical break, 20 deg, rough, stepped, open 1"			
			2	117.3, 117.55' - Mechanical break (2), <10 deg, smooth, undulating			
			NR	118.1, 118.4' - Fracture (2), 40 deg and 70 deg, smooth, undulating, trace staining on fracture at 118.4'			R11: 8 minutes
120 -77.6	120.0		8	120.0-120.35' - Fracture zone, multiple intersecting fractures including a 60 deg fracture with trace staining			
	R12-NQ 5 ft 24%	0	1	120.65, 120.75, 121.05' - Mechanical break (3), 0-20 deg, rough, undulating			
			NR				R12: 5 minutes
125 -82.6	125.0		>10	125.0-125.2' - Fracture zone, rough, undulating, multiple intersecting fractures			
	R13-NQ 5 ft 22%		0	125.6' - Mechanical break, horizontal, rough, undulating			
			7	125.8' - Fracture or mechanical break, 40 deg, rough, undulating			
			NR	125.95' - Mechanical break, horizontal, rough, undulating			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

E-08

SHEET 8 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722897.6 N, 458228.0 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten, T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.41 ft bgs on 3/06/07

START : 2/15/2007

END : 2/23/2007

LOGGER : R. Gomez, R. Bitely, T. Stewart

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.
130 -87.6	130.0						
	R14-NQ 5 ft 30%	18	4	130.05' - Fracture, rough, undulating, open		Limestone 130.0-131.5' - light olive gray, (5Y 5/2), very fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16" cover 50% of surface, few cavities up to 1/4" diameter, few macrofossil molds, potential gaps from fines washing out at 130.05', 130.4', and 131.3', 3/4" iron cemented sand (no HCl reaction, very fine grained, medium strong [R3]) at 130.0-130.05' No Recovery 131.5-135.0'	R13: 9 minutes
			1	130.4' - Fracture, smooth, undulating, open			14:00-15:00 PM HW casing unscrewed at 10.0', removed NQ to retrieve HW
			NR	130.75' - Fracture or mechanical break, 20 deg, smooth, undulating			15:00-16:30 PM Advanced HW casing from 35.0'-70.0'
				131.0' - Fracture or mechanical break, <10 deg, smooth, undulating			17:30-18:30 PM NQ tooling locked in slough at 100' below ground surface, back hammering to retrieve
				131.3' - Fracture, rough, undulating, open			18:00-18:30 PM little to no movement, stop for the day
135 -92.6	135.0						2/21/07 Stop drilling for the day
	R15-NQ 5 ft 24%	0	0	135.0, 135.2' - Fracture (2), <10 deg, smooth, undulating		Limestone 135.0-135.2' - pale yellowish brown to olive gray, (10YR 6/2 to 5Y 4/1), very fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids up to 1/16" cover 30% of surface, possible worm burrows at 135.0-135.2' No Recovery 135.2-138.0' Limestone 138.0-138.8' - light olive gray to olive gray, (5Y 6/1 to 5Y 4/1), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), crystalline surfaces visible to naked eye, macrofossil molds up to 3/4"x1/4" (spiral gastropod), voids up to 3/16" variable 0-30% over surface, bedding plane laminations rare, trace organics No Recovery 138.8-140.0' Limestone 140.0-140.45' - dark yellowish brown to light olive gray, (10YR 4/2 to 5Y 5/2), fine to medium grained, moderate to strong HCl reaction, extremely weak (R0), poorly competent with some silty sand and gravel, angular grains up to gravel size, trace bedding plane laminations and organics	2/22/07, 07:00-12:30 PM Retrieved tooling and cleaned out boring from 85.0-130.0'
			NR	138.15, 138.25' - Mechanical break, variable angles, variably open			Advanced HW casing to 85.0'
			NR	138.25-138.65' - Fracture zone, coarse gravel-size rock fragments, visible signs of mechanical wear			R14: 10 minutes
140 -97.6	140.0						Very fine sand-sized grains in drilling mud (identified by grit between fingers), black grains (possibly heavy minerals) present in grit only, not sample
	R16-NQ 5 ft 74%	23	>10	140.0-140.25' - Fracture zone, rough, stepped, infilling			Continuous slow advancement through interval, no void
			10	140.45' - Bedding plane, horizontal, rough, undulating, 1/4" open			R15: 13 minutes
			6	140.9-141.6' - Fractures or bedding plane, 70-90 deg, rough, undulating			15:15 PM 0.8'-long section of core retrieved from cutting shoe of core barrel, logged as R15 core from 138.0-138.8'
			3	141.9' - Mechanical break, 10 deg, rough, undulating			2/22/07 Stop drilling for the day at 140.0'
			NR	141.95-142.1' - Fracture zone, 50-70 deg, smooth, undulating			Begin drilling 2/27/07 at 08:45
				142.2' - Bedding plane, horizontal, smooth, undulating			
				142.4' - Fracture, 70 deg, rough, undulating			
				142.6, 143.0, 143.2, 143.55' - Fractures (4), rough, stepped, variably open (<1/8")			
145 -102.6	145.0						
	R17-NQ 5 ft 70%	13	>10	145.0-145.45' - Fracture zone or mechanical break, rough, undulating			
			8	145.8, 146.1, 146.26, 146.35, 146.5, 146.6, 146.7' - Bedding plane (7), <10 deg, smooth, undulating			
				146.7-148.0' - Fracture, 70-90 deg, smooth to rough, undulating to stepped, with multiple intersecting bedding plane and subhorizontal fractures			
			5	148.1' - Fracture, 50 deg, smooth, undulating			



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-08	SHEET 9 OF 10
ROCK CORE LOG		

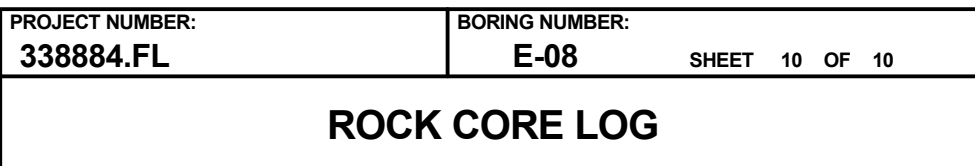
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722897.6 N, 458228.0 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten, T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 4.41 ft bgs on 3/06/07 START : 2/15/2007 END : 2/23/2007 LOGGER : R. Gomez, R. Bitely, T. Stewart

WATER LEVELS : 4.4 ft (10.0 m) on 3/30/07							START : 2/13/2007		END : 2/23/2007		LOGGERS : R. Gomez, R. Birely, T. Stewart	
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								
150 -107.6	150.0		NR	148.3' - Bedding plane, <10 deg, smooth, undulating to stepped, <1/4" open			140.45-143.7' - dark yellowish brown to grayish olive with light gray mottling, (10YR 4/2 to 10Y 4/2 with N7), very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids over 30-40% of surface and vesicles over 60-80% of the surface, unfilled voids/cavities up to 1"x1/2" especially at 143.5-143.7', heavy bioturbation and secondary infill of voids	R17: 17 minutes				
	R18-NQ 5 ft 84%	30	6	150.15' - Bedding plane, <10 deg, rough, undulating			No Recovery 143.7-145.0' Limestone 145.0-145.45' - Same as 140.45-143.7' 145.45-146.7' - light olive gray, (5Y 5/2), very fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16" cover 20% of the surface, few macro fossils, laminated subhorizontal bedding with organics, minor bioturbation decreasing with depth 146.7-148.5' - Same as 145.45-146.7' except rare laminations, no to trace organics	R18: 9 minutes				
5			150.3, 150.55, 150.6' - Bedding plane (3), <10 deg, rough, undulating									
8			150.7' - Mechanical break, 50-90 deg, rough, stepped									
5			151.05, 151.25, 151.5, 151.8, 152.05' - Bedding plane (5), rough, undulating									
1			151.95' - Mechanical break, vertical, rough, stepped									
NR			152.05-152.25' - Fracture, vertical, smooth, undulating, with 3 horizontal intersecting fractures									
155 -112.6	155.0		NR	152.5' - Fracture, 40 deg and 60 deg, rough, stepped			155-156' Slow advancement					
	R19-NQ 5 ft 72%	23	5	152.85' - Fracture, 10-70 deg, smooth, undulating								
			3	152.95' - Fracture, 75 deg, smooth, undulating								
			5	153.1' - Mechanical break								
			2	153.4-153.65' - Fractures (4), 20-70 deg, smooth, undulating								
			NR	154.0' - Bedding plane, rough, undulating, <1/4" open								
			R20-NQ 5 ft 44%	7	4	155.15, 155.45, 155.5' - Bedding plane (3), <10 deg, smooth to rough, undulating						
	8	156.0' - Mechanical break, 20 deg, rough, undulating										
	0	156.15, 156.4' - Bedding plane, <10 deg, smooth, undulating										
	NR	157.0' - Fracture, 75 deg, rough, undulating										
	NR	157.2, 157.4, 157.6, 157.8, 157.9, 158.0' - Bedding plane (6), <10 deg, smooth, undulating										
	NR	158.15, 158.3' - Bedding plane (2), smooth, undulating										
	R21-NQ 5 ft 48%	12	5	160.35' - Fracture, 20 deg, rough, undulating								
			>10	160.65' - Bedding plane, horizontal, smooth, undulating								
			3	160.85' - Fracture, 65 deg, rough, undulating								
			NR	161.0' - Fracture, 15 deg, rough, undulating								
			NR	161.25' - Mechanical break, 45 deg, rough, undulating								
			NR	161.25-161.5' - Fracture zone, rough, undulating, multiple intersecting fractures								
165 -122.6	165.0		5	161.7' - Fracture, 15 deg, smooth, undulating								
	R22-NQ 5 ft 48%	12	>10	161.95' - Fracture, 65 deg, smooth, undulating								
			3	165.0-165.2' - Fracture zone, rough, stepped to undulating								
			NR	165.75-165.95' - Bedding plane, horizontal, smooth, undulating								
			NR	165.95-166.65' - Fracture zone, smooth to rough, undulating								
			NR	166.85' - Fracture or mechanical break, 60 deg, rough, stepped								
			NR									



LOGGER : R. Gomez, R. Bitely, T. Stewart

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01
SHEET 1 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724390.3 N, 457810.6 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.5 ft bgs on 4/5/2007 START : 4/4/2007 END : 4/5/2007 LOGGER : T. Stewart

WATER LEVELS : 4.5 (lbs) on 4/9/2007			START : 4/9/2007			END : 4/9/2007			LOGGER : T. Stewart		
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					
43.1	0.0	1.3	SS-1	2-2-2 (4)	Topsoil 0.0-0.3' - very dusky red, (10R 2/2), moist, 20-30% fine to coarse rootlets			SS-1 collected at 08:45			
	1.5				Poorly Graded Sand With Organics (SP) 0.3-1.3' - very light gray, (N8), moist, very loose, very fine to fine grained, trace nonplastic fines, 10% organics, decreasing with depth, silica sand						
									140-lb hammer NW rod 5.0' sections 4.75" tricone roller bit Added 1/8 52-lb bag QuikGel bentonite to full mud vat		
5	5.0										
38.1		0.9	SS-2	2-3-3 (6)	Poorly Graded Sand With Silt (SP-SM) 5.0-5.9' - very pale orange, (10YR 8/2), wet, loose, very fine to fine silica sand, 10-15% nonplastic fines, trace very fine black particles, clayey sand in last 0.2' of sample			SS-2 collected at 09:07			
	6.5								SS-2 is wet so water level is placed at 3.0' bgs		
10	10.0										
33.1		1.0	SS-3	7-8-7 (15)	Poorly Graded Sand (SP) 10.0-11.0' - very pale orange, (10YR 8/2), wet, medium dense, fine silica sand, 5% nonplastic fines, trace very fine black particles			SS-3 collected at 09:14			
	11.5										
15	15.0										
28.1		0.9	SS-4	5-8-12 (20)	Silty Sand (SM) 15.0-15.9' - pale yellowish brown, (10YR 6/2), wet, medium dense, fine silica sand, 20% nonplastic fines, trace very fine black particles			SS-4 collected at 09:23			
	16.5										
20											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-01

SHEET 2 OF 6

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724390.3 N, 457810.6 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.5 ft bgs on 4/5/2007

START : 4/4/2007

END : 4/5/2007

LOGGER : T. Stewart

WATER LEVELS : 4.510BS on 4/9/2007			START : 4/9/2007			END : 4/9/2007			LOGGERS : T. Stewart		
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					
23.1	20.0	1.0	SS-5	11-19-24 (43)	Silty Sand (SM) 20.0-21.0' - Same as 15.0-15.9' except dense			SS-5 collected at 09:32			
	21.5										
25	25.0										
18.1		1.1	SS-6	20-35-50 (85)	Silty Sand (SM) 25.0-26.1' - Same as 20.0-21.0' except very dense			SS-6 collected at 09:47			
	26.5										
30	30.0										
13.1		1.3	SS-7	23-48-50/4 (98/10")	Silty Sand (SM) 30.0-31.3' - pale yellowish orange, (10YR 6/2), wet, very dense, fine silica sand, 20% nonplastic fines, trace very fine black particles, 5% medium to coarse sand-sized concretions in the upper 0.3' of sample			SS-7 collected at 10:08			
	31.3										
35	35.0										
8.1		1.3	SS-8	24-43-50 (93)	Silty Sand (SM) 35.0-36.3' - pale yellowish orange, (10YR 6/2), wet, very dense, fine silica sand, 20% nonplastic fines, 5-10% very fine black particles, trace medium grain-sized concretions, trace organics			SS-8 collected at 10:22			
	36.5										
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-01

SHEET 3 OF 6

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724390.3 N, 457810.6 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 4.5 ft bgs on 4/5/2007

START : 4/4/2007

END : 4/5/2007

LOGGER : T. Stewart

WATER LEVELS : 4.5 (RDS) 01/4/9/2007			START : 4/4/2007			END : 4/9/2007			LOGGERS : T. Stewart		
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						
3.1	40.0	1.0	SS-9	30-50/6 (80/12")	Silty Sand (SM) 40.0-41.0' - pale yellowish brown, (10YR 5/4), wet, very dense, fine silica sand, 15-20% nonplastic fines, trace very fine black particles		SS-9 collected at 10:38				
	41.0										
45	45.0										
-1.9	45.9	0.9	SS-10	34-50/4.5 (84/10.5")	Silty Sand (SM) 45.0-45.9' - Same as 40.0-41.0' except very pale orange, (10YR 5/4), wet, very dense, dark yellowish orange (10YR 6/6) mottling in upper portion of sample, sample grades to pale yellowish brown (10YR 6/2) from 45.5-46.1', fine silica sand, 15-20% nonplastic fines, trace very fine to medium black particles, trace medium sand-sized concretions, similar to above		SS-10 collected at 10:57				
								Driller's Remark: 11:05 added 1/2 50-lb bag of QuikGel bentonite after removing sand cuttings from tub and refilling with clean water; maintained circulation since start			
50	50.0										
-6.9	51.5	1.2	SS-11	28-44-50 (94)	Silty Sand (SM) 50.0-51.2' - light olive gray, (5Y 5/2), wet, very dense, fine silica sand, 20-25% nonplastic fines, trace very fine black particles		SS-11 collected at 11:35				
55	55.0										
-11.9	56.5	1.2	SS-12	22-34-44 (78)	Silty Sand (SM) 55.0-56.2' - Same as 50.0-51.2' except trace coarse sand-sized concretions over first 0.1' (slough)		SS-12 collected at 13:54				



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01
SHEET 4 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724390.3 N, 457810.6 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.5 ft bgs on 4/5/2007 START : 4/4/2007 END : 4/5/2007 LOGGER : T. Stewart

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)				
		#TYPE				
-16.9	60.0	1.2	SS-13	25-43-50 (93) Silty Sand (SM) 60.0-61.2' - Same as 55.0-56.2' except no concretions and color changes from yellowish gray (5Y 7/2) in upper 0.25' to light olive gray (5Y 5/2) from 60.25-61.2'		SS-13 collected at 14:13
	61.5					
65	65.0					
-21.9	65.9	0.9	SS-14	32-50/4.5 (82/10.5") Silty Sand (SM) 65.0-65.9' - light olive gray, (5Y 5/2), wet, very dense, fine silica sand, 15-20% nonplastic fines, trace very fine black particles		SS-14 collected at 14:39
70	70.0					
-26.9	71.0	0.9	SS-15	35-50/6 (85/12") Silty Sand (SM) 70.0-70.9' - yellowish gray, (5Y 7/2), wet, very dense, fine silica sand, 15-20% nonplastic fines, trace very fine black particles		SS-15 collected at 15:00 Added water and 1/4 bag QuikGel bentonite
75	75.0					
-31.9	75.9	0.8	SS-16	33-50/5 (83/11") Silty Sand (SM) 75.0-75.8' - Same as 70.0-70.9'		SS-16 collected at 15:25
80						



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01
SHEET 5 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724390.3 N, 457810.6 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.5 ft bgs on 4/5/2007 START : 4/4/2007 END : 4/5/2007 LOGGER : T. Stewart

WATER LEVELS : 4.5 (RDS) 01/4/2007			START : 4/4/2007			END : 4/9/2007			LOGGER : T. Stewart		
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						
-36.9	80.0	1.4	SS-17	18-32-44 (76)	Silty Sand (SM) 80.0-81.4' - yellowish gray, (5Y 7/2), wet, very dense, grayish blue (5PB 5/2) mottling/staining of sand from 80.7-81.0', medium light gray (N6) staining from 81.0-81.4', fine silica sand, 20-25% nonplastic fines, trace very fine black particles		SS-17 collected at 15:50				
	81.5						Added 1/4 50-lb bag of QuikGel bentonite				
85	85.0										
-41.9		1.1	SS-18	15-12-12 (24)	Silty Sand (SM) 85.0-86.1' - Same as 80.0-81.4' except medium dense, 1" thick grayish blue seam near the top and very bottom of sample, 25-30% nonplastic fines		SS-18 collected at 16:15				
	86.5										
90	90.0										
-46.9		1.3	SS-19	11-11-10 (21)	Silty Sand (SM) 90.0-91.3' - grayish yellow, (5Y 8/4), wet, medium dense, very fine to fine silica sand, 20-25% nonplastic fines, trace very fine sand-sized black particles, 1/2" thick seam of medium dark gray to dark gray (N4 to N3) sand at 90.3' with 1/4"-3/8" subrounded gravel-sized sand concretions, possible pyrite		SS-19 collected at 16:39				
	91.5										
95	95.0										
-51.9		0.7	SS-20	6-7-8 (15)	Silty Sand (SM) 95.0-95.7' - pale yellowish brown, (10YR 6/2), wet, medium dense, fine silica sand, 30% nonplastic fines, trace fine sand-sized angular black particles, 1" concretion with a hollowed out section		SS-20 collected at 17:05				
	96.5										
100											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01
SHEET 6 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724390.3 N, 457810.6 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.5 ft bgs on 4/5/2007 START : 4/4/2007 END : 4/5/2007 LOGGER : T. Stewart

WATER LEVELS : 4.5 TDS ON 4/5/2007			START : 4/4/2007		END : 4/5/2007		LOGGER : T. Stewart	
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	
-56.9	100.0	1.5	SS-21	10-24-49 (73)	Silty Sand (SM) 100.0-101.5' - Same as 90.0-91.2' except very dense, no seams, trace angular dark gray (N3) concretions		SS-21 collected at 17:39 18:03 Driller tape measures hole Total depth at 97.0' Water level at 4.5' below ground surface 4/05/07 07:36 Water level at 3.5' bgs Grouted to surface with three 92 lb bags of Holcim brand Portland cement and two 47-lb bags of Quikrete brand Portland cement	
	101.5				Bottom of Boring at 101.5 ft bgs on 4/5/2007			
105 -61.9								
110 -66.9								
115 -71.9								
120								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-01A

SHEET 1 OF 6

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724368.5 N, 457807.6 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone and 3-7/8" drag bit





ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 4/6/07

START : 4/5/2007

END : 4/6/2007

LOGGER : T. Stewart

WATER LEVELS : 3.0 TDS ON 4/9/07		START : 4/9/2007		END : 4/9/2007		LOGGERS : T. Stewart	
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
42.9	0.0	1.5	SS-1	1-2-2 (4)	Poorly Graded Sand With Organics (SP) 0.0-1.0' - very light gray, (N8), moist, very loose, very fine to fine grained silica sand, trace nonplastic fines, 15% organics		SS-1 collected at 10:12
	1.5				Sandy Organic Soil (OL) 1.0-1.5' - brownish black and medium brown, (5YR 3/1, 5YR 3/4), moist, soft, low plasticity, 30-40% very fine silica sand, roots		Glen Davis is cathead operator 140-lb hammer 24" split spoon (SS) 5.0' sections of NW rod 4.75" tricone roller drill bit 1/2 50-lb bag QuikGel bentonite added to mud vat
5	5.0						
37.9		0.9	SS-2	3-6-8 (14)	Clayey Sand (SC) 5.0-5.5' - yellowish gray, (5Y 7/2), wet, medium dense, no HCl reaction, very fine to fine silica sand, 30% low plastic fines, 10-15% rootlets		SS-2 collected at 10:39
	6.5				Poorly Graded Sand (SP) 5.5-5.9' - very pale orange, (6YR 8/2), wet, medium dense, fine silica sand, trace nonplastic fines		
10	10.0						
32.9		1.3	SS-3	6-7-9 (16)	Silty Sand (SM) 10.0-11.3' - light olive gray, (5Y 6/1), wet, medium dense, fine silica sand, 30-35% nonplastic fines, trace very fine black particles		SS-3 collected at 10:46
	11.5						
15	15.0						
27.9		1.1	SS-4	8-10-13 (23)	Silty Sand (SM) 15.0-16.1' - Same as 10.0-11.3' except very pale orange, (10YR 8/2), 25% nonplastic fines		SS-4 collected at 10:52
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01A
SHEET 2 OF 6	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724368.5 N, 457807.6 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone and 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 4/6/07 START : 4/5/2007 END : 4/6/2007 LOGGER : T. Stewart

WATER LEVELS : 3.0 (RDS) 4/9/07			START : 4/9/2007			END : 4/9/2007			LOGGER : T. Stewart		
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						
22.9	20.0	1.1	SS-5	16-22-31 (53)	Silty Sand (SM) 20.0-21.1' - Same as 15.0-16.1' except very dense, slight hue change at bottom 4" toward pale yellowish brown (10YR 6/2), 20-25% nonplastic fines		SS-5 collected at 11:00				
	21.5										
25	25.0										
17.9		1.2	SS-6	20-38-55 (93)	Silty Sand (SM) 25.0-26.2' - Same as 15.0-16.1' except very pale orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), 20% high plasticity fines		SS-6 collected at 11:07				
	26.5										
30	30.0										
12.9		1.2	SS-7	21-31-41 (72)	Silty Sand (SM) 30.0-31.2' - Same as 25.0-26.2' except trace very fine sand-sized pale yellowish orange (10YR 8/6) particles, trace coarse sand-sized concretions		SS-7 collected at 11:17				
	31.5										
35	35.0										
7.9		1.5	SS-8	12-18-20 (38)	Silty Sand (SM) 35.0-36.5' - pale yellowish brown, (10YR 6/2), wet, dense, fine silica sand, 30-35% nonplastic fines, black (N1) mottling of sands in a 1/4" thick seam at 35.75', similar to above (30.0-31.2')		SS-8 collected at 11:26				
	36.5										
			</								



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01A
SHEET 3 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724368.5 N, 457807.6 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone and 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 4/6/07 START : 4/5/2007 END : 4/6/2007 LOGGER : T. Stewart

WATER LEVELS : 3.0 RDBS DT 4/9/07			START : 4/9/2007			END : 4/9/2007			LOGGER : T. Stewart		
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	1.2	SS-9	16-21-19 (40)	Silty Sand (SM) 40.0-41.2' - Same as 35.0-36.5' except random mottling of a grayish black to black sand in 1/8"-1/4" seams		SS-9 collected at 13:24				
	41.5										
45	45.0										
-2.1		1.2	SS-10	15-18-19 (37)	Silty Sand (SM) 45.0-46.2' - pale yellowish brown, (10YR 6/2), wet, dense, fine silica sand, 30% low plasticity fines, no mottling, sample relatively homogenous		SS-10 collected at 13:36				
	46.5										
							Driller's Remark: Change out rope on hammer after noticing a weakened/frayed zone in it				
50	50.0										
-7.1		1.5	SS-11	5-6-9 (15)	Fat Clay (CH) 50.0-51.5' - predominantly dusky yellow green, (5GY 5/2), moist, stiff, high plasticity, no dilatancy, mottled with dusky blue and very pale orange (5PB 3/2, 10YR 8/2), various clasts throughout sample including: trace flat, rounded coarse sand to fine gravel-sized clasts, 5% concretions near bottom of sample, trace medium sand-sized angular shaped black particles, trace rounded clasts to 1/8", low to mild HCl reaction on very pale orange clasts		SS-11 collected at 14:00				
	51.5										
55	55.0										
-12.1		1.5	SS-12	4-5-5 (10)	Sandy Fat Clay (CH) 55.0-56.5' - predominantly yellowish gray, (5Y 7/2), moist, stiff, high plasticity, no dilatancy, mottled with dark gray and grayish green (N3 and 10GY 5/2), 25-30% very fine silica sand in irregular lenses, trace to 5% fine carbonate sand, mild HCl reaction in carbonate particles		SS-12 collected at 14:22				
	56.5										
60											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-01A

SHEET 4 OF 6

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724368.5 N, 457807.6 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone and 3-7/8" drag bit





ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 4/6/07

START : 4/5/2007

END : 4/6/2007

LOGGER : T. Stewart

WATER LEVELS : 3.0 RDS ON 4/9/07			START : 4/9/2007			END : 4/9/2007			LOGGERS : T. Stewart		
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	1.5	SS-13	3-5-5 (10)	Fat Clay With Sand (CH) 60.0-61.5' - Same as 55.0-56.5' except no dark gray mottling, 10% very fine silica sand and 10-15% medium sand-sized very pale orange (10YR 8/2) carbonate particles throughout, mild HCl reaction in carbonates		SS-13 collected at 14:53				
	61.5										
65	65.0										
-22.1		1.5	SS-14	3-5-7 (12)	Fat Clay (CH) 65.0-66.5' - grayish green, (10GY 5/2), moist, stiff, high plasticity, no dilatancy, no HCl reaction, mottled with pale yellowish green (10GY 7/2) throughout, 1/2"-3/4" pocket of a white fat clay with 5-10% fine to medium sand-sized particles		SS-14 collected at 15:25				
	66.5										
							Driller's Remark: Will switch to a 3-7/8" drag bit to help drilling rate through clay Driller's Remark: NW rod (5 sections)				
70	70.0										
-27.1		1.5	SS-15	5-8-10 (18)	Fat Clay (CH) 70.0-71.5' - pale blue, (5B 6/2), moist, very stiff, high plasticity, no dilatancy, no HCl reaction, trace mottling with yellowish gray (5Y 8/1), trace yellowish gray medium sand-sized particles, fine gravel-sized pyrite at 70.2', silty sand (SM) seam in bottom 1-3/16" of sample		SS-15 collected at 16:10				
	71.5										
75	75.0										
-32.1		1.4	SS-16	19-21-23 (44)	Silty Sand (SM) 75.0-76.4' - pale yellowish brown, (10YR 6/2), wet, dense, no HCl reaction, fine silica sand, 20-30% nonplastic fines, trace very fine sand-sized black particles		SS-16 collected at 16:37				
	76.5										
80											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01A
SHEET 5 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724368.5 N, 457807.6 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone and 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 4/6/07 START : 4/5/2007 END : 4/6/2007 LOGGER : T. Stewart

WATER LEVELS : 3.0 RODS ON 4/5/07		START : 4/5/2007		END : 4/9/2007		LOGGER : T. Stewart	
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		
-37.1	80.0	1.2	SS-17	24-41-50 (91)	Silty Sand (SM) 80.0-81.2' - medium dark gray, (N4), wet, very dense, fine silica sands, trace very fine black particles, 20% nonplastic fines, first 4-13/16" of sample is irregularly bedded silty sand (SM) from 75.0-76.4' and the remaining 9-5/8" sand is as described above		SS-17 collected at 17:01
	81.5						
85	85.0						
-42.1		1.2	SS-18	26-48-50/5.5 (98/11.5")	Silty Sand (SM) 85.0-86.2' - pale yellowish brown, (10YR 6/2), wet, very dense, medium dark gray (N4) staining, fine silica sand, 25-30% nonplastic fines, trace medium sand-sized concretions		SS-18 collected at 17:28
	86.5						Driller's Remark: 04/05/07 Stop drilling for the day at 17:34
90	90.0						
-47.1		1.5	SS-19	14-9-9 (18)	Silty Sand (SM) 90.0-91.5' - pale yellowish brown, (10YR 6/2), wet, medium dense, fine silica sand, 30-40% low plastic fines including 7-10% very fine sand-sized black particles, trace medium dark gray (N4) staining, trace angular fine gravel-sized pyrite at top of sample (possibly slough)		SS-19 taken at 09:24
	91.5						Driller's Remark: Glen Davis is cathead operator on 04/06/07 N-rod (5.0' sections NW) 3-7/8" drag bit 140-lb cathead hammer 50-lb bags of QuikGel brand bentonite in use 08:15 water level at 3.0' below ground surface 08:50 pump not circulating (Rods/pump?) Clogged with sand
							Rods broke out, cleared, re-assembled Mud vat mixed 1/2 bag bentonite for drilling
95	95.0						
-52.1		1.5	SS-20	15-8-7 (15)	Silty Sand (SM) 95.0-96.5' - pale yellowish brown, (10YR 6/2), wet, medium dense, fine silica sand, 25% low plastic fines, trace very fine sand-sized black particles		Driller's Remark: 09:35 sand clogs rods again during installation into borehole
	96.5						
100							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01A
SHEET 6 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724368.5 N, 457807.6 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-3/4" tri-cone and 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 4/6/07 START : 4/5/2007 END : 4/6/2007 LOGGER : T. Stewart

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	
-57.1	100.0	1.2	SS-21	3-4-3 (7)	Silty Sand (SM) 100.0-101.2' - pale yellowish brown, (10YR 6/2), wet, very loose, fine silica sand, 20% nonplastic fines, trace fine to coarse gravel-sized pyrite Bottom of Boring at 101.5 ft bgs on 4/6/2007		SS-21 collected at 10:46 Driller's Remark: Circulation has been maintained at all times during drilling, No casing was installed 10:46 End of drilling for GSC-01A (20.0' offset for sand delineation from GSC-01)	
	101.5							
105 -62.1								
110 -67.1								
115 -72.1								
120								



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01B
SHEET 1 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724347.3 N, 457805.5 E (NAD83)
 ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 03/10/07 START : 4/6/2007 END : 4/9/2007 LOGGER : T. Stewart

WATER LEVELS : 3.0 (RDS) ON 03/10/07			START : 4/9/2007			END : 4/9/2007			LOGGER : T. Stewart		
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				
42.8	0.0	1.3	SS-1	1-2-2 (4)	Poorly Graded Sand (SP) 0.0-1.3' - very light gray, (N8), moist, very loose, very fine to fine silica sand, 5% nonplastic fines, trace very fine sand-sized black particles, trace organics and brown mottling		SS-1 taken at 15:26 24" split spoon (SS) 50-lb bags of QuikGel brand bentonite Added 1/4 bag bentonite to full mud vat				
	1.5										
5	5.0						Water level at 3.0' below ground surface at 15:35 based on moist SS-1, wet SS-2 samples				
37.8		0.9	SS-2	7-9-8 (17)	Poorly Graded Sand (SP) 5.0-5.9' - yellowish gray, (5Y 8/1), wet, medium dense, fine grained, silica sand, trace nonplastic fines including trace sand-sized black particles		SS-2 taken at 15:49				
	6.5										
10	10.0										
32.8		1.3	SS-3	8-11-12 (23)	Silty Sand (SM) 10.0-11.3' - very light gray to yellowish gray, (N8 to 5Y 8/1), wet, medium dense, fine grained, low plasticity, silica sand, 25-35% low plastic fines including trace very fine sand-sized black particles, trace fine gravel-sized concretions		SS-3 taken at 15:54				
	11.5										
15	15.0										
27.8		1.2	SS-4	12-15-13 (28)	Silty Sand (SM) 15.0-16.2' - very light gray to yellowish gray, (N8 to 5Y 8/1), wet, medium dense, fine grained, nonplastic, silica sand, 20-25% nonplastic fines, trace very fine grain black particles		SS-4 taken at 15:59				
	16.5										
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01B
SHEET 2 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724347.3 N, 457805.5 E (NAD83)
 ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 03/10/07 START : 4/6/2007 END : 4/9/2007 LOGGER : T. Stewart

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
22.8	20.0	1.1	SS-5	12-15-14 (29)	Silty Sand (SM) 20.0-21.1' - Same as 15.0-16.2'		SS-5 taken at 16:04
	21.5						
25	25.0						
17.8		1.0	SS-6	12-75-72 (147)	Silty Sand (SM) 25.0-26.0' - Same as 20.0-21.1'		
	26.5						
30	30.0						
12.8		1.5	SS-7	5-7-6 (13)	Fat Clay (CH) 30.0-31.5' - mixed CH materials in irregular lenses and pockets, 30.0-30.4' is grayish green (10GY 5/2), with medium gray to dark gray mottling (N3 to N4), 30.4-31.1' is very pale orange (10YR 8/2), 31.1-31.5' is grayish green (10GY 5/2) with very pale orange mottling (10YR 8/2), moist to wet (30.4-31.1'), stiff, high plasticity, no HCl reaction, trace medium sand-sized very pale orange (10YR 8/2) and dark gray (N1) clasts		SS-7 taken at 16:21
	31.5						
35	35.0						
7.8		0.8	SS-8	15-13-13 (26)	Clayey Limestone Gravel With Sand (GC) 35.0-35.8' - yellowish gray with light olive gray staining, (5Y 8/1 with 5Y 5/6), wet, medium dense, strong HCl reaction, angular gravel-sized limestone, 20-25% fine to coarse sand-sized, 20% medium to high plastic fines, carbonate materials		Driller's Remark: change to tricone roller bit 3-7/8" at 34.0', hit hard rock SS-8 taken at 16:44
	36.5						
40							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-01B

SHEET 3 OF 6

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724347.3 N, 457805.5 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 03/10/07

START : 4/6/2007

END : 4/9/2007

LOGGER : T. Stewart

WATER LEVELS : 3.0 (RDS) 01/03/10/07			START : 4/3/2007			END : 4/9/2007			LOGGER : T. Stewart		
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						
2.8	40.0	0.4	SS-9	11-8-9 (17)	Clayey Sand (SC) 40.0-40.4' - white to yellowish gray, (N9 to 5Y 8/1), moist, medium dense, fine to medium grained, low to medium plasticity, very strong HCl reaction, 25% low to medium plastic fines, carbonate materials		SS-9 taken at 16:54				
	41.5										
							Driller's Remark: 17:02 43.5' hard drilling, loss of circulation (LOC) up to 100%				
45	45.0										
-2.2		1.0	SS-10	7-9-8 (17)	Clayey Sand With Limestone Fragments (SC) 45.0-46.0' - Same as 40.0-40.4' except 25% fine to coarse gravel-sized limestone fragments, fossiliferous		SS-10 taken at 17:06 Installed 40.0' HW casing				
	46.5										
50	50.0										
-7.2		1.5	SS-11	20-14-11 (25)	Clayey Sand With Limestone Fragments (SC) 50.0-51.5' - Same as 45.0-46.0' except staining over upper most 4.0', 40% fine to coarse gravel-sized limestone, trace moderate brown to dusky brown (5YR 3/4 to 5YR 2/2) concretions		8:22 water level at 18.0' below ground surface on 4/7/07 N-rod (5.0' sections) 45.0' HW casing in hole 1/8 50-lb bag of QuikGel brand bentonite added to mud vat 3-7/8" tricone roller drill bit SS-11 taken at 09:42				
	51.5										
55	55.0										
-12.2		1.2	SS-12	22-15-14 (29)	Clayey Gravel With Sand (GC) 55.0-56.2' - Same as 50.0-51.5' except 60% fine to coarse gravel-sized, 20-25% sand-sized, highly fossiliferous		100% circulation loss; refill vat, add 1/2 bag bentonite				
	56.5										
							11:02 Driller's Remark: hard at 53.0', light to moderate chatter, soft from 54.0'-55.0', hole collapse at bottom so that split spoon resting on 1.5' of cave-in material 11:15 N-rod pulled out to install NW casing with advancer and tricone roller drill bit wireline accessory (Serial Number: 83963-CN) Refill mud vat, add 1/4 bag bentonite SS-12 taken at 13:55				
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01B	SHEET 4 OF 6
SOIL BORING LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724347.3 N, 457805.5 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 03/10/07

START : 4/6/2007

END : 4/9/2007

LOGGER : T. Stewart

WATER LEVELS : 3.0 TDS ON 03/10/07		START : 4/9/2007		END : 4/9/2007		LOGGER : J. Stewart	
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		
-17.2	60.0	1.0	SS-13	30-22-23 (45)	Silty Limestone Gravel With Sand (GM) 60.0-61.0' - Same as 55.0-56.2' except low plasticity fines, 50% fine to coarse gravel-sized, 35% fine to coarse sand-sized, 15% fines, highly fossiliferous		Driller's Remark: 14:05 switch to N-rod (5.0' sections) 2-7/8" tricone roller bit due to continued down-hole cave-in SS-13 taken at 14:32
	61.5						
65	65.0						
-22.2		1.2	SS-14	19-16-10 (26)	Clayey Sand With Limestone Fragments (SC) 65.0-66.2' - Same as 60.0-61.0' except white to very light gray, (N9 to N8), low plasticity, medium light gray (N6) staining over bottom half of sample, fine to coarse sand-sized, 35% fine to coarse gravel, 20-25% fines, highly fossiliferous		SS-14 taken at 16:02
	66.5						
70	70.0						
-27.2		1.5	SS-15	6-7-8 (15)	Sandy Fat Clay (CH) 70.0-71.5' - pale green with pale olive gray sands, (6G 6/2 with 5Y 5/2), moist, stiff, high plasticity, no dilatancy, trace dusky blue (5PB 3/2) mottling, 30% very fine to fine silica sand, 5% carbonate sand in irregular pockets, carbonate clasts with mild HCl reaction		08:35 water level at 3.0' below ground surface on 4/8/07
	71.5						
							SS-15 taken at 09:02
							5.0' NW casing added to advance boring
75	75.0						
-32.2		1.5	SS-16	12-17-15 (32)	Clayey Sand With Limestone Fragments (SC) 75.0-76.5' - white to bluish white, (N9 to 5B 9/1), wet, dense, fine to coarse grained, very strong HCl reaction, trace dark gray (N3) mottling or staining, 25-30% low to medium plastic fines, 15-20% fine gravel-sized, 1-1/2" silty sand (SM) seam and fat clay (CH) seam, highly fossiliferous		Driller's Remark: 09:20 he'll have to switch back to 2-7/8" tricone drag bit to get through clay - will no longer be advancing NW casing 70.0' NW currently installed Driller's Remark: 09:40 good circulation through NW casing Two irregular blows in SS-16 SPT
	76.5						
							Driller's Remark: adding another 5.0' section of NW casing, losing depth to cave-in
80							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-01B

SHEET 5 OF 6

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724347.3 N, 457805.5 E (NAD83)

ELEVATION : 42.8 ft (NAVD88)

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

DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 3.0 ft bgs on 03/10/07

START : 4/6/2007

END : 4/9/2007

LOGGER : T. Stewart

WATER LEVELS : 3.0 (BGS) 01/03/10/07		START : 4/9/2007		END : 4/9/2007		LOGGERS : T. Stewart	
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		
-37.2	80.0	1.5	SS-17	4-6-11 (17)	Clayey Sand With Limestone Gravel (SC) 80.0-81.5' - Same as 75.0-76.5' except white to bluish white, (N9 to 5B 9/1), wet, medium dense, fine to coarse grained, strong HCl reaction, low to medium plastic fines, trace medium dark gray (N4) staining, 35-40% plastic fines, 15% fine gravel-sized limestone, all carbonate		SS-17 taken at 10:42
	81.5						
85	85.0						
-42.2		1.5	SS-18	4-5-12 (17)	Interbedded Sands And Clays, Silty Sand (SM) 85.0-85.2' - yellowish gray, (5Y 7/2), wet, medium dense, nonplastic, mild HCl reaction, silica sand, trace fine carbonate sand, 25% nonplastic fines, mild HCl reaction in carbonate sand Fat Clay (CH) 85.2-85.3' - grayish green, (5Y 5/2), moist, stiff, high plasticity, no dilatancy, no HCl reaction, trace dusky blue (5PB 5/2) mottling lense of yellowish gray (5Y 8/1) silt/clay, trace white (N9) fine sand-sized particles, trace flat subrounded pyrite 1/8"-1/4" fragments Clayey Sand (SC) 85.3-86.5' - moderate yellowish brown, (10YR 5/4), moist, medium dense, fine silica sand, trace fine carbonate sand, 40-45% medium plastic fines, mild HCl reaction in carbonate grains Interbedded Silty Sand And Fat Clay, And Clayey Sand (SM) 90.0-91.5' - Same as 85.0-86.5'		SS-18 taken at 11:19 Driller's Remark: 75% circulation loss at 85.0'
	86.5						
90	90.0						
-47.2		1.5	SS-19	5-14-22 (36)			SS-19 taken at 11:27
	91.5						
95	95.0						
-52.2		1.4	SS-20	5-12-15 (27)	Fat Clay (CH) 95.0-95.9' - Same as 85.0-86.5' except no yellowish gray lens, white fine sand-sized particles in pockets Clayey Sand (SC) 95.9-96.4' - Same as 85.0-86.5' except 35-40% low to medium plastic fines		SS-20 taken at 11:55
	96.5						
100							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-01B
SHEET 6 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724347.3 N, 457805.5 E (NAD83)
 ELEVATION : 42.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.0 ft bgs on 03/10/07 START : 4/6/2007 END : 4/9/2007 LOGGER : T. Stewart

WATER LEVELS : 3.0 ft bgs on 03/10/07			START : 4/9/2007			END : 4/9/2007			LOGGER : T. Stewart		
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						
-57.2	100.0	1.5	SS-21	7-8-8 (16)	Silty Sand (SM) 100.0-101.5' - yellowish gray, (5Y 7/2), wet, medium dense, fine grained, no HCl reaction, silica sand, 15-20% nonplastic fines, trace very fine sand-sized black particles, trace black staining near bottom of sample Bottom of Boring at 101.5 ft bgs on 4/9/2007		SS-21 taken at 12:22 SS-21 (100.0-101.5') is the last sample for GSC-01B, end of drilling Hole abandoned on 4/9/07 with 50-55 gallons of grout mix, 12 bags of 47-lb each of Quick Portland cement Type I/II				
	101.5										
105 -62.2											
110 -67.2											
115 -72.2											
120											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-02

SHEET 1 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724300.1 N, 457447.2 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 1.4 ft bgs on 5/16/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Bitely, D. Whitaker

WATER LEVELS : 1.410BS ON 9/10/07			START : 9/19/2007			END : 9/17/2007			LOGGERS : K. Biley, D. Whitaker		
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					
40.4	0.0	1.1	SS-1	1-2-3 (5)	Topsoil (OL) 0.0-0.3' - brownish black, (5YR 2/1), moist, very soft, 60% organic no fines, <40% roots/vegetative detritus						
	1.5				Poorly Graded Sand With Some Limestone Fragments (SP) 0.3-1.1' - very pale beige, (10YR 8/2), moist, very loose, very fine to fine grained, nonplastic, trace nonplastic fines, 10-15% organics, silica sand						
5	5.0										
35.4		0.4	SS-2	5-18-10 (28)	Sandy Clay And Organic Wood Debris (SC) 5.0-5.4' - light gray to yellowish gray, (N/7, 5Y8/1), moist, very stiff, medium plasticity, no to mild HCl reaction, <30% very fine to medium grained carbonate sands, 50% of sample is wood debris			Driller's Remark: Wood from 5.0-8.5' below surface, several scoops of wood chips removed from mud pit			
	6.5								Driller's Remark: Smooth, easy drilling, light chatter at 7.0' and 9.5'		
10	10.0										
30.4	10.3	0.3	SS-3	50/4 (50/4")	Silt (ML) 10.0-10.3' - grayish yellow, (5Y 8/4), moist to wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 5-10% very fine sand, 5-10% limestone fragments <1/4" diameter, carbonate materials						
15	15.0										
25.4		0.5	SS-4	13-3-8 (11)	Silt (ML) 15.0-15.5' - grayish yellow with moderate yellow lenses, (5Y 8/4 with 5Y 7/6), moist to wet, stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 10-15% very fine to medium sand, carbonate materials						
	16.5										
20											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-02

SHEET 2 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724300.1 N, 457447.2 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 1.4 ft bgs on 5/16/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Bitely, D. Whitaker

WATER LEVELS : 1.4 fms G.S. 5/16/07			START : 5/15/2007		END : 5/17/2007		LOGGER : K. Greer, D. Whitaker	
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			
20.4	20.4	0.2	SS-5	50/5 (50/5")	Sandy Silt (ML) 20.0-20.2' - grayish yellow, (5Y 8/4), moist to wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 30-35% fine to coarse sand-sized limestone fragments, lenses <1/4" thick, carbonate materials			
25	25.0							
15.4	26.5	1.2	SS-6	35-40-35 (75)	Sandy Silt With Limestone Lenses (ML) 25.0-26.2' - grayish yellow, (5Y 8/4), moist to wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 25% fine to medium sand, <30% limestone lenses <1/4" thick, carbonate materials			
30	30.0							
10.4	31.5	1.0	SS-7	15-15-40 (55)	Silt With Limestone Lenses (ML) 30.0-31.0' - Same as 25.0-26.2' except dark yellowish orange, (10YR 6/6)		Stop drilling for the day at 17:30, resume drilling 5/16/07 08:00, water level at 1.4' below ground surface	
35	35.0							
5.4	35.7	0.5	SS-8	35-50/2 (85/8")	Silty Sand (SM) 35.0-35.5' - yellowish gray, (5Y 7/2), moist, very dense, moderate HCl reaction, fine to coarse sand, 30% nonplastic fines, carbonate materials		Driller's Remark: Moderate to light chatter from 35.0-39.0'	
40							Driller's Remark: 39.0-40.0' rapid smooth drilling	



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-02
SHEET 3 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724300.1 N, 457447.2 E (NAD83)
 ELEVATION : 40.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 6" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.4 ft bgs on 5/16/07 START : 5/15/2007 END : 5/17/2007 LOGGER : R. Bitely, D. Whitaker

WATER LEVEL: 1.41 BGS ON 1/10/07		START: 1/10/2007		END: 1/17/2007		ECCENT: A. Gray, D. Whitaker	
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		
0.4	40.0	0.3	SS-9	50/3.5 (50/3.5")	Silty Sand And Limestone Fragments (SM) 40.0-40.3' - Same as 35.0-35.5' except 35-40% fine gravel-sized limestone fragments		Driller's Remark: Smooth drilling with moderate to fast movement, intermittent light chatter
45	45.0						
-4.6	46.5	1.3	SS-10	18-20-35 (55)	Sandy Silt And Limestone Lenses/fragments (ML) 45.0-46.3' - Same as 40.0-40.3' except 25% nonplastic fines, 35% fine gravel-sized limestone fragments in lenses		
50	50.0						
-9.6	50.9	0.8	SS-11	50-50/5 (100/11")	Limestone And Silty Sand 50.0-50.8' - Same as 45.0-46.3' except 60% fine to coarse gravel-sized limestone fragments, 30-35% fine to coarse sand, 15-20% of nonplastic fines Begin Rock Coring at 51.0 ft bgs See the next sheet for the rock core log		
55							
-14.6							
60							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-02

SHEET 4 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724300.1 N, 457447.2 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.4 ft bgs on 5/16/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Bitely, D. Whitaker

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			
51.0	R1-NQ 5 ft 89%	58	2	51.2' - Bedding plane, horizontal, smooth, undulating, open <1/4"		Limestone 51.0-55.45' - pale yellow brown, (10YR 6/2), fine to medium grained, moderate to high HCl reaction, extremely weak to weak (R0 to R2), voids <1/16" diameter over 50% of surface, trace fossil molds <1/2" diameter, trace cavities <1/2" diameter, trace crystallized limestone infill	Establish rock contact at 51.0' below ground surface, set HW casing to 51.0' below ground surface Begin rock coring using NQ wireline tooling from 51.0' below ground surface R1:2 minutes
			0	51.7' - Fracture or mechanical break, 30 deg, rough, undulating, open <1/4"			
			6	52.35' - Mechanical break			
			3	53.05' - Fracture or mechanical break, 30 deg, rough, undulating, open <1/4"			
			1	53.25, 53.6, 53.85' - Bedding plane or mechanical break (3), horizontal, smooth, undulating, open <1/4"-1/2"			
55 -14.6			NR	53.5' - Mechanical break		No Recovery 55.45-56.0' Limestone 56.0-61.0' - pale yellowish brown, (10YR 6/2), fine to medium grained, high HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over 40-50% of surface, trace fossil molds	R2:3 minutes
56.0	R2-NQ 5 ft 100%	92	2	53.9' - Fracture or mechanical break, 20 deg and 40 deg, rough, undulating, open <1/4"			
			2	54.3' - Bedding plane or mechanical break, horizontal, smooth, undulating, open <1/4"-1/2"			
			1	54.5' - Fracture or mechanical break, 20 deg and 40 deg, rough, undulating, open <1/4"			
			1	54.6, 54.7' - Mechanical break (2)			
60 -19.6			1	54.75' - Fracture or mechanical break, 20 deg and 40 deg, rough, undulating, open <1/4"		61.0-64.5' - pale yellowish brown to light gray, (10YR 6/2 to N7), very fine to medium grained, strong HCl reaction, 61.0-62.0' and 62.45-63.0' very weak to weak (R1 to R2) rock, 62.0-62.45' extremely weak (R0) rock, 63.0-64.5' medium strong to strong (R3 to R4) rock, voids (<1/16") over 30-50% surface except trace voids from 62.0-62.45', trace fossil molds <1/2" diameter, trace cavities <1/2" diameter from 61.0-62.0', trace organics No Recovery 64.5-66.0' Limestone 66.0-70.9' - pale yellow brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), except 67.5-67.9' that is extremely weak (R0) to very weak (R1) rock, voids (<1/16") over 30-50% of surface, 10-20% fossil molds <1/4" diameter, trace cavities <3/4" by 1/2", trace organics	R3:3 minutes
61.0	R3-NQ 5 ft 70%	44	3	60.1' - Fracture or mechanical break, 65 deg, smooth, undulating, tight to open <1/4"			
			2	61.5' - Bedding plane or mechanical break, <10 deg, smooth to rough, undulating, open <1/2"-1/4"			
			2	61.7' - Mechanical break or fractures, 20 deg, rough, undulating, tight to open <1/2"			
			2	62.0' - Bedding plane or mechanical break, <10 deg, smooth to rough, undulating, open <1/2"-1/4"			
65 -24.6			NR	62.7' - Mechanical break or fractures, 20 deg, rough, undulating, tight to open <1/2"			R4:5 minutes
	R4-NQ 5 ft 98%	88	1	62.95' - Bedding plane or mechanical break, <10 deg, smooth to rough, undulating, open <1/2"-1/4"			
			3	63.15' - Mechanical break or fractures, 50 deg, rough, undulating, tight to open <1/2"			
			0	63.35' - Mechanical break or fractures, 10 deg, rough, undulating, tight to open <1/2"			
			1	63.5' - Mechanical break			
70 -29.6			2	64.25' - Bedding plane or mechanical break, <10 deg, smooth to rough, undulating, open <1/2"-1/4"			
			1	64.4' - Mechanical break or fractures, 50 deg, rough, undulating, tight to open <1/2"			
			1	66.5, 67.45' - Fractures or mechanical break (2), 20 deg and 30 deg, rough, undulating, open <1/4"			
			2	67.7, 68.85' - Bedding plane or mechanical break (2), <10 deg, rough, undulating, open <1/2"			
71.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-02	SHEET 5 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724300.1 N, 457447.2 E (NAD83)

ELEVATION : 40.4 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.4 ft bgs on 5/16/07 START : 5/15/2007 END : 5/17/2007 LOGGER : R. Bitely, D. Whitaker

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
75 -34.6	R5-NQ 5 ft 100%	84	NR		No Recovery 70.9-71.0' Limestone 71.0-76.0' - pale yellowish brown to light gray, (10YR 6/2 to N7), very fine to medium grained, strong HCl reaction, weak to medium strong (R2 to R3), grain size increases with depth, except 73.5-74.7' extremely weak to very weak (R0 to R1) rock, voids (<1/16") over <20-50% of surface-variable, no cavities, few fossil molds <1/4" diameter, strong rock zone from 72.4-72.85'	R5:4 minutes
			2			
			0			
			3			
			2			
76.0	R6-NQ 5 ft 73%	18	2		76.0-79.65' - pale yellowish brown to light gray, (10YR 6/2 to N7), very fine to medium grained, strong HCl reaction, 76.0-77.8' and 78.7-78.9' very weak (R1) to weak (R2) rock, 77.8-78.7' and 78.9-79.65' medium strong (R3) to strong (R4) rock, voids (<1/16") over 20-30% of surface, trace fossil molds <1/4" diameter, about 10-20% cavities <1/2" diameter especially from 77.8-78.7'	R6:8 minutes
			3			
			>10			
			>10			
			3			
80 -39.6	R7-NQ 5 ft 98%	60	NR		No Recovery 79.65-81.0' Limestone 81.0-85.9' - pale yellowish brown to light olive gray, (10YR 6/2 to 5YR 5/2), very fine to medium grained, moderate to strong HCl reaction, weak to strong (R2 to R4), voids (<1/16") over 40-60% of surface, moderately fossiliferous, many fossil molds/casts up to 2" diameter, trace cavities <1" diameter possible void space/cavity in fracture zone at 81.0-81.5', crystal infill, trace over surface except 82.0-82.5' over 50% of surface, trace organic laminations especially at 81.8' No Recovery 85.9-86.0' Limestone 86.0-89.5' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 20-40% of surface, highly fossiliferous with fossil molds/casts <1/2" diameter, trace cavities <1" diameter	Stop drilling for the day at 18:00 Resume drilling 5/17/07 07:30, water level at 3.0' below ground surface
			>10			
			3			
			0			
			1			
85 -44.6	R8-NQ 5 ft 70%	56	>10		No Recovery 89.5-91.0'	R7:5 minutes
			NR			
			2			
			1			
			0			
90 -49.6			>10			Driller's Remark: Light chatter (89.5-91.0') R8:7 minutes
			NR			
91.0						

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724300.1 N, 457447.2 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing


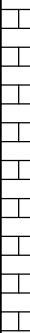


ORIENTATION : Vertical

WATER LEVELS : 1.4 ft bgs on 5/16/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Bitely, D. Whitaker

WATER LEVEL: 1.1833333333333333		DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		SYMBOLIC LOG	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					
95 -54.6	R9-NQ 5 ft 90%	64	0				Limestone 91.0-95.5' - pale yellowish brown to moderate yellowish brown transitioning to yellowish gray beyond 94.0', (10YR 6/2 to 10YR 5/4 to 5Y 8/1), fine to very fine grained, grain size fining with depth, weak to medium strong (R2 to R3) rock to 94.3', 93.46-93.05' and 94.3-94.7' extremely weak (R0) rock with red organic soils, 94.7-95.5' very weak to weak (R0 to R2) rock, 93.45-93.85' fracture zone with interbedded organic silts up to 3/4" in the beds, 93.45-93.85' fracture zone with poorly competent silts to no competent elastic silts (MH) up to 2" thick as beds, 91.0-93.45' voids (<1/16") over 50-60% of surface, highly fossiliferous with molds/casts <1" diameter, few cavities <3/4" diameter, moderate to strong HCl reaction, 93.45-93.85' fragments with organics interbedded, 93.85-94.3' no voids, no cavities, very fine grained medium strong (R3) rock; 94.3-94.7' fragments with silt/elastic silt interbedded; 94.7-95.5' voids (<1/16") over 10-50% of surface, few cavities <1/4" diameter, poorly fossiliferous	R9:8 minutes	
			2	92.1, 91.65, 93.45' - Bedding plane or mechanical break (3), <10 deg, rough, undulating, open <1/4"					
			>10	93.45-93.85' - Fracture zone, rough, undulating, organic zone, gravel-sized fragments <1" diameter					
			>10	94.1-94.7' - Fracture zone, smooth to rough, undulating, silt horizon, gravel-sized fragments <2" diameter					
			0						
			NR						
100 -59.6	R10-NQ 5 ft 100%	92	0				97.05' - Mechanical break or bedding plane, horizontal and 70 deg, rough, undulating, tight	R10:3 minutes	
			1						
			0						
			3	99.0, 99.15' - Fractures (2), undulating, intersecting fractures, tight to open <1/4"					
			1	99.5' - Mechanical break					
			1	99.7' - Mechanical break or bedding plane, horizontal, rough, undulating, tight					
105 -64.6	R11-NQ 5 ft 99%	73	5	100.85' - Mechanical break or bedding plane, horizontal, smooth, undulating, open <1/4"			No Recovery 95.5-96.0' Limestone 96.0-101.0' - pale yellowish brown to yellowish brown, (10YR 6/2 to 5YR 5/2), very fine to fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over <20-50% of surface (variable), trace organics, trace infill, trace laminated bedding, moderately fossiliferous with fossil molds/casts <1" diameter, trace cavities	R11:5 minutes	
			0	101.0, 101.1, 100.3, 101.6, 102.0' - Bedding plane or mechanical break (5), smooth, undulating, open <1/4"					
			10	103.0' - Fractures (>5), smooth, undulating, 5 plus intersecting fractures from one main fracture, 70 degrees with 0 degree minor , open <1/4"					
			0	103.6, 105.75' - Bedding plane or mechanical break (2), smooth, undulating, open <1/4"					
			1						
			NR						
110 -69.6	R12-NQ 5 ft 100%	70	3	106.3, 106.6, 106.9, 107.1, 107.5, 107.9, 108.25, 108.7, 109.05' - Bedding plane or mechanical break (9), 40 deg, smooth to rough, undulating, tight to open <1/4"			101.0-105.95' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, weak (R2), voids (<1/16") over 30% of surface, moderately fossiliferous with molds/casts <1/2" diameter, trace organics	R12:4 minutes	
			3						
			2						
			2	109.5' - Mechanical break					
			4						
			NR						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-02

SHEET 7 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724300.1 N, 457447.2 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.4 ft bgs on 5/16/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Bitely, D. Whitaker

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.
115 -74.6	R13-NQ 5 ft 98%	80	>10	109.55, 110.05, 110.65, 110.85, 111.0' - Bedding plane or mechanical break (5), 40 deg, smooth to rough, undulating, tight to open <1/4"		111.0-115.9' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, weak (R2), voids (<1/16") over <10% of surface, poorly fossiliferous, laminated bedding from 111.0-111.3'	R13:7 minutes
			0	111.0-111.8' - Bedding plane (>10), horizontal, smooth, undulating, tight to open <1/4"			
			1	113.0' - Bedding plane, horizontal, smooth, undulating, tight to open <1/4"			
			2	113.5' - Mechanical break			
			2	114.3' - Fracture or mechanical break, 80 deg, rough, undulating, tight to open <1/4"			
			0				R14:3 minutes
116.0			NR			No Recovery 115.9-116.0' Limestone	
			2	116.4, 116.8, 117.55, 117.65, 117.7, 117.8, 118.2' - Bedding plane or mechanical break (7), rough, undulating, tight to open <1/4"		116.0-120.95' - yellowish gray, (5Y 7/2), very fine to medium grained, strong HCl reaction, weak (R2), voids (<1/16") over 30% of surface increasing with depth, grain size and recrystallized texture increasing with depth, moderately fossiliferous with molds/casts <1/2" diameter, trace laminated organics, 10-20% cavities <1/2" diameter	
			4				
	R14-NQ 5 ft 99%	70	3	118.6' - Mechanical break			
120 -79.6			6	118.85, 119.1, 119.2, 119.3, 119.4, 119.5, 119.6' - Bedding plane or mechanical break (7), rough, undulating, tight to open <1/4"			R15:3 minutes
			1	120.2' - Mechanical break			
			NR	120.5' - Bedding plane or mechanical break, rough, undulating, tight to open <1/4"		No Recovery 120.95-121.0' Limestone	
			0			121.0-125.85' - yellowish gray, (5Y 7/2), fine to medium grained, strong HCl reaction, very weak to medium strong (R1 to R3), rock strength increasing with depth, highly fossiliferous from 122.8-125.7' with molds/casts and shells <1" diameter otherwise moderately fossiliferous, voids (<1/16") variable over surface from <10-20%, trace cavities <1/2" diameter	
			3	122.15, 122.25, 122.6' - Bedding plane or mechanical break (3), smooth to rough, undulating, tight to open <1/2"			
	R15-NQ 5 ft 97%	65	0	123.1, 123.6, 123.8' - Mechanical break			R16:3 minutes
125 -84.6			4	124.4, 124.55, 124.7, 124.9, 125.1, 125.4' - Bedding plane or mechanical break (6), smooth to rough, undulating, tight to open <1/2"			
			2				
			NR			No Recovery 125.85-126.0' Limestone	
			0			126.0-131.0' - yellowish gray to moderate yellowish brown, (5Y 7/2 to 10YR 5/4), very fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over 30-50% of surface, few cavities <1" diameter, moderately fossiliferous with molds/casts <3/4" in diameter	
			0	127.3, 128.5, 129.6, 130.8' - Mechanical break (4)			R16:3 minutes
	R16-NQ 5 ft 100%	100	0				
130 -89.6			0				
			0				
			0				
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PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-02

SHEET 8 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724300.1 N, 457447.2 E (NAD83)

ELEVATION : 40.4 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.4 ft bgs on 5/16/07

START : 5/15/2007

END : 5/17/2007

LOGGER : R. Bitely, D. Whitaker

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.
135 -94.6	R17-NQ 5 ft 100%	66	3	131.5, 131.7, 131.9, 132.1' - Bedding plane or mechanical break (4), <10 deg and horizontal, smooth to rough, undulating, tight to open <1/4"		Limestone 131.0-136.0' - yellowish gray to medium light gray, (5Y 7/2 to N6), very fine to medium grained, strong HCl reaction, weak to medium strong (R2 to R3), rock strength increasing with depth, voids <1/16" over 0-30% of surface, variable, <20% of core with laminated bedding, poorly fossiliferous with few fossil molds/casts <1/2" diameter, trace cavities <1/4" diameter	R17:4 minutes
			1				
			1	133.5' - Mechanical break			
			5	134.0, 134.25, 134.3, 134.4, 134.45, 135.05' - Bedding plane or mechanical break (6), <10 deg and horizontal, smooth to rough, undulating, tight to open <1/4"			
			1				
140 -99.6	R18-NQ 5 ft 93%	44	2	136.3, 136.45, 137.1, 137.35, 138.1' - Bedding plane or mechanical break (5), <10 deg, smooth to rough, undulating, tight to open <1/4"		136.0-140.65' - pale yellowish brown to yellowish gray, (10YR 6/2, 5Y 7/2), very fine to medium grained, strong HCl reaction, very weak (R1) to weak (R2) rock from 136.0-138.6', extremely weak to very weak (R0 to R1) rock from 138.6-139.5', weak to strong (R3 to R4) rock from 139.5-140.65', voids <1/16" over <20% of surface to 138.6', trace voids 138.6-140.65', moderately fossiliferous with fossil molds/casts <1/2" diameter, trace infill of cavities 136.0-138.6', many cavities up to 2" diameter some with infill No Recovery 140.65-141.0'	R18:4 minutes
			2				
			3	138.5' - Mechanical break			
			>10	138.6, 138.95, 139.1, 139.3' - Bedding plane or mechanical break (4), <10 deg, smooth to rough, undulating, tight to open <1/4"			
			1				
145 -104.6	R19-NQ 5 ft 94%	62	NR	141.0			
			4	141.1' - Fracture or mechanical break, vertical and 0-3 deg, rough, undulating, intersecting fractures, tight to open <1/4"		Limestone 141.0-145.7' - pale yellowish brown to yellowish gray, (10YR 6/2, 5Y 7/2), very fine to medium grained, strong HCl reaction, medium strong to strong (R3 to R4), voids <1/16" over <10-30% of surface, cavities 2" diameter over 20-40% of surface, few cavities with infill and subhedral crystal faces, highly fossiliferous with fossil molds/casts to 1" diameter, trace laminated bedding especially 144.45-144.7' No Recovery 145.7-146.0'	R19:5 minutes
			>10	141.8' - Bedding plane, <10 deg, rough, undulating, tight to open <1/4"			
			>10	142.3, 142.45, 142.55' - Fracture or mechanical break (3), <10 deg and 70 deg, rough, undulating, variable orientation, open <1/2"			
			2	142.9-143.2' - Fracture zone, rough, undulating, gravel-sized fragments <1" diameter			
			0	143.25' - Bedding plane or mechanical break, <10 deg and 10 deg, rough, undulating, open <1/2"			
150 -109.6	R20-NQ 5 ft 100%	92	NR	146.0		146.0-151.0' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids <1/16" over <10% of surface, few fossils <1/2" diameter, laminated bedding over <15% of surface, trace infill	Drilling completed 5/17/07 12:30 R20:4 minutes
			3	143.7-143.9' - Fracture zone, gravel-sized fragments <1" diameter			
			3	143.9, 144.5, 144.7' - Bedding plane or mechanical break (3), <10 deg and 10 deg, rough, undulating, open <1/2"			
			0	146.35, 146.5, 146.55, 147.2, 147.3, 147.7' - Bedding plane or mechanical break (6), <10 deg, smooth to rough, undulating, tight to open <1/2"			
			0	148.5' - Mechanical break			
			1	150.25' - Bedding plane or mechanical break, <10 deg, smooth to rough, undulating, tight to open <1/2"			
						Bottom of Boring at 151.0 ft bgs on 5/17/2007	



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-03
SHEET 1 OF 10	
SOIL BORING LOG	


PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)
 ELEVATION : 40.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0.1 ft bgs on 6/3/07 START : 6/3/2007 END : 6/6/2007 LOGGER : D. Whitaker

WATER LEVELS : 0.1105019.9.97		START : 03/2007		END : 03/2007		LOGGERS : D. Whitaker	
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
40.5	0.0	0.4	SS-1	0-1-1 (2)	Topsoil (OL) 0.0-0.1' - brownish black, (5YR 2/1), wet, very soft, 60% organic nonplastic fines, 40% roots/vegetative detritus		SS-1: first 6" = weight of hammer
	1.5						
					Poorly Graded Sand (SP) 0.1-0.4' - moderate yellowish brown, (10YR 5/4), wet, very loose, fine silica sand, 15% organics decreasing with depth		
5	5.0						
35.5		1.0	SS-2	2-5-5 (10)	Poorly Graded Sand (SP) 5.0-6.0' - yellowish gray grades to pale yellowish brown, (5Y 8/1 to 10YR 6/2), wet, very fine to fine grained, color grades at 5.6', silica sand with trace nonplastic fines increasing to 30% high plastic fines in brown material		
	6.5						
10	10.0						
30.5		1.3	SS-3	0-6-7 (13)	Silty Sand (SM) 10.0-11.8' - grades from grayish orange (10.0-10.5') to pale yellowish brown (10.5-10.8') to very pale orange (10.8-11.3'), (10YR 7/4 to 10YR 6/2 to 10YR 8/2), wet, medium dense, very fine to fine grained, iron staining (orangish red) from 10.0-10.8', silica sand, 30% nonplastic fines		SS-3: first 6" = weight of hammer
	11.5						
15	15.0						
25.5		1.3	SS-4	4-6-6 (12)	Silty Sand (SM) 15.0-16.0' - pale yellowish brown, (10YR 6/2), wet, medium dense, very fine to fine grained, silica sand with 20% nonplastic fines		
	16.5						
					Sandy Fat Clay (CH) 16.0-16.25' - pale yellowish brown, (10YR 6/2), wet, stiff, medium plasticity, no to slow dilatancy, 30-35% very fine silica sand		
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-03
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)
 ELEVATION : 40.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0.1 ft bgs on 6/3/07 START : 6/3/2007 END : 6/6/2007 LOGGER : D. Whitaker

WATER LEVELS : 0.11035019.9.97		START : 0.9.2007		END : 0.9.2007		LOGGERS : D. Whitaker	
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
20.5	20.0	1.3	SS-5	0-2-3 (5)	Fat Clay (CH) 20.0-20.45' - wet, stiff, no dilatancy, pale blue from 20.0-20.2', light olive gray from 20.2-20.45', (5G 6/2, 5Y 6/1), high plasticity fines, mild HCl reaction possibly from interbedded silt, one limestone fragment or concretion, no HCl reaction Silt (ML) 20.45-20.9' - very pale orange, (10YR 8/2), wet, soft, nonplastic, rapid dilatancy, mild HCl reaction, 5-10% very fine to fine sand-sized, carbonate materials Fat Clay (CH) 20.9-21.3' - Same as 20.2-20.45'		SS-5: first 6" = weight of hammer
	21.5						



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-03
SHEET 3 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)
 ELEVATION : 40.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0.1 ft bgs on 6/3/07 START : 6/3/2007 END : 6/6/2007 LOGGER : D. Whitaker

WATER LEVELS : 0.11035019.9.97			START : 0/3/2007		END : 0/9/2007		LOGGERS : D. Whitaker	
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	
0.5	40.0	0.7	SS-9	16-50/4 (66/10")	Silty Sand And Limestone Fragments (SM) 40.0-40.7' - yellowish gray, (5Y 7/2), wet, very dense, fine to coarse sand-sized, 35% low plastic fines, 40% of sample is limestone fragments from 40.0-40.2', mild HCl reaction from 40.2-40.7'			
	40.8							
45	45.0	0.2	SS-10	50/2.5 (50/2.5")	Limestone Fragments 45.0-45.2' - yellowish gray, (5Y 7/2), mild HCl reaction, coarse sand to fine gravel-sized material			
-4.5	45.2							
50	50.0	1.4	SS-11	0-3-2 (5)	Silty Sand (SM) 50.0-51.4' - yellowish gray, (5Y 7/2), wet, loose, fine to coarse grained, mild HCl reaction, 30% nonplastic fines, all carbonate		SS-11: first 6" = weight of hammer	
-9.5	51.5							
55	55.0	0.3	SS-12	50/4 (50/4")	Limestone Fragments 55.0-55.3' - yellowish gray, (5Y 7/2), mild HCl reaction, coarse sand to fine to coarse gravel-sized fragments			
-14.5	55.3							
60								



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-03
SHEET 4 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)
 ELEVATION : 40.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 0.1 ft bgs on 6/3/07 START : 6/3/2007 END : 6/6/2007 LOGGER : D. Whitaker

WATER LEVELS : 0.11 bgs on 9/3/07			START : 9/3/2007		END : 9/3/2007		LOGGERS : D. Whitaker	
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			
-19.5	60.0 60.8	0.8	SS-13	10-50/4 (60/10")	Limestone And Silt 60.0-60.8' - yellowish gray, (5Y 7/2), wet, hard, low plasticity, rapid dilatancy, mild HCl reaction, coarse sand to fine to coarse gravel-sized limestone fragments from 60.0-60.3' and 60.75-61.0', carbonate materials		Water level 0.1 ft below ground surface at 0742, 08:06 Set casing-HW casing to 60.0', 09:50 HW casing down 30.0', water gushing out top of casing above ground surface-continue setting casing, 10:08 hole caving, 15:50 only get 35.0' HW casing in	
65	65.0							
-24.5	65.3	0.3	SS-14	50/3 (50/3")	Limestone Fragments 65.0-65.3' - yellowish gray, (5Y 7/2), mild HCl reaction, coarse sand to fine to coarse gravel-sized fragments		Begin SS sampling again at 65.0' at 16:30	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-03

SHEET 5 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)

ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 6/3/07

START : 6/3/2007

END : 6/6/2007

LOGGER : D. Whitaker

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.
-29.5	70.0	67	1	70.05, 71.3, 71.8, 72.7' - Bedding plane or mechanical break (4), <10 deg, smooth to rough, undulating, open <1/2" with very fine-sized gravel infill except in fracture at 71.3'		Limestone 70.0-73.6' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 40% of surface, trace cavities >1/16", fossil molds No Recovery 73.6-75.0'	08:30 Install 0.0-70.0' NW casing, 10:46 water level = 0.2', Depth = 70.0', 12:00 Begin Rock Coring Driller's Remark: 72.0-72.5' and 73.0-74.5' soft R1: 6 minutes
			2				
			1	72.4-72.5' - Mechanical break, horizontal and 80 deg, tight			
			0				
			NR				
75	75.0	14	4	75.0-75.05' - Fracture zone, angular fine gravel		Limestone 75.0-77.2' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), strong HCl reaction 75.0-76.1' - very fine grained, medium strong (R3), voids (<1/16") over 5% of surface 76.1-77.2' - fine grained, very weak to extremely weak (R1 to R0), voids (<1/16") over 30% of surface, cavities throughout from fossil molds up to 1/2", 10% voids have recrystallization infill No Recovery 77.2-80.0'	Driller's Remark: 76.0-77.0' void R2: 6 minutes
-34.5			>10	75.2, 76.2, 76.3, 75.35' - Bedding plane or mechanical break (4), <10 deg, rough, undulating, 76.2' smooth and fine angular gravel in fracture (15 deg at 75.35') open <1/2"			
			>10	75.3' - Fracture or mechanical break, vertical, smooth, undulating, tight			
			NR	75.5' - Mechanical break			
			NR	76.45-77.2' - Fracture zone, smooth to rough, undulating, fine to coarse <2" diameter gravel, subangular			
80	80.0	0	>10	80.1, 80.8, 80.95' - Bedding plane (3), <10 deg, smooth to rough, undulating to stepped, open <1/2", eroded surfaces		Limestone 80.0-81.25' - moderate yellowish brown, (10YR 5/4), fine to medium grained, strong HCl reaction, strong (R4), voids (>1/16") over 40% of surface, up to 35% of core is cavity infill, trace cavities up to 1/4", fossil molds No Recovery 81.25-85.0'	Driller's Remark: 80.0-82.0' void, 82.0-83.0' soft, 83.0-84.0' rock, 84.0-85.0' void, at top of 85.0' felt rock (84.9-85.0') R3: 4 minutes
-39.5			>10	80.25-80.4, 80.55-80.7' - Fracture zone (2), very fine to coarse angular to subangular gravel-sized limestone			
			NR	81.0-81.35' - Fracture zone, very fine to coarse angular to subangular gravel-sized limestone			
			NR				
			NR				
85	85.0	22	>10	85.0-85.05' - Fracture zone, very fine angular gravel and coarse sand-sized material and silt, possible infill		Limestone 85.0-85.6' - very pale orange, (10YR 8/2), fine grained, strong HCl reaction, extremely weak (R0), voids (<1/16") over 15-25% of surface, fine cavities up to 3/16" diameter, trace fossils up to 1/16"x1/8" 85.6-88.2' - Same as 80.0-81.25' except very weak (R1) probably due to less recrystallization in voids and more cavities up to 3/4" No Recovery 88.2-90.0'	Driller's Remark: various soft spots throughout, could be silt or soft rock R4: 6 minutes
-44.5			>10	85.6-85.8' - Fracture zone, angular to subangular rock crush, fine to coarse gravel-sized, trace silt infill			
			>10	86.3-86.5' - Fracture zone, fine to coarse-sized subangular to subrounded fragments			
			>10	86.8, 87.0, 87.2' - Bedding plane or mechanical break (3), <10 deg, smooth to rough, undulating, tight except open <1/2" at 87.0'			
			NR				
90	90.0						



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-03	SHEET 6 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)

ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 6/3/07

START : 6/3/2007

END : 6/6/2007

LOGGER : D. Whitaker

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.
-49.5	R5-NQ 5 ft 79%	46	8	87.4-87.5, 87.85-88.2' - Fracture zone (2), fine to coarse-sized subangular to subrounded fragments		Limestone 90.0-90.35' - grayish orange, (10YR 7/4), fine grained, strong HCl reaction, extremely weak (R0), voids ($<1/16''$) over 15% of surface, 25% of rock has infilled molds or black organic material 90.35-91.3' - Same as 85.0-85.6' except 20-30% cavities up to 1-1/4" 91.3-93.95' - Same as 86.6-88.2' except cavities up to 1" No Recovery 93.95-95.0'	Driller's Remark: lost circulation at 90.0-110.0', 94.5-94.8' void R5: 5 minutes
			3	90.1, 90.2, 90.3, 90.4, 90.55, 90.7, 90.8, 91.0' - Bedding plane or mechanical break (8), <10 deg, smooth, undulating, tight to open $<1/2''$, 90.3' and 91.0' have fractured gravel-sized fragments in the fractures			
			1	91.35-91.45' - Fracture zone			
			2	91.5, 92.5, 93.8' - Bedding plane or mechanical break (3), <10 deg, smooth, undulating, tight to open $<1/2''$, 91.5' tight			
			NR				
95 -54.5	R6-NQ 5 ft 26%	0	6	95.0-95.1' - Bedding plane, 10 deg, rough, undulating, tight, eroded subrounded gravel fragments		Limestone 95.0-96.3' - grayish orange, (10YR 7/4), very fine to fine grained, strong HCl reaction, weak (R2), voids ($<1/16''$) over 5% of surface, trace cavities up to 1/4", light olive gray (5Y 5/2) clay/silty clay infill from 95.45-95.65' No Recovery 96.3-100.0'	Driller's Remark: 95.0-95.5' soft R6: 5 minutes
			2	95.25, 95.4' - Bedding plane or mechanical break (2), <10 deg, rough, planar to undulating, tight, open $<1/4''$ with fine gravel at 95.4'			
			NR	95.6' - Bedding plane, <10 deg, smooth, planar to undulating, 1" of infill, clay and fine to very fine gravel-sized fragments 95.75, 95.9' - Bedding plane or mechanical break (2), <10 deg, rough, planar to undulating, tight 96.1-96.2' - Fracture zone			
100 -59.5	R7-NQ 5 ft 10%	0	>10	100.0-100.1' - Fracture zone, trace black staining, subangular to subrounded, very fine to coarse-sized gravel		Limestone 100.0-100.5' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), very fine grained, strong HCl reaction, very weak (R1), voids ($<1/16''$) over 40% of surface, black organic staining, cavities up to 3/16", fossil molds, trace fossils $<1/8''$ No Recovery 100.5-105.0'	R7: 3 minutes
			NR	100.25' - Fracture, vertical and 70 deg, rough, undulating, black staining, trace (thin layer) silt/clay infill $<1/16''$, tight $<1/16''$ 100.4-100.5' - Fracture zone, trace black staining, very fine to coarse-sized subangular to subrounded gravel			
105 -64.5	R8-NQ 5 ft 30%	0	>10	105.1-105.4' - Fracture zone, angular to subangular, very fine to coarse gravel-sized fragments		Limestone 105.0-106.5' - yellowish gray to grayish yellow, (5Y 7/2 to 5Y 8/4), very fine to fine grained, very strong HCl reaction, extremely weak (R0), voids ($<1/16''$) over 30-40% of surface, many recrystallized fossil casts up to 3/16", few black possibly carbon or organic material up to 1/8", fossiliferous No Recovery 106.5-110.0'	R8: 2 minutes
			>10	105.4-106.5' - Bedding plane, smooth, undulating, open 1/4"-1", tight			
			NR				
110	110.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-03

SHEET 7 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)

ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 6/3/07

START : 6/3/2007

END : 6/6/2007

LOGGER : D. Whitaker

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.
-69.5	R9-NQ 5 ft 45%	23	2	110.05' - Bedding plane, <10 deg, smooth, planar, open <1/16"		Limestone 110.0-112.25' - grayish yellow to yellowish gray, (5Y 8/4 to 5Y7/2), very fine to fine grained, strong HCl reaction, extremely weak (R0), 111.5-111.8' silt and sand-sized material, voids (<1/16") over 50% of surface, 5+ cavities up to 9/16", few fossil molds	16:10 core barrel retriever is boud and is pulling casing with it, 16:14 got it out but have to pull out all core barrel - tip is blocked
			>10	110.2' - Bedding plane, <10 deg, smooth to rough, undulating, trace gravel fragments in fracture, open 1/2"-3/4"			
			3	111.4-111.9' - Fracture zone, medium sand to fine gravel-sized fragments, trace wet silt infill			
	R10-NQ 5 ft 0%	0	NR	112.1' - Bedding plane, <10 deg, rough, undulating, open 3/4" with rock fragments, eroded planes/surfaces		No Recovery 112.25-120.0'	R9: 3 minutes
				112.2' - Bedding plane, <10 deg, rough, undulating, open <1/4", eroded planes/surfaces			
115 -74.5	R11-NQ 5 ft 60%	0	>10	120.1, 120.2, 120.25, 120.6, 120.4, 120.9, 121.0' - Bedding plane or mechanical break (6), <10 deg, smooth, planar to undulating, tight to 3/4" at 120.4', sand-sized material to fine gravel-sized in most fractures due to soft core, breaks easily		Limestone 120.0-123.0' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), fine to medium grained, very strong HCl reaction, extremely weak (R0), voids (<1/16") over 25% of surface, trace cavities up to 3/16", 5% black organic material up to 1/2", many fossil molds, moderately to highly fossiliferous 121.1-121.9' - Same as 120.0-123.0' except loose material, wet, 70% silt, 30% fine to coarse sand No Recovery 123.0-125.0'	When core barrel was brought out after a struggle, there was not any recovery. May have dropped into borehole on way up.
			1	122.15-122.5, 122.8-123.0' - Bedding plane (2), <10 deg, smooth, planar to undulating, tight to 1/4", partings closely spaced			
			>10	122.5-122.8' - Fracture zone, fine angular to subangular gravel-sized fragments			
120 -79.5	R12-NQ 5 ft 66%	16	NR			Limestone 125.0-125.1' - Same as 120.0-123.0' 125.1-125.8' - light brownish gray, (5YR 6/1), fine to medium grained, strong HCl reaction, very weak (R1), voids (<1/16") over 50% of surface, cavities up to 3/8", highly fossiliferous, casts, molds, fossils 125.8-128.3' - Same as 120.0-123.0' except weak rock (R2) No Recovery 128.3-130.0'	R10: 3 minutes
			>10	125.0-125.2' - Fracture zone, fine to coarse-sized gravel and coarse sand-sized fragments, angular to subrounded			
			>10	125.3, 125.7, 125.8, 126.1, 126.2' - Bedding plane (5), horizontal, smooth to rough, planar, tight			
	R12-NQ 5 ft 66%	16	>10	125.85-126.0' - Fracture zone, fine to coarse-sized gravel and coarse sand-sized fragments, angular to subrounded			R11: 4 minutes
			2	126.1, 126.2' - Bedding plane (2), horizontal, smooth to rough, planar, tight			
			NR	126.4-126.5, 126.75-126.95' - Fracture zone, fine to coarse-sized gravel and coarse sand-sized fragments, angular to subrounded			
125 -84.5	R12-NQ 5 ft 66%	16	>10				Driller's Remark: 125.5-126.0' void, 127.5-128.0' soft, lost circulation at 127.0', 08:04 lots of chatter at 128.0'
			>10				
			>10				
125 -84.5	R12-NQ 5 ft 66%	16	>10				R12: 5 minutes
			>10				
			>10				
130 -84.5	R12-NQ 5 ft 66%	16	>10				
			>10				
			>10				
130	R12-NQ 5 ft 66%	16	>10				
			>10				
			>10				
130	R12-NQ 5 ft 66%	16	>10				
			>10				
			>10				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-03

SHEET 8 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)

ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 6/3/07

START : 6/3/2007

END : 6/6/2007

LOGGER : D. Whitaker

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.
-89.5	R13-NQ 5 ft 64%	20	4	126.95-127.75' - Bedding plane, horizontal, smooth to rough, planar, tight, partings (127.05-127.25'), 127.35-127.75' rock is eroded and rounded openings are up to <1-1/2" from rock's outer diameter to adjacent rock		Limestone 130.0-133.05' - yellowish gray, (5Y 8/1), very fine to fine grained, strong HCl reaction, very weak (R1), voids (<1/16") over 40% of surface, many have infill, cavities up to 3/8", casts/molds, moderately fossiliferous	R13: 5 minutes
			>10	128.2-128.3' - Bedding plane, horizontal and 86 deg, smooth, undulating			
			>10	130.0-130.1' - Bedding plane, horizontal, smooth, undulating, limestone fragments, very fine to coarse gravel-sized from 130.0-130.1'			
			1	130.8, 131.0, 131.35' - Bedding plane or mechanical break (3), <10 deg, smooth, undulating, tight to open 1/4"			
135	R14-NQ 5 ft 54%	0	NR	131.46-131.75' - Bedding plane, <10 deg, smooth, undulating, tight		Limestone 135.0-135.3' - yellowish gray, (5Y 8/1), fine grained, strong HCl reaction, weak (R2), voids over 5% of surface, poorly fossiliferous	R14: 4 minutes
-94.5			>10	131.75-131.9, 132.1-132.15, 132.6-133.05' - Fracture zone (3), angular to subangular gravel-sized limestone fragments			
			>10	132.35' - Fracture, 35 deg, smooth, undulating, limestone fragments in fracture, open 1/2"-1"			
			>10	135.0-135.2, 135.75-136.05' - Fracture zone (2), very fine to coarse angular to subrounded gravel sized limestone fragments and coarse sand sized material			
140	R15-NQ 5 ft 90%	38	NR	135.35, 135.45, 135.55, 135.7' - Bedding plane or mechanical break (4), <10 deg, smooth to rough, undulating, tight to 1/4"		135.5-135.8' - Same as 135.0-135.3' except very fine grained 135.8-135.95' - Same as 130.0-133.05' 135.95-136.5' - Same as 120.0-127.0' 136.5-137.7' - yellowish gray, (5Y 7/2), very fine to fine grained, extremely weak (R0), 50% limestone, 50% silt with sand-sized fragments, poorly fossiliferous, voids over 0-5% of surface No Recovery 137.7-140.0' Limestone 140.0-143.65' - grayish orange, (10YR 7/4), fine to medium grained, strong HCl reaction, weak (R2), voids (<1/16") over 5-10% of surface, fossiliferous with several molds/casts, cavities up to 1/2"	R15: 6 minutes
-99.5			2	135.9' - Fracture, 75 deg, smooth to rough, undulating, eroding fracture planes, gravel in fracture			
			8	136.0' - Bedding plane or mechanical break, <10 deg, smooth to rough, undulating, open 1/2" with fine gravel sand in fracture			
			>10	136.05' - Fracture, 65 deg, smooth to rough, undulating, eroding fracture planes, gravel in fracture			
	R16-NQ 5 ft 86%	45	>10	136.3, 136.6, 136.75' - Bedding plane or mechanical break (3), <10 deg, smooth to rough, undulating, tight to open 1/4" except at 136.6', open 1/2" with fine gravel sand in fracture		143.65-144.5" - very light gray, (N8), very fine grained, strong HCl reaction, strong (R4), moderately fossiliferous, trace small voids, few cavities, fossil molds up to 3/4" No Recovery 144.5-145.0' Limestone 145.0-145.2' - Same as 143.0-144.5' 145.2-147.0' - pale yellowish brown, (10YR 6/2), fine to medium grained, weak to medium strong (R2 to R3), voids (<1/16") over 25% of surface, 60-70% recrystallized surface/voids, cavities up to 1"x3/8", trace black organic material, poorly fossiliferous	R16: 9 minutes
145			>10	136.75-138.3' - rock has fissures/fractures vertically			
-104.5			>10	137.25' - Fracture, 85 deg, smooth to rough, undulating, eroding fracture planes, gravel in fracture			
			>10	140.45, 140.5, 141.4, 141.6-141.85, 142.06, 143.5, 143.7' - Bedding plane or mechanical break (8), <10 deg, smooth, planar to undulating, tight to open 1/4"			
	R16-NQ 5 ft 86%	45	3	142.6-142.8' - Bedding plane, <10 deg, smooth, undulating, tight		145.0-145.2, 146.25-146.65' - Fracture zone (2), angular to subrounded fine to coarse-sized gravel limestone fragments	
			2	143.5-143.7, 143.8-144.2' - Fracture zone (2), 75 deg, rough, undulating, limestone fragments between the two fractures			
			1	145.0-145.2, 146.25-146.65' - Fracture zone (2), angular to subrounded fine to coarse-sized gravel limestone fragments			
150			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-03

SHEET 9 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)

ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 6/3/07

START : 6/3/2007

END : 6/6/2007

LOGGER : D. Whitaker

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.
-109.5	R17-NQ 5 ft 96%	60	5	145.35' - Fracture, 30-35 deg, rough, undulating, open <1/4" with limestone fragments in fracture		Limestone 147.0-149.0' - very fine grained, very strong (R5), black organic lineations, voids over <5% of surface, 90% recrystallized surfaces, many cavities up to 3/8" 148.0-149.3' - Same as 125.8-128.3' No Recovery 149.3-150.0' Limestone 150.0-151.8' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine to medium grained, strong HCl reaction, weak (R2), highly fossiliferous with molds and casts (3/8"), voids (<1/16") over 40% of surface, strong rock (R4) from 158.5-154.8' No Recovery 154.8-155.0' Limestone 155.0-159.7' - Same as 150.0-154.8' except 155.0-156.4' strong rock (R4), 157.0-158.2' and 158.2-159.9' extremely weak rock (R0)	Driller's Remark: 153.0-153.5' void
			2	145.75, 145.85, 146.0, 148.5, 148.95, 149.0' - Bedding plane (6), <10 deg, rough, undulating to stepped, tight to 1/2", most with sand to fine gravel-sized limestone fragments in fractures			
			2	146.95, 147.05' - Fractures (2), 25 deg, rough, undulating, open <1/2" with limestone fragments in fractures			
			3	147.2, 147.5, 148.15' - Mechanical break (3)			
			1	150.3, 150.4, 150.45, 150.55, 150.85, 151.2, 151.75, 152.35, 152.55, 153.2, 154.4' - Bedding plane or mechanical break (11), <10 deg, smooth, planar to undulating, tight to <1/4"			
155	R18-NQ 5 ft 94%	22	NR	150.75-150.9, 151.42-151.6, 154.2-154.5' - Fracture zone (3)		No Recovery 159.7-160.0' Limestone 160.0-164.8' - Same as 150.0-154.8' and 155.0-159.2' except medium strong to strong (R3 to R4), 160.0-160.3' and other zones of recrystallized surface voids and limestone	R17: 6 minutes
-114.5			7	150.85-151.0' - Fracture zone, coarse gravel-sized			
			>10	151.1' - Fracture, 60 deg, rough, planar			
			2	152.4' - Mechanical break			
			>10	152.55, 153.0' - Bedding plane or mechanical break (2), <10 deg, smooth, planar to undulating, tight to <1/4"			
	R19-NQ 5 ft 96%	58	>10	152.9-153.65' - Bedding plane, <10 deg, smooth to rough, undulating, tight		No Recovery 164.8-165.0' Limestone 165.0-169.7' - Same as 150.0-165.0' except very fine grained and strong rock (R4) from 166.0-166.5'	R18: 8 minutes
			>10	153.1' - Fracture, 75 deg, smooth, undulating, 2 bedding plane fractures perpendicular at 153.05', rough, planar open <1/4"			
160			NR	155.25, 153.4, 155.6, 155.75, 155.9, 156.2, 156.28, 156.3, 156.4, 156.42, 156.6, 156.7, 156.8, 156.85, 156.9, 156.95, 156.97, 157.05, 157.9, 159.2, 159.5' - Bedding plane or mechanical break (21), <15 deg, smooth to rough, undulating, tight to <1/4"			
-119.5			1	160.3, 161.25, 161.5, 161.65, 161.7, 161.8, 161.95, 162.05, 162.2' - Bedding plane or mechanical break (9), <10 deg, smooth to rough, undulating, open up to <1/2", most open <1/4" or tight			
			2	162.25, 162.5' - Mechanical break (2)			
	R20-NQ 5 ft 94%	21	2	163.1, 163.6, 164.3, 164.5' - Bedding plane or mechanical break (4), <10 deg, smooth to rough, undulating, open up to <1/2", most open <1/4" or tight		No Recovery 169.7-170.0'	R19: 11 minutes
165			NR	165.0-165.1, 166.07-166.15, 166.5-166.6, 166.9-166.95' - Fracture zone (4)			
-124.5			3	165.75, 165.85, 166.07, 166.15, 166.35, 166.5, 166.6, 166.9' - Bedding plane or mechanical break (8), <10 deg, smooth to rough, planar to undulating, few are partings, tight to open 1/2", sand to fine gravel-sized limestone fragments in fracture			
			6				
			5				
	R20-NQ 5 ft 94%	21	5			No Recovery 169.7-170.0'	R20: 10 minutes
			5				
170			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-03

SHEET 10 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724068.0 N, 457449.3 E (NAD83)

ELEVATION : 40.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Daytona Beach, FL; Driller: A. Deghetani

CORING METHOD AND EQUIPMENT : CME 55 S/N 299205, mud rotary, NQ tools, NW/HW casing

ORIENTATION : Vertical

WATER LEVELS : 0.1 ft bgs on 6/3/07

START : 6/3/2007

END : 6/6/2007

LOGGER : D. Whitaker

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.
-129.5	R21-NQ 5 ft 40%	0	>10	166.95, 167.2, 167.4, 167.6, 167.7, 167.85, 168.1, 168.7, 168.2, 168.3, 168.5, 168.95, 169.05, 169.15, 169.17, 169.24, 169.3, 169.44' - Bedding plane or mechanical break		Limestone 170.0-172.0' - light olive gray, (5Y 5/2), weak (R2), voids (<1/16") over 25% of surface, few cavities up to 3/8", poorly fossiliferous, secondary infill in voids over 10-20% of surface No Recovery 172.0-175.0'	R21: 7 minutes
			>10	(18), <10 deg, smooth to rough, planar to undulating, few are partings, tight to open 1/2", sand to fine gravel-sized limestone fragments in fracture			
			NR	170.0-170.6, 171.0-171.2, 171.55-172.0' - Fracture zone (3), fine to coarse angular to subangular limestone fragments, 2% sand 170.7, 170.95, 171.2, 171.3, 171.4, 171.55' - Bedding plane or mechanical break (6), <10 deg, smooth, planar to undulating, open <1/2", sand in fractures			
175 -134.5	R22-NQ 5 ft 56%	8	>10	171.35' - Fracture, vertical, rough, planar 175.0-175.1, 175.2-175.4, 176.55-176.81, 177.1-177.5' - Fracture zone (4), fine to coarse angular to subangular gravel-sized limestone fragments		Limestone 175.0-177.8' - Same as 170.0-172.0' except weak to medium strong rock (R2-R3) No Recovery 177.8-180.0'	R22: 5 minutes
			>10	175.1, 175.2, 175.4, 175.85, 175.9, 175.55, 176.8, 177.3, 177.5' - Bedding plane (9), rough, undulating, sand/fine gravel in fractures, open up to 1"			
			NR	176.2, 176.3' - Bedding plane (2), rough, undulating, little sand in fractures, open <1/4"			
180 -139.5	R23-NQ 5 ft 28%	9	>10	180.0-180.91' - Fracture zone, fine to coarse gravel-sized angular to subrounded gravel		Limestone 180.0-181.4' - Same as 170.0-180.0' except from 180.9-181.4' fossiliferous with many molds and casts, voids (<1/16") over 50-60% of surface, many cavities up to 1"x1/2" No Recovery 181.4-185.0'	R23: Runtime not recorded
			0				
			NR				
185 -144.5						Bottom of Boring at 185.0 ft bgs on 6/6/2007	12:00 Last rock core completed, total depth is 185.0' below ground surface



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-04
SHEET 1 OF 9	
<h2 style="margin: 0;">SOIL BORING LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723824.3 N, 457384.0 E (NAD83)
 ELEVATION : 40.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.2 ft bgs on 5/31/2007 START : 5/31/2007 END : 6/1/2007 LOGGER : R. McComb

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
40.0	0.0	0.6	SS-1	2-4-5 (9)	Topsoil (OL) 0.0-0.6' - dark gray to grayish black, (N2 to N3), trace fine silica sand, abundant organic material		
	1.5						
5	5.0						
35.0		0.9	SS-2	6-7-6 (13)	Clayey Sand (SC) 5.0-5.9' - moderate yellowish brown and dark yellowish brown, (10YR 5/1 and 10YR 4/2), moist, medium dense, very fine to fine grained, silica sand, 25-30% low to medium plastic fines, trace root fragments		
	6.5						
10	10.0						
30.0		1.1	SS-3	7-9-12 (21)	Silty Sand (SM) 10.0-11.05' - pale yellowish brown, (10YR 6/2), wet, medium dense, 20% nonplastic to low plastic fines, fine silica sand		
	11.5						
15	15.0						
25.0		1.4	SS-4	6-8-10 (18)	Silty Sand (SM) 15.0-16.4' - Same as 10.0-11.05'		
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-04
SHEET 2 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723824.3 N, 457384.0 E (NAD83)
 ELEVATION : 40.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.2 ft bgs on 5/31/2007 START : 5/31/2007 END : 6/1/2007 LOGGER : R. McComb

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)					
20.0	20.0	1.2	SS-5	11-12-12 (24)	Silt Sand (SM) 20.0-21.2' - Same as 15.0-16.4'		
	21.5						
25	25.0						
15.0		0.9	SS-6	5-4-5 (9)	Silty Sand (SM) 25.0-25.9' - Same as 20.0-21.2'		
	26.5						
30	30.0						
10.0		1.5	SS-7	2-3-2 (5)	Silty Sand (SM) 30.0-31.5' - Same as 25.0-25.9'		
	31.5						
35	35.0						
5.0		1.4	SS-8	5-8-7 (15)	Sandy Lean Clay Or Sandy Organic Soil (CL-OL) 35.0-35.7' - dark gray to grayish black, (N3 to N2), moist, stiff, low to medium plasticity, slow dilatancy, 30% very fine silica sand		35.0-35.7' appears organic rich
	36.5				Silty Sand (SM) 35.7-36.4' - pale yellowish brown mottled with dark yellowish brown, (10YR 6/2 mottled with 10YR 4/2), wet, medium dense, very fine to fine silica sand, 30-35% low plastic fines		
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-04
SHEET 3 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723824.3 N, 457384.0 E (NAD83)
 ELEVATION : 40.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.2 ft bgs on 5/31/2007 START : 5/31/2007 END : 6/1/2007 LOGGER : R. McComb

WATER LEVELS : 3.2 TUBS ON 9/3/2007			START : 9/3/2007			END : 9/7/2007			LOGGERS : T. MCGRUB		
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			
0.0	40.0	0.8	SS-9	3-3-4 (7)	Sandy Organic Soil And Sandy Lean Clay (OL-CL) 40.0-40.8' - Same as 35.0-35.7' except grayish black, (N2), moist, medium stiff, low to medium plasticity, slow dilatancy, 30% very fine to fine silica sand						
	41.5										
45	45.0										
-5.0		1.5	SS-10	3-2-4 (6)	Silt And Sandy Organic Soil (ML-OL) 45.0-45.6' - moderate yellowish brown, (10YR 5/4), moist, medium stiff, nonplastic to low plasticity, rapid dilatancy, contact between lithologies abrupt and inclined; 70% ML, 30% OL, trace very fine silica sand, OL is grayish black (N2), moist, medium stiff, low to medium plastic, slow to rapid dilatancy, 20% very fine to fine silica sand Clayey Sand (SC) 45.6-46.5' - grayish black, (N2), wet, loose, very fine to fine grained silica sand, 25-30% low to medium plastic fines		45.6-46.5' appears organic rich				
	46.5										
50	50.0										
-10.0		1.2	SS-11	30-40-45 (85)	Silt (ML) 50.0-51.2' - moderate yellowish brown, (10Y 5/4), wet, hard, low plasticity, rapid dilatancy, mild HCl reaction, trace fine grained sand, carbonate material						
	51.5										
55	55.0										
-15.0		1.1	SS-12	8-5-12 (17)	Silty Sand With Limestone (SM) 55.0-56.1' - moderate yellowish brown, (10YR 5/4), wet, medium dense, fine to coarse grained, mild HCl reaction, 20-25% low plastic fines, 25% fine gravel-sized limestone fragments, carbonate materials			Driller's Remark: hard drilling at 53.5'			
	56.5										
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-04
SHEET 4 OF 9	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723824.3 N, 457384.0 E (NAD83)
 ELEVATION : 40.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.2 ft bgs on 5/31/2007 START : 5/31/2007 END : 6/1/2007 LOGGER : R. McComb

WATER LEVELS : 3.2 TUBS ON 3/3/2007		START : 3/3/2007		END : 3/7/2007		LOGGER : T. MCCLUNG	
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		
-20.0	60.0	0.9	SS-13	25-50/5.5 (75/11.5")	Silty Sand With Limestone (SM) 60.0-60.9' - Same as 50.0-51.2' except 35-40% fine gravel-sized limestone fragments		Driller's Remark: Depth to water 5.2' below ground surface
	61.0						
65	65.0						
-25.0	65.3	0.1	SS-14	50/3 (50/3")	Limestone Fragments 65.0-65.1' - dark yellowish brown, (10YR 4/2), mild HCl reaction, some black organic staining on bedding planes		Driller's Remark: soft drilling at 66.67', Rig chatter at 67.0' harder drilling
70	70.0						
-30.0	70.8	0.7	SS-15	26-50/3 (76/9")	Sandy Silt And Limestone Fragments (ML) 70.0-70.7' - pale yellowish brown, (10YR 6/2), wet, hard, low plasticity, rapid dilatancy, mild HCl reaction, 40% ML and 60% limestone, 25-30% fine to coarse sand-sized; fine to coarse gravel-sized limestone fragments, carbonate materials		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-04

SHEET 5 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723824.3 N, 457384.0 E (NAD83)

ELEVATION : 40.0 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.2 ft bgs on 5/31/2007

START : 5/31/2007

END : 6/1/2007

LOGGER : R. McComb

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			
-40.0	80.0	8	3	80.15' - Bedding plane, horizontal, smooth, open		Limestone Fragments 80.0-81.35' - light olive gray, (5Y 5/2), moderate HCl reaction, very weak to weak (R1 to R2), fossiliferous (voids, casts, molds), voids up to 1/16", some cavities generally <6/16"x6/16" Limestone 81.35-82.3' - pale greenish yellow, (10Y 8/2), fine to very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), <2% voids and cavities, variegated color with contact at 81.9' No Recovery 82.3-85.0' Limestone 85.0-90.0' - yellowish gray with pale greenish yellow mottling, (5Y 7/2 with 10Y 8/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), lithoclasts like fractures at 86.0-86.4' and 87.0-87.4' (light colored limestone with few voids); fossiliferous (casts and molds), voids and cavities up to 3/8"-3/4"x3/8" over 40-50% of surface	Switching over to NQ coring at 80.0'
			4	80.35' - Fracture, 30 deg, rough, stepped, black organic film over 15-20%, tight			
			10	80.6' - Fracture, 50-60 deg, rough, undulating, tight			
			NR	81.03' - Fracture, 0-80 deg, rough, stepped, tight			
		44		81.35' - Bedding plane, horizontal, smooth, stepped, open		81.35-82.3' - pale greenish yellow, (10Y 8/2), fine to very fine grained, strong HCl reaction, weak to medium strong (R2 to R3), <2% voids and cavities, variegated color with contact at 81.9' No Recovery 82.3-85.0' Limestone 85.0-90.0' - yellowish gray with pale greenish yellow mottling, (5Y 7/2 with 10Y 8/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), lithoclasts like fractures at 86.0-86.4' and 87.0-87.4' (light colored limestone with few voids); fossiliferous (casts and molds), voids and cavities up to 3/8"-3/4"x3/8" over 40-50% of surface	R1:7 minutes
				81.67, 81.8' - Bedding plane, horizontal, smooth, open			
				82.2' - Bedding plane, horizontal, smooth, open			
85	85.0	90	1	85.9' - Fracture or mechanical break, horizontal, rough, undulating, tight		85.0-90.0' - yellowish gray with pale greenish yellow mottling, (5Y 7/2 with 10Y 8/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), lithoclasts like fractures at 86.0-86.4' and 87.0-87.4' (light colored limestone with few voids); fossiliferous (casts and molds), voids and cavities up to 3/8"-3/4"x3/8" over 40-50% of surface	Core fell out upon retrieval, had to make multiple trips to get rock out of outer barrel
-45.0			1	86.6-87.75' - Fracture zone, vertical, rough, undulating, tight			
			2				
			3	88.4-88.8' - Fracture zone, 0-<5 deg, rough, undulating, tight to open			
		74	3	89.15-89.3' - Fracture zone, 0-90 deg, Undulating to stepped, tight to open		85.0-90.0' - yellowish gray with pale greenish yellow mottling, (5Y 7/2 with 10Y 8/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), lithoclasts like fractures at 86.0-86.4' and 87.0-87.4' (light colored limestone with few voids); fossiliferous (casts and molds), voids and cavities up to 3/8"-3/4"x3/8" over 40-50% of surface	R2:5 minutes
			0	89.6' - Fracture, 0-90 deg, rough, Undulating to stepped, open			
90	90.0		1	90.7' - Fracture, <5 deg, rough, undulating, tight			
-50.0			0				
		90	0			85.0-90.0' - yellowish gray with pale greenish yellow mottling, (5Y 7/2 with 10Y 8/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), lithoclasts like fractures at 86.0-86.4' and 87.0-87.4' (light colored limestone with few voids); fossiliferous (casts and molds), voids and cavities up to 3/8"-3/4"x3/8" over 40-50% of surface	R3:9 minutes
			1	93.4' - Bedding plane, horizontal, rough, undulating, tight			
			2				
95	95.0	74	1	94.6' - Fracture, horizontal, rough, undulating, tight		85.0-90.0' - yellowish gray with pale greenish yellow mottling, (5Y 7/2 with 10Y 8/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), lithoclasts like fractures at 86.0-86.4' and 87.0-87.4' (light colored limestone with few voids); fossiliferous (casts and molds), voids and cavities up to 3/8"-3/4"x3/8" over 40-50% of surface	R4:9 minutes
-55.0			0	94.9' - Fracture, horizontal, rough, undulating, tight			
			1	95.2' - Bedding plane, horizontal, smooth, undulating, open			
			2				
		74	1	97.5' - Bedding plane, <5 deg, rough, undulating, open		85.0-90.0' - yellowish gray with pale greenish yellow mottling, (5Y 7/2 with 10Y 8/2), fine grained, mild HCl reaction, very weak to weak (R1 to R2), lithoclasts like fractures at 86.0-86.4' and 87.0-87.4' (light colored limestone with few voids); fossiliferous (casts and molds), voids and cavities up to 3/8"-3/4"x3/8" over 40-50% of surface	R4:9 minutes
			2	98.5' - Bedding plane, horizontal, smooth, undulating, open, organic material			
			10	98.8' - Fracture, 20 deg, rough, undulating, tight			
			NR				
100	100.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-04

SHEET 6 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723824.3 N, 457384.0 E (NAD83)

ELEVATION : 40.0 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.2 ft bgs on 5/31/2007

START : 5/31/2007

END : 6/1/2007

LOGGER : R. McComb

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.
-60.0	R5-NQ 5 ft 88%	37	10	99.35' - Fracture zone, 0-90 deg, rough, Undulating to stepped, open		Limestone 95.0-98.4' - variegated light olive brown to yellowish gray, (5Y 5/6 to 5Y 7/2), fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), fossiliferous (mold/casts) with some organic fossiliferous particles at 95.4-95.7'; becoming interspaced with very fine grained limestone with depth, voids (up to 1/16") and cavities (up to 3/8"-3/4"x3/8") over 20-25% of surface Clay (CL) 98.4-98.45' - dark gray, (N3), strong HCl reaction, platy	R5:6 minutes
			4	100.0-100.3' - Fracture zone, 0-90 deg, smooth, open			
			4	100.7-100.9' - Fracture, 70 deg, rough, undulating, tight			
			1	101.2, 101.3' - Bedding plane (2), horizontal, smooth, undulating, open, black organic staining over 35%			
			10	101.8-102.5' - Fracture zone, 0-90 deg, rough, Stepped to undulating, open to tight			
			NR	102.65, 102.8, 102.98, 103.17' - Bedding plane (4), 0-<5 deg, rough, undulating, open			
105 -65.0	R6-NQ 5 ft 74%	33	4	104.1-104.4' - Fracture zone, 0-90 deg, open		Limestone 98.4-98.45' - dark gray, (N3), strong HCl reaction, platy Limestone 98.45-99.5' - very light gray, (N8), very fine grained, strong HCl reaction, weak (R2), some fossil voids and casts over 10% of surface No Recovery 99.5-100.0' Limestone 100.0-104.4' - yellowish gray, (5Y 8/1), fine to very fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), trace fossils as molds and casts, voids 3/8"x3/4" over 10-15% of surface, cavities <2% less than 3/8"x3/8", chalk-like texture, becoming very soft, extremely weak (R0) at 104.0', thick, laminated from 101.2-101.3' with some black organic material No Recovery 104.4-105.0' Limestone 105.0-108.7' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), fossiliferous (molds and casts), transition from trace to 20% increasing with depth, void and cavities ranging from <5% to 15-20% with depth, some original fossil material (echinoids) at 108.4-108.7' No Recovery 108.7-110.0' Limestone 110.0-113.3' - yellowish gray, (5Y 8/1 to 5Y 7/2), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), color transition at 112.2', voids (up to 1/16") over 5-10% of surface, fossiliferous casts/molds of original material (echinoids) suspended in matrix 113.3-114.9' - Same as 110.0-113.3' except cavities and voids more common covering 30-40% of surface, echinoids rare to absent No Recovery 114.9-115.0'	R6:6 minutes
			4	105.12' - Bedding plane, 0-<5 deg, smooth, Planar to stepped, open			
			4	105.3-105.95' - Fracture zone, 0-<5 deg, smooth, planar, open, fracture extending total length, extends from one side of contacts to the other side			
			1	105.95' - Bedding plane, horizontal, smooth, planar, tight to open			
			10	106.3' - Fracture, 30-40 deg, rough, stepped, tight			
			NR	106.5, 106.7, 106.95' - Bedding plane (3), horizontal, smooth, undulating, tight to open			
110 -70.0	R7-NQ 5 ft 98%	78	0	107.85' - Fracture, 0-90 deg, rough, stepped, tight		Limestone 108.2' - Bedding plane, <5 deg, rough, stepped, open	R7:7 minutes
			0				
			0				
			1				
			10	113.9' - Bedding plane, horizontal, rough, undulating, open			
			NR	113.9-114.1' - Fracture, vertical, rough, undulating, open			
115 -75.0	R8-NQ 5 ft 86%	74	2	114.1' - Bedding plane, 0-30 deg and 30 deg, rough, undulating, open		Limestone 114.5' - Bedding plane, horizontal, rough, planar, open 114.6-114.9' - Fracture zone, horizontal, rough, planar, limestone fragments, open 115.1' - Fracture zone, smooth, planar and undulating, limestone fragments 115.25, 117.55, 118.18, 118.53, 118.55, 119.3' - Bedding plane (6), smooth, undulating to planar, open	R8:8 minutes
			0				
			1				
			3				
			NR				
120	120.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-04

SHEET 7 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723824.3 N, 457384.0 E (NAD83)

ELEVATION : 40.0 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.2 ft bgs on 5/31/2007

START : 5/31/2007

END : 6/1/2007

LOGGER : R. McComb

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.
-80.0	R9-NQ 5 ft 88%	24	4	120-120.35' - Fracture, vertical, smooth, planar		Limestone 115.0-119.3' - yellowish gray to very pale orange, (5Y 8/1 to 10YR 8/2), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), "chalk-like" texture, zones where voids and cavities are nearly absent grades to zones/thin beds with voids up to 1/16" covering 20-30% (e.g. 116.1-116.2") cavities, <2% (more abundant near beginning of run, up to 3/8"x3/8"); fossil void to rate, becoming slightly more common at base of run No Recovery 119.3-120.0' Limestone 120.0-122.7' - Same as 115.0-119.3' 122.7-124.4' - Same as 120.0-122.7' except more voids/cavities up to 75-80% of surface covered with voids 1/16", cavities up to 3/8"-3/4"x3/8"-3/4", fossiliferous (molds/casts) No Recovery 124.4-125.0' Limestone 125.0-129.3' - Same as 122.7-124.4' except some thin laminations at base of interval 129.3-129.5' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, medium strong (R3), laminated bedding, thick, laminae incline 10-15 deg, 1 cavity 3/8"x3-7/8", voids less than 1/16" over 10-15% of surface, dense limestone No Recovery 129.5-130.0' Limestone 130.0-133.5' - yellowish gray, (5Y 8/1), strong HCl reaction, weak to very weak (R2 to R1), voids up to 1/16" or less over 5-10% of surface, rare cavities (3/16"x3/16"), trace fossil molds/casts; thin lamination in upper 0.1-0.2' of section No Recovery 133.5-135.0' Limestone 135.0-139.5' - Same as 130.0-133.5' except cavities and voids more frequent becoming fine to medium grained at 166.67' with some fossils, cavities becoming common with depth up to 3/8"-3/4"x3/8", some mottling (coating of limestone matrix) becoming extremely weak rock (R0) at 138.4' to 139.0', thick laminated from 138.0-139.5', few voids No Recovery 139.5-140.0'	R9:5 minutes
			2	120.35' - Fracture, 40 deg, rough, undulating, tight			
			7	120.55' - Fracture, 0-60 deg, smooth, planar, open			
			8	120.75' - Bedding plane, horizontal, undulating, open			
			4	121.35' - Bedding plane, horizontal, smooth, stepped, tight			
			NR	121.97, 122.25, 122.37, 122.7, 122.77, 122.87, 123.0, 123.15, 123.4, 123.5, 123.55, 123.63, 123.7, 123.82, 123.88, 123.9, 140.1, 140.2, 140.3, 140.45' - Bedding plane (20), horizontal, rough, undulating to stepped, open			
125 -85.0	R10-NQ 5 ft 90%	25	6	125.3, 125.47, 125.57, 125.67, 125.82, 125.96, 126.05, 126.12, 126.27, 126.32, 126.51, 126.65, 126.72, 126.90, 127.15, 127.25, 127.35, 127.48, 127.7, 127.78, 127.92, 128.0, 128.07' - Bedding plane or mechanical break (23), horizontal, rough, undulating to stepped, open			R10:7 minutes
			8				
			8				
			1				
			2				
			NR	129.3' - Bedding plane, 10-15 deg, smooth, planar, tight			
130 -90.0	R11-NQ 5 ft 70%	8	3	129.48' - Bedding plane, <5 deg, smooth, stepped, open			R11:7 minutes
			7	130.25, 130.58, 130.9, 131.2, 131.28, 131.5, 131.55, 131.64, 131.78, 131.97, 132.13, 132.35, 132.42, 132.47, 132.68, 132.92, 132.97, 133.05' - Bedding plane (18), horizontal, smooth, undulating to planar, open			
			7				
			2				
			NR				
135 -95.0	R12-NQ 5 ft 90%	0	5	135.1, 135.2' - Bedding plane (2), horizontal, smooth, undulating, open			R12:7 minutes
			7	135.3' - Bedding plane or fracture, 0-60 deg, rough, stepped to undulating, open			
			5	135.5-136.65' - Fracture zone, 0-90 deg, smooth, undulating, gravel			
			>10	136.72, 136.82, 136.92, 137.05, 137.27, 137.5' - Bedding plane (6), horizontal, rough, undulating, open			
			2	137.6' - Bedding plane or fracture, 0-50 deg, smooth, undulating, open			
			NR	138.04, 138.25, 138.4' - Bedding plane (3), horizontal, rough, undulating, open			
140				138.4-139.0' - Fracture zone, 0-90 deg, smooth to rough, undulating to stepped, open			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-04

SHEET 8 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723824.3 N, 457384.0 E (NAD83)

ELEVATION : 40.0 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.2 ft bgs on 5/31/2007

START : 5/31/2007

END : 6/1/2007

LOGGER : R. McComb

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.
-100.0	R13-NQ 5 ft 84%	10	5	139.25' - Bedding plane, horizontal, rough, stepped to undulating, open		Limestone 140.0-144.2' - variegated yellowish gray with gray laminae, (5Y 8/1 to 5Y 9/2), very fine to fine grained, strong HCl reaction, weak to very weak (R2 to R1), voids and cavities, 3-5% becoming 10-15% with depth, fossiliferous with trace echinoids in top portion, molds and casts increase with depth (5-10%), thick laminated 133.9-134.0'	R13:6 minutes
			6	140.3, 140.42, 140.6, 140.75, 140.95' - Bedding plane or mechanical break (5), horizontal, smooth, planar to undulating			
			6	141.18, 141.28, 141.33, 141.39, 141.5, 141.8' - Bedding plane or mechanical break (6), horizontal, smooth, planar to undulating			
			6	142.0, 142.08, 142.18, 142.46, 142.75, 142.9' - Bedding plane or mechanical break (6), horizontal, smooth, planar to undulating			
			2	143.05, 143.13, 143.65, 143.88, 143.95, 143.98' - Bedding plane or mechanical break (6), horizontal, rough, planar to undulating			
145	R14-NQ 5 ft 84%	10	NR	144.08, 144.18' - Bedding plane or mechanical break (2), horizontal, rough, planar to undulating		No Recovery 144.2-145.0' Limestone 145.0-147.1' - light gray to medium gray, (N7 to N6), very fine grained, strong HCl reaction, medium strong (R3), fossiliferous (molds and casts) over 3-5%, voids up to 1/16" over 3-5% of surface 147.1-149.2' - yellowish gray grading to medium gray with depth, (5Y 7/2 to N5), fine grained, mild to moderate HCl reaction, thinly laminated in upper 0.5', trace fossil molds/casts, 1 cavity 3/8"x2", voids up to 1/16" over 15-20% of surface, some dissolution features (cavities) at 148.2' as discontinuous bedding plane voids No Recovery 149.2-150.0' Limestone 150.0-150.9' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, moderate to mild HCl reaction, medium strong (R3), becomes thinly laminated with depth, voids up to 1/16" over 30-40% of surface with trace thin laminae of very fine limestone with few voids 150.9-151.8' - variegated yellowish gray, dusky yellow to light olive brown, (5Y 7/2, 5Y 6/4 to 5Y 5/6), coarse grained, strong HCl reaction, weak (R2), abundant possible lithoclasts (possible conglomeratic) Limestone 151.8-153.3' - dusky yellow to yellowish gray, (5Y 6/4 to 5Y 7/2), medium grained, weak (R2) 153.3-155.0' - Same as 150.0-150.9' except thinly laminated, voids up to 1/16" over 5-10%, mild to strong HCl reaction with depth, some early fracture development/dissolution at 154.7'	R14:6 minutes
-105.0			>10	145.0-147.25' - Fracture zone, 0-90 deg, limestone gravel, stepped, undulating, smooth to rough, open			
			>10				
			10	147.25' - Bedding plane, horizontal, rough, undulating, open			
			7	147.3, 147.45, 147.52, 147.92, 148.0, 148.05, 148.24, 148.65' - Bedding plane (8), 0-5 deg, undulating to planar, rough to smooth, some organic black coating over 70-80% of surfaces			
150	R15-NQ 5 ft 100%	90	NR	148.65-148.90' - Fracture zone			R15:6 minutes
-110.0			1				
			0	150.9' - Bedding plane, horizontal, rough, undulating			
			1	152.55' - Bedding plane, horizontal, rough, undulating, tight			
			14	153.25-153.4' - Fracture zone, 0-90 deg, rough			
	R16-NQ 5 ft 98%	76	1	153.5' - Bedding plane or fracture, horizontal, rough, planar, open			R16:8 minutes
155			0	153.5-153.85' - Fracture, 80-90 deg, rough, undulating, tight			
-115.0			1				
			7	156.4, 157.15, 157.25, 157.33, 157.52, 157.65, 157.73, 157.96' - Bedding plane (8), 0-5 deg, rough, undulating, open to tight			
			3	158.0, 158.15, 158.22' - Bedding plane (3), horizontal, smooth, undulating, open			
	R16-NQ 5 ft 98%	76	2	159.1' - Bedding plane, 0-5 deg, rough, undulating, open			Actual Not Recovered interval from 159.9-160.0'
160			NR	159.5' - Fracture, 50 deg, rough, stepped, tight			

338884.FL

BORING NUMBER:

GSC-04

SHEET 9 OF 9

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723824.3 N, 457384.0 E (NAD83)

ELEVATION : 40.0 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 5.2 ft bgs on 5/31/2007

START : 5/31/2007

END : 6/1/2007





LOGGER : R. McComb

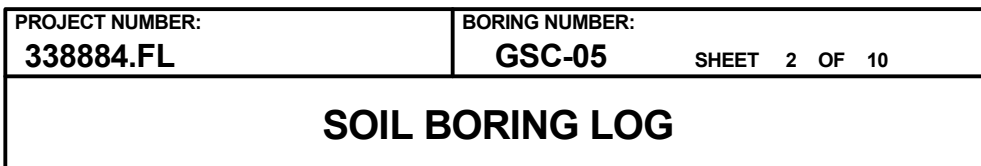
WATER LEVEL : 61.10 bgs on 6/1/2007		START : 6/1/2007		END : 6/1/2007		LOGGERS : M. MORGAN	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
		R Q D (%)	FRACTURES PER FOOT		DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, 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 155.0-157.25' - variegated yellowish gray to light gray brownish gray, (5Y 7/2 to N7), fine grained, mild to moderate HCl reaction, medium strong to weak (R3 to R2), competent, becoming thinly laminated with depth, fossil casts and molds over 5-10%, voids 10-15%, cavities 1/16"x3/16" showing alteration coloring, transitioned to lithology below, becoming light olive brown in color 157.25-158.2' - variegated yellowish gray to light olive brown to moderate brown, (5Y 7/2 to 5Y 5/2 to 5Y 4/4), fine to medium grained, mild to moderate HCl reaction, weak (R2), competent, very thinly laminated with possibly organic material, trace fossils, some voids and cavities over 10-15% of surface 158.2-159.1' - yellowish gray, (5Y 7/2), some medium gray (n7-n8) mottling, fine grained, mild HCl reaction, weak to medium strong (R2 to R3), competent, voids up to 1/16" over 2-3%, several cavities 3/16"x3/8" over <1%, fossiliferous (<1%), casts/molds (echinoids) 159.1-159.9' - yellowish gray to light olive brown, (5Y 7/1 to 5Y 8/1), fine to medium grained, moderate to strong HCl reaction, weak (R2), fossiliferous, voids/cavities over 10-15% of surface No Recovery 159.9-160.0' Bottom of Boring at 160.0 ft bgs on 6/1/2007		



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-05
SHEET 1 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723689.4 N, 457584.8 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 5-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.2 ft bgs on 5/5/07 START : 5/4/2007 END : 5/6/2007 LOGGER : N. Jarzyniecki

WATER LEVELS : 1.2 TUBES ON 9/3/07			START : 9/4/2007			END : 9/9/2007			LOGGERS : N. Gajzarski		
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						
41.3	0.0	1.2	SS-1	1-2-3 (5)	Topsoil 0.0-0.2' - olive black, (5Y 2/1), roots, organics		10:59 Begin drilling				
	1.5				Poorly Graded Sand With Organics (SP) 0.2-1.2' - pale yellowish brown grading to moderate yellowish brown at 0.95', (10YR 6/2 to 10YR 5/4), moist, loose, very fine to fine silica sand, trace nonplastic fines, 15% organics decreasing with depth		Driller's Remark: Hammer by M. Craus (manual with NWJ rod)				
5	5.0										
36.3		0.9	SS-2	3-2-2 (4)	Silty Sand (SM) 5.0-5.9' - pale yellowish brown to light olive gray, (10YR 6/2 to 5Y 6/1), moist to wet, very loose, very fine to fine silica sand, 25% nonplastic fines, becoming low plastic at 5.7'						
	6.5										
10	10.0										
31.3		0.9	SS-3	8-14-18 (32)	Silt (ML) 10.0-10.91' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 5-10% very fine sand-sized, carbonate materials						
	11.5										
15	15.0										
26.3	15.3	0.2	SS-4	50/3 (50/3")	Poor Recovery Limestone Fragments 15.0-15.2' - grayish orange, (10YR 5/4), moderate HCl reaction, fragments up to 1/2"						
20											



WATER LEVELS : 1.2 ft bgs on 5/5/07 START : 5/4/2007 END : 5/6/2007 LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-05
SHEET 3 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723689.4 N, 457584.8 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NWJ rods, 5-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.2 ft bgs on 5/5/07 START : 5/4/2007 END : 5/6/2007 LOGGER : N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		RECOVERY (ft)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
						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
1.3	40.0	0.8		SS-9	30-50/4 (96")	Sandy Silt With Limestone (ML) 40.0-40.85' - grayish olive mottled with olive gray, (10Y 4/3 with 5Y 3/2), wet, hard, low plasticity, rapid dilatancy, mild HCl reaction, 35-40% fine to coarse sand-sized, 20-25% of sample is fine to coarse limestone fragments, carbonate materials Begin Rock Coring at 41.0 ft bgs See the next sheet for the rock core log		Driller's Remark: 15:55 insert AWJ rod to clear out hole (with bit)
45 -3.7								
50 -8.7								
55 -13.7								
60								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-05

SHEET 4 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723689.4 N, 457584.8 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

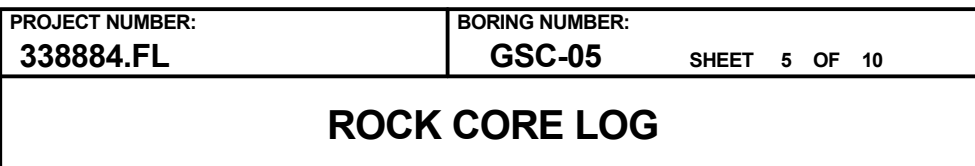
WATER LEVELS : 1.2 ft bgs on 5/5/07

START : 5/4/2007

END : 5/6/2007

LOGGER : N. Jarzyniecki

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.
41.0	R1-NQ 5 ft 92%	87	2	41.05' - Bedding plane, 10-25 deg, rough, undulating, open up to 1/2"		Limestone 41.0-45.6' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, moderate HCl reaction, voids (up to 1/8") over <5-30% of surface with interclasts at 41.0-41.9' and 44.5-45.6', from 41.0-44.5' trace fossils up to 1/8" and 44.5-45.6' moderately fossiliferous, casts and molds up to 1" from 43.3-45.6' infill of highly voided and moderately fossiliferous material of the same color, with infill increasing to more than 70% of surface at 44.5', 41.0-43.1' very weak (R1), 43.1-44.4' medium strong (R3), 44.4-45.6' weak (R2)	5/5/07 08:07 begin coring 08:00 water level = 1.2' below ground surface
			>5	41.7' - Bedding plane or mechanical break, 25 deg, rough, undulating			
			1	42.95-43.1' - Fracture zone, intersecting fractures, fragments to 1"			
			2	43.5' - Mechanical break			
			1	43.6' - Bedding plane or mechanical break, 15-20 deg, rough, undulating			
45 -3.7	R2-NQ 5 ft 98%	38	NR	44.5' - Bedding plane, <10 deg, rough, undulating, open up to 1/4"		No Recovery 45.6-46.0' Limestone 46.0-49.05' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), poorly competent, friable, organic laminar features (discontinuous) from 46.0-46.5', some (<5%) dissolution features up to 1/4" poorly fossiliferous, extremely weak (R0) voids up to 1/16" over <5% of surface	R1:6 minutes
			>10	44.8' - Bedding plane or mechanical break, 15-20 deg, rough, undulating			
			2	45.25' - Bedding plane or mechanical break, <5 deg, rough, undulating			
			>10	46.0-46.9' - Fracture zone, multiple intersecting fractures, fragments up to 4"			
			0	47.4, 47.6' - Bedding plane or mechanical break (2), <5 deg, rough, undulating			
50 -8.7	R3-NQ 5 ft 91%	66	NR	48.05' - Bedding plane or mechanical break, <5 deg, rough, undulating, open up to 1/8"		No Recovery 49.05-50.9' Limestone 49.05-50.9' - moderate HCl reaction, very weak to weak (R1 to R2), moderate to highly fossiliferous, casts up to 1"x1/2", voids to 1/16" over 15% of surface	R2:3 minutes
			2	48.5-48.7' - Fracture zone, multiple intersecting fractures, fragments up to 4"			
			0	48.95' - Bedding plane or mechanical break, <5 deg, rough, undulating, broken on edges of fractures open up to 1/2"			
			0	49.7' - Mechanical break			
			NR	51.15' - Bedding plane, 10 deg, rough, undulating, open up to 1/4"			
55 -13.7	R4-NQ 5 ft 78%	30	NR	51.75' - Bedding plane, with missing pieces (could be associated with dissolutions), open 1"		No Recovery 50.9-51.0' Limestone 51.0-54.5' - Same as 49.0-50.9' except fossils are moderate and up to 1/4", <1/16" voids over 20-30% of surface, infill of medium light gray (N6) and medium gray (N5) up to 1/8"x1/4", possibly breccia	R3:3 minutes
			0	53.5' - Mechanical break			
			>10	54.5-54.6' - Fracture zone, multiple intersecting fractures, 1" fragments			
			1	54.95' - Bedding plane, 25 deg, rough, undulating, open up to 1", associated dissolution and in softer material			
			NR	55.4' - Bedding plane, <5 deg, rough, undulating			
60 -18.7	R4-NQ 5 ft 78%	30	NR	56.3' - Fracture, 50 deg, rough, undulating, with silt-sized fragments		No Recovery 55.55-56.0' Limestone 56.0-58.5' - moderate yellowish brown, (10YR 5/4), fine grained, very mild HCl reaction, extremely weak (R0), voids (1/16") over 5-10% of surface with increasing voids and hardness with depth to 20% of surface, trace cavities <1/4" and weak rock (R2) below 57.3'	R4:4 minutes
			>5	56.5' - Bedding plane or mechanical break, <5 deg, rough, undulating, open			
			>5	56.75' - Bedding plane, 10 deg, rough, undulating, open up to 1/8"			
			4	57.1-57.3' - Fracture zone, intersecting fractures, up to 2" fragments			
			NR	58.7-59.0' - Fracture zone, intersecting fractures, up to 2" fragments, associated laminar organics			
61.0							



ORIENTATION : Vertical

LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-05	SHEET 7 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723689.4 N, 457584.8 E (NAD83)

ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.2 ft bgs on 5/5/07 START : 5/4/2007 END : 5/6/2007 LOGGER : N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
105 -63.7	R13-NQ 5 ft 86%	18	NR		Limestone 91.0-92.9' - very fine grained, trace voids (1/16") over 30% of surface increasing with depth, dusky yellowish brown (10YR 2/2), friable, 5-30% fossils increasing with depth, 92.3-92.8' clay infill very pale orange (10YR 8/2) 92.9-95.1' - yellowish gray, (5Y 7/2), very weak to medium strong (R1 to R3), highly fossiliferous casts to 1/2", voids over 20% of surface up to 1/16", dissolution features to 3"x1"	R13:2 minutes
			0			
			>10			
			>10			
			>10			
110 -68.7	R14-NQ 5 ft 99%	95	2			
			NR			
			0			
			0			
			0			
115 -73.7	R15-NQ 5 ft 100%	78	0		No Recovery 95.1-96.0' Limestone 96.0-100.9' - yellowish gray, (5Y 7/2), very fine grained, extremely weak to medium strong (R0 to R3), yellowish gray (5Y 8/1) to moderate yellowish brown (10YR 5/4) infill, voids up to 1/16" over 25% of surface, highly fossiliferous, casts and molds to 1/4", shallow dissolution features up to 2"x1-1/2"	R14:3 minutes
			0			
			0			
			0			
			0			
120 -78.7	R16-NQ 5 ft 100%	62	NR		No Recovery 100.9-101.0' Limestone 101.0-101.9' - yellowish gray mottled with pale yellowish brown, (5Y 7/2 with 10YR 6/2), very weak to extremely weak (R1 to R0), voids up to 1/16" over 15% of surface, fossiliferous casts and molds to 1/4", becomes softer with depth 101.9-105.3' - very fine to fine grained, competent, 5% trace organics, fossil molds up to 1/2", trace fossils, trace voids to 1/16", very weak (R1) at 105.1' No Recovery 105.3-106.0' Limestone 106.0-110.95' - Same as 101.0-101.9' except very weak to weak (R1 to R2), highly fossiliferous, fossil casts and molds, trace to 15% <1/16" sized infill of very pale orange (10YR 8/2) decreasing with depth, trace organic features No Recovery 110.95-111.0' Limestone 111.0-116.0' - Same as 96.0-100.9' except (5Y 8/1), yellowish gray (5Y 7/2) is mottled with yellowish gray infill, (5Y8/1), very weak (R1), infill poorly fossiliferous, trace (<5%) voids up to 1/16", infill is over 70-100% of surface at 111.0'	R15:5 minutes
			0			
			2			
			1			
			2			
121.0			2			R16:7 minutes
			0			
			2			
			0			
			0			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-05

SHEET 8 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723689.4 N, 457584.8 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.2 ft bgs on 5/5/07

START : 5/4/2007

END : 5/6/2007

LOGGER : N. Jarzyniecki

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.
125 -83.7	R17-NQ 5 ft 100%	20	0	119.4' - Mechanical break		116.0-121.0' - Same as 111.0-116.0' except from 116.0-118.1' highly fossiliferous and fine grained fossil casts and molds to 1/2", medium light gray (N6) infill over <10%, voids up to 1/16" over 20% of surface and 118.1-121.0' fine grained to very fine grained, size decreasing with depth Limestone 121.0-126.0' - Same as 111.0-116.0' except 124.4-124.75' is mottled with pale orange (10YR 8/2)	R17:2 minutes
			1	122.5' - Fracture, 45 deg, rough, undulating			
			1	123.15' - Bedding plane, <5 deg, rough, undulating, up to 1/4" open			
			>10				
			3	124.8-124.95' - Fracture zone, intersecting fractures, 1-1/2" fragments			
130 -88.7	R18-NQ 5 ft 100%	85	1	125.8-126.0' - Fracture zone, intersecting fractures, 1-1/2" fragments		126.0-131.0' - yellowish gray, (5Y 7/2), very fine to fine grained, very weak to weak (R1 to R2), grain size increasing with depth, <10-25% voids to 1/16", voids increasing with depth, moderately fossiliferous, fossils to 1/4", fossil size increasing with depth, trace dissolution zones to 1/2", 129.1-129.8' very fine to fine grained	R18:5 minutes
			0	126.75' - 80 deg, rough, undulating, open 1/8" to tight (missing very small fragments in part of fracture)			
			1	128.0' - Bedding plane, <5 deg, rough, undulating, up to 1/4" open			
			>10	129.1-129.8' - Bedding plane or mechanical break, <5 deg, rough to smooth, planar to undulating, tight, some have <1/8" open			
			1	130.3' - Bedding plane, <5-30 deg, rough to smooth, planar to undulating, (break changes in middle of fracture, smoothness and planar change with angle), <1/8" open			
135 -93.7	R19-NQ 5 ft 100%	85	0	131.8' - Mechanical break		131.0-136.0' - Same as 126.0-131.0' except from 132.2-132.7' fine and very fine grained, trace organic content, moderate to highly fossiliferous (casts and molds), 133.35' 1/4" bedding plane of very light gray (N8)	R19:8 minutes
			1	132.7' - Bedding plane, <10 deg, smooth to rough, undulating, up to 1/8" open			
			0	133.2, 133.5, 133.6' - Mechanical break (3)			
			1	134.05' - Bedding plane, 15-20 deg, rough, undulating, could be mechanical break due to drilling			
			1				
140 -98.7	R20-NQ 5 ft 98%	44	0	135.8' - Bedding plane, <5 deg, smooth, undulating, rock fragments		136.0-137.7' - Same as 131.0-136.0' except grades from moderate yellowish brown to yellowish gray (10YR 5/4 to 5Y 7/2), fine to very fine grained, extremely weak to weak (R0 to R1), very fine at 137.4', 1.2" thick moderate olive brown (5Y 4/4), trace voids to 1/16"	R20:10 minutes
			2	136.2, 136.3, 137.4' - Mechanical break (3)			
			>5	137.7' - Bedding plane, <5 deg, rough, undulating, 1/2" open			
			1	137.95-138.3' - Bedding plane, <5 deg, smooth to rough, planar, <1/8" open except for 138.3' with up to 1/4" open			
			0	138.5' - Mechanical break, along bedding plane			
			0	138.6' - Bedding plane, <5 deg, rough, undulating, 1/4" open			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-05

SHEET 9 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723689.4 N, 457584.8 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Crews

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

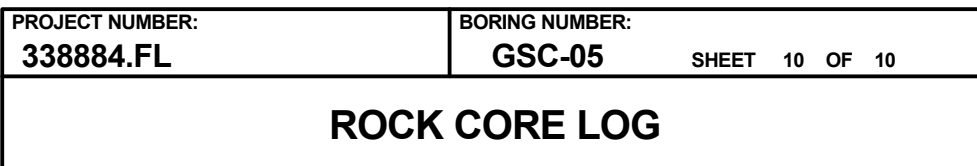
WATER LEVELS : 1.2 ft bgs on 5/5/07

START : 5/4/2007

END : 5/6/2007

LOGGER : N. Jarzyniecki

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.
145 -103.7	R21-NQ 5 ft 82%	30	NR >10 5 >10 >10 0 NR	139.3' - Bedding plane, <5 deg, rough, undulating, open 140.15' - Fracture, 45 deg, rough, undulating, open 141.0-141.25' - Fracture zone, intersecting fractures, fragments 1", organic stain 141.6, 141.8' - Bedding plane (2), 10-20 deg, rough, undulating, organic stain, up to 1/4" open associated dissolution features 141.7' - Fracture, 85 deg, rough, undulating, organic stain, open to 1/8" 142.1' - Bedding plane, <5 deg, rough, undulating, organic stain 142.4, 142.5, 142.6' - Bedding plane (3), <5 deg, rough, undulating, up to 1/8" open 142.9' - Bedding plane, <5 deg, rough, undulating, up to 1/2" open 143.1-143.4' - Fracture zone, intersecting fractures, fragments to 1-1/2", organic stain 144.0-144.2' - Fracture zone, intersecting fractures, pieces to 1-1/2", organic stain 144.4' - Bedding plane, <5 deg, rough, undulating, up to 1/2" 144.7' - Bedding plane, <5 deg, rough, undulating, organic stain 144.9' - Bedding plane, 5 deg, rough, undulating, up to 1/4" open 146.35' - Bedding plane, <5 deg, smooth to rough, undulating, up to 1-1/2" open 147.1' - Fracture, 60 deg, rough, undulating 148.5' - Bedding plane, 10 deg, rough, undulating, up to 1/2" open 149.3, 149.45' - Fractures (2), 75-80 deg, rough, undulating 149.65' - Bedding plane, 20 deg, rough, undulating, open <1/8" 149.9' - Bedding plane, <5 deg, rough, undulating 150.25-150.4' - Fracture zone, intersecting fractures, 1" fragment 150.6-150.8' - Fracture zone, intersecting fractures, 1" fragment 151.15-151.3' - Fracture zone, intersecting fractures up to 1" 151.4, 151.6' - Bedding plane, <5 deg, rough, undulating, open up to 1/2" 151.8' - Bedding plane, <5 deg, rough, undulating, up to 1/8" open 151.9-152.2' - Fracture zone, fragments to 2" 152.5' - Fracture, 65-70 deg, smooth, undulating, organic stain 152.6' - Bedding plane, <5 deg, rough, undulating, organic stain, <1/8" open 152.8' - Bedding plane, <5 deg, rough, undulating, associated with dissolution zone 153.3' - Fracture, 65-70 deg, smooth, undulating 154.4' - Fracture, 65-70 deg, smooth, undulating 154.8' - Fracture, 65-70 deg, smooth, undulating		Limestone 137.7-138.3' - moderate olive brown, (5Y 4/4), very fine grained, medium strong (R3), voids (up to 1/16") over 20% of surface, moderate fossils (casts) to 1/4"; interbedded with medium light gray (N6) with trace voids to 1/16", poorly fossiliferous 138.3-140.9' - Same as 131.0-136.0' except grades from poorly fossiliferous to moderate to high fossils, fossils up to 1/4" grades from trace voids (<1/16") to voids (1/16") over 10% of surface, interbeds of light olive gray (5Y 5/2) up to 1/2" thick, interbed (discontinuous or could be infill) at 138.75' very light gray (N8) and infill of same material seen in interbeds of light olive gray (5Y 5/2) at 140.15' that is 2" thick No Recovery 140.9-141.0' Limestone 141.0-144.2' - light gray to light olive gray, (N7 to 5Y 6/1), very fine grained, weak to medium strong (R2 to R3), voids (up to 1/16") over 10-15% of surface, fossils up to 1/4", dissolution features up to 2"x1/2", dusky yellow (5Y 6/2) infill very fine grained, voids over 25%, few 1/4"-1/2" dissolution features 144.2-145.1' - moderate yellowish brown with wavy light olive gray beds, (10YR 5/4 with 5Y 5/2), up to 1/2" thick and a 1-1/2" thick medium light gray (N6) bed, dusky yellow and light olive gray has 20-30% voids up to 1/16", fossils to 1/8" No Recovery 145.1-146.0' Limestone 146.0-150.8' - moderate yellowish brown to yellowish gray, (10YR 5/4 to 5Y 7/2), fine to very fine grained, grain size increasing with depth, appears to have breccia clasts, yellowish gray (5Y 7/2), pale olive (10YR 6/2) and light gray (N7), moderately fossiliferous up to 1/4", at 148.9' abrupt change to light olive gray (5Y 6/1), very fine grained, strong to very strong (R4 to R5), trace voids to 20%, voids increase with depth, poorly fossiliferous with bedding features at 150.05-150.35' yellowish gray (5Y 8/1), olive gray (5Y 3/2) and pale yellowish brown (10YR 6/2) No Recovery 150.8-151.0' Limestone 151.0-152.8' - Same as 137.7-138.3'	R21:11 minutes
150 -108.7	R22-NQ 5 ft 96%	62	1 1 1 4 >10 NR				R22:11 minutes
155 -113.7	R23-NQ 5 ft 90%	56	>10 >5 1 2 2 NR				R23:8 minutes
							11:10 water level 3.0'
							11:11 grout hole, used 31 bags of grout



ORIENTATION : Vertical

LOGGER : N. Jarzyniecki

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-06

SHEET 1 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 4/17/07

START : 4/17/2007

END : 4/19/2007

LOGGER : C. Wallestad

WATER LEVELS : 2.5' RDGS ON 4/17/07			START : 4/19/2007			END : 4/19/2007			LOGGERS : C. Wallestad		
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						
42.5	0.0	1.1	SS-1	1-2-2 (4)	Poorly Graded Sand (SP) 0.0-0.8' - very light gray to brownish gray, (N8 to 5YR 4/1), brownish gray mottling, moist, soft, very loose, fine grained, no HCl reaction, silica sand, dark mottling (organics) and 5% organics as roots and debris Sandy Organic Soil (OL) 0.8-1.1' - brownish black, (5YR 2/1), moist, no HCl reaction, organic matter and/or nonplastic silt, 20% fine silica sand, organics as roots		Encountered water between 0.8' and 5.0', water level at 2.5' below ground surface at 14:15				
	1.5										
5	5.0										
37.5	6.5	1.2	SS-2	1-3-4 (7)	Silty Sand (SM) 5.0-6.2' - moderate yellowish brown, yellowish gray, (10YR 5/4, 5Y 8/1), wet, loose, fine grained, nonplastic, moderate yellowish brown transitioning to yellowish gray, fine silica sand with 20-30% fines						
10	10.0										
32.5	11.5	0.8	SS-3	2-4-14 (18)	Silty Sand (SM) 10.0-10.2' - yellowish brown, (5Y 7/2), wet, medium dense, fine grained, no HCl reaction, fine silica sand with 20% plastic fines Clayey Sand (SC) 10.2-10.75' - yellowish gray, (5Y 8/1), wet, medium dense, fine to coarse grained, low to medium plasticity, moderate HCl reaction, 30% low to medium plastic fines, one coarse gravel-sized limestone fragment, organic lens from 10.55-10.6'		Driller's Remark:11.5-15.0' heavy chattering				
15	15.9										
27.5	0.1	SS-4	50/1.5 (50/1.5")	Silt (ML) 15.0-15.1' - grayish yellow, (5Y 8/4), moist, nonplastic, rapid dilatancy, moderate HCl reaction, (5-10%) very fine sand-sized limestone fragments with coarse sand-sized to fine gravel-sized, carbonate materials			Driller's Remark:15.2-16.0' heavy chattering				
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-06
SHEET 2 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.5 ft bgs on 4/17/07 START : 4/17/2007 END : 4/19/2007 LOGGER : C. Wallestad

WATER LEVELS : 2.510050 ft 4/17/07			START : 4/17/2007			END : 4/19/2007			LOGGERS : G. Wallenda		
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				
22.5	20.0	0.2	SS-5	50/2 (50/2")	Limestone Fragments 20.0-20.2' - grayish yellow, (5Y 8/4), strong HCl reaction, fragments to 3/16" in size						
25	25.0										
17.5		1.1	SS-6	28-30-45 (75)	Silty Sand (SM) 25.0-26.1' - grayish orange, (10YR 7/4), moist, very dense, mild to moderate HCl reaction, fine to coarse sand-sized and trace gravel-sized, 35% nonplastic fines						
	26.5										
30	30.0										
12.5		0.9	SS-7	20-13-8 (21)	Silty Sand (SM) 30.0-30.85' - Same as 25.0-26.1' except moderate to strong HCl reaction, grayish yellow limestone (10YR 7/4), from 30.7-30.85' and very stiff, not hard						
	31.5										
35	35.0										
7.5	35.2	0.2	SS-8	50/2.5 (50/2.5")	Silty Sand (SM) 35.0-35.15' - Same as 25.0-26.1'						
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-06

SHEET 3 OF 11

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 4/17/07

START : 4/17/2007

END : 4/19/2007

LOGGER : C. Wallestad

WATER LEVELS : 2.5 (0.0) to 41.7 (0.7)			START : 4/17/2007			END : 4/19/2007			LOGGERS : C. Wallenda		
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						
2.5	40.0	0.1	SS-9	50/1 (50/1")	Limestone Fragments 40.0-40.1' - pale yellowish brown, (10YR 6/2), moderate HCl reaction, carbonate		Driller's Remark: Heavy chatter throughout except no chatter at 41.0-41.5'				
45 -2.5	45.0 45.2	0.2	SS-10	50/2 (50/2")	Silty Sand And Limestone (SM) 45.0-45.2' - light olive gray, (5Y 5/2), wet, very dense, fine to coarse grained, moderate HCl reaction, fine to coarse sand-sized, 20-25% fines, 40% of sample is coarse sand to fine gravel-sized limestone fragments						
50 -7.5	50.0										
	51.5	1.3	SS-11	45-25-40 (65)	Silty Sand And Limestone (SM) 50.0-51.25' - moderate yellowish brown, (10YR 5/4), wet, very dense, fine grained, moderate HCl reaction, 20-25% low plastic fines, 35-40% of sample is coarse sand to fine gravel-sized limestone fragments						
55 -12.5	55.0										
	57.1	0.2	SS-12	7/1-1/24 (8/25")	Limestone And Silty Sand (SM) 55.0-55.2' - Same as 50.0-51.25' except 60% of sample is limestone, 40% of sample is silty sand		Driller's Remark: During SPT for SS-12, spoon fell 2.0' after 7 blows over 1 inch, possible 2' void at 55.1'				
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-06
SHEET 4 OF 11	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.5 ft bgs on 4/17/07 START : 4/17/2007 END : 4/19/2007 LOGGER : C. Wallestad

WATER LEVELS : 2.5 TUBS ON 4/17/07			START : 4/17/2007		END : 4/19/2007		LOGGERS : C. Waltestad	
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	
-17.5	60.0	1.2	SS-13	42-32-50/4.5 (82/10.5)	Silty Sand And Limestone (SM) 60.0-61.2' - Same as 50.0-51.25' except 45-50% fine to coarse limestone fragments, 30% fine to coarse sand-sized, 20-25% low plastic fines		Finished drilling at 17:48 on 4/17/07, setting HW casing to 61.0' below ground surface	
	61.4				Begin Rock Coring at 61.5 ft bgs See the next sheet for the rock core log			
65 -22.5								
70 -27.5								
75 -32.5								
80								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-06

SHEET 5 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 4/17/07

START : 4/17/2007

END : 4/19/2007

LOGGER : C. Wallestad

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.
61.5	R1-NQ 5 ft 86%	32	2	61.7' - Mechanical break		Limestone 61.5-65.8' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, extremely weak to weak (R0 to R2), rock strength increasing with depth, voids, to 3/16" over 20-30% of surface, moderately fossiliferous with casts to 1/4"-1/2", dissolution cavities to 1/2"x1" over 5-15% of surface, (dark possibly organic) material over 5-10% as of surface from 61.5-62.3'	Resume drilling at 07:45 at 4/18/07 with rock coring Water level is 2.5' below ground surface
			4	62.0, 62.1, 62.65, 62.85, 63.15, 63.3, 63.75, 64.15, 65.4, 65.55' - Bedding plane or mechanical break (10), horizontal, smooth, undulating, tight to 1/8" open			
			2	62.35' - Mechanical break			
65 -22.5			1				
			1				
66.5	R2-NQ 5 ft 91%	52	NR			No Recovery 65.8-66.5' Limestone 66.5-71.05' - Same as 61.5-65.8' except very weak to weak (R1 to R2), no dark/organic material, and all very weak to weak rock (R1 to R2)	R1:2 minutes
			10	66.5-66.8' - Fracture zone			
			1	67.1, 68.4, 68.9, 69.6, 70.5' - Bedding plane or mechanical break (5), smooth, undulating, tight to 1/8" open			
70 -27.5			3	69.1, 69.2, 69.85, 69.95, 70.4' - Bedding plane or mechanical break (5), rough, undulating, tight to 1/2" open			
			6	70.15, 72.5, 72.75, 73.0, 75.05, 75.55' - Bedding plane or mechanical break (6), horizontal, smooth, undulating, tight			
71.5	R3-NQ 5 ft 98%	66	1	70.35' - Fracture or mechanical break, rough, undulating		No Recovery 71.05-71.5' Limestone 71.5-76.4' - Same as 61.5-65.8' except no dark, possibly organic material, dissolution cavities to 1"x1/2" over 5% surface, extremely weak rock (R0) from 72.2-72.6' and 72.9-73.4' and increasing to moderately strong rock (R3) with depth	R2:3 minutes
			NR				
			1				
75 -32.5			4	73.25, 73.6, 73.75' - Bedding plane or mechanical break (3), <10 deg, rough, undulating, tight, 1/2" open			
			2	74.0' - Mechanical break			
76.5	R4-NQ 5 ft 64%	25	1			No Recovery 76.4-76.5' Limestone 76.5-77.35' - moderately yellowish brown to grayish orange, (10YR 5/4 to 10YR 7/4), medium grained, moderate HCl reaction, very weak to medium strong (R1 to R3), voids to 1/8" over 15-30% of rock, poorly fossiliferous with trace casts to 1/16" x3/16", trace dissolution cavities to 2"x1"	R3:9 minutes
			NR	76.6, 77.35, 77.55, 77.8, 78.4, 78.9, 79.9' - Bedding plane (7), horizontal, smooth, undulating, tight to 1/8" open			
			2	77.8-78.15' - Fracture zone, fragments to 1"x2"			
80 -37.5			10	78.25' - Fracture, 80 deg, smooth, undulating, open			
			3	79.0' - Bedding plane or mechanical break, <10 deg, rough, undulating, 1/2"-1" open			
81.5			1	79.5' - Fracture, 80 deg, smooth, undulating, tight			
			NR				R4:7 minute



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-06	SHEET 6 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 4/17/07 START : 4/17/2007 END : 4/19/2007 LOGGER : C. Wallestad

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			
85 -42.5	R5-NQ 5 ft 76%	28	3	81.55,82.55,83.3,84.0' - Bedding plane or mechanical break (4), horizontal, rough, undulating, 1/4" open to open		Limestone 77.35-79.1' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), fine to medium grained, strong HCl reaction, weak to medium strong (R2 to R3), voids to 1/8" over 5-20% of surface, poorly fossiliferous with trace fossil casts to 1/8"x1/8", dissolution cavities to 1"x1/2" (trace)	Driller's Remark: Void at 81.5-82.0 (dropped stem), 100% loss of circulation
			10	81.95, 82.4, 83.15' - Bedding plane or mechanical break (3), 10-20 deg, rough, undulating, tight to 1/2" open			
			4	82.4-83.8, 83.3-83.8' - Fracture zone (2), fragments to 1"x3"			
			10	84.1' - rough, 2 intersecting near vertical fractures, undulating			
			NR	84.7-85.3' - Fracture zone, fragments to 1-1/2"x3", fractures at 70-90 deg		No Recovery 79.7-81.5'	
86.5						Limestone 81.5-85.3' - Same as 79.1-79.7'	R5:5 minutes
			10	86.5-86.65' - only recovered rock		No Recovery 85.3-86.5'	
90 -47.5	R6-NQ 5 ft 3%	0	NR			Limestone 86.5-86.65' - Same as 79.1-79.7'	
						No Recovery 86.65-91.5'	
91.5							Driller's Remark: Core blockage caused no recovery for core run R6 R6:25 minutes
95 -52.5	R7-NQ 5 ft 94%	44	10	91.65, 92.9, 94.05, 94.5' - Bedding plane (4), horizontal, smooth, undulating to planar, tight to 1/2" open		Limestone 91.5-94.1' - yellowish gray, (5Y 7/2), very fine to fine grained, strong HCl reaction, medium strong (R3), voids to 1/16" over 5-10% of surface, trace fossil casts to 3/16", trace cavities to 1-1/2"x1/16", with poorly competent infill, silty layer at 91.9-92.0' and 92.5-92.65'	
			10	91.65-92.0' - Fracture zone, fragments to 1-1/2"x2", some silt infill			
			10	92.5-92.8' - Fracture zone, fragments to 1-1/2"x1-1/2", silt and coarse sand infill, 92.5-92.65'			
			1	93.25, 93.3, 93.55' - Fracture zone or mechanical break (3), 70 deg, undulating to stepped, smooth to rough			
			0	93.5' - Fracture, 80 deg, smooth, undulating, dark staining, tight			
			NR	93.75' - Fracture, as above at 93.5' except 20 deg			R7:21 minutes
96.5							
			2	94.1-94.25' - Fracture zone			
			0	95.7' - Fracture, 40 deg, smooth, planar, silty infill, tight		No Recovery 96.2-96.5'	
			1	96.55, 96.6' - Bedding plane (2), 0-10 deg, smooth, undulating to stepped, dark staining (possibly organics), infill, tight		Limestone 96.5-101.5' - Same as 94.1-96.2' except trace cavities with light colored infill to 1"x1-1/2"	
100 -57.5	R8-NQ 5 ft 100%	97	1	99.4' - Mechanical break or fracture, 30 deg, rough, undulating, tight to 1/4" open			
			1	100.1' - Fracture, at 99.4' except very rough and undulating			
			0				R8:7 minutes
101.5							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-06

SHEET 7 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 4/17/07

START : 4/17/2007

END : 4/19/2007

LOGGER : C. Wallestad

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 -62.5	R9-NQ 5 ft 90%	69	1	101.7' - Fracture, 80 deg, smooth, undulating, tight		Limestone 101.5-106.0' - Same as 94.1-96.2' except trace cavities to 1/2" diameter with no infill and trace fossil casts to 3/4"x1/4"	R9:7 minutes
			10	102.8, 103.25, 103.3, 103.55, 103.9, 104.85, 105.65, 105.75' - Fracture (8), 0-20 deg, smooth, undulating to planar, tight to 1/4"			
			3	open			
			1	103.25-103.3' - Fracture zone, fragments to 1/2"x1"			
			2				
106.5			NR			No Recovery 106.0-106.5'	
110 -67.5	R10-NQ 5 ft 100%	68	1	107.1, 108.4, 108.7, 109.25, 109.65, 109.8, 110.3' - Bedding plane or mechanical break (7), horizontal, smooth, undulating, tight to 1/4" open		Limestone 106.6-111.5' - Same as 101.5-106.0' except percentage of voids decreasing with depth down to 5%	R10:6 minutes
			1				
			3				
			4				
			10	110.45-111.25' - Fracture zone, fragments to 2"x4", most at 40 deg			
115 -72.5	R11-NQ 5 ft 92%	46	>10	111.6-112.5' - Fracture zone, fragments to 2"x2", many horizontal bedding planes		111.5-116.5' - grayish orange, (10YR 7/4), fine to medium grained, strong HCl reaction, extremely weak to very weak (R0 to R1), voids to 1/16" over 5-20% of rock increasing in coverage with depth, trace fossil casts to 1/4"x1/8", wavy bedding planes from 111.5-112.6'	R11:6 minutes
			1				
			1	113.5' - Bedding plane, horizontal, smooth, undulating, tight			
			10	114.7-114.9' - Fracture zone, fragments to 1-1/2"x2"			
			2				
116.5			NR			No Recovery 116.1-116.5'	Finish drilling on 4/18/07 at 17:00, at 116.5'
120 -77.5	R12-NQ 5 ft 84%	46	10	116.5-116.6, 116.85-116.95, 117.45-117.65, 119.3-119.5' - Fracture zone (4), fragment to 1-1/2"x1-1/2"		Limestone 116.5-120.7' - pale yellowish orange to pale yellowish brown, (10YR 8/2 to 10YR 6/2), medium to coarse grained, strong HCl reaction, extremely weak to weak (R0 to R2), voids to 3/16" over 5-25% of rock, fossil casts to 1/2" diameter over 5% surface, trace cavities filled with dark material	Resume drilling at 07:20 on 4/19/07
			10	116.6, 116.85, 116.95, 117.1, 117.3, 117.45, 117.65, 119.3, 119.5, 119.8, 120.5' - Bedding plane or mechanical break (11), all rough to smooth, undulating, open to 1/4" open, except 120.5' <10 deg			
			10				
			1				
			NR			No Recovery 120.7-121.5'	R12:8 minutes
121.5							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-06

SHEET 8 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 4/17/07

START : 4/17/2007

END : 4/19/2007

LOGGER : C. Wallestad

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.
125 -82.5	R13-NQ 5 ft 94%	48	4	121.7-121.9' - Bedding plane, horizontal, smooth, planar to stepped, tight		Limestone 121.5-126.2' - Same as 116.5-120.7' except voids decreasing to 5% coverage with depth, highly fossiliferous from 121.5-124.4 with casts to 1/4"-1/2" over 15% of surface, solution cavities to 1/4"-1/2" over 5-7%, interval of fine grained moderately strong (R3) rock with distinct lamination and trace voids (up to 1/16") at 121.7-121.9'	R13:5 minutes
			4	122.65, 122.7, 122.85, 123.0, 125.25' - Bedding plane or mechanical break (5), 0-5 deg, smooth, undulating, tight			
			2	124.4' - Fracture zone or mechanical break, 20 deg, smooth, undulating, tight			
			10	124.5' - Fracture, 80 deg, smooth, planar, tight			
			10	124.95' - Fracture, 30 deg, smooth, planar, tight			
126.5	R14-NQ 5 ft 90%	26	NR	125.25-125.6' - Fracture zone, fragments to 3"x1"		No Recovery 126.2-126.5' Limestone 126.5-131.0' - very pale orange, (10YR 8/2), fine to coarse grained, strong HCl reaction, extremely weak to very weak (R0 to R1), grain size becoming more coarse with depth, voids to 1/8" over 5-25% of surface, trace cavities to 1/2"x1" filled with light colored infill, poorly fossiliferous with trace casts to 1/4"	R14:4 minutes
			10	125.6' - Fracture, 65 deg, smooth, planar, open			
			4	125.9-126.0' - Fracture zone, fragments to 1"x1-1/2"			
			10	126.5-127.0' - Fracture zone, some dark staining, fragments to 2"x1"			
			4	127.0, 127.3, 127.45, 128.0, 128.2, 128.35, 129.25, 129.4, 130.7, 130.8' - Bedding plane or mechanical break (10), 0-5 deg, smooth, planar to undulating, tight			
130 -87.5	R15-NQ 5 ft 84%	34	2	129.55, 129.95, 130.2' - Fractures, 50 deg, smooth, undulating to planar, tight to 1/4" open		No Recovery 131.0-131.5' Limestone 131.5-135.05' - Same as 126.5-131.0' except laminated at 134.25-134.9'	R15:10 minutes
			NR	129.7' - Fracture, rough, undulating, near vertical, open			
			10	131.75, 131.8, 131.95, 132.0, 132.35, 132.45' - Bedding plane (6), horizontal, smooth, planar, tight			
			2	131.85' - Fracture, vertical, smooth, planar			
			10	132.55, 132.95, 134.45, 135.15, 135.35' - Bedding plane (5), horizontal, smooth, planar, tight			
135 -92.5	R16-NQ 5 ft 78%	38	5	133.85, 134.25' - Bedding plane or mechanical break (2), 0-10 deg, rough, undulating, 1/4" open		No Recovery 135.7-136.5' Limestone 136.5-138.4' - Same as 135.05-135.7' except 10% fossil casts and molds to 1/2" diameter, and color darkens to moderate yellowish brown with depth (10YR 5/4) 138.4-138.85' - Same as 121.7-121.9' except pale yellowish brown, (10YR 6/2) 138.85-139.65' - Same as 136.5-138.4'	R16:7 minutes
			1	134.35-134.55' - Fracture zone, fragments to 1"x2"			
			NR	134.65' - Fracture, 30 deg, smooth, planar, open			
			>10	136.6' - Fracture or mechanical break, vertical, smooth, undulating, tight			
			>10	136.75, 137.15, 137.55, 132.6, 138.05' - Bedding plane (5), horizontal, rough to smooth, undulating, many open (next to fracture zone)			
140 -97.5	R16-NQ 5 ft 78%	38	>10	137.15-137.55, 138.2-138.75, 139.65-139.8' - Fracture zone (3), fragment to 1-1/2"x1/2"			
			>10	138.2, 138.25, 138.4, 138.85, 139.25, 139.65' - Bedding plane (6), horizontal, rough to smooth, undulating, many open (next to fracture zone)			
			10	138.4-138.7' - Fracture zone, many bedding planes horizontal			
			NR				
141.5							

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing


ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 4/17/07

START : 4/17/2007

END : 4/19/2007

LOGGER : C. Wallestad

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		
145 -102.5	R17-NQ 5 ft 88%	36	2	140.2' - Mechanical break or bedding plane, 5 deg, rough, undulating, 1/4" open		Limestone 139.65-140.4' - yellowish gray with moderate yellowish brown infill, (5Y 7/2 with 10YR 5/4), fine grained, strong HCl reaction, medium strong (R3), voids to 1/8" over 5-15% surface, cavities to 2"x1" over 20-30% of rock with infill material, trace fossil casts and molds to 1/2"x1/16", infill is coarse grained weak rock (R2) with voids to 1/8" over 25-30% surface and moderate HCl reaction No Recovery 140.4-141.5' Limestone 141.5-144.25' - Same as 139.65-140.4' 144.25-145.9' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, medium strong (R3), voids to 1/8" over 0-15% surface, dark 1/16" thick laminations over 20% of rock, voids increasing in percentage with depth No Recovery 145.9-146.5' Limestone 146.5-150.9' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), coarse grained, mild to strong HCl reaction, extremely weak to medium strong (R0 to R3), (weaker rock from 147.7-149.5'), voids to 3/16" over 20-40% of rock, moderately fossiliferous with casts and molds to 1/4"x1/2" (many echinoderm casts), three 1" thick light colored, fine grained, medium strong (R3) layers at 146.65', 147.0', and 150.8' No Recovery 150.9-151.5' Limestone 151.5-155.7' - light olive gray to pale yellowish brown, (5Y 7/2 to 10YR 6/2), fine to coarse grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), voids to 1/16" over 5-20% of surface (variable), trace fossil casts, dark thick laminations from 153.8-154.25' No Recovery 155.7-156.5' Limestone 156.5-159.4' - Same as 146.5-150.9' except moderate yellowish brown, (10YR 5/4), and a 4"-thick, light colored, fine grained, medium strong (R3) rock layer at 157.05' No Recovery 159.4-161.5'	R17:11 minutes	
			4	141.7, 141.95, 142.65, 142.8, 143.2, 143.35, 143.6' - Fractures or mechanical break (7), 0-20 deg, rough, undulating, horizontal-MB, tight to 1/2" open				
			>10	143.65' - Fracture zone, as 141.7' except dark stain and tight 143.85-144.25' - Bedding plane, horizontal, smooth, undulating, open				
			10	144.4, 144.8, 144.9, 145.0, 145.8' - Bedding plane (5), horizontal, smooth				
			1	144.4-144.9' - Fracture zone, fragments to 1"x1/2"				
150 -107.5	R18-NQ 5 ft 88%	50	NR	146.5-146.55' - Fracture zone, fragments to 1"x1/2"				
			10	146.55, 147.5, 148.6, 148.7, 149.1, 149.3, 149.35, 149.45, 149.7, 148.75, 150.5, 150.7' - Bedding plane, 10 deg, smooth, undulating, 1/2" open				
			10					
			6					
			4	150.1' - Mechanical break, (by drillers)				
155 -107.5	R19-NQ 5 ft 84%	46	3	150.7' - Fracture, vertical, rough, undulating, tight				
			NR					
			>10					
			>10					
			10					
160 -117.5	R20-NQ 5 ft 58%	33	1					
			0					
			NR					
			10	156.5-156.8, 159.1-159.3' - Fracture zone (2), fragments to 2"x1"				
			1	156.8, 157.05, 157.2, 157.4, 158.2, 159.1' - Bedding plane, horizontal, smooth, planar to undulating, tight except adjacent to fracture zone				
161.5			10					
			NR					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-06

SHEET 10 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.5 ft bgs on 4/17/07

START : 4/17/2007

END : 4/19/2007

LOGGER : C. Wallestad

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.
165 -122.5	R21-NQ 5 ft 80%	19	10	161.5-161.7' - Fracture zone, dark staining, fragments to 1/2" thick, all bedding planes at horizontal		Limestone 161.5-162.5' - Same as 156.5-159.3' and 146.5-150.9' except pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, medium strong to weak (R3 to R2), 5-15% voids <1/16", trace cavities <1/4" 162.5-165.5' - Same as 144.25-145.9' except grayish orange to pale yellowish brown, (10YR 7/4 o 10YR 6/2), very fine to fine grained, moderate HCl reaction, strong (R4), 5% coverage of voids (<1/16"), increasing to 15% with depth No Recovery 165.5-166.5' Limestone 166.5-168.5' - Same as 161.5-162.5'	R21:8 minutes
			10	162.25, 163.15, 163.4, 163.55, 165.05, 165.4' - Bedding plane (6), horizontal, smooth, undulating to planar, some with dark staining, tight except next to fracture zone			
			10	162.45' - Fracture or mechanical break, <10 deg, rough, undulating, 1/2" open			
			10	162.6-162.85' - Fracture zone, some dark staining, parallel 45 deg fractures, tight			
			NR	162.7' - Fracture, 70 deg, smooth, undulating, dark staining, tight			
170 -127.5	R22-NQ 5 ft 90%	17	>10	163.65' - Fracture, 70 deg, smooth, planar, dark staining, tight		168.5-171.0' - Same as 162.5-165.5' except voids to 1/8" over 5-30% of surface (variable) and laminations throughout No Recovery 171.0-171.5' Limestone 171.5-176.4' - grayish orange, (10YR 7/4), fine grained, mild HCl reaction, weak to medium strong (R2 to R3), voids to 3/16" over 5-20% surface (variable), trace fossil casts to 1/4"x1/2", trace cavities to 1"x1/2"	R22:6 minutes
			>10	164.0-165.05' - Fracture zone, fragments to 3"x1"			
			>10	166.5-167.5, 168.2-168.5, 169.2-164.65, 170.35-170.55' - Fracture zone (4), fragments to 4"x1-1/2"			
			>10	167.65, 168.65' - Fractures (2), rough, undulating, no stain or infill, tight			
			>10	168.2, 168.5, 168.85, 169.2, 169.8, 170.35, 178.55' - Bedding plane (7), horizontal, rough to smooth, undulating to planar, no stain or infill, tight except next to fracture zone			
175 -132.5	R23-NQ 5 ft 98%	72	1	169.75, 170.3' - Fractures (2), 70 deg, smooth, undulating, little dark staining, open and tight respectively		No Recovery 176.4-176.5' Limestone 176.5-181.15' - Same as 171.5-176.4' except trace dark laminations at 177.4-177.7' and cavities to 1/2" diameter over 10% of rock from 180.5-180.95' No Recovery 181.15-181.5'	R23:7 minutes
			NR	171.55, 172.05, 172.1, 172.65, 173.2, 173.4, 173.5, 173.9, 175.55, 176.0, 176.1, 176.35' - Bedding plane (12), horizontal, smooth, undulating to planar, some with dark staining, tight except by fracture zone			
			>10	173.5-173.9, 176.35-176.4' - Fracture zone (2), fragments to 2"x2"			
			0				
			4				
180 -137.5	R24-NQ 5 ft 93%	36	NR	173.5-173.9, 170.35-176.4, 176.6, 176.9, 177.0, 177.3, 177.4, 177.6, 178.6, 178.65, 179.5, 179.8, 179.85, 180.25, 180.35, 180.75' - Bedding plane (15), horizontal, smooth, undulating to planar, few with dark stains, tight except on fracture zones			R24:8 minutes
			2	176.95' - Fracture, vertical, smooth, undulating, tight			
			3	177.1' - Fracture, 80 deg, smooth, undulating, open			
			10	177.9' - Fracture, 25 deg, rough, undulating, tight			
			2	178.85' - Fracture, horizontal, same as 177.9' except horizontal			
			NR	179.65' - same as 177.1' except rough			



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-06
SHEET 11 OF 11	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723774.1 N, 457972.0 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical





WATER LEVELS : 2.5 ft bgs on 4/17/07 START : 4/17/2007 END : 4/19/2007 LOGGER : C. Wallestad

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	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			
185 -142.5	R25-NQ 5 ft 100%	62	3	180.3' - Fracture, same as 179.65'		Limestone 181.5-185.0' - Same as 176.5-181.15' except layer of medium strong (R3) rock at 183.1-183.65' 185.0-186.5' - pale yellowish brown, (10YR 6/2), coarse grained, moderate HCl reaction, medium strong (R3), voids to 1/16" over 15-25% of surface, fossil casts to 3/4"x1/2" over 20% of surface Bottom of Boring at 186.5 ft bgs on 4/19/2007	R25:9 minutes Total depth of boring is 186.5'
			5	180.4-180.8' - Fracture zone, fragments to 2"x2"			
			1	182.15' - Fracture, 20 deg, smooth, undulating, tight			
			10	182.3, 182.35, 182.6, 182.65, 183.05, 183.15, 183.65, 184.6, 184.7, 184.8' - Bedding plane (10), horizontal, smooth, undulating to planar, some dark staining, tight except by fracture zone			
			0	183.0' - Fracture, 80 deg, rough, undulating, open			
				184.6-184.85' - Fracture zone, fragments to 1-1/2"x2"			
				185.3, 185.4' - Fractures (2), 30 deg and 20 deg, rough, undulating			



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-07
SHEET 1 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723499.5 N, 458024.9 E (NAD83)
 ELEVATION : 42.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.25 ft bgs on 4/20/07 START : 4/20/2007 END : 4/20/2007 LOGGER : C. Wallestad

WATER LEVELS : 1.25 ft bgs on 4/20/07			START : 4/20/2007			END : 4/20/2007			LOGGER : C. Wallstead		
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			
42.7	0.0	1.1	SS-1	1-3-4 (7)	Topsoil (OL) 0-0.2' - grayish black, (N2), moist, organic matter with 20% fine silica sand		Began at 8:37 on 4/20/07				
	1.5				Poorly Graded Sand With Organics (SP) 0.2-1.1' - brownish gray to grayish black, (5YR 4/1 to N2), moist, loose, fine silica sand with 40% organic fines, decreasing to 10% with depth						
5	5.0										
37.7		1.2	SS-2	2-1-1 (2)	Silty Sand (SM) 5.0-6.2' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), wet, very loose, no HCl reaction, fine silica sand with 30% nonplastic fines						
	6.5										
10	10.0										
32.7		0.4	SS-3	0-0-0 (0)	Fat Clay (CH) 10.0-10.35' - grayish blue, (5PB 5/2), moist, very soft, high plasticity, no dilatancy, no HCl reaction, 10% fine silica sand						
	11.5										
15	15.0										
27.7		0.8	SS-4	4-5-3 (8)	Silt (ML) 15.0-15.8' - grayish yellow, (5YR 8/4), wet, medium stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 5-10% very fine sand, carbonate materials, trace organics, 1/16" thick gray layer at 15.2'						
	16.5										
20											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-07

SHEET 2 OF 6

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723499.5 N, 458024.9 E (NAD83)

ELEVATION : 42.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 1.25 ft bgs on 4/20/07

START : 4/20/2007

END : 4/20/2007

LOGGER : C. Wallestad

WATER LEVELS : 1.25 ft bgs on 4/20/07			START : 4/20/2007			END : 4/20/2007			LOGGERS : G. Walstead		
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						
22.7	20.0	1.3	SS-5	3-3-3 (6)	Silt (ML) 20.0-21.3' - Same as 10.0-10.35' except greenish gray, (5G 6/1), medium stiff, no HCl reaction, with light olive yellow mottling (5Y 5/6) in 15-20% of silt, three concretions to 1"x1/4" between 20.0-20.5'						
	21.5										
25	25.0										
17.7		1.3	SS-6	2-2-2 (4)	Sandy Fat Clay (CH) 25.0-26.3' - light olive gray, (5YR 6/1), with mottling from 25.0-25.3', moist, soft, high plasticity, no dilatancy, no HCl reaction, 30% fine silica sand, one coarse gravel-sized silica sand concretion						
	26.5										
30	30.0										
12.7		1.5	SS-7	2-4-7 (11)	Organic Soil (OH) 30.0-31.5' - olive black, (5Y 2/1), moist, stiff, medium to high plasticity, slow dilatancy, no HCl reaction, 5-10% fine silica sand, fine silica sand lens from 30.45-30.55'						
	31.5										
35	35.0										
7.7		1.0	SS-8	3-5-3 (8)	Organic Soil (OH) 35.0-36.0' - olive gray, (5Y 4/1), wet, medium stiff, medium to high plasticity, slow dilatancy, no HCl reaction, 40% fine silica sand						
	36.5										
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-07
SHEET 3 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723499.5 N, 458024.9 E (NAD83)
 ELEVATION : 42.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.25 ft bgs on 4/20/07 START : 4/20/2007 END : 4/20/2007 LOGGER : C. Wallestad

WATER LEVELS : 1.25 ft bgs on 4/20/07			START : 4/20/2007		END : 4/20/2007		LOGGERS : C. Wallstead	
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			
2.7	40.0	1.1	SS-9	6-6-7 (13)	Sandy Organic Soil (OH) 40.0-41.1' - Same as 35.0-36.0' except 30-40% fine silica sand			
	41.5							
45	45.0							
-2.3		1.4	SS-10	3-5-6 (11)	Sandy Organic Soil (OH) 45.0-46.4' - Same as 40.0-41.1' except grayish orange, (10YR 7/4), mottled, silt stringers			
	46.5							
50	50.0							
-7.3		1.2	SS-11	6-16-20 (36)	Interbedded Organic Soil With Silt (OH) 50.0-51.2' - Organic Soil (OH) is same as 30.0-31.5' except olive black (5Y 2/1), moist, hard, 10-15% fine silica sand; the Silt (ML) is same as 15.0-15.8' except hard, no to low plasticity, no organics			
	51.5							
55	55.0							
-12.3		1.3	SS-12	18-28-50/3 (78/9")	Silt (ML) 55.0-56.3' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), wet, hard, low plasticity, rapid dilatancy, moderate to strong HCl reaction, 1/4"-1" thick organic layers at 55.25' and 55.8' respectively, 5-10% fine sand			
	56.3							
60								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-07

SHEET 4 OF 6

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723499.5 N, 458024.9 E (NAD83)

ELEVATION : 42.7 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit



ORIENTATION : Vertical

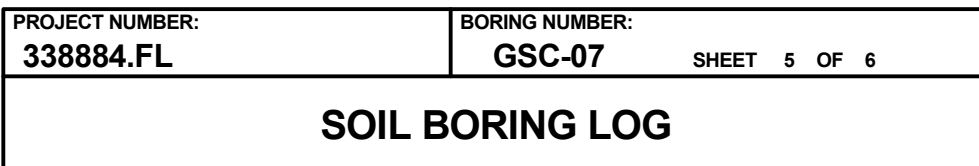
WATER LEVELS : 1.25 ft bgs on 4/20/07

START : 4/20/2007

END : 4/20/2007

LOGGER : C. Wallestad

WATER LEVELS : 1.25 ft bgs on 4/20/07			START : 4/20/2007			END : 4/20/2007			LOGGER : C. Wallstead		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS				
			RECOVERY (ft)				DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION				
	#TYPE	6"-6"-6" (N)									
-17.3	60.0	1.0	SS-13	17-42-50/5 (92/11")	Silt (ML) 60.0-61.0' - Same as 55.0-56.3' except trace dark mottling, 1/16" thick organic soil layer at 60.1', trace fine sand-sized and gravel-sized limestone fragments		At 13:35 water level is 1.25' below ground surface				
	61.4										
65	65.0										
-22.3		1.5	SS-14	5-10-14 (24)	Silt (ML) 65.0-66.5' - olive gray with grayish orange mottling, (5Y 4/1 with 10YR 7/4), wet, very stiff, low plasticity, rapid dilatancy, moderate HCl reaction, 5-10% fine sand, trace gravel-sized limestone fragments, carbonate materials, 10% organic lamination						
	66.5										



LOGGER : C. Wallestad

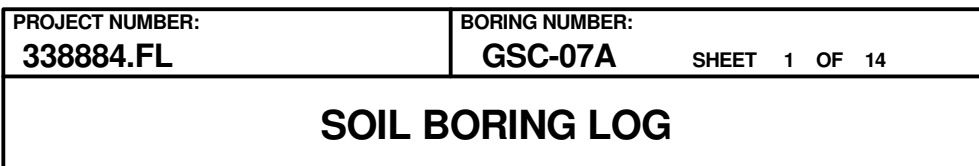
Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-07
SHEET 6 OF 6	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723499.5 N, 458024.9 E (NAD83)
 ELEVATION : 42.7 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.25 ft bgs on 4/20/07 START : 4/20/2007 END : 4/20/2007 LOGGER : C. Wallestad

WATER LEVELS : 1.25 ft bgs on 4/20/07			START : 4/20/2007			END : 4/20/2007			LOGGERS : C. Walstead		
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					
-57.3	100.0	0.4	SS-21	50/6 (50/6")	Silt (ML) 100.0-100.4' - grayish orange, (10YR 7/4), moist, hard, low plasticity, slow to rapid dilatancy, moderate HCl reaction, carbonate material, organic soil layers 3/16" thick at 100.1' and 100.3' Bottom of Boring at 100.5 ft bgs on 4/20/2007			Finished drilling/sampling at 15:30 on 4/20/07 Total depth of boring 100.5' Surface collapse; filled with grout			
105 -62.3											
110 -67.3											
115 -72.3											
120											



WATER LEVELS : 5.0 ft bgs on 4/21/07 START : 4/21/2007 END : 4/26/2007 LOGGER : C. Wallestad, R. McComb

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-07A
SHEET 2 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell
 DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 5.0 ft bgs on 4/21/07 START : 4/21/2007 END : 4/26/2007 LOGGER : C. Wallestad, R. McComb

WATER LEVELS : 3.0 TUBS ON 4/2/07			START : 4/2/2007			END : 4/20/2007			LOGGERS : G. Wallestad, H. McCord		
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					
23.1	20.0	0.9	SS-5	5-10-15 (25)	Silt (ML) 20.0-20.9' - Same as 10.0-11.1' except dark yellowish orange (10YR 6/6), 1/8" thick layer at 20.5', very stiff, fine to coarse sand-sized limestone fragments at 20.0-20.3' and 20.75-20.9'						
	21.5										
25	25.0										
18.1		0.9	SS-6	10-20-23 (43)	Sandy Silt (ML) 25.0-25.9' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 30% fine to coarse sand-sized, carbonate materials						
	26.5										
30	30.0										
13.1	30.3	0.2	SS-7	50/4 (50/4")	Silty Sand (SM) 30.0-30.2' - grayish orange, (10YR 7/4), wet, very dense, moderate HCl reaction, fine to coarse sand-sized, 35% nonplastic fines, 10% fine gravel-sized limestone fragments, carbonate materials						
35	35.0										
8.1	35.3	0.3	SS-8	50/4 (50/4")	Silty Sand (SM) 35.0-35.3' - moderate olive brown, (5Y 4/4), wet, very dense, moderate HCl reaction, fine to coarse sand-sized, 25% nonplastic fines, trace fine gravel-sized limestone, carbonate materials			HW casing set at 35 ft below ground surface			
	40.0										
	40.2	0.1	SS-9	50/2 (50/2")	Limestone Fragments 40.0-40.05' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, coarse sand-sized fragments						
40											
					Begin Rock Coring at 40.0 ft bgs See the next sheet for the rock core log						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-07A

SHEET 3 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.0 ft bgs on 4/21/07

START : 4/21/2007

END : 4/26/2007

LOGGER : C. Wallestad, R. McComb

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.
3.1	40.0 R1-NQ 1 ft 85%	0	1	40.6' - Fracture, 70 deg, smooth, undulating to stepped, tight		Limestone 40.0-40.85' - light olive gray, (5Y 5/2), medium to coarse grained, strong HCl reaction, weak (R2), mottled with grayish orange (10YR 7/4), voids to 1/8" over 15-25% of surface, trace cavities to 1"x1/4", trace fossils to 1/2"x1/4"	R1:2 minutes
	41.0		NR	41.0-41.4' - Fracture zone, fragments to 2"x1"		No Recovery 40.85-41.0'	
			>10	41.75' - Bedding plane or mechanical break, horizontal, smooth, undulating, tight		Limestone 41.0-43.7' - light olive gray, (5Y 5/2), fine to coarse grained, weak to moderate HCl reaction, extremely weak (R0), poorly competent, trace voids to 1/16", unconsolidated sandy silt from 42.5-43.55'	R2:2 minutes
	R2-NQ 5 ft 54%	0	0			No Recovery 43.7-46.0'	
45 -1.9			NR				
	46.0		N/A			Sandy Silt (ML) 46.0-48.25' - moderate yellowish brown, (10YR 5/4), wet, medium grained, strong HCl reaction, carbonate silt with 20-50% carbonate	
			N/A				
	R3-NQ 5 ft 94%	24	>10			Limestone 48.25-50.7' - moderate yellowish brown, (10YR 5/4), medium to coarse grained, moderate HCl reaction, highly competent, voids to 1/8" over 15-45% of rock, trace fossil casts to 3/16" diameter	R3:3 minutes
50 -6.9			4	48.95, 49.05' - Bedding plane or mechanical break (2), horizontal, smooth, planar, tight to 1/4" open		No Recovery 50.7-51.0'	
			3	49.0' - Fracture or mechanical break, vertical, smooth, planar, open		Limestone 51.0-56.0' - grayish orange, (10YR 7/4), fine to coarse grained, moderate to weak HCl reaction, extremely weak to weak (R0 to R2), voids to 1/8" over 10-40% of rock, trace fossils to 1/8" diameter, extremely weak, fine grained rock at 53.5-54.2' and 55.4-55.6', voids over 10-15% of surface, 25-30% dark laminations 1/16"-3/16" thick	R4:4 minutes
	51.0		NR	49.8, 50.1' - Fractures (2), 60 deg, rough, undulating, tight			
			0	50.15' - Fracture, 30 deg, rough, undulating, tight			
	R4-NQ 5 ft 100%	11	3	50.4' - Fracture, 80 deg, rough, undulating, tight			
			1	50.5' - Fracture, 50 deg, rough, undulating, tight			
55 -11.9			2	52.1, 52.5, 52.85, 53.98, 54.2, 54.75, 55.4' - Bedding plane or mechanical break (7), horizontal and 10 deg, smooth, undulating, tight			
	56.0		1			56.0-56.3' - Same as 51.0-56.0'	
			N/A			Silt (ML) 56.3-57.7' - grayish orange, (10YR 7/4), fine grained, strong HCl reaction, extremely weak (R0), grading to extremely weak (R0) limestone, thinly bedded with 1/16" thick, dark laminations (possible organics) over 25% of surface	
			1	57.4, 59.15' - Bedding plane or mechanical break (2), horizontal, smooth, undulating, tight to 1/4" open		Limestone 57.7-59.7' - Same as 51.0-56.0'	
	R5-NQ 5 ft 98%	34	0				
			1				
60							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-07A

SHEET 4 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.0 ft bgs on 4/21/07

START : 4/21/2007

END : 4/26/2007

LOGGER : C. Wallestad, R. McComb

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			
-16.9			N/A			Silt (ML) 59.7-60.3' - grayish orange, (10YR 7/4), strong HCl reaction, extremely weak (R0), grading to extremely weak (R0) limestone, thinly bedded with 1/16" thick, dark laminations (possible organics) over 25% of surface	R5:5 minutes
61.0			NR			Limestone 60.3-60.9' - Same as 51.0-56.0'	
	R6-NQ 5 ft 98%	84	1	61.5, 65.8' - Bedding plane or mechanical break (2), 20 deg, smooth, undulating to planar		No Recovery 60.9-61.0'	
			2	62.3' - Bedding plane or mechanical break, horizontal, smooth, undulating to planar		Limestone 61.0-61.4' - pale yellowish brown, (10YR 6/2), fine to coarse grained, moderate HCl reaction, very weak to weak (R1 to R2), competent, voids to 1/8" over 5-15% of rock, trace cavities to 1.0' diameter most filled with extremely weak rock (R0), few open, trace dark laminations	R6:9 minutes
65			N/A				
-21.9			1			Silt (ML) 61.4-62.6' - poorly competent as	
			NR			56.3-57.7'	
			2	66.15, 66.8' - Bedding plane or mechanical break (2), horizontal, smooth, undulating, tight to 1/4" open		Limestone 62.6-64.8' - pale yellowish brown, (10YR 6/2), fine to coarse grained, moderate HCl reaction, very weak to weak (R1 to R2), competent, voids to 1/8" over 5-15% of rock, trace cavities to 1.0' diameter most filled with extremely weak rock (R0), few open, trace dark laminations (possible organics)	
	R7-NQ 5 ft 100%	57	1			Silt (ML) 64.8-65.9' - poorly competent as	
			0	68.85' - Fracture or mechanical break, 20 deg, rough, undulating to stepped, tight		56.3-57.7'	
			1	69.5, 70.4' - Bedding plane or mechanical break (2), horizontal, smooth, undulating, tight to 1/4" open		No Recovery 65.9-66.0'	
70			1			Limestone 66.0-71.0' - moderate yellowish brown, (10YR 5/4), moderate to strong HCl reaction, extremely weak to weak (R0 to R2), voids to 1/16" over 0-25% of rock, trace fossil casts, trace dark laminations, extremely weak from 66-66.6', 67.3-68.3', and 69.1-71.0'	R7:3 minutes
-26.9						71.0-72.6' - Same as 66.0-71.0' except extremely weak (R0)	
			1			72.6-73.5' - moderate yellowish brown, (10YR 5/4), coarse grained, moderate HCl reaction, weak to medium strong (R2 to R3), competent, voids to 3/16" over 15-30% of rock, fossil casts to 3/16"x3/8" over 5-15% of rock, trace cavities to 1/4"x1.5', trace dark material (possible organics)	
	R8-NQ 5 ft 100%	70	10	71.1, 73.55, 73.8' - Bedding plane or mechanical break (3), horizontal, smooth, undulating to planar, 1/16" thick infill of fines infill, tight		73.5-74.4' - Same as 71.0-72.6'	
			10	72.05' - Fracture, 55 deg, rough, undulating, tight			
				72.55' - Fracture, 70 deg, rough, undulating, tight			
				73.8-74.3' - Fracture zone			
			1	74.9' - Fracture, 85 deg, smooth, undulating			
75							
-31.9							
			1	75.05' - Fracture, 60 deg, smooth, undulating			
				75.4' - Fracture, 50 deg, smooth, undulating			
			0				
			1	77.25, 78.1' - Bedding plane or mechanical break (2), 85 deg, smooth, planar, tight			
	R9-NQ 5 ft 96%	77	2				
			1	78.7' - Fracture, 30 deg, rough, undulating, tight			
				79.25-79.85' - Fracture zone, fragments to 1" diameter			
80							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-07A

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.0 ft bgs on 4/21/07

START : 4/21/2007

END : 4/26/2007

LOGGER : C. Wallestad, R. McComb

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.
-36.9			>10	79.75, 79.85' - Mechanical break or fractures (2), horizontal, rough, undulating, associated with dissolution cavity, open		Limestone 74.4-76.0' - moderate yellowish brown, (10YR 5/4), coarse grained, moderate HCl reaction, weak to medium strong (R2 to R3), competent, voids to 3/16" over 15-30% of rock, fossil casts to 3/16"x3/8" over 5-15% of rock, trace cavities to 1/4"x1.5", trace dark material (possible organics)	R9:8 minutes
	81.0		NR	80.4' - Fracture, 75 deg, rough, associated with dissolution cavity, open			
			>10	80.4-80.8' - Fracture zone, fragments 1.5"x2"			
			2	81.0-81.05, 81.55-81.95' - Fracture zone (2), fragments 1.5"x2"			
		43	3	81.05, 81.55, 81.95' - Bedding plane or mechanical break (3), horizontal, rough, undulating, open by fracture zones			
			4	81.45' - Fracture or mechanical break, 40 deg, rough, undulating, tight to 1/4" open			
			0	82.1, 83.6' - Bedding plane or mechanical break (2), rough, undulating, tight to 1/4" open			
85			NR	82.8' - Fracture or mechanical break, 30 deg, smooth, planar, tight			R10:7 minutes
-41.9			2	83.45' - Fracture or joint, 60 deg, undulating, as 81.5'			
			10	84.25' - Bedding plane, <10 deg, smooth, undulating, apparently along possible organic layer, tight			
			2	84.85' - Fracture or mechanical break, 40 deg, rough, undulating, 1/4" open			
		51	10	85.0' - 20 deg			
			10	86.2, 87.35, 88.9, 89.7' - Bedding plane or mechanical break (4), horizontal, smooth, undulating to planar, tight except for fracture zone			
90			10	86.45, 86.65' - Fractures or mechanical break (2), 50 deg, rough, undulating, tight to 1" open			R11:8 minutes
-46.9			NR	87.2' - Fracture or mechanical break, 20 deg, smooth, undulating, open by fracture zone			
			2	87.2-87.35, 89.7-90.35' - Fracture zone (2), 20 deg, up to 2"x3" diameter			
			2	88.75' - Fracture, 85 deg, smooth, undulating			
			10	89.0' - Fracture, 50 deg, smooth, undulating			
			10	91.6' - Fracture, 20 deg, smooth, planar, tight			
		28	10	91.65' - Fracture, 70 deg, smooth, undulating, tight			
			10	92.55' - Fracture, 35 deg, smooth, planar, tight			
			NR	92.65' - Fracture, 60 deg, smooth, planar, tight			
95				93.05' - Fracture, 60 deg, smooth, undulating, tight			R12:11 minutes
-51.9				93.2' - Fracture, 80 deg, smooth, undulating, tight			
			>10	93.55' - Fracture or mechanical break, 20 deg, rough, undulating, 1/16"-3/16" open			
			10	93.55-94.25' - Fracture zone, fragments to 1.5"x2.5", infill in cavities			
			3	94.25' - Bedding plane, horizontal, smooth, planar, open			
		15	4	96.0-96.75' - Fracture zone, dark, fragments to 3"x1", stain on many faces			
				96.75' - Bedding plane, horizontal, smooth, planar, tight			
100							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-07A	SHEET 6 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.0 ft bgs on 4/21/07 START : 4/21/2007 END : 4/26/2007 LOGGER : C. Wallestad, R. McComb

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			
-56.9			NR	97.1' - Fracture, 85 deg, smooth, undulating, dark, tight		93.55-94.7' - grayish orange, (10YR 7/4), fine grained, strong HCl reaction, medium strong (R3), competent, voids to 1/8" over 0-15% of surface, trace cavities to 1/4" diameter, tight plastic clay infilling in some cavities	R13:9 minutes
	101.0			97.15-97.25' - Bedding plane, horizontal, smooth, planar, 1" thick silt, tight			
				97.35' - Fracture, 75 deg, smooth, undulating, dark, tight			
				97.6-97.7' - Fracture zone, fragments to 1"x3/4"			
	R14-NQ 5 ft 34%	9	NR	98.5' - Fracture, 20 deg, rough, undulating, tight		No Recovery 94.7-96.0' Limestone	07:55 water level = 2.5' below ground surface NW casing set at 101 ft below ground surface No recovery at 101.0-104.3 due to core barrel blockage
				98.85' - Fracture, 70 deg, smooth, undulating, dark, tight		96.0-97.2' - very pale orange, (10YR 8/2), fine grained, moderate HCl reaction, medium strong (R3), voids to 1/16" over 0-10% of surface, dark staining on broken face	
				98.9, 99.0' - Bedding plane or mechanical break (2), horizontal, smooth, planar, tight		97.2-97.7' - very pale orange, (10YR 8/2), fine grained, strong HCl reaction, extremely weak to weak (R0 to R2), competent, voids to 1/16" over 10-20% of rock, moderately fossiliferous with casts and molds to 3/16"x3/8", trace dark inclusions	
105			>10	99.15' - Fracture, 20 deg, rough, undulating, tight			
-61.9			3	99.3' - Fracture, 40 deg, smooth, undulating, dark, tight			R14:10 minutes
	106.0			99.8' - Fracture, 75 deg, smooth, undulating, open			
			>10	104.3-104.7' - Fracture zone, dark staining on some faces, fragments to 3/4"x1.5"			
			>10	104.7, 104.9, 105.0, 105.15' - Mechanical break (4), horizontal, smooth, undulating			
	R15-NQ 5 ft 66%	0	>10	104.95' - Fracture or mechanical break, 40 deg, smooth, planar, dark, tight			
			0	105.2' - Bedding plane, horizontal, smooth, planar, dark, open			
				105.4, 105.75' - Mechanical break (2)			
				105.7' - Bedding plane, horizontal, smooth, undulating, tight to 1/2" open			
110			NR	106.25, 107.2, 109.2' - Fractures (3), 80 deg, smooth, undulating, dark, open (missing opposite face)		98.9-99.5' - Same as 96.0-97.2'	R15:4 minutes
-66.9				106.4-107.1, 107.5-109.0' - Fracture zone (2), fragments to 3"x2", some dark staining on faces in lower interval		No Recovery 99.5-104.3' Limestone	
			10	109.0' - Fracture, 20 deg, smooth, undulating, dark, missing opposite face		104.3-105.7' - grayish orange, (10YR 7/4), fine grained, moderate to strong HCl reaction, medium strong (R3), medium strong (R3) at 105.4', voids up to 1/16" over 0-30% (mostly 0-5%) of surface, trace dark laminations 3/16" thick	
			0	111.0-111.15' - Fracture zone, fragments to 1"x1/4"		105.7-106.0' - fine to medium grained, moderate to strong HCl reaction, extremely weak to very weak (R0 to R1), very weak rock at 105.75', voids up to 1/16" over 5-15% of rock, trace dark inclusions	
	R16-NQ 5 ft 94%	46	10	111.15' - Mechanical break or bedding plane, horizontal, rough, undulating, open (missing opposite face)		106.0-109.3' - grayish orange, (10YR 7/4), medium to coarse grained, weak to strong HCl reaction, extremely weak to weak (R0 to R2), poorly competent, voids to 1/8" over 25% of surface, fossil casts to 3/4"x1/4" over 3-12% of surface, trace dark mottling	
			3	111.35' - Fracture, 80 deg, rough, undulating, tight		No Recovery 109.3-111.0' Limestone	
115			>10	113.25-113.6' - Fracture zone, fragments up to 2" in diameter		111.0-115.7' - Same as 106.0-109.3'	R16:3 minutes
-71.9			NR	113.25, 113.6' - Bedding plane or mechanical break (2), smooth, undulating, open (missing opposite face)		No Recovery 115.7-116.0' Limestone	
			10	113.95, 114.1' - Fractures (2), 45 deg and 35 deg, tight to 1" open		116.0-119.1' - Same as 106.0-109.3'	
			0	114.6' - Bedding plane or mechanical break, smooth, undulating, tight to 1/4" open			
	R17-NQ 5 ft 100%	90	1	114.85' - Fracture, 80 deg, rough, undulating, dark, stain			
				115.35-115.7' - Fracture zone, fragments to 2"x2"			
			1	116.6' - Fractures (2), 80 deg, smooth, undulating, intersecting, tight			
120							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-07A

SHEET 7 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

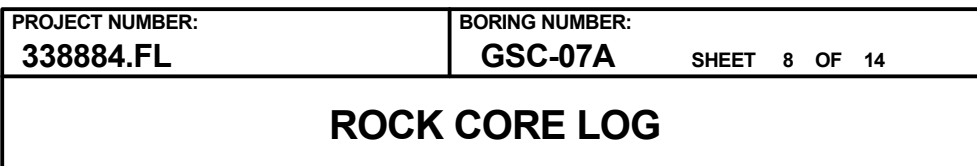
WATER LEVELS : 5.0 ft bgs on 4/21/07

START : 4/21/2007

END : 4/26/2007

LOGGER : C. Wallestad, R. McComb

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.
-76.9			0	116.75' - Bedding plane or mechanical break, <10 deg, smooth, undulating, tight		Limestone 119.1-119.5' - yellowish gray, (5Y 7/2), weak HCl reaction, weak to medium strong (R2 to R3), voids to 1/8" over 0-20% of surface, trace cavities to 1.5"x1/4" with no infilling	R17:5 minutes
121.0			1	116.9' - Fracture or mechanical break, 60 deg, smooth, undulating, tight		119.5-121.0' - Same as 106.0-109.3'	
			1	118.95' - Bedding plane or fracture, 20 deg, smooth, undulating, tight		121.0-123.55' - Same as	
			0	119.5' - Bedding plane, horizontal, smooth, undulating, tight		116.0-121.0' except increased fossil casts with depth, voids up to 1/2"x1/4" over 5-10% of rock	
125	R18-NQ 5 ft 99%	99	0	121.6, 122.6, 125.5' - Bedding plane (3), horizontal, smooth, undulating, tight		123.55-123.85' - Same as	
-81.9			0			119.1-119.5' except fossil casts/molds to 1/2"-1/4" over 5% of rock, trace cavities filled with clay, tight, many voids infilled	
			1			123.85-125.95' - moderate yellowish brown, (10YR 5/4), medium to coarse grained, moderate HCl reaction, weak (R2), voids to 1/16" over 30-40% of rock, no visible fossils or cavities	R18:11 minutes
			2	126.0		No Recovery 125.95-126.0'	
			10	126.3, 126.9, 127.1 127.65, 127.7, 127.95, 128.0, 128.4, 128.45, 129.65' - Bedding plane (10), horizontal, smooth, undulating to planar, mostly tight except at fracture zones		Limestone 126.0-127.7' - Same as	
	R19-NQ 5 ft 90%	58	10	127.65-127.7, 128.4-128.95' - Fracture zone or bedding plane (2), horizontal, fragments to 1/2"x1/4"		123.85-123.95' except extremely weak to medium strong rock (R0 to R3), mostly weak rock, moderately fossiliferous with echinoderm molds to 1/2"x1/4" at 126.3-127.7', trace fossil molds throughout entire run	
			>10			127.7-128.0' - Same as 104.3-105.7'	
130			0	129.65-129.95' - Bedding plane, horizontal, smooth, undulating to planar, mostly tight except by fracture zones		128.0-130.5' - Same as 126.0-127.7'	R19:10 minutes
-86.9			NR			No Recovery 130.5-131.0'	
			1	131.0		Limestone 131.0-134.9' - Same as 126.0-130.5' except moderately fossiliferous from 132.6-133.8' with casts to 1/2"x1/4" over 5-10% of rock, bigger voids and coarser texture with depth, thick rock as at 104.3-105.7' and 134.0-134.8'	07:30 water level = 3.0' below ground surface
			10	131.05, 132.1, 132.3, 133.8, 133.95, 134.2, 134.3, 134.4, 134.65' - Bedding plane (9), horizontal, smooth to rough, undulating to planar, tight except by fracture zones and where missing opposite face			
	R20-NQ 5 ft 78%	42	10	132.05, 134.65' - Fractures (2), 60 deg, rough to smooth, undulating to planar			
			>10	132.5-132.65, 133.8-133.95, 134.2-134.3, 134.65-134.8' - Fracture zone (4), fragments to 1.25"x1/2"			
135			NR	134.2' - Bedding plane, horizontal, smooth to rough, undulating to planar, tight except by fracture zones where missing opposite face			
-91.9						No Recovery 134.9-136.0'	
			>10	136.0			
			5	136.0-136.75' - Fracture zone or bedding plane, horizontal, fragments up to 1"x2"		Limestone 136.0-137.0' - pale olive, (10YR 6/2), fine to medium grained, weak HCl reaction, medium strong (R3), competent, trace voids to 1/16", trace cavities on interbeds to 1/2" thick with increased percentage of voids to 3/16" over 30-60% infill	R20:6 minutes
	R21-NQ 5 ft 82%	42	1	136.75, 136.95, 137.0, 137.2, 137.45, 137.55, 137.75, 138.1' - Bedding plane (8), horizontal, smooth, planar, tight			
			1	137.3, 138.5' - Mechanical break (2)			
140							



ORIENTATION : Vertical

LOGGER : C. Wallestad, R. McComb

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-07A	SHEET 9 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.0 ft bgs on 4/21/07 START : 4/21/2007 END : 4/26/2007 LOGGER : C. Wallestad, R. McComb

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.
-116.9			10	156.45' - 50 deg and 80 deg, smooth, planar, open, missing opposite face		158.5-160.9' - interbedded rock as 156.0-158.5' with rock as	R25:9 minutes
	161.0		NR	156.5' - Fracture, 50 deg, smooth, undulating, tight		138.1-140.0' in layers 2"-4" thick, dark, wavy laminations (1/8") at 158.85'	
			1	156.65' - Fracture, 65 deg, smooth, planar, tight		No Recovery 160.9-161.0' Limestone	
			10	156.7, 159.05, 159.15, 159.5, 160.35, 160.5' - Bedding plane (6), horizontal, smooth, undulating, tight, some planar		161.0-163.5' - Same as 138.1-140.1' except moderate yellowish brown to dark yellowish brown (10YR 4/2 to 10YR 5/4) mottling from 161.7-163.5'	
	R26-NQ 5 ft 70%	23	>10	157.15' - Fracture, 50 deg, smooth, undulating, tight		163.5-164.5' - pale yellowish brown, (10YR 6/2), fine to medium grained, strong HCl reaction, medium strong (R3), voids to 1/8" over 10-20% of rock, fossil cavities to 1/2"-1/4" over 5-10% of rock, possible high percentage of dissolution cavities as evidence by fracture zone breakage pattern	R26:8 minutes
			>10	157.7' - Fractures (2), 70 deg and 5 deg, smooth, undulating, open, missing opposite face		No Recovery 164.5-166.6' Limestone	
165			NR	158.95' - Fracture, 65 deg, smooth, undulating, tight		166.6-168.7' - Same as 163.5-164.5'	
-121.9				160.35-160.5' - Fracture zone, fragments up to 1"x2"			
	166.0		NR	161.85' - Fracture, 45 deg, smooth, undulating, tight		168.7-171.0' - Same as 163.5-164.5' except pale yellowish brown to dark yellowish orange, (10YR 6/6 to 10YR 6/2), fine grained, voids to 1/16" over 5-20% of surface, few cavities to 1/8"-3/4", medium strong (R3), moderate HCl reaction	
			>10	162.15' - Fracture or mechanical break, smooth, undulating, tight to 1/4" open		171.0-171.5' - Same as 168.7-171.0'	
			>10	162.5' - Bedding plane, <10 deg, smooth, undulating, tight		171.5-172.2' - light olive gray, (5Y 5/2), very fine grained, mild HCl reaction, very strong (R5), voids to 3/16" over 5% of surface, weak HCl reaction, 1" thick, fine grained section at 171.7'	
	R27-NQ 5 ft 88%	42	>10	162.0-164.5' - Fracture zone, fractures associated with dissolution cavities		172.2-173.6' - dark yellowish orange, (10YR 6/6), fine to medium grained, mild HCl reaction, weak (R2), with light olive gray, moderate to coarse grained (80% orange, 20% gray, bimodal), 1/16" voids over 40%, trace larger voids/cavities (<3/16")	
			2	166.6-168.7' - Fracture zone, fragments to 3"x2", average 1/4" diameter, associated with possible dissolutions cavities		173.6-176.0' - pale yellowish brown to dark yellowish orange, (10YR 6/2 to 10YR 6/6), very fine grained, 5-10% voids (1/16"), 5% cavities from round 1/4" to 1/4"x1/2" elongate, fossiliferous, strong (R4) dropping to weak to medium (R2 to R3) below 174.8', HCl reaction similar to 163.5-164.5'	
170			2	168.7, 169.8, 169.85, 170.2, 170.35' - Bedding plane (5), horizontal and 10 deg, smooth, planar, dark, tight except next to fracture zone		176.0-181.0' - Same as 173.6-176.0' except weak to medium strong (R2 to R3)	R27:7 minutes
-126.9							
	171.0		5	171.55, 173.55' - Fractures (2), 60 deg, rough, undulating, tight			
			10	171.65, 171.75, 171.85, 172.3' - Bedding plane (4), horizontal, smooth, undulating, tight			
	R28-NQ 5 ft 100%	55	10	173.55' - Bedding plane, 10 deg, smooth, undulating, tight			
			10	173.65' - Fracture, 45 deg, rough, undulating, tight			
175			10	174.9-174.95' - Bedding plane, 10 deg, smooth, undulating, associated with lamination surfaces, tight			R28:7 minutes
-131.9			10	174.95-175.55' - Fracture zone, fragments to 3"x1"			
			10	175.55' - Fracture, 30 deg, smooth, planar, tight			
			10	175.7' - Fracture, 70 deg, smooth, planar, tight			
	R29-NQ 5 ft 100%	45	10	175.85' - Fracture, 20 deg, smooth, planar, tight			
			2	176.0-176.25' - Fracture zone, fragments to 1"x2"			
180							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-07A	SHEET 10 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 5.0 ft bgs on 4/21/07 START : 4/21/2007 END : 4/26/2007 LOGGER : C. Wallestad, R. McComb

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			
-136.9			10	176.25' - Fractures (2), 70 deg and 40 deg, smooth, planar, open, intersecting fractures, fracture zone			R29:10 minutes
181.0			>10	176.55' - Bedding plane, horizontal, smooth, undulating, tight to 1/4" open		Limestone 181.0-185.2' - pale yellowish brown to dark yellowish orange, (10YR 6/2 to 10YR 6/6), fine to very fine grained, strong HCl reaction, medium strong to very strong (R3 to R5)	
	R30-NQ 5 ft 84%	8	>10	176.9, 177.0' - Fractures (2), horizontal, smooth, undulating, fragments to 1"x1/4"			
			>10	177.8' - Fracture, 75 deg, smooth, undulating, open by fracture zone			
			>10	177.8-178.2' - Fracture zone, fragments to 2" diameter			
			>10	178.2' - Fracture, 75 deg, smooth, undulating, dark, open			
185			1	178.35' - Fracture, 55 deg, smooth, planar, dark, tight			
-141.9			NR	178.45, 178.7' - Fractures (2), 55 deg, smooth, undulating, tight		No Recovery 185.2-186.0'	R30:9 minutes
186.0			>10	178.85-179.1' - Fracture zone, fragments to 1" diameter		Limestone 186.0-189.4' - Same as 181.0-185.2' except strong to very strong (R4 to R5)	
	R31-NQ 5 ft 68%	0	>10	179.9' - Fracture, 20 deg and 55 deg, smooth, planar, tight			
			>10	180.0' - Fracture, 30 deg, smooth, planar, dark, tight			
			>10	180.75-181.0' - Fracture zone, fragments to 1"x2"			
			>10	181.0-181.45, 182.0-184.35' - Fracture zone (2), fragments to 2"x2", some staining			
190			NR	181.45' - Fracture, 20 deg, smooth, planar, open by fracture zone		No Recovery 189.4-191.0'	Core blockage
-146.9				181.65' - 10 deg and 75 deg, smooth, undulating to planar, tight			R31:6 minutes
191.0			10	181.85, 181.9' - Fractures (2), 75 deg, smooth, planar, tight		Limestone 191.0-191.4' - Same as 186.0-189.4' 191.4-195.9' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), voids to 1/8" over 10-25% of rock, fossil casts to 1/4" diameter over 5-10% of rock, trace dissolution cavities filled with lighter colored porous rock; 193.1-193.2' same as 191.0-191.4' and 181.0-189.4'	
	R32-NQ 5 ft 98%	65	>10	184.35' - Fracture, 85 deg, smooth, undulating, dark, open by fracture zone			
			3	184.65' - Bedding plane, <5 deg, smooth, undulating, tight			
			0	185.0' - Fracture, 85 deg, smooth, undulating, open by fracture zone			
			1	186.0-189.4' - Fracture zone, fragments to 5"x2", dark staining on many faces			
195			NR	191.0-191.3' - Fracture zone, fragments to 3" x 1"			
-151.9			8	191.3' - Fracture, 40 deg, smooth, undulating, dark, some staining, open to fracture zone		No Recovery 195.9-196.0' Limestone 196.0-198.9' - pale yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), very fine grained, strong HCl reaction, strong to very strong (R4 to R5), 5-10% voids (1/16"), trace cavities from 1/4" round to 1/4"x1/2"	
	R33-NQ 5 ft 97%	60	>10	192.2' - Fracture, 60 deg, rough, undulating, tight			
			2	192.5' - Fracture, 70 deg, rough, undulating, tight			
			0	192.5-192.8' - Fracture zone, fragments to 2" in diameter			
					192.8' - Bedding plane, 10 deg, rough, undulating, low angle fracture, tight		
200				193.15' - Bedding plane, <10 deg, smooth, planar, tight			
				193.25' - Fracture, 50 deg, smooth, planar, tight			
				193.75' - Fracture, 30 deg, smooth, planar, tight			
				195.7' - Bedding plane, horizontal, smooth, planar, tight to 1/4" open			



PROJECT NUMBER:
338884.FL

BORING NUMBER:
GSC-07A

SHEET 11 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

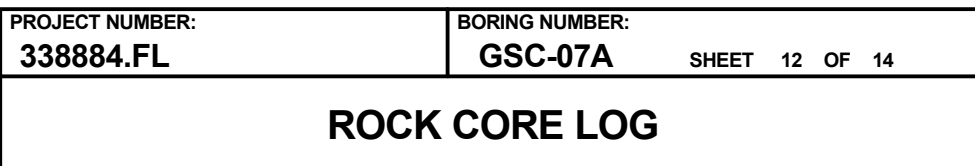
WATER LEVELS : 5.0 ft bgs on 4/21/07

START : 4/21/2007

END : 4/26/2007

LOGGER : C. Wallestad, R. McComb

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			
-156.9			>10	196.45, 196.6' - Bedding plane (2), horizontal, smooth, planar to undulating, dark, some staining, tight to 1/8" open		Limestone 198.9-200.85' - pale yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), fine grained, moderate HCl reaction, strong (R4), 2" infilling of elongate cavities 1/8"-1/2" wide and up to 1" long with dark gray infilling, 10% voids (1/16"), trace cavities predominantly round up to 1/2"	R33: Run time not recorded
201.0			NR	196.8' - Fracture, 80 deg, smooth, undulating, dark, some staining, tight to 1/16" open			
			1	197.0' - Fracture, 50 deg, smooth, undulating, tight			
			10	197.05' - Fracture, 10 deg, smooth, undulating, tight			
			>10	197.2' - Fracture, 75 deg, rough, undulating, open			
	R34-NQ 5 ft 100%	58		197.2-197.7' - Fracture zone, fragments 2-1/2"x1", some dark staining		No Recovery 200.85-201.0' Limestone	
			5	198.3' - Fractures (2), 65 deg and 25 deg, smooth, planar, tight, intersecting		201.0-201.3' - pale yellowish brown, (10YR 6/2), fine grained, moderate to strong HCl reaction, medium strong (R3), competent	
205			3	200.35' - Bedding plane, horizontal, smooth, planar to undulating, dark, some staining, tight to 1/16" open		201.3-206.0' - pale yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), fine grained, strong HCl reaction, medium strong (R3), competent, voids to 3/16", trace fossil cavities, trace dark laminations to 3/16" thick, yellowish orange, porous inclusions to 1"x1/2" over 5-10% of rock from 201.3-203.5'	R34: Run time not recorded
-161.9			>10	200.35-200.85' - Fracture zone, fragments 1"x2"		206.0-207.2' - Same as 201.0-201.3' except trace laminations (3/8" thick) with high void % and one cavity 1"x1/8"	
			3	201.5' - Fracture, 40 deg, smooth, undulating, tight		207.2-210.9' - moderate yellowish brown to light olive gray, (10YR 5/4 to 5Y 5/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids to 3/16" over 30% of rock, trace fossil casts to 1/2"x1/4", suspected dissolution in fracture zones, secondary infilling with light olive gray, medium strong rock (R3) to 2"x1/2" in brown rock, moderate HCl reaction	
	R35-NQ 5 ft 98%	48		202.5' - Fracture, 70 deg, smooth to rough, undulating, tight		No Recovery 210.9-211.0' Limestone	
			>10	202.8' - Fractures (2), 60 deg, smooth, undulating, 2 parallel fractures, tight		211.0-211.4' - Same as 207.2-210.9'	
			>10	202.9-203.7' - Fracture zone, fragments to 3-1/2"x1"		211.4-212.9' - yellowish gray to grayish orange, (5Y 7/2 to 10YR 7/4), very fine grained, very strong HCl reaction, strong (R4), no voids, trace 1/4" cavities, HCl reaction similar to 201.0-201.3'	
210			3	203.8, 203.9' - Fractures (2), 55 deg, smooth, undulating, tight		212.9-215.95' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), fine grained, moderate to strong HCl reaction, medium strong to strong (R3 to R4), voids to <1/16" from 10-30%, a few to many cavities up to 1/2"	
-166.9			NR	204.0, 204.5, 204.75, 205.3' - Bedding plane (4), horizontal, smooth, planar to undulating, tight to 1/4" open		No Recovery 215.95-216.0' Limestone	
			1	204.15' - Fracture, 20 deg, smooth, undulating, tight to 1/4" open			
			10	205.4' - Fracture, 80 deg, smooth, undulating, tight			
			>10	206.0-206.3' - Fracture zone, fragments to 1.5"x1"			
	R36-NQ 5 ft 99%	52		206.3' - Bedding plane, horizontal, smooth, planar to stepped, open to fracture zone			
			2	207.05' - Bedding plane, horizontal, smooth, planar, tight			
			2	207.2' - Fracture, 70 deg, smooth, planar, tight			
215			NR	207.85' - Fracture, 40 deg, rough, undulating, tight			
-171.9			0	208.35' - Fracture, vertical and 40 deg, rough, undulating, open, missing opposite face			
			0	208.6-208.95' - Fracture zone, fragments to 1.5"x1"			
	R37-NQ 5 ft 98%	80		209.0' - Bedding plane, horizontal, smooth, planar, tight			
			1	209.5-210.0' - Fracture zone, fragments to 1.5"x1"			
			3	210.25' - Fracture, 30 deg, smooth, undulating, tight to 1" open			
220				210.6' - Fracture, 30 deg, smooth, undulating, tight to 1/2" open			



ORIENTATION : Vertical

LOGGER : C. Wallestad, R. McComb

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-07A

SHEET 13 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723463.8 N, 458028.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: M. Pennell

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 5.0 ft bgs on 4/21/07

START : 4/21/2007

END : 4/26/2007

LOGGER : C. Wallestad, R. McComb

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.
-196.9			NR	231.1' - Fracture, <10 deg, rough, stepped, open		Limestone 226.0-277.65' - yellowish gray, (5Y 7/2), medium grained, strong HCl reaction, weak to medium strong (R2 to R3), voids to 1/8" over 5-25% of rock decreasing with depth, fossil casts to 2"x1" over 5-10% of rock	R41: Run time not recorded
241.0			>10	231.4-231.7' - Fracture zone, <10 to 90 deg, rough, stepped to undulating, open			
				232.8' - Fracture, <10 to horizontal deg, rough, undulating, open			
				232.9-233.4' - Fracture, 80 deg, rough, undulating, open			
	R42-NQ 5 ft 18%	0	NR	233.4-234.5, 234.8-235.6' - Fracture zone (2), <10 to horizontal deg, rough, stepped to undulating, open		Limestone 227.65-229.15' - yellowish gray, (5Y 7/2), medium grained, strong HCl reaction, extremely weak to weak (R0 to R2), trace voids to 1/16", trace cavities to 1"x2", dark laminations to 1/8" thick over 10-20% of surface	
245				236.0-237.0, 237.0-238.0' - Fracture zone (2), horizontal to 90 deg, rough, stepped to undulating, open			
-201.9				238.0-239.5' - Fracture zone, various orientations, predominantly limestone gravel		Clay With Silt (CL-ML) 229.15-229.85' - medium plasticity, poorly competent, clay and silt with limestone fragments to 1/4", strong pungent sulfur or petroleum odor (fetid)	R42: Run time not recorded
				241.0-241.9' - Fracture zone, various orientations, predominantly limestone gravel			
				246.0-248.4' - Fracture zone, horizontal to 90 deg, rough, stepped to undulating, open, gravel-sized to fine cobble-sized limestone fragments		229.85-230.6' - Same as 227.65-229.15'	
	R43-NQ 5 ft 48%	0	>10	247.0' - Mechanical break		No Recovery 230.6-231.0' Limestone	
			>10			231.0-235.2' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids up to 1/16" over 15-20%; <3-5% from 232.8-233.8', where limestone appears to become conglomerate (harder fragments within matrix), cavities up to 3/4"-1-3/16"x3/8"-3/4", penetrate into core surface, becomes thickly laminated and less fragmented with depth with voids and cavities	4/26/07 11:35 total depth at 251.0'
250			NR			235.2-235.6' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, extremely weak (R0), poorly competent, somewhat friable; crumbles to silt and sand-sized material (5-10%)	
-206.9						No Recovery 235.6-236.0' Limestone	R43: Run time not recorded
						236.0-239.1' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak (R1), poorly competent to competent, somewhat friable, voids up to 1/16" over 50-60% of surface, cavities >5, 2"x2", trace fossil molds/casts	
						239.1-239.5' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, strong (R4), competent, voids covering 3-10% of surface	
						No Recovery 239.5-241.0'	





PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-08
SHEET 1 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)
 ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 13.8 ft bgs on 04/22/07 START : 4/21/2007 END : 4/23/2007 LOGGER : C. Dougherty

WATER LEVELS : 15.6 ft bgs on 4/22/07			START : 4/21/2007		END : 4/23/2007		LOGGERS : G. Dougherty	
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			
43.2	0.0	1.2	SS-1	2-2-2 (4)	Poorly Graded Sand With Organics (SP) 0.0-0.9' - medium light gray, (N6), moist, loose, fine silica sand, organic material, trace nonplastic fines, plant roots		Began drilling at 16:30, 4/21/07	
	1.5				Silty Sand (SM) 0.9-1.2' - grayish brown, (5Y 3/2), moist, loose, fine silica sand, 25% nonplastic fines, organic material			
5	5.0							
38.2		0.9	SS-2	2-3-3 (6)	Poorly Graded Sand With Silt (SP-SM) 5.0-5.9' - grayish yellow, (5Y 8/4), wet, loose, fine silica sand, 5-10% nonplastic fines, some plant roots			
	6.5							
10	10.0							
33.2		1.0	SS-3	3-4-4 (8)	Silty Sand (SM) 10.0-11.0' - yellowish gray, (5Y 7/2), wet, loose, fine grained, fine silica sand, 25% low plastic fines			
	11.5							
15	15.0							
28.2		1.0	SS-4	3-2-3 (5)	Silty Sand (SM) 15.0-15.95' - Same as 10.0-11.0'			
	16.5							
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-08
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)
 ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 13.8 ft bgs on 04/22/07 START : 4/21/2007 END : 4/23/2007 LOGGER : C. Dougherty

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)				
		#TYPE				
23.2	20.0	1.3	SS-5	2-2-3 (5) Silty Sand (SM) 20.0-21.3' - Same as 15.0-15.95'		
	21.5					
25	25.0					
18.2		1.0	SS-6	2-2-3 (5) Silty Sand (SM) 25.0-25.5' - Same as 15.0-15.95' and 20.0-21.3' Clayey Sand (SC) 25.5-26.0' - yellowish gray, (5Y 7/2), moist, loose, fine silica sand, 30% medium plastic fines		
	26.5					
30	30.0					
13.2		1.4	SS-7	0-0-1 (1) Silty Sand (SM) 30.0-30.35' - dark yellowish orange, (10YR 6/6), wet, very loose, fine grained, silica sand, 30% nonplastic to low plastic fines, 30.35' abrupt contact in materials, 1/2" thick gray fat clay (CH) seam Clayey Sand (SC) 30.35-31.35' - yellowish gray with medium gray mottling, (5Y 7/2 with N5), moist, very loose, fine grained, silica sand, 35% medium to high plastic fines		Driller's Remark: Weight of hammer drove sampler through top 12 inches of sample Stop work for the day, drilled to 30.0' below ground surface, collected 30.0-35.35', stopped at 17:35 Drilling resumes 08:40, 4/22/07 Water level 13' 10" below ground surface at 08:30
	31.5					
35	35.0					
8.2		1.5	SS-8	2-5-8 (13) Sandy Fat Clay (CH) 35.0-36.5' - medium gray with yellowish gray mottling, (N5 with 5YR 7/2), moist, medium stiff, high plasticity, 35% fine silica sand increasing with depth, mottling increasing with depth at 35.7'		Slough at top of 35.0-36.5' has silty sand with iron oxide modules up to 1/4" (most about 1/16")
	36.5					
40						



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-08
SHEET 3 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)
 ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 13.8 ft bgs on 04/22/07 START : 4/21/2007 END : 4/23/2007 LOGGER : C. Dougherty

WATER LEVELS : 15.5 ft bgs on 04/22/07			START : 4/21/2007			END : 4/23/2007			LOGGERS : G. Dougherty		
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			
3.2	40.0	1.2	SS-9	1-2-1 (3)	Silty Sand (SM) 40.0-41.2' - light olive gray with medium dark gray mottling, (5Y 5/2 with N4), wet, loose, fine silica sand, 25% nonplastic fines						
	41.5										
45	45.0										
-1.8		1.5	SS-10	3-4-3 (7)	Fat Clay With Sand (CH) 45.0-45.5' - light olive gray with medium dark gray mottling, (5Y 5/2 with N4), moist, medium stiff, high plasticity, no dilatancy, 20% fine silica sand		May also be organic rich				
	46.5										
					Organic Soil With Sand (OH) 45.5-46.4' - grayish black, (N2), moist, medium stiff, high plasticity, slow dilatancy, interfingered with fine sand, medium gray (N5)						
					Silty Sand (SM) 46.4-46.5' - Same as 40.0-41.2' except light olive gray, (5Y 5/2)						
50	50.0										
-6.8		1.5	SS-11	2-2-2 (4)	Silty Sand (SM) 50.0-50.3' - yellowish gray, (5Y 7/2), wet, loose, fine silica sand, 25% low plastic fines						
	51.5										
					Organic Soil With Sand (OH) 50.3-51.5' - Same as 45.5-46.4'						
55	55.0										
-11.8		1.5	SS-12	2-3-2 (5)	Organic Soil With Sand (OH) 55.0-56.5' - Same as 45.5-46.4' except 30% sand						
	56.5										
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-08
SHEET 4 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)
 ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 13.8 ft bgs on 04/22/07 START : 4/21/2007 END : 4/23/2007 LOGGER : C. Dougherty

WATER LEVELS : 15.5 ft bgs on 04/22/07			START : 4/21/2007		END : 4/23/2007		LOGGERS : G. Dougherty	
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			
-16.8	60.0	0.9	SS-13	25-50/5 (75/11")	Silt (ML) 60.0-60.9' - yellowish gray, (5Y 7/2), moist, hard, low plasticity, rapid dilatancy, moderate HCl reaction, with carbonate, 1/2" sandy organic soil (OH) seam at top of sample			
	60.9							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-08

SHEET 5 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)

ELEVATION : 43.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 13.8 ft bgs on 04/22/07

START : 4/21/2007

END : 4/23/2007

LOGGER : C. Dougherty

DISCONTINUITIES				SYMBOLIC LOG	LITHOLOGY	COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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		
-31.8	75.0		NR	77.5-78.0, 78.5-79.0, 80.2, 80.7, 80.8' - Mechanical break (5), fragments too irregular to determine fit	No Recovery 75.0-77.5' Limestone 77.5-79.0' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), voids abundant, only 78.0-78.5' (75% of surface) No Recovery 79.0-80.0'	13:50, 4/22/07, soil split spoon sampling is halted. Will set casing and begin rock coring T. Williams becomes operator Driller's Remark: Little resistance to drilling until about 77.5'	
	R1-HQ 5 ft 30%	7	>10				
			2				
			NR				R1: Run time not recorded
80	80.0		3	81.0, 81.3' - Joint (2), horizontal, smooth, planar, some organic material 81.3-81.9' - Fracture, vertical, rough, undulating, black, staining on 75% of surface 81.9, 85.5, 85.9, 86.2, 86.9, 87.3, 87.5, 88.6, 90.3-90.9, 91.7, 92.1' - Mechanical break (11)	Limestone 80.0-81.9' - Same as 77.5-79.0 except laminated bedding below 80.4', trace organics along bedding 80.5-81.4', voids (<1/16") >5% of surface, along bedding plane 81.9-84.2' - yellowish gray, (5Y 7/2), fine grained, moderate HCl reaction, weak (R2), voids (1/16") over 75% of surface (1/16" or larger) over 5%, laminated bedding at 87.2-87.5', 88.1-88.3', and 88.9-94.1' No Recovery 84.2-85.0'		
-36.8			4				
	R2-HQ 5 ft 84%	15	4				
			0				
			0				
			NR				R2: 7 minutes
85	85.0		2	92.5-93.0' - Fracture zone 93.0, 93.15' - Mechanical break (2)	Limestone 85.0-90.0' - Same as 81.9-84.2' except laminated uneven bedding at 85.1-85.3', and 86.2-86.9', trace large (3/8") voids, weakly competent interval 88.6-89.4', trace organics 87.5-88.0' No Recovery 84.2-85.0' Silt (ML) 92.3-92.7' - light olive brown, (5Y 5/2), moderate HCl reaction, carbonate derived, limestone fragments at bottom of zone		
-41.8			2				
	R3-HQ 5 ft 100%	65	0				
			1				
			>10				R3: 6 minutes
90	90.0		>10	92.5-93.0' - Fracture zone 93.0, 93.15' - Mechanical break (2)	90.0-92.3' - Same as 81.9-84.2' except from 91.0-91.8' has 75% area as very few voids, abundant voids <1/16" of surface, larger voids (3/16"x 3/4" and smaller) are present 91.4-92.2' (5% of area)		
-46.8			1				
	R4-HQ 5 ft 66%	38	>10				
			2				
			NR			R4: 6 minutes	
95	95.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-08

SHEET 6 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)

ELEVATION : 43.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 13.8 ft bgs on 04/22/07

START : 4/21/2007

END : 4/23/2007

LOGGER : C. Dougherty

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
-51.8	R5-HQ 5 ft 68%	47	>10	95.0-95.4' - Fracture zone	Limestone 92.7-93.3' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, very weak (R1), voids (1/16") over 30% of surface No Recovery 93.3-95.0' Limestone 95.0-95.4' - Same as 92.7-93.3' except trace organics 95.4-95.7' - yellowish gray, (5Y 7/2), strong HCl reaction, very weak (R1), voids (1/16") over 85% of surface 95.7-96.1' - Same as 92.7-93.3' 96.1-98.4' - Same as 95.4-95.7' except very fine grained, few voids, zone from 96.5-97.4' has interfingering limestone with voids over 75% of surface, trace organics throughout; thin zones (1-1/5") of carbonate-derived lean clay at 98.1-98.3' No Recovery 98.4-100.0' Fat Clay (CH) 100.0-100.4' - yellowish gray, (5Y 7/2), thin (3/8") layered limestone at 100.3', carbonate derived Fat Clay (CH) 100.4-100.6' - black, (N1), strong HCl reaction, carbonate derived Silt (ML) 100.6-101.0' - light olive gray, (5Y 5/2), strong HCl reaction, carbonate derived Limestone 101.0-104.2' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (1/16") over 75% of surface, large voids (up to 3/8" x 3/4") over <5%, very fossiliferous 104.2-104.7' - Same as 101.0-104.2' except light olive gray, (5Y 7/2), moderate HCl reaction No Recovery 104.7-110.0' Limestone 110.0-111.9' - yellowish gray with medium gray mottling, (5Y 7/2 with N5), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (1/16" or less) over 85% of surface, moderately fossiliferous (casts and molds) No Recovery 111.9-115.0'	Driller's Remark: lost circulation at 98.0' R5: 10 minutes
			2	95.8, 96.1' - Mechanical break (2)		
			3	96.6-97.6' - Fracture, vertical		
			>10	97.6-98.0' - Mechanical break (3)		
			NR	98.0-98.3' - Fracture zone		
100	R6-HQ 5 ft 94%	60	>10	100.0-100.8' - Fracture zone, also organics and carbonate derived silt	Fat Clay (CH) 100.0-100.4' - yellowish gray, (5Y 7/2), thin (3/8") layered limestone at 100.3', carbonate derived Fat Clay (CH) 100.4-100.6' - black, (N1), strong HCl reaction, carbonate derived Silt (ML) 100.6-101.0' - light olive gray, (5Y 5/2), strong HCl reaction, carbonate derived Limestone 101.0-104.2' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (1/16") over 75% of surface, large voids (up to 3/8" x 3/4") over <5%, very fossiliferous 104.2-104.7' - Same as 101.0-104.2' except light olive gray, (5Y 7/2), moderate HCl reaction No Recovery 104.7-110.0' Limestone 110.0-111.9' - yellowish gray with medium gray mottling, (5Y 7/2 with N5), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (1/16" or less) over 85% of surface, moderately fossiliferous (casts and molds) No Recovery 111.9-115.0'	R6:5 minutes
-56.8			1	100.9-101.4' - Fracture or mechanical break, 79 deg, rough, undulating		
			2	101.4-101.9' - Fracture zone, some fragments have slight dark staining		
			4	102.3, 102.8, 103.0, 103.2, 103.5' - Mechanical break (5)		
			0	103.5-103.9' - Fracture, 70 deg, tight		
105	R7-HQ 5 ft 0%	0	NR		Limestone 101.0-104.2' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (1/16") over 75% of surface, large voids (up to 3/8" x 3/4") over <5%, very fossiliferous 104.2-104.7' - Same as 101.0-104.2' except light olive gray, (5Y 7/2), moderate HCl reaction No Recovery 104.7-110.0' Limestone 110.0-111.9' - yellowish gray with medium gray mottling, (5Y 7/2 with N5), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (1/16" or less) over 85% of surface, moderately fossiliferous (casts and molds) No Recovery 111.9-115.0'	R7: 2 minutes
-61.8			NR			
110	R8-HQ 5 ft 38%	37	1	110.7, 111.2' - Mechanical break (2)	Limestone 110.0-111.9' - yellowish gray with medium gray mottling, (5Y 7/2 with N5), very fine grained, strong HCl reaction, very weak to weak (R1 to R2), voids (1/16" or less) over 85% of surface, moderately fossiliferous (casts and molds) No Recovery 111.9-115.0'	Driller's Remark: rod drop 3 feet at 110.0' below ground surface
-66.8			3	111.6, 111.8' - Joint (2), horizontal, tight		
			NR			
115						R8: 1 minute



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-08

SHEET 7 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)

ELEVATION : 43.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

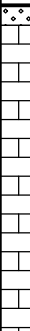
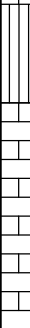


ORIENTATION : Vertical

WATER LEVELS : 13.8 ft bgs on 04/22/07

START : 4/21/2007

END : 4/23/2007

LOGGER : C. Dougherty

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				
-71.8	R9-HQ 5 ft 20%	10	1	115.5' - Mechanical break		Sand (SW) 115.0-115.3' - yellowish gray and olive gray, (5Y 7/2 and 5Y 3/2), fine to coarse grained, strong HCl reaction	Limestone 115.3-116.0' - Same as 110.0-111.9' except yellowish gray, (5Y 7/2) No Recovery 116.0-120.0'	R9: 3 minutes
120			NR					
-76.8	R10-HQ 5 ft 30%	0	N/A	120.0-121.5" - yellowish gray, (5Y 7/2), soft, strong HCl reaction, weakly competent limestone fragments at bottom of section, carbonate derived		Sandy Silt (ML) 120.0-121.5" - yellowish gray, (5Y 7/2), soft, strong HCl reaction, weakly competent limestone fragments at bottom of section, carbonate derived	No Recovery 121.5-125.0'	Driller's Remark: 120.0-125.0' rod dropped entire interval
125			NR					
-81.8	R11-HQ 5 ft 70%	52	>10	125.0-128.3, 125.8-126.2' - Fractures or mechanical break (2), no visible orientation		Limestone 125.0-126.4' - Same as 110.0-111.9' except poorly competent, trace black, staining throughout core	Limestone 126.4-128.5' - light gray, (N7), strong HCl reaction, very weak (R1), voids (1/16") over 70% of surface, cavities (up to 3/4"x1-9/16") over 5% of surface, very fossiliferous (mold and casts) No Recovery 128.5-130.0'	R11: 4 minutes
>10			126.4, 126.6, 127.5' - Mechanical break (3)					
1								
0								
NR								
130	R12-HQ 5 ft 92%	8	>10	131.7-132.0' - Fracture zone 132.4-134.6' - Fracture zone, most are probable mechanical breaks		Sandy Silt (ML) 130.0-131.3' - grayish orange to light olive gray, (10YR 7/6 to 5Y 5/2), strong HCl reaction, fine sand-sized particles about 25%, carbonate derived, abrupt transition to 131.3-132.2'	Limestone 131.3-132.2' - very pale orange to light olive gray, (10YR 8/2 to 5Y 5/2), fine grained, strong HCl reaction, medium strong (R3), laminated bedding (<1/16" thick) below 131.8', transitions gradually to 132.2-134.6'	R12: 7 minutes
>10								
>10								
>10								
>10								
NR								
135								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-08

SHEET 8 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)

ELEVATION : 43.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 13.8 ft bgs on 04/22/07

START : 4/21/2007

END : 4/23/2007

LOGGER : C. Dougherty

DISCONTINUITIES									
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	LITHOLOGY	COMMENTS		
				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.		
-91.8	R13-HQ 5 ft 82%	47	>10	135.0-136.0' - Fracture zone, fragments		Limestone 132.3-134.6' - very pale orange to yellowish gray, (10YR 8/2 to 5Y 7/2), fine grained, extremely weak to very weak (R0 to R1), trace intervals of laminated bedding No Recovery 134.6-135.0' Limestone 135.0-137.9' - Same as 132.3-134.6' except zone of light olive gray (5YR 5/2) 137.9-139.1' - light olive gray, (5YR 5/2), fine grained, strong HCl reaction, weak (R2), voids (1/16") over 60% of surface, oriented along bedding planes (laminated bedding), zone of medium gray (N5) limestone, medium strong (R3) from 137.9-138.1' No Recovery 139.1-140.0' Limestone 140.0-143.0' - Same as 137.9-139.1' laminated bedding only in top foot of core 143.0-143.3' - Same as 140.0-143.0' except mottled medium gray (n5), with few voids No Recovery 143.3-145.0'	R13: 5 minutes		
			3	136.3, 136.6, 136.95' - Mechanical break (3)					
			1	137.4-137.7' - Fracture zone or mechanical break					
			>10	138.2-138.5' - Fractures (5), smooth, planar, fractures along bedding planes, probably mechanical breaks					
			NR						
140	R14-HQ 5 ft 66%	13	2	140.4' - Mechanical break				Limestone 145.0-147.8' - medium light gray to yellowish gray, (N6 to 5Y 7/2), fine grained, strong to moderate HCl reaction, strong to very strong (R4 to R5), voids over 25% of surface, one cavity (3/4"x3/4") passes through core at 145.5' 147.8-149.3' - yellowish gray, (5Y 7/2), very fine grained, strong to very strong HCl reaction, very strong (R5), laminated to thinly bedded, voids (1/16") occur in some bedding planes but not others, overall in about 20% of surface No Recovery 149.3-150.0' Limestone 150.0-150.4' - dusky yellow, (5Y 6/4), fine to medium grained, moderately HCl reaction, very weak (R1), voids (1/16") over 90% of surface 150.4-151.0' - very pale orange to yellowish brown, (10YR 8/2 to 10YR 6/2), fine grained, strong HCl reaction, very strong (R5) 151.0-152.2' - Same as 150.0-150.4' 152.2-153.8' - Same as 150.4-151' except with slight increase in voids (1/16") over 5-10% (mostly in browner rock)	R14: 5 minutes
-96.8			>10	140.6-140.9' - Fracture zone, no visible orientation					
			>10	142.2-142.3' - Fracture zone or mechanical break, rough, undulating					
			NR						
145	R15-HQ 5 ft 86%	68	0	146.1-146.5' - Fracture zone		Limestone 150.0-150.3' - Fracture zone 151.1, 151.2' - Fractures (2), horizontal, rough, undulating, probable mechanical breaks but surfaces don't match 151.3, 151.6' - Mechanical break (2) 152.1' - Fracture, horizontal, smooth, undulating, probable mechanical breaks, but surfaces don't match 152.2-153.8' - Fracture, horizontal, smooth, undulating, black, probable mechanical breaks, but surfaces don't match			R15: 9 minutes
-101.8			>10	146.6' - Mechanical break					
			3	147' - Fracture, horizontal, rough, undulating, black staining on surface					
			2	147.3' - Mechanical break					
			2	147.6' - Fracture, horizontal, smooth, undulating, black staining on surfaces					
			0	148.3' - Mechanical break					
			NR						
150	R16-HQ 5 ft 76%	45	1	150.0-150.3' - Fracture zone				Limestone 150.0-150.4' - dusky yellow, (5Y 6/4), fine to medium grained, moderately HCl reaction, very weak (R1), voids (1/16") over 90% of surface 150.4-151.0' - very pale orange to yellowish brown, (10YR 8/2 to 10YR 6/2), fine grained, strong HCl reaction, very strong (R5) 151.0-152.2' - Same as 150.0-150.4' 152.2-153.8' - Same as 150.4-151' except with slight increase in voids (1/16") over 5-10% (mostly in browner rock)	R16: Runtime not recorded
-106.8			4	151.1, 151.2' - Fractures (2), horizontal, rough, undulating, probable mechanical breaks but surfaces don't match					
			3	151.3, 151.6' - Mechanical break (2)					
			1	152.1' - Fracture, horizontal, smooth, undulating, probable mechanical breaks, but surfaces don't match					
			NR	152.2-153.8' - Fracture, horizontal, smooth, undulating, black, probable mechanical breaks, but surfaces don't match					
155									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-08

SHEET 9 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)

ELEVATION : 43.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing



ORIENTATION : Vertical

WATER LEVELS : 13.8 ft bgs on 04/22/07

START : 4/21/2007

END : 4/23/2007

LOGGER : C. Dougherty

WATER LEVELS : 15.6 ft bgs on 04/22/07		START : 4/21/2007		END : 4/23/2007		LOGGER : C. Dougherty			
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					
-111.8	R17-HQ 5 ft 78%	47	3	155.1' - Fracture or mechanical break 155.1-155.7' - Fracture, vertical, rough, undulating, some staining on surface		No Recovery 153.8-155.0' Limestone 155.0-156.1' - Same as 152.2-153.8'	R17: 9 minutes		
2			155.7' - Fracture, 5 deg, smooth, planar, coating of olive gray (5Y 3/2), carbonate derived silt and fine sand on faces	156.1-157.3' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, weak (R2), voids (1/16") over 35% of surface					
2			156.1' - Fracture, horizontal, smooth, undulating, probable mechanical break, but faces don't match up	157.3-158.9' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), voids (1/16") of over 85% of surface, large (3/8") voids over 5%					
1			156.8' - Mechanical break 156.8-157.2' - Fracture, 70 deg, rough, planar, some black staining on surface	No Recovery 158.9-160.0'					
NR			157.2' - Mechanical break 157.5' - Fracture or mechanical break, rough, undulating						
160 -116.8	R18-HQ 5 ft 16%	0	>10	160.0-160.8' - Fracture zone		Limestone 160.0-160.4' - Same as 157.3-158.9' 160.4-160.7' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, very weak (R1), voids (1/16") over 80% of surface No Recovery 160.8-165.0'		R18: 2 minutes	
			NR						
165 -121.8	R19-HQ 5 ft 78%	47	2	165.4-165.7' - Fracture or mechanical break, 60 deg, rough, undulating		Limestone 165.0-168.7' - light olive gray, (5YR 5/2), fine grained, strong HCl reaction, weak (R2), trace laminated bedding 166.7-167.5', voids (1/16"-3/16") over 5% of surface 165.0-166.0'			R19: 8 minutes
			4	165.9' - Fracture, 30 deg, rough, undulating 166.1-166.5' - Fracture or mechanical break, 70 deg, rough, undulating		168.7-168.9' - moderate olive brown, (5Y 4/4), fine to medium grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), voids (1/16") over 80% of surface. No Recovery 168.9-170.0 Limestone 170.0-170.3' - Same as 168.7-168.9' 170.3-174.7' - light olive gray, (5YR 5/2), fine grained, strong HCl reaction, weak (R2)			
			>10	166.6, 166.8' - Mechanical break (2) 167.3-167.8' - Fracture zone					
			>10	168.2' - Fracture, horizontal, smooth, planar, iron oxide 168.3-168.9' - Fracture zone, probable mechanical break, but faces don't match up					
			NR						
170 -126.8	R20-HQ 5 ft 94%	52	2	170.0-175.0' - Fracture, vertical, rough, undulating, black, staining on 10% of surface 170.2' - Fracture, horizontal, probable mechanical break but faces don't match up		R20: 9 minutes			
			>10	171.4-171.9' - Mechanical break					
			4	171.9-172.9' - Fracture, vertical, rough, undulating					
			4	172.2' - Mechanical break 172.2-172.6' - Fractures or mechanical break (2), rough, undulating					
			1	172.6' - Mechanical break 173' - Fracture, horizontal, smooth, planar, slight black staining on surfaces					
			NR						
175			NR			No Recovery 174.7-175.0'			



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-08
SHEET 10 OF 10	
ROCK CORE LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723365.5 N, 457759.0 E (NAD83)
 ELEVATION : 43.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: R. Haire, T. Williams
 CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 13.8 ft bgs on 04/22/07 START : 4/21/2007 END : 4/23/2007 LOGGER : C. Dougherty

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.
-131.8	R21-HQ 5 ft 100%	55	2	173.4-173.9' - Fractures or mechanical break (2), horizontal and 50 deg, rough, undulating		Limestone 175.0-180.0' - Same as 170.3-174.7' except laminated bedding from 175.9-176.5' and 179.3-180.0'	R21: 9 minutes
			2	173.9, 174.3' - Fractures (2), horizontal, smooth, undulating, some dark staining on surface			
			1	175.6' - Fracture, horizontal, smooth, planar, dark staining on surfaces			
			>10	176.4' - Fracture, horizontal, smooth, planar, coating of carbonate derived silt			
			>10	177' - Fracture or mechanical break, horizontal, rough, undulating			
180	R22-HQ 5 ft 100%	57	2	177.0-177.3' - Fracture or mechanical break, 70 deg, rough, undulating		180.0-181.8' - dusky yellow, (5Y 6/4), moderate HCl reaction, weak (R2), voids over 75% of surface. Below 180.6', limestone appears to interfinger (possible infilling) and then laminated bedding as in 175.0-180.0' 181.8-185.0' - Same as 175-180.0' except zone from 182.5-183.5' with voids (3/8"x3/4") <5% of surface	Plugging borehole on 4/24/07 R22: 6 minutes
-136.8			>10	178.3' - Fracture, horizontal, smooth, undulating, coating of carbonate derived silt			
			2	178.5-179.5' - Fracture zone			
			3	179.6, 179.7' - Mechanical break (2)			
			2	180.3' - Fracture, horizontal, rough, undulating, dark staining			
185				180.9' - Mechanical break		Bottom of Boring at 185.0 ft bgs on 4/23/2007	
-141.8				182.0-182.4' - Fracture or mechanical break, vertical, rough, undulating			
				182.5' - Fracture, horizontal, smooth, undulating, coating of carbonate derived silt, trace of dark staining			
				183.7, 183.9, 184.0' - Fracture or mechanical break (3), 45 deg, rough, undulating			
				184' - Fracture or mechanical break, 45 deg, rough, undulating			
				184.4' - Fracture, horizontal, smooth, undulating, dark staining on 70% of surface			
				184.4-184.7' - Fracture or mechanical break, vertical, rough, undulating			



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-08A
SHEET 1 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723362.2 N, 457763.1 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.9 ft bgs on 6/17/07 START : 6/14/2007 END : 6/16/2007 LOGGER : J. Schaeffer, D. Thomas

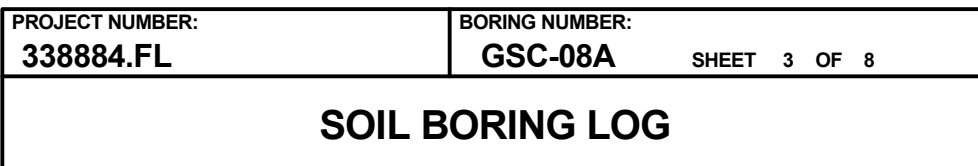
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
		RECOVERY (ft)				
		#TYPE				
43.1			6"-6"-6" (N)			Blind drill to 25.0' to begin split spoon sampling
5						Boring GSC-08A is 5.0' offset from GSC-08 toward E-6 (southeast)
38.1						Cuttings from 5.0-10.0' appear to be fine sands
10						Cuttings from 10.0-15.0' appear to be sand and clayey sands
33.1						
15						Drilling mud is Quick Gel bentonite
28.1						
20						



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-08A
SHEET 2 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723362.2 N, 457763.1 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 4.9 ft bgs on 6/17/07 START : 6/14/2007 END : 6/16/2007 LOGGER : J. Schaeffer, D. Thomas

WATER LEVELS : 4.9 TDS ON 9/17/07			START : 9/14/2007			END : 9/19/2007			LOGGERS : J. Schaeffer, D. Thomas		
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				
23.1											
25	25.0										
18.1		1.1	SS-1	2-2-2 (4)	Silty Sand (SM) 25.0-26.1' - light brownish gray, (5YR 6/1), wet, very loose, nonplastic, no HCl reaction, very fine to fine grained sand, 25% fines, silica sand						
	26.5										
30	30.0										
13.1		1.1	SS-2	5-5-6 (11)	Silty Sand (SM) 30.0-31.1' - Same as 25.0-26.1' except medium dense						
	31.5										
35	35.0										
8.1		1.5	SS-3	2-3-5 (8)	Fat Clay With Sand (CH) 35.0-36.5' - brownish gray and olive gray, (5YR 4/1 and 5Y 4/1), mottled, moist, no HCl reaction, medium stiff, high plasticity, 20% very fine to fine silica sand						
	36.5										
40											



LOGGER : J. Schaeffer, D. Thomas

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-08A

SHEET 4 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723362.2 N, 457763.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" tri-cone bit

ORIENTATION : Vertical

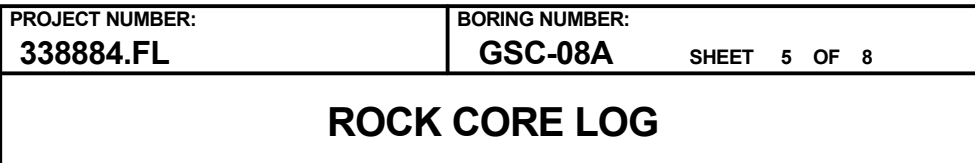
WATER LEVELS : 4.9 ft bgs on 6/17/07

START : 6/14/2007

END : 6/16/2007

LOGGER : J. Schaeffer, D. Thomas

WATER LEVELS : 4.9 TDS ON 9/17/07		START : 9/14/2007		END : 9/19/2007		LOGGERS : J. Schaefer, D. Thomas	
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		
-16.9	60.0	1.5	SS-8	4-4-5 (9)	Silty To Clayey Sand (SM-SC) 60.0-61.5' - Same as 55.0-56.5' except no HCl reaction, interbedded peat/organic soil (PT/OH), interbedded in lenses 1/16"-2" thick, mostly irregular, slickenside appearance in organic soil/peat, sample is 60% organic soil/peat and 40% silty to clayey sand		
	61.5						
65	65.0						Driller's Remark: Harder at 64.0'
-21.9		1.3	SS-9	7-4-9 (13)	Silt (ML) 65.0-65.2' - yellowish gray, (5Y 8/1), moist, medium stiff, nonplastic, rapid dilatancy, moderate HCl reaction, carbonate material, organic soil/peat lenses at top and bottom, 1/4" thick, laminated, same as above Poorly Graded Sand With Silt To Silty Sand (SP-SM) 65.2-66.25' - pale yellowish brown, (10YR 6/2), wet, medium dense, no HCl reaction, fine sand, 10-15% nonplastic fines Silt (ML) 66.25-66.3' - Same as 65.0-65.2'		Driller's Remark: Circulation loss continues at 25% Driller's Remark: Material from 64.0-70.0' drills hard and soft in layers Will switch to rock coring after 70.0' sample
	66.5						
70	70.0						
-26.9		0.8	SS-10	39-50/4 (89/10")	Silty Sand (SM) 70.0-70.8' - pale yellowish brown, (10YR 6/2), wet, very dense, mild to moderate HCl reaction, fine to coarse sand, 35% nonplastic fines, trace fine gravel-sized limestone, carbonate materials		
	70.8						
					Begin Rock Coring at 72.0 ft bgs See the next sheet for the rock core log		
75							
-31.9							
80							



ORIENTATION : Vertical

LOGGER : J. Schaeffer, D. Thomas

Rev. 4



PROJECT NUMBER:
338884.FL

BORING NUMBER:
GSC-08A

SHEET 6 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723362.2 N, 457763.1 E (NAD83)

ELEVATION : 43.1 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 4.9 ft bgs on 6/17/07

START : 6/14/2007

END : 6/16/2007

LOGGER : J. Schaeffer, D. Thomas

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			
95 -51.9	R5-HQ 5 ft 54%	13	<10	92.0-92.4' - Fracture zone, angular 1/4"-1" of over and underlying material		Limestone 88.25-91.0' - Same as 87.0-87.3' except with 20% voids and increased elongate fossils, transition from overlying paler-colored material, material has several filled voids, thin (up to 1/4" thick) layers of silt-sized material at 89.5' with moderate HCl reaction, organics at 90.8'	Driller's Remark: May have lost circulation at 91'
			3	92.5' - Fracture, rough, undulating, horizontal, end of rock fragments			
			2	92.6' - Fracture, 70 deg, rough, undulating, joins with horizontal fracture at 92.5'			
			NR	93.0' - rough, planar, discontinuity, horizontal, open, faces do not match		No Recovery 91.0-92.0' Limestone 92.0-92.4' - Same as 87.3-88.25' except pale yellowish brown and moderate yellowish brown, (10YR 6/2 and 10YR 5/4), up to 2" angular color blocks co-mingled	R5:5 minutes Driller's Remark: No circulation while drilling 92- 97'
97.0				93.15' - Fracture, 45 deg, planar, healed, <1/16" relief			
				93.9, 94.0' - Fracture (2), rough, undulating, horizontal, more open at 93.9', healed at 94.0'			
				94.4, 94.5' - Fracture (2), 0-30 deg, rough, stepped, open, fragments			
100 -56.9	R6-HQ 5 ft 100%	73	1	97.6' - discontinuity between overlying unconsolidated material and underlying rock, some rock fragments above		92.4-92.7' - Same as 87.3-88.25'	
			1	98.3' - Fracture, 40 deg, rough, undulating, healed		92.7-93.0' - Same as 87.0-87.3'	
			1			93.0-93.3' - Same as 87.3-88.25'	
			2	99.8, 100.2' - Fractures (2), 10 deg, rough, undulating, transition from overlying limestone with voids to yellow limestone at 99.8', then to weaker limestone, both have silt-sized infill		except transitions to material below at 70 degree angle	
			2	100.7' - Fracture, 70 deg, rough, undulating		93.3-94.1' - Same as 87.0-87.3'	
102.0			NR	101.3' - Mechanical break, or fracture, healed		94.1-94.6' - Same as 87.3-88.25'	
			<10	101.7' - Fracture, 40 deg, rough, undulating, fragments		except becoming softer with depth, very weak rock (R1) in the last 2' of interval, fractures at 94.5' and 94.6' in very weak rock	R6:5 minutes
			<10	102.6-103.4' - fragments, unconsolidated		94.6-94.7' - unconsolidated pale yellowish brown and black organics	
105 -61.9	R7-HQ 5 ft 88%	60	0	103.4-103.8' - Fracture zone		No Recovery 94.7-97.0' Limestone 97.0-97.6' - dark yellowish gray grading to pale greenish yellow with depth, (10YR 4/2 to 10YR 8/2), fine grained, strong HCl reaction, angular blocks of color	Core loss interpreted to be at beginning of core run based on drill time
			0	104.3, 107.35' - Fractures (2), horizontal, infill, upper fracture is open, lower is tight and similar in color, calcareous infill, silt-sized		97.6-99.8' - pale yellowish brown, (10YR 6/2), strong HCl reaction, weak (R2), fossil cavities up to 1/4" and up to 1" elongated	
			0	104.5' - horizontal discontinuity		99.8-100.7' - pale greenish yellow, (10Y 8/2), strong HCl reaction, medium strong to very weak (R3 to R1), <5% voids on core surface, friable	R7:4 minutes
			0	105.2' - 10 deg, healed or mechanical break		100.7-102.0' - Same as 97.6-99.8' except with fragments at the last 0.2' of interval	
107.0			2			No Recovery 102.0-102.6'	
			1	108.1' - Fracture, tight, horizontal or mechanical break		Silt (ML) 102.6-103.6' - light olive gray, (5Y 5/2), very soft, fine grained, moderate HCl reaction, carbonate derived	
110 -66.9	R8-HQ 5 ft 100%	90	0			103.6-104.0' - Same as 102.6-103.6' except with a 1" thick fragment of limestone (yellowish gray (5Y 7/2), very weak [R1], 10% coverage of 1/16" voids)	R8:4 minutes
			2	110.1' - Fracture, 10 deg, mechanical, healed			
			1	110.9, 111.0' - Fractures (2), horizontal, very similar to fractures and zone at 107.3', calcareous infill, open			
112.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-08A
SHEET 7 OF 8	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	


PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723362.2 N, 457763.1 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 4.9 ft bgs on 6/17/07 START : 6/14/2007 END : 6/16/2007 LOGGER : J. Schaeffer, D. Thomas

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.
115 -71.9	R9-HQ 5 ft 6%	0	1 NR	112.15' - Fracture, 10 deg, open, unconsolidated sediments beneath		Limestone 104.0-107.0' - pale greenish yellow, (10Y 8/2), fine grained, strong HCl reaction, weak (R2), 20% voids, fossils 1/4"-1" size Limestone 107.0-112.0' - Same as 104.0-107.0' except extremely weak (R0) at fracture zones (intervals 1"-2" in length) at 107.3' and 110.0', very consistent color, texture and voids Limestone 112.0-112.15' - Same as 107.0-112.0' Silt (ML) 112.15-112.3' - pale greenish yellow, (10Y 8/2), fine grained, strong HCl reaction, carbonate derived No Recovery 112.3-123.5'	Driller's Remark: 3.5' of void at 113.5-117' R9:1 minute
120 -76.9	R10-HQ 5 ft 0%	0	NR				Driller's Remark: Rods lowered without drilling to 120' (about 3 feet) R10:1 minute Driller's Remark: Felt like drilling sediment at 120-122'; drilling fluid was coffee color Driller's Remark: Rods pushed 122.0-123.0', definitely sediments, not a void; then troubles getting core barrel to set
125 -81.9	R11-HQ 5 ft 58%	0	N/A	123.5' - interpret no recovery before due to R10, drill rates, and competent material at 126.0'		Elastic Silt (MH) 123.5-126.0' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), wet, soft to medium stiff, low plasticity, no to slow dilatancy, strong HCl reaction, trace organics (1/16" fragments and one 1" chunk)	
127.0			4 NR	126.0, 126.15, 126.2' - Fractures (3), smooth, planar, horizontal, numerous other planes every 1/16"		Limestone 126.0-126.4' - light olive gray, (5Y 5/2), fine to very fine grained, strong (R4), horizontal laminations and fractures, no voids No Recovery 126.4-127.0'	R11:3 minutes
130 -86.9	R12-HQ 5 ft 96%	45	5 >10 0 1 3	126.3' - Fractures, above horizontal fractures and with partial vertical fractures 126.4' - no recovery 127.1' - Fracture, overlying large fragment to horizontal fracture, with debris 127.1-128.6' - Fracture, vertical, open to tight, gray discolorations along fracture faces, other vertical and horizontal fractures starting from main fracture, but most are short and tight 128.6-128.9' - fragment, terminated below by a 60 deg rough and undulating fracture at 129.0' 130.1' - Fracture, rough, undulating, horizontal, open		Limestone 127.0-131.8' - yellowish gray to grayish orange, (5Y 7/2 to 10YR 7/4), fine grained, strong HCl reaction, weak (R2), 3% coverage of voids (1/16"), several fossils (casts/molds [elongate (1/4"-1/2")]), shallow (1/4") cavities though very intact looking, at 131.4-131.8' increased voids and cavities, infilled elongate cavities with hard gray limestone	R12:4 minutes
132.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-08A
SHEET 8 OF 8	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723362.2 N, 457763.1 E (NAD83)
 ELEVATION : 43.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 4.9 ft bgs on 6/17/07 START : 6/14/2007 END : 6/16/2007 LOGGER : J. Schaeffer, D. Thomas

WATER LEVELS : 4.9 ft bgs on 6/17/07		START : 6/14/2007		END : 6/16/2007		LOGGER : J. Schaefer, D. Thomas	
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			
135 -91.9	R13-HQ 5 ft 76%	22	NR	131.5' - Fracture, 70 deg, with several 1-2" fragments mostly elongate, all roughly stepped to undulating, possible multiple vertical fractures 132.3-132.4' - Fractures, horizontal, smooth, planar, Fragments bounded by smooth, planar fractures, flat 1/4" triangles 133.4-133.95' - Fracture, 40 deg, rough, stepped, leading into fragments with angular block with vertical and horizontal fractures, transition between limestone within fragments 133.95, 134.05, 134.4, 134.6, 134.9' - Fractures (5), horizontal to 10 deg fractures along visible horizontal laminations/planes, roughly to smoothly planar 135.1' - Fracture, 70 deg, rough, undulating 135.25, 135.2, 135.5' - Fractures (3), 20 deg, rough, undulating, tight, open 135.65' - Fracture, sealed fracture plane with light gray silt-sized infill 1/4" thick		No Recovery 131.8-132.0' Limestone 132.0-132.1' - Same as 127.0-131.8' except pale greenish yellow, (10Y 8/2) 132.1-132.55' - Same as 126.0-126.4 except moderate to strong HCl reaction, strong (R4), horizontal bedding planes with breaks and fragments broken along horizontal planes 132.55-133.75' - Same as 132.0-132.1' except strong HCl reaction, weak to very weak (R2 to R1), weakening and becoming friable with depth 133.75-135.8' - Same as 132.1-132.55' except weak to medium strong (R2 to R3), banding/layering with gray and greener bands No Recovery 135.8-137.0' Bottom of Boring at 137.0 ft bgs on 6/16/2007	R13:5 minutes Total depth of boring 137.0' Hole open to 97.0' after removing casing Water level at 4.9' below ground surface at 08:50 on 6/17/07
			3				
			>10				
			5				
			4				
137.0			NR				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-09

SHEET 1 OF 10

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723154.0 N, 457653.4 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/05/07

START : 4/5/2007

END : 4/7/2007

LOGGER : R. McComb

WATER LEVELS : 2.0 (RDS) ON 4/3/07			START : 4/3/2007		END : 4/12/2007		LOGGERS : R. MCCOMB	
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			
41.3	0.0	1.2	SS-1	1-2-3 (5)	Topsoil 0.0-0.2' - grayish black, (N2), moist, soft, organics, 15-20% fine silica sand		Water level at 2.0'	
	1.5				Poorly Graded Sand With Organics (SP) 0.2-1.2' - medium gray to medium dark gray, (N5 to N4), moist, loose, fine silica sand, trace nonplastic fines, 10-15% fine organics, increasing to 20% at 0.9'			
5	5.0							
36.3		1.1	SS-2	1-2-2 (4)	Silty Sand (SM) 5.0-6.1' - light olive brown to moderate olive brown, (5Y 5/6 to 5Y 4/1), wet, very loose, very fine silica sand, 15-20% nonplastic fines, trace organics		Driller's Remark: Light chattering at 8.0'	
	6.5							
10	10.0							
31.3		0.8	SS-3	10-22-50/3 (72/9")	Silt (ML) 10.0-10.75' - grayish yellow to moderate yellow, (5Y 8/4 to 5Y 7/6), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, carbonate material, 3/8" thick lens of clayey sand (SC) at top of sample, bluish gray, fine silica sand, medium plastic fines		Driller's Remark: Very slow rate of penetration (27 minutes)	
	11.3							
15	15.0							
26.3		0.8	SS-4	42-50/3 (92/9")	Silt (ML) 15.0-15.8' - Same as 10.0-10.75' except grayish yellow, (5Y 8/4), mild HCl reaction			
	15.8							
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-09
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723154.0 N, 457653.4 E (NAD83)
 ELEVATION : 41.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 04/05/07 START : 4/5/2007 END : 4/7/2007 LOGGER : R. McComb

WATER LEVELS : 2.0 (RDS) 04/03/07			START : 4/3/2007			END : 4/12/2007			LOGGER : R. MCCOMB		
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				
21.3	20.0	1.0	SS-5	32-50 (82")	Silt (ML) 20.0-21.0' - Same as 15.0-15.8' except 5-10% very fine to fine sand						
	21.0										
25	25.0										
16.3		1.2	SS-6	45-47-50/4 (97/10")	Silt (ML) 25.0-26.2' - Same as 20.0-21.0' except very fine to medium sand-sized material increasing to 15% with depth						
	26.3										
30	30.0										
11.3	30.3	0.2	SS-7	50/4 (50/4")	Silt And Limestone Fragments (ML) 30.0-30.2' - Same as 25.0-26.2' except 30% coarse sand-sized limestone fragments, dark gray (N3) fragments (non-calcareous), with black calcareous material on some surfaces						
35	35.0										
6.3		1.4	SS-8	42-27-40 (67)	Sandy Silt (ML) 35.0-36.4' - light olive gray, (5Y 5/2), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 30-35% fine to coarse sand-sized limestone fragments, trace fine gravel-sized limestone fragments, carbonate material						
	36.5										
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-09

SHEET 3 OF 10

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723154.0 N, 457653.4 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/05/07

START : 4/5/2007

END : 4/7/2007

LOGGER : R. McComb

WATER LEVELS : 2.0 (bgs) on 4/3/2007			START : 4/3/2007			END : 4/12/2007			LOGGER : R. MCCOMB		
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						
1.3	40.0	1.5	SS-9	1-2-4 (6)	Silty Sand (SM) 40.0-41.5' - light olive gray to olive gray, (5Y 5/2 to 5Y 3/2), wet, loose, mild HCl reaction, fine to coarse sand-sized limestone fragments, 30% low plastic fines, 5% fine gravel-sized limestone fragments, carbonate materials			Driller's Remark: Lost circulation at 40.0'			
	41.5										
	44.7										
45 -3.7		0.3	SS-10	50/4 (50/4")	Limestone Fragments And Silt 45.0-45.3' - yellowish gray, (5Y 7/2), mild HCl reaction, carbonate material, 80% fine to coarse gravel-sized limestone fragments; 20% Silt (ML): wet, nonplastic, rapid dilatancy Begin Rock Coring at 45.0 ft bgs See the next sheet for the rock core log			Split spoon sample SS-10 actually advanced 45.0-45.35'			
50 -8.7											
55 -13.7											
60											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-09

SHEET 4 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723154.0 N, 457653.4 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/05/07

START : 4/5/2007

END : 4/7/2007

LOGGER : R. McComb

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.
-3.7	45.0					No Recovery 45.0-49.0'	Began rock coring at 45.0'
	R1-HQ 5 ft 20%	0	NR				
50	50.0		>10	49.0-50.0' - Fracture zone, various orientations 49.5' - 0-60 deg, smooth, planar, open 50.0' - Fracture, 60 deg, rough, undulating		Limestone 49.0-49.5' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, extremely weak (R0), friable, voids over 50-60% of surface 49.5-50.0' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 8/2), very fine grained, mild to moderate HCl reaction, very weak (R1), presence of micro fractures inclined 60-70 deg, voids over less than 1% of surface, 3/4"-1-3/16" size cavities over less than 9% of the surface 50.0-51.75' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids over 1-3% of surface, 3/4"-3/16" cavities over up to 10% of the surface, trace fossil cast and molds, trace cavity infilling No Recovery 51.75-54.6' Limestone 54.6-55.0' - Same as 50.0-51.75' except yellowish gray, (5Y 7/2), voids over less than 3% of the surface, few cavities Limestone 55.0-56.3' - dusky yellow to light olive gray, (5Y 6/4 to 5Y 6/1), fine grained, mild HCl reaction, very weak (R1), voids over 15-30% of surface, cavities are 3/4"-1-3/16" long and 1/8"-3/16" wide, fossiliferous (molds/casts) No Recovery 56.3-60.0' Limestone 60.0-60.4' - light olive brown, (5Y 5/6), fine grained, mild HCl reaction, extremely weak (R0), voids over 25% of the surface, fossiliferous (possible shark tooth), molds and casts No Recovery 60.4-64.0'	R1:4 minutes Driller's Remark: Last 1.0' is harder than above; no circulation Driller's Remark: Very soft from 52.0-55.0' R2:7 minutes R3:7 minutes Driller's Remark: Very soft from 61.0-64.0' R4:7 minutes
-8.7		0					
	R2-HQ 5 ft 43%	35	NR	51.05' - Fracture, 60 deg, rough, stepped, tight 51.75' - Fracture, horizontal, rough, undulating, open			
55	55.0		2				
-13.7			>1	54.6' - Fracture, <5 deg, rough, undulating, open 54.8' - Fracture, 80 deg, rough, stepped			
	R3-HQ 5 ft 26%	14	NR	56.8' - Fracture, 60 deg, rough, stepped to undulating, open			
60	60.0		>10				
-18.7							
	R4-HQ 5 ft 30%	20	NR	64.0' - Fracture, 0-50 deg, rough, stepped			
65	65.0		1				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-09

SHEET 5 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723154.0 N, 457653.4 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/05/07

START : 4/5/2007

END : 4/7/2007

LOGGER : R. McComb

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.
-23.7	R5-HQ 5 ft 100%	16	N/A			Limestone 64.0-65.0' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, mild HCl reaction, extremely weak (R0), voids up to 1/16" over 40-50% of surface, 3/4"-1-3/16" size cavities over 1-3% of surface, fossiliferous (molds/casts) Carbonate Sand (SP) 65.0-69.2' - moderately yellowish brown to pale yellowish brown, (10YR 5/4 to 10YR 6/2), wet, loose, fine to very fine grained, moderate HCl reaction	Driller's Remark: Hard spot at 67.0' R5:4 minutes
			N/A				
			N/A				
			N/A				
70	R6-HQ 5 ft 36%	22	>1	69.2' - Fracture, 40 deg, smooth, stepped to undulating, black coating over 5% of the joint surface		Limestone 69.2-70.0' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine grained, mild HCl reaction, very weak (R1), voids up to 1/16" over 15-20% of the surface, 1/16-1/8" size voids becoming more abundant with depth, slightly fossiliferous (molds and casts) 70.0-71.55' - Same as 69.2-70.0' except mottled No Recovery 71.55-74.75'	Driller's Remark: No return of circulation continues ever since 45.0' R6:9 minutes
-28.7			0				
			>3	71.1' - Fracture, 0-60 deg, rough, stepped, open			
				71.35' - Fracture, horizontal, rough, stepped, open			
	R7-HQ 5 ft 44%	36	NR	71.4' - Fracture, horizontal, smooth, stepped, open		Limestone 74.75-75.0' - moderate yellow, (5Y 7/6), fine to very fine grained, moderate HCl reaction, extremely weak (R0), friable, slightly fossiliferous (molds/casts), mottled with very fine grained lamination with fewer voids, few cavities up to 3/16"x3/16" No Recovery 75.0-77.8' Limestone 77.8-79.0' - yellowish gray, (5Y 7/2), mottled, very fine grained, mild HCl reaction, weak (R2), voids up to 1/16" over 15-25% of surface, few cavities up to 3/16", slightly fossiliferous (casts and molds), up to 1" cavities with secondary infill of limestone with voids (1/16") over 40% of surface 79.0-80.0' - yellowish gray, (5Y 7/2), very fine grained, moderate HCl reaction, weak (R2), voids up to 1/16" over 3% of surface, interspaced with cavities with 2% infill of very weak lamination with voids over 50-60%, trace fossil (mold/cast)	Driller's Remark: Recovery from bottom (77.8-80.0') R7:8 minutes
75			>1	74.75' - Fracture, 50 deg, rough, undulating, open			
-33.7			NR				
			1				
	R8-HQ 5 ft 68%	38	2	78.8' - Fracture, 30 deg, smooth, undulating, black stain over 5% of surface			R8:Runtime not recorded
				79.0' - Fracture, <5 deg, smooth, undulating, tight			
80			3	79.35' - Fracture, <5-30 deg, rough, stepped to undulating, open			
-38.7			1	80.4' - Fracture, <5 deg and 50 deg, rough, undulating, open			
			4	80.8' - Fracture, <5 deg, smooth, undulating, open			
				81.0' - Fracture, 0-70 deg, rough, stepped, open			
				81.1' - Fracture, 40 deg, rough, undulating, open			
			NR	82.05' - Fracture, <5-50 deg, rough, stepped to undulating, open			
85				82.3' - Fracture, 40 deg, rough, stepped, open			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-09

SHEET 6 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723154.0 N, 457653.4 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/05/07

START : 4/5/2007

END : 4/7/2007

LOGGER : R. McComb

WATER LEVEL: 20.85g on 4/5/07		DATE: 4/5/2007		LOGGERS: T.M. MOORE			
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		
-43.7	R9-HQ 5 ft 0%	0	NR		Limestone 80.0-83.4' - yellowish gray, (5Y 7/2), fine to very fine grained, mild to moderate HCl reaction, very weak to weak (R1 to R2), voids (up to 1/16") over 15-25% of surface, many 3/16"x1/16" cavities, few cavities up to 3/8"x3/16", fossiliferous (molds/casts) No Recovery 83.4-90.0'	On 4/5/07 at 85.0', advanced HW casing to 86.0' from 45.0' due to sand interval above a slipping casing, very soft at 86.0', able to hammer casing easily several feet, able to get the circulation back Lost circulation at 87.0'	
90 -48.7	R10-HQ 5 ft 20%	0	NR		Limestone Fragments 90.0-90.5' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, very weak (R1), voids over 50-60% of surface with cavities up to 3/16", fossiliferous (infill/casts) No Recovery 90.5-93.0'	R9:5 minutes Driller's Remark: Pulled core barrel but no recovery, tagged the bottom of borehole at 90.0', suspect 85.0-90.0' is sand 90.0-90.5' firm drilling 90.5-93.0' very soft 93.0-94.0' some what harder 94.0-95.0 very soft	
95 -53.7	R11-HQ 5 ft 52%	36	NR		Limestone 93.0-93.5' - yellowish gray, (5Y 7/2), very fine grained, mild HCl reaction, weak (R2), voids over up to 5-10% of surface, carbonate black coating on 5% of the surface, cavities No Recovery 93.5-95.0' Limestone 95.0-95.8' - light olive gray, (5Y 5/2), very fine grained, mild HCl reaction, weak (R2), voids over 13% of surface, with sand and silt-sized carbonate grains, clayey No Recovery 95.8-98.2'	R10: No run time recorded Driller's Remark: HW casing continue to drop, advancing HW to 95.0'	
100 -58.7	R12-HQ 5 ft 58%	20	NR		Limestone 98.2-100.0' - yellowish gray, (5Y 7/2), fine to very fine grained, mild HCl reaction, weak (R2), up to 1/16" voids over 15-20% of surface, few cavities up to 9/16"x3/4" on the surface, mottled, interspaced with very fine grained limestone with fewer voids, fossiliferous (molds and casts) 100.0-101.4' - moderate olive brown, (5Y 4/4), fine grained, mild HCl reaction, weak (R2), gravel-sized fragments, voids up to 1/8" over 25-30% of surface, few 3/8"x3/16" cavities on surface, fossiliferous (molds/casts)	SPT from 95.0-96.5 to determine the lithology, recorded 0.8' limestone gravel; will switch back to HW coring (17, 50/3', 67/9") R11:8 minutes	
105							R12:11 minutes



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-09

SHEET 7 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723154.0 N, 457653.4 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/05/07

START : 4/5/2007

END : 4/7/2007

LOGGER : R. McComb

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			
-63.7	R13-HQ 5 ft 48%	23	10	105.0-106.0' - Fracture zone, 0 to inclined 60-70 deg, rough, undulating, open		Limestone 101.4-101.9' - pale greenish yellow to yellowish gray, (10Y 8/2 to 5Y 7/2), very fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3) Clay With Limestone (CL) 101.9-102.2' - black to very dark gray, (N1 to N3), wet, soft, black carbonate coated gravel-sized fragments Limestone 102.2-102.9' - Same as 100.0-101.4' except yellowish gray to grayish yellow, (5Y 7/2 to 5Y 8/4), cavity infilling up to 1-3/16"-3/4", fossil molds and casts No Recovery 102.9-105.0' Limestone 105.0-107.4' - yellowish gray, (5Y 7/2), fine to very fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), fossil molds and casts, voids up to 1/16" over 30-40% of surface, few cavities up to 3/16"x3/16" exist on the rock surface No Recovery 107.4-110.0' Limestone 110.0-112.45' - Same as 105.0-107.4' No Recovery 112.45-115.0' Limestone 115.0-116.0' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak (R1), friable, voids up to 1/16" over 25-30% of surface, 3/4"-1-3/16" cavities rarely exist on surface, rare fossiliferous (casts/molds) No Recovery 116.0-125.0'	R13:7 minutes
			10	106.45' - Fracture, <5 deg, rough, undulating, open			
			>10	106.45-107.4' - Fracture zone, rough, stepped, various orientations, open			
			NR				
110	R14-HQ 5 ft 49%	23	4	110.2' - Fracture, 70 deg, rough, stepped, open		No Recovery 102.9-105.0' Limestone 105.0-107.4' - yellowish gray, (5Y 7/2), fine to very fine grained, mild to moderate HCl reaction, weak to medium strong (R2 to R3), fossil molds and casts, voids up to 1/16" over 30-40% of surface, few cavities up to 3/16"x3/16" exist on the rock surface No Recovery 107.4-110.0' Limestone 110.0-112.45' - Same as 105.0-107.4' No Recovery 112.45-115.0' Limestone 115.0-116.0' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak (R1), friable, voids up to 1/16" over 25-30% of surface, 3/4"-1-3/16" cavities rarely exist on surface, rare fossiliferous (casts/molds) No Recovery 116.0-125.0'	R14:4 minutes
-68.7			>10	110.5' - Fracture, 0-90 deg, rough, stepped, open			
			1	110.6' - Fracture, 70 deg, rough, stepped 110.8' - Fracture, <5 deg, rough, stepped, joins with fracture at 110.6'			
			NR	111.3- 111.9' - Fracture zone, various orientations 112.45' - Fracture zone, 0-90 deg, rough, stepped, open			
115	R15-HQ 5 ft 20%	7	3	115.2' - Fracture, 0-60 deg, rough, undulating to stepped, open		No Recovery 112.45-115.0' Limestone 115.0-116.0' - yellowish gray, (5Y 7/2), fine grained, mild HCl reaction, very weak (R1), friable, voids up to 1/16" over 25-30% of surface, 3/4"-1-3/16" cavities rarely exist on surface, rare fossiliferous (casts/molds) No Recovery 116.0-125.0'	R15:4 minutes
-73.7				115.4' - Fracture, 40 deg, rough, undulating, tight			
				115.85' - Fracture, 50 deg, rough, undulating, open			
			NR				
120	R16-HQ 5 ft 0%	0				Driller's Remark: Retrieved a handful of material consisting of loose sand, carbonate material, moderate to high HCl reaction, silty to sandy, light gray	R16:3 minutes
-78.7							
125							

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723154.0 N, 457653.4 E (NAD83)

ELEVATION : 41.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: T. Williams

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ tools, HW casing





ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/05/07

START : 4/5/2007

END : 4/7/2007

LOGGER : R. McComb

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		
-83.7		R17-HQ 5 ft 34%	0	>10		Carbonate Sand With Silt (SP-SM) 125.0-125.5' - pale olive to yellowish gray, (10Y 6/2 to 5Y 7/2), wet, loose, fine grained, rapid dilatancy, moderate HCl reaction, trace limestone fragments	Stop drilling 04/06/2007 Resume on 04/07/07; water level 6.0' below ground surface	
			NR	>10			Limestone 125.5-126.5' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, extremely weak (R0), voids over 10-15% of surface 126.5-126.7' - light olive gray, (5Y 5/2), mild HCl reaction, very weak (R1), voids up to 1/16" over 5-10% of surface, cavities up to 3/16"x3/16"	R17:3 minutes
130	130.0							
-88.7		R18-HQ 5 ft 20%	0	>10		No Recovery 126.7-130.0' Limestone 130.0-131.0' - pale yellowish brown to yellowish gray, (10YR 6/2 to 5Y 7/2), fine to very fine grained, mild HCl reaction, very weak (R1), voids up to 1/16" over 10-15% of surface, fossil molds and cast are rare, some solution cavities up to 1"x3/16"		
			NR				No Recovery 131.0-135.0'	R18:7 minutes
135	135.0							
-93.7		R19-HQ 5 ft 64%	35	3		Limestone 135.0-136.75' - yellowish gray, (5Y 7/2), very fine grained, moderate to strong HCl reaction, very weak to weak (R1 to R2), 1/16" voids over 1-3% of surface, many 2"-2-3/8"x3/4"-1-3/16" cavities on rock surface, fossil molds and casts		
			NR	>10			No Recovery 136.75-138.6'	
				>1			Limestone 138.6-139.05' - light olive gray, (5Y 5/2), very fine grained, moderate HCl reaction, weak (R2), voids up to 1/16" over 1-3% of surface	R19:10 minutes
				2			139.05-139.15' - yellowish gray, (5Y 7/2), very fine grained, very weak (R1), voids up to 1/16" over 10% of surface, trace fossil casts and molds	
140	140.0							
-98.7		R20-HQ 5 ft 78%	29	10		139.05-139.15' - yellowish gray, (5Y 7/2), very fine grained, very weak (R1), voids up to 1/16" over 10% of surface, trace fossil casts and molds		
			NR				139.15-140.0' - Same as 138.6-139.05' except mottled with brownish limestone	
				>10				
				3				
				3				
145	145.0			2			R20:11 minutes	



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-10
SHEET 1 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722899.7 N, 457706.1 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/19/2007 END : 4/22/2007 LOGGER : A. Erickson

WATER LEVELS : 1.61 ft bgs on 4/7/07		START : 4/19/2007		END : 4/22/2007		LOGGERS : A. Erickson	
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		
42.3	0.0	1.3	SS-1	1-2-2 (4)	Topsoil Grading To Poorly Graded Sand With Organics (SP) 0.0-1.3' - grayish black, (N2), moist, very loose, fine grained, silica sand, 50% organics decreasing with depth, trace nonplastic fines		Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08) Water levels not recorded during drilling
	1.5						
5	5.0						
37.3		0.9	SS-2	3-3-3 (6)	Silty Sand (SM) 5.0-5.9' - light brown, (5Y 5/6), moist, loose, fine silica sand, 15-20% nonplastic fines, trace organics		
	6.5						
10	10.0						
32.3		0.7	SS-3	0-0-1 (1)	Silty Sand (SM) 10.0-10.7' - pale orange, (10YR 8/2), wet, loose, fine to medium grained, strong HCl reaction, 20% low plastic fines, fossiliferous, carbonate material		Weight of hammer enough to drive of SS-3 first 12"
	11.5						
15	15.0						
27.3		0.8	SS-4	40-50/3 (90/9")	Silt (ML) 15.0-15.8' - grayish orange, (10YR 7/4), moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, 5-10% very fine sand-sized, carbonate materials		Driller's Remark: Feels like hard material
	15.8						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-10
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722899.7 N, 457706.1 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/19/2007 END : 4/22/2007 LOGGER : A. Erickson

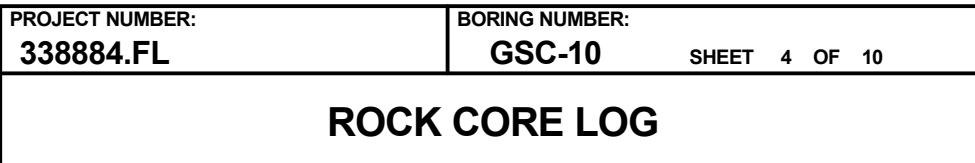
WATER LEVELS : 1.61 ft bgs on 4/7/07		START : 4/19/2007		END : 4/22/2007		LOGGER : A. LICKSOT	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION		
22.3	20.0	1.4	SS-5	28-45-43 (88)	Silt (ML) 20.0-21.4' - Same as 15.0-15.9'		Driller's Remark: Water loss at 28.0'
	21.5						
25	25.0						
17.3		1.5	SS-6	35-44-33 (77)	Silt (ML) 25.0-26.5' - Same as 15.0-15.9'		
	26.5						
30	30.0						
12.3		1.3	SS-7	17-32-32 (64)	Sandy Silt (ML) 30.0-31.3' - Same as 15.0-15.9' except grayish orange, 20-25% fine to coarse sand-sized, trace fine gravel-sized limestone, carbonate materials		Driller's Remark: Hard drilling at 32.5'
	31.5						
35	35.0						
7.3		1.2	SS-8	31-26-24 (50)	Silt With Sand (ML) 35.0-36.2' - yellowish gray, (5Y 7/2), moist, hard, nonplastic, rapid dilatancy, mild HCl reaction, very fine to fine sand-sized, 10% fine to coarse sand-sized, carbonate		
	36.5						
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-10
SHEET 3 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722899.7 N, 457706.1 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, auto hammer, AWJ rods, 4-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/19/2007 END : 4/22/2007 LOGGER : A. Erickson

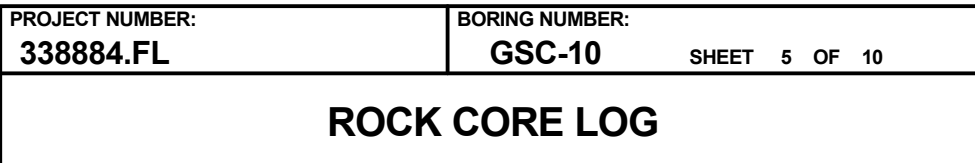
WATER LEVELS : 1.01 ft bgs on 4/7/07			START : 4/19/2007			END : 4/22/2007			LOGGERS : A. LICKSON		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS			
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION					
2.3	40.0	1.5	SS-9	10-17-27 (44)	Sandy Silt (ML) 40.0-41.5' - Same as 35.0-36.2' except 30-35% fine to coarse sand-sized and trace organics						
	41.5										
45	45.0										
-2.7											
		1.1	SS-10	23-52-50 (102)	Silty Sand (SM) 45.0-46.1' - Same as 40.0-41.5'			Driller's Remark: Will set casing to 45.0' below ground surface			
	46.5										
								Driller's Remark: Hard drilling at 47.0', sample was slough in sand-sized limestone fragments			
50	50.0	0.0	SS-11	50/2 (50/2")	No Recovery 50.0-50.2' Begin Rock Coring at 50.0 ft bgs See the next sheet for the rock core log						
-7.7	50.2										
55											
-12.7											
60											



ORIENTATION : Vertical

LOGGER : A. Erickson

Rev. 4



LOGGER : A. Erickson

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-10
SHEET 6 OF 10	
ROCK CORE LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722899.7 N, 457706.1 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/19/2007

END : 4/22/2007

LOGGER : A. Erickson

WATER LEVELS : 1.01 ft (RDS) on 6/14/07		START : 4/19/2007		END : 4/22/2007		LOGGERS : A. LICKSITT		
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
-47.7			NR	87.15' - Fracture, horizontal and 30 deg, rough, planar, open	Limestone	R9:9 minutes		
91.0			5	87.3, 87.4, 87.55' - Fractures (3), horizontal, smooth, rounded rock fragments		81.75-84.2' - moderate yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, strong (R4), voids (<1/16") over 5-15% of surface, except for 1" interval at 83.4' with 25% voids on surface		
	R10-NQ 5 ft 88%	38	3	87.9, 88.25, 88.35, 88.6, 88.8, 89.2, 89.4' - Fractures (7), horizontal, significant fragmentation in places	84.2-84.4' - Same as 81.0-81.75' except extremely weak (R0)			
			5	89.45-89.9' - Fracture zone, 30 deg	84.4-85.3' - Same as 81.75-84.2' except weak (R2), voids over 3% of surface, this material more of a transition between the two types from 81.0-84.2'			
			1	91.0-91.4' - Fracture zone, several large subangular fragments with weathered appearance, very open	85.3-86.0' - Same as 81.0-81.75' except strong HCl reaction, very weak (R1)	R10:8 minutes		
95			0	91.7' - Fracture, 20 deg, rough, planar, tight	86.0-86.5' - moderately yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, weak (R2), fine organic inclusions, no voids			
-52.7			NR	92.5' - Fracture, horizontal, rough, undulating, fragmentation	86.5-87.1' - Same as 86.0-86.5' except fine (<1/16") voids over 30% of surface (up to 40% at 86.6'), few larger 1/4" cavities/fossil molds			
	96.0		0	92.6' - Fracture, 60 deg, rough, undulating, tight	87.1-88.9' - Same as 86.0-86.5' except very weak to weak (R1 to R2), voids vary over 10-30% of surface			
			0	92.8' - Fracture, 60 deg, rough, planar, tight	88.9-89.9' - Same as 86.0-86.5' except weak to medium strong (R2 to R3), 10% voids (<1/16"), few larger (1/4") cavities/fossil molds	R11:7 minutes		
			1	93.3' - Fracture, 45 deg, rough, planar, tight	No Recovery 89.9-91.0'			
			4	93.7' - Fracture, horizontal, rough, planar, very open, material beneath is discontinuous and somewhat fragmented	Limestone			
100	R11-NQ 5 ft 94%	78	0	93.9' - Fracture, horizontal, rough, stepped, very open with fragmentation, subangular	91.0-91.4' - dark yellowish orange, (10YR 6/6), fine grained, moderate to strong HCl reaction, very weak (R1), fine voids over 10% of surface, 1/4" rounded gray inclusions	Driller's Remark: 20% water loss at 103.0'		
-57.7			NR	95.0' - Fracture, horizontal, rough, stepped, with missing fragments	91.4-95.4' - moderate yellowish brown, (10YR 5/4), moderate to strong HCl reaction, weak to medium strong (R2 to R3), no voids			
	101.0		6	98.75' - Fracture, horizontal, rough, stepped, tight	91.5-91.8', voids (1/16") over 10-20% of surface elsewhere, some fossil cavities/molds variably up to 1/2", though most smaller, poorly fossiliferous	R12:7 minutes		
			5	99.05, 99.15' - Fractures (2), horizontal, rough, undulating, very open with weathered appearance in zone of increased voids/cavities	No Recovery 95.4-96.0'			
			1	99.75' - Fracture, horizontal, rough, undulating, tight	Limestone			
			5	99.95' - Fracture, horizontal, smooth, planar, very open with apparent change of rock type abruptly at fracture	96.0-98.75' - moderate yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, medium strong (R3), voids (1/16") over 3-10% of surface, few cavities/molds up to 1/2", but most are 1/4"			
	R12-NQ 5 ft 74%	47	NR	100.0-103.5' - 3 to 4 large 1-1/2" fragments, primarily horizontal breaks along lignite lamination				
			1	100.55' - Fracture, horizontal, planar, black bedding plane/lamination, tight				
			5	101.8' - Fracture, horizontal, rough, stepped, open to fragments beneath				
105			NR	101.8-102.0' - subangular rock crush 1" in size				
-62.7			2	102.15' - Fracture, 70 deg, rough, undulating, open to overlying fragments and terminating at 101.8' horizontal fracture and at 102.3'				
	106.0		0	102.7, 102.75' - Fractures, horizontal, smooth, stepped, tight				
			>10	103.0' - Fracture or mechanical break, 30 deg, rough, undulating, tight				
			2	104.1' - Fracture, horizontal, rough, planar, followed by fragments				
	R13-NQ 5 ft 76%	48	2	104.1-104.7' - Fracture zone, contains a large 3" fragment but some subangular vertical and horizontal fragments				
110								



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-10	SHEET 7 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722899.7 N, 457706.1 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/19/2007

END : 4/22/2007

LOGGER : A. Erickson

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			
-67.7			NR	106.35, 106.55' - Fractures (2), 10 deg, rough, undulating, open, fine calcareous infill/coating		98.75-99.95' - Same as 96.0-98.75' except weak (R2), voids from 15-40% of surface, increased voids and cavities at 98.75-99.2', with fractures	R13:5 minutes
111.0			0	108.25, 108.6' - Fractures (2), 20 deg, rough, stepped, very open, with dissolved appearance		Limestone 99.95-100.7' - Same as 96.0-98.75' except weak to medium strong (R2 to R3), voids decrease with depth from 5% to 0% of surface where black laminations (<1/16" thick each) become darker brown/gray banded organics	
	R14-NQ 5 ft 100%	80	2	108.6-109.1' - Fracture zone, subangular, primarily 1/2"-3/4" with a few larger fragments		No Recovery 100.7-101.0' Limestone 101.0-101.8' - dark yellowish brown, (10YR 4/2), fine grained, moderate to strong HCl reaction, strong (R4), voids over 3% of surface, few 1/4" elongated fossil casts, banded black organics (lignite) in upper portion turning to minor with depth	R14:6 minutes
115			4	109.1' - Fracture, horizontal, rough, stepped, terminates fracture zone		101.8-104.7' - moderate yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, strong (R4), voids (1/16") over 25% of surface, thin elongated 1/4"-1/2" fossil molds, few larger cavities up to 3/4", small casts (1/4"), fossiliferous	
-72.7			2	112.45' - Fracture, 45 deg, rough, stepped, nearly healed		No Recovery 104.7-106.0' Limestone 106.0-109.8' - moderate yellowish brown, (10YR 5/4), fine grained, moderate to strong HCl reaction, strong (R4), some short, weaker fracture zones, voids (1/16") over 25% of surface, many round to oval 1/4" fossil molds, increased size and frequency of cavities (up to 1/2") at 108.25-109.1'	R15:7 minutes
			8	112.8' - Fracture, horizontal, rough, stepped, open		No Recovery 109.8-111.0' Limestone 111.0-116.0' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (1/16") over 25-40% of surface, 1/4"-1" areas of lighter-colored infill with strong HCl reaction; infill is clayey in texture often not at fractures	
			2	113.5' - Fracture, 30 deg, rough, stepped, open		116.0-118.0' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), voids (1/16") voids over 5% of surface, fine bedding planes particularly from 116.65-117.1', except at 117.6-118.0' where rock is friable and extremely weak (R0)	R16:5 minutes
			4	113.7, 114.0' - Fractures (2), horizontal, rough, planar, open to tight			
			2	113.85' - Fracture, vertical, rough, undulating, tight, bounded by overlying and underlying horizontal fractures			
	R15-NQ 5 ft 72%	13	>10	114.2' - Fracture, 10 deg, smooth, undulating, very open			
			3	114.95-115.1' - Fractures, rough, stepped, subangular rock fragments bounded by horizontal fractures			
120			NR	115.3, 115.5' - Fractures (2), 20-30 deg, rough, undulating, tight to open			
-77.7				116.85, 116.95, 117.05, 117.1' - Fractures (4), 0-10 deg, rough to smooth, planar to undulating, along bedding planes			
				117.35' - Fracture, horizontal, rough, stepped, open			
			>10	117.6' - Fracture, horizontal, rough, stepped			Driller's Remark: 100% water loss at 120.0'
			4	118.3' - Fracture, horizontal, rough, stepped, terminates the fragments			Quite possible no recovery is from fracture zone of 118.0' (which would shift down to 119.6')
	R16-NQ 5 ft 70%	32	0	118.45-119.1' - Fracture zone, rock fragments, gray subangular rock fragments from 1/2"-1"			
			2	119.75' - Fracture, vertical, rough, undulating, from overlying rock fragments to end core at 119.6' some fragmentation/splitting			
125			NR	121.0-121.9' - Fractures (12), horizontal, every 1/2"-1", all tight to open with rounding			
-82.7				122.05, 122.2, 122.25, 122.3' - Fractures (4), horizontal, smooth, undulating, open to tight			
				124.05' - Fracture or mechanical break, 20 deg, rough, undulating, healed			
				124.3' - Fracture, horizontal, rough, undulating, tight			
			8	126.6' - Fracture, horizontal, smooth, stepped, open to fragments/fracture zone below			
			>10	126.6-127.5' - Fracture zone, subangular and angular fragments 1/2"-2", browner at top, grayer at bottom			
	R17-NQ 5 ft 78%	53	7	127.5' - Fracture, horizontal, rough, stepped, fracture terminates fracture zone, gray fragments above, brown limestone beneath, abrupt transition at fracture			
			0				
130							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-10	SHEET 8 OF 10
ROCK CORE LOG		

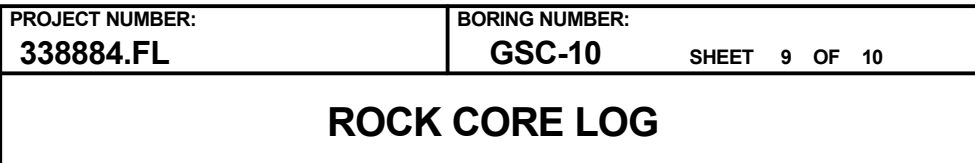
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722899.7 N, 457706.1 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07 START : 4/19/2007 END : 4/22/2007 LOGGER : A. Erickson

WATER LEVELS : 1.01 ft below 01/14/2017		START : 4/19/2007		END : 4/22/2007		LOGGER : A. LICKSON		
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
-87.7			NR	128.2-128.5' - Fracture, horizontal, rough, stepped, leads into several inches of angular (1/4"-1/2") fragments		118.0-119.6' - light olive gray, (5Y 3/2), fine grained, moderate to strong HCl reaction, medium strong (R3), voids (1/16") over 5-10% of surface No Recovery 119.6-121.0' Limestone	R17:6 minutes	
131.0		1	128.75' - Fracture, horizontal, rough, planar, tight	121.0-124.5' - yellowish gray, (5Y 8/1), very fine grained, strong HCl reaction, weak (R2), voids (1/16") over 5% of surface, trace fossil imprints (mostly on fracture faces), after 122.05' inclusion of gray very fine to fine grained particles		R18:8 minutes		
	R18-NQ 5 ft 86%	4	131.8' - Fracture, horizontal, rough, planar, tight	beginning as very fine particles transition to fine to medium grained and yellowish gray (5Y 7/2) after 122.5', less friable				
		7	132.7' - Fracture, horizontal, smooth, planar, open	No Recovery 124.5-126.0' Limestone				
		1	132.7-133.5' - Fractures, smooth, planar, rock fragments (fragments broken in horizontal plane, then broken again)	126.0-127.5' - moderate yellowish brown to dark yellowish orange, (10YR 5/4 to 10YR 6/6), moderate HCl reaction, medium strong (R3), some subtle change in color with olive gray (5Y 3/2) fragments,				
		5		127.0-127.5' voids over 5% of surface, few 1/4" cavities				
135		NR	134.8' - Fracture, horizontal, smooth, planar, open	127.5-129.9' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, medium strong (R3), voids (1/16"-3/8") over 15% of surface, many 1/8"-1/4" cavities		R19:4 minutes		
-92.7		>10	135.1' - Fracture, horizontal, smooth, planar, smooth to planar lower face, open	No Recovery 129.9-131.0' Limestone				
		0	135.2, 135.25, 135.3' - Fractures (3), horizontal, smooth, planar	131.0-132.7' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, medium strong (R3), voids (1/16"), many 1/4" cavities (elongate and round up to 3/4")				
	R19-NQ 5 ft 22%	7	135.1-135.3' - Fracture zone, horizontal, planar	132.7-135.3' - moderate yellowish brown to dusky yellow, (10YR 5/4 to 5Y 6/4), moderate to strong HCl reaction, medium strong (R3), voids over 3% of surface with occasional zones of 15% coverage, no to few cavities except at zones with more voids, HCl reaction is strongest in zones with few voids				
		NR	136.0-136.6' - Fractures, horizontal, smooth, planar, angular fragments	No Recovery 135.3-136.0' Limestone				
140			136.6' - Fracture, horizontal, smooth, planar, terminates fragments	136.0-137.1' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), voids over 0-5% of surface with occasional band of increased voids (and small cavities), generally no cavities, harder where no voids, weaker where voids are present	R20:10 minutes			
-97.7			136.8' - Fracture, horizontal, rough, planar, open to tight	No Recovery 137.1-141.0'				
		>10	141.0-141.9' - Fracture zone, with angular rock fragments					
		>10	141.2' - Fracture, 10 deg, rough, stepped, open to fragmented					
	R20-NQ 5 ft 60%	25	141.4' - Fracture, 10 deg, rough to smooth, stepped to undulating, open to fragmented					
		3	141.7, 141.9' - Fracture (2), 20 deg, rough, stepped, open with cavities/fragmentations					
		NR	142.15' - Fracture, 20 deg, rough, stepped, very open					
145			142.6' - Fracture, 10 deg, rough, stepped, open to fragmented					
-102.7			142.8, 143.05' - Fractures (2), 10 deg, rough, stepped, open					
			142.6-142.8' - 1/2"-3/4" angular fragments					
		4	143.1' - Fracture, vertical, rough, stepped, 1" long					
		2	143.15' - Fracture, horizontal, rough, stepped, discontinuity, smooth on upper side, rough to planar on low side					
	R21-NQ 5 ft 72%	48	143.8' - Fracture, horizontal, rough, planar to undulating, open					
		1	146.6, 146.7, 146.8, 146.9' - Fractures (4), horizontal, rough, planar, open, concurrent with increasing voids (described in lithology)					
		>10	147.35' - Fracture, 0-60 deg, rough, undulating, tight, with infill					
150								



ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

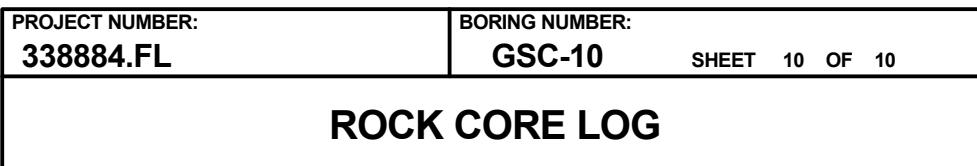
WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/19/2007

END : 4/22/2007

LOGGER : A. Erickson

APPENDIX 2BB-975



ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 55 S/N 252345, mud rotary, NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.61 ft bgs on 6/14/07

START : 4/19/2007

END : 4/22/2007

LOGGER : A. Erickson

APPENDIX 2BB-976



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-11
SHEET 1 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722723.7 N, 457915.1 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.7 ft bgs on 2/11/07 START : 2/7/2007 END : 2/12/2007 LOGGER : T. Stewart, C. Sump

WATER LEVELS : 1.7 RODS ON 2/1/07			START : 2/1/2007			END : 2/12/2007			LOGGERS : T. Stewart, C. Sump		
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								Begin drilling at 15:00			
	3.5							24" split spoon			
5	5.0	0.8	SS-1	1-2-1 (3)	Silty Sand (SM) 3.5-4.25' - grayish orange, (10YR 7/4), wet, very loose, 20% nonplastic fines, fine gravel fragment, non-calcareous, very fine grained to cemented silt, silica sand						
37.9											
	8.5										
10	10.0	1.1	SS-2	1-1-3 (4)	Poorly Graded Sand With Organics (SP) 8.5-9.6' - dusky yellowish brown, (10YR 2/2), wet, very loose, 15-20% fine organics, fine silica sand						
32.9											
	13.5										
15	15.0	1.1	SS-3	5-6-8 (14)	Silty Sand (SM) 13.5-14.6' - pale yellowish brown, (10YR 6/2), wet, medium dense, 20-25% nonplastic fines, trace very fine sand-sized black particles, fine silica sand			SS-3 taken at 15:12			
27.9											
	18.5										
20	20.0	1.5	SS-4	7-10-9 (19)				SS-4 taken at 15:11			



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-11
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722723.7 N, 457915.1 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.7 ft bgs on 2/11/07 START : 2/7/2007 END : 2/12/2007 LOGGER : T. Stewart, C. Sump

WATER LEVELS : 1.7 Rods on 2/1/07			START : 2/1/2007			END : 2/1/2007			LOGGER : T. Stewart, C. Sump		
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				
22.9				Silty Sand (SM) 18.5-20.0' - medium dark gray mottled with pale yellowish brown, (N4 with 10YR 6/2), wet, medium dense, trace fine sand-sized black particles, 15-20% nonplastic fines, fine silica sand							
23.5											
25	1.5	SS-5	5-5-5 (10)	Silty Sand (SM) 23.5-25.0' - pale yellowish brown, (10YR 6/2), wet, loose, 20-25% nonplastic fines, trace very fine sand-sized black particles, fine silica sand			SS-5 taken at 15:25				
25.0											
17.9											
28.5											
30	1.5	SS-6	6-5-3 (8)	Silty Sand (SM) 28.5-30.0' - Same as 23.5-25.0' except trace black laminae			SS-6 taken at 15:43				
30.0											
12.9											
33.5											
35	1.5	SS-7	3-2-2 (4)	Silty Sand (SM) 33.5-35.0' - pale yellowish brown, (10YR 6/2), wet, very loose, 20% nonplastic fines, fine silica sand, trace fine black particles			SS-7 taken at 15:49				
35.0											
7.9											
38.5											
40	1.5	SS-8	4-5-3 (8)	Silty Sand (SM) 38.5-40.0' - Same as 33.5-35.0' except loose			SS-8 taken at 15:54				
40.0											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-11
SHEET 3 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722723.7 N, 457915.1 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.7 ft bgs on 2/11/07 START : 2/7/2007 END : 2/12/2007 LOGGER : T. Stewart, C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)				
		#TYPE				
2.9						
	43.5					
		1.0	SS-9	6-6-8 (14) Clayey Sand (SC) 43.5-44.5' - light bluish gray to light gray mottled with yellowish gray, (5B 7/1 to N7 with 5Y 8/1), wet, medium dense, 35-40% high plastic fines, trace fine black particles, very fine to fine silica sand		SS-9 taken at 16:01
45 -2.1	45.0					
	48.5					
		1.3	SS-10	2-2-3 (5) Silty Sand (SM) 48.5-49.0' - pale yellowish brown, (10YR 6/2), wet, very loose, 30% low plastic fines, very fine to fine silica sand		SS-10 taken at 16:09
50 -7.1	50.0			Clayey Sand (SC) 49.0-49.75' - dark gray, (N3), wet, loose, 30-35% medium plastic fines, very fine to fine silica sand		
	53.5					Driller's Remark: 16:15 - 52.5' light rig chatter of drag bit
		1.3	SS-11	8-13-11 (24) Silty Gravel With Sand (GM) 53.5-54.8' - medium dark gray, (N4), wet, medium dense, no HCl reaction, fine to coarse angular gravel, appears to be calcite cemented, fine silica sands, 10-15% nonplastic fines, 20% very fine to fine silica sand		S-11 taken at 16:19
55 -12.1	55.0					Driller's Remark: 16:27 switch to 3-7/8" tricone roller bit to continue drilling
	58.5					
		1.5	SS-12	3-2-3 (5)		SS-12 taken at 16:35
60	60.0					



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-11
SHEET 4 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722723.7 N, 457915.1 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.7 ft bgs on 2/11/07 START : 2/7/2007 END : 2/12/2007 LOGGER : T. Stewart, C. Sump

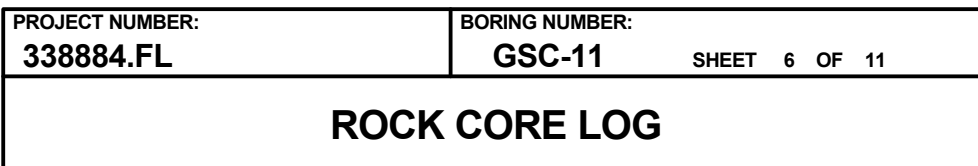
WATER LEVELS : 1.7 RODS ON 2/1/07				START : 2/1/2007		END : 2/12/2007		LOGGERS : T. Stewart, C. Sump	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
			RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION	
-17.1						Silty Sand (SM) 58.5-60.0' - grayish black to black, (N2 to N1), wet, loose, 15-20% low plastic fines, organic soil (OH) lenses 9/16" thick (black [N1] high plasticity, slow dilatancy), very fine to fine silica sands			
63.5									
65									
-22.1									End drilling for 2/07/07 at 17:12 at 65.0' below ground surface



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-11
SHEET 5 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722723.7 N, 457915.1 E (NAD83)
 ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten
 DRILLING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, auto hammer, AWJ rods, 3-7/8" drag bit ORIENTATION : Vertical
 WATER LEVELS : 1.7 ft bgs on 2/11/07 START : 2/7/2007 END : 2/12/2007 LOGGER : T. Stewart, C. Sump

WATER LEVELS : 1.7 tubs on 2/1/07			START : 2/1/2007		END : 2/12/2007		LOGGER : J. Stewart, C. Sump	
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					
-37.1					Silty Sand With Limestone (SM) 78.5-79.3' - yellowish gray, (5Y 7/2), wet, very dense, mild HCl reaction, fine to coarse sand-sized, 25% low plastic fines, 25% fine to coarse gravel-sized limestone fragments, 5% organics, carbonate			
83.5								
83.7	0.0	SS-17	50/2 (50/2")		Limestone Fragments 83.5-83.7' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, two 1/4" thick limestone fragments recovered		SS-17 taken at 09:33 Driller's Remark: Advised driller to begin coring, will use HQ coring assembly 09:44 begin setting casing using 'devils head' bit for 4" casing Resume drilling at 16:40	
85								
-42.1	85.0				No Recovery 85.0-90.0'			
	0.0	R1-HQ					R1: No run time recorded	
90								
-47.1	90.0 90.2	0.2 SS-18	50/2 (50/2")		Limestone Fragments 90.0-90.2' - yellowish gray to moderate yellow, (5Y 7/2 to 5Y 7/6), mild HCl reaction Begin Rock Coring at 90.0 ft bgs See the next sheet for the rock core log		SS-18 taken at 16:45	



ORIENTATION : Vertical

LOGGER : T. Stewart, C. Sump

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-11

SHEET 7 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722723.7 N, 457915.1 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ/NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.7 ft bgs on 2/11/07

START : 2/7/2007

END : 2/12/2007

LOGGER : T. Stewart, C. Sump

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			
-67.1	R6-NQ 5 ft 82%	56	>10	109.15' - Fracture, horizontal, smooth, undulating, open 1/2"		Limestone 109.0-113.1' - Same as 104.0-109.0' except many dissolution cavities 1/8"x3/8", 15% voids <1/16" over surface, light olive color (5Y 5/2) transitions to dusky yellow gray (5Y 6/4) mottled with light olive gray (5Y 5/2)	Driller's Remark: Loose drilling at 111.0'
			>10	110.0-110.3' - Fracture zone, vertical and horizontal, tight			
			1	110.55' - Fracture, <5 deg, rough, undulating, tight			
			NR	111.0-111.4' - Fracture zone, rock fragments 111.9' - Fracture, 20 deg, black stain, tight			
114.0	R7-NQ 5 ft 100%	30	NR	112.85' - Fracture, 10 deg, smooth, undulating, no infill, black staining		No Recovery 113.1-114.0' Limestone 114.0-119.0' - mottled pale yellowish orange and light olive gray, (10YR 8/6 and 5Y 5/2), fine to medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), strongly cemented, 40-50% voids up to 1/16" over rock surface, poorly fossiliferous (casts), <1% fine to medium grained black particles	R6:4 minutes
			3	114.5' - Mechanical break, horizontal, smooth, undulating, tight			
			>10	114.6' - Fracture, <5 deg, smooth, undulating, black staining, open 1/2"			
			3	114.8' - Fracture, 40 deg, rough, undulating, no staining, open, top of fractured zone at 114.8-115.7'			
			4	116.0' - Mechanical break, horizontal, rough, undulating, tight			
	R8-NQ 5 ft 48%	20	1	116.2' - Fracture, vertical, rough, undulating, black staining, open		119.0-121.4' - mottled pale yellowish orange and medium gray and light olive gray, (10YR 8/6 and N5 and 5Y 5/2), fine to medium grained, weak to medium strong (R2 to R3), strong HCl reaction on light colored areas, moderate HCl reaction on darker colored areas, strongly competent, 20-30% voids 1/16"x1/16", 5-10% dissolution cavities 1/8"x1/16", poorly to moderately fossiliferous, casts, 1" section at top is moderate olive brown (5Y 4/4) and moderately to highly fossiliferous (casts) No Recovery 121.4-124.0' Limestone 124.0-124.6' - yellowish gray, (5Y 7/2), medium grained, strong HCl reaction, very weak (R1), weakly to moderately competent, voids (<1/16") over 75% of surface, 40% fine to medium grained black (N1) particles 124.6-126.4' - light olive brown and moderate olive brown, (5Y 5/6 and 5Y 4/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), moderately to highly fossiliferous (many casts, trace molds), white crystal as partial infill in cavities (with mild to moderate HCl reaction) No Recovery 126.4-129.0'	R7:6 minutes
			>10	116.55' - Fracture, <5 deg, rough, undulating, stains over 1/4"			
			NR	116.8' - Mechanical break, horizontal, smooth, planar, open 1/8"			
			1	117.0, 117.25, 117.45' - Mechanical break (3)			
			>10	117.85' - Fracture, 70 deg, rough, undulating 118.1' - Fracture, horizontal, smooth, undulating, open			
119.0	R9-NQ 5 ft 48%	31	NR	118.2' - Fracture, <5 deg, rough, undulating, open 3/8"		124.0-124.6' - Fracture zone 124.6' - Mechanical break, horizontal 125.1' - Fracture, <5 deg, rough, undulating, open	Driller's Remark: 121.0- 122.5' soft Driller's Remark: Slightly harder drilling at 122.5' R8:6 minutes Driller's Remark: 123.5' slipped down Started R9-NQ at 14:27
			NR	118.6-118.7' - Fracture zone or mechanical break			
			>10	119.1' - Mechanical break, along bedding plane from drilling			
			1	119.5, 119.6' - Fracture (2), horizontal, rough, undulating, open			
			3	119.9' - Fracture, horizontal, rough, planar, open			
124.0	R9-NQ 5 ft 48%	31	NR	120.05-121.0' - Fracture zone, rough, undulating, open		124.6-126.4' - light olive brown and moderate olive brown, (5Y 5/6 and 5Y 4/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), moderately to highly fossiliferous (many casts, trace molds), white crystal as partial infill in cavities (with mild to moderate HCl reaction) No Recovery 126.4-129.0'	Driller's Remark: Soft at 124.0-127.0'
			>10	124.0-124.6' - Fracture zone			
			1	124.6' - Mechanical break, horizontal			
			3	125.1' - Fracture, <5 deg, rough, undulating, open			
			NR	126.15' - Bedding plane, rough, stepped, open 1/4"			
	R9-NQ 5 ft 48%	31	NR	126.25' - Fracture, horizontal, rough, undulating, open 1/4"		126.4' - Fracture, horizontal, rough, undulating, open	R9:3 minutes
			NR	126.4' - Fracture, horizontal, rough, undulating, open			
			>10	129.0-130.8' - Fracture zone			
129.0			>10				
130			>10				



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-11	SHEET 8 OF 11
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722723.7 N, 457915.1 E (NAD83)

ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ/NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.7 ft bgs on 2/11/07 START : 2/7/2007 END : 2/12/2007 LOGGER : T. Stewart, C. Sump

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			
-87.1	R10-NQ 5 ft 74%	26	>10	130.8' - Fracture, horizontal, rough, undulating, tight 131.0' - Fracture, 60 deg, rough, undulating, tight 131.65' - Fracture, 40 deg, rough, undulating, tight 132.3' - Fracture, <5 deg, rough, undulating, open, fractured from 132.3-132.7'			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-11

SHEET 9 OF 11

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722723.7 N, 457915.1 E (NAD83)

ELEVATION : 42.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ/NQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 1.7 ft bgs on 2/11/07

START : 2/7/2007

END : 2/12/2007

LOGGER : T. Stewart, C. Sump

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		
-107.1		R14-NQ 5 ft 86%	37	3	148.3' - Fracture, horizontal, rough, undulating, open 149.0-149.35' - Fracture zone, limestone gravel-sized fragments to 3/4"x1" 149.35' - Fracture, horizontal, rough, undulating, open 149.5' - Fracture, horizontal, rough, undulating, open 3/16" 149.75' - Fracture, horizontal, rough, undulating, tight 149.9' - Fracture, horizontal, rough, undulating, open, top of fracture zone 149.9-150.2' - Fracture zone, rock fragments to 1"x 1"	Limestone 149.5-151.9' - light olive brown to light olive gray, (5Y 5/6 to 5Y 5/2), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), poorly fossiliferous (casts), trace voids up to 1/8" 151.9-153.3' - Same as 146.2-148.3'	Measured depth of water at 1.7' below ground surface on 2/11/07 at 08:30	
	5							
	0							
	1							
	154.0			NR		No Recovery 153.3-154.0'	R14:7 minutes	
155		R15-NQ 5 ft 76%	18	1	150.2' - Fracture, horizontal, rough, undulating, tight to open 1/8" 150.3, 150.35, 150.72, 151.0, 151.25, 151.6, 151.75, 151.9' - Fractures (8), horizontal, rough, undulating, tight 153.3' - Fracture, horizontal, rough, undulating 154.5' - Fracture, horizontal, rough, planar, tight 154.6-155.1' - Fracture zone 155.5' - Fracture, 80 deg, slickensided, stepped, brown staining, tight 156.85, 157.0, 157.6' - Fractures (3), horizontal, rough, undulating, open 159.4, 159.5' - Fractures (2), rough, undulating, open 1/8"	Limestone 154.0-157.2' - moderate yellow to dusky yellow, (5Y 7/6 to 5Y 6/4), fine to medium grained, strong HCl reaction, weak to medium strong (R2 to R3), ripple laminated in light olive gray (5Y 5/2), alternating parallel intervals of bioturbation, voids up to 1/16" over 5-10% of surface 157.2-157.8' - olive gray, (5Y 3/2), medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids <1/16" on 50-70% of surface, trace dusky yellow (5Y 6/4) discoloration No Recovery 157.8-159.0' Limestone 159.0-162.5' - dusky yellow to moderate olive brown, (5Y 6/4 to 5Y 4/4), fine to medium grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids (<1/16") over 30-40% of surface, dissolution cavities up to 3/8"x3/4" on 5% of surface, white mineral infill, some cavities 162.5-163.6' - very pale orange and mottled medium light gray, (10YR 8/2 and N6), strong HCl reaction, weak to medium strong (R2 to R3), highly fossiliferous (very small <1/16" molds/casts) No Recovery 163.6-164.0' No Recovery 164.0-166.0'	R15:5 minutes	
-112.1	1							
	1							
	2							
	159.0			NR				
160		R16-NQ 5 ft 92%	56	2	160.9, 161.0, 161.1' - Bedding plane (3), <5 deg, rough, undulating, tight 161.2, 161.3' - Fracture or mechanical break (2), horizontal, rough, undulating, tight 161.5, 161.6, 161.7, 162.0, 162.1, 162.2' - Bedding plane (4), horizontal, rough, planar, tight 162.6' - Bedding plane, horizontal, rough, undulating 162.7, 163.0' - Mechanical break (2) 163.45' - Fracture, horizontal, rough, undulating, tight, open 1/8"		R16: No run time recorded	
-117.1	1							
	7							
	5							
				0				
	164.0			NR				
165		R17-HQ 2 ft 0%	0	NR		No Recovery 163.6-164.0' No Recovery 164.0-166.0'	Driller's Remark: Driller switch to HQ core assembly and used a 2.0' stake on core run R17:1 minute	
-122.1	NR							
	NR							
	NR							
	166.0			NR				
		R18-HQ 5 ft 70%	16	2	166.65' - Bedding plane, horizontal, rough, undulating, open 166.9' - Bedding plane, horizontal, smooth, planar, open 166.9-171.0' - Mechanical break, horizontal, smooth, planar, highly competent limestone intervals, related to drilling	Limestone 166.0-166.9' - moderate olive brown and light olive gray, (5Y 4/4 and 5Y 6/1), fine grained, strong HCl reaction, strong (R4), 30-40% medium grained medium gray (N5) particles, poorly fossiliferous (few casts), laminations at 166.0'		
				>10				
				>10				
				>10				
170								



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-11	SHEET 10 OF 11
ROCK CORE LOG		

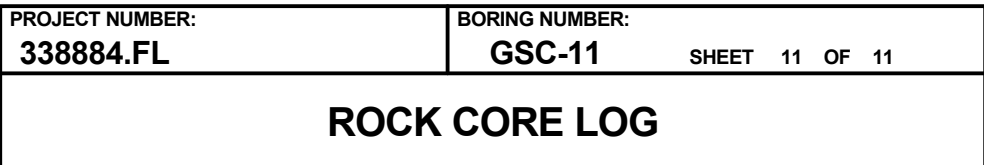
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722723.7 N, 457915.1 E (NAD83)

ELEVATION : 42.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Orlando, FL; Driller: D. Patten

CORING METHOD AND EQUIPMENT : CME 550X S/N 340253, mud rotary, HQ/NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.7 ft bgs on 2/11/07 START : 2/7/2007 END : 2/12/2007 LOGGER : T. Stewart, C. Sump

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.
-127.1			NR			Limestone 166.9-169.5' - moderate olive brown, (5Y 4/4), medium to coarse grained, strong HCl reaction, weak (R2), 5-10% powder white mineral infill in voids and cavities, 166.9-167.2' and 167.6-168.0' is olive gray (5Y 6/1), fine matrix, microlaminated No Recovery 169.5-171.0'	R18: No run time recorded
171.0			1	171.7' - Mechanical break, horizontal, undulating, 1/4" x 5/16" relief, fossil molds exposed on surface			
			3	172.2' - Fracture, horizontal, smooth, undulating			
	R19-HQ 5 ft 100%	56	2	172.4' - Fracture or mechanical break, <5 deg		Limestone 171.0-171.9' - yellowish gray, (5Y 7/2), medium to coarse grained, strong HCl reaction, weak to medium strong (R2 to R3), 10-20% dissolution cavities up to 9/16"x3/8", up to 35% medium gray (N5) coarse-sized grains, poorly fossiliferous (trace casts), sharp contact	
175			2	172.5, 172.9, 173.6' - Bedding plane (3), horizontal, rough, undulating, open 3/16"			
-132.1			2	174.1' - Mechanical break or fracture, 70 deg, rough, undulating			R19: 8 minutes
			2	175.1' - Mechanical break, horizontal, rough, undulating, irregular			
176.0			2	175.3' - Mechanical break, horizontal, rough, undulating			
			4	175.4' - Bedding plane, horizontal, rough, undulating, open 1/8"x3/16"			
			4	176.4-176.6' - Fracture, horizontal, rough, clay/gravel interbed, clay infill			
	R20-HQ 5 ft 96%	32	1	177.0, 177.1' - Fractures (2), horizontal, rough, undulating, clay infill			
			7	177.8' - Fracture or mechanical break, 70 deg, rough, undulating, closely spaced fracture			
180			5	178.6' - Fracture, 45 deg, rough, undulating			
-137.1			NR	179.0' - Mechanical break, horizontal, rough, undulating			R20: No run time recorded
			4	179.2, 179.3, 179.35' - Bedding plane (3), horizontal, rough, planar to undulating		No Recovery 180.8-181.0'	
			3	179.6' - Mechanical break, 10-15 deg, clean, tight		Limestone 181.0-185.0' - Same as 171.9-176.0'	
			0	179.7, 179.85' - Fracture (2), horizontal, rough, planar, dark brown staining			
			6	180.0' - Mechanical break, 0-5 deg, undulating, clean			
185			5	180.1, 180.3' - Bedding plane (2), horizontal, rough, brown staining			
-142.1	R21-HQ 5 ft 90%	48	NR	180.6, 180.7' - Fractures (2), horizontal, rough, undulating, slight staining, no infill			
				181.2' - Fracture, fragmented limestone			
				181.5, 181.6, 181.7' - Fracture (3), fragmented limestone, horizontal planar breaks			
				182.0' - Bedding plane, horizontal, rough, planar, slight brown staining on fracture			
				182.5' - Fracture, rough, horizontal partings, cavity-rich limestone breaks (fragmented)			
				182.7' - Fracture, rough, irregular break			
				184.0' - Bedding plane, horizontal, smooth			
				184.05, 184.45, 184.50, 184.6' - Bedding plane (4), horizontal, smooth			
				184.95, 185.0, 185.05, 185.1' - Bedding plane (4), horizontal, smooth, fine spaced (3/8"x7/8")			
						Limestone 185.3-185.5' - dark brown, fossiliferous surface, voids on >60% of surface, molds and casts No Recovery 185.5-186.0' Bottom of Boring at 186.0 ft bgs on 2/12/2007	R21: No run time recorded







LOGGER : T. Stewart, C. Sump

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-12
SHEET 1 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)
 ELEVATION : 41.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 05/17/2007 START : 5/16/2007 END : 5/19/2007 LOGGER : C. Wallested

WATER LEVELS : 3.5 TUBS ON 03/17/2007			START : 3/10/2007			END : 3/19/2007			LOGGERS : G. Wallstedt		
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							
41.0	0.0	1.2	SS-1	1-3-3 (6)	Topsoil 0.0-0.2' Poorly Graded Sand (SP) 0.2-1.15' - grayish orange to moderate yellowish brown, (10YR 7/4 to 10YR 5/4), moist, loose, 5% nonplastic fines, trace organics, fine silica sand		Driller's Remark: Material at 5.0-5.65' started at 3.0' below ground surface				
	1.5										
5	5.0										
36.0		0.7	SS-2	3-3-3 (6)	Clayey Sand (SC) 5.0-5.65' - light olive gray, (5Y 6/1), moist, loose, very fine to fine silica sand, 40-45% high plastic fines, trace fine gravel (possible concretion)		Driller's Remark: Lost circulation at 10.0' below ground surface Driller mixed thick mud, regain circulation				
	6.5										
10	10.0										
31.0		0.4	SS-3	3-13-6 (19)	Silty Limestone Gravel With Sand (GM) 10.0-10.4' - yellowish gray, (5Y 8/4), wet, medium dense, strong HCl reaction, fine to coarse gravel-sized limestone, composed of mostly (<75%) fossil cast and molds (possible shell hash coquina), 35-40% fine to coarse sand sized (similar to limestone), 15% nonplastic to low plastic fines, carbonate material						
	11.5						Driller's Remark: Light chattering at 15.8' below ground surface				
15	15.0										
26.0		0.8	SS-4	32-50/4.5 (82/10.5")	Silty Limestone Gravel With Sand (GM) 15.0-15.8' - Same as 10.0-10.4' except moderately fossiliferous with 3/4"x3/16" size casts over 10-15% of the rock surface, light olive brown (5Y 5/6) staining on some face						
	15.9										
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-12
SHEET 2 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)
 ELEVATION : 41.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 05/17/2007 START : 5/16/2007 END : 5/19/2007 LOGGER : C. Wallested

DEPTH BELOW SURFACE AND ELEVATION (ft)		SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
						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	
		RECOVERY (ft)	#TYPE	6"-6"-6" (N)						
21.0	20.0	1.2	SS-5	8-12-12 (24)	Silty Sand (SM) 20.0-21.15' - yellowish gray, (5Y 8/1), wet, medium dense, very fine to fine silica sand, trace fine carbonate sand, 20% nonplastic fines, moderate HCl reaction in carbonate material, 1" thick bed of sandy fat clay at bottom of sample					
	21.5									
25	25.0	1.5	SS-6	5-4-19 (23)	Sandy Silt (ML) 25.0-26.15' - yellowish gray, (5Y 8/1), wet, very stiff, low plasticity, rapid dilatancy, strong HCl reaction, 25% fine to coarse carbonate sand, 1" thick dark greenish gray (5GY 4/1) and 2-1/2" thick dark yellowish orange (10YR 6/6) fat clay lenses at 25.0' and 25.95' respectively Silt (ML) 26.15-26.5' - very pale orange, (10YR 8/2), wet, very stiff, low plasticity, rapid dilatancy, moderate to strong HCl reaction, carbonate material					
16.0	26.5									
30	30.0	0.7	SS-7	46-50/5.5 (96/11.5")	Sandy Silt With Limestone Fragments (ML) 30.0-30.7' - grayish orange, (10YR 7/4), wet, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 25% fine to coarse sand sized, 10-15% fine gravel sized limestone fragments, carbonate material					
11.0	31.0									
35	35.0	0.8	SS-8	5-9-16 (25)	Sandy Silt And Limestone (ML) 35.0-35.8' - Same as 30.0-30.7' except yellowish gray, (5Y 7/2), very stiff, 1-1/4" limestone fragments				Driller's Remark: 36.5' below ground surface: hard rock	
6.0	36.5									
40										



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-12
SHEET 3 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)
 ELEVATION : 41.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 05/17/2007 START : 5/16/2007 END : 5/19/2007 LOGGER : C. Wallested

WATER LEVELS : 3.5 TUBS ON 05/17/2007			START : 5/10/2007			END : 5/19/2007			LOGGERS : G. Wainsted		
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								
1.0	40.0	0.9	SS-9	15-22-41 (63)	Silt With Sand And Limestone (ML) 40.0-40.9' - dusky yellow, (5Y 6/4), moist, hard, nonplastic, rapid dilatancy, moderate HCl reaction, 20-25% fine to coarse sand-sized, 10% fine to coarse gravel-sized limestone fragments, carbonate material, dark (possible organic) 1/4" thick layer at 40.45', yellowish gray (5Y 8/1) limestone fragment at top of sample (similar to SS-3 and SS-4)		Driller's Remark: Lost 100 % circulation at 40.0' below ground surface; mixed thick mud and regained circulation				
	41.5										
45	45.0										
-4.0		1.2	SS-10	14-15-26 (41)	Silt With Sand (ML) 45.0-46.2' - yellowish gray, (5Y 7/2), wet, hard, low plasticity, rapid dilatancy, moderate to strong HCl reaction, 20% fine to coarse sand-sized, trace fine gravel-sized limestone fragments, carbonate material						
	46.5										
50	50.0										
-9.0		1.3	SS-11	22-18-23 (41)	Limestone Fragments 50.0-50.2' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction Silt With Sand (ML) 50.2-51.3' - moderate yellowish brown, (10YR 5/4), wet, hard, low plasticity, rapid dilatancy, strong HCl reaction, 20% fine to coarse sand-sized, trace fine gravel-sized limestone fragments, dark (possible organic), 1/4" thick layer at 50.8'						
	51.5										
55	55.0										
-14.0		1.5	SS-12	34-39-49 (88)	Silt With Sand (ML) 55.0-56.5' - Same as 50.2-51.3' except increase in fine gravel-sized limestone with depth to 10%, trace dark (possible organic) mottling		Driller's Remark: End of drilling at 56.5' below ground surface on 5/16/07 at 17:00 On 5/17/07 at 08:03, water level is at 3.5' below ground surface; at 08:15, begin cleaning hole and circulating mud				
	56.5										
60											



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-12
SHEET 4 OF 10	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)
 ELEVATION : 41.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 05/17/2007 START : 5/16/2007 END : 5/19/2007 LOGGER : C. Wallested

WATER LEVELS : 3.5 ft bgs on 03/17/2007			START : 3/10/2007			END : 3/19/2007			LOGGERS : G. Wallstedt		
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					
-19.0	60.0	1.4	SS-13	24-27-38 (65)	Silt With Sand (ML) 60.0-61.4' - Same as 50.2-51.3' except dark yellowish orange, (10YR 6/6), dark organic layers at 60.8', 61.15', and 61.25'			Driller's Remark: Increase in hardness of material at 68.0' below ground surface			
	61.5										
65	65.0										
-24.0		1.3	SS-14	41-47-45 (92)	Sandy Silt (ML) 65.0-66.3' - Same as 50.2-51.3' except grayish orange, (10YR 7/4), 30-35% fine to coarse sand-sized limestone, trace dark (possible organic) mottling throughout						
	66.5										
70	70.0										
-29.0	70.3	0.1	SS-15	50/3 (50/3")	Limestone Fragments 70.0-70.1' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction						
75	75.0										
-34.0	75.1	0.1	SS-16	50/2 (50/2")	Limestone Fragments 75.0-75.05' - Same as 70.0-70.1' Begin Rock Coring at 75.0 ft bgs See the next sheet for the rock core log						
80											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-12

SHEET 5 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)

ELEVATION : 41.0 ft (NAVD88)

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

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


ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 05/17/2007

START : 5/16/2007

END : 5/19/2007

LOGGER : C. Wallested

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			
-34.0	75.0	43	4	75.15, 78.15, 78.55, 78.65, 78.8' - Bedding plane (5), horizontal, smooth, undulating, tight		Limestone 75.0-79.4' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate to strong HCl reaction, extremely weak to weak (R0 to R2), up to 1/8" voids cover 15-40% of surface, up to 3/16"x3/8" fossil casts, up to 3/16" thick dark (possible organic) lamination, voids cover 40% of surface below 78.3' with trace grayish hard infill to 9/16" diameter, trace <9/16" cavities throughout the core No Recovery 79.4-80.0'	Begin rock coring at 75'
	3		75.6' - Bedding plane or mechanical break, 10 deg, smooth, undulating, open 1/2"				
	2		75.7' - Fracture, 80 deg, smooth, undulating, tight				
	4		75.95' - Bedding plane, horizontal, smooth, planar, tight				
	0		76.1' - Fracture, vertical, smooth, undulating, tight, vertical from 75.6-76.55'				
80	80.0	10	NR	76.55' - Bedding plane, horizontal, smooth, undulating, tight		Limestone 80.0-81.25' - Same as 75.0-79.4' except 3/4" thick brownish black (5YR 2/1) fat clay at 80.25-80.3' No Recovery 81.25-85.0'	R1:7 minutes
-39.0				76.85' - Mechanical break or fracture, 40 deg, smooth, undulating, tight			
			>10	77.2' - Fracture, 70 deg, smooth, undulating, tight			
			>1	77.35' - Fracture, 30 deg, smooth, undulating, tight			
			NR	80.0-80.25' - Fracture zone, fragments to 1"x1-1/2"			
				80.25-80.3' - Clay seam, clay layer or infill			
				80.3' - Bedding plane, horizontal, smooth, planar, in contact with clay layer or infill			
				80.55' - Mechanical break or bedding plane, horizontal, smooth, stepped, tight			
				81.0-81.25' - Fracture zone, fragments to 1-3/4"x2"			
85	85.0		73	2	85.4, 85.6, 86.3, 86.6, 86.8, 87.0' - Mechanical break (6), rough, undulating, associated with cavities, open 1/4"-2"		
-44.0		3					
		1					
		0					
		1					
90	90.0	85	0	89.8' - Fracture, 60 deg, smooth, undulating, tight	R3:6 minutes		
-49.0			1				
			2	91.65' - Bedding plane, horizontal, smooth, planar to stepped, tight			
			1	92.05' - Mechanical break, 10 deg, smooth, undulating, tight			
			>3	92.8' - Fracture (2), 85 deg, smooth, undulating, intersecting, tight			
				93.5' - Fracture or mechanical break, 10 deg, smooth, undulating, tight		R4:11 minutes	
				94.2' - Fracture, 70 deg, smooth, undulating, tight			
95	95.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-12

SHEET 6 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)

ELEVATION : 41.0 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 05/17/2007

START : 5/16/2007

END : 5/19/2007

LOGGER : C. Wallested

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.
-54.0	R5-NQ 5 ft 82%	60	NR	94.5-94.55' - Fracture zone		No Recovery 94.85-95.0' Limestone 95.0-99.1' - grayish orange, (10YR 7/4), fine to medium grained, mild to moderate HCl reaction, weak (R2), voids (up to 3/16") cover 5-25% of the surface, trace dark (possible organic) mottling, extremely weak (R0) at 97.4-98.05', fossil casts (up to 3/8") over 5-10% of surface	Driller's Remark: Very crumbly feeling between 97.0-98.5' below ground surface; soft
			1	95.05' - Bedding plane or mechanical break, <10 deg, rough, undulating, tight			
			0				
			>3	97.0' - Fracture, 80 deg, smooth, undulating, tight			
			4	97.2' - Bedding plane, horizontal, smooth, planar, tight			
	R6-NQ 5 ft 98%	68	0	97.75-97.85' - Fracture zone, fragments to 2"		No Recovery 99.1-100.0' Limestone 100.0-104.9' - Same as 95.0-99.1' except no extremely weak (R0) zone	R5:7 minutes
			NR	98.0' - Fracture or mechanical break, 45 deg, rough, undulating, open to fracture zone			
100			2	98.15' - Bedding plane, <10 deg, smooth, undulating, dark stain on one face, open 1/2"			
-59.0			3	98.45' - Bedding plane or mechanical break, <10 deg, smooth, undulating, tight			
			2	98.8' - Fracture, 50 deg, rough, undulating, undulating to planar, tight			
	R7-NQ 5 ft 75%	26	3	100.85' - Fracture, 20 deg, smooth, undulating to planar, tight		No Recovery 104.9-105.0' Limestone 105.0-108.75' - Same as 95.0-99.1' except moderate HCl reaction, extremely weak (R0) zone at 105.3-105.65' and 106.85-107.35'	R6:8 minutes
			>2	100.95' - Fracture, 70 deg, smooth, undulating to planar, tight, intersects fracture at 108.5'			
105			NR	101.8' - Fracture, 40 deg, smooth, undulating, tight			
-64.0			>10	101.9' - Fracture, 70 deg, smooth, undulating, tight			
			>2	102.0' - Fracture, 20 deg, smooth, undulating, tight			
	R8-NQ 5 ft 100%	60	NR	102.35' - Bedding plane, horizontal, smooth, undulating, tight		No Recovery 108.75-110.0' Limestone 110.0-115.0' - Same as 95.0-99.1' except extremely weak (R0) zone at 110.8-111.3', 103.6-104.8' depth intervals, trace dark (possible organic) lamination, mild HCl reaction in weak (R2) zone, moderate HCl reaction in extremely weak (R0) zone	Driller's Remark: Soft between 105.5-106.5' and 107.0-108.0'
			>3	103.1' - Fracture, 65 deg, smooth, undulating, tight			
			3	103.45' - Fracture, 10 deg, smooth, undulating, tight			
			NR	103.7' - Fracture, 20 deg, smooth, undulating, tight			
			2	104.4-104.55' - Fracture zone, fragments to 1"x2"			
110			2	104.55' - Fracture, 30 deg, smooth, undulating, tight, open to fracture zone			R7:6 minutes End of day on 05/17/2007 at 17:10 Begin coring on 05/18/2007 at 08:28
-69.0			2	104.8' - Fracture, 80 deg, rough, undulating, tight			
			1	105.0-105.4' - Fracture zone, fragments to 1-1/2"			
			3	105.4' - Bedding plane or mechanical break, 20 deg, smooth, undulating, open to fracture zone			
			2	105.8' - Fracture, 20 deg, smooth, undulating, tight			
			2	105.9' - Fracture, 30 deg, smooth, undulating, tight to open 1/2"			Driller's Remark: Soft between 113.5-114.5' R8:7 minutes
			1	106.45' - Fracture, 20 deg, smooth, undulating, tight to open			
			2	106.55' - Fracture, 60 deg, rough, undulating, tight to open			
			3	106.85-107.35' - Fracture zone, fragments to 1/2"			
			2	107.75-107.95' - Fracture zone, fragments to 1"x2"			
115	115.0						



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-12	SHEET 7 OF 10
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)

ELEVATION : 41.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis

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

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 05/17/2007

START : 5/16/2007

END : 5/19/2007

LOGGER : C. Wallested

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.
-74.0	R9-NQ 5 ft 52%	10	3	108.4' - Fracture, 20 deg, smooth, undulating, tight		Limestone 115.0-117.6' - moderate yellowish brown, (10YR 5/4), fine grained, mild to moderate HCl reaction, medium strong (R3) rock becoming weak (R2) rock below 117.0', voids (up to 1/16") cover 10% of the surface, trace cavities up to 1/4", similar to 95.0-99.1' No Recovery 117.6-120.0'	R9:7 minutes
			>3	108.6' - Fracture, 80 deg, smooth, undulating, tight, intersects fracture at 108.4'			
			>10	110.05' - Fracture, 80 deg, smooth, undulating, tight, continues same fracture at 108.6'			
			NR	110.85' - Bedding plane, horizontal, smooth, undulating, tight 111.15' - Mechanical break 111.2' - Fracture, 10 deg, smooth, undulating, tight 111.25' - Fracture, 50 deg, smooth, undulating, tight, intersects fracture at 111.2'			
120	R10-NQ 5 ft 68%	40	3	112.4' - Fracture or mechanical break, 65 deg, rough, undulating, tight 113.35' - Fracture, 30 deg, smooth, undulating, tight		Limestone 120.0-121.5' - Same as 115.0-117.6' except extremely weak (R0) zone at 120.4-120.55' 121.5-122.35' - moderate yellowish brown, (10YR 5/4), fine to medium grained, moderate HCl reaction, medium strong (R3), voids (up to 1/16") cover 5-20% of surface, moderately fossiliferous with up to 3/16"x3/8" echinoid casts, harder fine grained light colored infill, trace voids in 121.95-122.0' and 122.2-122.35' 122.35-123.4' - moderate yellowish brown, (10YR 5/4), medium grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (up to 3/16") cover 15% of surface, trace cavities up to 3/8"x2", 3/8"x2" trace fossil casts No Recovery 123.4-125.0' Limestone 125.0-125.6' - Same as 95.0-99.1' except mild HCl reaction, no extremely weak (R0) zone 125.6-126.4' - Same as 121.5-122.35 except interbedded with hard light colored fine grained rock 126.4-127.3' - Same as 122.35-123.4 except weak to medium strong (R2 to R3) No Recovery 127.3-130.0' Limestone 130.0-130.5' - Same as 121.5-122.35 except interbedded No Recovery 130.5-135.0'	Driller's Remark: At 121.5', 100% loss of circulation R10:9 minutes
-79.0			>3	113.4' - Fracture, 75 deg, smooth, undulating, tight, intersects fracture at 113.35'			
			1	113.8' - Bedding plane or mechanical break, 10 deg, smooth, undulating, tight, top of extremely weak (R0) zone			
			3	114.2' - Bedding plane or mechanical break, 10 deg, smooth, undulating, tight, middle of extremely weak (R0) zone			
125	R11-NQ 5 ft 46%	0	NR	114.7-114.8' - Fracture zone, extremely weak (R0) zone 115.55' - Fracture, 70 deg, smooth, undulating, tight			R11:6 minutes
-84.0			>10	115.6' - Fracture, 20 deg, smooth, undulating, tight, intersects fracture at 115.55'			
			>10	115.9' - Fracture, 15 deg, smooth, undulating, tight 116.2' - Fracture, 80 deg, smooth, undulating, tight			
			2	116.4-116.6' - Fracture zone, fragments to 1"x1-1/2"			
	R12-NQ 5 ft 10%	0	NR	116.75' - Fracture, 20 deg, smooth, undulating, tight 117.05-117.6' - Fracture zone, fragments to 1"x1-1/2"			Driller's Remark: Very soft between 131.5-134.0'
			NR	120.4' - Bedding plane or mechanical break, 10 deg, rough, undulating, tight to open 1/4"			
130			>10	120.55' - Fracture, 35 deg, smooth, undulating, tight 120.6' - Fracture, 10 deg, smooth, undulating, tight			
-89.0			NR	121.2' - Bedding plane, horizontal, smooth, undulating, tight 121.2-121.5' - Fracture zone, fragments to 1"x2"			
				121.8-121.9' - Fracture zone, 1" fragments 122.35' - Bedding plane, horizontal, smooth, undulating, tight 123.05' - Fracture, 35 deg, smooth, undulating, tight to open 1/4"			R12:3 minutes
				123.15' - Fracture, 45 deg, smooth, planar, tight			
135							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-12

SHEET 8 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)

ELEVATION : 41.0 ft (NAVD88)

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

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


ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 05/17/2007

START : 5/16/2007

END : 5/19/2007

LOGGER : C. Wallested

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					
-94.0	R13-NQ 5 ft 56%	8	>10	123.3' - Bedding plane, horizontal, smooth, undulating, tight, voids and cast parallel to break		Limestone 135.0-137.8' - dark yellowish orange to moderate yellowish brown, (10YR 6/6 to 10YR 5/4), medium grained, weak to medium strong (R2 to R3), voids (up to 3/16") over 5-15% of surface, casts (up to 3/16"x3/8") cover 5% of surface, 1" thick trace light gray fine grained infill at the end of run, no voids visible at 136.85-136.95' No Recovery 137.8-140.0'	R13:6 minutes		
>10			125.0-125.3, 125.6-125.7' - Fracture zone (2), fragments to 3/4"x1-1/2"						
2			126.1-126.4' - Fracture zone, fragments to 1"x2", many parallel horizontal bedding plane breaks						
NR			126.65' - Bedding plane, horizontal, smooth, undulating, tight 126.75' - Fracture, 70 deg, smooth, undulating, tight 127.0, 127.15' - Fracture (2), 10 deg, smooth, undulating, tight 130.-130.5' - Fracture zone, fragments to 1"x2" parallel to horizontal bedding planes in many places 135.0-137.0' - Fracture zone, fragments to 2"x3"						
140	R14-NQ 5 ft 66%	27	>10	137.4' - Fracture, 20 deg, smooth, undulating					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

GSC-12

SHEET 9 OF 10

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)

ELEVATION : 41.0 ft (NAVD88)

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

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

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 05/17/2007

START : 5/16/2007

END : 5/19/2007

LOGGER : C. Wallested

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.
-114.0	R17-NQ 5 ft 95%	34	3	155.15, 155.4, 155.8, 156.0, 156.4, 157.2, 157.25, 157.45, 157.6, 157.9, 158.1, 158.6, 158.7' - Bedding plane, horizontal, smooth, planar to undulating, tight to open 1/4"		No Recovery 153.9-155.0' Limestone 155.0-157.9' - grayish orange to moderate yellowish brown, (10YR 7/4 to 10YR 5/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (up to 1/16") cover 5-15% of surface, trace cavities (up to 3/8") 157.9-158.5' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/2), very fine grained, strong HCl reaction, strong to very strong (R4 to R5), no voids or cavities 158.5-158.7' - Same as 155.0-157.9' 158.7-159.4' - Same as 157.9-158.5' 159.4-159.75' - Same as 155.0-157.9' except voids (up to 1/16") coverage increasing to 25%	Driller's Remark: Soft drilling at 158.5-159.0' R17:6 minutes
			6	156.1' - Fracture, 45 deg, rough, undulating, tight			
			>7	156.2' - Fracture, 45 deg, rough, undulating, open			
			2	156.8' - Mechanical break or bedding plane, horizontal, rough, undulating, tight			
			3	156.9, 156.95' - Fracture (2), 75 deg, rough, undulating, tight			
160	R18-NQ 5 ft 74%	52	NR	157.6-157.8' - Fracture zone, fragments to 2"		No Recovery 159.75-160.0' Limestone 160.0-161.4' - Same as 155.0-157.9' except fossil casts to 3/8"x3/4" and voids cover 5-30% of surface 161.4-161.6' - Same as 157.9-158.5' 161.6-162.5' - Same as 160.0-161.4' 162.5-163.7' - Same as 157.9-158.5'	Driller's Remark: Very soft at 161.0-162.0'
-119.0			>2	158.85' - Fracture, 30 deg, smooth, undulating, tight			
			>4	159.0-159.2' - Fracture zone, fragments to 3/4"x2"			
			2	160.0-160.4' - Fracture zone, fragments to 2"x1"			
			1	160.8, 161.3, 161.35, 161.55, 161.6, 161.7, 162.05, 162.95, 163.3' - Bedding plane, horizontal, smooth, planar, tight to open 1/4"			
	R19-NQ 5 ft 96%	28	NR	160.9' - Fracture, 70 deg, smooth, undulating, tight		No Recovery 163.7-165.0' Limestone 160.0-161.4' - Same as 155.0-157.9' except fossil casts to 3/8"x3/4" and voids cover 5-30% of surface 161.4-161.6' - Same as 157.9-158.5' 161.6-162.5' - Same as 160.0-161.4' 162.5-163.7' - Same as 157.9-158.5'	R18:5 minutes End of day on 5/18/07 at 17:35 Begin coring on 5/19/07 at 08:05
			>6	161.3-161.35' - Fracture zone, fragments to 1/4"x2", mostly planar bedding plane			
			>4	165.3' - Fracture, 80 deg, smooth, planar, open, fragments			
			5	165.35, 165.4, 165.55, 165.7, 165.85, 166.45, 166.55, 166.65, 166.95, 167.1, 167.4, 167.6, 167.75' - Bedding plane (13), horizontal, smooth, planar, tight			
			2	166.55-166.65' - Fracture zone, fragments to 1/4"x1", mostly planar, horizontal bedding plane			
165	R20-NQ 5 ft 100%	69	NR	168.0, 168.1' - Fracture (2), 10 deg, smooth, planar, tight		165.0-167.8' - repeated alternating transitions between moderate yellowish brown and pale yellowish brown, (10YR 5/4 and 10YR 6/2), moderate HCl reaction, medium strong to strong (R3 to R4), pale yellowish brown material is very fine grained and stronger, with no voids, moderate yellowish brown material is fine grained with 20-30% voids, 5% medium grained gray limestone imbedded in the matrix of the moderate yellowish brown material (possible infill), gradual transition to limestone at 167.8-169.8' 167.8-169.8' - yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), fine to medium grained, moderate HCl reaction, medium strong (R3), voids (up to 1/8") over 5-25% of surface, fossil casts (up to 3/16"x3/8") over 10% of surface, trace dark grey infill (to 1/8"x1"), delayed HCl reaction No Recovery 169.8-170.0'	R19:10 minutes
-124.0			4	168.35' - Fracture, 45 deg, smooth, undulating, tight			
			NR	169.1' - Fracture, 35 deg, smooth, undulating, tight			
			5	169.1' - Fracture, 35 deg, smooth, undulating, tight			
			>3	169.3' - Fracture, 60 deg, smooth, undulating, tight			
170	R20-NQ 5 ft 100%	69	NR	169.55' - Fracture, 60 deg, smooth, undulating, tight		165.0-167.8' - repeated alternating transitions between moderate yellowish brown and pale yellowish brown, (10YR 5/4 and 10YR 6/2), moderate HCl reaction, medium strong to strong (R3 to R4), pale yellowish brown material is very fine grained and stronger, with no voids, moderate yellowish brown material is fine grained with 20-30% voids, 5% medium grained gray limestone imbedded in the matrix of the moderate yellowish brown material (possible infill), gradual transition to limestone at 167.8-169.8' 167.8-169.8' - yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), fine to medium grained, moderate HCl reaction, medium strong (R3), voids (up to 1/8") over 5-25% of surface, fossil casts (up to 3/16"x3/8") over 10% of surface, trace dark grey infill (to 1/8"x1"), delayed HCl reaction No Recovery 169.8-170.0'	R19:10 minutes
-129.0			2	169.6' - Fracture, 10 deg, smooth, undulating, tight			
			1	170.35, 170.75, 170.85, 170.9, 171.1, 171.55, 174.05' - Bedding plane (7), horizontal, smooth, planar, tight except by fracture zone			
			4	170.7' - Fracture, 80 deg, smooth, undulating, tight			
			4	171.55-171.9' - Fracture zone, fragments to 1"x2-1/2"			
175							



PROJECT NUMBER: 338884.FL	BORING NUMBER: GSC-12
SHEET 10 OF 10	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	


PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722835.8 N, 458289.6 E (NAD83)
 ELEVATION : 41.0 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: G. Davis
 CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, HW casing ORIENTATION : Vertical
 WATER LEVELS : 3.5 ft bgs on 05/17/2007 START : 5/16/2007 END : 5/19/2007 LOGGER : C. Wallested

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.
-134.0	R21-NQ 5 ft 80%	55	1	171.9' - Fracture, rough, undulating, open by fracture zone		Limestone 170.0-175.0' - Same as 167.8-169.8' except trace cavities up to 1-9/16" with grayish orange very weak (R1) infill, voids (up to 1/16") cover 20% of infill, laminated layers of very weak rock (R1) at 170.9-171.15' and 173.95-174.1' 175.0-176.4' - Same as 167.8-169.8' except trace cavities up to 3/16"x1-9/16" lying parallel to bedding 176.4-179.0' - sequences of interbedded limestone that begins as similar to 145.0-147.6' then grades into material similar to 167.8-169.8', except trace cavities to 3/16"x1-9/16", cavities are mostly parallel to bedding, sequences run 176.4-177.25', 177.25-177.7', 177.7-178.55', and 178.55-179.0' No Recovery 179.0-180.0' Limestone 180.0-182.2' - Same as 167.8-169.8' except trace fossil casts and trace dark laminations 182.2-184.6' - Same as 165.0-167.8' except poorly competent, extremely weak (R0) at 182.55-182.75' 184.6-185.0' - Same as 165.0-167.8'	R21:7 minutes
			3	172.25' - Fracture, 30 deg, smooth, undulating, tight			
			>7	172.7' - Fracture, 20 deg, smooth, undulating, tight			
			10	173.7' - Bedding plane, <5 deg, smooth, undulating, dark stain, tight			
			NR	174.6, 174.65' - Fracture (2), 50 deg, smooth, undulating, tight			
180	R22-NQ 5 ft 100%	80	3	175.4, 176.35, 176.38, 176.4, 177.05, 177.15, 177.25, 177.55, 177.6, 177.85, 178.3, 178.32, 170.4, 178.45, 178.49, 178.5, 178.51, 178.53' - Bedding plane (18), horizontal, smooth, planar, tight		Bottom of Boring at 185.0 ft bgs on 5/19/2007	R22:9 minutes
-139.0			1	177.2' - Fracture, vertical, smooth, undulating, missing opposite faces			
			2	177.55-177.6' - Fracture zone, fragments to 1/4"x1/2"			
			0	178.9, 178.95' - Fracture (2), 75 deg, smooth, undulating, tight			
			1	180.05, 181.7, 182.55, 182.75' - Bedding plane, horizontal, smooth, planar to undulating, tight to open 1/4"			
185				180.4' - Fracture, 70 deg, smooth, undulating, missing face			
-144.0				180.75' - Fracture, 60 deg, smooth, undulating, tight to open 1/2"			
				184.65' - Fracture, 25 deg, smooth, undulating, dark stain, tight			



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-01
SHEET 1 OF 15	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/20/2007 END : 2/22/2007 LOGGER : R. Gomez

WATER LEVELS : 3.65 DGS ON 3/6/07		START : 2/20/2007		END : 2/22/2007		LOGGER : R. Gomez	
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		
42.5	0.0				Poorly Graded Sand (SP) 0.0-1.3' - gray, (N3), moist to wet, fine grained, silica sand, trace nonplastic fines		"Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)"
		6.0	R1-SN		Silty Sand (SM) 1.3-3.0' - moderate yellowish brown grading to dark yellowish orange, (10YR 5/4 to 10YR 6/6), moist to wet, fine grained, poorly graded, with nonplastic fines		Water levels were not recorded for I-01
					Silty Sand (SM) 3.0-4.0' - dark yellowish orange, (10YR 6/6), wet, fine grained, silica sand, with nonplastic to low plasticity fines		
5					Sandy Silt/sandy Lean Clay (CL-ML) 4.0-4.5' - yellowish gray, (5Y 7/2), moist, low to medium plasticity, blocky, with fine grained silica sand		
37.5	6.0				Fat Clay With Sand (CH) 4.5-5.0' - medium light gray, (N6), moist to wet, medium to high plasticity, with fine grained silica sand		
					Silt (ML) 5.0-13.0' - very pale orange, (10YR 8/2), moist, nonplastic to low plasticity, carbonate materials		
10							
32.5		10.0	R2-SN				
					</		



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-01
SHEET 2 OF 15	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)
 ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/20/2007 END : 2/22/2007 LOGGER : R. Gomez

WATER LEVELS : 3.65 bgs on 3/3/07			START : 2/20/2007			END : 2/22/2007			LOGGER : R. Gomez		
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				
22.5	10.0	R3-SN		Sandy Silt (ML) 19.5-24.5' - pale yellowish brown, (10YR 6/2), moist to wet, nonplastic to low plasticity, blocky, all carbonate materials		<div></div>	Top of rock estimated to be approximately 26.0' below ground surface				
25 17.5				Limestone Fragments 24.5-26.0' - very pale orange, (10YR 8/2), fossiliferous, fragments up to 3"-4"							
30 12.5			Begin Rock Coring at 26.0 ft bgs See the next sheet for the rock core log								
35 7.5											
40											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-01

SHEET 3 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/20/2007

END : 2/22/2007

LOGGER : R. Gomez

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
26.0						
30						
12.5	R4-SN 10 ft 70%	NA	26.0-36.0' - NA		Limestone 26.0-29.7' - grayish orange to dark yellowish orange, (10YR 7/4 to 10YR 6/6), mild HCl reaction, fossiliferous, fine to coarse sand and fine to coarse gravel-size limestone fragments, all carbonate materials	Set 8" casing to 28" with bentonite around between 8" to 6" casing
35						
7.5		NR			Limestone Fragments 29.7-33.0' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), mild to strong HCl reaction, non fossiliferous, full core-diameter fragments up to 2" thick	NA = Not Applicable NR = No Recovery
36.0						
					No Recovery 33.0-36.0'	Coring run times not recorded for I-01
40						
2.5	R5-SN 10 ft 75%	NA	36.0-46.0' - NA		Limestone 36.0-38.0' - dark yellowish brown, (10YR 4/2), dry, moderate HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over 50-70% of surface, cavities up to 3/8" over 10-15% of surface, fossiliferous	SC-1 collected at 36.0- 37.3'
45						
-2.5		NR			Silt With Limestone Fragments 38.0-41.0' - dark yellowish brown, (10YR 4/2), wet, sand to gravel-sized limestone fragments, fossiliferous	
46.0					Limestone Fragments 41.0-42.0' - limestone fragments from sand to fine gravel-sized, fossiliferous 42.0-43.5' - dark yellowish brown, moderate HCl reaction, silt to fine gravel-sized limestone fragments	
					No Recovery 43.5-46.0'	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-01

SHEET 4 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

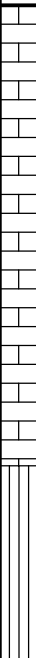

ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/20/2007

END : 2/22/2007

LOGGER : R. Gomez

WATER LEVEL: 36.35 SS SN 56.7'		START: 22/12/2007		END: 22/12/2007		LOGGERS: J.H. GUNZE	
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		
50 -7.5	R6-SN 10 ft 100%	NA	NA		Limestone 46.0-47.0' - Same as 36.0-38.0' except medium to coarse grained, voids (<1/16") over <40% of surface at 46.0-46.7', fossiliferous Limestone Fragments 47.0-51.0' - mild to moderate HCl reaction, fossiliferous, limestone fragments sand to gravel-sized and up to 2-1/2"	SC-2 collected at 46.0- 46.7'	
55 -12.5	56.0				51.0-53.0' - fine grained, medium strong to strong (R3 to R4), 10-20% fossils (casts/molds), sand to gravel-sized fragments up to 2-1/2"		
					Silt (ML) 53.0-56.0' - moderate yellowish brown, (10YR 5/4), nonplastic, mild to moderate HCl reaction		
60 -17.5	R7-SN 10 ft 93%	NA	NA		Limestone Fragments 56.0-57.0' - limestone fragments <3-1/2" in size, fossiliferous Clay (CL) 57.0-58.8' - dark yellowish orange, (10YR 6/6), low to medium plasticity, moderate HCl reaction, unconsolidated material, <20% silt at 58.8' Limestone Fragments 58.8-61.0' - Same as 56.0-57.0'	SC-3 collected at 63.0- 63.9'	
					Clayey Silt (CL-ML) 61.0-61.7' - light brown to moderate yellowish brown, (5YR 5/6 to 10YR 5/4) Limestone Fragments 61.7-65.3' - dark yellowish brown, (10YR 4/2), moderate HCl reaction, very weak to weak (R1 to R2), 50-70% voids <1/16", cavities to 3/8" over 10-15% of surface, fossiliferous		
65 -22.5	66.0		NR		No Recovery 65.3-66.0'		End drilling for the day; R8 is down-hole, will retrieve in morning



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-01

SHEET 5 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/20/2007

END : 2/22/2007

LOGGER : R. Gomez

WATER LEVEL: 66.633 SH 30.3'		DATE: 12/2/2007		EQUIP. NO. 30302			
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		
70 -27.5	R8-SN 10 ft 100%	NA	NA		Limestone 66.0-71.5' - moderate yellowish brown, (10YR 5/4), weak to medium strong (R2 to R3), <10% cavities across surface, fossiliferous	Resume drilling 2/21/07	
75 -32.5	76.0				Clay (CH) 71.5-72.3' - dark yellowish orange, (10YR 6/6), moist, mild HCl reaction, carbonate material	SC-4 collected at 68.4-69.3'	
					Limestone Fragments 72.3-73.6' - very fine grained, strong HCl reaction, extremely weak (R0), limestone fragments to 2", silty matrix		
					Silt (ML) 73.6-75.5' - dry, very stiff, nonplastic, strong HCl reaction, blocky, carbonate material		
					Silty Clay (CL) 75.5-76.0' - light brown, (5YR 5/6), moist, low to medium plasticity		
					Limestone Fragments 76.0-79.0' - fragments up to 2-3/8", 15-30% fragments to 1-3/8", silty/clay (fines) matrix in limestone, fossiliferous (molds/casts/shell fragments)		
80 -37.5	R9-SN 10 ft 75%	NA	NA		Silty Clay (CL) 79.0-79.3' - moderate yellowish brown, (10YR 5/4), moist to wet, soft, black organic partings in matrix	SC-5 collected at 81.0-82.5'	
					Limestone Fragments 79.3-81.0' - Same as 76.0-79.0'		
					Limestone 81.0-82.5' - fossiliferous		
85 -42.5			NR		Limestone Fragments 82.5-83.5' - fragments up to 2-1/2", breaks between fragments mostly caused by fractures within rocks and mechanical breaks from drilling		
	86.0			No Recovery 83.5-86.0'			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-01

SHEET 6 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/20/2007

END : 2/22/2007

LOGGER : R. Gomez

WATER LEVELS : 3.05 bgs on 3/6/07		START : 2/20/2007		END : 2/22/2007		LOGGER : R. Gomez		
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
90 -47.5 								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-01

SHEET 7 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/20/2007

END : 2/22/2007

LOGGER : R. Gomez

WATER LEVEL: 6.36 SS SH 6.37		START: 12/2/07		END: 12/1/07		LOGGERS: R. CORSE	
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		
110 -67.5	R12-SN 10 ft 100%	NA	NA		Limestone 105.1-105.8' - fragments 105.8-106.0' - Same as 105.0-105.1' 106.0-109.5' - grayish orange, (10YR 7/4), very fine to fine grained, strong HCl reaction, laminar bedding, where the pieces are broken down the material is silt-sized, fragments to 3/8" in size 109.5-114.0' - very fine to fine grained, sand to gravel-sized fragments, non fossiliferous		
115 -72.5	116.0				114.0-114.2' - dark yellowish brown, (10YR 4/2), strong HCl reaction, laminated bedding 114.2-121.0' - very pale orange, (10YR 8/2), very fine to fine grained, strong HCl reaction, 20-30% gravel-sized and 70-80% fines, fragments up to 2"		
120 -77.5	R13-SN 10 ft 100%	NA	NA		Disaggregated Limestone 121.0-126.0' - pale yellowish brown, (10YR 6/2), strong HCl reaction, with sand-sized to fine gravel-sized limestone fragments	Rock disaggregated due to sonic drilling method	
125 -82.5	126.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-01

SHEET 8 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

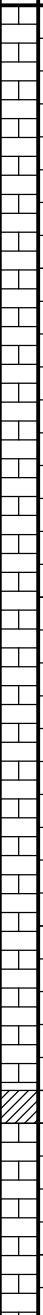
ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/20/2007

END : 2/22/2007

LOGGER : R. Gomez

WATER LEVEL: 0.00 GSG 0.00'		START: 00/00/00		END: 00/00/00		LOGGERS: R. GORSE	
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		
130 -87.5	R14-SN 10 ft 100%	NA	NA		Limestone 126.0-136.0' - grayish orange to pale yellowish brown, (10YR 7/4 to 10YR 6/4), very fine to fine grained, strong HCl reaction, sand to gravel-sized weak (R2) limestone fragments, grains and gravel reduce to silt-sized material (rock flour), few fine grained weak to medium strong (R2 to R3) fragments from 132.0-133.5'		
135 -92.5	136.0				136.0-136.9' - Same as 126.0-136.0' 136.9-142.5' - very pale yellowish brown, (10YR 6/2), medium strong to strong (R3 to R4), very fossiliferous, up to 70% covered in fossil shells/casts/molds, 10-20% covered in voids (<1/16" up to 3/8"), cavities up to 4-3/4", broken sand to gravel-sized pieces at 139.0-139.5'		
140 -97.5	R15-SN 10 ft 100%	NA	NA		Silty Clay (CL) 142.5-143.0' - moderate brown, (5YR 4/4), dry, low plasticity, blocky partings Limestone 143.0-146.0' - Same as 126.0-136.0'		
145 -102.5	146.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-01

SHEET 9 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel


ORIENTATION : Vertical

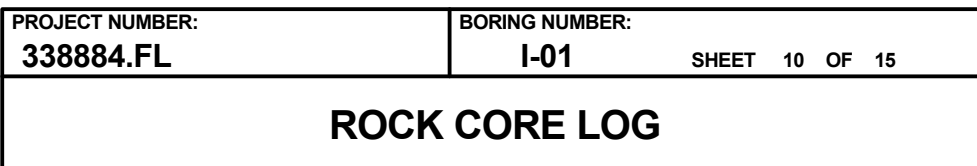
WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/20/2007

END : 2/22/2007

LOGGER : R. Gomez

WATER LEVEL: 0.00 0.00 0.00 0.00		START TIME: 12:00:00		END TIME: 00:00:00		EQUIP. TYPE: CORRE	
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		
150 -107.5	R16-SN 10 ft 88%	NA	NA		Limestone 146.0-148.7' - moderate yellowish brown, (10YR 5/4), fine grained, strong HCl reaction, strong to very strong (R4 to R5), <1/16" voids over <10% of surface, trace fossils 148.7-151.0' - strong HCl reaction, silt to fine gravel-sized limestone fragments 151.0-151.9' - strong HCl reaction, very weak to weak (R1 to R2), very fossiliferous 151.9-154.0' - Same as 148.7-151.0' Limestone Fragments 154.0-154.8' - strong HCl reaction No Recovery 154.8-156.0' Disaggregated Limestone 156.0-161.6' - pale yellowish brown, (10YR 6/2), strong HCl reaction, silt to coarse gravel-sized limestone fragments Limestone 161.6-161.8' - moderate yellowish brown, (10YR 5/4), fine grained, strong HCl reaction, medium strong to strong (R3 to R4), non fossiliferous Disaggregated Limestone 161.8-163.0' - strong HCl reaction, carbonate materials Limestone Fragments 163.0-165.7' - moderate brown, (5YR 4/4), fine grained with silt, silt to 1" size limestone fragments	SC-6 collected at 146.3-147.2'	
155 -112.5	156.0		NR				
160 -117.5	R17-SN 10 ft 100%	NA	NA				
165 -122.5	166.0						



ORIENTATION : Vertical

LOGGER : R. Gomez

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-01

SHEET 11 OF 15

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel


ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/20/2007

END : 2/22/2007

LOGGER : R. Gomez

WATER LEVEL: 0.00 SCS 0.00'		START: 12/2/00		END: 12/2/00		LOGGERS: R. GORSE	
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		
190 -147.5	R20-SN 10 ft 100%	NA	NA		Limestone 185.7-186.0' - Same as 176.0-179.5' 186.0-196.0' - moderate yellowish brown, (10YR 5/4), medium to coarse grained, mild to moderate HCl reaction, sand to gravel-sized fragments, fossiliferous, cavities up to 3/16" over 30-50% of surface at 186.6-186.8'		
195 -152.5	196.0				196.0-201.8' - grayish orange to dark yellowish orange, (10YR 7/4 to 10YR 6/6), strong HCl reaction, blocky partings, silt to gravel-sized limestone fragments, friable		
200 -157.5	R21-SN 10 ft 58%	NA	NA		No Recovery 201.8-206.0'		
205 -162.5	206.0		NR				



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-01	SHEET 12 OF 15
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/20/2007 END : 2/22/2007 LOGGER : R. Gomez

WATER LEVEL: 0.00 0.00 0.00		START: 12/2/2007		END: 12/1/2007		LOGGER: R. GRISE	
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		
210 -167.5	R22-SN 10 ft 100%	NA	NA		Limestone 206.0-216.0' - Same as 196.0-201.8'		
215 -172.5							
216.0					216.0-223.0' - Same as 196.0-201.8'		
220 -177.5	R23-SN 10 ft 100%	NA	NA		216.0-226.0' - NA		
225 -182.5					Clayey Silt (ML) 223.3-224.0' - light brown to very pale orange, (5YR 6/4 to 10YR 8/2), dry to moist, low plasticity when wet		
226.0					Limestone 224.0-226.0' - Same as 196.0-201.8'		




PROJECT NUMBER: 338884.FL	BORING NUMBER: I-01
SHEET 13 OF 15	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/20/2007 END : 2/22/2007 LOGGER : R. Gomez

WATER LEVEL: 636.535 SH 3/3/37		START DATE: 12/2/2007		END DATE: 12/2/07		EQUIP. NO. 00002		CORR. NO. 00002	
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				
230 -187.5	R24-SN 10 ft 100%	NA	NA		Limestone 226.0-233.0' - very pale orange, (10YR 8/2), fine grained, strong HCl reaction, extremely weak (R0), sand to coarse gravel-sized fragments, friable				
235 -192.5					233.0-236.0' - Same as 226.0-233.0' except increase in dark yellowish brown (10YR 4/2) silt				
240 -197.5					236.0-246.0' - Same as 226.0-233.0'				
245 -202.5	R25-SN 10 ft 100%	NA	NA						
246.0									



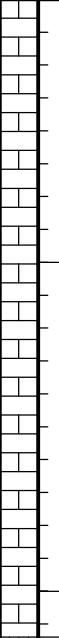
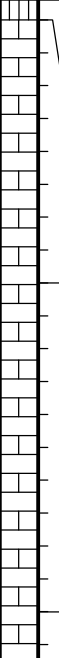

PROJECT NUMBER: 338884.FL	BORING NUMBER: I-01	SHEET 14 OF 15
ROCK CORE LOG		

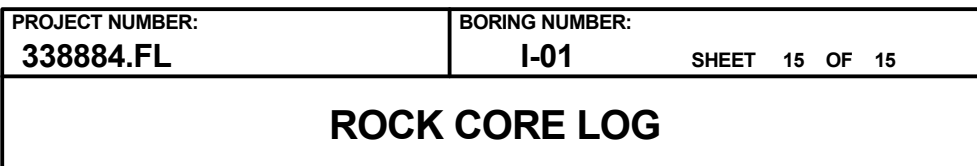
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724110.3 N, 457635.3 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/20/2007 END : 2/22/2007 LOGGER : R. Gomez

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		
250 -207.5	R26-SN 10 ft 100%	NA	NA		Limestone 246.0-255.7' - Same as 226.0-233.0'		
255 -212.5							
256.0	R27-SN 10 ft 97%	NA	NA		Silt (ML) 255.7-256.0' - grayish orange, (10YR 7/4), strong HCl reaction, unconsolidated material, silt to sand grain-sized		
260 -217.5							
265 -222.5	266.0	NA	NR		Limestone 256.0-265.7' - Same as 226.0-233.0'		
					No Recovery 265.7-266.0'		



CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

LOGGER : R. Gomez

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PROJECT NUMBER: 338884.FL	BORING NUMBER: I-02
SHEET 1 OF 17	
SOIL BORING LOG	




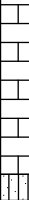
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/23/2007 END : 2/26/2007 LOGGER : C. Sump, S. Parks

WATER LEVELS : 3.65 bgs on 3/6/07			START : 2/20/2007		END : 2/20/2007		LOGGER : G. Gump, S. Pairs		
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			
42.3	0.0				Topsoil 0.0-1.0'			Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)"	
					Poorly Graded Sand (SP) 1.0-5.4' - light gray to medium gray, (N7 to N5), medium to coarse grained, with variable iron oxide staining, silica sand			Water levels were not recorded for I-02	
	6.4	R1-SN							
5 37.3					Sandy Silt (ML) 5.4-6.4' - yellowish gray, (5Y 7/2), moist to wet, low to non plasticity, some fine to medium grain sand No Recovery 6.4-7.0'				
	7.0				Sandy Silt (ML) 7.0-9.0' - Same as 5.4-6.4'				
					9.0-15.0' - grayish yellow to yellowish gray, (5Y 7/2 to 5Y 8/4), moist, nonplastic to low plasticity, some fine to coarse sand-size and gravel-size, some "clasts" <1" size at 9.5-10.5', all carbonate material				
10 32.3									
	10.0	R2-SN							
15 27.3					Limestone Fragments With Silt 15.0-17.0' - fragments are 1"-3" diameter, making up >50% of sample, with silt <50% of soil, all carbonate materials (soil may be thin limestone beds with silty interbeds)			Possibly drill induced breakage	
	17.0								
					Silty Sand With Limestone Fragments (SM) 17.0-22.0' - yellowish gray, (5Y 7/2), moist, fine to coarse grained, grades to sandy silt with depth, <10% fine to coarse gravel-sized (<1/2") limestone clasts, all carbonate materials				
20									



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-02
SHEET 2 OF 17	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/23/2007 END : 2/26/2007 LOGGER : C. Sump, S. Parks

WATER LEVELS : 3.65 bgs on 3/6/07			SOIL DESCRIPTION		LOGGERS : G. Gump, S. Parks	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)			
22.3	10.0	R3-SN				Possibly drill induced breakage (breaks without infilling of fines)
			Limestone Fragments 22.0-23.6' - moderate yellowish brown, (10YR 5/4), 1"-3" thick fragments with 1"-2" thick light tan/gray silt/clay infill (possible interbeds)			
			Silty Sand With Limestone Fragments (SM) 23.6-27.0' - grayish orange, (10YR 7/4), fine to coarse grained, strong HCl reaction, 10-20% fine to coarse gravel-sized limestone fragments (1/4"-1-1/4")			
25 17.3	7.8	R4-SN				Possibly drill induced breakage
			Limestone Fragments 27.0-29.0' - moderate yellowish brown, (10YR 5/4), 1"-4" thick fragments, fossiliferous with small (1/16"-1/8") voids across the surface (40-60%), clay/silt on fragment faces, all carbonate derived			
			Silty Sand With Limestone Fragments (SM) 29.0-31.4' - moderate yellowish brown, (10YR 5/4), fine to coarse grained, 10-15% fine to coarse gravel-sized limestone fragments (<1" diameter), all carbonate material			
30 12.3			Limestone Fragments 31.4-31.7' - yellowish gray, (5Y 8/1), moderate HCl reaction, 1" thick fragments, light gray (N7) clay interbeds between fragments, all carbonate materials			
			Sandy Silt (ML) 31.7-33.0' - moderate yellowish brown, (10YR 5/4), 10-15% fine to coarse gravel-sized limestone fragments, all carbonate derived materials			
35 7.3			Limestone Fragments 33.0-34.8' - dark gray, (N3), fine grained, moderate HCl reaction, medium strong (R3), silt material infilling around fragments, all carbonate materials No Recovery 34.8-37.0'			Possibly drill induced breakage
			Limestone 37.0-39.6' - olive gray, (5Y 4/1), medium strong (R3), finer grained than above, poorly fossiliferous, fine laminations/bedding planes visible in zones (1/8"-1/2"), horizontal partings 1"-4" spacing, light gray to medium gray (N7 to N6) clayey infill on partings, all carbonate materials			
40						Possibly drill induced breakage



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-02

SHEET 3 OF 17

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

WATER LEVELS : 3.65 bgs on 3/6/07			START : 2/29/2007		END : 2/29/2007		LOGGERS : G. Gump, S. Parks		
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			
2.3					Silty Sand With Limestone Fragments (SM) 39.6-44.0' - pale yellowish brown, (10YR 6/2), fine to coarse grained, 20-50% fine to coarse gravel-sized limestone fragments, increasing with depth, all carbonate materials				
45 -2.7	10.0	R5-SN			Limestone 44.0-44.5' - yellowish gray, (5Y 7/2), fossiliferous (molds/casts), 50% small surface voids (1/16"-1/8") and small roughly circular solution cavities (1/2"), horizontal partings 1"-2", silty clay infilling material on partings Silty Sand (SM) 44.5-47.0' - yellowish gray, (5Y 7/2), fine to coarse grained, 20-30% fine to coarse gravel-sized limestone fragments, decreasing with depth, all carbonate materials				
50 -7.7	47.0				Silty Sand With Limestone Fragments (SM) 47.0-53.2' - fine to medium grained, 50-70% angular to subangular limestone fragments, full-diameter (4") limestone core pieces 2"-4" thick at 49.0-49.5' and 50.0-51.0' with thin clayey silt material on horizontal parting surfaces, all carbonate materials			Difficulty driving 6" casing to 51.0' below ground surface	
55 -12.7	6.2	R6-SN						Top of rock estimated to be approximately 53.0' below ground surface	
60					Begin Rock Coring at 53.2 ft bgs See the next sheet for the rock core log				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-02

SHEET 4 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel


ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

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		
55 -12.7	53.2	R6-SN 3.8 ft 100%	NA	NA		Limestone 53.2-57.0' - yellowish brown to gray, moderate to strong HCl reaction, light gray silty clay interbed/infill material on horizontal parting surfaces spaced 1"-2" with few up to 4", medium yellowish brown silt (<15%) zone at 54.0-54.5', highly fragmented 56.0-57' with angular to subangular fragments 2"-3" in size, increasing silt sized component with depth	Start of rock core	
	57.0					Limestone Fragments 57.0-59.5' - strong HCl reaction, angular to subangular fragments 1-3" in diameter, <40% carbonate derived clayey silt, fines change color from light gray to moderate yellowish brown at 58.0'	Highly fragmented limestone Possibly drill induced breakage	
	60 -17.7	R7-SN 10 ft 100%	NA	NA		Limestone 59.5-63.0' - moderate yellowish brown, (10YR 5/4), horizontal partings 1"-2" spacing with dark grayish brown clayey silt interbed material rough and undulating, fine black laminar inclusions 1/16"-1/8" in length (horizontal)	NA = Not Applicable NR = No Recovery	
	65 -22.7					63.0-64.7' - yellowish gray to olive gray, fine grained, trace to no fossils, few small surface voids (1/16"-1/8"), horizontal partings at various spacing from 1"-8", parting surfaces mostly clean with trace silty clayey material	Possibly drill induced breakage	
	70 -27.7	67.0	R8-SN 10 ft 100%	NA		NA	Silt (ML) 64.7-65.5' - dark brown, black mottling/laminations, possibly organics, possible bioturbation	
		Limestone 65.5-68.1' - grayish yellow brown, medium strong (R3), fossiliferous, horizontal partings with 2"-4" spacing, trace to no infill in partings, surface coverage of small (<1/8") voids >50%			Possibly drill induced breakage			
					Silt With Limestone Fragments (ML) 68.1-68.8' - orange gray, limestone fragments 1/2"-1" diameter	Possibly drill induced breakage		
					Limestone 68.8-70.0' - yellowish brown, fine grained, medium strong to strong (R3 to R4), few fossils (<5%) few surface voids, dense partings 3/4"-4", light gray silty infilling (interbeds)	Repeating limestone/silt interbeds		
					Silt (ML) 70.0-70.5' - Same as 68.1-68.8' except strong HCl reaction			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-02

SHEET 5 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

WATER LEVEL: 6.66 6/25/2007		DATE: 12/20/2007		EODER: G. Semp. P. Fink			
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		
75 -32.7							
	77.0						
80 -37.7							
	R9-SN 10 ft 93%	NA	NA				
85 -42.7							
	87.0		NR				
90 -47.7							
	R10-SN 10 ft 100%	NA	NA				





PROJECT NUMBER: 338884.FL	BORING NUMBER: I-02
SHEET 6 OF 17	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

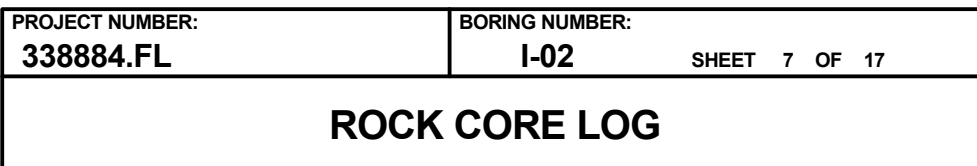
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/23/2007 END : 2/26/2007 LOGGER : C. Sump, S. Parks

WATER LEVEL: 6.66 6.66 6.66 6.66		DATE: 12/20/2007		END: 12/20/2007		LOGGER: G. Campbell, P. King	
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		
95 -52.7					91.4-91.6' - light grayish tan, weak (R2) Limestone 91.6-92.7' - light yellowish gray, medium strong (R3), <10% small surface voids (1/16"-1/8"), fossiliferous Disaggregated Limestone 92.7-94.4' - light grayish tan, compacted, <20% gravel size (<1") limestone fragments, dark olive brown laminations (possible organics) Limestone 94.4-94.8' - Same as 91.6-92.7' Disaggregated Limestone 94.8-97.0' - light grayish orange, few (<10%) gravel sized (<3/4") limestone fragments, dark brown lamination appears to transect bedding Limestone Fragments 97.0-107.0' - 0-25% carbonate derived clay, gravel size (<1") limestone fragments, few fragments >1-1/2", friable fragments of slightly more competent material are easily broken by hand, sparse dark brown roughly horizontal laminations associated with finer grained zones (organics)	Upward fining sequences of increasing clay and decreasing sand fractions over 4.0'-6.0' intervals	
97.0			97.0-107.0' - NA				
100 -57.7	R11-SN 10 ft 100%	NA	NA				
105 -62.7					107.0-117.0' - Same as 97.0-107.0'		
107.0					107.0-117.0' - NA		
110 -67.7	R12-SN 10 ft 100%	NA	NA				



ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bqs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

APPENDIX 2BB-1019



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-02

SHEET 8 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

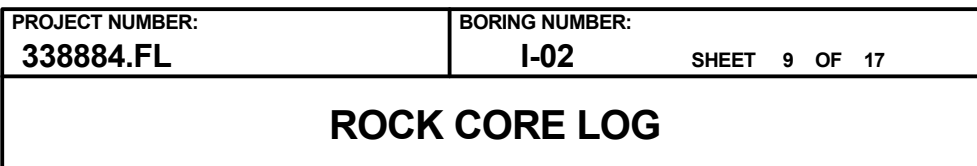
WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

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		
135 -92.7							
	137.0				Limestone Fragments 137.0-139.5' - Same as 97.0-107.0'		
140 -97.7							
	R15-SN 10 ft 100%	NA	NA		Limestone 139.5-143.0' - very pale grayish orange, numerous (1/2"-1") solution cavities, fine black inclusions (<1/8"), variable zones of small voids (<1/16") on surface, fossiliferous, molds and casts up to 3/4" in size, dark brown staining on some of the partings (original bedding plane), mottled dark gray 143.0-145.6' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, dense, less fossiliferous than above, few surface voids/cavities (<10%), horizontal partings 2"-4" spacing, 2"-3" semi-compacted clayey silt interbeds Disaggregated Limestone 145.6-147.0' - grayish orange brown, few gravel sized (<1/2") limestone fragments 147.0-148.9' - Same as 145.6-147.0' except increasing percent of limestone fragments and increase in size of fragments (1"-3")	Fossiliferous, partial recrystallization (very fine subhedral/cross faces)	
145 -102.7							
	147.0				Limestone 148.9-151.6' - grayish orange, (10YR 7/4), small voids (1/16"-1/8") covering 50% surface, horizontal partings 6"-1.0' spacing, silty clay interbeds (up to 1.0"), partings thickness decreasing with depth Disaggregated Limestone 151.6-152.3' - moderate yellowish brown, (10YR 5/4), with friable limestone fragments 3/4"-1 1/2" diameter	Repeating sequences of limestone with softer (carbonate derived) interbeds separated by zones of unconsolidated carbonates with limestone fragments (possibly drill induced breakage)	
150 -107.7							
	R16-SN 10 ft 100%	NA	NA				



ORIENTATION : Vertical

LOGGER : C. Sump, S. Parks

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-02

SHEET 10 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel





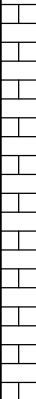
ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

WATER LEVEL: 6.66 6.65 6.64 6.63 6.62 6.61 6.60 6.59 6.58 6.57 6.56 6.55 6.54 6.53 6.52 6.51 6.50 6.49 6.48 6.47 6.46 6.45 6.44 6.43 6.42 6.41 6.40 6.39 6.38 6.37 6.36 6.35 6.34 6.33 6.32 6.31 6.30 6.29 6.28 6.27 6.26 6.25 6.24 6.23 6.22 6.21 6.20 6.19 6.18 6.17 6.16 6.15 6.14 6.13 6.12 6.11 6.10 6.09 6.08 6.07 6.06 6.05 6.04 6.03 6.02 6.01 6.00 5.99 5.98 5.97 5.96 5.95 5.94 5.93 5.92 5.91 5.90 5.89 5.88 5.87 5.86 5.85 5.84 5.83 5.82 5.81 5.80 5.79 5.78 5.77 5.76 5.75 5.74 5.73 5.72 5.71 5.70 5.69 5.68 5.67 5.66 5.65 5.64 5.63 5.62 5.61 5.60 5.59 5.58 5.57 5.56 5.55 5.54 5.53 5.52 5.51 5.50 5.49 5.48 5.47 5.46 5.45 5.44 5.43 5.42 5.41 5.40 5.39 5.38 5.37 5.36 5.35 5.34 5.33 5.32 5.31 5.30 5.29 5.28 5.27 5.26 5.25 5.24 5.23 5.22 5.21 5.20 5.19 5.18 5.17 5.16 5.15 5.14 5.13 5.12 5.11 5.10 5.09 5.08 5.07 5.06 5.05 5.04 5.03 5.02 5.01 5.00 4.99 4.98 4.97 4.96 4.95 4.94 4.93 4.92 4.91 4.90 4.89 4.88 4.87 4.86 4.85 4.84 4.83 4.82 4.81 4.80 4.79 4.78 4.77 4.76 4.75 4.74 4.73 4.72 4.71 4.70 4.69 4.68 4.67 4.66 4.65 4.64 4.63 4.62 4.61 4.60 4.59 4.58 4.57 4.56 4.55 4.54 4.53 4.52 4.51 4.50 4.49 4.48 4.47 4.46 4.45 4.44 4.43 4.42 4.41 4.40 4.39 4.38 4.37 4.36 4.35 4.34 4.33 4.32 4.31 4.30 4.29 4.28 4.27 4.26 4.25 4.24 4.23 4.22 4.21 4.20 4.19 4.18 4.17 4.16 4.15 4.14 4.13 4.12 4.11 4.10 4.09 4.08 4.07 4.06 4.05 4.04 4.03 4.02 4.01 4.00 3.99 3.98 3.97 3.96 3.95 3.94 3.93 3.92 3.91 3.90 3.89 3.88 3.87 3.86 3.85 3.84 3.83 3.82 3.81 3.80 3.79 3.78 3.77 3.76 3.75 3.74 3.73 3.72 3.71 3.70 3.69 3.68 3.67 3.66 3.65 3.64 3.63 3.62 3.61 3.60 3.59 3.58 3.57 3.56 3.55 3.54 3.53 3.52 3.51 3.50 3.49 3.48 3.47 3.46 3.45 3.44 3.43 3.42 3.41 3.40 3.39 3.38 3.37 3.36 3.35 3.34 3.33 3.32 3.31 3.30 3.29 3.28 3.27 3.26 3.25 3.24 3.23 3.22 3.21 3.20 3.19 3.18 3.17 3.16 3.15 3.14 3.13 3.12 3.11 3.10 3.09 3.08 3.07 3.06 3.05 3.04 3.03 3.02 3.01 3.00 2.99 2.98 2.97 2.96 2.95 2.94 2.93 2.92 2.91 2.90 2.89 2.88 2.87 2.86 2.85 2.84 2.83 2.82 2.81 2.80 2.79 2.78 2.77 2.76 2.75 2.74 2.73 2.72 2.71 2.70 2.69 2.68 2.67 2.66 2.65 2.64 2.63 2.62 2.61 2.60 2.59 2.58 2.57 2.56 2.55 2.54 2.53 2.52 2.51 2.50 2.49 2.48 2.47 2.46 2.45 2.44 2.43 2.42 2.41 2.40 2.39 2.38 2.37 2.36 2.35 2.34 2.33 2.32 2.31 2.30 2.29 2.28 2.27 2.26 2.25 2.24 2.23 2.22 2.21 2.20 2.19 2.18 2.17 2.16 2.15 2.14 2.13 2.12 2.11 2.10 2.09 2.08 2.07 2.06 2.05 2.04 2.03 2.02 2.01 2.00 1.99 1.98 1.97 1.96 1.95 1.94 1.93 1.92 1.91 1.90 1.89 1.88 1.87 1.86 1.85 1.84 1.83 1.82 1.81 1.80 1.79 1.78 1.77 1.76 1.75 1.74 1.73 1.72 1.71 1.70 1.69 1.68 1.67 1.66 1.65 1.64 1.63 1.62 1.61 1.60 1.59 1.58 1.57 1.56 1.55 1.54 1.53 1.52 1.51 1.50 1.49 1.48 1.47 1.46 1.45 1.44 1.43 1.42 1.41 1.40 1.39 1.38 1.37 1.36 1.35 1.34 1.33 1.32 1.31 1.30 1.29 1.28 1.27 1.26 1.25 1.24 1.23 1.22 1.21 1.20 1.19 1.18 1.17 1.16 1.15 1.14 1.13 1.12 1.11 1.10 1.09 1.08 1.07 1.06 1.05 1.04 1.03 1.02 1.01 1.00 0.99 0.98 0.97 0.96 0.95 0.94 0.93 0.92 0.91 0.90 0.89 0.88 0.87 0.86 0.85 0.84 0.83 0.82 0.81 0.80 0.79 0.78 0.77 0.76 0.75 0.74 0.73 0.72 0.71 0.70 0.69 0.68 0.67 0.66 0.65 0.64 0.63 0.62 0.61 0.60 0.59 0.58 0.57 0.56 0.55 0.54 0.53 0.52 0.51 0.50 0.49 0.48 0.47 0.46 0.45 0.44 0.43 0.42 0.41 0.40 0.39 0.38 0.37 0.36 0.35 0.34 0.33 0.32 0.31 0.30 0.29 0.28 0.27 0.26 0.25 0.24 0.23 0.22 0.21 0.20 0.19 0.18 0.17 0.16 0.15 0.14 0.13 0.12 0.11 0.10 0.09 0.08 0.07 0.06 0.05 0.04 0.03 0.02 0.01 0.00							DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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							
175 -132.7				177.0-187.0' - NA		Pasty Limestone 170.5-171.0' - yellowish gray to orange gray, dark brown laminations (possible organics), no gravel sized fragments	Possibly drill induced breakage				
	177.0		NR			Limestone 171.0-173.9' - Same as 167.2-168.4'					
						Disaggregated Limestone 173.9-176.4' - brown, limestone fragments generally 3/4" but up to 1"-3" diameter, light gray interbeds					
180 -137.7				177.0-187.0' - NA		No Recovery 176.4-177.0'					
						Disaggregated Limestone 177.0-177.3' - Same as 173.9-176.4'	Possibly drill induced breakage				
						Limestone 177.3-179.0' - yellowish gray, dense, little to no surface voids, horizontal partings 1"-3" spacing					
	R19-SN 10 ft 100%	NA	NA	177.0-187.0' - NA		Limestone Fragments 179.0-179.9' - moderate yellowish brown, (10YR 5/4), fine grained, 50% limestone fragments 3/4"-1-1/2" size					
						Limestone 179.9-180.9' - Same as 177.3-179.0' except increase in small (1/16"-1/8") surface voids and soft interbeds on 1"-2" partings					
						Disaggregated Limestone 180.9-183.6' - moderate yellowish brown, (10YR 5/4), fine grained, with limestone fragments					
185 -142.7				177.0-187.0' - NA		Limestone 183.6-187.0' - yellowish gray, fragmented, fragments <1/2"-3" size					
	187.0					187.0-189.0' - fragmented, angular to subangular, 1-1/2"-3" size	Possibly drill induced breakage				
						189.0-192.0' - fossiliferous (molds/casts), horizontal partings 1"-3" spacing, very thin soft interbeds (1/2")					
190 -147.7				187.0-197.0' - NA							
	R20-SN 10 ft 81%	NA	NA			Limestone Fragments 192.0-195.1' - limestone fragments, sand-sized to 1/2"-2" size	Possibly drill induced breakage				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-02

SHEET 11 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	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.
195 -152.7						
		NR			No Recovery 195.1-197.0'	
197.0						
			197.0-207.0' - NA		Limestone Fragments 197.0-203.3' - medium to coarse grained, grain size increasing with depth, limestone fragments are 2"-4" size, subangular to angular, fragments above 200' are fine grained, exhibit bedding plane fractures and have trace to no surface voids, fragments below 200.0' are fossiliferous (molds/casts) and exhibit 30-40% small (1/16"-1/8") surface voids and small cavities ($<1/2"$)	
200 -157.7		NA				
	R21-SN 10 ft 74%	NA				
205 -162.7					Disaggregated Limestone 203.3-204.4' - yellowish gray/moderate brown, 25% limestone fragments No Recovery 204.4-207.0'	Lost material may be fines from across entire run
		NR				
207.0						
			207.0-217.0' - NA		Limestone Fragments 207.0-215.7' - mild HCl reaction, variable (5-15%) clay-sized pasty limestone, limestone is fine grained, fossiliferous with 1/2"-3/4" cavities, fragments are angular to subangular with smooth to irregular surfaces, 6" clayey layers at 211.0' and 215.7', silt and clay-sized carbonate content decrease with depth	Possibly drill induced breakage
210 -167.7						
	R22-SN 10 ft 87%	NA				



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-02

SHEET 12 OF 17

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

WATER LEVELS : 3.05 bgs on 3/6/07		START : 2/23/2007		END : 2/20/2007		LOGGER : C. Sump, S. Pairs		
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES				SYMBOLIC LOG	LITHOLOGY	
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS		COMMENTS	
								DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS
215 -172.7								
			NR				No Recovery 215.7-217.0'	
217.0								
				217.0-227.0' - NA			Disaggregated Limestone 217.0-217.5' - very pale orange and grayish orange, (10YR 8/2 and 10YR 7/4), moderate HCl reaction, laminated, dark brown organic rich layers, limestone fragments (<10%) 1/4"-1/2" in diameter	
220 -177.7								
	R23-SN 10 ft 90%	NA	NA				Limestone Fragments 217.5-226.0' - pale greenish yellow to very light gray, (10Y 8/2 to N8), repeating sequences of upward fining material with limestone fragments up to 3" in coarse zones, average sequence length 2.0'-2.5', limestone fragments are moderate to strong HCl reaction fossiliferous, (molds & casts), mostly subangular, few subrounded fragments	
225 -182.7								
			NR				No Recovery 226.0-227.0'	
227.0								
				227.0-237.0' - NA			Limestone Fragments 227.0-235.5' - medium to coarse grained, 30-50% limestone fragments generally <3/4", few >1" fragments, repeating/alternating zones (1'-2' length) of coarser material and finer silt zones (less fragments)	
230 -187.7								
	R24-SN 10 ft 100%	NA	NA					



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-02	SHEET 13 OF 17
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/23/2007 END : 2/26/2007 LOGGER : C. Sump, S. Parks

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		
235 -192.7							
	237.0						
240 -197.7							
	R25-SN 10 ft 100%	NA	NA				
245 -202.7							
	247.0						
250 -207.7							
	R26-SN 10 ft 87%	NA	NA				



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-02
SHEET 14 OF 17	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

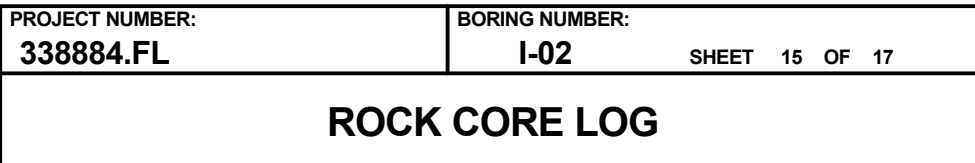
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724046.5 N, 457700.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 3.65 bgs on 3/6/07 START : 2/23/2007 END : 2/26/2007 LOGGER : C. Sump, S. Parks

WATER LEVEL: 6.36 595 SN 3637		START: 1/20/2007		END: 2/20/2007		LOGGER: G. Camp, G. Park	
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		
255 -212.7					No Recovery 255.7-257.0'		
			NR				
257.0					Limestone Fragments 257.0-268.5' - Same as 247.0-255.7'		
				257.0-267.0' - NA			
260 -217.7							
	R27-SN 10 ft 100%	NA	NA				
265 -222.7							
267.0					268.5-271.5' - very pale orange, (10YR 8/2), mild to moderate HCl reaction, laminated with organic layers in top 6", limestone fragments are angular to subangular, average 1/4"-1/2" size		
				267.0-277.0' - NA			
270 -227.7							
	R28-SN 10 ft 100%	NA	NA				



ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

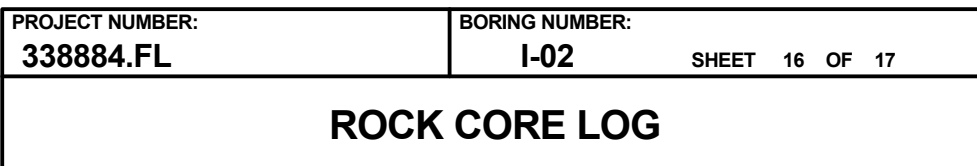
WATER LEVELS : 3.65 bqs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

APPENDIX 2BB-1027



ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

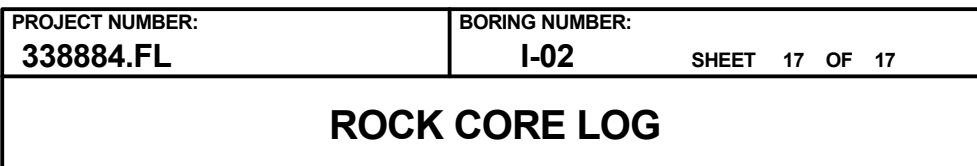
WATER LEVELS : 3.65 bqs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

APPENDIX 2BB-1028



ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.65 bqs on 3/6/07

START : 2/23/2007

END : 2/26/2007

LOGGER : C. Sump, S. Parks

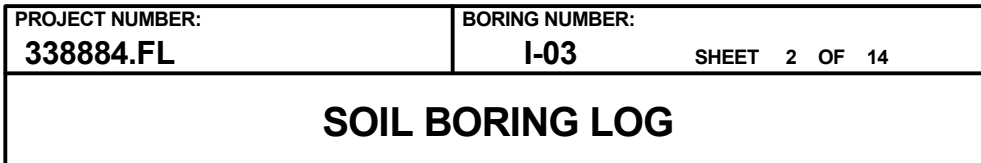
APPENDIX 2BB-1029



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-03
SHEET 1 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)
 ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 2.0 ft bgs on 3/21/07 START : 3/21/2007 END : 3/23/2007 LOGGER : C. Sump, J. Burkard

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)				
		#TYPE				
42.1	0.0			Poorly Graded Sand (SP) 0.0-3.0' - fine to medium grained, no HCl reaction, brownish black (5YR 2/1) and organic rich from 0.0-1.0' (topsoil) grading to pale brown (5YR 5/2) to dark yellowish brown (10YR 4/2) between 2.0-3.0'		Start drilling 12:32 Set 8" casing 0-27' below ground surface Water level: 2 ft below ground surface
	5.4	R1-SN		Clayey Sand (SC) 3.0-6.0' - medium plasticity, no HCl reaction, fine silica sand, finely laminated with dark yellowish orange (10YR 6/6) layers and light gray (N7) layers		R1: 2 minutes
5 37.1	6.0			Silt With Sand (ML) 6.0-16.0' - grayish orange, (10YR 7/4), mild to strong HCl reaction, very fine to fine sand-sized particles, 2-1/2" limestone fragments at 15.8', carbonate materials		
	10.0	R2-SN				
10 32.1						
	16.0			Limestone 16.0-17.5' - very pale orange, (10YR 8/2), fossiliferous with molds/casts. Fossils exhibit preferential horizontal orientation (bedding plane), few large molds (3/4"), numerous small voids (3/8" to 1-3/16") over 40% of surface. Horizontal partings (1-4") with clay/silt interbeds up to 2" thick, partings may be mechanical breaks		R2: 10 minutes 5 bolts sheared off on drill head. Down for maintenance 12:55-15:13 (2:18)
15 27.1						
20						



LOGGER : C. Sump, J. Burkard

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-03

SHEET 3 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel




ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07

START : 3/21/2007

END : 3/23/2007

LOGGER : C. Sump, J. Burkard

WATER LEVELS : 2.01 RBGS ON 3/21/07			START : 3/21/2007		END : 3/23/2007		LOGGER : C. Sump, J. Burkard	
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			
36.0	R5-SN 10 ft 89%	NA	NA		Limestone Fragments 36.0-39.6' - with horizontal partings (2-4" spacing) with clayey silt interbeds/infilling on partings (1/4"-3/4" thick)	NA = Not Applicable NR = No Recovery		
40 2.1					Silt (ML) 39.6-41.0' - moderate yellow brown, (10YR 5/4), mild to moderate HCl reaction			
45 -2.9					Well Graded Limestone Fragments With Sand 41.0-43.0' - limestone fragments <1". At 41.0' large, irregularly shaped limestone fragment (5")			
46.0	R6-SN 10 ft 96%	NR	NR		Limestone 43.0-44.9' - Same as 36.0-39.6' except with very thin clayey silt infilling on horizontal parting surfaces (bedding planes)	R5: 13 minutes		
					No Recovery 44.9-46.0'			
50 -7.9					Limestone And Limestone Fragments 46.0-56.0' - Same as 41.0-44.9' except on 1.5-2.0' spacing with well graded gravel (limestone fragments) with silt and sand (GW-GM) interval in between, very thin clayey silt similar to 41.0-44.9' above			
55 -12.9	NR	NR	NR		No Recovery 55.6-56.0'	R6: 14 minutes		
56.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-03

SHEET 4 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07

START : 3/21/2007

END : 3/23/2007

LOGGER : C. Sump, J. Burkard

WATER LEVEL: 20.000 OF 02/10/7		DISCONTINUITIES		LOGGER: G. Camp, G. Barkard				
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DESCRIPTION		SYMBOLIC LOG	LITHOLOGY	COMMENTS		
		R Q D (%)	FRACTURES PER FOOT				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.
60 -17.9	R7-SN 10 ft 100%	NA	NA	56.0-66.0' - NA	Limestone 56.0-58.3' - very pale orange, (10YR 8/2), fossiliferous limestone (molds/casts), voids (1/16"-1/8") over 20-30% of surface, horizontal partings on 2-6" spacing (bedding plane), with 1-2" clayey, silty (low to moderate plasticity) interbeds with gravel-sized limestone fragments <1" Calcareous Silt With Limestone Fragments (ML) 58.3-60.0' Limestone 60.0-61.4' Limestone Fragments 61.4-66.0' - up to 4"	R7: 38 minutes Core run times not recorded below R7-SN		
65 -22.9	66.0			66.0-76.0' - NA	Limestone 66.0-68.6' - medium to coarse grained, voids (<1/16") over 80% of surface Limestone Fragments 68.6-70.1' Limestone 70.1-71.5' Limestone Fragments 71.5-72.5' Disaggregated Limestone 72.5-74.5' - contains limestone fragments No Recovery 74.5-76.0'			
70 -27.9	R8-SN 10 ft 85%	NA	NA					
75 -32.9			NR					
76.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-03

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel


ORIENTATION : Vertical

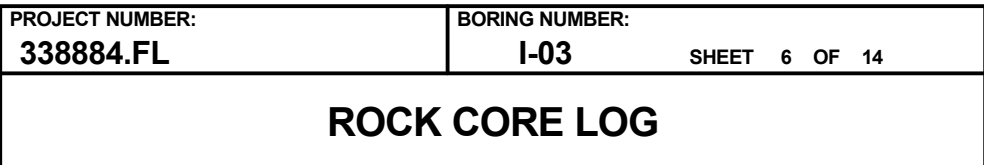
WATER LEVELS : 2.0 ft bgs on 3/21/07

START : 3/21/2007

END : 3/23/2007

LOGGER : C. Sump, J. Burkard

WATER LEVEL: 20.0 ft		CORING LOG: 2/1/07		CUT: 1/2/2007		END: 02/2/2007		EQUIP: 3. Sample: 2007	
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				
80 -37.9	R9-SN 10 ft 100%	NA	NA		Limestone 76.0-79.0' - pale yellowish brown, (10YR 6/2), moderate HCl reaction, discs up to 3" in length with interbeds of silt and gravel-sized fragments with voids over 10% of surface				
					79.0-81.0' - Same as 76.0-79.0' except limestone fragments with increased fines and interbeds of clay and sand-sized particles				
					81.0-82.5' - pale yellowish brown, (10YR 6/2), moderate HCl reaction				
					82.5-83.7' - gravel-sized limestone fragments with silt size fines				
85 -42.9					83.7-86.0' - moderate yellowish brown, (10YR 4/2), moderate HCl reaction, 4" limestone fragments with voids over 60-75% of surface, poorly fossiliferous				
86.0					86.0-88.0' - Same as 83.7-86.0' except 2" fragments				
					Limestone Fragments 88.0-88.8' - Same as 86.0-88.0' except gravel-sized fragments 88.8-90.3' - Same as 83.7-86.0' except with black organic matter (1-1/2"- 1/2" spacing)				
90 -47.9	R10-SN 10 ft 100%	NA	NA		Limestone Fragments With Clay And Sand 90.3-92.4' - yellowish gray, (5Y 7/2), strong HCl reaction, fragments are gravel-sized				
					Limestone Fragments 92.4-95.0' - very pale orange, (10YR 8/2), strong HCl reaction, limestone disc up to 5" in length with thin clay interbeds, trace voids on surface, apparent non-fossiliferous, rock is dry and powdery				
95 -52.9					95.0-96.0' - Same as 92.4-95.0' except with thin beds of dry lean clay				
	96.0								



LOGGER : C. Sump, J. Burkard

Rev. 4



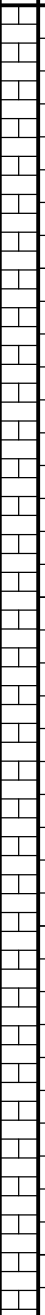
PROJECT NUMBER: 338884.FL	BORING NUMBER: I-03	SHEET 7 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07 START : 3/21/2007 END : 3/23/2007 LOGGER : C. Sump, J. Burkard

WATER LEVEL: 20180501 02:15:07 START: 1/2/2007 END: 3/20/2007 LOGGER: G. Camp, S. Sanford							
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		
120 -77.9	R13-SN 10 ft 100%	NA	NA		Disaggregated Limestone 116.0-126.0' - Same as 106.0-116.0'		
125 -82.9	126.0				126.0-134.3' - very pale orange, (10YR 8/2), strong HCl reaction, interbedded limestone discs and fragments, locally moist and dry sections		
130 -87.9	R14-SN 10 ft 85%	NA	NA		No Recovery 134.3-136.0'		
135 -92.9			NR				
136.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-03

SHEET 8 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

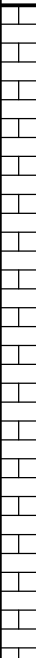



ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07

START : 3/21/2007

END : 3/23/2007

LOGGER : C. Sump, J. Burkard

WATER LEVEL: 20.003 ON 02/15/2017		DISCONTINUITIES		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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			
140 -97.9	R15-SN 10 ft 93%	NA	NA	136.0-146.0' - NA		Limestone Fragments 136.0-139.4' - yellowish gray, (5Y 7/2), strong HCl reaction, gravel-sized fragments	SC-1 collected at 144.2-145.3'
						139.4-142.3' - moderate brown, (10YR 6/2), strong HCl reaction, limestone fragments up to 2" in length with little to no fines, with worm holes that contain pyrite, fine grained, moderately fossiliferous	
145 -102.9	146.0	NR		146.0-156.0' - NA		142.3-143.6' - gravel-sized rock fragments up to 2" in diameter with thin clay coating	
						Limestone 143.6-146.0' - yellowish gray, (5Y 7/2), 13" long with no fines, voids over 50-75% of surface, fine grained, poorly fossiliferous No Recovery 145.3-146.0'	
150 -107.9	R16-SN 10 ft 100%	NA	NA			Limestone Fragments 146.0-148.0' - yellowish gray, (5Y 7/2), strong HCl reaction, fragments are gravel-sized	
						148.0-149.5' - dusky yellow, (5Y 6/4), strong HCl reaction, fragments are gravel-sized, silica sand present	
155 -112.9	156.0					Limestone 149.5-152.9' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, limestone core segment with interbedded clay lenses 1/8" to 2" thick, poorly fossiliferous	
						Limestone Fragments 152.9-156.0' - dusky yellow, (5Y 6/4), strong HCl reaction, fragments are gravel-sized, silica sand present 154.3-156.0' - pale yellowish brown, (10YR 6/2), strong HCl reaction, limestone core segment up to 5" in length with interbedded clay, poorly fossiliferous	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-03

SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

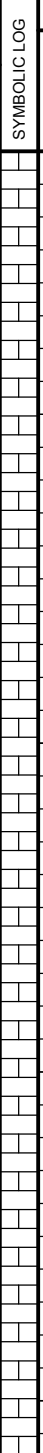
ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07

START : 3/21/2007

END : 3/23/2007

LOGGER : C. Sump, J. Burkard

WATER LEVELS : 2.01665 ON 5/21/07		START : 5/21/2007		END : 5/23/2007		LOGGER : C. Sump, J. Burkard	
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		
160 -117.9	R17-SN 10 ft 100%	NA	NA		Disaggregated Limestone 156.0-163.7' - yellowish gray, (5Y 7/2), strong HCl reaction, contains isolated limestone fragments up to 3" in diameter	Possible rip-up clast at 168.8'	
165 -122.9	166.0				Limestone 163.7-166.0' - dusky yellow, (5Y 6/4), fine grained, strong HCl reaction, limestone fragments up to 1" in length with interbedded silty sand, poorly fossiliferous		
170 -127.9					Limestone Fragments 166.0-168.9' - yellowish gray, (10YR 6/2), fine grained, strong HCl reaction, up to 3" in length with no fines, moderately fossiliferous, voids over 25-50% of surface		
175 -132.9	R18-SN 10 ft 100%	NA	NA		Disaggregated Limestone 168.9-170.5' - grayish orange, (10YR 7/4), strong HCl reaction		
					Limestone 170.5-172.3' - pale yellowish brown, (10YR 6/2), moderate HCl reaction, with limestone discs up to 4" in length with thin interbeds of clay, voids over 20-40% of surface		
					Disaggregated Limestone 172.3-173.5' - dusky yellow, (5Y 6/4), strong HCl reaction		
					Limestone 173.5-176.0' - Same as 170.5-172.3'		
	176.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-03

SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07

START : 3/21/2007

END : 3/23/2007

LOGGER : C. Sump, J. Burkard

WATER LEVEL: 120.03 ON 02/15/		DISCONTINUITIES		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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			
180 -137.9	R19-SN 10 ft 100%	NA	NA	176.0-186.0' - NA		Limestone Fragments 176.0-181.0' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, strong HCl reaction, 4" in length, poorly fossiliferous, voids over 10-20% of surface	
185 -142.9	186.0					Disaggregated Limestone 181.0-182.1' - yellowish gray, (5Y 7/2), moderate HCl reaction 182.1-183.6' - moderate yellowish brown, (10YR 5/4), strong HCl reaction	
190 -147.9				186.0-196.0' - NA		Limestone 183.6-186.0' - pale yellowish brown, (10YR 6/2), strong HCl reaction, discs up to 3" in length with interbedded clays 1/8" to 1" thick, highly fossiliferous with voids over 30-60% of surface Disaggregated Limestone 186.0-196.0' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, limestone fragments throughout 10' section, 60-80% limestone fragments from 186.0-188.8', decreases with depth to <10% from 192.0-196.0'	
195 -152.9	R20-SN 10 ft 100%	NA	NA				
196.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-03

SHEET 11 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel

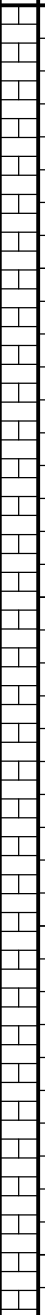
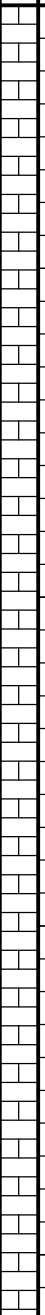
ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07

START : 3/21/2007

END : 3/23/2007

LOGGER : C. Sump, J. Burkard

WATER LEVEL: 20 REGS ON 1/21/07		START: 1/21/2007		END: 1/22/2007		EQUIP: 1.0; Camp, S. Sankar	
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		
200 -157.9	R21-SN 10 ft 80%	NA	NA		Limestone Fragments 196.0-199.7' - yellowish gray, (5Y 7/2), fine grained, mild to moderate HCl reaction, vary from 2"-5" in length and discs 1/8" to 2-1/2" in diameter		
205 -162.9			NR		Disaggregated Limestone 199.7-203.0' - grayish orange, (10YR 7/4), mild to moderate HCl reaction, fragments with voids over 50-70% of surface		
206.0					Limestone Fragments 203.0-204.0' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, fragments are gravel-sized, up to 1/2" in diameter No Recovery 204.0-206.0'		
210 -167.9	R22-SN 10 ft 100%	NA	NA		Limestone Fragments 206.0-207.0' - yellowish gray, (5Y 7/2), very fine to fine grained, mild HCl reaction, poorly fossiliferous Disaggregated Limestone 207.0-216.0' - yellowish gray, (5Y 7/2), mild to strong HCl reaction, gravel-sized fragments up to 1" in diameter, subrounded to subangular		
215 -172.9							
216.0							



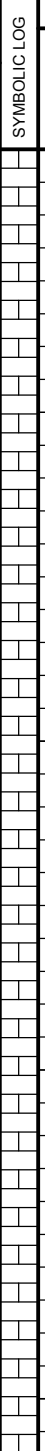
PROJECT NUMBER: 338884.FL	BORING NUMBER: I-03
SHEET 12 OF 14	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07 START : 3/21/2007 END : 3/23/2007 LOGGER : C. Sump, J. Burkard

WATER LEVEL: 20180501 02:15:07				START: 1/2/2007		END: 3/20/2007		EQUIP: G. Camp, S. Sanford	
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				
220 -177.9	R23-SN 10 ft 100%	NA	NA		Disaggregated Limestone 216.0-233.0' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, subangular to angular gravel-sized fragments up to 1" in diameter, limestone fragments up to 3" in diameter at 220.0-220.7', pale greenish yellow (10YR 8/2), fine grained, strong HCl reaction				
225 -182.9	226.0								
230 -187.9	R24-SN 10 ft 85%	NA	NA						
235 -192.9			NR		Limestone Fragments 233.0-234.5' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, fragments are gravel-sized No Recovery 234.5-236.0'				
236.0									



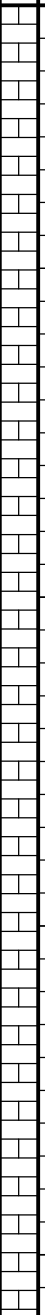
PROJECT NUMBER: 338884.FL	BORING NUMBER: I-03
SHEET 13 OF 14	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07 START : 3/21/2007 END : 3/23/2007 LOGGER : C. Sump, J. Burkard

WATER LEVEL: 230.0 ft on 1/2/2007		START: 1/2/2007		END: 1/20/2007		LOGGER: G. Camp, S. Sanford	
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		
240 -197.9	R25-SN 10 ft 100%	NA	NA		Limestone Fragments 236.0-246.0' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, fine-grained limestone fragments, subrounded to subangular gravel-sized fragments up to 1" in diameter		
245 -202.9	246.0				Disaggregated Limestone 246.0-254.6' - Same as 236.0-246.0'		
250 -207.9	R26-SN 10 ft 86%	NA	NA		Limestone Fragments 249.5-254.6' - fine grained, mild HCl reaction, non fossiliferous 250.8-254.6' - mild HCl reaction, highly fossiliferous limestone fragments with voids over 60-80% of surface		
255 -212.9			NR		No Recovery 254.6-256.0'		
256.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-03	SHEET 14 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723978.8 N, 457771.7 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 8" surface casing, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 3/21/07 START : 3/21/2007 END : 3/23/2007 LOGGER : C. Sump, J. Burkard

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			
260 -217.9	R27-SN 10 ft 100%	NA	NA	256.0-266.0' - NA		Limestone Fragments 256.0-266.0' - Same as 249.5-254.6'	
265 -222.9							
266.0							
						Bottom of Boring at 266.0 ft bgs on 3/23/2007	



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-04
SHEET 1 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)
 ELEVATION : 41.6 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 3/23/07 START : 3/23/2007 END : 3/24/2007 LOGGER : A. Teal, C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
		RECOVERY (ft)				
		#TYPE				
41.6	0.0			Poorly Graded Sand (SP) 0.0-4.0' - moderate yellowish brown, (10YR 5/4), trace fine gravel, fine to medium silica sand to 1/16", trace fines, trace organics, color varies to dark yellowish orange (10YR 6/6) between 1.0-2.0' , dusky yellow (5Y 6/4) between 2.0-4.0'		
5		6.0	R1-SN	Sandy Lean Clay (CL) 4.0-5.0' - pale olive, (10Y 6/2), moist, soft, low to medium plasticity, slow to rapid dilatancy, no HCl reaction, 30-35% very fine to fine silica sand Silt (ML) 5.0-6.0' - grayish yellow, (5Y 8/4), wet, stiff, nonplastic, rapid dilatancy, moderate HCl reaction, 10% very fine sand-sized sand, carbonate materials 6.0-7.9' - Same as 5.0-6.0'		R1: 3 minutes
36.6	6.0			Limestone 7.9-9.9' - dusky yellow, (5Y 6/4), medium grained, mild HCl reaction, very weak (R1), moderately cemented, 60% coverage of small voids Silt (ML) 9.9-16.0' - Same as 4.0-5.0' except small 1-2" thick sections of limestone		
10		10.0	R2-SN			
31.6				16.0-26.0' - Same as 5.0-6.0' except strong HCl reaction, limestone fragments up to 3" thick, many small fragments from gravel-size up to 3/8"		R2: 7 minutes
15		16.0				
26.6						
20						



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-04
SHEET 2 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)
 ELEVATION : 41.6 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 3/23/07 START : 3/23/2007 END : 3/24/2007 LOGGER : A. Teal, C. Sump

WATER LEVELS : 1.011045 ON 9/29/07			START : 9/29/2007		END : 9/29/2007		LOGGER : A. Earl, C. Sump	
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	
21.6		10.0	R3-SN					
25								
16.6	26.0							R3: 9 minutes
30								
11.6		10.0	R4-SN					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-04

SHEET 3 OF 14

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

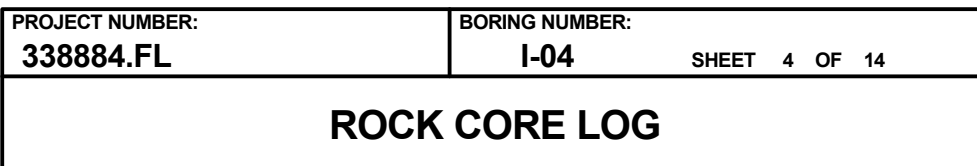
WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

WATER LEVELS : 1.0 RODS ON 9/29/07			START : 9/29/2007			END : 9/29/2007			LOGGER : A. Earl, C. Sump		
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				
1.6											
		10.0	R5-SN								
45											
-3.4		46.0			Sandy Lean Clay (CL) 44.7-46.0' - moderate olive brown, (5Y 4/4), moist, low to moderate plasticity, strong HCl reaction, 30-40% sand-sized sand, carbonate materials		R5: 8 minutes				
					Silt (ML) 46.0-47.6' - light olive gray, (5Y 5/2), nonplastic to low plasticity, moderate to strong HCl reaction, fine to medium sand-sized particles, carbonate materials						
					Limestone 47.6-55.5' - Same as 36.0-46.0' except many zones where rock fragments from fine to medium sand-sized up to cobble sized fragments, possibly from drilling						
50		9.5	R6-SN								
-8.4											



ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

APPENDIX 2BB-1047



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-04

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

WATER LEVEL: 10.00 ft on 5/26/07		START: 1:02:00		END: 1:02:00		EQUER: 1.00, 1.00, 0.00	
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		
80 -38.4	R9-SN 10 ft 93%	NA	NA		Limestone 76.0-86.0' - Same as 36.0-46.0' except at 76.0-77.0' dark gray solution features, very fine micro-sized grains, many cavities up to 1/4" 77.0-86.0' - several silt zones, possibly due to drilling	The limestone matrix (olive gray limestone) has strong HCl reaction, while dark gray features have mild HCl reaction 	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-04

SHEET 6 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

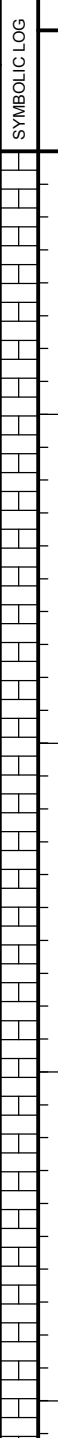
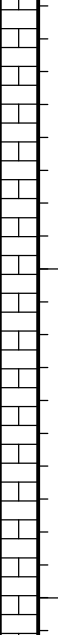
ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

WATER LEVELS : 101.0' BUS ON 3/23/07							START : 3/23/2007							END : 3/24/2007							LOGGER : A. Pearl, C. Sump						
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																							
100 -58.4	R11-SN 10 ft 50%	NA	NA	96.0-106.0' - NA			Limestone 96.0-106.0' - Same as 36.0-46.0'																				
105 -63.4			NR						No Recovery 101.0-106.0'																		
110 -68.4	R12-SN 10 ft 100%	NA	NA	106.0-116.0' - NA			Disaggregated Weak Limestone 106.0-116.0' - very pale orange, (10YR 8/2), strong HCl reaction, gravel-sized clasts of more indurated fine grained material, thin (<1/32") calcite fracture coating observed on one indurated fragment, fossil molds visible on few indurated fragments; 115.5-116.0' - weak (R2), roughly horizontal parting surfaces (2-3" apart), rough and undulating	R11: 27 minutes Logger changes to C. Sump at 106.0' until end of log Driller's Remark: maintaining drilling fluid circulation at 106.0-112.0' Weak limestone completely disaggregated by drilling method Run time: N/A, core at end of previous shift retrieved at start of this shift (3/24/07)																			
115 -73.4																											
116.0																											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-04

SHEET 7 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

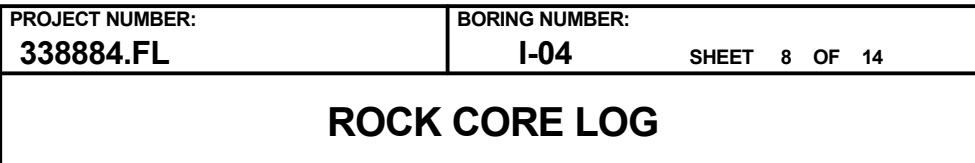
WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

WATER LEVEL: 10.000	
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ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

APPENDIX 2BB-1051



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-04

SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
160 -118.4	R17-SN 10 ft 87%	NA	156.0-166.0' - NA		Limestone 147.8-150.5' - pale yellowish brown, (10YR 6/2), strong HCl reaction, medium strong to strong (R3 to R4), dense, poorly fossiliferous with few small voids (1/32-1/8") on <5% of surface, light gray (N7) clayey silt interbed at 148.2' (2" thick) with thin coatings on partings below, slight recrystallization evident on fresh surfaces 150.5-151.5' - moderate yellowish brown, (10YR 5/4), mild to moderate HCl reaction, friable thinly bedded (<1/2") limestone fragments with sandy fines, trace silica sand grains (<5%) 151.5-153.5' - Same as 150.5-151.5' except moderate yellowish brown, sandy silt at bottom No Recovery 153.5-156.0' Disaggregated Limestone With Limestone Fragments 156.0-161.6' - with few subangular to subrounded limestone fragments at top of run grading with depth to Poorly Graded Gravel with Sand (GP), sand-sized and gravel-sized fragments are all carbonate derived and likely segregated during drilling 161.6-161.8' - moderate yellow brown, (10YR 5/4), strong HCl reaction Limestone 161.8-164.7' - moderate yellow brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), moderate to strong particularly at grain boundaries HCl reaction, argillaceous, horizontal partings, 1-6" spacing with light gray sandy silt interbeds/coating (light gray, N7) No Recovery 164.7-166.0' Limestone 166.0-168.5' - light olive gray, (5Y 5/2), moderate especially grain boundaries HCl reaction, poorly to moderately indurated argillaceous fine grained limestone, finely laminated, with very thin (1/16-1/8") very pale orange (10YR 8/2) laminations, 1/8"-3/8" spacing, more indurated zones exhibit well developed bedding plane partings, less indurated zones are soft and friable and exhibit contorted lamination surfaces, pale orange greater than olive gray	Driller's Remark: Sample fell out of core barrel during retrieval. Used 20' core barrel to recover this interval plus following run (166.0-176.0'). Sample is disturbed, upward fining sequence from 156.0-161.0' may be the result of losing the sample on first attempt. Up to 10% silica sand grains With up to 10% fine silica sand grains
165 -123.4						
170 -128.4	R18-SN 10 ft 89%	NA	166.0-176.0' - NA			166.0-176.0' interval not disturbed
175 -133.4						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-04

SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

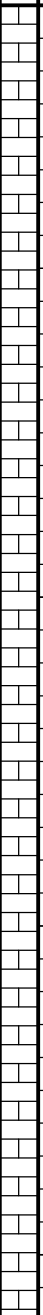
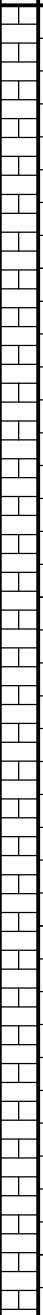
ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

WATER LEVEL: 15.0' (30.0' ON 0.0' 0.0')							START: 02/02/07							END: 02/12/07							LOGGERS: J. Ford, S. Camp						
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																							
180 -138.4	R19-SN 10 ft 84%	NA	NA	176.0-186.0' - NA			Limestone 168.5-171.0' - yellowish gray, (5Y 7/2), medium strong (R3), poorly fossiliferous with small voids (1/16-1/8") over <10% of surface, horizontal partings 1-4" spacing, light gray (N7) clayey silt with gravel-sized limestone fragments Limestone Fragments 171.0-174.9' - Same as 168.5-171.0' except with more fragmentation and disaggregation (down to silt and clay-sized particles) possibly due to drilling, full core-sized limestone fragment at end of run No Recovery 174.9-176.0' Limestone Fragments 176.0-178.6' - moderate yellow brown, (10YR 8/9), fine grained, argillaceous, with fine gravel-sized small fragments, fragments exhibit well defined bedding plane fractures (1/4" bedding) Disaggregated Limestone With Limestone Fragments 178.6-178.9' - moderate yellow brown, (10YR 8/9), medium to coarse grained, moderate HCl reaction Limestone 178.9-182.0' - grayish orange, (10YR 7/4), 20-30% small voids (1/16-1/8") in discreet zones, few larger solution cavities (possible fossil molds) 1"x1" Disaggregated Limestone With Limestone Fragments 182.0-183.5' - Same as 178.9-182.0 except moderate yellow brown, (10YR 8/9), 4" layer argillaceous, limestone fragments are gravel-sized Limestone 183.5-184.4' - Same as 178.9-182.0' except increasing fossil content with depth, large (up to 1.0") brachiopod and gastropod molds and casts No Recovery 184.4-186.0'				10% silica fine sand																
185 -143.4			NR				Up to 10% silica sand																				
186.0							R19: 33 minutes																				
190 -148.4	R20-SN 10 ft 93%	NA	NA	186.0-196.0' - NA																							
195 -153.4			NR								R20: 23 minutes																
196.0																											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-04

SHEET 11 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

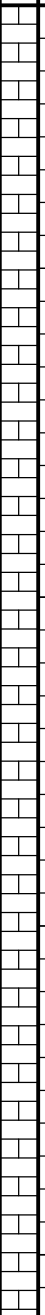
ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

WATER LEVEL: 10.00 ft on 5/25/07		DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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		
200 -158.4	R21-SN 10 ft 92%	NA	NA	196.0-206.0' - NA		R21: 22 minutes	
205 -163.4	206.0		NR	206.0-216.0' - NA			
210 -168.4	R22-SN 10 ft 100%	NA	NA				
215 -173.4							
	216.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-04

SHEET 12 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)

ELEVATION : 41.6 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 3/23/07

START : 3/23/2007

END : 3/24/2007

LOGGER : A. Teal, C. Sump

WATER LEVEL: 10.000 ON 02/03/07				START: 02/02/07		END: 02/02/07		LOGGERS: A. Ford, S. Camp	
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				
220 -178.4	R23-SN 10 ft 94%	NA	NA		Disaggregated Limestone With Limestone Fragments 216.0-226.0' - mild HCl reaction, grading to Silty Sand with Gravel (SP-SM) in places, similar to above (206.0-216.0') except greater silt and sand-sized particles and limestone fragments are smaller (<1") and weaker (very friable) 216.6-217.0' moderately indurated silt-sized, light gray (N7) bed, friable				
225 -183.4	226.0		NR		No Recovery 225.4-226.0'	R23: 24 minutes			
230 -188.4	R24-SN 10 ft 100%	NA	NA		Disaggregated Limestone With Limestone Fragments 226.0-236.0' - Same as 216.0-226.0' except no semi indurated silt bed, slight increase in overall fine to medium sand-sized material (carbonate derived), few zones with very thin (<3/4") gravel-sized angular fragments of limestone (or indurated calcareous silt-sized material)				
235 -193.4	236.0					R24: 36 minutes			



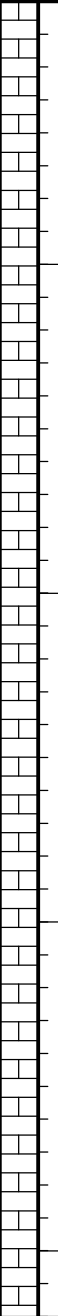
PROJECT NUMBER: 338884.FL	BORING NUMBER: I-04
SHEET 13 OF 14	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

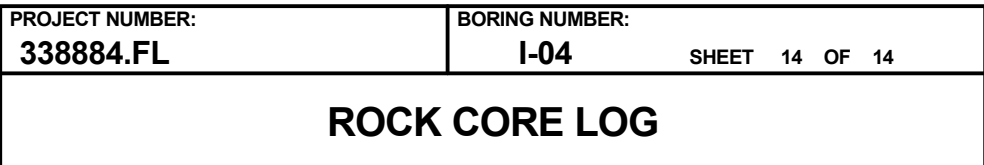
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723902.3 N, 457585.6 E (NAD83)

ELEVATION : 41.6 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

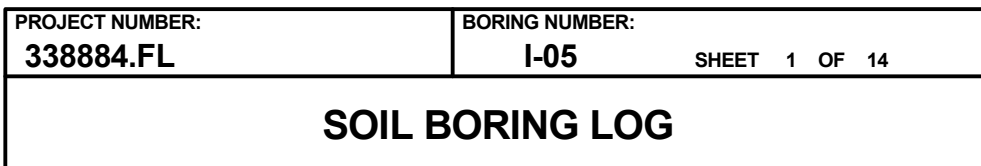
WATER LEVELS : 1.0 ft bgs on 3/23/07 START : 3/23/2007 END : 3/24/2007 LOGGER : A. Teal, C. Sump

WATER LEVELS : 1.0 ft bbs on 3/23/07			START : 3/23/2007		END : 3/24/2007		LOGGER : A. Year, C. Sump	
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				
240 -198.4	R25-SN 10 ft 100%	NA	NA	236.0-246.0' - NA		Disaggregated Limestone With Limestone Fragments 236.0-246.0' - Same as 226.0-236.0' except weakly consolidated silt-sized material with little gravel-sized limestone fragments from 236.0-237.5', otherwise very similar to above		
245 -203.4								
246.0							R25: 27 minutes	
250 -208.4	R26-SN 10 ft 100%	NA	NA	246.0-256.0' - NA		246.0-256.0' - mild to moderate HCl reaction, slightly more indurated silt-sized material forming larger clasts, finely laminated very weakly indurated 6" thick silt zones at 248.5, 249.2', 251.8' and 254.0' (repeating sequence), may be argillaceous		
255 -213.4							R26: 31 minutes	
256.0								



LOGGER : A. Teal, C. Sump

Rev. 4



LOGGER : M. Faurote, J. Burkard

Rev. 4




PROJECT NUMBER: 338884.FL	BORING NUMBER: I-05
SHEET 2 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

DRILLING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 2/9/2007 END : 2/12/2007 LOGGER : M. Faurete, J. Burkard

WATER LEVELS : 4.41 bgs on 3/6/07		START : 2/9/2007		END : 2/12/2007		LOGGERS : M. Gaudette, J. Burkard	
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		
22.2	10.0	R3-SN		Silty Sand With Limestone Fragments (SM) 20.0-21.3' - dusky yellow, (5Y 6/4), limestone fragments are friable, 1/4" to 2" in size, fossiliferous (casts/molds), some shell "hash", all carbonate material			
				Sandy Silt (ML) 21.3-24.8' - dusky yellow, (5Y 6/4), nonplastic to low plasticity, mild to moderate HCl reaction, carbonate material			
25 17.2	26.0			Silty Sand With Limestone Fragments (SM) 24.8-31.2' - grayish orange, (10YR 7/4), fine to coarse grained, moderate HCl reaction, with nonplastic to low plasticity fines and fine to coarse gravel-sized (1/4 to 1/2") limestone (fossiliferous [molds/casts], friable), all carbonate materials, iron oxide staining at 27.0'		Forams, gastropods, possible bryozoans	
30 12.2	10.0	R4-SN		Limestone 31.2-34.0' - greenish gray, (5GY 6/1), very fine to fine grained, mild HCl reaction, fragmented (up to 2" size), fragments separated by fat clay with sand (pale yellowish brown [10YR 6/2]), limestone fragments have abundant fossil casts, sparse organic fragments and cast linings, HCl reaction occurs mostly at void linings and healed fractures		Interfragmental filling of fat clay, clay and clayey silt, with or without additional smaller gravel-sized fragments; the fines have moderate reaction to HCl, limited plasticity	
				Silt With Sand (ML) 34.0-36.0' - pale yellowish brown, (10YR 6/2), nonplastic, moderate HCl reaction, with very fine grained sand-size particles, all carbonate materials			
35 7.2	36.0			Fat Clay With Sand (CH) 36.0-37.6' - grayish brown, (5YR 3/2), high plasticity, no HCl reaction, with very fine to fine grained silica sand, organic rich		Silica grains (very fine) to silt-sized in very thin pseudobeds may exhibit microstructures of deformation and bedding	
				Silty Sand To Sandy Silt (SM) 37.6-47.8' - pale yellowish brown, (10YR 6/2), trace fine gravel-sized fragments of fossiliferous limestone, with grayish brown (5YR 3/2) stringers of clay (medium plastic, trace sand-sized grains) at 46.7-47.5', all carbonate materials			
40							



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-05
SHEET 3 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 4.41 bgs on 3/6/07 START : 2/9/2007 END : 2/12/2007 LOGGER : M. Faurete, J. Burkard

WATER LEVELS : 4.41 bgs on 3/6/07			START : 2/9/2007			END : 2/12/2007			LOGGER : M. Laurite, J. Burkard		
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				
2.2											
		10.0	R5-SN								
45											
-2.8		46.0									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-05

SHEET 4 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

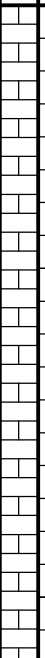

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/9/2007

END : 2/12/2007

LOGGER : M. Faurote, J. Burkard

WATER LEVEL - 41.433 SH 3/3/7		DISCONTINUITIES		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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			
56.0				56.0-66.0' - NA		Limestone Fragments 56.0-57.5' - pale yellowish brown, (10YR 6/2), fine to medium grained, moderate HCl reaction, fragments from 1/2" to 1" in length, fossil casts and tiny voids over 100% of the surface Disaggregated Limestone With Limestone Fragments 57.5-62.5' - dusky yellow, (5Y 6/4), moderate HCl reaction, sparse limestone fragments to 4"	Rock may have been fragmented due to the drilling process Limestone fragments 58.5-59.3', 61.7-62.0'
60 -17.8	R7-SN 10 ft 100%	NA	NA				NA = Not Applicable NR = No Recovery
65 -22.8							
66.0				66.0-76.0' - NA		66.0-70.0' - moderate olive brown, (5Y 4/4), fine grained, strong HCl reaction, medium strong to strong (R3 to R4), fragmented, with fragments from 4" to 6", fossiliferous with voids (<1/16") covering 85% of surface, intermittent sections of clay, silt, gravelly silt, and silty clay comprising 10% of core	
70 -27.8	R8-SN 10 ft 100%	NA	NA			Disaggregated Weak Limestone 70.0-71.0' - light brown, (5YR 6/4), moderate to strong HCl reaction, all carbonate derived 71.0-71.8' - light medium brown to grayish orange, (10YR 7/4) Limestone 71.8-76.5' - Same as 66.0-70.0' except light brown, (5YR 6/4), weak to medium strong (R2 to R3), fragments to 3" in length, 15% fine sand-sized particles, sparse organic material	SC-1 collected at 69.3-70.0' Possible organics in 1/4" or less stringers
75 -32.8							
76.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-05

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/9/2007

END : 2/12/2007

LOGGER : M. Faurote, J. Burkard

WATER LEVELS : 4.41 bgs on 3/6/07		START : 2/9/2007		END : 2/12/2007		LOGGER : M. Paulote, J. Barakat	
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		
80 -37.8	R9-SN 10 ft 90%	NA	NA		Disaggregated Limestone With Limestone Fragments 76.5-79.5' - light brown, (5YR 5/6), strong HCl reaction, gravel-sized (3/8" to 1") limestone fragments	Limestone fragments are very friable, easily broken with finger pressure, very fossiliferous and composed of sand and silt sized carbonate derived grains	
85 -42.8	86.0		NR		Limestone 79.5-85.0' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, medium strong to strong (R3 to R4), fragments up up 4" in length, infilling between fragments or partings, partings range from 1/2" to 2" wide, 60-70% porosity on fresh surface, delayed reaction to HCl		
					No Recovery 85.0-86.0'		
90 -47.8	R10-SN 10 ft 90%	NA	NA		Limestone 86.0-87.0' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, pulverized to sand-sized particles Limestone Fragments 87.0-88.0' - light brown, (5YR 5/6), fragments are in a sandy silt matrix, probably separated from material 86.0-87.0' Disaggregated Limestone With Limestone Fragments 88.0-89.8' - yellowish gray, (5Y 7/2), strong HCl reaction, carbonate derived, subrounded limestone fragments up to 1-1/2", with moderate HCl reaction Disaggregated Limestone 89.8-92.5' - yellowish gray, thinly bedded (<3/8") down to varve-like planes Limestone 92.5-93.4' - very pale orange, (10YR 8/2), micritic, sparse flecks of organic material	Limestone contains numerous voids (65-70%) of fossil casts and molds, thin (<1/8") organic stringers less than 1/2" long	
95 -52.8			NR				
	96.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-05

SHEET 6 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/9/2007

END : 2/12/2007

LOGGER : M. Faurote, J. Burkard

WATER LEVEL: 41.433 SH 3/3/37		DISCONTINUITIES		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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			
100 -57.8	R11-SN 10 ft 100%	NA	NA	96.0-106.0' - NA		Disaggregated Limestone With Limestone Fragments 93.4-95.0' - very pale orange fines, (10YR 5/2), strong HCl reaction, grayish orange pink (5YR 7/2) limestone fragments from 3/16" to >2", fragments are fossiliferous with casts and molds, <5% shell fragments, <10% organic material, fragments react moderately to HCl No Recovery 95.0-96.0' Disaggregated Limestone With Limestone Fragments 96.0-115.5' - very pale orange, (10YR 8/2), moderate to strong HCl reaction, grades from a tacky, pasty, carbonate derived silt/clay with 10-15% sand-sized particles becoming 35-45% gravel-sized fragments at 102.3', fragments are fossiliferous limestone (bi-valves, forams and bryozoans) with 50% void space, no organic material	
105 -62.8	106.0			106.0-116.0' - NA			
110 -67.8	R12-SN 10 ft 95%	NA	NA			Very friable light brown (5YR 6/4) limestone fragments of carbonate derived sand and silt at 110.5', fragments from 2"x2-1/2" to pea gravel size with numerous fossil casts and visible shell fragments, most of the rock is sand and silt-sized grains, void space is minimal at 25-30%, moderate HCl reaction	Loose carbonate grains are the same as the constituents of the limestone fragments, suggesting that the drilling method disaggregates the limestone
115 -72.8			NR			No Recovery 115.5-116.0'	
	116.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-05

SHEET 7 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/9/2007

END : 2/12/2007

LOGGER : M. Faurote, J. Burkard

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		
120 -77.8	R13-SN 10 ft 100%	NA	NA		Disaggregated Limestone With Limestone Fragments 116.0-118.3' - very fine grained, 6" of light brown sandy silt-sized particles with gravel-sized particles atop 0.8' of limestone fragments, pale yellowish brown (micritic) limestone clasts with 15% void space and poorly fossiliferous Disaggregated Limestone 118.3-123.1' - very pale orange to grayish orange, (10YR 8/2 to 10YR 7/4), strong HCl reaction, strong reaction to HCl in all carbonate derived particles, gravel-sized fragments at 120.5-121.0'	Delayed mild to moderate reaction to HCl on actual limestone, finer grained clast fillings react strongly to HCl This is carbonate silt-sized material	
125 -82.8	126.0				Disaggregated Limestone With Limestone Fragments 123.1-125.2' - very pale orange, (10YR 8/2), strong HCl reaction, limestone fragments up to 1" in size 125.2-126.0' - very pale orange, (10YR 8/2), 15% fragments (up to 3/4") of very fine grained limestone 126.0-128.1' - very pale orange, (10YR 8/2), moderate HCl reaction, sand and silt-sized carbonate grains, limestone fragments are composed of sand and silt-sized grains and 3-5% black spots (1/16") that appear organic Disaggregated Interbedded Weak Limestone 128.1-135.6' - grayish orange pink, (5YR 7/2), moderate to strong HCl reaction, friable to micritic thin (<1/2") limestone beds; beds are undulant and generally discontinuous across the width of the core	The sequence at 126.0-136.0' looks very similar to the immediately preceding fining upward materials The major part of these runs were sliced in half by the spatula and moved with a mortar trowel; the gravelly parts tend to be in more pieces	
130 -87.8	R14-SN 10 ft 100%	NA	NA				
135 -92.8	136.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-05

SHEET 8 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/9/2007

END : 2/12/2007

LOGGER : M. Faurote, J. Burkard

WATER LEVEL: 141.535 SN 93.97		DISCONTINUITIES		EQUIPMENT: 120/2007		EQUIPMENT: 120/2007		EQUIPMENT: 120/2007	
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				
140 -97.8	R15-SN 10 ft 90%	NA	NA		Limestone Fragments 135.6-137.5' - pale yellowish brown, (10YR 6/2), fine grained, mild HCl reaction, strong to very strong (R4 to R5), partings show thin re-crystallized coatings of carbonate and minor iron oxide Disaggregated Weak Limestone With Limestone Fragments 137.5-141.0' - light brown, (5YR 6/4), fine grained, mild HCl reaction, fragments are angular, with apparent carbonaceous material on fracture surfaces and 5-15% of "spots" in fine grained limestone Limestone Fragments 141.0-142.5' - grayish orange, (10YR 7/4), very fine grained, mild HCl reaction, fragments up to 4" long, many partings with not much infilling, some iron oxides noted, particularly at 142.0-142.5' Limestone 142.5-145.0' - angular, granulated fragments, fragments are very friable and composed of silt and sand-sized carbonate particles No Recovery 145.0-146.0'	Large fossil (possible gastropod) in pale yellowish brown (10YR 6/2) limestone This unit appears to be weak rock; limestone destroyed during sonic drilling			
145 -102.8	146.0		NR		Limestone 146.0-148.6' - the first 0.8' is angular to very angular washed limestone fragments up to 2-1/2", most fragments are porous (55% voids space) from fossil dissolution Disaggregated Weak Limestone 148.6-151.0' - yellowish gray, (5Y 7/2), strong HCl reaction, all size ranges are carbonate derived grains	Limestone fragments appear broken due to drilling methods			
150 -107.8	R16-SN 10 ft 100%	NA	NA		Limestone 151.0-151.3' - light brown, (5YR 6/4), fossiliferous (casts), fragments up to 1" in size Disaggregated Limestone With Limestone Fragments 151.3-156.5' - strong HCl reaction, limestone fragments (5-20%) are yellowish gray (5Y 8/1), very fine to fine grained, friable, "orange" spots may indicate iron oxide halos, no discernible bedding features, at 155.6-156.0' the limestone fragments are up to 1-1/2", angular, and friable				
155 -112.8									
	156.0								



PROJECT NUMBER:

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BORING NUMBER:

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SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel


ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/9/2007

END : 2/12/2007

LOGGER : M. Fauroute, J. Burkard

WATER LEVELS: 4-11 bgs on 3/6/07			START: 2/9/2007		END: 2/12/2007		LOGGER: M. Fauriol, J. Barakat	
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				
160 -117.8	R17-SN 10 ft 100%	NA	NA	156.0-166.0' - NA		Arenaceous Limestone 156.5-161.0' - pale brown, (5YR 5/2), very fine grained, medium strong (R3), fossiliferous, fragmented with the largest fragment being 0.4' long, 60% void spaces (casts of dissolved biota), sparse 1/16"-3/16" voids, thin to laminar bedding with beds as thin as 1/8", possible pyrite blebs	159.0-161.0' may have been broken apart by the drilling method	
165 -122.8						166.0	Limestone 161.0-162.3' - light brown, (5YR 6/4), very fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), fossiliferous (casts) Limestone To Arenaceous Limestone 162.3-163.8' - light brown, (5YR 6/4), mild HCl reaction, very thinly to thinly bedded, limestone contains silica grains Disaggregated Weak Limestone 163.8-165.2' - light olive gray, (5Y 5/2), carbonate derived silt-sized particles along bedding planes <1/8" to 3/8" thick, beds contain <10% silica sand Arenaceous Limestone 165.2-170.8' - light brown, (5YR 6/4), mild HCl reaction, medium strong (R3), 15-25% very fine silica grains widely distributed through the micro to very fine grained limestone, mild reaction to HCl, with a weak intergranular and void filling response, 40-45% porosity, arenaceous limestone grades into very fine grained limestone that is represented as 0.1' to 0.4' pieces to the end of this run (170.8') Disaggregated Weak Limestone 170.8-171.6' - moderate brown, (5YR 4/4), moderate HCl reaction, <2% muscovite and pyrite as slightly oxidized blebs, some small rock fragments Limestone 171.6-175.0' - pale brown, (5YR 5/2), very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), thinly interbedded, porosity is 35-45%, mostly fossil casts No Recovery 175.0-176.0'	This material is highly broken



PROJECT NUMBER:

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BORING NUMBER:

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SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel


ORIENTATION : Vertical

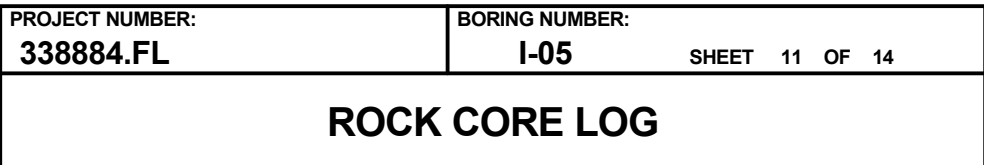
WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/9/2007

END : 2/12/2007

LOGGER : M. Faurote, J. Burkard

WATER LEVELS : 4.41 bgs on 3/6/07							START : 2/9/2007		END : 2/12/2007		LOGGER : M. Paulote, J. Barakat	
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								
180 -137.8	R19-SN 10 ft 90%	NA	NA	176.0-186.0' - NA		Limestone 176.0-183.2' - grayish orange to pale brown, (10YR 7/4 to 5YR 5/2), very fine grained, mild to moderate HCl reaction, arenaceous, thinly interbedded with carbonate intergranular filling, HCl reaction is mainly in void filling and fossil cast lining, poorly fossiliferous, overt porosity is <35%, limestone contact is irregular and gradational in a very thin zone (<1/16")	Partings or interbed surfaces exhibit organic or iron oxide (Gothite) patinas or stains					
185 -142.8	186.0		NR	186.0-196.0' - NA		Disaggregated Weak Limestone 183.2-185.0' - grayish orange, (10YR 7/4), very fine grained, strong HCl reaction, carbonate derived silt-sized and very fine sand-sized grains in irregular thin beds with organic material defining some of the planar features, silica <5% and sparse No Recovery 185.0-186.0' Disaggregated Limestone With Limestone Fragments 186.0-194.1' - grayish orange, (10YR 7/4), mild to moderate HCl reaction, up to 40% gravel-sized limestone fragments, broken and granulated, fragments range from <1/4" to 1-1/2"x2"x1", independent clasts exhibit bedding plane discontinuities and settling features, limestone moderately fossiliferous (casts)	179.0-179.6' - Appears as a breccia, gray clast in pale brown limestone matrix					
190 -147.8	R20-SN 10 ft 100%	NA	NA					181.0-182.1' - Thinly bedded limestone				
195 -152.8							182.1-183.2' - Thin broken beds, drilling related					
196.0							183.2-185.0' - Unit may have been broken by drilling method, particularly in "harder" beds					
							This appears to be partially to be a very weak agglomeration of silt, sand and rock (gravel-sized fragments) that may represent a collapse feature					



ORIENTATION : Vertical

LOGGER : M. Faurote, J. Burkard

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PROJECT NUMBER: 338884.FL	BORING NUMBER: I-05
SHEET 12 OF 14	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 2/9/2007 END : 2/12/2007 LOGGER : M. Fauroute, J. Burkard

WATER LEVEL: 141.535 SH 3/3/97		DATE: 12/3/2007		EQUER: M: Fardic, S: Barakat			
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		
220 -177.8	R23-SN 10 ft 95%	NA	NA		Disaggregated Fossiliferous Limestone 216.0-225.5' - grayish orange to grayish orange pink, (10YR 7/4 to 5YR 7/2), moderate to strong HCl reaction, friable and pliable, with carbonate derived sand and silt-sized grains that react to HCl, thin (<1" to 2") layers with a 10-15% clay content and higher plasticity, sparse rock fragments consisting of very fine grained, fossiliferous (casts) limestone that exhibits HCl reactions primarily in void filling or along partings	At 218.5' there are apparent carbonaceous organic materials, but they are degraded	
225 -182.8							
226.0			NR		No Recovery 225.5-226.0' Disaggregated Fossiliferous Limestone 226.0-236.0' - Same as 216.0-225.5'		
230 -187.8	R24-SN 10 ft 100%	NA	NA				
235 -192.8							
236.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-05

SHEET 13 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724148.8 N, 457804.5 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

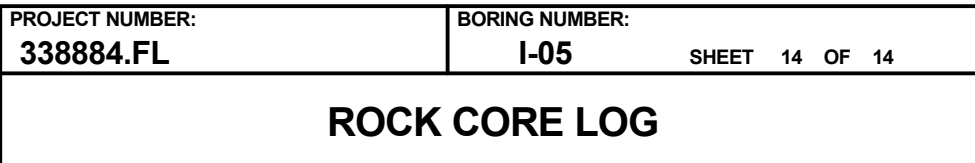
WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/9/2007

END : 2/12/2007

LOGGER : M. Faurote, J. Burkard

WATER LEVELS : 4-41 bgs on 3/6/07		START : 2/9/2007		END : 2/12/2007		LOGGERS : M. Fauriol, J. Barakat	
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		
240 -197.8	R25-SN 10 ft 100%	NA	NA		Disaggregated Fossiliferous Limestone 236.0-246.0' - Same as 216.0-236.0' except with occasional limestone fragments	At 236.5' - very fine grained, small (1/2"x3/8") limestone fragment is moderate orange pink (5YR 8/4), with very few fossil casts, strong HCl reaction	
245 -202.8	246.0				246.0-254.5' - very pale orange, (10YR 8/2), strong HCl reaction, fragments of very fine grained fossiliferous limestone at 247.5' exhibit very sharp angular edges, fragments are easily broken, a fragment at 254.3' shows a nearly horizontal contact between fossiliferous (casts) and very fine grained limestone, both exhibiting strong reactions to HCl, the rock character change is obvious	All of these samples were split with the spatula blade and one-half the core was placed in the core box; very few rock fragments impeded the cut	
250 -207.8	R26-SN 10 ft 85%	NA	NA				
255 -212.8			NR		No Recovery 254.5-256.0'		
	256.0						



LOGGER : M. Faurote, J. Burkard

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-06
SHEET 1 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 4.41 bgs on 3/6/07 START : 3/7/2007 END : 3/10/2007 LOGGER : C. Sump

WATER LEVELS: 4.41 bgs on 3/6/07		START: 3/7/2007		END: 3/10/2007		LOGGERS: C. Samp	
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		
42.3	0.0				Topsoil 0.0-0.3' - brownish black, (5YR 2/1), organic rich Poorly Graded Sand Grading To Poorly Graded Sand With Silt (SP-SM) 0.3-3.3' - brownish black grading to grayish orange, (5YR 2/1 grading to 10YR 7/4), fine grained, fines increase with depth to 10-15%, HCl reaction in fines, silica sands 3.3-4.5' - light gray, (N7 to N8), fine grained, 10-15% silt/clay increasing with depth, carbonate matrix, silica sand, 2-1/2" limestone fragment at 4.3-3.5' (very pale orange [10YR 8/2], fossiliferous [molds/casts], strong HCl reaction) No Recovery 4.5-6.0'		Reduced recovery typical of partial core lengths (6' in 10' core barrel) "Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" Water levels were not recorded for I-06 Coring run times were not recorded for I-06
5 37.3	6.0				Poorly Graded Sand (SP) 6.0-7.0' - light gray, (N7), brownish black (5YR 2/1) organic material (slough) Silty Sand With Limestone Fragments (SM) 7.0-8.5' - 3" yellowish gray (5Y 8/1), disc shaped, rounded clast at 7.4' Sandy Silt (ML) 8.5-15.0' - <10% fine gravel clasts (<1/2"), large concretionary limestone masses (possible stromatolites) at 10' that have botryoidal, non-concentric, globular appearance, and a strong reaction to HCl, medium strong (R3), portion at 14.5' has a tapered horn shape 15.0-16.0' - Same as 8.5-15.0' except grayish orange, (10YR 7/4), moderate to strong HCl reaction, weak (R2), thin bedding plane fractures (1/4-3/4"), friable, carbonate 16.0-26.0' - Same as 15.0-16.0' except nonplastic to low plasticity, very fine sand-sized particles decreasing with depth, trace fine gravel-sized limestone fragments, carbonate materials		At 10.0-14.0' possible stromatolites, large euhedral crystals (associated with globular concretionary masses), smoky clear with tetrahedral form well defined, twinning visible, no reaction to HCl
10 32.3	10.0	R2-SN					
15 27.3	16.0						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-06
SHEET 2 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)
 ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 4.41 bgs on 3/6/07 START : 3/7/2007 END : 3/10/2007 LOGGER : C. Sump

WATER LEVELS : 4.41 bgs on 9/6/07			START : 9/7/2007			END : 9/10/2007			LOGGER : C. Gump		
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				
22.3											
	10.0	R3-SN									
25											
17.3	26.0			26.0-30.3' - Same as 16.0-26.0' except no very fine sand, no fine gravel-sized limestone fragments							
30											
12.3				Begin Rock Coring at 30.0 ft bgs See the next sheet for the rock core log							
				</							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 3 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

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		
12.3	30.0						
	R4-SN 6 ft 100%	NA	NA		Limestone 30.3-36.0' - grayish orange and medium gray, (10YR 7/4 and N5), moderate to strong HCl reaction, medium strong (R3), thin to medium bedding, horizontal partings 3/4"-4", numerous small (1/32"-1/8") voids, few (<3/4") cavities, fossiliferous with significantly more molds than casts, thin horizontal zones (possibly beds) of fine grained limestone with no voids; 1/2"-4" thick (1"-3" average) silt/clay interbeds with gravel-sized limestone fragments, light gray (N6) grading to medium dark gray (N4) with depth, sharp contacts	NA = Not Applicable NR = No Recovery	
35 7.3							
	36.0				Sandy Silt With Limestone Fragments (ML) 36.0-46.0' - moderate yellowish brown, (10YR 5/4), nonplastic to low plasticity, moderate HCl reaction, fine gravel-sized fragments (<10%) <1/2" diameter, <10% very fine to fine sand-sized, dark brown organic material at 42.0'		
40 2.3	R5-SN 10 ft 100%	NA	NA				
45 -2.8							
	46.0				46.0-52.5' - Same as 36.0-46.0' except coarse grained sand-sized limestone fragments, dark brown organic mottling, 10% to >50% sand content, <10% fine gravel-sized limestone fragments		
50							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 4 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

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		
-7.8	R6-SN 10 ft 100%	NA	NA				
55 -12.8							
56.0							
					Limestone 52.5-52.8' - yellowish gray, (5Y 7/2), fossiliferous (significantly more molds than casts), numerous <1/32"-1/8" voids, very few small cavities 1/4"-1/2" diameter, full diameter core fragments; horizontal, smooth, planar partings; thin silty clay coating on fracture surface		
					Sandy Lean Clay With Limestone Fragments (CL) 52.8-56.0' - 15-25% subangular to subrounded gravel-sized (1/2"-1") limestone fragments 56.0-61.0' - Same as 52.8-56.0' except 10-20% gravel-sized moderate yellowish brown limestone fragments		
60 -17.8	R7-SN 10 ft 100%	NA	NA				
65 -22.8							
66.0							
					Interbedded Limestone And Clay 61.0-63.4' - light medium gray (clay), (N6), moderate to strong HCl reaction, few fossils or surface voids or cavities, dark brown/black laminated inclusions, thin partings every 1"-3" Disaggregated Limestone 63.4-66.0' - moderate yellowish brown, moderate to strong HCl reaction, mostly very fine sand-sized limestone fragments, with gravel-sized limestone fragments similar to 61.0-63.4'		
					Limestone 66.0-66.9' - Same as 61.0-63.4' except thin bedding and clayey silt interbeds Limestone Fragments 66.9-68.7' - fine gravel-sized (4"-6") particles, sandy silt, carbonate derived	Repeating sequences of mostly thinly bedded limestone with silty clay / clayey silt interbeds (1-2") with larger zones of sandy silt +/- clay with gravel sized limestone fragments (3-5") Driller's Remark: Difficulty advancing 6" casing	
70							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

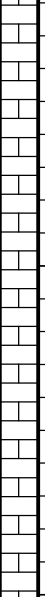
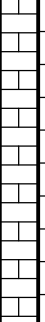
ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

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		
-27.8	R8-SN 10 ft 100%	NA	NA		Interbedded Limestone 68.7-73.5' - thin bedding, similar to 66.9-68.7' except increasing interbed thickness with depth (<1"-6"), limestone partings		
75 -32.8	76.0				Disaggregated Limestone 73.5-76.0' - moderate HCl reaction, 10-20% gravel-sized (1/2"-1") limestone fragments, carbonate derived material		
80 -37.8	R9-SN 10 ft 100%	NA	NA		76.0-83.0' - 20-50% gravel-sized limestone fragments, dark brown organic silt laminae, coarse sand	Driller's Remark: Extremely difficult advancing 6" casing, lost drilling fluid circulation	
85 -42.8	86.0				Limestone Fragments 83.0-86.0' - yellowish gray, coarse sand to coarse gravel-sized fragments (1/4" to >3")		
90					86.0-86.3' - yellowish gray to dusky yellow, (5Y7/2 to 5Y6/4), fragments 3" diameter 86.3-89.5' - moderate yellowish brown, moderate HCl reaction, 30-50% gravel-sized limestone fragments, friable, 30-40% small voids (1/32"-1/8"), with coarse sand-sized matrix, thin silty zones with thin (1/4"-1/2") dark brown to black organic layers	Driller's Remark: Difficult advancing 6" casing; no drilling mud circulation	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 6 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

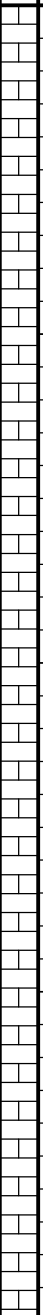
ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
		R Q D (%)	FRACTURES PER FOOT				DESCRIPTION
							DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS
-47.8	R10-SN 10 ft 100%	NA	NA		Limestone Fragments 89.5-96.0' - moderate yellowish brown, (10YR 5/4), fine grained, strong (R4), >3" diameter limestone fragments with 6"-10" spacing, clayey silt interbeds are mottled pale brown (5YR 5/2) to light olive gray (5Y 5/2), dark brown / black organic laminations/mottling sparse except at 92.0-92.5', gravel-size limestone fragments range from 1/2"-1" diameter and become yellowish gray to light olive gray with depth, few zones of material similar to 86.3-89.5', few fragments with 30-40% voids (1/16"-1/8")		
95 -52.8	96.0				96.0-106.0' - NA	96.0-98.0' - grayish orange pink with olive gray staining on fracture surfaces, (5YR 7/2 with 5Y 5/2), irregular zones of small voids (1/32"-1/8") with fossil molds and casts, fine sand-sized limestone particles 98.0-98.4' - Same as 96.0-98.0' except silty clay infilling on 1"-2" horizontal partings Disaggregated Limestone With Limestone Fragments 98.4-106.0' - moderate yellowish brown at 99.0', 90% gravel-sized (1/4"-3/4" diameter) limestone fragments, large (>3" to full core diameter) fragments on approximately 1.0' spacing with fine grained disaggregated interbeds in between, the percentage of larger fragments increases at end of run (>50%)	
100 -57.8	R11-SN 10 ft 100%	NA	NA		106.0	106.0-116.0' - NA	Driller's Remark: Difficulty establishing correct amount of tube when driving 6" casing (stuck at 5000); difficulty for previous 3 runs (86-116') may increase potential for drill induced breakage and/or segregation of disaggregated material in retrieved cores
105 -62.8							
110							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 7 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

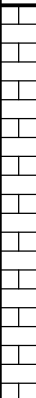


ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

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		
-67.8	R12-SN 10 ft 100%	NA	NA		Limestone Fragments With Disaggregated Limestone 106.0-116.0' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, fragments (3"-4") comprise >50% of core at top of run, decreasing with depth to 15-30% as core material becomes more disaggregated, matrix is disaggregated limestone and smaller (<1") limestone fragments, fragments exhibit small voids (25-30% of surface) and few (<5%) fine black horizontal (possibly organic) laminae (3/16"-3/8" long), interval at 114.0-114.5' is pale yellowish brown (10YR 6/6) fine grained limestone, strong (R4), with no small voids or fossils 116.0-122.0' - Same as 106.0-116.0' except limestone fragments (3"-4") are irregularly shaped, angular to subangular, gravel-sized limestone fragments (30-80%), in silt-sized to sand-sized disaggregated limestone material	Driller's Remark: Difficulty advancing 6" casing	
115 -72.8	116.0				116.0-126.0' - NA		
120 -77.8	R13-SN 10 ft 100%	NA	NA		Interbedded Limestone And Clayey Silt 122.0-123.5' - dusky yellowish brown limestone, medium strong (R3), very thin to thin bedding, few small voids (1/32"-1/8"), 5% dark yellowish gray horizontal banding, horizontal partings 2"-4" with clayey carbonaceous silt interbeds (1"-3"), contains limestone fragments <1" Limestone Fragments With Disaggregated Limestone 123.5-126.0' - Same as 116.0-122.0' except limestone fragments with sandy silt with gravel Limestone 126.0-127.0' - coarse sand-sized carbonate derived material grading to silty fine sand with 3"-4" limestone fragments 127.0-127.7' - yellowish gray, (5Y 7/2), medium strong to strong (R3 to R4), trace small voids (1/32"-1/8") <5%, single full core diameter piece		
125 -82.8	126.0				126.0-136.0' - NA		
130							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 8 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

WATER LEVELS : 4.41 bgs on 3/6/07			START : 3/7/2007		END : 3/10/2007		LOGGER : C. Simpson	
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
-87.8	R14-SN 10 ft 100%	NA	NA				Limestone 127.7-133.0' - limestone fragments 2"-4" diameter with varying amounts of fine grained disaggregated limestone, interval at 128.5-129.0' has 3 full size core fragments with fragments in between and exhibits fine (1/10"-1/2") bedding planes 133.0-134.9' - yellowish gray, (5Y 7/2), similar to 127.0-127.7', horizontal partings vary from 1"-7", light gray clayey silt infilling on partings	
135 -92.8	136.0			136.0-146.0' - NA			134.9-136.0' - limestone fragments with sandy silt to gravel-sized fragments, angular to subangular, similar to above except more silt to sand-sized particles 136.0-141.0' - medium gray intermixed with yellowish gray, (N6 with 5Y 7/2), moderate to strong HCl reaction, medium strong (R3), fragmented, fossiliferous (molds & casts), large burrows (1/2" wide, 3"-4" long), voids in irregular zones (up to 30% surface), cavities (1/2" diameter, circular), fragments 1"-4" diameter/length, lack of fines except in interval at 140.0-140.4' which is medium brown, fine grained disaggregated limestone (5-10% silica grains) with moderate HCl reaction 141.0-143.4' - with limestone fragments up to 3", intact core sections up to 0.3' in length	Driller's Remark: Advancing 6" casing becoming easier (better rock)
140 -97.8	R15-SN 10 ft 86%	NA	NA				Disaggregated Limestone 143.4-144.6' - mild to moderate HCl reaction, 10-20% silica grains	
145 -102.8			NR				No Recovery 144.6-146.0'	
	146.0			146.0-156.0' - NA			Limestone Fragments 146.0-147.6' - very coarse grained, with >50% of fragments 1/4" or larger, grading to coarse sand-sized with 2"-3" limestone fragments, all carbonate derived 147.6-147.9' - yellowish brown, 1-1/2"-2" thick, no interbed 147.9-151.0' - similar to 147.6-147.9', bedding plane parting evident 1/2"-3/4" thick	
150								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

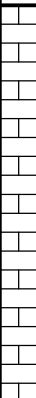

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS
		R Q D (%)	FRACTURES PER FOOT			
					DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS
-107.8	R16-SN 10 ft 100%	NA	NA		Limestone 151.0-151.8' - medium strong to strong (R3 to R4), fossiliferous (molds & casts), voids (1/32"-1/8") < 5% Limestone Fragments 151.8-153.9' - Same as 151.0-151.8' except 1" thick Disaggregated Limestone 153.9-155.0' - with gravel-sized limestone fragments, some dark brown mottling, possible organics Limestone 155.0-155.4' - Same as 151.0-151.8' Disaggregated Limestone 155.4-156.0' - Same as 153.9-155.0' Limestone Fragments 156.0-166.0' - moderate yellowish brown to medium light gray, (10YR 5/4 to N6), strong (R4), with thin yellowish gray/dark brown sandy silt layer (1-1/2"-2" thick) at 158.0' and 159.0', few full core diameter limestone fragments 2"-3" thick at 161.0-163.0' with smaller fragments in between, disaggregated limestone increasing with depth at 164.5-166.0', fragments are medium strong to strong (R3 to R4), with trace small voids (1/32"-1/8") and cavities (<3/4" diameter) at 161.4-162.6' and 165.5-166.0', fragments are generally thin, partial disc shaped fragments that appear to be breaking on bedding plane surfaces, full core diameter limestone fragments at 158.6-159.0'	
155 -112.8	156.0				156.0-166.0' - NA	
160 -117.8	R17-SN 10 ft 100%	NA	NA		Disaggregated Limestone 166.0-166.9' - with gravel-sized limestone fragments Limestone Fragments 166.9-167.7' - yellowish gray to light olive gray, medium strong to strong (R3 to R4), 1"-3" partings, clayey silt-sized infilling Limestone Fragments With Disaggregated Limestone 167.7-169.3' - fragments 1"-1-1/2" diameter, angular to subangular	Driller's Remark: Segregated by drilling
165 -122.8	166.0				166.0-176.0' - NA	
170						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel



ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

WATER LEVELS : 4.41 fgs on 3/6/07							START : 3/7/2007		END : 3/10/2007		LOGGER : C. Sump	
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								
-127.8	R18-SN 10 ft 100%	NA	NA				Limestone Fragments 169.3-171.6' - limestone with clayey silt light gray (N4) interbeds, limestone 1"-3" thick with interbeds 1"-2" thick 171.6-176.0' - limestone fragments (2"-4") with variable amounts of disaggregated limestone, full core diameter, limestone fragments from 173.1-173.3' and 175.4-176.0' are 2-1/2"-3" thickness					
175 -132.8	176.0			176.0-186.0' - NA			176.0-176.2' - dense, hard, well rounded cobble-sized limestone fragments, spherical to lenticular, 1"-2" diameter, very fine crystal faces suggest recrystallization, strong HCl reaction when scratched 176.2-183.4' - limestone fragments are fine grained and angular to subangular, increasing disaggregation with depth					
180 -137.8	R19-SN 10 ft 100%	NA	NA									
185 -142.8	186.0			186.0-196.0' - NA			Disaggregated Limestone With Limestone Fragments 183.4-184.3' - gray clayey silt-sized limestone fragments with gravel-sized limestone fragments (3/4"-1-1/2") 184.3-185.3' - 2"-3" partings/fractures with clayey silt-sized limestone interbeds Disaggregated Limestone 185.3-186.0' - with gravel-sized limestone fragments 186.0-187.0' - disaggregated limestone Limestone With Limestone Fragments 187.0-188.9' - medium strong (R3), fragments are 2"-4" size, fossiliferous (molds and casts), cavities (1/2")		Driller's Remark: Segregation due to drilling			
190												



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 11 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

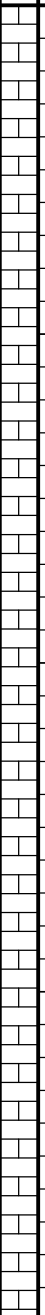
ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

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		
-147.8	R20-SN 10 ft 100%	NA	NA		Limestone 188.9-189.7' - strong (R4), trace fossils/voids Limestone Fragments 189.7-192.0' - coarse sand-sized grading downward to gravel-sized limestone fragments (2"-4") 192.0-192.2' - medium strong to strong (R3 to R4), moderate yellowish brown limestone breccia 192.2-196.0' - limestone fragments with coarse sand/fine gravel-sized disaggregated limestone, full core diameter limestone fragments at 192.0' and 196.0'		
195 -152.8	196.0				Limestone With Limestone Fragments 196.0-206.0' - moderate yellowish brown to grayish yellow, medium strong to strong (R3 to R4), limestone and fragmented limestone, fossiliferous with molds & casts to 10%, voids (1/32"-1/8") variable with depth and occurring in discreet zones (up to 40% of surface area), cavities roughly circular with diameters to 1", fine grained strong (R4) rock at 201.0-201.4'		
200 -157.8	R21-SN 10 ft 100%	NA	NA				
205 -162.8	206.0				Limestone Fragments 206.0-207.5' - light olive gray, (5Y 5/2), fossiliferous, fragmented (2 full core diameter fragments), fossil molds and small cavities (<3/4") aligned horizontally along bedding planes, fragments are disc shaped 1/2"-3/4" thick with clayey silt on parting surfaces (thin beds)		
210							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-06

SHEET 12 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel



ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/7/2007

END : 3/10/2007

LOGGER : C. Sump

WATER LEVELS : 4.41 bgs on 3/6/07			START : 3/7/2007		END : 3/10/2007		LOGGER : C. Sump	
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				
-167.8	R22-SN 10 ft 85%	NA	NA	216.0-226.0' - NA		Limestone Fragments 207.5-214.5' - silty to sandy gravel-sized limestone fragments, fragments vary from to 50 to >90% of core and range in size from 1/2" to >3" diameter, medium brown silt layer at 213.5' (organics)		
215 -172.8			NR			No Recovery 214.5-216.0'		
216.0								
220 -177.8	R23-SN 10 ft 90%	NA	NA	226.0-236.0' - NA		Limestone 216.0-225.0' - similar to 207.5-216.0', repeating sequence of (2"-4") angular limestone fragments and few full core diameter disc shaped fragments with sandy to silt with gravel-sized limestone fragment layers (1.0-2.0' thick) Limestone Fragments 217.2-217.6' - light olive gray, highly fossiliferous limestone fragments, large molds and casts (>1/2") (brachiopods), dark gray/black pyritic surface staining on parting surfaces and often restricted to fossil molds 217.6-219.3' - highly fragmented limestone, few fossils/voids Limestone Breccia 219.3-219.6' - light yellowish gray, medium strong (R3), with olive gray angular clasts, pyrite on fracture surfaces Disaggregated Limestone 220.0-222.4' - with gravel-sized limestone fragments (<1") Limestone 222.4-222.8' - 1" thick limestone beds Disaggregated Limestone 222.8-225.0' - with gravel-sized limestone fragments (1/4" to >1" diameter), large (>3") fragments, olive gray highly fossiliferous limestone at end of run (225.0') No Recovery 225.0-226.0' Limestone 226.0-227.0' - solution cavities (1/4"-1/2" diameter up to 1" length/depth) and/or burrows, very fossiliferous, with molds (brachiopods) exhibiting horizontal alignment (bedding plane orientation)		
225 -182.8			NR					
226.0								
230								



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-06
SHEET 13 OF 14	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 3/7/2007 END : 3/10/2007 LOGGER : C. Sump

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		
-187.8	R24-SN 10 ft 100%	NA	NA		Limestone 227.0-228.0' - fine grained, few fossils or cavities exhibiting pronounced bedding plane parting (1/4" -1/2" thick), highly fragmented 228.0-236.0' - disaggregated, coarse sand and fine gravel-sized (<1/2"), limestone fragments (1"-3") silt and fine sand-size percentage varies but is <15%, except medium brown sandy silt with <10% small (<1/4") limestone fragments at 232.0-232.5'		
235 -192.8							
	236.0				236.0-246.0' - NA		
					236.0-246.0' - Same as 228.0-236.0' except medium brown with gravel-sized fragments (<15%)		
240 -197.8	R25-SN 10 ft 100%	NA	NA				
245 -202.8					244.2-245.4' - few larger (>1") limestone fragments, moderate HCl reaction		
	246.0				246.0-256.0' - NA	Driller's Remark: 6" casing advanced very easily	
250							



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-06
SHEET 14 OF 14	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723163.0 N, 457960.6 E (NAD83)

ELEVATION : 42.3 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 3/7/2007 END : 3/10/2007 LOGGER : C. Sump

WATER LEVELS : 4.41 bgs on 3/6/07		START : 3/7/2007		END : 3/10/2007		LOGGER : C. Sump	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY		COMMENTS
		R Q D (%)	FRACTURES PER FOOT		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS		
					DESCRIPTION		SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.



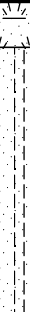
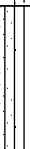

PROJECT NUMBER: 338884.FL	BORING NUMBER: I-07
SHEET 1 OF 16	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 2/27/2007 END : 3/7/2007 LOGGER : C. Sump, J. Burkard

WATER LEVELS : 4.41 bgs on 3/6/07		START : 3/17/2007		END : 3/17/2007		LOGGERS : C. J. Gump, J. Burkard	
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		
42.4	0.0				Topsoil 0.0-0.7' - dark brownish black, (5YR 2/1), fine silica sand, organic matter Poorly Graded Sand Grading To Poorly Graded Sand With Silt (SP/SP-SM) 0.7-4.8' - brownish black grading to light gray mottled with dark yellowish orange, (5YR 2/1 to N7 with 10YR 6/6), no HCl reaction, fine silica sand, fines increase to 10% with depth, organics decrease with depth		Note: Retrieved core appears compressed (larger diameter >6"); actual recovery is likely closer to 100% "Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)" Water levels not recorded during drilling
5 37.4		5.0	R1-SN		Silty Sand / Sandy Silt (SM/ML) 4.8-5.0' - yellowish gray, (5Y 7/2), strong HCl reaction, very fine to fine sand, nonplastic fines, carbonate materials No Recovery 5.0-7.0'		Coring run times not recorded for I-07
7.0							
10 32.4					Poorly Graded Sand (SP) 7.0-8.3' - no HCl reaction, fine silica sand, may be slough material Silt With Sand (ML) 8.3-17.0' - grayish orange, (10YR 7/4), nonplastic to low plasticity, strong HCl reaction, <5% coarse sand to fine gravel (1/8"-1/4"), carbonate materials, at 8.0-9.0' are two 4"-5" diameter spherical, hard limestone fragments, with concentric layering/banding, light gray/light olive brown, possible re-crystallization indicated by fine "sparkling" reflective grains		Retrieved core greater than 10.0 ft; 1.3 ft silica sand may be slough from run R1-SN Two stromatolite-like semi-spherical structures with concentric layering, nodule at base, fine tube-like branching structures on surface (1/16" wide >1.0" in length), fine dimple pattern on surface
15 27.4		10.0	R2-SN				
		17.0					
					17.0-27.0' - Same as 8.3-17.0' except grades to silty sand with gravel-sized limestone fragments at 19.0-22.0', grades back to silt with sand from 22.0-27.0', fragments are very friable and fossiliferous, with small (1/16") surface voids over 30-40% of surface, strong HCl reaction for both the silt and the limestone fragments, all material carbonate		
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-07
SHEET 2 OF 16	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 4.41 bgs on 3/6/07 START : 2/27/2007 END : 3/7/2007 LOGGER : C. Sump, J. Burkard

WATER LEVELS : 4.41 bgs on 3/6/07							STARTY : 2/27/2007		END : 3/7/2007		LOGGERS : G. Gump, J. Burkard	
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				
22.4												
		10.0	R3-SN									
25												
17.4												
		27.0										
					Silty Sand With Limestone Fragments (SM) 27.0-29.5' - grayish orange, (10YR 7/4), fine grained, with gravel-sized (1/4"-3/4") limestone fragments (similar to fragments described for 19.0-22.0' above), gravel fragments are <15% of sample, clayey zone at 29.0' with dark brown silt layer (possible organics), all carbonate materials			Core "hot" immediately following drilling, likely drying thin layers				
30					Limestone 29.5-36.6' - pale yellowish brown, (10YR 6/2), core is fragmented, with one piece 8" in length, fossiliferous (casts/molds), small (1/16"-1/8") surface voids over 10-15% of surface, horizontal partings roughly 1"-2-1/2" apart, yellowish gray (5YR 7/2) clayey silt interbeds between partings, interbeds average <1" and are compacted, between 34.0-35.0' and 36.0-36.7' there are some 12" thick clay/silt interbeds with 10% coarse sand and fine gravel-sized particles							
12.4		9.6	R4-SN									
35												
7.4												
							</					



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-07

SHEET 3 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

WATER LEVEL: 4.1' @ 5/11/2007		START: 2/7/2007		END: 5/1/2007		LOGGER: C. Camp, S. Barkard	
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		
37.0	R5-SN 10 ft 100%	NA	NA	37.0-47.0' - NA	Silt And Limestone Fragments (ML) 37.0-47.0' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, with limestone in 1.0' thick interbeds at 4.0' intervals, limestone fragments (1"-3") subangular to slightly subrounded, contains numerous small voids (1/16"-1/8") and are friable (easily broken by hand), all carbonate materials	Start of rock coring	
40 -2.4						Coring run times not recorded for I-07	
45 -2.6						NA = Not Applicable NR = No Recovery	
47.0	R6-SN 10 ft 92%	NA	NA	47.0-57.0' - NA	Disaggregated Weak Limestone 47.0-54.5' - moderate yellow brown, (10YR 5/4), trace (<5%) limestone fragments (1/2"-3/4" in diameter), similar to above except zones containing thin dark brown/black lamination (possible organics)		
50 -7.6							
55 -12.6							
57.0			NR		Limestone 54.5-55.3' - moderate yellowish brown, with light yellowish gray silty clay interbeds, horizontal partings 1/2"-1" with clayey interbeds 1/4"-1/2" thick	Limestone not full core diameter, possible drill induced breakage	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-07

SHEET 4 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

WATER LEVEL: 44.453 SH 30.37		DATE: 1/27/2007		LOGGERS: G. Camp, S. Sanford			
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		
60 -17.6	R7-SN 10 ft 95%	NA	NA		Disaggregated Weak Limestone 55.3-56.2' - Same as 47.0-54.5' No Recovery 56.2-57.0' Disaggregated Limestone 57.0-63.0' - very fine grained, <5% limestone fragments (1/4"-3/4" in diameter), few large limestone fragments at 57.4' and 60.0' may represent thin harder limestone interbeds		
65 -22.6							
67.0			NR		Limestone Fragments 63.0-63.5' - fragments are 1"-1-1/2" thick with silty (carbonate derived) material on surfaces, friable, fossiliferous (casts/molds), numerous small (1/16"-3/16") voids covering 50-60% of surface Disaggregated Limestone 63.5-66.5' - pale yellowish brown, changing with depth to limestone fragments 1/4"-2" in diameter, dark brown/black thin organic rich lamination No Recovery 66.5-67.0' Limestone Fragments 67.0-76.6' - interbedded sequences, 4.0-5.0' of limestone fragments (2"-4" size) and disaggregated limestone with <5% small (<1/2") limestone fragments, thinly bedded (1/2"-3/4"), limestone with fine silt material and bedding plane parting 69.0-69.5', very friable, (mild to no HCl reaction on faces, mild reaction on partings), 1/2" thick, dark black laminated organic layer at 74.5' at top of upward fining sequence (silt zone)		
70 -27.6	R8-SN 10 ft 96%	NA	NA				
75 -32.6							
77.0			NR		No Recovery 76.6-77.0'		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-07

SHEET 5 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

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		
80 -37.6	R9-SN 10 ft 100%	NA	NA		Limestone Fragments 77.0-83.3' - Same as 67.0-76.6' except gravel-sized limestone fragments with depth (locally up to 4")	Lost circulation between 77.0-87.0'	
85 -42.6					83.3-85.6' - 4"-5" limestone fragments, light gray clayey silt with 15% small (1/4"-3/4") limestone fragments		
87.0					Limestone 85.6-87.0' - yellowish gray, (5Y7/2), dense, fine grained, fossiliferous (casts/molds), small voids (1/16"-1/8"), 10-15% small cavities (1/2"), 8"-9" core fragment, light gray clayey interbed Disaggregated Limestone 87.0-92.5' - carbonate derived very fine sand, dark brown/black organic layers (1"-2" thick), limestone fragments, subangular with few subrounded, 75% of limestone fragments are <1" in diameter with large (2"-4") fragments from 91.5-92.5'		
90 -47.6	R10-SN 10 ft 100%	NA	NA		Limestone 92.5-97.0' - moderate yellowish brown, (10YR5/4), fine grained, moderately strong to strong (to R4), fossiliferous limestone, with variable percentages small surface voids (1/16"-1/8"), small circular solution cavities (<1/2"), clayey silt and limestone interbeds 94.0-94.5' and 94.6-95.0'		
95 -52.6							
97.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-07

SHEET 6 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

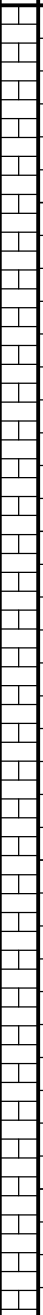
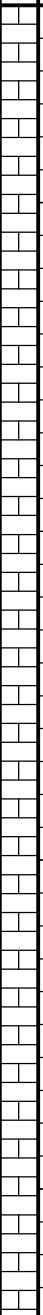
ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

WATER LEVEL: 4.1' (9.1' SN 0.0')		START: 12/2007		END: 01/2008		LOGGER: C. Camp, S. Barkard	
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		
100 -57.6	R11-SN 10 ft 96%	NA	NA		Limestone 97.0-98.8' - grayish orange, (10YR 7/4), fine grained, trace surface voids or cavities, fine bedding lamination visible in discrete zones, irregularly shaped fragments 98.8-104.1' - moderate yellowish brown, (10YR 5/4), variable density of small (1/16"-1/8") surface voids with few small (<3/4") cavities	SC-1 collected at 99.2-100.0'	
105 -62.6					Limestone Fragments 104.1-106.6' - large (2"-4") and fine gravel-sized limestone fragments (1/4"-3/4" in diameter), silty and sandy matrix (disaggregated limestone), very weak (R1) at 105.0-106.0'		
107.0			NR		No Recovery 106.6-107.0' Disaggregated Limestone 107.0-108.0' - with limestone fragments 1/4"-3/4" in diameter Limestone 108.0-110.9' - pale yellowish gray, (5Y 7/2), fossiliferous (molds & casts) (5%), small voids (1/16"-1/8") 30-40%, roughly circular cavities 1/2"-3/4" in diameter	"Sandy" material at top of run may be the result of segregation during drilling	
110 -67.6	R12-SN 10 ft 100%	NA	NA		Limestone Fragments 110.9-113.1' - Same as 108.0-110.9' except larger fragments (3"-4"), with irregular subangular shape	Possible drill induced breakage	
115 -72.6					Limestone 113.1-113.9' - Same as 108.0-110.9' except less fragmented Limestone Fragments 113.9-114.4' - very friable Limestone 114.4-117.0' - Same as 113.9-114.4' except less fragmented	SC-2 collected at 113.1-113.9'	
117.0						SC-3 collected at 115.8-116.6'	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-07

SHEET 7 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

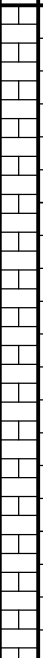

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

WATER LEVEL: 4.1' GCSN 6/6/07		START: 12/7/00		END: 1/1/00		LOGGER: G. Camp, G. Barkard	
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		
120 -77.6	R13-SN 10 ft 100%	NA	NA		Disaggregated Limestone With Limestone Fragments 117.0-121.2' - moderate yellowish brown, (10YR 5/4), moderate to strong HCl reaction, gravel-sized fragments are friable limestone, fragments range from 1/4"-1-1/4" with few large 2"-4" fragments	Possible drill induced breakage	
125 -82.6					Limestone 121.2-122.0'		
127.0					Limestone Fragments 122.0-125.4' - moderate yellowish brown, (10YR 5/4), fragments of fine grained limestone in a light gray clayey silt matrix		
130 -87.6	R14-SN 10 ft 100%	NA	NA		Limestone 125.4-127.0' - Same as 108.0-110.9' except moderate yellowish brown, fragmented at 126.5-127.0'		
135 -92.6					Disaggregated Limestone With Limestone Fragments 127.0-128.0' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, carbonate derived		
137.0					Limestone 128.0-137.0' - pale yellowish brown, (10YR 6/2), fine to medium grained, strong HCl reaction, limestone beds and fragments, fossiliferous, voids (<1/16") over 75% of surface at 128.0-128.9', 10% voids 128.9-133.0', trace voids on surface 134.0-137.0', interbedded with clay at 133.0-134.0'		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-07

SHEET 9 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

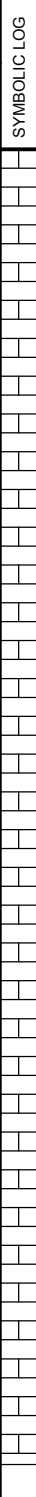
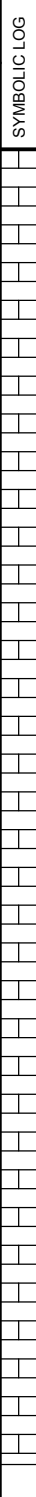
ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

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		
160 -117.6		R17-SN 10 ft 90%	NA	NA		Disaggregated Limestone With Limestone Fragments 157.0-157.8' - pale yellowish brown, (10YR 6/2), sand-sized disaggregated limestone material, with gravel-sized limestone fragments Limestone 157.8-158.3' - yellowish gray, (6Y 7/2), fine to medium grained, strong HCl reaction 158.3-160.9' - light olive gray, (5YR 5/2), fine to medium grained, strong HCl reaction, delayed HCl reaction, fragmented 160.9-164.6' - light olive gray, (5Y 5/2), fine to medium grained, strong HCl reaction, partially broken into disc-shaped fragments, numerous small solution cavities		
165 -122.6						164.6-166.0' - Same as 160.9-164.6' except more fragmented, with silt at bottom of section		
	167.0		NR			No Recovery 166.0-167.0'		
170 -127.6		R18-SN 10 ft 85%	NA	NA		Disaggregated Limestone With Limestone Fragments 167.0-167.3' - pale yellowish brown, (10YR 6/2), fragments are gravel-sized Limestone 167.3-175.5' - yellowish gray, (5Y 7/2), medium grained, partially broken into disc-shaped fragments, voids (<1/16") over 10-25% of surface, with some small solution cavities (<5), HCL reaction is delayed	Possible drill induced breakage 167.3-171.0'	
175 -132.6							Possible drill induced breakage 172.0-173.0'	
	177.0		NR			No Recovery 175.5-177.0'		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-07

SHEET 10 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel




ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

WATER LEVELS : 4.41 bgs on 3/6/07		START : 2/27/2007		END : 3/7/2007		LOGGER : C. Sump, J. Burkard	
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		
180 -137.6	R19-SN 10 ft 100%	NA	NA		Limestone Fragments 177.0-180.0' - light olive gray, (5Y 5/2), fine to medium grained, moderate to strong HCl reaction, fragmented, voids (1/16") over 75% of surface, fossiliferous		
185 -142.6					Limestone Fragments With Disaggregated Limestone 180.0-185.3' - moderate yellowish brown, (10YR 5/4), large (up to 1" thick) limestone fragments, with silt and sand-sized disaggregated limestone, at 181.3-181.6' the limestone fragments are light olive gray (5YR 5/2), very fine grained, with moderate HCl reaction		
187.0	R20-SN 10 ft 94%	NA	NA		Limestone 185.3-187.0' - light olive gray, (5Y 5/2), fine to medium grained, moderate to strong HCl reaction, fragmented, voids (1/16") over 10-40% of surface, fossiliferous		
190 -147.6					Limestone Fragments 187.0-196.4' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine to medium grained, mild to moderate HCl reaction, fragmented (1/4"-1"), with disc-shaped fragments up to 3" thick, poorly fossiliferous, voids vary from 0-30% coverage		
195 -152.6	197.0	NR			No Recovery 196.4-197.0'		



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-07

SHEET 11 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

WATER LEVELS : 4-11 DGS ON 3/6/07				START : 2/27/2007		END : 3/7/2007		LOGGER : C. Sump, J. Burkard	
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				
200 -157.6	R21-SN 10 ft 100%	NA	NA		Disaggregated Limestone 197.0-198.2' - coarse grained, carbonate derived, few (<10%) gravel-sized limestone fragments Limestone 198.2-203.0' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/1), abundant voids, thin (1/16" thick) light olive gray (5Y 5/2) convoluted bedding lamination with variable spacing (1/16"-1/2"), horizontal parting surfaces, also thin zones of limestone fragments with little or no surface voids or fossils visible	Possible drill induced segregation of core materials Run drilled 2/28/07 Infill material may have been lost during drilling 198.2-200.0' (parting/ fracture surfaces do not match)			
205 -162.6					Limestone Fragments 203.0-207.0' - yellowish gray, with light olive gray to medium gray inclusions, (5Y 7/2 with 5Y 5/2 to N5), medium to coarse grained, moderate to strong HCl reaction, fragmented, void rich, fossiliferous, inclusions (1/2"-4") that are very hard/dense with mild HCl reaction even when pulverized (may be breccia fragments)	Possible drill induced breakage			
207.0					207.0-208.0' - yellowish gray, (5Y 7/2), fine grained, fragmented into 1"-4" diameter angular to subangular fragments 208.0-215.4' - moderate yellowish brown to light olive gray, (10YR 5/4 to 5Y 5/2), fine grained, medium strong (R3), fragmented (3/4"-2" diameter) with few pieces of full diameter core, highly fossiliferous (molds/casts), abundant voids, zone of less competent rock at 213.5', fine grained fossil-poor zone at 211.5'	Possible drill induced breakage			
210 -167.6	R22-SN 10 ft 84%	NA	NA						
215 -172.6			NR		No Recovery 215.4-217.0'				
217.0									



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-07	SHEET 12 OF 16
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 2/27/2007 END : 3/7/2007 LOGGER : C. Sump, J. Burkard

WATER LEVEL: 4.4 ft bgs ST-307		DISCONTINUITIES		SYMBOLIC LOG		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS					
220 -177.6	R23-SN 10 ft 100%	NA	NA	217.0-227.0' - NA			Limestone Fragments 217.0-219.5' - yellowish gray, (5Y 7/2), fine grained, fragmented, thin light olive gray (5Y 5/2) to medium gray (N5) lamination, well defined bedding plane partings (smooth, planar, 1/2"-1" spacing) on many fragments, other fragments are typically angular to subangular 219.5-227.0' - medium to coarse grained, fragmented, with increasing percentage of sand-size material (carbonate derived), highly fossiliferous (casts/molds), fragments include medium gray angular inclusions (1/2"-1") at 222.0-224.0' (possible limestone breccia zone)		
225 -182.6								Possible limestone breccia zones	
227.0									
230 -187.6	R24-SN 10 ft 100%	NA	NA	227.0-237.0' - NA			227.0-237.0' - yellowish gray, (5Y 8/1), fine grained, with light olive gray (5Y 6/1) lamination, fragmented to coarse sand- and gravel-sized irregular-shaped fragments (large [>1"] fragments make up 10-20% of volume), fragments exhibit strong bedding plane features (beds 1/2"-1" thick) at 230.0-232.0', some fragments exhibit dark gray surface coating that appear partially recrystallized (fine reflective crystal faces)	Possible drill induced breakage	
235 -192.6									
237.0									





PROJECT NUMBER: 338884.FL	BORING NUMBER: I-07
SHEET 13 OF 16	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 2/27/2007 END : 3/7/2007 LOGGER : C. Sump, J. Burkard

WATER LEVEL: 41.433 SH 3/3/37		DISCONTINUITIES		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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			
240 -197.6	R25-SN 10 ft 100%	NA	NA	237.0-247.0' - NA		Limestone Fragments 237.0-247.0' - Same as 227.0-237.0' except 6" of medium brown silt with gravel at 240.0', increasing percentage of sand-sized material with depth, limestone fragments are more friable and tend to decrease in size with depth	Possible drill induced "disaggregation"
245 -202.6							
247.0	R26-SN 10 ft 100%	NA	NA	247.0-257.0' - NA		247.0-257.0' - Same as 237.0-247.0' except limestone fragments vary from 30-70% over most of interval except sandy silt zone at 253.0-254.0'	Repeating upward fining sequences.
250 -207.6							
255 -212.6							
257.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-07
SHEET 14 OF 16	
ROCK CORE LOG	

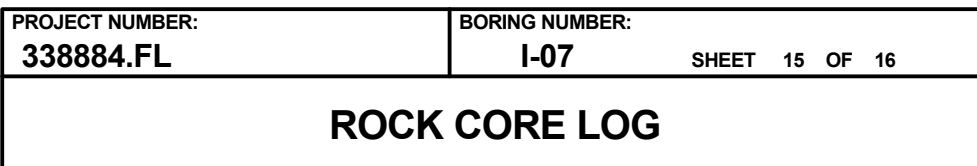
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 2/27/2007 END : 3/7/2007 LOGGER : C. Sump, J. Burkard

WATER LEVELS : 4.41 bgs on 3/6/07				START : 2/27/2007		END : 3/7/2007		LOGGER : C. Sump, J. Burkard	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS			
		R Q D (%)	FRACTURES PER FOOT		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.			
					DESCRIPTION				
DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS									
260 -217.6	R27-SN 10 ft 100%	NA	NA		Limestone Fragments 257.0-267.0' - Same as 247.0-257.0' except consisting of sand to gravel-size (1") limestone fragments, with fragments decreasing and becoming more friable with depth, few large fragments of more competent fine grained limestone, silt zone is absent				
265 -222.6									
267.0	R28-SN 10 ft 100%	NA	NA		267.0-277.0' - Same as 257.0-267.0' except with gravel-sized fragments (1/4"-1-1/2") and sand-sized fragments of varying percentages, few large (>3") limestone fragments at 267.0' and 269.5' that exhibit fine bedding laminations (1/8"-1/2") and bedding plane partings, medium brown silty zone at 275.0'	Material appears drier than similar zone at boring I-02--drilling with mud Repeating upward fining sequences (3-4' thick)			
270 -227.6									
275 -232.6									
277.0									



ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

APPENDIX 2BB-1100



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-07

SHEET 16 OF 16

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723097.8 N, 458026.5 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel


ORIENTATION : Vertical

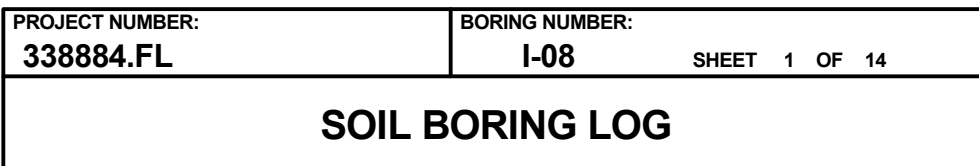
WATER LEVELS : 4.41 bgs on 3/6/07

START : 2/27/2007

END : 3/7/2007

LOGGER : C. Sump, J. Burkard

WATER LEVELS : 4.41 bgs on 3/6/07		START : 2/27/2007		END : 3/7/2007		LOGGER : C. Sump, J. Burkard	
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		
300 -257.6	R31-SN 10 ft 100%	NA	NA		Disaggregated Limestone With Limestone Fragments 297.0-297.8' - Same as 292.0-297.0' except limestone fragments are up to 3/4" diameter and make up 10% of sample	20 ft long 4" core barrel used to core to 307.0', bottom 10ft is representative of 297.0-307.0'; about 6 ft of additional material recovered represents a disturbed sample from 292-297' plus slough material from advancing the 6" casing from 292.0-297.0'	
Disaggregated Limestone 297.8-298.8' - light gray, (N6), compacted, with friable clasts 1/16"-3/16" in length, fine bedding structure visible with lighter clasts oriented along bedding / lamination planes, distinctive downward curving laminations may represent subsidence feature					Core material at 292.0-297.0' is from 2nd attempt and is disturbed		
305 -262.6					Clayey Silt (ML) 298.8-299.0' - dark brown and black, no HCl reaction, finely laminated, vitreous sheen on laminae surfaces, organics	Disaggregated Limestone With Limestone Fragments 299.0-306.0' - mottled yellowish gray, light olive gray, and light gray, (5Y 7/2, 5Y 5/2, and N6), strong HCl reaction, compacted, with gravel-sized limestone fragments (<10%)	306.0-307.0' - Same as 299.0-306.0' except clear subhedral quartz (silica) crystals (<1/16"-1/4") in discrete irregular zones (possible void infilling)
307.0							
</							



LOGGER : L. Prochaska, C. Sump

Rev. 4



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-08

SHEET 2 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

WATER LEVELS : 3.31 fbs on 9/13/07			START : 9/13/2007			END : 9/13/2007			LOGGERS : E. Hochstetler, C. Smith		
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							
15 27.5	R2-SN 10 ft 100%	NA	NA	11.0-16.0' - NA		11.0-11.3' - Same as 10.9-11.0 Fat Clay (CH) 11.3-16.0' - very pale orange, (10YR 8/2), dry, strong HCl reaction, extremely fine to very fine sand-sized, very friable fragments up to 4" in diameter Silty Sand And Limestone (SM) 16.0-21.6' - Same as 11.3-16.0' except fragments up to 4" in diameter from 19.8-20.6', predominately gravel-sized fragments (<1/2"), voids (<1/16") covering 30-40% of surface, fossiliferous (molds and casts) 21.6-24.4' - Same as 11.3-16.0' except strong HCl reaction, 20-30% sand-sized particles, 30% gravel-sized fragments (<2"), carbonate materials 24.4-26.0' - Same as 16.0-21.6' except grayish orange, (10YR 7/4)	NA = Not Applicable NR = No Recovery R2: 9 minutes, 6' slough at top of core (discarded) Note: Installed 30' of 8" casing during run				
	16.0	16.0-26.0' - NA									
	20 22.5	R3-SN 10 ft 100%	NA	NA		26.0-36.0' - NA	Sandy Silt (ML) 26.0-31.8' - grayish orange, (10YR 7/4), very fine to fine grained, nonplastic, carbonate (similar to 24.4-26.0')	R3: 26 minutes			
	25 17.5										
30 12.5	R4-SN										



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-08

SHEET 3 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

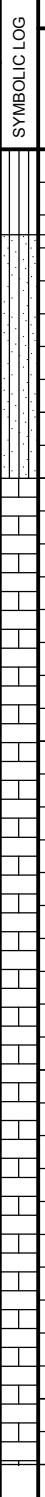
ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

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		
35 7.5	10 ft 100%	NA	NA		Silt With Sand (ML) 31.8-32.3' - pale yellowish brown, mottled dusky yellowish brown, (10YR 6/2, 10YR 4/2), fine to medium grained, nonplastic, rapid dilatancy, dusky yellowish brown material has no HCl reactivity; pale yellowish brown material is calcium carbonate, dusky yellowish brown is organics and moderate HCl reaction	R4: 11 minutes	
40 2.5	36.0 R5-SN 10 ft 100%	NA	NA		Silty Sand And Limestone Fragments (SM) 32.3-32.5' - Same as 24.4-26.0' 32.5-36.0' - Same as 24.4-26.0' except light gray, (N7), moist, strong HCl reaction, friable fragments up to 4" in diameter comprised of very fine to fine sand-sized particles, carbonate materials Limestone Fragments 36.0-46.0' - pale yellowish brown, (10YR 6/2), moist, very fine to fine grained, strong HCl reaction, very weak (R1), very friable; 36.0-36.8' fragments up to 3-1/2" in diameter and 2" in length of medium strong (R3) rock, voids up to 3/16" covering approximately 20% of the surface, no fossils; 36.8-37.2': fracture zone same as 36.0-36.8' except maximum 2" diameter; 37.2-37.5': fragment zone same as 36.8-37.2' except gravel fragments up to 1/2"; 41.1-42.0': black (N1) mottling, organics	Driller's Remark: Broke threads on 6" casing during run 41.1-42.0' Possible carbonized organics	
45 -2.5	46.0				Disaggregated Weak Limestone With Limestone Fragments 46.0-56.0' - grayish orange, (10YR 7/4), <10% gravel (<1-1/2"), dark brown/black mottling and thin layer at irregular intervals (organics), moderate reaction to HCl (slow to start, especially given fine grain size), gravel-sized limestone fragments of weak (R2) and friable material, carbonate derived with possible trace silica fine sand-sized grains	R5: 11 minutes End drilling 3/13/07 Resume drilling on 3/14/07	
50 -7.5	R6-SN						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-08

SHEET 4 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel



ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

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		
55 -12.5	10 ft 100%	NA	NA		Disaggregated Limestone With Limestone Fragments 56.0-66.0' - similar to 46.0-56.0' (carbonate derived) from 56.0-61.0', thin limestone beds (1" thick) with light gray clayey silt interbeds (1/2"-1" thick) from 61.0-62.0', from 62.0-66.0 grayish orange (10YR 7/4) sandy-silt with gravel-sized limestone fragments as described above from 56.0-61.0', fragments angular to subangular and most (90%) are <3/4" diameter	Higher percentage of sand-sized particles at top of run, possible segregation during drilling or slough material	
56.0						56.0-66.0' - NA	R6: 11 minutes
60 -17.5	R7-SN 10 ft 100%	NA	NA		Limestone 66.0-69.5' - thinly bedded (3/4"-2") with silty sand material on parting surfaces, highly fossiliferous (mold, casts, brachiopods), numerous small voids (1/32"-1/8") over 40-50% surface area, few voids/molds filled with black platy soft material (possible organics) 69.5-71.0' - thin beds with finer clayey soft interbed material (1/2"-1" thick), limestone exhibits fine bedding laminations with dark brown/black shining on parting surfaces	Driller's Remark: Slightly more difficulty advancing 6" casing	
65 -22.5						66.0-76.0' - NA	R7: 15 minutes
66.0						Silty sand interbeds washed out during drilling	
70 -27.5	R8-SN					Continued repeating sequences of thin limestone beds with fine grained interbeds separated by silty sands with limestone fragment zones 4.0-6.0' thick	



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-08

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

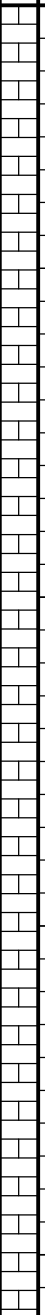
ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
		R Q D (%)	FRACTURES PER FOOT				DESCRIPTION
							DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS
75 -32.5	10 ft 100%	NA	NA		Disaggregated Limestone 71.0-76.0' - with gravel-sized limestone fragments (all carbonate derived), becoming more coarse with depth to gravel-sized limestone fragments, 10% gravel-sized fragments >1" diameter (upward fining sequence)	R8: 24 minutes	
76.0					Disaggregated Limestone With Limestone Fragments 76.0-83.9' - coarse sand-sized with bi-modal gravel-sized limestone fragments, fine gravel-sized fragments (1/4"-3/4") with few (<10%) 1"-2" fragments, all carbonate derived (moderate to strong reaction with HCl), silt dominated zones at 78.0-78.5' and 80.8-81.4', black tacky clayey layer approximately 3" thick at 81.2'	Driller's Remark: Difficulty driving 6" casing, tight, (80.0-81.0') medium coarse sand causing problems	
80 -37.5	R9-SN 10 ft 100%	NA	NA		Limestone And Limestone Fragments 83.9-86.0' - medium strong (R3), 1"-3-1/2" fragments and full diameter for core fragments, yellowish gray, fossiliferous (molds>casts), small voids over 20% of surface 86.0-87.4' - Same as 83.9-86.0'	Fine interbed material possibly washed out during drilling R9: 18 minutes	
85 -42.5					87.4-88.5' - coarse grained, sandy gravel-sized limestone fragments (1-3" diameter), increasing clay content Limestone 88.5-91.4' - 1"-4" thick with light gray (N7) clayey silt interbeds (1/2"-2" thick)	Driller's Remark: Lost drilling fluid (bentonite mud) circulation	
86.0							



PROJECT NUMBER:

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SHEET 6 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

WATER LEVEL CORRECTION		DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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		
95 -52.5	10 ft 100%	NA	NA	96.0-106.0' - NA	Limestone Fragments 91.4-94.0' - yellowish gray, silty coarse sandy gravel-sized with 3"-5" silt zones with 1"-1-1/2" black, tacky clayey layers (organics) matrix	R10: 26 minutes	
	96.0				94.0-96.0' - pale yellowish brown to light olive gray, (10YR 6/2 to 5Y 5/2), 3"-4" in diameter, 2"-2-1/2" thick, fossiliferous, numerous small voids (1/32"-1/8") (approximately 30-40% of surface), grayish yellow (5Y 8/4) 4" thick silt with 1/2"-1" gravel sized limestone fragments at 96.0'		
	100 -57.5	R11-SN 10 ft 92%	NA	NA	Limestone And Limestone Fragments 96.0-98.7' - yellowish gray, variable small cavities (1/4"-3/4"), 2-3 linear worm boring type features (1/2" wide X 1-1/2"-2" long), 14" long core piece with high angle fracture running nearly entire length, limestone fragments are finer grained and contain no small voids/cavities	R11: 25 minutes	
	105 -62.5			NR	Disaggregated Limestone With Limestone Fragments 98.7-102.9' - moderate yellowish brown, (10YR 5/4), fine grained, gravel-sized fragments varies from <5% small fragments (<1/2") to larger fragments (3/4"-1-1/2") comprising approximately 50% of material, larger limestone fragments >3" in diameter, fossiliferous (molds & casts), irregular zones of small voids (1/32"-1/8" diameter) and increased fossil density		
110 -67.5				106.0-116.0' - NA	Limestone Fragments 102.9-105.2' - increasing clay content, large fragments (>3") separated by finer <1-1/2" fragments with silt and sand, all carbonate derived	Approximately 50% of run limestone fragments	
	R12-SN				No Recovery 105.2-106.0' Limestone 106.0-115.0' - with clayey silt with gravel-sized fragment interbeds (light gray N7), limestone beds, bedding plane partings range from 1"-4" in length with clayey interbeds ranging from <1/2" to >6", limestone yellowish gray (5Y 7/2) with small voids (1/16"-1/8") across 20-30% of the surface		



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SHEET 7 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

WATER LEVELS : 3.31 RDBS ON 9/13/07		START : 9/13/2007		END : 9/13/2007		LOGGER : E. Prohaska, C. Smith	
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		
115 -72.5	10 ft 100%	NA	NA		Disaggregated Limestone 115.0-116.0' - with gravel-sized limestone fragments as found in 106.0-115.0' (sharp contact)	R12: 16 minutes	
116.0					Fragmented Limestone 116.0-123.8' - moderate yellowish brown, (10YR 5/4), moderate to strong HCl reaction, medium strong (R3), with coarse sandy fines and fine gravel-sized limestone in zones (1/4"-1"), large limestone fragments are fossiliferous with numerous small voids (1/32"-1/8") over 20-40% of the surface, large cavities (1/2") associated with large fossil molds, few worm borings (1/4" diameter, 1"-3" long). End of run: limestone fragment with fine grained angular clasts 1/4" thick, 1"-1-1/2" across (may be rip-up clasts) with mild reaction to HCl when scratched, clasts are hard and contain at least 10% silica (fine quartz grains visible in fracture corners), clasts are finely laminated with alternating light and dark layers (1/32"-1/8" thick)	Driller's Remark: 118.0-120.0' & 121.0-123.0' possible voids based on penetration rate	
120 -77.5	R13-SN 10 ft 78%	NA	NA		No Recovery: 123.8-126.0'	R13: 29 minutes	
125 -82.5			NR				
126.0							
126.0-136.0' - NA							
130 -87.5	R14-SN	NA					



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SHEET 8 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

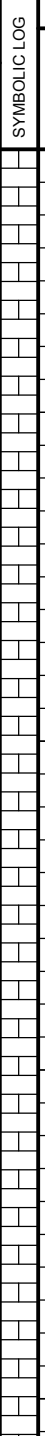
ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

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		
135 -92.5	10 ft 93%	NA			Limestone Fragments 126.0-135.3' - alternating 1.0-2.0' intervals of large limestone fragments (>3") and coarse sandy gravel-sized limestone fragments (1/2"-2") with finely laminated (1/16"-1/6") argillaceous fragments from 132.3-133.9', fragments exhibit well defined bedding plane parting (smooth and planar) and react moderately to HCl when scratched (poorly when not), fine quartz grains visible on fresh fracture faces and corners (10-15% quartz) no fossils or voids, siliceous, well bedded, finely laminated, calcareous, silty sandy limestone material below No Recovery 135.3-136.0' Limestone Fragments 136.0-144.6' - mild HCl reaction, medium strong (R3), limestone fragments with coarse sand and gravel-sized fragments of limestone (1/4"-1"), larger limestone fragments (>3" diameter), at 136.8 finely bedded limestone, 1/4" bedding planes, smooth & planar, fine alternating light/dark laminations, quartz (silica) grains visible on fracture edges (approximately 10%)	Driller's Remark: Possible void at 131.0-133.0' based on 4" core penetration rate	
136.0			NR		136.0-146.0' - NA	R14: 18 minutes	
140 -97.5	R15-SN 10 ft 86%	NA					
145 -102.5			NR		No Recovery 144.6-146.0'	R15: 37 minutes	
146.0					Limestone 146.0-146.3' - light olive gray, (5Y 5/2), fine grained, mild to moderate HCl reaction, fine silica grains, drusy calcite, fine, clear yellowish recrystallized grains, poorly fossiliferous, sharp contact with underlying rock 146.3-148.0' - yellowish grey, (5Y 7/2), strong HCl reaction, fossiliferous, with small voids (1/32"-1/8") over 10% of surface	Disaggregated due to drilling method	
150 -107.5	R16-SN						



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SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

WATER LEVELS : 3.31665 ON 3/13/07							START : 3/13/2007							END : 3/13/2007							LOGGER : E. Prochaska, C. Smith						
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																							
155 -112.5	10 ft 100%	NA	NA	156.0-166.0' - NA			Limestone Fragments 148.0-154.3' - yellowish gray, (5Y 7/2), fossiliferous with small voids (1/32"-1/8") over 10-20% of surface, few larger (1/2") cavities (fossil molds), 2"-4" horizontal partings with clayey silt and gravel-sized limestone fragment interbeds (1/2"-1-1/2" thick), interbed material exhibits low to moderate plasticity, thin zone (2"-3" thick) of friable limestone fragments and moderately graded sand-sized material, strong reaction to HCl and trace (<5%) silica grains is present at 148.6' 154.3-156.0' - moderate yellowish brown, (10YR 5/4), moderate to strong HCl reaction, silty, sandy gravel-sized material (all carbonate derived), gravel-sized fragments friable 156.0-156.8' - yellowish gray, (5Y 7/2), fossiliferous, small voids (1/32"-1/8") over 10-20% surface, large cavities (up to 1/2" diameter and 1/2" deep), fragments subangular to subrounded in shape 156.8-158.0' - moderate yellowish brown to dark yellowish orange, (10YR 5/4 to 10YR 6/6), very friable, fine recrystallization, possible trace silica sand 158.0-163.0' - Same as 156.0-156.8' except strong HCl reaction, light gray clayey silt layer at 160.9' (low plasticity), moderate brown (5YR 3/4) poorly graded very fine sand/silt-sized material, possible trace silica sand (fine), fine clear particles (recrystallization) Limestone 163.0-165.4' - light olive gray, (5Y 5/2), strong (R4), dense, hard, few small voids (1/32"-1/8") <5% surface, horizontal partings (3/4"-5" spacing), generally planar, silty with gravel-sized limestone fragments, interbeds at 164.0' (2" thick) and 164.5' (light gray N7, dry), at 164.3' very dry, powdery silt-sized interbed material No Recovery 165.4-166.0'		Disaggregated due to drilling method R16: 34 minutes																		
	156.0																										
	160 -117.5	R17-SN 10 ft 94%	NA	NA																							
	165 -122.5			NR	166.0-176.0' - NA						Assume material not recovered was lost at end of run R17: 36 minutes																
166.0																											
170 -127.5	R18-SN		NA																								



PROJECT NUMBER:

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BORING NUMBER:

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SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

WATER LEVELS : 3.51 RDBS OF 9/13/07		START : 9/13/2007		END : 9/13/2007		LOGGERS : E. Hochaska, C. Smith			
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					
175 -132.5	10 ft 78%	NA		176.0-186.0' - NA		Limestone And Limestone Fragments 166.0-173.8' - light olive gray, (5Y 5/2), with intervals of completely disaggregated limestone material, silty sand-sized with gravel-sized fragments (all carbonate derived) to silty-sandy gravel-sized limestone fragments, limestone at top of run has moderately developed bedding plane partings, limestone core (6") at 169.5' exhibits very fine bedding plane partings on top of core (finely laminated <1/32"), few small (1/2") cavities (sharp contact with above), bedding planes not visible over core length, amount of disaggregated sand-sized and smaller limestone fragments increasing with depth, slightly plastic clayey silt (light gray N7) at end of run No Recovery 173.8-176.0' Limestone Fragments 176.0-179.0' - light olive gray, (5Y 5/2), slow to moderate HCl reaction, subangular to angular, coarse sandy/gravel-sized carbonate disaggregated material (drilling induced), fragments are 2"-4" and larger in diameter, coarse sand and gravel-sized unconsolidated material is moderate yellowish brown (10YR 5/4), reacts strongly to HCl and is well rounded (gravel-sized <1") Limestone 179.0-179.8' - dark yellowish orange to grayish orange, (10YR 6/6, 10YR 7/4), strong HCl reaction, small voids (1/32"-1/16") over 5-10% of surface, poorly fossiliferous with few molds (1/2"), fine recrystallization, Limestone Fragments 179.8-181.7' - silty sandy gravel-sized material, carbonate derived, yellowish gray (5Y 7/2) fines 181.7-182.7' - moderate brown grading to pale yellowish brown, (5YR 4/4 to 10YR 6/2), moderate HCl reaction, very fine sand/salt with gravel-sized limestone fragments (<10%), trace silica sand 182.7-183.8' - Same as 179.0-179.8' Limestone And Limestone Fragments 183.8-186.0' - strong HCl reaction, with clayey silt-sized material	R18: 16 minutes		
	176.0		NR						
	180 -137.5	R19-SN 10 ft 100%	NA	NA			186.0-196.0' - NA		Driller's Remark: possible void from 177.0-181.0' based on advancement of 4" core barrel, void not suggested based on 100% recovery
	185 -142.5								
186.0					R19: 38 minutes				
190 -147.5	R20-SN								



PROJECT NUMBER:

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BORING NUMBER:

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SHEET 11 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel



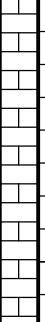
ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

WATER LEVEL: 63.00 (Elev. 513.0') CORRECTION: 0.00 START: 1/31/2007 END: 1/31/2007 EQUIP: E. Fossler, C. Camp		DISCONTINUITIES				LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION		SYMBOLIC LOG	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					
195 -152.5	10 ft 100%	NA	NA	196.0-206.0' - NA			Limestone Fragments 186.0-196.0' - alternating sequences of fragmented limestone and fossiliferous limestone fragments, fragmented limestone exhibit fine laminations (1/32"-3/4") and planar bedding plane partings, silty sand and gravel-sized limestone fragments at 192.5-193.0' and 195.0-196.0', sharp contact between fragmented finely laminated limestone and coarse fossiliferous limestone with large (1/2") fossil casts/molds at 194.0'		R20: 25 minutes
196.0									
200 -157.5	R21-SN 10 ft 90%	NA	NA	206.0-216.0' - NA			196.0-205.0' - with coarse sand/fine gravel-sized material (<10%), limestone fragments alternating between fine grained finely bedded limestone (argillaceous) and fossiliferous massive limestone with small voids (1/32"-1/8") over 10-15% of surfaces, fine grained limestone forms very angular fragments and are typically <3" in size and are <3/4" thick, fine grained limestone is light olive gray (5Y 5/2) with slow mild HCl reaction, fossiliferous limestone is yellowish gray to grayish orange (5Y 7/2 to 10YR 7/4) with moderate HCl reaction and is typically associated with coarse sand-sized material, coarse moderately graded sand-sized material at top of run (196.0-196.7'), possibly segregated during drilling		R21: 18 minutes Finished drilling on 3/14/07
206.0		NR							
210 -167.5	R22-SN						Limestone Fragments 206.0-216.0' - silty sandy gravel-sized well graded limestone fragments 1/2"-3" and larger in diameter with fines grading to coarse sand and silt-sized (<5%), fragments are subangular, fossiliferous (more molds than casts), and exhibit small voids (1/32"-1/8") over 10-20% over the surface		Resume drilling on 3/15/07



PROJECT NUMBER:

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BORING NUMBER:

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SHEET 12 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07

START : 3/13/2007

END : 3/15/2007

LOGGER : L. Prochaska, C. Sump

WATER LEVELS : 3.31635 OF 3/13/07		START : 3/13/2007		END : 3/13/2007		LOGGER : E. Prochaska, C. Smith	
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		
215 -172.5	10 ft 100%	NA	NA				
216.0							
220 -177.5	R23-SN 10 ft 100%	NA	NA				
225 -182.5							
226.0							
230 -187.5	R24-SN						

216.0-226.0' - NA

Limestone Fragments

216.0-219.0' - yellowish brown, medium strong to strong (R3 to R4), gravel-sized limestone fragments, little to no finer material, thin zones of grayish orange fossiliferous limestone with small voids over 10-20% of surface

219.0-226.0' - well graded gravel-sized limestone fragments with coarse sand-sized material, 6" zones of large fragments (>3") at 222.0' and 223.5' may represent competent beds, fragmented by drilling method

226.0-236.0' - NA

226.0-236.0' - well graded coarse sandy gravel-sized limestone fragments, mostly less than 1" with few exceptions, 20-30% of gravel-sized clasts are very friable and composed silt to sand-sized carbonate material

R22: 11 minutes

R23: 26 minutes



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-08	SHEET 13 OF 14
ROCK CORE LOG		

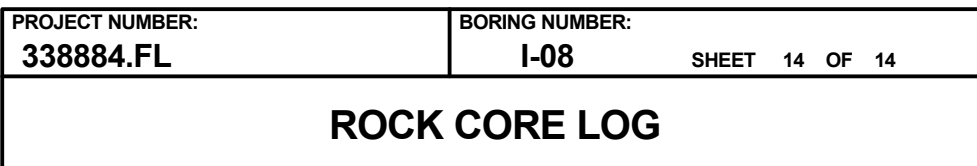
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723055.0 N, 458076.8 E (NAD83)

ELEVATION : 42.5 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 3.5 ft bgs on 3/13/07 START : 3/13/2007 END : 3/15/2007 LOGGER : L. Prochaska, C. Sump

WATER LEVEL: 63.08/63.07		START: 10/12/07		END: 10/12/07		LOGGER: E. F. Hoshaka, C. Camp	
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		
235 -192.5	10 ft 100%	NA	NA			R24: 27 minutes	
236.0							
240 -197.5							
240 -197.5	R25-SN 10 ft 100%	NA	NA		Limestone Fragments 236.0-246.0' - Same as 226.0-236.0' except increasing percentage silt and fine sand-sized component, medium yellowish brown (10YR 5/4) silty zones		
245 -202.5							
245 -202.5						R25: 13 minutes	
246.0							
246.0-256.0' - NA					246.0-256.0' - Same as 236.0-246.0' except decreasing percentage of silt-sized material (similar to 226.0-236.0'), increasing percentage of coarse, sand-sized material, all carbonate		
250 -207.5							
250 -207.5	R26-SN						



CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel


LOGGER : L. Prochaska, C. Sump

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-09
SHEET 1 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 4.41 bgs on 3/6/07 START : 3/11/2007 END : 3/12/2007 LOGGER : C. Sump, L. Prochaska

WATER LEVELS : 4.41 bgs on 3/6/07			START : 3/11/2007		END : 3/12/2007		LOGGER : C. Gump, E. Prochaska	
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			
42.4	0.0				Sandy Organic Topsoil 0.0-1.0' - dark brown		Water level above ground surface due to pressure head from sonic tooling "Water level is based on Ground Water Monitoring at LNP site (FSAR Table 2.4.12.08)"	
	6.0	R1-SN			Poorly Graded Sand (SP) 1.0-4.0' - grayish yellow, (5Y 5/4), fine grained, no HCl reaction, silica sand 4.0-6.0' - Same as 1.0-4.0' except yellowish gray, (5Y 8/1)			
5 37.4	6.0				6.0-16.0' - Same as 1.0-4.0' except yellowish gray, (5Y 8/2 to 5Y 8/1), very poorly graded, yellowish gray from 6.0-10.0' becoming lighter shade of yellowish gray from 10.0-16.0'			
	10.0	R2-SN			16.0-20.4' - Same as 4.0-6.0' except very poorly graded			
10 32.4								
15 27.4								
20								



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-09
SHEET 2 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)
 ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 4.41 bgs on 3/6/07 START : 3/11/2007 END : 3/12/2007 LOGGER : C. Sump, L. Prochaska

WATER LEVELS : 4.41 bgs on 3/6/07			START : 3/11/2007		END : 3/12/2007		LOGGER : C. Gump, E. Prochaska	
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	
22.4								
		10.0	R3-SN		Poorly Graded Sand (SP) 20.4-26.0' - pale yellowish brown to pale brown, (10YR 6/2 to 5YR 5/2), silica sand			
25 17.4		26.0						
					26.0-31.5' - Same as 20.0-26.0' except mottled dusky yellowish brown, (10YR 2/2), moist, fine grained			
30 12.4								
		5.5	R4-SN		No Recovery 31.5-36.0'			
35 7.4								
					Begin Rock Coring at 36.0 ft bgs See the next sheet for the rock core log			
40								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-09

SHEET 3 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel



ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

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		
40 2.4	R5-SN 10 ft 100%	NA	NA		Sand (SP) 36.0-37.7' - Same as 26.0-31.5' except pale yellowish brown to dusky yellowish brown, (10YR 6/2 to 10YR 2/2), mottled	NA = Not Applicable NR = No Recovery	
					Silt (ML) 37.7-38.9' - dark yellowish brown to dusky yellowish brown, (10YR 4/2 to 10YR 2/2), moist, <10% sand, nonplastic, rapid dilatancy, no HCl reaction, siliceous, heavily mottled		
					Limestone 38.9-46.0' - yellowish gray, (5Y 7/2), dry, very fine to fine grained, strong HCl reaction, extremely weak (R0), unconsolidated and very fine grained from 41.7-41.9'		
45 -2.6	46.0	NA	NA		Silty Sand (SM) 46.0-47.1' - brownish gray, (5YR 4/1), wet, fine to coarse grained, very poorly graded, gravel-size fragments up to 2", fine grained silica and carbonate sand mixture (20-30%)		
50 -7.6					Silt (ML) 47.1-51.0' - pale yellowish brown, (10YR 6/2), moist, nonplastic, slow dilatancy, strong HCl reaction, <10% poorly graded sand, all carbonate		
55 -12.6					Silt With Sand (ML) 51.0-52.5' - pale yellowish brown, (10YR 6/2), wet, nonplastic, rapid dilatancy, moderate HCl reaction, 10-20% medium grained sand, all carbonate 52.5-56.0' - Same as 51.0-52.5' except moist, strong HCl reaction, very fine to medium grained sand, gravel-sized calcareous rock fragments up to 3" in diameter		
56.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-09

SHEET 4 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

WATER LEVEL: 4.1' SGS 0.0' START: 0.0' END: 0.0' LOGGERS: G. Camp, E. Probst		DISCONTINUITIES		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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			
60 -17.6	R7-SN 10 ft 100%	NA	NA	56.0-66.0' - NA		Limestone 56.0-56.3' - dark yellowish brown, (10YR 4/2), moderate HCl reaction, weak to medium strong (R2 to R3), fragments up to 3" in diameter Disaggregated Limestone 56.3-57.9' - dark yellowish brown, (10YR 4/2), strong HCl reaction, staining, organics, moderate dilatancy, carbonate 57.9-65.6' - dark yellowish brown, (10YR 4/2), strong HCl reaction, 20-30% poorly graded sand-sized, all carbonate	
65 -22.6							
66.0				66.0-76.0' - NA		Limestone 65.6-66.0' - pale yellowish brown, (10YR 6/2), moderate HCl reaction, extremely weak (R0), clay interbeds up to 1" Disaggregated Limestone 66.0-66.5' - dark yellowish brown, (10YR 4/2), moderate HCl reaction, 10-20% poorly graded fine to medium grain sand, calcareous Limestone 66.5-67.5' - Same as 56.0-56.3' except fragments up to 4" in diameter Disaggregated Limestone 67.5-69.5' - Same as 56.3-57.9' Limestone 69.5-76.0' - pale yellowish brown to grayish orange, (10YR 6/2 to 10YR 7/4), very fine to fine grained, strong HCl reaction, gravel-sized rock fragments up to 5-1/2"	
70 -27.6	R8-SN 10 ft 100%	NA	NA				
75 -32.6							
76.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-09

SHEET 5 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

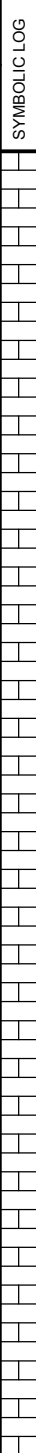

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

WATER LEVELS : 4.41 bgs on 3/6/07		START : 3/11/2007		END : 3/12/2007		LOGGER : C. Sump, E. Prochaska	
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		
80 -37.6	R9-SN 10 ft 100%	NA	NA		Disaggregated Limestone 76.0-76.8' - Same as 66.0-66.5' except limestone fragments up to 1" in diameter 76.8-79.0' - Same as 56.3-57.9'		
85 -42.6					79.0-83.2' - Same as 66.0-66.5' except few extremely weak (R0) limestone fragments, up to 4" in diameter		
86.0					83.2-86.0' - Same as 66.0-66.5' except dry, one fragment (up to 1") with organic staining, few limestone fragments (up to 2" diameter)		
90 -47.6	R10-SN 10 ft 100%	NA	NA		86.0-87.5' - Same as 66.0-65.5' except 20-40% poorly graded sand-sized calcareous particles, limestone fragments up to 1" diameter, 1" lens of staining dark yellowish brown (10YR 4/2) Limestone 87.5-88.0' - subangular rock fragments 2"-4" in diameter 88.0-88.4' - yellowish gray, (5Y 8/1), weak (R2), fossiliferous (molds/casts), small voids/cavities ($<1/2$ ") due to fossil molds, 1"-2" thick irregular horizontal partings, rough to undulating bedding planes, little to no infilling or staining Disaggregated Limestone 88.4-90.7' - gravel-sized limestone fragments, >50%, ranging in size from 1/4"-1" Limestone With Clayey Silt 90.7-94.0' - grayish yellow to yellowish brown, voids (1/16"-1/8") across 15-20% of surface and concentrated in irregular zones, small black inclusions (1/16"-1/8"), horizontal partings/beds, 1"-4" in thickness with light gray to medium gray (N7 to N5) gravel-sized clayey silt fragments, interbeds (1"-2" thick)	Driller's Remark: Loss of circulation	
95 -52.6							
96.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-09

SHEET 6 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

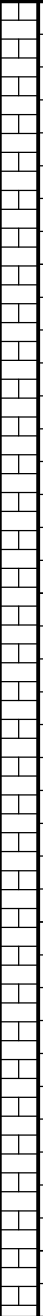
ORIENTATION : Vertical

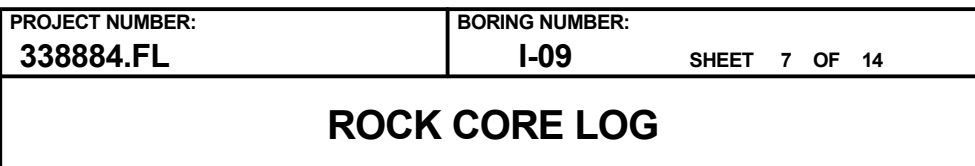
WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

WATER LEVELS : 4.41 bgs on 3/6/07							START : 3/11/2007		END : 3/12/2007		LOGGER : C. Gump, E. Prochaska	
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								
100 -57.6	R11-SN 10 ft 100%	NA	NA	96.0-106.0' - NA			Disaggregated Limestone 94.0-96.0' - Same as 86.0-87.5' except 10% fewer gravel-sized limestone clasts 96.0-97.6' - Same as 66.0-66.5' except 20-40% poorly graded sand-sized calcareous grains, 20% gravel-sized limestone clasts from 3/16"-3" Limestone 97.6-98.4' - Same as 69.5-76.0' except subangular rock fragments up to 3" in diameter Disaggregated Limestone 98.4-99.3' - Same as 56.3-57.9' 99.3-100.0' - Same as 66.0-66.5' except 10% gravel-size calcareous fragments up to 1/2" in diameter Limestone With Clayey Silt 100.0-102.8' - Same as 90.7-94.0' except no black inclusions Disaggregated Limestone 102.8-103.5' - Same as 99.3-100.0' 103.5-104.5' - Same as 56.3-57.9'					
105 -62.6				106.0			Limestone With Clayey Silt 104.5-106.0' - Same as 90.7-94.0' except no black inclusions					
110 -67.6	R12-SN 10 ft 87%	NA	NA	106.0-116.0' - NA			Limestone 106.0-108.0' - Same as 87.5-87.8' except with some silt 20-30%, up to 3" in diameter Disaggregated Limestone 108.0-108.6' - Same as 99.3-100.0' except 30-50% gravel-sized rock fragments up to 1-1/2" Limestone With Clay And Silt 108.6-114.7' - Same as 90.7-94.0' except no black inclusions and sandy silt (ML-SP) beds, same as 99.3-100' from 101.3-101.5' and 102.3-103.0'					
115 -72.6			NR			No Recovery 114.7-116.0'						



ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

APPENDIX 2BB-1122



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-09

SHEET 8 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

WATER LEVELS : 4.41 bgs on 3/6/07							START : 3/11/2007		END : 3/12/2007		LOGGER : C. Sump, E. Prochaska	
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								
140 -97.6	R15-SN 10 ft 100%	NA	NA	136.0-146.0' - NA		Disaggregated Limestone 136.0-140.5' - coarse grained, 30% angular to subangular limestone fragments ranging in size between (1/4"-1") and 50% ranging in size from 2"-4" in diameter						
145 -102.6						140.5-142.1' - Same as 136.0-140.5' except increasing percentage of silt- and sand-sized material						
						142.1-145.5' - mild to strong HCl reaction, increasing silt/clay content, limestone fragments up to 2"-4" in diameter on 2"-4" spacing with light gray (N7) silty, clayey, and gravelly interbeds, few voids or fossils						
146.0						145.5-146.0' - moderate yellowish brown to dark yellowish brown, (10YR 5/4 to 10YR 4/2), strong HCl reaction, sharp contact, mottled appearance, 5-10% very fine grained silica sand						
				146.0-156.0' - NA		Interbedded Limestone 146.0-148.5' - yellowish gray to grayish orange, (5Y 7/2 to 10YR 7/4), with silt and clay, interbeds with gravel-sized limestone fragments, voids 1/16"-1/8" over <20% surface, few fossils (mold/casts), core and fragment thickness range from 1-1/2"-5" with light gray (N7) clayey silt with gravel interbeds 2"-4" thick						
150 -107.6	R16-SN 10 ft 100%	NA	NA			Disaggregated Limestone 148.5-150.5' - moderate yellowish brown and dark yellowish brown, (10YR 5/4 and 10YR 4/2), very fine silty sand-sized						
						Disaggregated Interbedded Limestone 150.5-155.3' - moderate yellowish brown, (10YR 5/4), with thin beds of gravel-sized limestone fragments, 6" limestone bed at 152.0-152.6', large limestone fragments every 6"-8" with clayey gravel (<2")						
155 -112.6						Disaggregated Limestone 155.3-156.0' - Same as 148.5-150.5'						
156.0												



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-09

SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

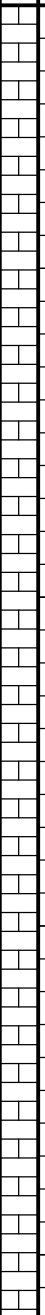
ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

WATER LEVEL: 141.535 SH 3/3/07		START: 1/3/12007		END: 1/3/12007		EQUIPMENT: C. Computer, Protractor	
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		
160 -117.6	R17-SN 10 ft 100%	NA	NA		Disaggregated Interbedded Limestone 156.0-157.5' - Same as described above except 2" silty, very fine, dark yellowish brown (10YR 4/2 to 10YR 2/2) sand-sized layer at 157.0' (similar to previously described), trace silica (quartz) grains; appears to be part of repeating sequence of gravel-sized fragments with few full core diameter limestone pieces with dark yellowish brown silty to very fine sandy layers on 25.0' spacing Limestone 157.5-158.5' - yellowish gray, (5Y 8/2), fine grained, mild to moderate HCl reaction, weak (R2), few fossils or voids Disaggregated Interbedded Limestone 158.5-162.0' - limestone fragments less than 2", increasing silt and clay-sized content with depth Disaggregated Limestone 162.0-162.4' - dark yellowish brown, (10YR 4/2), poorly graded Disaggregated Interbedded Limestone 162.4-166.0' - Same as 150.5-155.3' Limestone 166.0-169.9' - yellowish gray, (5Y 8/1), fine grained, weak (R2), limestone fragments (>2"), 1-3" core lengths, very thin clayey silt (<1/16") on parting surfaces, fine alternating light and dark laminae at 166.0-166.3', very fine iridescent grains (pyrite) on fresh surface, trace fine grained silica Disaggregated Interbedded Limestone 169.9-171.3' - light gray, (N7), with large (>3") fragments separated by silty to clayey gravel (<1-1/2" pieces), suggestive of interbeds 171.3-174.5' - with large limestone fragments (3"-4")		
165 -122.6	166.0				166.0-176.0' - NA		
170 -127.6	R18-SN 10 ft 100%	NA	NA				
175 -132.6	176.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-09

SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

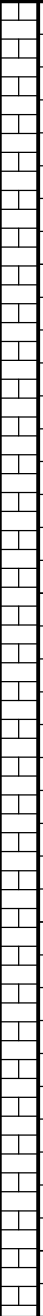

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

WATER LEVELS : 4.41 bgs on 3/6/07		START : 3/11/2007		END : 3/12/2007		LOGGER : C. Sump, E. Prochaska	
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		
180 -137.6	R19-SN 10 ft 100%	NA	NA		Disaggregated Limestone 174.5-176.0' - moderate yellowish brown to yellowish gray, (10YR 5/4 to 5Y 8/1), very fine with few fine gravel-sized fragments (<5%), with darker brown mottled layer at 174.9' Limestone Fragments 176.0-178.3' - fine to coarse grained limestone fragments, trace fine silica sand, subangular with 20% subrounded fragments 1"-2" in diameter Limestone 178.3-183.6' - fractured limestone fragments 2"-4" with very few fines, highly fossiliferous fragments containing numerous molds (and few casts) 1/4"-1/2" in diameter Limestone Fragments 183.6-186.0' - limestone fragments, similar to 176.0-178.3', 50% limestone fragments (>2") exhibit bedding plane partings or fractures 3/4"-1" thick		
185 -142.6							
186.0							
190 -147.6	R20-SN 10 ft 100%	NA	NA		Disaggregated Interbedded Limestone 186.0-196.0' - limestone fragments (1"-4" in diameter) with coarse sand to fine gravel-sized (1/4"-3/4") limestone fragments, 3.0' zones of large fragments (>2") with 1-2' thick zones of smaller limestone fragments (1/2"-1-1/25") and increased percentage of coarse sand to fine gravel-sized fragments		
195 -152.6							
196.0							



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-09	SHEET 11 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 3/11/2007 END : 3/12/2007 LOGGER : C. Sump, L. Prochaska

WATER LEVELS : 4-11 bgs on 3/6/07		START : 3/11/2007		END : 3/12/2007		LOGGER : C. Sump, E. Prochaska	
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		
200 -157.6	R21-SN 10 ft 100%	NA	NA		Disaggregated Interbedded Limestone 196.0-206.0' - Same as 186.0-196.0' except repeating sequences of large limestone fragments separated by zones of coarse sand and finer gravel-sized limestone fragments, some bedding plane fractures (1/4"-1/2" thick), angular fragments		
205 -162.6							
206.0							
					Limestone Fragments 206.0-209.5' - coarse grained, all carbonate derived, more coarse with depth to poorly graded gravel-sized limestone fragments <1/2", angular		
210 -167.6	R22-SN 10 ft 100%	NA	NA		209.5-216.0' - angular to subangular limestone fragments more coarse with depth, from 211.0-216.0' fragments are 2"-5" in diameter, 4" diameter pieces from 213.2-214.2', 1"-2" thick limestone beds with silty sand interbeds (<1/2" thick)		
215 -172.6							
216.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-09

SHEET 12 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel



ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

WATER LEVELS : 4-11 BGS ON 3/6/07				START : 3/11/2007		END : 3/12/2007		LOGGER : C. Sump, E. Prochaska	
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				
220 -177.6	R23-SN 10 ft 100%	NA	NA		Disaggregated Interbedded Limestone 216.0-226.0' - alternating 1.0-2.0' thick zones of coarse sandy gravel-sized limestone fragments and large (>3") limestone fragments, finer gravel-sized fragments (<3/4") are angular and some exhibit bedding plane fractures (smooth, planar), larger fragments are mostly irregular subangular in shape with undulating fracture surfaces				
225 -182.6									
226.0									
230 -187.6	R24-SN 10 ft 100%	NA	NA		Limestone Fragments 226.0-231.0' - coarse sandy gravel-sized (<1/2") limestone fragments at top, more coarse to large (>3") limestone fragments at 231.0', fragments are angular to subangular, fragments <1-1/2" exhibit bedding plane fracture surfaces (smooth and planar) 1/4"-3/4" in thickness, fragments >2" are irregular 231.0-235.7' - coarse grained, less than 10% subangular to subrounded fragments 2" or greater				
235 -192.6									
236.0									



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-09
SHEET 13 OF 14	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

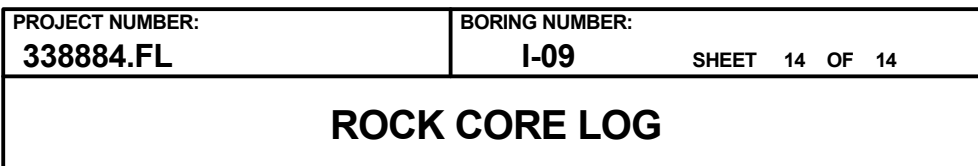
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1722958.6 N, 457888.4 E (NAD83)

ELEVATION : 42.4 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07 START : 3/11/2007 END : 3/12/2007 LOGGER : C. Sump, L. Prochaska

WATER LEVEL: 41.453 SH 3/3/97		START: 3/17/2007		END: 3/17/2007		LOGGER: G. Camp, E. Probst	
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		
240 -197.6	R25-SN 10 ft 90%	NA	NA				
245 -202.6							
246.0			NR		No Recovery 245.0-246.0'	Extreme difficulty advancing 6" casing. Casing advanced to 250.0' then 4" casing and core retracted. Finished driving 6" and then cleared out the hole prior to coring to 266.0'.	
250 -207.6	R26-SN 10 ft 85%	NA	NA				
255 -212.6							
256.0			NR		No Recovery 254.5-256.0'		



ELEVATION : 42.4 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 4.41 bgs on 3/6/07

START : 3/11/2007

END : 3/12/2007

LOGGER : C. Sump, L. Prochaska

APPENDIX 2BB-1129



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-10
SHEET 1 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/25/07 START : 3/25/2007 END : 3/26/2007 LOGGER : J. Burkard

WATER LEVELS : 1.0' RDS ON 03/20/07		START : 3/20/2007		END : 3/20/2007		LOGGER : J. Burkard	
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		
42.0	0.0				Poorly Graded Sand (SP) 0.0-5.0' - grayish brown to moderate yellowish brown, (5Y 3/2 to 10YR 5/4), moist, fine grained, no HCl reaction, silica sand, one very pale orange (10YR 8/2), round limestone fragment 3" diameter at 4.6' with strong HCl reaction		Water level is 1.0' below ground surface
	5.0	R1-SN			No Recovery 5.0-6.0'		Core run times not recorded for I-10
5 37.0	6.0				Poorly Graded Sand (SP) 6.0-11.0' - moderate yellowish brown to very pale orange, (10YR 5/4 to 10YR 8/2), moist, fine grained, strong HCl reaction, silica sand, with carbonate fines in orange material near bottom of interval		
	9.0	R2-SN			Limestone Fragments 11.0-13.0' - moderate yellowish brown transitioning to yellowish gray, (10YR 5/4 to 5Y 7/2), strong HCl reaction, very fine grained to microcrystalline, contains numerous voids surfaces, colors vary depending on voids, visible calcite crystals with visible cleavage planes 13.0-14.4' - yellowish gray, (5Y 7/2), mild HCl reaction, voids (<1/16") on 20-40% of surface		
10 32.0	16.0				Silt (ML) 14.4-15.0' - very pale orange, (10YR 8/2), strong HCl reaction, carbonate material No Recovery 15.0-16.0'		
15 27.0					Silt (ML) 16.0-16.5' - very pale orange, (10YR 8/2), strong HCl reaction, carbonate material		
					Limestone Fragments 16.5-19.6' - very pale orange, (10YR 8/2), strong HCl reaction, limestone fragments up to 4" in diameter with sections of pulverized rock less than 1" in diameter, voids (<1/16") on 20-40% of surface, poorly fossiliferous		
20							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-10

SHEET 2 OF 14

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

DRILLING METHOD AND EQUIPMENT : Rotasonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07

START : 3/25/2007

END : 3/26/2007

LOGGER : J. Burkard

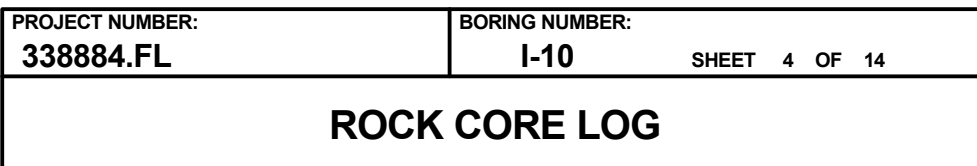
WATER LEVELS : 1.0 TUBES ON 03/20/07			START : 3/20/2007		END : 3/20/2007		LOGGERS : J. Burkard		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION			
22.0	10.0	R3-SN		Limestone Fragments 19.6-26.0' - grayish orange, (10YR 7/4), mild HCl reaction, fine sand-sized to fine gravel-sized (up to 1") limestone fragments, highly fossiliferous, limestone has immediate mild HCl reaction, carbonate materials			Driller's Remark: Drill rod dropped quickly between 28.0-31.0' in depth, possible void (however, 100% recovery achieved)		
25 17.0									26.0
30 12.0	10.0	R4-SN		26.0-29.5' - Same as 19.6-26.0' except mild to no HCl reaction 29.5-31.4' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, fragments up to 7" with interbedded clays, poorly fossiliferous, voids (<1/16") on 50-75% of surface 31.4-36.0' - light olive gray, (5Y 5/2), mild to moderate HCl reaction, fragments up to 3" with surface voids, moderately fossiliferous					
									36.0
35 7.0				Disaggregated Interbedded Limestone 36.0-41.4' - dark yellowish brown, (10YR 4/2), mild to moderate HCl reaction, carbonate material, part of repeating alternating sequences of silt and broken limestone fragments and core segments					
40									



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-10
SHEET 3 OF 14	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)
 ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache
 DRILLING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/25/07 START : 3/25/2007 END : 3/26/2007 LOGGER : J. Burkard

WATER LEVELS : 1.0 ft bgs on 9/20/2007			START : 9/20/2007		END : 9/20/2007		LOGGER : J. Burkard	
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					
2.0		10.0	R5-SN		Limestone Fragments 41.4-42.7' - moderate yellowish brown, (10YR 5/4), mild HCl reaction, fragments up to 2", voids (<1/16") on 15-30% of surface, poorly fossiliferous Disaggregated Interbedded Limestone 42.7-44.2' - Same as 36.0-41.4'			
45 -3.0	46.0				Limestone Fragments 44.2-44.9' - Same as 41.4-42.7' 44.9-46.0' - dark yellowish brown, (10YR 4/2), moderate to strong HCl reaction, carbonate materials, coarse sand-sized to gravel-sized limestone fragments 46.0-56.6' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), moderate to strong HCl reaction, fine to coarse sand-sized and fine to coarse gravel-sized limestone fragments in varying amounts throughout interval, isolated limestone core segment (1" long) at 47.4' with strong HCl reaction and voids (<1/16") covering 50-75% of surface, black (N1) organic staining at 53.9-54.3'			
50 -8.0		10.0	R6-SN					
55 -13.0					Begin Rock Coring at 56.0 ft bgs See the next sheet for the rock core log			
60								



ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07

START : 3/25/2007

END : 3/26/2007

LOGGER : J. Burkard

APPENDIX 2BB-1133



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-10	SHEET 5 OF 14
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07 START : 3/25/2007 END : 3/26/2007 LOGGER : J. Burkard

WATER LEVEL: 10.485 ON 03/20/07		START: 10/20/2007		END: 03/20/2007		LOGGERS: G. Sanford	
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		
80 -38.0	R9-SN 10 ft 100%	NA	NA		Limestone Fragments 76.0-86.0' - Same as 66.5-76.0' except pulverized rock fragments <1/4" in diameter	Pulverized rock most likely is more cohesive rock that has been broken up as a result of the sonic drilling method	
85 -43.0							
86.0					86.0-88.6' - Same as 76.0-86.0'		
90 -48.0	R10-SN 10 ft 100%	NA	NA		Disaggregated Limestone 88.6-89.2' - dusky yellowish brown, (10YR 2/2), strong HCl reaction, carbonate material Limestone Fragments 89.2-96.0' - moderate yellowish brown, (10YR 5/4), moderate HCl reaction, fragments and core segments with pulverized gravel-sized particles, voids (<1/16") on 25-50% of fragment surfaces, poorly to non fossiliferous	Gravel-sized particles most likely part of cohesive rock but broken by drilling method	
95 -53.0							
96.0							



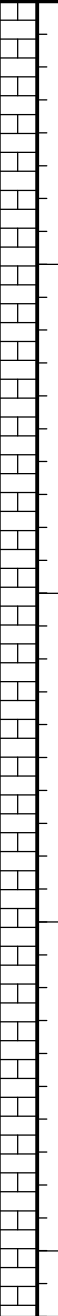
PROJECT NUMBER: 338884.FL	BORING NUMBER: I-10
SHEET 6 OF 14	
<h2 style="margin: 0;">ROCK CORE LOG</h2>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07 START : 3/25/2007 END : 3/26/2007 LOGGER : J. Burkard

WATER LEVELS : 1.0 ft bgs on 03/29/07			START : 3/29/2007		END : 3/29/2007		LOGGER : J. Burkard	
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				
100 -58.0	R11-SN 10 ft 100%	NA	NA	96.0-106.0' - NA		Limestone Fragments 96.0-106.0' - Same as 89.2-96.0'	Lost circulation during run at 96.0-106.0'	
				106.0-116.0' - NA		106.0-116.0' - dark yellowish orange, (10YR 6/6), moderate to strong HCl reaction, voids (<1/16") on 25-50% of surface, fragments and core segments up to 5" in length, with sections of pulverized rock that is gravel to coarse sand-sized particles	Pulverized rock most likely is more cohesive rock that has been broken up as a result of the sonic drilling method	
105 -63.0								
106.0								
110 -68.0	R12-SN 10 ft 100%	NA	NA					
115 -73.0								
116.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-10

SHEET 7 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07

START : 3/25/2007

END : 3/26/2007

LOGGER : J. Burkard

WATER LEVEL: 10.0 FEET ON 3/25/07							START: 1:02:00P							END: 3:02:00P							COOLER: 0.0 Barrels																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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120 -78.0	R13-SN 10 ft 100%	NA	NA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

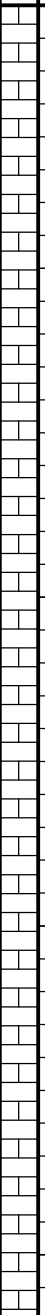
ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07

START : 3/25/2007

END : 3/26/2007

LOGGER : J. Burkard

WATER LEVEL: 10.185 ON 01/20/07							START: 1/20/2007							EODER: B. Sarkis							END: 02/07/07						
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																							
140 -98.0	R15-SN 10 ft 100%	NA	NA	136.0-146.0' - NA			Limestone Fragments 134.0-135.5' - yellowish gray and medium gray, (5Y 8/1 and N5), mild to moderate HCl reaction, limestone fragments and core segments up to 6" in length, sharp color contact on some core segments and fragments, poorly fossiliferous, few cavities (1/4"-1/2" in size) present on core between 135.0-135.5' No Recovery 135.5-136.0' Limestone Fragments 136.0-137.5' - yellowish gray, (5Y 7/2), mild HCl reaction, gravel-sized rock fragments, voids (<1/16") on 15-25% of surface with small (1/4") surface cavities (possible solution cavities) 137.5-140.2' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), fine grained, mild HCl reaction, fragments up to 8" in length, consisting of void-rich limestone (light olive gray), interbedded with fine grained limestone (yellowish gray) in intervals up to 1" thick, up to 20% coverage of small (1/16") voids 140.2-144.5' - dusky yellow, (5Y 6/4), mild HCl reaction, pulverized limestone in medium to fine sand-size particles and rock fragments up to 3" in diameter 144.5-146.0' - light olive gray, (5Y 6/1), moderate HCl reaction, core segments up to 4" in length, trace voids on surface 146.0-147.9' - light olive gray, (5Y 6/1), mild to moderate HCl reaction, trace voids on surface 147.9-152.0' - dusky yellow, (5Y 6/4), moderate HCl reaction, gravel-sized limestone fragments with pulverized limestone (silt-sized particles)				Repeating alternating sequences from 147.9-156.0'																
145 -103.0	146.0			146.0-156.0' - NA																							
150 -108.0	R16-SN 10 ft 100%	NA	NA				152.0-153.3' - light olive gray to medium bluish gray, (5Y 6/1 to 5B 5/1), core segments up to 5" in length 153.3-154.5' - Same as 147.9-152.0' except contains a core segment up to 4" in length 154.5-156.0' - Same as 152.0-153.3'																				
155 -113.0																											
156.0																											



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-10

SHEET 9 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07

START : 3/25/2007

END : 3/26/2007

LOGGER : J. Burkard

WATER LEVEL: 10.000 ON 06/20/07				START: 06/20/07		END: 06/20/07		LOGGERS: G. Barkard	
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				
160 -118.0	R17-SN 10 ft 100%	NA	NA		Limestone Fragments 156.0-161.2' - dusky yellow, (5Y 6/4), mild HCl reaction, fragments up to 4" in diameter, voids (<1/16") on 25-50% of surface, sections of coarse to medium sand-sized particles of pulverized limestone				
165 -123.0					161.2-166.0' - light olive gray, (5Y 5/2), dense, fine grained, mild HCl reaction, fragments and core segments up to 2" in length, trace voids on surface				
166.0									
170 -128.0	R18-SN 10 ft 100%	NA	NA		Limestone 166.0-168.8' - dusky yellow, (5Y 6/4), coarse to medium grained, mild HCl reaction, cavities (1/4" in diameter) present on surface, fragments up to 8" in length				
175 -133.0					Limestone Fragments 168.8-175.7' - dusky yellow, (5Y 6/4), fine grained, mild HCl reaction, gravel-size particles and core fragments up to 6" long, trace voids on surface				
176.0									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-10

SHEET 10 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07

START : 3/25/2007

END : 3/26/2007

LOGGER : J. Burkard

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.
180 -138.0	R19-SN 10 ft 100%	NA	NA	176.0-186.0' - NA		Disaggregated Limestone 175.7'-176.0' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, carbonate sand with 10-20% silica content Limestone Fragments 176.0-179.9' - moderate yellowish brown, (10YR 5/4), strong HCl reaction, gravel-sized particles between 1/4"-1" in diameter, all carbonate materials 179.9-185.0' - dusky yellow, (5Y 6/4), strong HCl reaction, core segments up to 4", voids (<1/16") over 50-75% of surface, numerous cavities on surface, poorly to highly fossiliferous, some interbedded clay between 184.1-185.0'	
185 -143.0	186.0			186.0-196.0' - NA		185.0-186.0' - light olive gray, (5Y 6/1), fine grained, mild HCl reaction, core segments up to 3" in length Disaggregated Limestone 186.0-186.5' - light olive gray, (5Y 6/1), strong HCl reaction, silt-sized with coarse sand-sized particles, possibly slough material, all carbonate material Limestone Fragments 186.5-187.5' - light olive gray, (5Y 6/1), dense, fine grained, mild HCl reaction, core segments up to 2" in length, fragments 1/4"-1" in diameter 187.5-194.7' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, core segments up to 3" in length, fragments 1/2"-2" in diameter, moderate to highly fossiliferous, numerous surface cavities present on limestone	
190 -148.0	R20-SN 10 ft 87%	NA	NA				
195 -153.0			NR			No Recovery 194.7-196.0'	
	196.0						



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-10

SHEET 11 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07

START : 3/25/2007

END : 3/26/2007

LOGGER : J. Burkard

WATER LEVEL: 10.00 ft on 01/20/07		DISCONTINUITIES		LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	SYMBOLIC LOG	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			
200 -158.0	R21-SN 10 ft 100%	NA	NA	196.0-206.0' - NA		Limestone Fragments 196.0-198.0' - light olive gray, (5Y 5/2), strong HCl reaction, silt with sand-sized particles and gravel-sized limestone fragments, all carbonate 198.0-200.0' - light olive gray, (5Y 6/1), fine grained, mild HCl reaction, fragments 1/2"-4" in diameter, several surface cavities (1/4"-1/2") at 198.2-198.5', fracture at 45 deg through one cavity 200.0-205.0' - fragments range from 1/4"-3", possible breccia zone, matrix appears as for material from 196.0-198.0', clasts appear as for material from 198.0-200.0'	
205 -163.0							
206.0				206.0-216.0' - NA		205.0-206.0' - light olive gray, (5Y 6/1), very fine grained, moderate HCl reaction, fragments and core segments up to 4" in diameter 206.0-216.0' - light olive gray, (5Y 6/1), strong HCl reaction, coarse sand-sized particles and rock fragments up to 4", highly fossiliferous, voids (<1/16") over 25-50% of surface, with isolated sections of fine grained, dense, yellowish gray (5Y 7/2) core segments and fragments, with strong HCl reaction, at 210.0-210.4', 211.3-211.4' and 214.6-215.0'	
210 -168.0	R22-SN 10 ft 100%	NA	NA				
215 -173.0							
216.0							



PROJECT NUMBER:

338884.FL

BORING NUMBER:

I-10

SHEET 12 OF 14

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

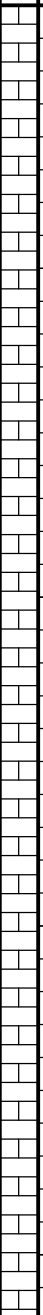
ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07

START : 3/25/2007

END : 3/26/2007

LOGGER : J. Burkard

WATER LEVEL: 10.000 ON 06/20/07		START: 06/20/07		END: 06/20/07		LOGGERS: G. Barkard	
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		
220 -178.0	R23-SN 10 ft 100%	NA	NA		Limestone Fragments 216.0-217.5' - light olive gray, (5Y 6/1), strong HCl reaction, with sand-sized particles and gravel-sized rock fragments, all carbonate material 217.5-219.2' - yellowish gray, (5Y 7/2), dense, fine grained, moderate HCl reaction, fragments up to 4" in diameter, poorly fossiliferous 219.2-221.4' - yellowish gray, (5Y 7/2), mild to moderate HCl reaction, void rich, poorly fossiliferous 221.4-222.2' - Same as 217.5-219.2' 222.2-225.0' - Same as 219.2-221.4'	Apparent repeating sequences at 217.5-225.0'	
225 -183.0	226.0				Disaggregated Limestone 225.0-226.0' - yellowish gray, (5Y 7/2), moderate HCl reaction, carbonate material Limestone Fragments 226.0-236.0' - dark yellowish orange, (10YR 6/6), sand-sized particles to gravel-sized limestone fragments, strong HCl reaction for the silt and sand-sized particles, mild to moderate HCl reaction for gravel-sized fragments, limestone fragments are easily distinguished as either fine grained, yellowish gray (5Y 7/2), dense, and poorly fossiliferous with moderate HCl reaction, or as void rich, yellowish gray (5Y 7/2), poorly fossiliferous, with mild to moderate HCl reaction	Silt and limestone fragments are most likely cohesive rock that has been broken up by the sonic drilling method	
230 -188.0	R24-SN 10 ft 100%	NA	NA				
235 -193.0	236.0						



PROJECT NUMBER: 338884.FL	BORING NUMBER: I-10
SHEET 13 OF 14	
ROCK CORE LOG	

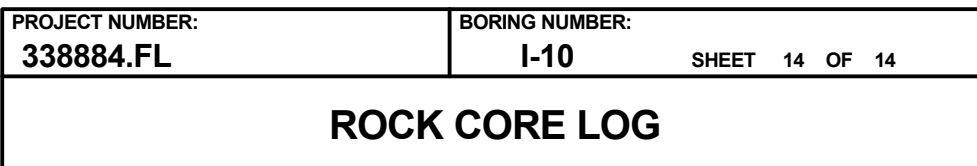
PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723172.2 N, 458130.7 E (NAD83)

ELEVATION : 42.0 ft (NAVD88) DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07 START : 3/25/2007 END : 3/26/2007 LOGGER : J. Burkard

WATER LEVELS : 1.01665 ON 09/20/07		START : 9/20/2007		END : 9/20/2007		LOGGER : J. Burkard	
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		
240 -198.0	R25-SN 10 ft 100%	NA	NA		Limestone Fragments 236.0-246.0' - Same as 226.0-236.0' except with isolated sections of fine grained and void-rich limestone		
245 -203.0							
246.0							
					246.0-256.0' - NA		
250 -208.0	R26-SN 10 ft 100%	NA	NA		246.0-256.0' - Same as 236.0-246.0' except less void-rich limestone (only trace to 10% coverage of small [<1/16"] voids)	Original page of field log (246.0-256.0') "lost", page re-written by original logger J. Burkard on 2/7/08 based on photographs of recovered material	
255 -213.0							
256.0							



ELEVATION : 42.0 ft (NAVD88)

DRILLING CONTRACTOR : Prosonic, Ocala, FL; Driller: N. Gamache

CORING METHOD AND EQUIPMENT : Rotosonic S/N SR-116, sonic, 6" outer casing and 4" core barrel

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/25/07

START : 3/25/2007

END : 3/26/2007

LOGGER : J. Burkard

APPENDIX 2BB-1143



PROJECT NUMBER:

338884.FL

BORING NUMBER:

IT-01

SHEET 1 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705495.9 N, 457735.8 E (NAD83)

ELEVATION : 20.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 3-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 42.0 ft bgs on 6/28/07

START : 6/27/2007

END : 6/29/2007

LOGGER : J. Schaeffer, D. Thomas

WATER LEVELS : 42.0 ft bgs on 6/29/07			START : 6/27/2007		END : 6/29/2007		LOGGERS : J. Schaeffer, D. Thomas	
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			
20.9	0.0	1.2	SS-1	1-5-10 (15)	Topsoil 0.0-0.2' - roots Sandy Silt With Limestone Fragments (ML) 0.2-1.2' - grayish orange, (10YR 7/4), orange, dry to moist, medium stiff, nonplastic, strong HCl reaction, 30 % fine to coarse sand-sized material, 30% fine to coarse gravel-sized material		SS-1 looks like fill, mixed chunks of material Driller's Remark: Sand at 3.0-3.5'	
	1.5							
5	5.0							
15.9		0.6	SS-2	2-3-4 (7)	Poorly Graded Sand With Silt (SP-SM) 5.0-5.6' - moderate yellowish brown, (10YR 5/4), moist to wet, loose, no to moderate HCl reaction, fine silica sand, trace medium grained carbonate sand, trace nonplastic fines			
	6.5							
10	10.0							
10.9		0.6	SS-3	3-3-3 (6)	Poorly Graded Sand With Silt (SP-SM) 10.0-10.3' - Same as 5.0-5.6' except dark yellowish brown, (10YR 4/2), mottled, 5-10% nonplastic fines, trace medium sand-sized carbonate sand Poorly Graded Sand With Silt And Organics (SP-SM) 10.3-10.6' - grayish brown, (5YR 3/2), moist, loose, no HCl reaction, fine silica sand, 15-20% fines that appear to be very fine grained organics, nonplastic fines			
	11.5							
15	15.0							
5.9		0.8	SS-4	5-7-11 (18)	Poorly Graded Sand (SP) 15.0-15.8' - dark yellowish brown, (10YR 4/2), white, moist, medium dense, nonplastic, no HCl reaction, fine silica sand			
	16.5							
20								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

IT-01

SHEET 2 OF 8

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705495.9 N, 457735.8 E (NAD83)

ELEVATION : 20.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 3-7/8" tri-cone bit





ORIENTATION : Vertical

WATER LEVELS : 42.0 ft bgs on 6/28/07

START : 6/27/2007

END : 6/29/2007





LOGGER : J. Schaeffer, D. Thomas

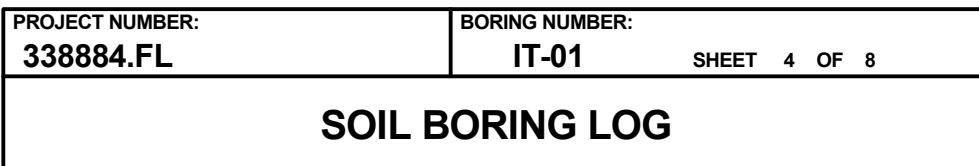
WATER LEVELS : 42.0 ft bgs on 9/29/07		STARTY : 9/27/2007		END : 9/29/2007		LOGGER : J. Schaeffer, D. Thomas		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY				
0.9	20.0	0.9	SS-5	11-10-13 (23)	Poorly Graded Sand With Silt (SP-SM) 20.0-20.9' - pale yellowish brown, (10YR 6/2), dark yellowish brown (10yr 4/2), moist, medium dense, fine silica sand, trace carbonate sand in first 0.2', trace nonplastic fines, no HCl reaction in silica, mild in carbonate			
	21.5							
25	25.0							
-4.1		0.8	SS-6	4-5-5 (10)	Poorly Graded Sand (SP) 25.0-25.8' - dark yellowish brown, (10YR 4/2), mottled, wet, loose, no HCl reaction, fine silica sand, trace nonplastic fines			
	26.5							
30	30.0							
-9.1		0.9	SS-7	2-3-4 (7)	Poorly Graded Sand (SP) 30.0-30.9' - Same as 25.0-25.8' except mottled and banded			
	31.5							
35	35.0						Driller's Remark: Very soft at 33.0', possible change of material in SS-8	
-14.1		1.5	SS-8	0-0-0 (0)	Interbedded Organic Soil (SP) 35.0-35.6' - dusky brown, (5YR 2/2), wet, 60% organic soil and 40% poorly graded sand; organic soil exhibits low to medium plasticity, slow dilatancy, no HCl reaction; poorly graded sand is fine grained, possible orange silica grains, 10-15% organic fines, no HCl reaction Poorly Graded Sand Grading To Silty Sand With Organics (SP) 35.6-36.5' - dusky brown, (5YR 2/2), wet, very loose, no HCl reaction, fine sand, possible orange silica grains, trace coarse sand-sized pyrite grains, 10-25% low plastic fines, increasing with depth, appear to be organics			
	36.5							
							Driller's Remark: Gravelly material at 38.0' (like SS-9)	
40								



PROJECT NUMBER: 338884.FL	BORING NUMBER: IT-01
SHEET 3 OF 8	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705495.9 N, 457735.8 E (NAD83)
 ELEVATION : 20.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 3-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 42.0 ft bgs on 6/28/07 START : 6/27/2007 END : 6/29/2007 LOGGER : J. Schaeffer, D. Thomas

WATER LEVELS : 42.0 ft bgs on 6/26/07		START : 6/27/2007		END : 6/29/2007		LOGGER : J. Schaeffer, D. Thomas			
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			
-19.1	40.0	1.3	SS-9	3-5-8 (13)	Silty Sand (SM) 40.0-41.3' - mixed yellowish gray, medium light gray, light bluish gray, (5Y 8/1, N6, 5B 7/1), wet, medium dense, strong HCl reaction, fine to coarse sand-sized shells and limestone			Driller's Remark: 100% loss of circulation at 44.0-44.5'	
	41.5								
45	45.0								
-24.1	46.5	0.8	SS-10	12-41-40 (81)	Silty Gravels (GM) 45.0-45.8' - 50/50 split in sample; lenses alternates, 1"-2-1/2" thick limestone fragments are medium gray (N5), strong HCl reaction, same as SS-9, angular fine to coarse gravel-sized, silt with sand (ML) is pale yellowish brown, wet, very soft, nonplastic, very rapid dilatancy, 10-20% very fine sand-sized particles, mild to moderate HCl reaction, carbonate materials			Finished drilling at 45.0' at end of 6/27/07 at 18:00 Driller set HW casing Driller's Remark: Caving at 16.0-17' (possible water table); casing is dry up to 43.5'. On 6/28/07 water table is at 42.0'; resume drilling at 07:30 AM Driller's Remark: Alternating layers of soft and hard material between 45.0-50.0'; lost circulation at 45.0'	
	46.5								
50	50.0								
-29.1	51.5	1.4	SS-11	31-27-17 (44)	Silty Gravels (GM) 50.0-51.4' - Same as 45.0-45.8' except limestone in gravel-sized particles, one 1" fragment in middle of sample, fine to coarse angular gravel-sized limestone from 51.0-51.4'; silt is same as SS-10				
	51.5								
55	55.0								
-34.1	55.6	0.5	SS-12	50-50/1.5 (100/7.5")	Well Graded Limestone Gravel With Silt And Sand (GW) 55.0-55.5' - Same as 45.0-45.8' except medium gray to moderate yellowish brown, (N5, 10YR 5/4), wet, very dense, gravel is in both colors and fines are in brown color, fine to coarse angular gravel-sized limestone, 30% fine to coarse angular sand-sized material, 15% nonplastic fines, gray material has strong HCl reaction, brown material has mild to moderate HCl reaction, all carbonate materials			Driller's Remark: Change to SS-13 material at 58.0'; Install casing to 60.0'	
	55.6								
60									



LOGGER : J. Schaeffer, D. Thomas

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: IT-01	SHEET 5 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705495.9 N, 457735.8 E (NAD83)

ELEVATION : 20.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 42.0 ft bgs on 6/28/07 START : 6/27/2007 END : 6/29/2007 LOGGER : J. Schaeffer, D. Thomas

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						
-54.1	75.0 R1-HQ 1 ft 100%	100	0	76.95, 79.85, 80.55' - Fracture (3), 25 deg and 45 deg, rough, planar to undulating, tight nearly healed 77.4' - Fracture, 30 deg, rough, undulating, healed 77.75' - Fracture, horizontal, rough, planar, tight 78.3' - Fracture, horizontal, rough, planar to undulating, tight		Limestone 75.0-76.0' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, weak (R2), voids (up to 1/16") cover 20% of the surface area, one large 3/4" deep and 4" long cavity, 2"X3/16" with up to 1/8" calcite crystals 76.0-77.55' - Same as 75.0-76.0' except moderate yellowish brown to dark yellowish orange, (10YR 5/4, 10YR 6/6), weak to very weak (R2 to R1), voids (up to 1/16") cover 5-25% of the surface area, voids coverage decreases with depth 77.55-79.5' - light olive gray, (5Y 5/2), fine to coarse grained, moderate HCl reaction, medium strong (R3), 25% of the rock grains are sub angular to sub rounded, voids (up to 1/16") cover 10% of the surface, voids (1/8"-3/16") cover 10% of the surface, shallow and elongated cavities up to 2" long 79.5-81.0' - Same as 79.5-81.0' except grayish orange, (10YR 7/4), very fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (up to 1/16") cover 25% of the surface, few voids (1/8"-3/16"), no cavities 81.0-86.0' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), voids (<1/16") cover 25-30% of the surface area, few cavities (1/4"-1/2"), somewhat friable; except 81.7-82.1' weak rock (R2), voids cover 5% of the surface 86.0-86.55' - Same as 81.0-86.0' except medium strong (R3), 25-30% void coverage 86.55-87.65' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, very weak (R1), voids (<1/16") cover 0-5% of the surface, 1/4"-1/2" thick trace planar bedding 87.65-88.6' - Same as 86.0-86.55' 88.6-88.7' - light olive gray, (5Y 5/2), very fine grained, moderate HCl reaction, strong (R4), 20% sub angular coarse sand-sized particles (possible shell fragments), voids (up to 1/16") cover 3% of the rock surface, cavities (up to 1/2") 88.7-89.8' - Same as 86.0-86.55' 89.8-90.4' - Same as 86.0-86.55' except light olive gray, (5Y 5/2), strong to very strong (R4 to R5) No Recovery 90.4-91.0'	Switch to coring; finished soil drilling at 15:30 on 6/28/07 R1: 3 minutes			
76.0			0							
			2							
	R2-HQ 5 ft 100%	97	1							SC-1 collected at 78.5-79.5'
			1							Drilled twice as fast from 79.5-81.0'
80			1				R2: 17 minutes			
-59.1	81.0									
			1	81.9' - Fracture, horizontal, rough, planar 82.35' - Fracture (2), 30 deg, rough, planar, with a 1" fragment wedge between 2 fractures 83.95' - Fracture, 50 deg, rough, stepped, tight 84.55' - Fracture, 10 deg, rough, planar 84.85' - Fracture, 60 deg, rough, undulating, leading to fracture zone at 85.0' 85.0-85.15' - Fracture zone, small 1/4 and smaller 85.15, 85.4, 85.75' - Fracture (3), 10 deg, rough, undulating to stepped 85.5' - Fracture, 80 deg, rough, undulating to stepped, from 85.15 to 85.75 85.85' - Fracture, 70 deg, rough, undulating, from 85.75 to 86.0 continuation of overlying fracture 86.2' - Fracture, 75 deg, rough, undulating, tight to open 86.55' - Fractures, horizontal, rough, stepped, very open fracture with significant fragmentation and debris, nearly fracture zone infill 87.0, 87.2' - Fracture (2), 10 deg, rough, planar, open, rounded 87.65' - Fracture, 10 deg and 30 deg, rough, undulating, open 88.45' - Fracture, horizontal, rough, undulating to stepped, tight to healed 88.75' - Fracture, 75 deg, rough, stepped, tight, bounded by fractures at 88.15 and 89.15' 89.15' - Fracture, 20 deg, rough, stepped, very open with fragmentation 89.5-89.8' - Fracture zone						
			1							
	R3-HQ 5 ft 100%	63	1							
			2							
			>10					R3: 8 minutes		
85	86.0									
-64.1			3							
			3							
	R4-HQ 5 ft 88%	35	3							
			>10				Driller's Remark: 50% circulation loss			
			5				R4: 9 minutes			
90	91.0		NR							
-69.1			8							
			3				Driller's Remark: 100% circulation loss as soon as drilling starts at 91.0'; 100% loss through to 96.0'			
	R5-HQ 5 ft 68%	28	7							
			0							
95										



PROJECT NUMBER:

338884.FL

BORING NUMBER:

IT-01

SHEET 6 OF 8

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705495.9 N, 457735.8 E (NAD83)

ELEVATION : 20.9 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 42.0 ft bgs on 6/28/07

START : 6/27/2007

END : 6/29/2007

LOGGER : J. Schaeffer, D. Thomas

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			
-74.1			NR	89.8' - Fracture, 30 deg, rough, undulating, open to fracture zone		Limestone 91.0-91.65' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, weak (R2), voids cover 25% of the surface, 3% gray voids, same as 88.6-88.7'	R5: 15 minutes
	96.0		0	90.05' - Fracture, 20 deg, rough, stepped, very open			
			0	90.2' - Fracture, 70 deg, rough, undulating, fracture to fragmentation		91.65-93.0' - light olive gray, (5Y 5/2), fine grained, moderate HCl reaction, strong (R4), transition to moderate yellowish brown	Added EZ-Mud, still 100% water loss
			2	91.25' - Fracture, 30 deg, smooth, undulating 91.45, 91.5, 91.6, 91.65' - Fracture (4), horizontal, rough, planar, open fragmentation (sub angular) from 91.6-91.65'			
		62	3	92.2' - Fracture, 40 deg, rough, planar, healed with trace fragmentation (sharp angular)		93.0-94.4' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), 5% rounded coarse fragments, voids (up to 1/16") cover 15-20% of the surface, 1/2" cavities and fossil casts	
100 -79.1			>10	92.35' - Fracture, 20 deg, rough, planar, fragments, joins with 92.2 fracture			
	101.0		0	92.55' - Fracture, horizontal, smooth, planar			R6: 5 minutes
			1	93.0' - Fracture, 70 deg, rough, undulating, tight			
			1	93.2' - Fracture, 20 deg, rough, undulating, tight			
			1	93.65' - Fracture, 70 deg, rough, undulating, tight		No Recovery 94.4-96.0' Limestone 96.0-98.1' - dusky yellow, (5Y 6/4), fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (up to 1/16") cover 30-40% of the surface, trace elongate cavities up to 3/4"x1/4", trace organics (up to 1/4")	100 % water loss from 101.0-106.0'
105 -84.1			2	93.8-93.95' - Fracture zone 93.95' - Fracture, 10 deg, rough, stepped, open			R7: 14 minutes
	106.0		NR	98.3' - Fracture, 25 deg, rough, undulating, tight			
			>10	98.55' - Fracture, 80 deg, rough, undulating, that starts at 98.3 and ends as unbroken fracture at 98.8,			
			>10	99.45' - Fracture, 50 deg, rough, planar, tight			
			>10	99.65' - Fracture, 70 deg, rough, undulating to planar, tight extends from 99.45 to 99.65'			
			>10	99.65' - Fracture, 30 deg, rough, planar, tight			
			>10	100.1' - Fracture, horizontal, rough, stepped, open to fracture zone below			
			>10	100.1-100.7' - Fracture zone, with several large 3" subangular fragments and several 0 to 70 degree fractures			
			>10	100.7' - Fracture, horizontal, rough, stepped, very weak (R1) rock and rounded core with faded color			
			>10	102.85' - Fracture, 60 deg, rough, undulating, healed			
			>10	103.45' - Fracture, 25 deg, rough, undulating, open			
			>10	103.65' - Fracture, horizontal, rough, stepped, very open			
			>10	104.25' - Fracture, 10 deg, rough, stepped, very open fracture with some fragments			
			>10	105.15' - Fracture, 50 deg, rough, undulating, healed			
			>10	105.35-105.45' - Fracture zone, rough, planar			
			2	106.3' - Fracture, 20 deg, rough, undulating, open			
			0	106.55' - Fracture, 20 deg, rough, undulating to stepped, very open fracture			
				106.7-106.85' - Fracture zone, 30 deg and 60 deg, subrounded			
115							



PROJECT NUMBER: 338884.FL	BORING NUMBER: IT-01	SHEET 7 OF 8
ROCK CORE LOG		

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705495.9 N, 457735.8 E (NAD83)

ELEVATION : 20.9 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

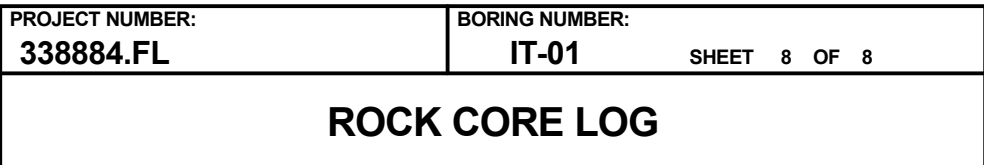
WATER LEVELS : 42.0 ft bgs on 6/28/07

START : 6/27/2007

END : 6/29/2007

LOGGER : J. Schaeffer, D. Thomas

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			
-94.1			>10	106.85' - Fracture, horizontal, rough, planar, with fragmentation transition abruptly to different material		Limestone 106.0-106.7' - moderate to dark yellowish brown, (10YR 5/4, 10YR 5/6), fine grained, moderate HCl reaction, medium strong (R3), voids (up to 1/16") cover 30% of the surface, 1" long elongated fossil molds and casts, slightly stronger where mottled as 105.15-105.8'	R9: 4 minutes
	116.0		NR	106.95' - Fracture, 45 deg, rough, stepped, very fine steps			100% circulation loss from 116.0-121.0'
			>10	107.15, 107.5' - Fracture (2), 80 deg, rough, undulating, stained			
			0	107.65' - Fracture, 10 deg and vertical, break, angular			
	R10-HQ 5 ft 100%	63	>10	107.75' - Fracture, 10 deg, rough, stepped, open, abrupt transition to material below		106.7-107.75' - light olive gray, (5Y 5/2), fine to very fine grained, mild to moderate HCl reaction, medium strong to strong (R3 to R4), voids (up to 1/16") cover 0-5%	
			2	107.75-108.75' - Fracture zone, horizontal and vertical, present significant 1/4" fragments		107.75-109.85' - Same as 106.0-106.7' except extremely weak (R0), transitioning gradually from 108.5-109.5' as very weak rock (R1) with voids (up to 1/16") cover 20% of the surface, trace fine organics	R10: 5 minutes
120			>10	108.75-109.85' - Fracture zone, angular fragments		109.85-111.0' - Same as 106.7-107.75' except increased voids to 10% and trace 1/4" cavities, trace organics, almost transition to rock similar to 105.15-105.8'	100% circulation loss from 121.0-126.0'
-99.1			4	109.85' - Fracture, vertical, rough, undulating, 10" long fracture		111.0-115.2' - moderate yellowish brown, (10YR 5/4, 10YR 6/6), fine grained, moderate HCl reaction, weak to very weak (R2 to R1), gradual transition throughout the core, voids (up to 1/16") cover 10-25% of the rock surface, trace 1/4" molds, molds (up to 1/2") over less than 2% of the surface, fewer voids and cavities where the rock strength is very weak (R1);	
			0	110.6-111.0' - Fracture, horizontal, rough, undulating, fracture zone, sub angular, 1-2" fragments to end of core		111.0-112.5', rock is weak (R2) and voids cover 15% of the surface with some cavities;	
			0	111.0-111.95' - Fracture zone, vertical, 1-4" subangular fragments		112.5-113.5', rock is very weak (R1) and voids cover 10% of the surface with few cavities;	
	R11-HQ 5 ft 98%	63	0	111.95, 112.35' - Fracture, horizontal, rough, undulating, open to fracture zone at 112.35		113.5-115.2', rock is weak (R2), voids cover 25% of the surface, some cavities, ends with rock fragments that are sub-angular to sub-rounded	SC-2 collected at 122.9-124.0'
			3	112.9' - Fracture, horizontal, rough, planar		No Recovery 115.2-116.0'	
			>10	113.5' - Fracture, 45 deg, rough, planar, fragmentation along plane, closely spaced fractures, tight to open		Limestone 116.0-116.75' - dark yellowish orange to moderate yellowish brown, (10YR 6/6, 10YR 5/4), fine grained, moderate HCl reaction, very weak (R1), voids (up to 1/16") cover 25% of the surface, trace cavities (1"-1/2" elongate infilled with grayish silt-sized infill)	
125			NR	113.9' - Fracture, 20 deg, rough, undulating, open		116.75-118.15' - Same as 116.0-116.75' except weak to extremely weak (R2 to R0), hard to determine voids and cavities	R11: 5 minutes Driller's Remark: Used 1200 gallons of water at hole; water 25.0' below ground surface before grouting at 6/29/07 at 14:00
-104.1				115.0-115.2' - Fracture zone, sand and sub angular fragments			
	126.0		NR	116.0-116.4' - Fracture zone, sub angular fragments, sand to 1" fragments			
				116.4' - Fracture, horizontal, rough, stepped, very open			
				116.85' - Fracture, 60 deg, smooth, undulating, tight			
				118.05' - Fracture, 60 deg, rough, undulating, similar to fracture above in size and orientation but followed at depth by crush			
				118.2-118.45' - Fracture zone, sand to 1" subangular fragments			
				118.45, 118.65' - Fractures (2), horizontal, rough, stepped, tight to open, fracture at 118.65 also splits off at 60 degree near one side			
				119.15' - Fracture, 10 deg, rough, planar, tight to healed			
				119.8' - Fracture, 15 deg, rough, undulating, tight			
				120.5, 120.55' - Fracture, horizontal, rough, planar, tight			
				120.55-120.8' - Fracture zone, sand to gravel sized fragments, weakly to non competent			
				120.8' - Fracture, horizontal, rough, undulating to stepped			
				121.5' - Fracture, 50 deg, smooth, undulating, open, with fragmentation to smaller orthogonal fractures at same depth			



LOGGER : J. Schaeffer, D. Thomas

Rev. 4



PROJECT NUMBER: 338884.FL	BORING NUMBER: IT-02
SHEET 1 OF 7	
SOIL BORING LOG	





PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705642.1 N, 457838.7 E (NAD83)
 ELEVATION : 29.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 30.0 ft bgs on 7/2/2007 START : 7/1/2007 END : 7/2/2007 LOGGER : J. Schaeffer, C. Dougherty

WATER LEVELS : 30.0 ft bgs on 7/2/2007			START : 7/7/2007			END : 7/2/2007			LOGGERS : J. Schaeffer, C. Dougherty		
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					
29.6	0.0	1.0	SS-1	0-2-3 (5)	Poorly Graded Sand With Silt To Silty Sand (SP-SM/SM) 0.0-1.0' - pale yellowish brown to moderate brown, (10YR 6/2 to 5YR 4/4), moist, loose, fine to medium grained, moderate HCl reaction in carbonate materials, mixed carbonate and silica grains, 10-20% nonplastic fines, trace roots			SS-1 appears to be fill			
	1.5										
5	5.0										
24.6		1.0	SS-2	11-12-13 (25)	Poorly Graded Sand With Silt (SP-SM) 5.0-6.0' - pale brown with grayish brown, (5YR 5/2 with 5YR 3/2), moist to wet, medium dense, fine grained, no HCl reaction, silica sand, 5-10% nonplastic fines						
	6.5										
10	10.0										
19.6		0.7	SS-3	4-7-11 (18)	Poorly Graded Sand (SP) 10.0-10.7' - light brownish gray grading to yellowish gray, (5YR 6/1 to 5Y 8/1), moist, medium dense, fine grained, no HCl reaction, silica sand, 5-10% nonplastic fines grading to <5%						
	11.5										
15	15.0										
14.6		0.7	SS-4	6-7-6 (13)	Poorly Graded Sand (SP) 15.0-15.7' - Same as 10.0-10.7' except trace, nonplastic fines, trace fine organics						
	16.5										
20											



PROJECT NUMBER: 338884.FL	BORING NUMBER: IT-02
SHEET 2 OF 7	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705642.1 N, 457838.7 E (NAD83)
 ELEVATION : 29.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 30.0 ft bgs on 7/2/2007 START : 7/1/2007 END : 7/2/2007 LOGGER : J. Schaeffer, C. Dougherty

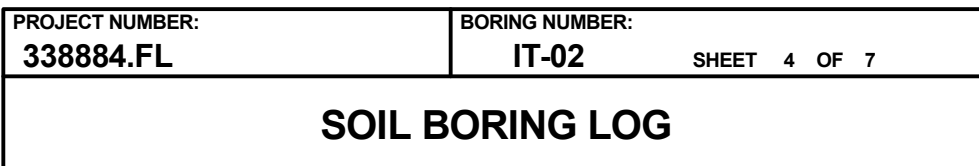
WATER LEVELS : 30.0 ft bgs on 7/2/2007			START : 7/7/2007			END : 7/2/2007			LOGGERS : J. Schaefer, C. Dougherty		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS			
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION						
9.6	20.0	0.9	SS-5	4-6-9 (15)	Poorly Graded Sand (SP) 20.0-20.9' - brownish gray, (5YR 4/1), moist to wet, medium dense, fine to medium grained, no HCl reaction, silica sand, 5% nonplastic fines		SS-5 is coarser grained than previous samples				
	21.5										
					Cuttings from bit above SS-6 are Fat Clay (CH) - greenish gray (5G 6/1), wet, high plasticity, no dilatancy, no HCl reaction						
25	25.0	0.0	SS-6	50/1" (50/1")	No Recovery 25.0-25.1' 25.0' - a few coarse grained limestone fragments, very mild HCl reaction		Driller's Remark: Hard at 24.5'				
4.6								Driller's Remark: 100% circulation loss at 26.0'; grinding to 26.0-26.5'; then softer drilling (still hard)			
30	30.0	0.9	SS-7	15-31-61 (92)	Limestone And Silty Sand (SM) 30.0-31.5' - medium gray, light olive gray and yellowish gray, (N5, 5Y 6/1 and 5Y 8/1), wet, dense, strong HCl reaction, fine to medium sand-sized, 3" lense of limestone, silty sand lenses 1/4" thick, 30% low to medium plastic fines, few carbonate material		Driller's Remark: 30.0-35.0' medium hard, no circulation				
-0.4	31.5										
35	35.0	0.0	SS-8	50/2" (50/2")	No Recovery 35.0-35.2'		Driller's Remark: Softer at 34.5'				
-5.4	35.2										
40											



PROJECT NUMBER: 338884.FL	BORING NUMBER: IT-02
SHEET 3 OF 7	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705642.1 N, 457838.7 E (NAD83)
 ELEVATION : 29.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard
 DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 30.0 ft bgs on 7/2/2007 START : 7/1/2007 END : 7/2/2007 LOGGER : J. Schaeffer, C. Dougherty

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
-10.4	40.0	1.5	SS-9	30-43-31 (74)	Silty Sand (SM) 40.0-41.5' - light olive gray, (5Y 5/2), wet, very dense, mild HCl reaction, very fine to medium sand-sized, all carbonate materials, 40-45% nonplastic fines, white thread-like lenses from 41.3-41.5', 1" limestone piece at 41.5', fossiliferous, mild HCl reaction		Driller's Remark: No circulation at 40'.0 (below casing) Driller's Remark: Harder at 42.5'; still no circulation. HW casing to 40.0'. Unclear if circulation loss is into formation at depth below casing or along the sides of the casing.
	41.5						
45	45.0				No Recovery 45.0-45.3' 45.0' - a few limestone fragments and cuttings, light olive gray (5Y 5/2), highly fossiliferous, mild to moderate HCl reaction		Driller's Remark: Circulation regained after casing set to 45.0' Driller's Remark: 45.0-50.0' not as hard as above
-15.4	45.3	0.0	SS-10	50/3" (50/3")			
50	50.0				Silty Sand (SM) 50.0-50.9' - mottled light olive gray, (5Y 5/2), wet, dense, mild to strong HCl reaction, fine to medium sand-sized, predominantly fine, 15-30% nonplastic to low plasticity fines varies throughout sample in lenses, 1" thick lens of coarse sand to fine gravel-sized lenticular limestone at 50.3', fine to coarse gravel-size, rounded limestone fragments with silt matrix surrounding fragments, HCl reaction varies from mild in limestone lense (50.0-50.5') to moderate to strong in fragments (50.5-50.9')		Driller's Remark: 50.0-55.0' drills hard and soft (alternates), feels like lenses SS-11 does not have massive appearance
-20.4	51.5	0.9	SS-11	21-14-9 (23)			
55	55.0				Silty Sand With Limestone Fragments (SM) 55.0-56.3' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), wet, dense, fine to coarse grained, mild to moderate HCl reaction, similar to SS-11, all carbonate, 30-40% nonplastic fines, 2" limestone fragment at top of sample, highly fossiliferous		
-25.4	56.5	1.3	SS-12	12-19-13 (32)			
60							



LOGGER : J. Schaeffer, C. Dougherty

Rev. 4



PROJECT NUMBER: <div style="background-color: black; color: white; padding: 2px; font-weight: bold;">338884.FL</div>	BORING NUMBER: <div style="background-color: black; color: white; padding: 2px; font-weight: bold;">IT-02</div> <div style="text-align: right; font-size: small;">SHEET 5 OF 7</div>
<div style="background-color: black; color: white; font-size: 1.2em; font-weight: bold; padding: 5px;">SOIL BORING LOG</div>	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705642.1 N, 457838.7 E (NAD83)

ELEVATION : 29.6 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

DRILLING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, auto hammer, NW rods, 4-7/8" tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 30.0 ft bgs on 7/2/2007 START : 7/1/2007 END : 7/2/2007 LOGGER : J. Schaeffer, C. Dougherty

WATER LEVELS : 30.0 ft bgs on 7/2/2007			START : 7/7/2007		END : 7/2/2007		LOGGERS : J. Schaeffer, C. Dougherty		
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			
-50.4	80.0	0.8	SS-17	41-50/5" (91/11")	Silty Sand With Limestone Fragments (SM) 80.0-80.7' - moderate yellowish brown, (10YR 5/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, similar to SS-15, 25-30% nonplastic fines, 15-20% fine gravel-sized limestone Mixed Materials 80.7-80.8' - moderate yellowish brown to dark yellowish brown to dusky brown, (10YR 5/4 to 10YR 4/2 to 5YR 2/2), moist, moderate HCl reaction, lense of mixed silts, fine to coarse sand-sized angular limestone and organic soil			SS-17: Lenses of limestone pieces throughout sample, much more than previous samples. Driller's Remark: 80-85 still drilling hard and soft, material is likely to wash out of core barrel	
80.9									
85	85.0	1.1	SS-18	5-8-9 (17)	Sandy Clay With Silt (CL-ML) 85.0-86.1' - moderate yellowish brown, (10YR 5/4), wet, stiff, nonplastic, rapid dilatancy, mild to moderate HCl reaction, 5-10% very fine to fine sand, all carbonate			Driller's Remark: 100% water loss at 88.0' Driller's Remark: Extremely soft at 88.5', possibly cavity	
-55.4	86.5								
90	90.5	0.4	SS-19	50/5" (50/5")	Silty Gravels (GM) 90.5-90.9' - mild to moderate HCl reaction, similar to SS-17 and SS-18, all carbonate materials, 1" rounded gravel-sized limestone piece, several 1/2" angular pieces Begin Rock Coring at 91.0 ft bgs See the next sheet for the rock core log			Driller's Remark: For SS-19 rods dropped to 90.5', SPT taken at 90.5', potential cavity from 88.5-90.5'	
-60.4	90.9								
95									
-65.4									
100									



PROJECT NUMBER:

338884.FL

BORING NUMBER:

IT-02

SHEET 6 OF 7

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1705642.1 N, 457838.7 E (NAD83)

ELEVATION : 29.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

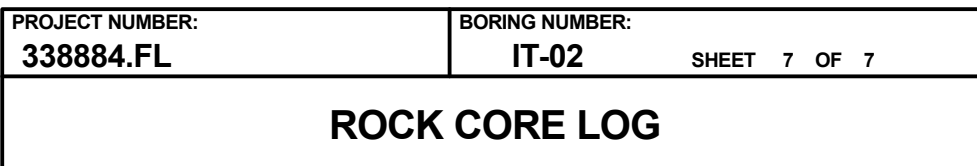
WATER LEVELS : 30.0 ft bgs on 7/2/2007

START : 7/1/2007

END : 7/2/2007

LOGGER : J. Schaeffer, C. Dougherty

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.
91.0	R1-HQ 5 ft 72%	33	>10	91.0-91.6' - Fracture zone, rough, undulating, numerous small fragments 3/16"-1-1/2" in size		Limestone 91.0-92.6' - moderate olive brown, (5Y 4/4), fine grained, mild to moderate HCl reaction, medium strong (R3), voids (<1/16") over 25% of surface, larger voids (up to 3/16") over 5% of surface, moderately fossiliferous, trace organics No Recovery 92.6-94.0' Limestone 94.0-96.0' - Same as 91.0-92.6'	Driller's Remark: Water at 30.0' below ground surface before extending casing from 45.0-90.0' Driller's Remark: Only about 25% return on circulation Driller's Remark: Core barrel hung up, barrel was pulled out, cleaned and put back in to finish run R1: 14 minutes
			>10	91.9' - Mechanical break			
			NR	92.1-92.6' - Fracture zone, rough, undulating, numerous small fragments 3/16"-1" in size			
			>10	94.0-94.5' - Fracture zone, 0-45 deg, rough, undulating, several fragments up to 9/16", film of organic material on some faces			
95 -65.4	R2-HQ 5 ft 100%	50	0	94.8-95.1' - Fracture zone, 0-90 deg, rough, undulating, fragments up to 2"		96.0-98.5' - Same as 91.0-92.6' except light olive gray, (5Y 5/2), strong (R4) rock at 97.7-97.8'	Driller's Remark: Loss of circulation at about 97.0'
			>10	95.4, 95.5, 96.5' - Mechanical break (3)			
			>10	97.0-98.6' - Fracture zone, 0-90 deg, rough, undulating, fragments from <3/8" - 3"			
			2	98.8' - Mechanical break, brown and gray staining on surfaces			
100 -70.4	R3-HQ 5 ft 84%	57	0	99.6-99.8' - Fracture, horizontal on lower face, 30 deg on upper face, crushed rock material and fragments up to 1/2"		Limestone 98.5-101.0' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), small voids (<1/16") over about 30% of surface, larger voids (3/16"x3/8") over about 5% of surface, fossil molds and casts common, very fossiliferous, small fragments of gray limestone make up <5% of surface. Thin (1/2") layer of gray limestone at 93.8' Limestone 101.0-105.2' - moderate yellowish brown, (10YR 5/4), fine grained, moderate HCl reaction, medium strong (R3), voids (<1/16") cover 25% of surface to about 102', then only 15%, trace voids larger than 1/16", trace organics No Recovery 105.2-106.0'	R2: 6 minutes
			>10	100.8' - Mechanical break			
			1	99.8-100.2' - Fracture, <5 deg			
			0	100.8' - Mechanical break			
105 -75.4	R4-HQ 5 ft 68%	47	0	101.0-102.1' - Fracture zone, numerous fragments, film of carbonate derived silt in fractures		106.0-109.4' - pale yellowish brown transitions to dusky yellow, (10YR 6/2 to 5Y 6/4), fine grained, moderate HCl reaction, medium strong (R3), <1/16" voids cover about 15% of surface, trace larger voids (up to 3/16"), trace organics 106.8-107.9' - voids more abundant (35% for <1/16" voids and 5% for up to 3/16" voids). Larger voids and fossil molds are up to 3/16"x1-3/16" 108.1' - a large cavity measuring about 1-3/16"x2-3/8" No Recovery 109.4-111.0'	SC-1 collected at 103.1-103.9' R3: 8 minutes
			NR	103.1' - Mechanical break			
			1	103.9' - Fracture, horizontal, film of carbonate derived silt infill			
			>10	104.8' - Mechanical break			
110 -80.4			2	106.5, 106.6' - Fractures, horizontal, rough, undulating, tight to open up to 1/16"			
			>10	107.0-107.2' - Fracture zone, rough, undulating, numerous small fragments (3/16" to 9/16")			
			1	107.7-107.8' - Fracture zone, same as for 107.0-107.2'			
			>10	107.8-108.1' - Fracture, vertical, rough, undulating, tight			
			>10	108.3-108.7' - Fracture, 70 deg, closed			
			NR	109.0-109.4' - Fracture zone			
111.0							



ELEVATION : 29.6 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Ft. Myers, FL; Driller: R. Woodard

CORING METHOD AND EQUIPMENT : CME 75 S/N 252437, mud rotary, HQ tools, HW casing

ORIENTATION : Vertical

WATER LEVELS : 30.0 ft bgs on 7/2/2007

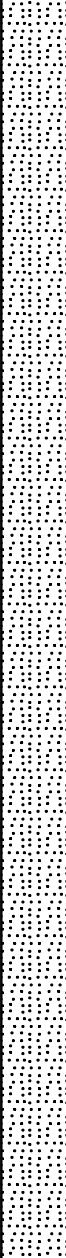
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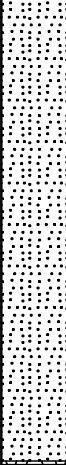

END : 7/2/2007

LOGGER : J. Schaeffer, C. Dougherty

APPENDIX 2BB-1158



LNP- OFFSET BORING PROGRAM						LOG OF BORING NO. O-1		PROJECT NO. 07-3935		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS		
						DESCRIPTION				
	0					0.0-20.0' Sand-fine grained.	sp	Destructive drilling from 0-20'. Log based on drill cuttings.		
	2									
	4									
	6									
	8						As above except with Dolomite layers, little clay.	sp		
	10									
	12									
	14									
DATE STARTED: 9/2/09						GWL: DEPTH: 3.4' DATE/TIME: 9/3/09 @ 0730		NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.		
DATE COMPLETED: 9/8/09						GWL: DEPTH: 4.5' DATE/TIME: 9/8/09 @ 0900				
FIELD GEOLOGIST: JLO						DRILLING METHOD: Mud Rotary/PQ3 Coring		RIG: Failing 1500		
CHECKED BY: WDS										
APPROVED BY:						DRILLER: Eddie Palmer HELPER: Chad/Cody				
DRILLING CO.: HUSS										

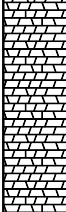
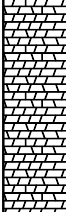
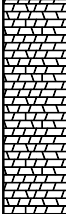
LNP- OFFSET BORING PROGRAM						LOG OF BORING NO. O-1		PROJECT NO. 07-3935	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS	
						DESCRIPTION			
22.7	<div style="text-align: center;">16</div> <div style="text-align: center;">18</div> <div style="text-align: center;">20</div> <div style="text-align: center;">22</div> <div style="text-align: center;">24</div> <div style="text-align: center;">26</div> <div style="text-align: center;">28</div>					As above except with organics.	sp	At 20' switched to core barrel for advancement-no casing set.	
						TOP OF AVON PARK FORMATION 20.0-35.0' DOLOMITE, fossiliferous, highly weathered, porous, soft.		Chatter at 28'. Soft area 25-30'. Kelly Bar RPM: 203 Engine PRM: 1300	
DATE STARTED: 9/2/09 DATE COMPLETED: 9/8/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 3.4' DATE/TIME: 9/3/09 @ 0730 GWL: DEPTH: 4.5' DATE/TIME: 9/8/09 @ 0900 DRILLING METHOD: Mud Rotary/PQ3 Coring			NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.	
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500	

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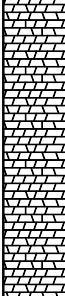
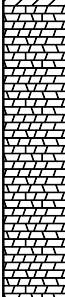
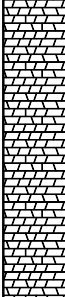


LNP- OFFSET BORING PROGRAM						LOG OF BORING NO. O-1		PROJECT NO. 07-3935			
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7		USCS SYMBOL	REMARKS		
						DESCRIPTION					
-11.3	44					45.0-54.0' DOLOMITE with interbedded degraded dolomite layers (sandy texture).					
	46										
	48										
	50					54.0-57.0' Clay, low to no plasticity.		cl	55.0-60.0' Drill time: 13min 18sec.		
	52										
	54										
-14.3	56					57.0-61.15' DOLOMITE.			Driller Notes: harder at 57'. Water level on 9/3/09 @ 0730 is 3.4'.		
	58										
DATE STARTED: 9/2/09					GWL: DEPTH: 3.4'		DATE/TIME: 9/3/09 @ 0730		NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.		
DATE COMPLETED: 9/8/09					GWL: DEPTH: 4.5'		DATE/TIME: 9/8/09 @ 0900				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring						
CHECKED BY: WDS											
APPROVED BY:					DRILLER: Eddie Palmer		HELPER: Chad/Cody		RIG: Failing 1500		
DRILLING CO.: HUSS											




LNP- OFFSET BORING PROGRAM	LOG OF BORING NO. O-1	PROJECT NO. 07-3935
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ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS	
						DESCRIPTION			
-20.4	60	R-1	100% (55%)	3.85		61.15-63.1' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard to hard, thick bedded, with organic layers, porous, unfractured, weak reaction to 1N HCl when powdered.	cl	60-62' Drill Time: 11min 20sec. Set casing at 62'. Run-1: Drilling Pressure: 250-300 psi Kelly Bar RPM: 199 Engine RPM: 1200-1300 Drill Time: 10min 8sec Circulation loss: none	
-21.1	62					63.1-63.8' CLAY, calcareous, sandy, no plasticity, some dolomite fragments throughout.			
	64					63.8-65.5' DOLOMITE, same as above.			
	66	R-2	96% (44%)	4.8		65.5-66.0' Wash out zone (evidence of bit spinning on core above).	cl	Run-2: Drilling Pressure: 300-350 psi Kelly Bar RPM: 197 Engine RPM: 1200 Drill Time: 26min 9sec Circulation loss: none 67', 67.5', 67.7', 67.8', 69.2' fines washed out.	
-26.7	68					66-69.4' DOLOMITE, pale yellowish brown (10YR 6/2), alternating zones of porous and fine grained layers, trace organics, moderately hard, fresh to slightly weathered, moderate reaction to 1N HCl when powdered.			
-27.3	70					69.4-70.0' Sandy CLAY (cl), pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), interbedded with highly weathered dolomite.			
	72	R-3	80% (40%)	4.0		70-75' DOLOMITE, pale yellowish brown (10YR 6/2) with limestone clasts (light gray (N7) to medium light gray (N6)), moderately hard, slightly to moderately weathered, porous, vuggy, becomes very sandy below 73', weak reaction to 1N HCl when powdered, some fossils. 71.2-72.1' Vertical fracture.		Run-3: Drilling Pressure: 350-250 psi Kelly Bar RPM: 207 Engine RPM: 1300 Drill Time: 12min 34sec Circulation loss: none	
						72.5' Soft zone (residual remains), silty clay, grayish brown (5YR 3/2).			
DATE STARTED: 9/2/09					GWL: DEPTH: 3.4' DATE/TIME: 9/3/09 @ 0730			NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.	
DATE COMPLETED: 9/8/09					GWL: DEPTH: 4.5' DATE/TIME: 9/8/09 @ 0900				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring				
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500	
APPROVED BY:									
DRILLING CO.: HUSS									

BORING NO. O-1
 SHEET 5 OF 15

LNP- OFFSET BORING PROGRAM						PROJECT NO. 07-3935			
LOG OF BORING NO. O-1									
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS	
						DESCRIPTION			
-35.8 -35.9	74	R-4	92% (10%)	4.6		75-78.5' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, porous, sandy texture, fined grained, fossiliferous, moderately weathered, thick bedded but moderately to intensely fractured, weak reaction to 1N HCl when powdered. Vertical fractures at 75.3-76.2', and 76.2-76.5'. 76.5-76.7' Rubble.	cl	Run-4: Drilling Pressure: 300-250 psi Kelly Bar RPM: 196 Engine RPM: 1200 Drill Time: 20min 53sec Circulation loss: none Driller Notes: 77.5-78.5' softer, dark color cuttings return. Vertical fractures at 75.3-76.2', 76.2-76.5'	
	76					78.5-78.6' Silty CLAY, grayish brown (5YR 3/2), as above. 78.6' Dolomite becomes very sandy, poorly indurated.			
	78					80.0-85.0' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, porous, slightly to moderately weathred, fossiliferous, moderate reaction to 1N HCl when powdered, thick bedded.			
	80	R-5	90% (38%)	4.5		81.7-82.0' Vertical fracture. 82.0-82.8' Dolomite becomes very sandy, severely weathered. Vuggy below 82.8'.		Run-5: Drilling Pressure: 350-500-300 psi Kelly Bar RPM: 198 Engine RPM: 1200 Drill Time: 29min 23sec Circulation loss: none	
82	85-85.6' DOLOMITE, pale yellowish brown (10YR 6/2), fresh, vuggy, weak reaction to 1N HCl when powdered, medium bedded, moderately hard. 85.6-88.3' DOLOMITE, pale yellowish brown (10YR 6/2), moderately to severely weathered, fossiliferous, porous, moderate reaction to 1N HCl when powdered, vuggy, intensely fractured.								
84									
	86	R-6	100% (32%)	2.5				Run-6: Drilling Pressure: 200 psi Kelly Bar RPM: 199 Engine RPM: 1200 Drill Time: 13min 41sec (85-85.8') 13min 54sec (85.8-87.5') Circulation loss: none Run-7:	
DATE STARTED: 9/2/09 DATE COMPLETED: 9/8/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 3.4' DATE/TIME: 9/3/09 @ 0730 GWL: DEPTH: 4.5' DATE/TIME: 9/8/09 @ 0900 DRILLING METHOD: Mud Rotary/PQ3 Coring			NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.	
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500	

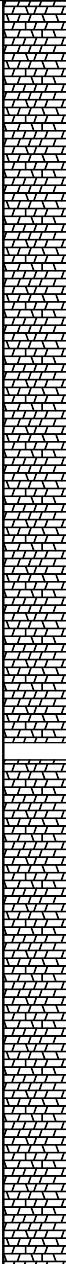
BORING NO. O-1
 SHEET 6 OF 15

LNP- OFFSET BORING PROGRAM						LOG OF BORING NO. O-1		PROJECT NO. 07-3935		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS		
						DESCRIPTION				
	88	R-7	92% (12%)	2.3		88.3' Olive gray (5Y 3/2), no plasticity sandy CLAY around dolomite pieces. 88.3-90' DOLOMITE becomes sandy, highly fractured, no fossils, hard, moderate reaction to 1N HCl when powdered, moderately weathered.		Drilling Pressure: 450-500 psi Kelly Bar RPM: 177 Engine RPM: 1100 Drill Time: 19min 24sec Circulation loss: 90% Water level on 9/4/09 @ 0730 is 4.8'. Run-8: Drilling Pressure: 500 psi Kelly Bar RPM: 209 Engine RPM: 1300 Drill Time: 23min 12sec Circulation loss: 20% Run-9: Drilling Pressure: 400 psi Kelly Bar RPM: 197 Engine RPM: 1200 Drill Time: 24min 51sec Circulation loss: 100% below 97' Run-10: Drilling Pressure: 450 psi Kelly Bar RPM: 183 Engine RPM: 1100-1200 Drill Time: 18min 36sec Circulation loss: 100%		
	90					90-90.8' DOLOMITE gravel (matrix possibly washed away).				
-48.8						90.8-91.5' DOLOMITE, sandy, porous, vuggy, grayish orange (10YR 7/4) with very pale orange (10YR 8/2) dolomite clasts, fossiliferous, moderately soft, slightly to moderately weathered, breaks easily.				
-49.3	92	ROD DROP 91.5-92'.								
		92-95.2' DOLOMITE, same as above.								
		92.3' Color change (gradual transition) to pale yellowish brown (10YR 6/2) with increase in amount and size of very pale orange (10 YR 8/2) dolomite clasts, fresh, thick bedded, moderately hard, weak to no reaction to 1N HCl when powdered.								
	94	93.5' Becomes highly fractured with clasts of crystalline dolomite.								
		95-95.2' Residual dolomite gravel from previous run.								
	96	95.2-97' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, slightly weathered, fossiliferous, porous, moderate reaction to 1N HCl when powdered, with thin layers of microcrystalline dolomite, sandy texture, medium bedded.								
-54.3			80% (22%)	4.0		97-97.8' ROD DROP.				
-55.1	98	97.8-100' DOLOMITE, as above except highly fractured.								
		100-100.7' DOLOMITE rubble.								
	100					100.7-101.6' DOLOMITE, grayish orange (10YR 7/4), moderately hard, moderate reaction to 1N HCl, medium bedded, vuggy, fossiliferous, fresh (except for 101-101.2' moderately weathered and fractured).				
		101.6-105.0' Color change to pale yellowish brown (10YR 6/2), vuggy.								
	102	102-102.2' Severely weathered/broken zone.								
DATE STARTED: 9/2/09					GWL: DEPTH: 3.4'		DATE/TIME: 9/3/09 @ 0730		NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'. RIG: Failing 1500	
DATE COMPLETED: 9/8/09					GWL: DEPTH: 4.5'		DATE/TIME: 9/8/09 @ 0900			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring					
CHECKED BY: WDS										
APPROVED BY:					DRILLER: Eddie Palmer		HELPER: Chad/Cody			
DRILLING CO.: HUSS										

LNP- OFFSET BORING PROGRAM

PROJECT NO. 07-3935

LOG OF BORING NO. O-1

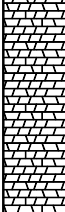
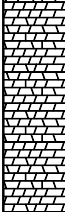
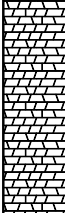

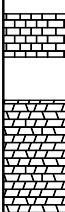
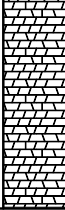
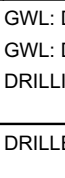
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS				
						DESCRIPTION						
-68.3 -68.5	104	R-10	100% (24%)	5.0		102.9' Broken zone, then becomes sandy DOLOMITE, moderately soft, highly fractured, vertical fracture from 103-104.5', moderate reaction to 1N HCl when powdered.		Run-11: Drilling Pressure: 400 psi Kelly Bar RPM: 228 Engine RPM: 1400-1500 Drill Time: 10min 15sec Circulation loss: 100%				
	106	R-11	100% (56%)	5.0		105-110' DOLOMITE, sandy, grayish orange (10YR 7/4), moderately soft, porous, few fossils, thick bedded, fresh to slightly weathered, some fractures (106.8' 45°- possibly mechanical), moderate reaction to 1N HCl when powdered.						
	108					108-109.1' Vertical fracture.						
	110					110-115.0' DOLOMITE, interlayered sandy and microcrystalline, vuggy, moderately fractured, moderate reaction to 1N HCl, few to no fossils, medium bedded, moderately to severely weathered.						
	112	R-12	86% (28%)	4.3		111.0-111.2' ROD DROP.				Run-12: Drilling Pressure: 300 psi Kelly Bar RPM: 199 Engine RPM: 1200-1300 Drill Time: 13min 6sec Circulation loss: 100% Driller notes slight rod drop around 111' (2 to 3") softer material, faster drilling.		
	114					112.7' Possible soft zone.						
	116					113.7' Dolomite becomes all sandy, larger vugs, fossiliferous, moderately hard, slightly to moderately weathered.						
									115-119.5' DOLOMITE, severely weathered, medium to coarse grained, poorly indurated, soft, fossiliferous, friable, pale yellowish brown (10YR 6/2), thick bedded, moderate reaction to 1N HCl when powdered.		Run-13: Drilling Pressure: 200-250 psi Kelly Bar RPM: 212 Engine RPM: 1300-1400 Drill Time: 6min 23sec Circulation loss: 100% Driller notes extremely soft first 4 feet.	
	DATE STARTED: 9/2/09					GWL: DEPTH: 3.4' DATE/TIME: 9/3/09 @ 0730			NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.			
	DATE COMPLETED: 9/8/09					GWL: DEPTH: 4.5' DATE/TIME: 9/8/09 @ 0900						
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring		RIG: Failing 1500					
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody							
APPROVED BY:												
DRILLING CO.: HUSS												

BORING NO. O-1
 SHEET 8 OF 15

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-1

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4	USCS SYMBOL	REMARKS	
						SURFACE EL: 42.7			
						DESCRIPTION			
	118	R-13	60% (32%)	3.0		119.5-120.0' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, fresh, moderate reaction to 1N HCl when powdered, fossiliferous, porous, sandy texture. 120-121.6' DOLOMITE, grayish orange (10YR 7/4), moderately hard, porous, fossiliferous, vuggy (in horizontal bands), medium bedded, fresh to slightly weathered, with interbedded layers of hard, fine grained dolomite, medium light gray (N6).		Run-14: Drilling Pressure: 200-300 psi Kelly Bar RPM: 193 Engine RPM: 1200 Drill Time: 17min 30sec Circulation loss: 100%	
	120					121.6-122.5' As above except no dolomite layers, intensely fractured, moderately weathered.			
	122	R-14	98% (56%)	4.9		122.5-124.8' DOLOMITE, grayish orange (10YR 7/4), moderately soft, moderate to strong reaction to 1N HCl when powdered, thick bedded, vuggy, fossiliferous, porous, fresh.			
	124					124.8-125' Same as 120-121.6'. 125-126.5' DOLOMITE, light olive gray (5Y 5/2), moderately hard, weak reaction to 1N HCl, vuggy, fossiliferous, porous/sandy texture, thick bedded, fresh to slightly weathered.			
-83.8						126.5'-127.0' ROD DROP 126.5-127.0'.		Run-15: Drilling Pressure: 200 psi Kelly Bar RPM: 200 Engine RPM: 1200-1300 Drill Time: 18min 10sec Circulation loss: 100% Driller Notes: soft at 128'.	
-84.3						127.0-127.5' LIMESTONE, medium light gray (N6), strong reaction to 1N HCl, thin bedded, few fossils.			
-84.8		R-15	62% (26%)	3.1		127.5'-128.0' ROD DROP 127.5-128.0'.			
-85.3	128					128-130' DOLOMITE, as above except moderately to severely weathered, fossiliferous, vuggy, porous.			
	130					130-130.8' DOLOMITE, fine grained but porous, moderate reaction to 1N HCl, medium bedded, fresh, few vugs and fossils, yellowish gray (5Y 7/2). 130.8-131.6' As above except more porous/sandy texture, friable, moderately weathered.		Run-16: Drilling Pressure: 350-200 psi Kelly Bar RPM: 198 and 188 Engine RPM: 1200-1300 and 1100-1200 Drill Time: 9min 30sec (130-131.5')	
DATE STARTED: 9/2/09					GWL: DEPTH: 3.4'		DATE/TIME: 9/3/09 @ 0730	NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.	
DATE COMPLETED: 9/8/09					GWL: DEPTH: 4.5'		DATE/TIME: 9/8/09 @ 0900		
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring				
CHECKED BY: WDS								RIG: Failing 1500	
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody				
DRILLING CO.: HUSS									

BORING NO. O-1
 SHEET 9 OF 15

LNP- OFFSET BORING PROGRAM

PROJECT NO. 07-3935

LOG OF BORING NO. O-1

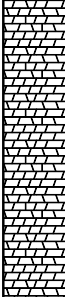
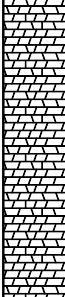
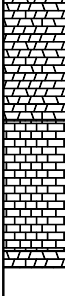
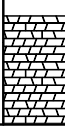
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (ROD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
-93.3 <								

BORING NO. O-1
 SHEET 10 OF 15

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-1

PROJECT NO. 07-3935

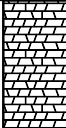
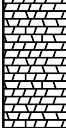
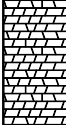
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4	USCS SYMBOL	REMARKS
						SURFACE EL: 42.7		
						DESCRIPTION		
	148	R-19	68% (30%)	3.4		146.5-150' DOLOMITE, yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), moderately hard to hard, alternating zones/bands of fresh and slightly to moderately weathered, fossiliferous, vuggy, sandy texture in weathered zones, moderate to strong reaction to 1N HCl when powdered, few clasts of limestone, thick bedded (horizontal breaks are mechanical).		2min 57sec (149-150') Circulation loss: 100%
	150					150-154' DOLOMITE, light olive gray (5Y 5/2), yellowish gray (5Y 7/2), pale yellowish brown (10YR 6/2), and pale yellowish orange (10YR 8/6) in thin layers, moderately hard, some vugs, few fossils, moderate reaction to 1N HCl when powdered, thick bedded, fresh.		Run-20: Drilling Pressure: 450-350 psi Kelly Bar RPM: 201 Engine RPM: 1200-1300 Drill Time: 16min 50sec (150-153') 9min 21sec (153-155') Circulation loss: 100%
	152	R-20	100% (64%)	5.0		151.4-151.8' As above except moderately weathered (porous texture). 151.8-153' Same as at 150'. 153-154' Intensely weathered to degraded, thinly laminated.		
	154					154-155' DOLOMITE, pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), moderately hard, thick bedded, crystalline, strong reaction to 1N HCl when powdered, moderately fractured (vertical).		
	156					155-156.2' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, moderate reaction to 1N HCl when powdered, fossiliferous, vuggy, fresh, thick bedded.		Run-21: Drilling Pressure: 250-300 Kelly Bar RPM: 210 Engine RPM: 1300 Drill Time: 7min 39sec (155-157') 21min 10sec (157-159') 2min 54sec (159-160') Circulation loss: 100% 155-155.6' Healed vertical fracture.
-114.8	158	R-21	92% (42%)	4.6		156.2-157.5' As above except moderately to severely weathered, porous texture, sandy.		
						157.5-159' LIMESTONE, moderately hard to hard, light gray (N7) to light olive gray (5Y 6/1), medium to thick bedded, fresh to slightly weathered, moderately fractured, banded layers, strong reaction to 1N HCl.		
-116.3						159-160' DOLOMITE as at 156.2'.		
-116.5						ROD DROP 159.2-159.7'.		
-117.0	160					160-161' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, porous texture, moderate reaction to 1N HCl, fossiliferous, moderated weathered, thick bedded.		Run-22: Drilling Pressure: 300 psi Kelly Bar RPM: 199 Engine RPM: 1200-1300
DATE STARTED: 9/2/09					GWL: DEPTH: 3.4' DATE/TIME: 9/3/09 @ 0730		NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.	
DATE COMPLETED: 9/8/09					GWL: DEPTH: 4.5' DATE/TIME: 9/8/09 @ 0900			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
DRILLING CO.: HUSS								

BORING NO. O-1
 SHEET 11 OF 15

LNP- OFFSET BORING PROGRAM

PROJECT NO. 07-3935

LOG OF BORING NO. O-1

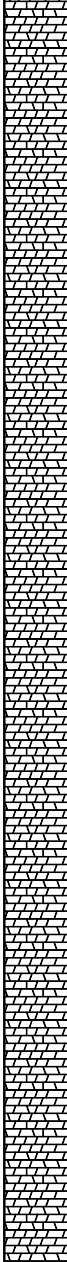
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
	162	R-22	94% (40%)	4.7		161-161.9' Vertical fracture. 161.9-162.7' DOLOMITE, as above except slightly weathered, vuggy, some pale brown (5YR 5/2) layers/bands and trace limestone. 162.7-163' As above except intensely broken (possibly mechanical). 163-165' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, strong reaction to 1N HCl when powdered, medium to thick bedded, moderately weathered, porous texture, fossiliferous, few horizontal breaks (possibly mechanical).		Drill Time: 10min 13sec (160-163') 6min 27sec (163-165') Circulation loss: 100%
	164							
	166	R-23	90% (16%)	4.5		165-167' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, moderate reaction to 1N HCl when powdered, moderately weathered, porous texture, sandy, vuggy, with limestone zones and layers, moderately fractured, limestone is medium light gray (N6), strong reaction to 1N HCl, hard. 167-170' DOLOMITE, crystalline, pale yellowish brown (10YR 6/2), moderately hard, fresh, thick bedded, few fossils, few vugs, strong reaction to 1N HCl. 168.2-168.5' Vertical fracture. 168.3-170' As above except intensely fractured (possibly mechanical).		Run-23: Drilling Pressure: 300-250-300 psi Kelly Bar RPM: 210 Engine RPM: 1300 Drill Time: 8min 39sec (165-167.5') 21min 56sec (167.5-170) Circulation loss: 100% 165.5-166' Vertical fracture-faces stained black with white rounded calcite grains.
	168							
	170					170-174.5' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, fresh to slightly weathered, thick bedded, moderate reaction to 1N HCl when powdered, with some light olive gray (5Y 5/2) dolomite clasts from 107.3-170.7'. 170.8-171.5' As above except moderately weathered, vuggy, porous texture, sandy.		Run-24: Drilling Pressure: 350-200-250 psi Kelly Bar RPM: 209 Engine RPM: 1300 Drill Time: 17min 11sec (170-172.5') 10min 34sec (172.5-174') 10min 1sec (174-175') Circulation loss: 100% Water level on 9/8/09 @ 0900 is 4.5'. NOTE: Zones at 172.5' and 174' mechanically broken during removal from shoe.
	172	R-24	100% (30%)	5.0		172-172.5' Intensely fractured. 172.5-173' Unfractured, no dolomite clasts. 173-174.5' Moderately fractured, moderately weathered.		
	174					174.5-175' DOLOMITE, hard, light olive gray (5Y 6/1), strong reaction to 1N HCl, crystalline, no fossils, thick bedded, moderately to intensely fractured (possibly mechanical), fresh to slightly weathered, few vugs.		Run-25: Drilling Pressure: 300-250 psi
DATE STARTED: 9/2/09					GWL: DEPTH: 3.4' DATE/TIME: 9/3/09 @ 0730		NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.	
DATE COMPLETED: 9/8/09					GWL: DEPTH: 4.5' DATE/TIME: 9/8/09 @ 0900			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
DRILLING CO.: HUSS								

BORING NO. O-1
 SHEET 12 OF 15

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-1

PROJECT NO. 07-3935





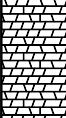




ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4	USCS SYMBOL	REMARKS				
						SURFACE EL: 42.7						
						DESCRIPTION						
	176	R-25	90% (38%)	4.5		175-180' DOLOMITE, moderately soft to moderately hard, pale yellowish brown (10YR 6/2) to dark yellowish orange (10YR 6/6), thick bedded, moderately weathered, porous texture, sandy (with nodules of dolomite-medium light gray (N6)), hard, strong reaction to 1N HCl, weak to moderate reaction to 1N HCl when powdered.		Kelly Bar RPM: 216 Engine RPM: 1300-1400 Drill Time: 30min 5sec Circulation loss: 100% Driller Notes: 175-176' very soft.				
	178					177.6' Dolomite becomes moderately fractured, vuggy.						
	180					180-185' DOLOMITE, moderately hard to hard, pale yellowish brown (10YR 6/2), moderately to intensely fractured, thick bedded, fresh to slightly weathered, moderate to strong reaction to 1N HCl when powdered, some vugs and medium light gray (N6) dolomite clasts.						
	182	R-26	100% (0%)	5.0		181.6' Very thin sandy CLAY layer, no plasticity, moderate yellowish brown (10YR 5/4)-in between a horizontal fracture.			Run-26: Drilling Pressure: 250-200 psi Kelly Bar RPM: 223 Engine RPM: 1400-1500 Drill Time: 12min 7sec (180-182') 21min 42sec (182-185') Circulation loss: 100%			
	184					185-187' DOLOMITE, pale yellowish brown (10YR 6/2) to grayish orange (10YR 7/4), moderately hard, moderate to strong reaction to 1N HCl when powdered, thick bedded, moderately to intensely fractured, few vugs and fossils, slightly to moderately weathered, MnO grains throughout, few thin layers of crystalline dolomite.				Run-27: Drilling Pressure: 200-250-250 Kelly Bar RPM: 225 Engine RPM: 1400-1500 Drill Time: 16min 9sec (185-187') 3min 25sec (187-190') Circulation loss: 100% 187-190' very soft-fast drilling.		
	186					187' Becomes moderately to severely weathered, sandy texture. 187-190.0' DOLOMITE, soft, severely weathered to degraded, sandy texture, intensely fractured, few nodules of unweathered limestone, moderate reaction to 1N HCl, few darker (possibly organic) layers, very thin.						
	188	R-27	90% (0%)	4.5		190-190.8' DOLOMITE, grayish orange (10YR 7/4) to pale yellowish			Run-28:			
	190											
	DATE STARTED: 9/2/09					GWL: DEPTH: 3.4' DATE/TIME: 9/3/09 @ 0730			NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.			
	DATE COMPLETED: 9/8/09					GWL: DEPTH: 4.5' DATE/TIME: 9/8/09 @ 0900						
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring							
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500					
APPROVED BY:												
DRILLING CO.: HUSS												

BORING NO. O-1
SHEET 13 OF 15

LNP- OFFSET BORING PROGRAM

PROJECT NO. 07-3935

LOG OF BORING NO. O-1

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
	192	R-28	100% (30%)	5.0		brown (10YR 6/2), moderately weathered, porous texture-sandy, vuggy, thick bedded, few small thin fractures, moderate reaction to 1N HCl when powdered. 190.8-192.4' DOLOMITE, pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 5/4), moderately soft, moderately weathered, thick bedded but with banded appearance, few vugs, moderately fractured, wavy basal contact.		Drilling Pressure: 200-150-200 psi Kelly Bar RPM: 215 Engine RPM: 1300-1400 Drill Time: 4min 38sec (190-192') 10min 26sec (192-193.5') 25min 44sec (193.5-195) Circulation loss: 100%
	194					192.4-195' DOLOMITE, crystalline, fresh, moderately fractured, pitted, pale yellowish brown (10YR 6/2) and grayish orange (10YR 7/4), moderately hard, few fossils, and few dolomite clasts.		
	196	R-29	100% (0%)	5.0		195-196.5' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2) to yellowish gray (5Y 7/2), intensely fractured, crystalline, slightly to moderately weathered, pitted, fossiliferous in bands, moderate to strong reaction to 1N HCl when powdered, thick bedded.		Run-29: Drilling Pressure: 150-200 psi Kelly Bar RPM: 204 Engine RPM: 1200-1300 Drill Time: 56min 43sec Circulation loss: 100%
	198					196.5-197.4' As above except very intensely fractured.		
	200					197.4-200' DOLOMITE, moderately hard, moderate to strong reaction to 1N HCl when powdered, banded appearance in color-grayish orange (10YR 7/4), pale yellowish brown (10Y 6/2), and moderate yellowish brown (10YR 5/4), fossiliferous, pitted/fossiliferous in zones/bands, thin bedded, moderately to intensely fractured.		
	202	R-30	100% (54%)	5.0		200-202.7' DOLOMITE, yellowish gray (5Y 7/2) to pale yellowish brown (10YR 6/2), thick bedded, moderately to intensely fractured, fossiliferous, pitted, moderately weathered, moderate reaction to 1N HCl when powdered.		Run-30: Drilling Pressure: 100-150-100 psi Kelly Bar RPM: 211 Engine RPM: 1300-1400 Drill Time: 35min 41sec Circulation loss: 100%
-160.8						202.7-203.5' DOLOMITE, as above except very slightly fractured, slightly weathered, pitted, vuggy, few thin laminae (dark gray (N3)).		
-161.4	204					203.5-204.1' LIMESTONE, moderately hard to hard, light olive gray (5Y 6/1), moderately fractured, slightly to moderately weathered, fine grained, pitted and fossiliferous in bands.		
						204.1-205' DOLOMITE, pale yellowish brown (10YR 6/2), slightly to		
DATE STARTED: 9/2/09 DATE COMPLETED: 9/8/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 3.4' DATE/TIME: 9/3/09 @ 0730 GWL: DEPTH: 4.5' DATE/TIME: 9/8/09 @ 0900 DRILLING METHOD: Mud Rotary/PQ3 Coring		NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.	
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	

BORING NO. O-1
 SHEET 14 OF 15

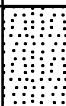


LNP- OFFSET BORING PROGRAM						LOG OF BORING NO. O-1		PROJECT NO. 07-3935	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723173.4 E 458057.4 SURFACE EL: 42.7	USCS SYMBOL	REMARKS	
						DESCRIPTION			
-162.3						moderately weathered, pitted/vuggy, fossiliferous, moderately hard, moderate reaction to 1N HCl when powdered, thick bedded, unfractured.			
	206					BOTTOM OF BORING 205'			
	208								
	210								
	212								
	214								
	216								
	218								
DATE STARTED: 9/2/09					GWL: DEPTH: 3.4'	DATE/TIME: 9/3/09 @ 0730	NOTES: Logging of coring per the Work Plan started at 62'. General rock description logged from 20-62'.		
DATE COMPLETED: 9/8/09					GWL: DEPTH: 4.5'	DATE/TIME: 9/8/09 @ 0900			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring				
CHECKED BY: WDS									
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500		
DRILLING CO.: HUSS									

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2


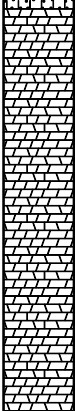
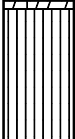
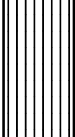
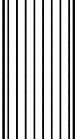
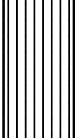

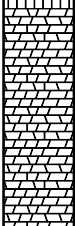
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS	
						DESCRIPTION			
36.7	0	S-1	4-7 5 (12)	0.8		0.0-1.5' POORLY GRADED SAND (sp), fine to medium grained, subrounded to rounded, no plasticity, no dry strength, rapid dilatancy, low toughness, grayish brown (5YR 3/2), moist to wet, no reaction to 1N HCl, medium dense.	sp		
	2	S-2	8-6 5 (11)	1.0		1.5-5.0' POORLY GRADED SAND (sp), fine to medium grained, well sorted, subangular to subrounded, no plasticity, no dry strength, rapid dilatancy, low toughness, dark yellowish orange (10YR 6/6), moist, no reaction to 1N HCl, medium dense.	sp		
	4	S-3	5-3 3 (6)	1.0			sp		
		S-4	5-4 4 (8)	1.0		5.0-6.0' POORLY GRADED SAND (sp), fine grained, subangular to rounded, well sorted, no plasticity, no dry strength, rapid dilatancy, low toughness, very pale orange (10YR 8/2), no reaction to 1N HCl, loose.	sp		
	6	S-5	3-3 4 (7)	1.0		6.0-9.0' POORLY GRADED SAND with CLAY (sp-sc), fine grained, well sorted, subangular to subrounded, medium plasticity, medium dry strength, slow dilatancy, medium toughness, light gray (N7) to medium light gray (N6), medium stiff, no reaction to 1N HCl.	sp-sc		
	8	S-6	1-1 1 (2)	0.9		7.5' As above except with less clay, very light gray (N8) to light gray (N7).	sp-sc		
	10	S-7	W-1 1 (2)	0.8		9.0-12.0' POORLY GRADED SAND with CLAY (sp-sc), 5% dolomite (large pebble size, soft), fine grained, subrounded to rounded, maximum size large pebble, well sorted, medium plasticity, medium dry strength, slow dilatancy, low toughness, medium dry strength, very light gray (N8) to light gray (N7), moist, very soft, strong reaction to 1N HCl.	sp-sc		
		S-8	W-W 1 (1)	0.4		10.5' As above except more dolomite.	sp-sc		
	30.7	12					12.0-12.8' POORLY GRADED SAND (sp), trace silt, fine to medium grained, low plasticity, low dry strength, rapid dilatancy, low toughness, light bluish gray (5B 7/1), moist, no reaction to 1N HCl, loose.		sp
	29.9		S-9	1-3 5 (8)		1.1			
	14	S-10	5-12 42 (54)	1.5		12.8-15.5' POORLY GRADED SAND with SILT (sp-sm), fine grained, no plasticity, low dry strength, rapid dilatancy, low toughness, grayish orange (10YR 7/4), moist, no reaction to 1N HCl, loose.	sp-sm		
DATE STARTED: 9/10/09					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715		NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'		
DATE COMPLETED: 9/18/09					GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring				
CHECKED BY: WDS									
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500		
DRILLING CO.: HUSS									

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2

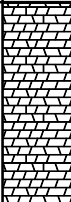
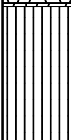
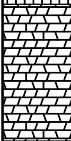
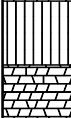
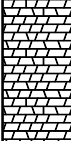
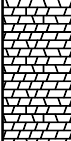
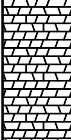
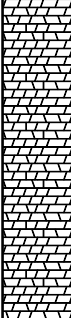
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
27.2	16	S-11	48-50/0 (50)	0.2		15.0' As above except with granule to small pebble size limestone pieces.	sp-sm	15.5-20.0' Started coring to advance boring-no casing set.
		OB-1	51% (51%)	2.3		15.5-20.0' DOLOMITE, moderately soft, very pale orange (10YR 8/2) to grayish orange (10YR 7/4), slightly weathered, fossiliferous, thick bedded, unfractured.		
22.7	20	S-12	2-5 6 (11)	1.2		20-21.5' SILT with GRAVEL (ml), 20% limestone granules, 10% sand, 70% silt, angular, maximum size-granule, no to slow dilatancy, low dry strength, low toughness, grayish orange (10YR 7/2), strong reaction to 1N HCl, medium dense, moist.	ml	Sample could also be classified as degraded dolomite. Driller notes: soft from 19.5-20'. Stopped coring at 20' and switched back to mud rotary and SPT sampling. NOTE: switched to NWJ rods for the remainder of drilling-Energy Testing attempted from 21.5-35.2'.
		S-13	9-24 37 (61)	1.4		21.5-24.5' SILT with GRAVEL (ml), 40% silt, 60% dolomite granules, angular, moderately soft granules, no plasticity, low dry strength, slow dilatancy, low toughness, grayish orange (10YR 7/4), moist, strong reaction to 1N HCl, dense.	ml	
24	S-14	46-34 50/6 (84)	1.2			ml		
	S-15	28-45 50 (95)	1.0		24.5-26.75' SANDY SILT with GRAVEL (ml), 20% fine grained sand, 20% dolomite granules, 60% silt, maximum particle size-granules, moderately soft, no plasticity, slow dilatancy, low toughness, low dry strength, grayish orange (10YR 7/4) to dark yellowish orange (10YR 6/6), moist, moderate reaction to 1N HCl, very dense.	ml		
26	S-16	28-50/3 (50)	0.5			ml		
	OB-2	37% (22%)	1.2		26.75-31.5' DOLOMITE, moderately hard, thick bedded, grayish orange (10YR 7/4) to dark yellowish orange (10YR 6/6), slightly weathered, fossiliferous, vuggy, porous.			
DATE STARTED: 9/10/09					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715		NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'	
DATE COMPLETED: 9/18/09					GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
DRILLING CO.: HUSS								

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2

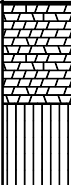
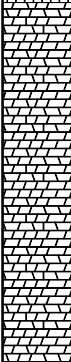
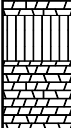
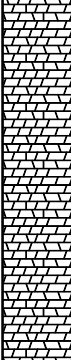
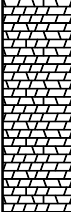

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
11.2 9.7 8.2 7.5	30	OB-3	0% (0%)	0		No recovery 30-31.5'.	ml	NOTE: 32.9-33.0' no sample. NOTE: Sample re-labeled to S-18-1. OB-8: Drilling Pressure: 250-200 psi Kelly Bar RPM: 220 Engine RPM: 1400 Drill Time: 22min 49sec (40-42.8') 4min 49sec (42.8-45') Circulation Loss: none Core loss area-wash out last 2.2 feet of run.
	32	S-17	16-31 50/5 (81)	1.1		31.5-33.0' SANDY SILT with GRAVEL (ml), similar to 24.5'.		
	34	OB-4	60% (0%)	0.9		33.0-34.5' DOLOMITE, as above, except moderately weathered.		
	36	S-18	42-50/2 (50)	0.4		34.5-35.2' SILT with GRAVEL (ml), 60% dolomite granules, 40% silt, angular grained-moderately soft, no plasticity, low dry strength, slow dilatancy, low toughness, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), wet, moderate reaction to 1N HCl, very dense.		
	38	OB-5	93% (20%)	1.4		35.2-40.0' DOLOMITE, very light gray (N8) to medium light gray (N6), moderately soft to moderately hard, thick bedded, moderately weathered, pitted/porous in zones (filled with weathered dolomite), moderately fractured.		
	40	OB-6	100% (0%)	1.5		38.2-41.2' Vertical fracture.		
	42	OB-7	100% (0%)	1.8		40-45' DOLOMITE, moderately soft to moderately hard, yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), fresh to slightly weathered, thick bedded, moderately fractured, fossiliferous, pitted, few vugs, strong reaction to 1N HCl.		
	42	OB-8	64% (22%)	3.2				
DATE STARTED: 9/10/09 DATE COMPLETED: 9/18/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715 GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725 DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring		NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'	
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2

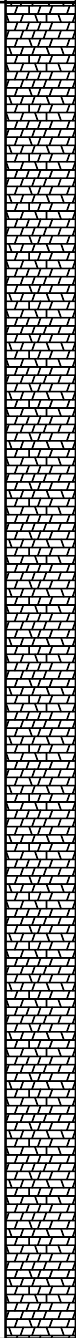
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
-2.3	44	S-18	20-50/5 (50)	0.8		45.0-45.9' SILT with GRAVEL (ml), 40% gravel, 60% silt, calcareous, coarse sand to very coarse sand size, subangular, moderately soft, no plasticity, low dry strength, slow dilatancy, low toughness, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), moist, strong reaction to 1N HCl, very dense.	ml	NOTE: sample re-labeled S-18-2 Water level on 9/12/09 @ 0715 5.2'. OB-9: Drilling Pressure: 250 psi Kelly Bar RPM: 212 Engine RPM: 1300-1400 Drill Time: 5min 38sec Circulation loss: none Note: OB-9 sample put in soil jar due to very soft soil-like nature.
-3.2	46					45.9-50.0' DOLOMITE above except moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2).		
	48	OB-9	20% (0%)	1.0				
-7.3	50	S-20	50/6 (50)	0.3		50.0-50.5' SILT with GRAVEL (ml), 40% dolomite gravel (coarse sand size), no plasticity, low dry strength, no dilatancy, low toughness, moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), strong reaction to 1N HCl, very dense.	ml	OB-10: Drilling Pressure: 150 psi Kelly Bar RPM: 214 Engine RPM: 1300-1400 Drill Time: 10min 28sec Circulation loss: none Special care sample: 50.8-51.6'.
-7.8						50.5-65.0' Degraded DOLOMITE, pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), very soft, poorly indurated, but mainly silt with gravel (as described above), strong reaction to 1N HCl, bedding not apparent.		
	52	OB-10	58% (0%)	2.9				
	54							
	56	S-21	43-50/3 (50)	0.5				OB-11: Drilling Pressure: 200 psi Kelly Bar RPM: 210 Engine RPM: 1300 Drill Time: 12min 15sec Circulation loss: none
	58	OB-11	52% (0%)	2.6				
DATE STARTED: 9/10/09 DATE COMPLETED: 9/18/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715 GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725 DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			
					RIG: Failing 1500			

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2


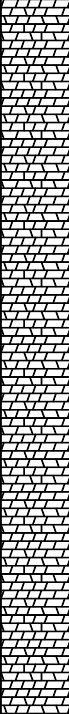
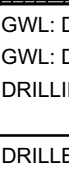
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
	60	S-22	50/5 (50)	0.3				OB-12: Drilling Pressure: 150 psi Kelly Bar RPM: 213 Engine RPM: 1300-1400 Drill Time: 8min 14sec Criculation loss: none
	62	OB-12	34% (0%)	1.7				
	64							
	66	OB-13	68% (0%)	1.7		65.0-67.5' DOLOMITE, severely weathered to degraded, 65-65.6' moderately to poorly indurated, 65.6-67.5', very soft, very dense, calcareous silt (degraded dolomite), moderately soft to soft, some very thin black (possibly organic layers) throughout, strong reaction to 1N HCl.		OB-13: Drilling Pressure: 200 psi Kelly Bar RPM: 216 Engine RPM: 1300-1400 Drill Time: 10min 0sec Circulation loss: none
	68	OB-14	100% (20%)	2.5		67.5-75.0' DOLOMITE, moderately hard, pitted/porous, vuggy, fossiliferous, moderately fractured, modetately weathered, pale yellowish brown (10YR 6/2), strong reaction to 1N HCl when powdered.		OB-14: Drilling Pressure: 150-200 psi Kelly Bar RPM: 209 Engine RPM: 1300 Drill Time: 10min 46sec Circulation loss: none
	70					As above except slightly to moderately fractured.		Run-1: Drilling Pressure: 150-150 psi Kelly Bar RPM: 207 Engine RPM: 1200-1300 Drill Time: 9min 16sec (70-73') 6min 34sec (73-75') Circulation Loss: none Driller Notes 70-72' very soft.
	72	R-1	80% (38%)	4.0				
DATE STARTED: 9/10/09						GWL: DEPTH: 5.2'		DATE/TIME: 9/12/09 @ 0715
DATE COMPLETED: 9/18/09					GWL: DEPTH: 4.3'		DATE/TIME: 9/19/09 @ 0725	
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer		HELPER: Chad/Cody	
DRILLING CO.: HUSS							RIG: Failing 1500	
							NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'	

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LOG OF BORING NO. O-2

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS		
						DESCRIPTION				
	74	R-2	90% (16%)	4.5		75-76' DOLOMITE, soft to very soft, moderately to intensely weathered, sandy texture, intensely fractured, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), weak to moderate reaction to 1N HCl when powdered, thick bedded, pitted/porous, no fossils. 76-77.7' As above except moderately hard, moderately to intensely fractured, fossiliferous.		Run-2: Drilling Pressure: 200 psi Kelly Bar RPM: 206 Engine RPM: 1200-1300 Drill Time: 4min 20sec (75-78') 15min 12sec (78-80') Circulation Loss: none Driller Notes 75-77.5' soft, 77.5-78' harder, then soft.		
	76					77.7-78.7' DOLOMITE, moderately hard to hard, very pale orange (10YR 8/2) to grayish orange (10YR 7/4), strong reaction to 1N HCl, vuggy, fresh to slightly weathered, moderately fractured.				
	78					78.7-80' DOLOMITE, as at 75-76'.				
	80					80-81.5' Degraded DOLOMITE, same as at 75-76' except not silty.				
	82	S-23	30-32 50/6 (82)	1.0		81.5-82.2' Same as above except moderately weathered, intensely fractured.		Run-3: Drilling Pressure: 150-200 psi Kelly Bar RPM: 213, 206 Engine RPM: 1200-1300 Drill Time: 4min 56sec (80-82.5') 9min 8sec (82.5-85') Circulation Loss: none		
		R-3	80% (18%)	4.0		82.2-83.8' DOLOMITE, moderately hard, moderately fractured, pitted/porous, moderately weathered, weak reaction to 1N HCl when powdered, pale yellowish brown (10YR 6/2).				
	84					83.8-85.0' DOLOMITE, moderately soft, grayish orange (10YR 7/4), thick bedded, fresh, pitted in thin bands, strong reaction to 1N HCl when powdered.				
	86					85-92.4' DOLOMITE, moderately hard, slightly to moderately weathered, pitted/porous, fossiliferous, yellowish gray (5Y 7/2), thick bedded, moderately to intensely fractured, strong reaction to 1N HCl, 86-87' rubble, very broken-possible zone of wash out/cave-in, few thin bands/pockets of dark brown (5YR 2/2) organic material.				
		R-4	92% (12%)	4.6				Run-4: Drilling Pressure: 150-200 psi Kelly Bar RPM: 208 Engine RPM: 1300 Drill Time: 6min 42sec (85-85.8') 15min 6sec (85.8-90') Circulation Loss: 30%		
DATE STARTED: 9/10/09						GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715			NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'	
DATE COMPLETED: 9/18/09						GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725				
FIELD GEOLOGIST: JLO						DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring				
CHECKED BY: WDS										
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500			
DRILLING CO.: HUSS										

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2

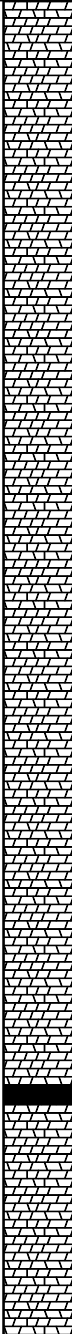
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
	88							
	90							Run-5: Drilling Pressure: 150 psi Kelly Bar RPM: 209 Engine RPM: 1300 Drill Time: 17min 27sec (90-94') 3min 42sec (94-95')-no recovery Circulation Loss: 100% starting at 92.5'.
	92	R-5	68% (10%)	3.4		92.4-95' DOLOMITE, soft, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), intensely weathered, silty-poorly indurated, strong reaction to 1N HCl when powdered, sandy texture, porous.		
	94	S-24	21-50/2 (50)	0.4				
	96					95-95.3' DOLOMITE as at 85'. 95.3-97.9' DOLOMITE, moderately hard, moderately weathered, thick bedded, porous/pitted, vuggy, fossiliferous, moderately to intensely fractured, weak reaction to 1N HCl, pale yellowish brown (10YR 6/2).		Run-6: Drilling Pressure: 150 psi Kelly Bar RPM: 208 Engine RPM: 1300 Drill Time: 26min 48sec Circulation Loss: 100%
	98	R-6	100% (0%)	5.0		98.1-99.2' DOLOMITE, as at 95.3' except with some dolomite clasts.		
-56.5						99.2-101.1' LIMESTONE, moderately hard, very pale orange (10YR 8/2), moderately to intensely fractured, thick bedded, strong reaction to 1N HCl, fossiliferous, slightly to moderately weathered, slightly pitted in zones.		
	100							Run-7: Drilling Pressure: 150 psi Kelly Bar RPM: 220 Engine RPM: 1400 Drill Time: 17min 4sec (100-103.5') 14min 17sec (103.5-105') Circulation Loss: 100%
-58.4						101.1-101.3' DOLOMITE, grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2), porous/pitted, fossiliferous, moderately hard, thick bedded. 101.3-103.2' Unfractured, then becomes moderately to intensely fractured dolomite and crystalline dolomite mix (102.6-103.2')		
	102							
DATE STARTED: 9/10/09 DATE COMPLETED: 9/18/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715 GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725 DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			
								RIG: Failing 1500

LNP- OFFSET BORING PROGRAM

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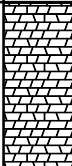




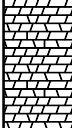


PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS		
						DESCRIPTION				
<div>-71.6</div> <div>-71.8</div>	104	R-7	96% (26%)	4.8		103.2-110' DOLOMITE, moderately hard, fresh to slightly weathered, weak reaction to 1N HCl when powdered, pitted/vuggy in thin bands/zones, fine grained to crystalline, fossiliferous, thick bedded, pale yellowish brown (10YR 6/2) to grayish orange (10YR 7/4). Vertical fracture 103.2-105.0'.		Run-8: Drilling Pressure: 100-150 psi Kelly Bar RPM: 205 Engine RPM: 1200-1300 Drill Time: 12min 10sec (105-107') 21min 40sec (107-110') Circulation Loss: 100%		
	106	S-25	32-48 50/5 (98)	0.9						
	108	R-8	100% (30%)	5.0						
	110	R-9	100% (10%)	5.0		110-120' DOLOMITE, very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2), pitted/porous, strong reaction to 1N HCl when powdered, moderately to intensely fractured, vertical fracture 110-112.2' (all other fractured extend from this vertical fracture), thick bedded, slightly to moderately weathered, moderately hard, few vugs, few fossils.			Run-9: Drilling Pressure: 100 psi Kelly Bar RPM: 214 Engine RPM: 1300-1400 Drill Time: 22min 20sec (110-113.2') 13min 7sec (113.2-115) Circulation Loss: 100%	
	112									
	114									
									<div>114.3'-</div> <div>114.3-114.5' Grouted area in core.</div> <div>114.5'-</div>	Run-10: Drilling Pressure: 100 psi Kelly Bar RPM: 207 Engine RPM: 1300 Drill Time: 12min 24sec (115-116') 18min 43sec (116-120') Circulation Loss: 100%
	116			116.6-118.3' Thin vertical fracture, closed from 117.5-118.3'.						
	DATE STARTED: 9/10/09					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715			NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'	
DATE COMPLETED: 9/18/09					GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725					
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring					
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500			
APPROVED BY:										
DRILLING CO.: HUSS										

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
	118	R-10	100% (40%)	5.0		118.6-119' As above except not as pitted.		Run-11: Drilling Pressure: 150-200 psi Kelly Bar RPM: 208 Engine RPM: 1300 Drill Time: 13min 38sec (120-121') Circulation Loss: 100% Driller notes soft at 121'
	120					120-121' DOLOMITE, very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2), moderately hard, pitted/porous, few vugs, thick bedded, fresh to slightly weathered, unfractured, fossiliferous, strong reaction to 1N HCl when powdered. 121' Start of fracture, black coating on surface-area becomes soft. 121-122.5' DOLOMITE, highly weathered, as above, black staining on some pieces, crushed/fracture zone. Horizontal fracture at 121.8'.		
-79.8	122	S-26	32-39 12 (51)	0.7		ROD DROP 122.5-123.7'.		
-81.0 -81.3	124	R-11	40% (16%)	2.0		123.7-124.0' DOLOMITE as above.		
						ROD DROP 124.0-125.0'.		
-82.3		S-27	2-3 17 (20)	0.6		125-127.5' Rubble (see remarks column).		125-126' clean out of rubble/ disturbance caused by split spoon sampling.
	126					127.5-130' DOLOMITE, grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2), moderately hard, slightly to moderately weathered, pitted/porous, some vugs, moderately to intensely fractured, strong reaction to 1N HCl when powdered, thick bedded, vertical fracture 127.5-128.4'.		Run-12: Drilling Pressure: 100 psi Kelly Bar RPM: 207 Engine RPM: 1200-1300 Drill Time: 6min 4sec (126-127') 2min 14sec (127-128') 2min 18sec (128-129') 5min 8 sec (129-130') Circulation Loss: 100%
	128	R-12	100% (12%)	4.0		130-131.0' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, weak reaction to 1N HCl when powdered, fresh, slightly pitted, few vugs, thick bedded, unbroken.		Run-13: Drilling Pressure: 150-200 psi Kelly Bar RPM: 207 Engine RPM: 1200-1300 Drill Time: 8min 22sec (130-132.5') 9min 16sec (132.5-135')
-88.3 -88.8	130					ROD DROP 131.0-131.5'.		
DATE STARTED: 9/10/09					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715		NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'	
DATE COMPLETED: 9/18/09					GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
DRILLING CO.: HUSS								

LNP- OFFSET BORING PROGRAM

PROJECT NO. 07-3935

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ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
-96.3 <								

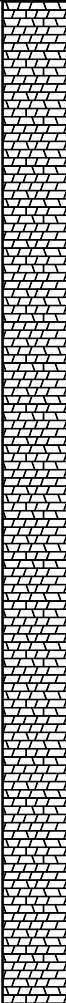
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SHEET 10 OF 16 Rev. 4

LNP- OFFSET BORING PROGRAM

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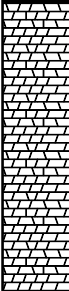
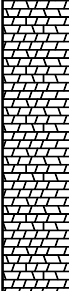
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ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS	
						DESCRIPTION			
-114.6	148	R-16	100% (86%)	5.0		146.2-149' As above except fresh to slightly weathered. 146.9' Horizontal fracture (crushed rock zone infilling). 149-149.5' Crystalline DOLOMITE, fresh as at 142.4'. 149.5-150' DOLOMITE as at 146.2'. 150-152.5' DOLOMITE, pale yellowish brown (10YR 6/2) and medium light gray (N6), moderately hard, moderately weathered, pitted/porous/vuggy in thin bands, moderately fractured, fossiliferous, strong reaction to 1N HCl when powdered, thick bedded.		Circulation loss: 100% Run-17: Drilling Pressure: 150 psi Kelly Bar RPM: 206 Engine RPM: 1200-1300 Drill Time: 44min 5sec (150-152.5') 44min 25sec (152.5-155') Circulation loss: 100%	
	150	R-17	100% (32%)	5.0		152.5-154' DOLOMITE, moderately hard, light gray (N7) to medium light gray (N6), moderately weathered, fossiliferous-weathering out creating long vugs, pitted/porous, slightly fractured- breaks along vugs. 154' As above except more porous, no fossils. 154-155' Vertical fracture-black coating on face-open.			
	152					155-155.9' DOLOMITE as at 154'			
	154					155.9-157' DOLOMITE, crystalline, pale yellowish brown (10YR 6/2), moderately hard, intensely fractured (some grout infilling fractures).			
	156	R-18	100% (20%)	5.0		157-160' Alternating beds of moderately weathered porous/vuggy dolomite and crystalline dolomite as described above, moderately fractured (thin, closed). 157.3-163.5' Grout-sidewall of adjacent A-series boring.	Run-18: Drilling Pressure: 150-200-150 psi Kelly Bar RPM: 202 Engine RPM: 1200-1300 Drill Time: 44min 13sec Circulation loss: 100%		
	158								
	160					160-163.0' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), fresh to slightly weathered, pitted/porous, moderately fractured (almost horizontal), with thin bands of dark yellowish brown (10YR 4/2), thick bedded, strong reaction to 1N HCl.			
	DATE STARTED: 9/10/09					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715		NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'	
	DATE COMPLETED: 9/18/09					GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725			
	FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring		RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody				
APPROVED BY:									
DRILLING CO.: HUSS									

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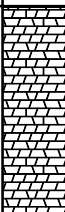
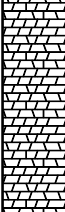
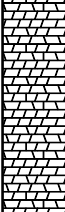
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						DESCRIPTION					
-120.8	162	R-19	100% (42%)	5.0		162.4-163' Becomes moderately to intensely fractured.		Drill Time: 44min 46sec Circulation loss: 100% First 0.3' of Run-19 from the end of R-18.			
	164					163-164.5' DOLOMITE, as above except with few (0.1' thick) moderate yellowish brown (10YR 5/4) bands.					
	166	R-20	100% (0%)	5.0		164.5-164.7' Crystalline DOLOMITE, moderately to intensely fractured. 164.7-165' DOLOMITE as at 163'. 165-170' DOLOMITE, grayish orange (10YR 7/4) and pale yellowish brown (10YR 6/2), moderately hard, porous/pitted, fossiliferous, few vugs, moderately to intensely fractured, slightly to moderately weathered, strong reaction 1N HCl when powdered. 165.5-165.6' Crystalline DOLOMITE, fresh, pale yellowish brown (10YR 6/2).					
	168										
	170					170-171.6' DOLOMITE, pale yellowish brown (10YR 6/2), moderately to intensely fractured, fresh to slightly weathered, slightly pitted, porous, few vugs, few fossils, thick bedded, strong reaction to 1N HCl when powdered.					
	172	R-21	100% (18%)	5.0		171.6-173.2' DOLOMITE, moderately weathered, thin bedded, variegated colors-pale yellowish brown (10YR 6/2), grayish orange (10YR 7/4), dark yellowish orange (10YR 6/6), porous/pitted, some fossils, slightly fractured (horizontal only).					
	174					173.2-173.4' Crushed zone. 173.4-175' DOLOMITE, as at 170'.					
						175-175.8' Crystalline DOLOMITE, moderately hard to hard, medium light gray (N6), intensely fractured (horizontal and vertical fractures).					
	DATE STARTED: 9/10/09 DATE COMPLETED: 9/18/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715 GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725 DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'		
	DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody					
							RIG: Failing 1500				

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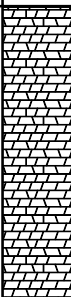
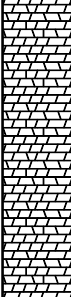
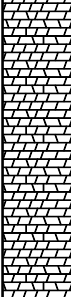
LOG OF BORING NO. O-2

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
	176	R-22	100% (0%)	5.0		175.8-176.1' DOLOMITE as at 170'. 176.1-177' DOLOMITE, moderately soft to soft, dark yellowish orange (10YR 6/6) and dark yellowish brown (10YR 4/2), thin bedded/ banded, pitted/porous, sandy texture, poorly indurated, strong reaction to 1N HCl when powdered. 177-178.5' DOLOMITE as at 170' except intensely fractured.		Kelly Bar RPM: 201 Engine RPM: 1200-1300 Drill Time: 37min 24sec Circulation Loss: 100% Driller notes: soft 176-177' and 178-179'.
	178					178.5-178.8' DOLOMITE as at 176.1'. 178.8-180' DOLOMITE as at 170'.		
	180	R-23	100% (46%)	5.0		180-181.1' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), moderately fractured (180.6-180.7'-intensely fractured/crushed), thick bedded, moderately weathered, weak to moderate reaction to 1N HCl when powdered. 181.1-182.7' DOLOMITE, moderately soft to soft, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), pitted/ porous, sandy texture, moderately to severely weathered, fossiliferous, vertical fracture from 182-182.4'. 182.2-182.7' Transitional/gradational zone, thin bedded/banded, some rip-up clasts of crystalline dolomite. 182.7-183.3' Crystalline DOLOMITE, moderately hard, light olive gray (5Y 6/1), intensely fractured along vertical fracture. 183.3-184.1' DOLOMITE, similar to 181.1'.		Run-23: Drilling Pressure: 200 psi Kelly Bar RPM: 220 Engine RPM: 1400 Drill Time: 41min 54sec Circulation Loss: 100% Driller notes: 181-182.5' very soft.
	182					184.1-185' DOLOMITE, similar to 182.7' except moderately fractured (all horizontal).		
	184	R-24	100% (46%)	5.0		185-186.2' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), moderately weathered, pitted/porous, vuggy, fossiliferous, sandy texture in weathered areas, thick bedded, strong reaction to 1N HCl when powdered. 186.2-187' Crystalline DOLOMITE, moderately hard, fresh, moderately fractured, light gray (N7) to light olive gray (5Y 6/1), strong reaction to 1N HCl when dry/powdered. 187-187.8' DOLOMITE as at 185'.		Run-24: Drilling Pressure: 200 psi Kelly Bar RPM: 224 Engine RPM: 1400-1500 Drill Time: 33min 13sec Circulation Loss: 100%
	186					187.8-188.2' Crystalline DOLOMITE as at 186.2'. 188.2-188.8' Severly weathered DOLOMITE, coarse grained, poorly indurated, pitted/porous, sandy texture. 188.8-191.9' DOLOMITE, moderately soft, moderate yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/2) and pale yellowish brown (10YR 6/2), thin bedded/banded, slightly fractured, moderately weathered, some vugs, weak to moderate reaction to 1N HCl when powdered, vertical fracture from 190-191.1'.		
	188							Run-25:
	190							
DATE STARTED: 9/10/09					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715		NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'	
DATE COMPLETED: 9/18/09					GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
DRILLING CO.: HUSS								

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2

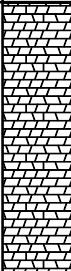
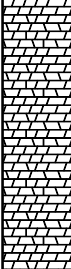
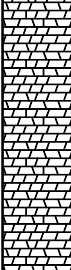
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS	
						DESCRIPTION			
	192	R-25	100% (18%)	5.0		191.9-192.2' Crystalline DOLOMITE, moderately to intensely weathered as at 186.2'. 192.2-194.2' DOLOMITE, moderately hard, strong reaction to 1N HCl when powdered, very pale orange (10YR 8/2) to yellowish gray (5Y 7/2) (cream color), slightly to moderately weathered, moderately fractured, fossiliferous, pitted, vuggy, thick bedded.		Drilling Pressure: 200 psi Kelly Bar RPM: 201 Engine RPM: 1200-1300 Drill Time: 26min 9sec Circulation Loss: 100%	
	194					194.2-195' DOLOMITE as at 188.8'.			
	196	R-26	92% (28%)	4.6		195-197.6' DOLOMITE, moderately soft, pale yellowish brown (10YR 6/2), moderately weathered, pitted/porous, unfractured, becomes intensely fractured below 197.3', thick bedded, dark yellowish brown (10YR 4/2) very thin bands from 196.7-197.6', strong reaction to 1N HCl when powdered.		Run-26: Drilling Pressure: 350 psi Kelly Bar RPM: 227 Engine RPM: 1400-1500 Drill Time: 20min 55sec Circulation Loss: 100% 9/18/09-No water level taken-rods locked in hole.	
	198					197.6-198.7' Transistion zone, thin alternating layers of dolomite as above and crystalline dolomite, moderately fractured.			
	200	R-27	100% (68%)	5.0		198.7-200' Crystalline DOLOMITE, pale yellowish brown (10YR 6/2) to light olive gray (5Y 6/1), moderately hard, vugs (0.05' wide), moderately to intensely fractured (possibly mechanical), thick bedded, fresh to slightly weathered, strong reaction to 1N HCl when dry/ powdered. 200-202.4' As above except slightly to moderately weathered, few very thin pitted bands, vertical fracture from 200-201.3'.		Run-27: Drilling Pressure: 200 psi Kelly Bar RPM: 234 Engine RPM: 1500 Drill Time: 23min 23sec Circulation Loss: 100%	
	202					202.4-205' DOLOMITE, very light gray (N8) to medium light gray (N6) on outside of core, light olive gray (5Y 6/1) on fresh sample, moderate yellowish brown (10YR 5/4) when weathered, moderately weathered, fossiliferous, pitted/porous, vuggy, sandy texture, with clasts of crystalline dolomite throughout, moderately soft to soft, weak reaction to 1N HCl when broken, unfractured by moderately to poorly indurated (conglomerate-like appearance) bedding no apparent.			
	204								
DATE STARTED: 9/10/09 DATE COMPLETED: 9/18/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715 GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725 DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'	
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500	

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2

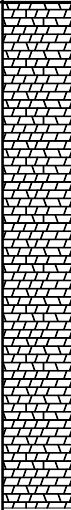
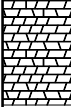
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS				
						DESCRIPTION						
	206	R-28	92% (36%)	4.6		205-205.6' DOLOMITE, light gray (N7), moderately hard, slightly weathered, vuggy, fossiliferous, pitted, unfractured, moderately weathered at ends of core. 205.6-206.1' DOLOMITE as at 202.4-205'. 206.1-206.5' DOLOMITE gravel, no matrix. 206.5-208.7' DOLOMITE, moderately soft, yellowish gray (5Y 8/1) and yellowish gray (5Y 7/2), thin to very thin bedded, banded with pale yellowish brown (10YR 6/2), fresh to slightly weathered, strong reaction to 1N HCl when powdered, unfractured-breaks along darker colored bands-slickensides. 208' Color change to very light gray (N8). 208.7-210' DOLOMITE, severely weathered, intensely fractured (some mechanical), fossiliferous, sandy texture, pitted/porous, pale yellowish brown (10YR 6/2).		Run-28: Drilling Pressure: 200 psi Kelly Bar RPM: 195 Engine RPM: 1200 Drill Time: 11min 20sec Circulation Loss: 100% Driller Notes: 206-209' soft.				
	208											
	210											
	212	R-29	94% (18%)	4.7		210-213' DOLOMITE, light gray (N7) to medium light gray (N6)-fresh zones, pale yellowish brown (10YR 6/2) on weathered zones, moderately to intensely weathered, moderately to intensely fractured due to weathering, strong reaction to 1N HCl when broken, conglomerate-like appearance (differential weathering), vuggy, fossiliferous, sandy texture, porous. 212-213' As above except more crystalline dolomite clasts (80-90%) and less weathered dolomite "matrix" (10-20%). 213-215' DOLOMITE, very light gray (N8) on outside of core, grayish orange (10YR 7/4), moderately hard, moderately weathered, slightly to moderately fractured, vuggy, weak reaction to 1N HCl when powdered, some fossils, thick bedded.		Run-29: Drilling Pressure: 250-150 psi Kelly Bar RPM: 201, 205 Engine RPM: 1200-1300 Drill Time: 15min 49sec (210-212') 12min 11sec (212-213') 4min 40sec (213-215') Circulation Loss: 100%				
	214											
	216											
	218	R-30	96% (44%)	4.8		215-216.6' DOLOMITE, moderately soft to moderately hard, light gray (N7) with very thin pale yellowish brown (10YR 6/2) bands, fresh to slightly weathered, thick bedded, few vugs (weathered out fossils), strong reaction to 1N HCl when powdered. 216.6-217' DOLOMITE, moderately hard, moderately weathered, fossiliferous, vuggy, pitted, light gray (N7). 217-217.8' DOLOMITE, moderately soft, grayish orange (10YR 7/4) and pale yellowish brown (10YR 6/2), moderately weathered, pitted/porous in bands, weak reaction to 1N HCl when powdered, sandy texture, friable. 217.8-218.6' DOLOMITE, intensely fractured/crushed zone. 218.6-220' DOLOMITE as at 216.6'.		Run-30: Drilling Pressure: 350-400 psi Kelly Bar RPM: 199 Engine RPM: 1200-1300 Drill Time: 18min 5sec Circulation Loss: 100%				
DATE STARTED: 9/10/09					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715			NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'				
DATE COMPLETED: 9/18/09					GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725							
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring							
CHECKED BY: WDS												
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500				
DRILLING CO.: HUSS												

LNP- OFFSET BORING PROGRAM

LOG OF BORING NO. O-2


PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722994.8 E 457937.7 SURFACE EL: 42.7	USCS SYMBOL	REMARKS
						DESCRIPTION		
-182.3	220	R-31	100% (46%)	5.0		220-221.7' DOLOMITE, moderately soft, moderately to severely weathered, with very thin dark yellowish brown (10YR 4/2) bands, vuggy, pitted/porous in bands, very light gray (N8), moderately fractured (along pitted bands).		Run-31: Drilling Pressure: 300 psi Kelly Bar RPM: 223 Engine RPM: 1400-1500 Drill Time: 23min 41sec Circulation Loss: 100% Water level on 9/19/09 at 0725 is 4.3'.
	222					221.7-222.3' DOLOMITE, as above except hard, slightly weathered.		
	224					222.3-224' DOLOMITE, soft, severely weathered, grayish orange (10YR 7/4), fossiliferous, area slightly washed out but still intact.		
						224-225' DOLOMITE, light gray (N7), moderately soft, pitted/porous, vuggy, moderately fractured (vertical fracture 223.1-223.7'), thick bedded, moderately weathered, weak reaction to 1N HCl when powdered, fossiliferous.		
						BOTTOM OF BORING 225'		
	226							
	228							
	230							
	232							
	234							
DATE STARTED: 9/10/09					GWL: DEPTH: 5.2' DATE/TIME: 9/12/09 @ 0715			NOTES: Used AWJ rods for SPT sampling from 0-20'. Used NWJ rods for SPT sampling below 20'
DATE COMPLETED: 9/18/09					GWL: DEPTH: 4.3' DATE/TIME: 9/19/09 @ 0725			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Continuous SPT/Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-3

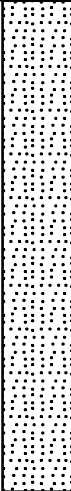
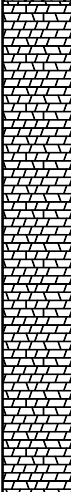
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
	0					0.0-10.0' Sandy CLAY.	cl	0-15' Destructive drilling, log based on drill cuttings.
	1.5							
	3							
	4.5							
	6							
	7.5							
	9							
32.5								
	10.5							
DATE STARTED: 9/21/09 DATE COMPLETED: 10/1/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 4.6' DATE/TIME: 9/22/09 @ 0715 GWL: DEPTH: 6.3' DATE/TIME: 10/1/09 @ 0720 DRILLING METHOD: Mud Rotary/PQ3 Coring			NOTES: NA
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500

LNP- Offset Boring Program

LOG OF BORING NO. O-3

PROJECT NO. 07-3935



ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS			
						DESCRIPTION					
27.5	12	OB-1	80% (40%)	2.8		TOP OF AVON PARK FORMATION 15.0-18.5' DOLOMITE, very pale orange (10YR 8/2) to grayish orange (10YR 7/4), moderately soft, strong reaction to 1N HCl when powdered, slightly weathered, unfractured, thick bedded, slightly pitted. 16.4-17' Becomes moderately to intensely weathered, intensely fractured, fossiliferous. 17-18.5' Slightly weathered, slightly fractured.		Switched to Coring Driller notes: harder at approximately 15 feet. Switched to coring to advance boring, no casing set. Soft-fast drilling 16.5-17.5'.			
	13.5										
	15										
	16.5										
	18										
	19.5	OB-2	100% (100%)	1.5		18.5-21.3' DOLOMITE, moderately soft, very pale orange (10YR 8/2) to grayish orange (10YR 7/4), slightly weathered, fossiliferous, vuggy, silty texture when weathered, unfractured-except 1 horizontal break at 19.5', strong reaction to 1N HCl when powdered. 21.3-30.9' DOLOMITE, severely weathered to degraded, soft to very soft, poorly indurated silt (gritty texture) with dolomite grains (coarse grain size), strong reaction to 1N HCl when powdered, dark yellowish					
	21										
	DATE STARTED: 9/21/09						GWL: DEPTH: 4.6' DATE/TIME: 9/22/09 @ 0715		NOTES: NA		
	DATE COMPLETED: 10/1/09						GWL: DEPTH: 6.3' DATE/TIME: 10/1/09 @ 0720				
	FIELD GEOLOGIST: JLO						DRILLING METHOD: Mud Rotary/PQ3 Coring			RIG: Failing 1500	
CHECKED BY: WDS											
APPROVED BY:		DRILLER: Eddie Palmer HELPER: Chad/Cody									
DRILLING CO.: HUSS											

LNP- Offset Boring Program

LOG OF BORING NO. O-3

PROJECT NO. 07-3935

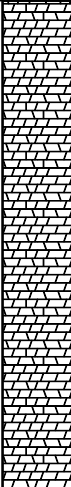
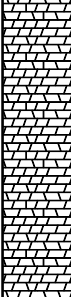
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
	22.5 <							

LNP- Offset Boring Program						PROJECT NO. 07-3935					
LOG OF BORING NO. O-3											
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5		USCS SYMBOL	REMARKS		
						DESCRIPTION					
4.1	33	OB-6	78% (46%)	3.9		35.0-37.7' As above except slightly fractured (horizontal-along bedding planes).			Driller notes: 38.5-40' soft drilling.		
	37.5					37.7-38.4' As above except moderately to intensely fractured.					
	39	OB-7	43% (32%)	2.0		38.4-43.2' SILT with GRAVEL (DEGRADED DOLOMITE), 50% silt, 50% gravel, nonplastic, no dry strength, gravel is very soft, slow to no dilatancy, low toughness, moderate yellowish brown (10YR 5/4) to dark yellowish orange (10YR 6/6), weak reaction to 1N HCl, poorly indurated.					
	43.5					43.2-44.7' DOLOMITE, moderately hard, pitted/porous, moderately weathered, unfractured, thick bedded, fossiliferous, pale yellowish brown (10YR 6/2).					
DATE STARTED: 9/21/09					GWL: DEPTH: 4.6'		DATE/TIME: 9/22/09 @ 0715		NOTES: NA		
DATE COMPLETED: 10/1/09					GWL: DEPTH: 6.3'		DATE/TIME: 10/1/09 @ 0720				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring					RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody						
APPROVED BY:											
DRILLING CO.: HUSS											

LNP- Offset Boring Program

LOG OF BORING NO. O-3

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS	
						DESCRIPTION			
	45	OB-8	91% (40%)	4.8		44.7-50' Same as above except 45.3-47.6' moderately to severely weathered, moderately to intensely fractured.		Water level on 9/22/09 @ 0715 4.6'.	
	46.5								
	48								
	49.5								
	51	OB-9	84% (36%)	4.2		50-51.2' DOLOMITE, moderately hard, pitted/porous, fossiliferous, slightly to moderately weathered, slightly fractured (2 horizontal at 50.3' and 50.7'), thick bedded, pale yellowish brown (10YR 6/2).			
	52.5					51.2-51.7' DOLOMITE, intensely weathered/degraded, soft to very soft, friable, moderate yellowish brown (10YR 5/4), sandy/silty texture.			
	54					51.7-57' DOLOMITE, moderately soft, thick bedded, vuggy, sandy texture, weathering in horizontal layers, moderate yellowish brown (10YR 5/4), moderately to poorly indurated, with very thin organic layers, moderately fractured (bedding planes).			
DATE STARTED: 9/21/09					GWL: DEPTH: 4.6' DATE/TIME: 9/22/09 @ 0715			NOTES: NA	
DATE COMPLETED: 10/1/09					GWL: DEPTH: 6.3' DATE/TIME: 10/1/09 @ 0720				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			RIG: Failing 1500	
CHECKED BY: WDS									
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody				
DRILLING CO.: HUSS									

LNP- Offset Boring Program

LOG OF BORING NO. O-3




PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
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LNP- Offset Boring Program

LOG OF BORING NO. O-3



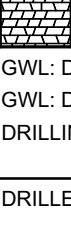
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
	66	OB-12	68% (56%)	1.7		67.5' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), slightly weathered, pitted/porous, sandy texture, unfractured, thick bedded, with banded appearance, strong reaction to 1N HCl when powdered.		Drill Time: 8min 23sec Circ. Loss: none Driller notes: 65-66.5' soft then hard.
	67.5							
	69	OB-13	100% (32%)	2.5		Becomes moderately to intensely fractured.		OB-13: Drilling Pressure: 150 psi Kelly Bar RPM: 199 Engine RPM: 1200-1300 Drill Time: 22min 42sec Circ. Loss: none
	70.5					70-72' Soft zone, possible wash out zone (see driller notes).		Run-1: Drilling Pressure: 150-200 psi Kelly Bar RPM: 240 Engine RPM: 1500-1600 Drill Time: 12min 31sec Circ. Loss: none Driller notes: soft 70-72'.
	72							
	73.5	R-1	66% (24%)	3.3		72-74.5' DOLOMITE, moderately hard, slightly to moderately weathered, pitted/porous, vuggy, fossiliferous, vertical fracture from 72.5-73.5' open, rough, pale yellowish brown (10YR 6/2), thick bedded, strong reaction to 1N HCl when powdered, slightly fractured.		
	75					74.5-75' As above except severely weathered to degraded, silty texture to sandy texture, poorly indurated.		
	76.5					75-80' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, slightly to moderately weathered, thick bedded, pitted/porous, fossiliferous, some larger vugs from 77-78' (0.05' wide), moderate to strong reaction to 1N HCl when powdered, fracture at 75.7-76'(stepped), and 76.6'(horizontal), slightly fractured.		R-2: Drilling Pressure: 150 psi Kelly Bar RPM: 196 Engine RPM: 1200-1300 Drill Time: 22min 33sec Circ. Loss: none Note: no water level taken on 9/23/09-still driving casing.
DATE STARTED: 9/21/09					GWL: DEPTH: 4.6'		DATE/TIME: 9/22/09 @ 0715	
DATE COMPLETED: 10/1/09					GWL: DEPTH: 6.3'		DATE/TIME: 10/1/09 @ 0720	
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			NOTES: NA
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer		HELPER: Chad/Cody	
DRILLING CO.: HUSS								RIG: Failing 1500

LNP- Offset Boring Program

LOG OF BORING NO. O-3



PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
	78	R-2	98% (82%)	4.9		79.3-79.4' Few very thin black organic layers, becomes slightly to moderately weathered, sandy texture.		R-3: Drilling Pressure: 150 psi Kelly Bar RPM: 226 Engine RPM: 1400-1500 Drill Time: 18min 45sec Circ. Loss: none
	79.5					80-80.8' Rubble zone (dolomite as above). 80.8-81.2' As above except moderately to intensely fractured.		
	81					81.2-81.6' Intensely fractured to crushed. 81.6-85' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), pitted/porous, moderately to intensely fractured, vertical fracture 81.6-85' open, rough, thick bedded, few vugs, fossiliferous, slightly weathered, end of run intensely fractured (mechanical).		
	82.5	R-3	76% (0%)	3.8		85-86' DOLOMITE, fossiliferous, pitted/porous, vuggy, pale yellowish brown (10YR 6/2), thick bedded, moderately to severely weathered (85.3-85.5' crushed/rubble zone), moderately hard.		R-4: Drilling Pressure: 150, 150 psi Kelly Bar RPM: 184, 218 Engine RPM: 1100-1200, 1300-1400 Drill Time: 9min 24sec (85-87') 11min 19sec (87-88.5') 2min 9sec (88.5-90') Circ. Loss: none Driller notes: soft 85-86', Becomes soft at 88.5, soft from 88.5-89' (core loss zone).
	84					86-90' DOLOMITE, slightly weathered, few fossils, pitted/porous in thin bands, moderately hard, unfractured except at 86.3' (horizontal), silty/sandy texture at fractures.		
	85.5					87.5' Becomes more pitted/porous and vuggy, few very thin organic		
	87	R-4	84% (54%)	4.2				
DATE STARTED: 9/21/09 DATE COMPLETED: 10/1/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 4.6' DATE/TIME: 9/22/09 @ 0715 GWL: DEPTH: 6.3' DATE/TIME: 10/1/09 @ 0720 DRILLING METHOD: Mud Rotary/PQ3 Coring			NOTES: NA
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500

LNP- Offset Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. O-3

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
	88.5	R-5	100% (24%)	5.0		lenses.		R-5: Drilling Pressure: 150, 150-200, 150 psi Kelly Bar RPM: 205, 221, 214 Engine RPM: 1200-1300, 1400-1500 Drill Time: 12min 3sec (90-91') 8min 22sec (91-92') 5min 23sec (92-93') 13min 3sec (93-95') Circ. Loss: none Used new core catcher starting on Run-5.
	88.5-89.8' Rubble-core loss area.							
90	90-91.8' Rubble, moderately weathered DOLOMITE, as above.							
91.5	91.8-92.3' Crystalline DOLOMITE, light gray (N7) to medium light gray (N6) outer core, pale yellowish brown (10YR 6/2) on fresh, hard, no fossils, intensely fractured (possibly mechanical), strong reaction to 1N HCl when dry. 92.3-92.4' Severly weathered. degraded DOLOMITE, very soft, friable.							
93	92.4-92.7' Crystalline DOLOMITE as above. 92.7-95' DOLOMITE, as at 86-90' except with very pale orange (10YR 8/2) dolomite clasts, moderately fractured (45° breaks).							
94.5	95-95.5' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2) with few zones of very pale orange (10YR 8/2), slightly to moderately weathered, pitted/porous, some fossils, weak to moderate reaction to 1N HCl when powdered, thick bedded, slightly fractured.	R-6	100% (0%)	5.0		95.5-96' Crystalline DOLOMITE, pale yellowish brown (10YR 6/2), hard, pitted in bands, strong reaction to 1N HCl when dry, few fossils, thin bedded, intensely fractured, fresh to slightly weathered. 96-102' DOLOMITE, pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), moderately hard, moderate to strong reaction to 1N HCl when powdered, pitted/porous, fossiliferous, sandy texture, moderately to intensely fractured (few rubble zones), few vugs, thick bedded.		R-6: Drilling Pressure: 200-250 psi Kelly Bar RPM: 210 Engine RPM: 1300 Drill Time: 27min 15sec (95-97.5') 12min 46sec (97.5-99') 5min 22sec (99-100') Circ. Loss: none Water level 9/28/09 @ 0740 5.7'
96								
97.5								
DATE STARTED: 9/21/09					GWL: DEPTH: 4.6' DATE/TIME: 9/22/09 @ 0715		NOTES: NA	
DATE COMPLETED: 10/1/09					GWL: DEPTH: 6.3' DATE/TIME: 10/1/09 @ 0720			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
DRILLING CO.: HUSS								

BORING NO. O-3

LNP- Offset Boring Program

LOG OF BORING NO. O-3

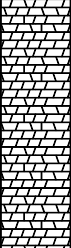
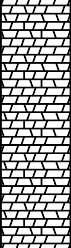
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
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LNP- Offset Boring Program

PROJECT NO. 07-3935


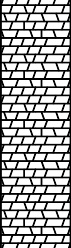

LOG OF BORING NO. O-3

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
	111	R-9	86% (56%)	4.3		110-111.8' DOLOMITE, as above except slightly weathered, unbroked (except 111.4-111.8' rubble/crushed zone).		R-9: Drilling Pressure: 150 psi Kelly Bar RPM: 203 Engine RPM: 1200-1300 Drill Time: 16min 22sec Circ. Loss: 10%
	112.5					111.8-112.2' Crystalline DOLOMITE light gray (N7), hard, pitted in very thin bands, few vugs. 112.2-115' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, pitted/porous, vuggy, some fossils, moderately weathered, sandy texture, becomes more weathered at approximately 114', weak reaction to 1N HCl when powdered, moderately fractured (bedding planes).		
	114					115-118.1' DOLOMITE, soft to very soft, moderate yellowish brown (10YR 5/4) to dark yellowish orange (10YR 6/6), severely weathered to degraded, friable, moderately to poorly indurated, sandy texture, vuggy, porous/pitted, fossiliferous, moderately to intensely fractured (mostly along bedding planes).		
	115.5	R-10	70% (10%)	3.5		118.1-118.8' LIMESTONE, moderately hard to hard, strong reaction to 1N HCl, fresh, few vugs filled with sandy textured DOLOMITE, few pits, no fossils, medium light gray (N6), thick bedded.		R-10: Drilling Pressure: 100-150 psi Kelly Bar RPM: 204 Engine RPM: 1200-1300 Drill Time: 4min 42sec (115-117.5') 12min 52sec (117.5-120') Circ. Loss: 10% SHELBY TUBE ST-1: Down Pressure 900 psi Pushed 3.5" Bottom crushed. Driller notes: soft-fast drilling 115-117.5' Fast drilling-very soft 119.2-120'
	117					118.8-120' DOLOMITE, severely weathered to degraded, very soft to soft, poorly indurated, sandy texture, moderate yellowish brown (10YR 5/4), no plasticity, low to no dry strength, slow dilatancy, low toughness, 60% dolomite, 40% degraded dolomite.		
	118.5					120-125' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, pitted/porous, vuggy, slightly weathered, thick bedded, moderately fractured (vertical fracture 120.7-122.3'), strong reaction to 1N HCl when powdered. some fossils.		
-75.6	118.5							R-11: Drilling Pressure: 150 psi Kelly Bar RPM: 227 Engine RPM: 1400-1500
-76.3	120							
DATE STARTED: 9/21/09 DATE COMPLETED: 10/1/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 4.6' DATE/TIME: 9/22/09 @ 0715 GWL: DEPTH: 6.3' DATE/TIME: 10/1/09 @ 0720 DRILLING METHOD: Mud Rotary/PQ3 Coring			NOTES: NA
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500

LNP- Offset Boring Program

LOG OF BORING NO. O-3

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
121.5		R-11	100% (42%)	5.0		123.4-123.6' Becomes intensely fractured/crushed.		Drill Time: 9min 4sec (120-122') 6min 41sec (122-125') Circ. Loss: 10%
123								
124.5								
126		R-12	86% (32%)	4.3		125-128' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, thick bedded, slightly weathered, pitted/porous, fossiliferous, vuggy, weak to moderate reaction to 1N HCl when powdered, slightly fractured (bedding planes).		R-12: Drilling Pressure: 150-200 psi Kelly Bar RPM: 207, 217 Engine RPM: 1200-1300, 1300-1400 Drill Time: 8min 46sec (125-128') 7min 55sec (128-129') Locked in hole, using EZ-mud, AIRLIFT 2min 54sec (129-130') Circ. Loss: 100% Driller Notes: 126-126.3' soft-possible core loss zone 127.5-127.8' soft-possible core loss zone 128-128.5' possible core loss zone Water level 9/29/09 @ 0745 5.35'
127.5						126-126.3' Larger vugs (0.05' thick) oblong shaped.		
129						128.5-129.0' DOLOMITE, crystalline, medium light gray (N6), hard with pockets of weathered fossiliferous dolomite (grayish orange (10YR 7/4)), no fossils, medium bedded, fresh to slightly weathered, slightly fractured (1 horizontal break at 128.9'). 129-130.35' DOLOMITE as at 126.3'.		
130.5						130.35-130.45' Crystalline DOLOMITE. 130.45-130.6' DOLOMITE, grayish orange (10YR 7/4) and dark yellowish brown (10YR 4/2), moderately soft to soft, friable, fossiliferous, moderately weathered, thin to medium bedded, moderately fractured, weak reaction to 1N HCl when powdered. 130.6-131.4' Crystalline DOLOMITE, light gray (N7) exterior, pale yellowish brown (10YR 4/2) on fresh, moderately hard, strong		R-13: Drilling Pressure: 150 psi Kelly Bar RPM: 204 Engine RPM: 1200-1300 Drill Time: 11min 18sec (130-132') 5min 55sec (132-135') Circ. Loss: 100%
DATE STARTED: 9/21/09 DATE COMPLETED: 10/1/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 4.6' GWL: DEPTH: 6.3' DRILLING METHOD: Mud Rotary/PQ3 Coring	DATE/TIME: 9/22/09 @ 0715 DATE/TIME: 10/1/09 @ 0720	NOTES: NA	
DRILLING CO.: HUSS					DRILLER: Eddie Palmer	HELPER: Chad/Cody	RIG: Failing 1500	

LNP- Offset Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. O-3

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
	132 <							

BORING NO. O-3

APPENDIX 2BB-1202

SHEET 13 OF 19 Rev. 4

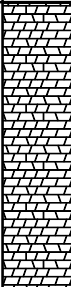
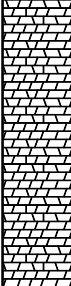
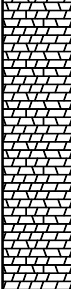
R-14:
 Drilling Pressure: 150-200, 200 psi
 Kelly Bar RPM: 213, 204
 Engine RPM: 1300-1400, 1200-1300
 Drill Time: 8min 43sec (135-136.6')
 10min 29sec (136.6-136.8')
 29min 38sec (136.8-140')
 Circ. Loss: 100%

R-15:
 Drilling Pressure: 150-200 psi
 Kelly Bar RPM: 219
 Engine RPM: 1400
 Drill Time: 55min 21sec (140-144')
 1min 10sec (144-145')
 Circ. Loss: 100%
 Driller notes: soft at 144'(poor recovery last 1 foot)

LNP- Offset Boring Program

LOG OF BORING NO. O-3

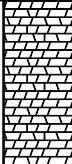
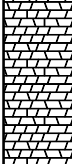
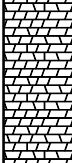
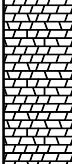
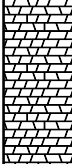

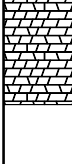
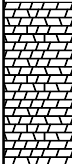
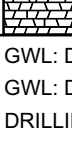

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9	USCS SYMBOL	REMARKS
						SURFACE EL: 42.5		
	144	ST-2	(14%)	1.2		144-145' DOLOMITE, dark yellowish orange (10YR 6/6), soft, fossiliferous (packstone-like), sandy texture.		Shelby Tube ST-2: 145-146.2' Down Pressure: 900 psi Pushed: 14 inches Recovery: 1.2'
	145.5		100% (NA%)			DOLOMITE, as above (144-145') except poorly cemented/indurated, harder piece at bottom of Shelby tube.		
	147					146.2-150' DOLOMITE as at 144-145' except moderately to fractured (bedding planes).		
	148.5	R-16	100% (29%)	3.8		147.2-148.0' Crushed zone.		R-16: Drilling Pressure: 150 psi Kelly Bar RPM: 211 Engine RPM: 1300-1400 Drill Time: 3min 15sec (146.2-147.8') 19min 32sec (147.8-150') Circ. Loss: 100%
	150			148.4-150.0' Unfractured (1 horizontal break at 149.7').				
	151.5	R-17A	86% (43%)	1.8		150-150.7' DOLOMITE, moderately hard, strong reaction to 1N HCl, medium light gray (N6) to light olive gray (5Y 6/1), slightly to moderately weathered, porous/pitted, vuggy, sandy texture in vugs filled with weathered dolomite, slightly fractured. 150.6-151.2' Vertical fracture. 150.7-155' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2) to dark yellowish orange (10YR 6/6), moderately weathered, pitted/porous, sandy texture, few vugs, slightly to moderately fractured, thick bedded, weak reaction to 1N HCl.		
	153		90%			152.1-152.5' Becomes moderately soft. 153.8-154.2' Vertical fracture.		Water level 9/30/09 @ 0725 5.3'.
DATE STARTED: 9/21/09 DATE COMPLETED: 10/1/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:						GWL: DEPTH: 4.6' DATE/TIME: 9/22/09 @ 0715 GWL: DEPTH: 6.3' DATE/TIME: 10/1/09 @ 0720 DRILLING METHOD: Mud Rotary/PQ3 Coring		
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody	RIG: Failing 1500		

LNP- Offset Boring Program

LOG OF BORING NO. O-3

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
	154.5	R-17B	(62%)	2.6		155-155.7' DOLOMITE, moderately weathered, thin bedded, sandy texture, fossiliferous, pale yellowish brown (10YR 6/2), moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2), pitted/porous, moderately soft, strong reaction to 1N HCl when powdered, unfractured except horizontal at 155.2'. 155.7-156.1' DOLOMITE, crystalline, hard, yellowish gray (5Y 7/2) to very light gray (N8), fresh, with very thin black organic layers, abrupt top and basal contact, strong reaction to 1N HCl when powdered, thin to moderate bedding, unfractured except vertical fracture from 155.9-157'. 156.1-160.0' DOLOMITE as at 155-155.7'.		R-18: Drilling Pressure: 200-300 psi Kelly Bar RPM: 211 Engine RPM: 1300-1400 Drill Time: 26min 8sec (155-158') 7min 24sec (158-160') Circ. Loss: 100%
	156							
	157.5	R-18	88% (20%)	4.4				
	159							
-118.0	160.5					160-160.5' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2) and dark yellowish brown (10YR 4/2), laminated (thin layers), moderately weathered, sandy texture, pitted/ porous, unfractured, weak to moderate reaction to 1N HCl when powdered.		R-19: Drilling Pressure: 150-200, 200 psi Kelly Bar RPM: 199 Engine RPM: 1200-1300 Drill Time: 3min 48sec (160-160.5') 9min 58sec (161.5-163.5') 3min 10sec (163.5-165') Circ. Loss: 100% Driller Notes: ROD DROP 160.5-161.5' ROD DROP 162.5-163' AIRLIFT
-119.0	162					160.5-161.5' ROD DROP.		
-120.0	162					161.5-162.8' DOLOMITE, as above except with few very thin layers/ pockets of crystalline dolomite.		
-120.5	163.5	R-19	50% (38%)	2.5		162.5-163.0' ROD DROP.		
						162.5-163.0' ROD DROP.		
						163.0-163.3' ROD DROP.		
						163.3-163.7' DOLOMITE as at 161.5-162.8'. 163.7-165' Washed out zone (piece of core wedged in core barrel shoe.)		
DATE STARTED: 9/21/09					GWL: DEPTH: 4.6' DATE/TIME: 9/22/09 @ 0715		NOTES: NA	
DATE COMPLETED: 10/1/09					GWL: DEPTH: 6.3' DATE/TIME: 10/1/09 @ 0720			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring		RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody			
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offset Boring Program						PROJECT NO. 07-3935		
LOG OF BORING NO. O-3								
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
-124.2 								

LNP- Offset Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. O-3

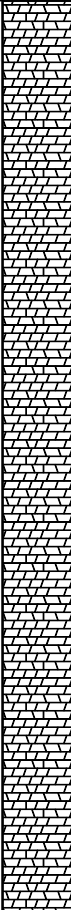
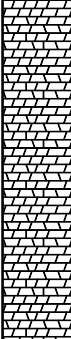
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5		USCS SYMBOL	REMARKS
						DESCRIPTION			
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LNP- Offset Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. O-3









ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5	USCS SYMBOL	REMARKS
						DESCRIPTION		
	187.5 							

LNP- Offset Boring Program						LOG OF BORING NO. O-3		PROJECT NO. 07-3935			
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1723189.3 E 458086.9 SURFACE EL: 42.5		USCS SYMBOL	REMARKS		
						DESCRIPTION					
	198	R-26	(28%)	5.0		198.1-200' DOLOMITE, yellowish gray (5Y 7/2), pitted, vuggy, fossiliferous, thick bedded, moderately weathered, intensely fractured (vertical fracture from 198.1-200', open, rough, dolomite more pitted/porous on fracture faces), strong reaction to 1N HCl when powdered.			R-27: Drilling Pressure: 200-300 psi Kelly Bar RPM: 195 Engine RPM: 1200 Drill Time: 48min 33sec Circ. Loss: 100%		
	199.5					200-201.6' DOLOMITE, moderately hard, yellowish gray (5Y 7/2) and pale yellowish brown (10YR 6/2), conglomerate-like appearance, moderately weathered, vuggy, some fossils, weak reaction to 1N HCl when powdered, sandy texture in weathered zones.					
	201					201.6-202' Crystalline DOLOMITE, hard, strong reaction to 1N HCl when dry/powdered, moderately fractured, medium bedded, pale yellowish brown (10YR 6/2).					
	202.5	R-27	100% (42%)	5.0		202-204.0' DOLOMITE, moderately hard, grayish orange (10YR 7/4) and pale yellowish brown (10YR 6/2), moderately weathered, porous/pitted, fossiliferous, thick bedded, slightly fractured, sandy texture.					
	204					204.0-205.0' DOLOMITE as at 195.3-198.1'.					
-162.5	205.5					BOTTOM OF BORING 205'					
	207										
DATE STARTED: 9/21/09					GWL: DEPTH: 4.6'		DATE/TIME: 9/22/09 @ 0715		NOTES: NA		
DATE COMPLETED: 10/1/09					GWL: DEPTH: 6.3'		DATE/TIME: 10/1/09 @ 0720				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring					RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody						
APPROVED BY:											
DRILLING CO.: HUSS											

LNP- Offset Boring Program

LOG OF BORING NO. O-4

PROJECT NO. 07-3935

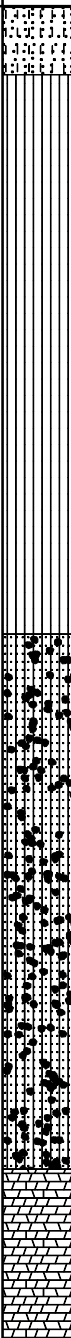
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
41.9	0	S-1	7-12 10 (22)	1.0		0.0-0.4' SILTY SAND (sm), 60% sand, 40% silt, sand-fine grained, no plasticity, no dry strength, slow dilatancy, low toughness, black (N9), wet, no reaction to 1N HCl, medium dense.	sm	
						0.4-1.5' POORLY GRADED SAND (sp), angular to rounded grains, fine grained, no plasticity, no dry strength, rapid dilatancy, low toughness, light gray (N7) to medium light gray (N6), no reaction to 1N HCl, moist, medium dense.		
	1.5	S-2	6-10 11 (21)	1.0		1.5-3.0' POORLY GRADED SAND (sp), angular to subrounded grains, fine to medium grained, no plasticity, no dry strength, rapid dilatancy, low toughness, dark yellowish orange (10YR 6/6), moist, no reaction to 1N HCl, medium dense.	sp	
	3	S-3	6-10 11 (21)	1.0		3.0-5.0' As above except dark yellowish orange (10YR 6/6) to grayish orange (10YR 7/4), medium dense.	sp	
	4.5	S-4	4-4 2 (6)	0.7		5.0-6.0' POORLY GRADED SAND with SILT (sp-sm), 90% sand, 10% silt, sand-fine grained, subrounded to rounded, no plasticity, no dry strength, rapid dilatancy, low toughness, dusky brown (5YR 2/2), moist, no reaction to 1N HCl, loose.	sp-sm	
37.3								
	6	S-5	4-4 3 (7)	1.0		6.0-7.5' Same as 3.0-5.0' except loose.	sp	
36.3								
	7.5	S-6	3-3 4 (7)	1.1		7.5-7.8' Same as above.	sp	
34.2								
	9	S-7	3-3 5 (8)	0.9		7.8-8.1' POORLY GRADED SAND (sp), medium grained, angular to subrounded grains, no plasticity, no dry strength, rapid dilatancy, low toughness, pinkish gray (5YR 8/1) to very light gray (N8), moist, no reaction to 1N HCl, loose.		
33.3								
						8.1-9.0' FAT CLAY with SAND (ch), 60% clay, 40% sand, sand-fine grained, subrounded to rounded, medium to high plasticity, medium dry strength, no dilatancy, medium toughness, light bluish gray (5B 7/1) to light greenish gray (5G 8/1), moist, weak reaction to 1N HCl, medium stiff.	ch	
						9.0-10.5' Same as 7.8-8.1'.	sp	
31.8	10.5					10.5-11' Same as 8.1-9.0'.	ch	
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745		NOTES: Used NWJ for SPT sampling.	
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring			
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
APPROVED BY:								
DRILLING CO.: HUSS								




LNP- Offset Boring Program

LOG OF BORING NO. O-4

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
31.3		S-8	6-10 9 (19)	1.0		11-12.0' Same as 9.0-10.5'.	sp	
	12	S-9	6-7 9 (16)	0.9		12.0-13.5' POORLY GRADED SAND (sp), fine to medium grained, no plasticity, no dry strength, rapid dilatancy, low toughness, very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2), moist, no reaction to 1N HCl, medium dense.	sp	
28.8	13.5	S-10	3-4 5 (9)	0.5		13.5-15.0' SILTY SAND (sm), 20% silt, 80% sand, sand-fine grained, subangular to rounded grains, low plasticity, low dry strength, slow dilatancy, low toughness, pale yellowish brown (10YR 6/2), moist, weak reaction to 1N HCl, loose.	sm	
27.3	15	S-11	5-6 6 (12)	0.9		15.0-16.5' POORLY GRADED SAND with SILT (sp-sm), 10% silt, 90% sand, sand-fine grained, angular to subrounded, no plasticity, low dry strength, rapid dilatancy, low toughness, pale brown (5YR 5/2), moist, weak reaction to 1N HCl, medium dense.	sp-sm	
	16.5	S-12	3-5 3 (8)	1.0		16.5-18.0' As above except with pockets of fat clay (ch), high plasticity, medium to high dry strength, no dilatancy, medium toughness, light bluish gray (5B 7/1) to greenish gray (5G 6/1), moist, no to weak reaction to 1N HCl, medium stiff.	sp-sm	
	18	S-13	3-3 3 (6)	1.1		18.0-19.5' Same as above.	sp-sm	
	19.5	S-14	2-3 2 (5)	1.4		19.5-21.0' POORLY GRADED SAND with SILT (sp-sm), 10% silt, 90% sand, sand-fine grained, subangular to rounded grains, no to low plasticity, no dry strength, slow dilatancy, low toughness, pale yellowish brown (10YR 6/2), moist, no reaction to 1N HCl, very loose, with few small pockets of moderate yellow (5Y 7/6) fat clay.	sp-sm	
	21	S-15	2-1 2 (3)	1.5		21.0-22.5' Same as above except also with few small pockets of silt (ml), very pale orange (10YR 8/2) to grayish orange (10YR 7/4).	sp-sm	
DATE STARTED: 10/6/09 DATE COMPLETED: 10/12/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745 GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750 DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring			NOTES: Used NWJ for SPT sampling.
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500

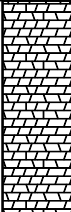
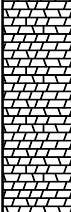
LNP- Offset Boring Program						LOG OF BORING NO. O-4		PROJECT NO. 07-3935	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS	
						DESCRIPTION			
19.8	22.5	S-16	WOR (0)	1.5		22.5-24' SILT with SAND (ml), 80-90% silt, 10-20% sand, sand-fine grained, low to no plasticity, low dry strength, slow dilatancy, low toughness, pale yellowish brown (10YR 6/2), no reaction to 1N HCl, very soft.	ml		
	24					S-17	2-3 5 (8)		0.5
	25.5	S-18	7-10 10 (20)	0.8					
	27					S-19	9-23 27 (50)		0.9
	28.5	S-20	15-17 17 (34)	1.3					
	30					S-21	14-32 50/5 (82)		1.3
31.5	30-31.4' Same as above.	gp-gm							
10.8	31.5					TOP OF AVON PARK FORMATION 31.5-35.2' DOLOMITE, soft to very soft, poorly indurated, grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2), strong reaction to 1N HCl, severely weathered, sandy/silty texture.		31.4-31.5' No sample. Switched to Coring Driller notes: some of sample was lost back down the hole while retrieving barrel-too soft to stay in barrel-amount unknown.	
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745		NOTES: Used NWJ for SPT sampling.		
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring		RIG: Failing 1500		
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody				
APPROVED BY:									
DRILLING CO.: HUSS									

LNP- Offset Boring Program						LOG OF BORING NO. O-4		PROJECT NO. 07-3935			
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3		USCS SYMBOL	REMARKS		
						DESCRIPTION					
	33	OB-1	34% (0%)	1.2		35.2-35.6' DOLOMITE, moderately soft to soft, dark yellowish brown (10YR 4/2), thin bedded, moderately weathered-sandy texture, intensely fractured, weak reaction to 1N HCl when powdered. 35.6-36.3' DOLOMITE, moderately hard, medium bedded, very pale orange (10YR 8/2), pitted/vuggy, slightly to moderately weathered, vertical fracture 35.6-36.5', strong reaction to 1N HCl when powdered. 36.3-37.4' DOLOMITE as at 35.2-35.6' except fossiliferous in thin bands.			OB-2: Drilling Pressure: 250 psi Kelly Bar RPM: 204 Enginer RPM: 1200-1300 Drill Time: 39min 18sec Circ. Loss: none NOTE: Top 4 inches of sample are drill cuttings		
	34.5										
	36	OB-2	92% (22%)	4.6		37.4-40' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), slightly weathered, slightly pitted, few vugs, few fossils, slightly fractured (all horizontal), strong reaction to 1N HCl when powdered, sandy texture when weathered.					
	37.5										
	39	OB-3	76% (20%)	3.8		40-42.7' DOLOMITE, moderately hard, strong reaction to 1N HCl when powdered, pale yellowish brown (10YR 6/2), fresh to slightly weathered, slightly pitted, unfractured, few vugs. 41.2-41.7' Moderately fractured. 41.7-42.5' Vertical fracture.			OB-3: Drilling Pressure: 250 psi Kelly Bar RPM: 210 Enginer RPM: 1300 Drill Time: 31min 17sec Circ. Loss: none Driller notes: Becomes soft at 44'.		
	40.5										
	42					42.7-45' DOLOMITE, moderately soft to soft, moderately to severely weathered, poorly indurated, intensely fractured, moderate to strong reaction to 1N HCl when weathered, gradual color change to dark yellowish orange (10YR 6/6), sandy/silty texture, bedding planes not evident.					
	43.5										
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1'		DATE/TIME: 10/7/09 @ 0745		NOTES: Used NWJ for SPT sampling.		
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4'		DATE/TIME: 10/13/09 @ 0750				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring						
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody					RIG: Failing 1500	
APPROVED BY:											
DRILLING CO.: HUSS											

LNP- Offset Boring Program

LOG OF BORING NO. O-4

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
	45	OB-4	76% (24%)	3.8		45-46.4' DOLOMITE, very soft, poorly indurated, silty texture, severely weathered to degraded, some areas sandy texture, no bedding evident, slightly fractured 45.7-47.5'.		OB-4: Drilling Pressure: 200 psi Kelly Bar RPM: 215 Engineer RPM: 1300-1400 Drill Time: 10min 35sec Circ. Loss: none
	46.5					46.4-47.2' GRAVELLY SILT (ml)/degraded DOLOMITE, 40% dolomite pieces-coarse sand size, soft-breaks easily, no plasticity, low dry strength, slow dilatancy, low toughness, pale yellowish brown (10YR 6/2), moist to wet, moderate to strong reaction to 1N HCl.		
	48					47.2-48.2' Same as 45-46.4' except with very thin organic layers/ laminations.		
	48.2-50'					As above except moderately soft.		
	49.5	OB-5	98% (28%)	4.9		50-55' DOLOMITE, alternating layers of soft to very soft moderate yellowish brown (10YR 5/4), moderately to severely weathered, poorly indurated, bedding structure not evident, slightly to moderately fractured (in zones), weak to moderate reaction to 1N HCl, pitted/ porous, sandy texture.		OB-5: Drilling Pressure: 250 psi Kelly Bar RPM: 213 Engineer RPM: 1300-1400 Drill Time: 11min 23sec Circ. Loss: none Note: 50-52.5' soft, fast drilling 0.1' top of run is cuttings. Water level 10/7/09 @ 0745 5.1'.
	51							
	52.5							
	54							
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745		NOTES: Used NWJ for SPT sampling.	
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring			RIG: Failing 1500
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody			
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-4

PROJECT NO. 07-3935




ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
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LNP- Offset Boring Program						LOG OF BORING NO. O-4			PROJECT NO. 07-3935	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3		USCS SYMBOL	REMARKS	
						DESCRIPTION				
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LNP- Offset Boring Program

PROJECT NO. 07-3935

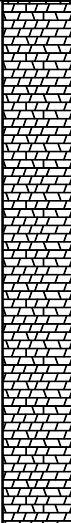
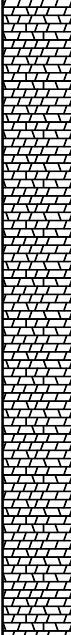
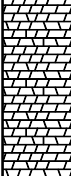
LOG OF BORING NO. O-4

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
	78	R-3	78% (0%)	3.9		77.5-80' As above except intensely fractured/rubble (not cave-in), fossiliferous.		
	79.5							
	81					80-80.7' DOLOMITE, moderately soft, pale yellowish brown (10YR 6/2), pitted/porous, moderately weathered, moderately to intensely fractured, moderate to strong reaction to 1N HCl when powdered.		Run-4: Drilling Pressure: 150 psi Kelly Bar RPM: 190 Enginer RPM: 1100-1200 Drill Time: 4min 30sec (80-82') 3min 4sec (82-85') 0.1' recovery, rig chattering Circ. Loss: 100% Driller Notes: very soft at 82' NOTE: Driller thinks 0.1' recovery harder than material below and softer material was washed out-not a void.
	82.5	R-4	38% (0%)	1.9		80.7-81.2' DOLOMITE, very light gray (N8) to light gray (N7), moderately hard to hard, moderately to severely weathered, vuggy, pitted in bands, intensely fractured, strong reaction to 1N HCl.		
	84					81.2-85' DOLOMITE, pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), soft, friable, sandy/silty texture, with some black (N9) organic laminae, pitted/porous, moderately to intensely weathered, moderate to strong reaction to 1N HCl when powdered.		
	85.5	ST-1	100% (NA%)	0.5		85-85.6' DEGRADED DOLOMITE (SILT (ml)), no plasticity, low dry strength, no dilatancy, low toughness, grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2), with very thin organic layers throughout.		Shelby Tube ST-1: Pushed: 7.5" Pressure: 100 psi Sample bagged Run-5: Drilling Pressure: 200 psi Kelly Bar RPM: 206 Enginer RPM: 1200-1300 Drill Time: 3min 32sec (85.5-87') 7min 41sec (87-90') Circ. Loss: 100% then circulation returns shortly after starting run
	87		100%			85.6-90' DOLOMITE, moderately soft to soft, pale yellowish brown (10YR 6/2), moderately to severely weathered, friable, pitted/porous, vuggy, moderate to strong reaction to 1N HCl when powdered, moderately to intensely fractured.		
DATE STARTED: 10/6/09 DATE COMPLETED: 10/12/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745 GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750 DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring			NOTES: Used NWJ for SPT sampling.
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500

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LOG OF BORING NO. O-4

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
	88.5	R-5	(13%)	4.5		88.7' Becomes moderately hard, slightly fractured.		Run-6: Drilling Pressure: 200 psi Kelly Bar RPM: 198 Enginer RPM: 1200-1300 Drill Time: 26min 6sec Circ. Loss: none
	90					90-90.7' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), slightly weathered, pitted, weak to moderate reaction to 1N HCl, thick bedded, slightly fractured.		
	91.5					90.7-91.6' As above except intensely fractured/rubble, moderately weathered.		
	93	R-6	100% (54%)	5.0		91.6-95' DOLOMITE, as at 90' except fresh to slightly weathered, few vugs, slightly fractured (horizontal break at 93.6').		
	94.5					Vertical fracture 94.1-95'.		Run-7: Drilling Pressure: 250-300, 200 psi Kelly Bar RPM: 210 Enginer RPM: 1300-1400 Drill Time: 10min 41sec (95-98') 1.2' recovery 22min 15sec (98-100') Circ. Loss: none Water level 10/8/09 @ 0745 6.5'
	96					95-96.2' DOLOMITE, moderately hard, weak reaction to 1N HCl when powdered, pitted, few vugs, few very thin black (N9) organic pockets, very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2), unfractured, thick bedded.		
	97.5	R-7	76% (44%)	3.8		96.2' Becomes moderately to intensely fractured (possible washout zone 96.2-98') 96.2-98' Crushed/rubble with silt, dark yellowish brown (10YR 4/2).		
						98-98.8' DOLOMITE, moderately hard, slightly weathered, pitted, moderately fractured (at 45° angles), fossiliferous, weak reaction to 1N HCl when powdered, pale yellowish brown (10YR 6/2).		
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745			NOTES: Used NWJ for SPT sampling.
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-4




PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5	USCS SYMBOL	REMARKS
						SURFACE EL: 42.3		
						DESCRIPTION		
-59.7 								

LNP- Offset Boring Program

LOG OF BORING NO. O-4

PROJECT NO. 07-3935

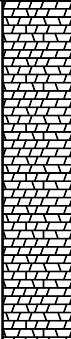
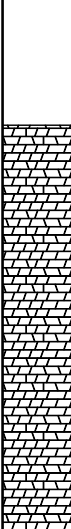

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
	111	R-10	86% (48%)	4.3		109.7-110' DOLOMITE as at 101-101.3'. 110-115' DOLOMITE, moderately hard, pitted/porous, pale yellowish brown (10YR 6/2), slightly weathered, slightly to moderately fractured, few vugs, thick bedded, weak reaction to 1N HCl when powdered, few fossils. 111.5-113.3' Vertical fracture.		Run-10: Drilling Pressure: 150 psi Kelly Bar RPM: 217 Engineer RPM: 1300-1400 Drill Time: 24min 33sec Circ. Loss: 100% 0.5' Rubble
	112.5							
	114							
	115.5	R-11	100% (82%)	5.0		115-120' DOLOMITE, as above except slightly fractured (bedding planes).		Run-11: Drilling Pressure: 150-200 psi Kelly Bar RPM: 206 Engineer RPM: 1200-1300 Drill Time: 26min 14sec Circ. Loss: 100% 0.3' Rubble
	117							
	118.5							
	120					120-121.5' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), slightly weathered, pitted/porous, moderately fractured-vertical fracture 120.4-122.0' open, rough, black coating on surface, strong reaction to 1N HCl when powdered.		Run-12: Drilling Pressure: 200 psi Kelly Bar RPM: 208 Engineer RPM: 1300
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745		NOTES: Used NWJ for SPT sampling.	
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring		RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody			
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-4

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
	121.5 							

LNP- Offset Boring Program						PROJECT NO. 07-3935			
LOG OF BORING NO. O-4									
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS	
						DESCRIPTION			
	132	R-14	74% (48%)	3.7		132-132.7' Vertical fracture, moderately to intensely fractured area.			
	133.5								
-92.2						134.5' Becomes fossiliferous.			134.5'
	135	R-15	54% (30%)	2.7		134.5-135.6' ROD DROP.		Run-15: Drilling Pressure: 150-200 psi Kelly Bar RPM: 218 Enginer RPM: 1300-1400 Drill Time: 1min 58sec (135-137') 1' recovery 15min 14sec (137-139') 1' recovery 5min 55sec (139-140') 0.7' recovery, 0.3' rubble Circ. Loss: 100% Driller notes: Rod drop 139.5-140' (0.3' rod drop measured from recovered core).	
-93.3						135.6-137' DOLOMITE, moderately soft to moderately hard, grayish orange (10YR 7/4) to dark yellowish orange (10YR 6/ 6), fossiliferous (sand dollar casts), moderately weathered, sandy texture, pitted/porous, vuggy, moderate to strong reaction to 1N HCl, slightly fractured (along bedding plane at 135.4').			135.6'
	136.5					137-139' Crystalline DOLOMITE, moderately hard to hard, moderately to intensely fractured, pale yellowish brown (10YR 6/2) to light gray (N7), moderate to strong reaction to 1N HCl when dry/ powdered, fresh, no fossils, pitted in very thin bands, medium to thick bedded.			
	138					139-139.7' DOLOMITE, light olive gray (5Y 6/1), moderately hard, medium to thick bedded, slightly weathered, pitted in very thin bands, unfractured, moderate to strong reaction to 1N HCl when powdered.			
-97.4						139.7-140' ROD DROP.			139.7'
-97.7		R-16	42%	2.1		140-140.3' DOLOMITE, moderately to severely weathered, moderately soft, grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2), pitted/porous, sandy texture, fossiliferous (sand dollars), moderate to strong reaction to 1N HC when powdered, slightly to moderately fractured.		Run-16: Drilling Pressure: 200 psi Kelly Bar RPM: 198 Enginer RPM: 1200-1300 Drill Time: 2min 47sec (140-142') 0.8' rubble, rods temporarily stuck Airlift 8min 55sec (142-145') 1.0' rubble Circ. Loss: 100% Driller Notes: Rod drop 140.3-141' and 143-144.5'	
-98.0						140.3-141' ROD DROP.			140.3'
-98.7	141					141-141.7' DOLOMITE, as above except moderately weathered, vuggy. 141.7-142.6' Banded/laminated apperance.			141'
	142.5								
DATE STARTED: 10/6/09 DATE COMPLETED: 10/12/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:				GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745 GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750 DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring			NOTES: Used NWJ for SPT sampling.		
DRILLING CO.: HUSS				DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500		

LNP- Offset Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. O-4

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
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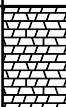
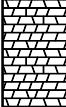
BORING NO. O-4

SHEET 14 OF 19 Rev. 4

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LOG OF BORING NO. O-4




PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
	154.5	R-19	100% (64%)	5.0		153.5-155' DOLOMITE, light gray (N7) and pale yellowish brown (10YR 6/2), slightly weathered, not as pitted, few vugs, strong reaction to 1N HCl when powdered, slightly fractured from 153.7-154.1', slightly to moderately weathered.		Run-19: Drilling Pressure: 200 psi Kelly Bar RPM: 207 Enginer RPM: 1200-1300 Drill Time: 10min 47sec (155-158') 0.5' rubble 7min 38sec (158-160') 0.2' rubble Circ. Loss: 100% Rods temporarily stuck.
	156					155-157.6' DOLOMITE, same as above except vuggy/pitted/fossiliferous in very thin bands.		
	157.5					157.6-158.7' DOLOMITE, thinly laminated, moderately weathered, porous/pitted, vuggy, moderately hard, unfractured to moderately fractured along bedding planes.		
	159					158.7-160' Crystalline DOLOMITE, pale yellowish brown (10YR 6/2) to light gray (N7), hard, strong reaction to 1N HCl when dry/powdered, moderately fractured (all horizontal), few vugs, pitted in very thin bands, fresh to slightly weathered.		
	160.5	R-20	84% (62%)	4.2		160-161.6' DOLOMITE, moderately hard, weak to moderate reaction to 1N HCl when powdered, slightly weathered, some fossils, vuggy, unfractured, thick bedded, light olive gray (5Y 6/1) to medium light gray (N6).		Run-20: Drilling Pressure: 250-300 psi Kelly Bar RPM: 200 Enginer RPM: 1200-1300 Drill Time: 5min 54sec (160-160.5') Airlift 6min 48sec (160.5-165') 0.2' rubble Circ. Loss: 100% Special Care Sample 162.0-163.2' Driller Notes: Rod drop 163.3-164.3' (approximately 1 foot, measured 0.8' in core)
	162					161.6-163.3' DOLOMITE, moderately hard, pitted/porous, some vugs, moderately weathered, banded apperance, light olive gray (5Y 6/1) to pale yellowish brown (10YR 6/2), thick bedded, unfractured (161.9-162.1' horizontal fracture), strong reaction to 1N HCl when powdered.		
-121.0	163.5					163.3-164.3' ROD DROP.		
-122.0						164.3-165' As above except vuggy, moderately weathered-sandy		
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745		NOTES: Used NWJ for SPT sampling.	
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring		RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody			
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-4

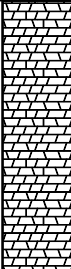
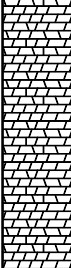
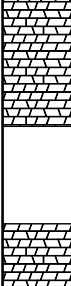
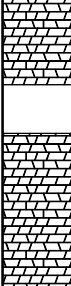

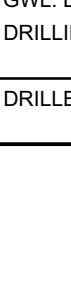

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
-123.0	165	R-21	74% (30%)	3.7		texture.		Run-21: Drilling Pressure: 250 psi Kelly Bar RPM: 207 Engine RPM: 1200-1300 Drill Time: 1min 47sec (165-166.3') 11min 30sec (166.3-168.3') Rods stuck-Airlift 7min 30sec (168.3-168.8') 7min 59sec (168.8-170') Circ. Loss: 100% Driller Notes: Rod drop 165.3-166.3' (approximate)
-124.0	166.5					165-165.1' DOLOMITE, moderately soft, dark yellowish orange (10YR 6/6), strong reaction to 1N HCl when powdered, pitted/porous, fossiliferous, sandy texture, moderately to severely weathered, thin bedded. 165.1-165.3' Crystalline DOLOMITE, light olive gray (5Y 6/1), moderately hard to hard, fresh to slightly weathered, porous/pitted in bands, strong reaction to 1N HCl when dry/powdered, slightly to moderately fractured (horizontal only) .		
						165.3-166.3' ROD DROP.		
						166.3-166.4' DOLOMITE as at 165-165.1'. 166.4-170' DOLOMITE as at 165.1-165.3'.		
	168	R-22	86% (48%)	4.3		170-170.7' DOLOMITE, moderately hard, light gray (N7) to light olive gray (5Y 6/1), pitted/porous in bands, slightly to moderately weathered, fossils in bands with pits, moderate to strong reaction to 1N HCl when powdered, medium bedded, moderately fractured-vertical fracture 170-170.8' (rough, open). 170.7-172.3' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2) to yellowish gray (5Y 7/2), moderately weathered-sandy texture, fossiliferous, pitted/porous, vuggy, unfractured to moderately fractured (107.7-171'), strong reaction to 1N HCl when powdered.		Run-22: Drilling Pressure: 200-250 psi Kelly Bar RPM: 195 Engine RPM: 1200 Drill Time: 19min 31sec 0.7' cuttings Circ. Loss: 100% Airlift after end of run
	169.5							
	171							
	172.5					172.3-173.5' crystalline DOLOMITE, as at 165.1'.		
	174					173.5-175' DOLOMITE, moderately hard, grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2), moderately weathered, pitted, slightly fractured (bedding planes), thick bedded, strong reaction to 1N HCl when powdered.		
	175.5					175-180' DOLOMITE, moderately hard, fresh to slightly weathered, pitted/porous in zones, medium to thick bedded, light olive gray (5Y 6/1) to light gray (N8), slightly fractured along bedding planes (except		
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745		NOTES: Used NWJ for SPT sampling.	
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring			
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-4








PROJECT NO. 07-3935

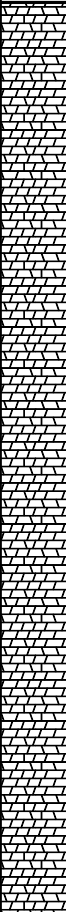
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
	177	R-23	96% (76%)	4.8		178.8-179.1' vertical fracture-moderately to intensely fractured), vuggy 177.6-178.7', strong reaction to 1N HCl when powdered.		Enginer RPM: 1100-1200 Drill Time: 18min 8sec 0.3' rubble Circ. Loss: 100%
	178.5					176.6-176.9' Moderately soft, fresh, not pitted.		
	180					180-180.5' DOLOMITE, moderately hard, thin to medium bedded, few interlayers of crystalline dolomite, fresh to slightly weathered, pitted in bands, unfractured, vuggy in bands, light olive gray (5Y 6/1) to medium light gray (N6), strong reaction to 1N HCl when powdered. 180.5-181' Crystalline DOLOMITE, medium light gray (N6) to light olive gray (5Y 6/1), hard, strong reaction to 1N HCl when dry/ powdered, fresh to slightly weathered, pitted in very thin bands, moderately to intensely fractured, thin to medium bedded.		
-138.7	181.5	R-24	78% (16%)	3.9		181-181.8' ROD DROP.		Run-24: Drilling Pressure: 200-300 psi Kelly Bar RPM: 221, 203 Enginer RPM: 1400-1500, 1200-1300 Drill Time: 3min 48sec (180-181.8') 13min 34sec (181.8- 183.4') Airlift 6min 5sec (183.4-183.5') 5min 38sec (183.5-185') Circ. Loss: 100% Rod drop 181-181.8' Rod drop 183-183.4'
-139.5						181.8-183' DOLOMITE as at 180.5-181'.		
	183					183-183.4' ROD DROP.		
-140.7						183.4-183.5' DOLOMITE as at 180.5', intensely fractured (bedding planes). 183.5-185.2' DOLOMITE same as at 181.8'.		
-141.1	184.5					185.2-185.8' DOLOMITE, moderately soft, grayish orange (10YR 7/ 4), moderately to severely weathered, pitted/porous- sandy texture, vuggy, unfractured, medium bedded, weak to moderate reaction to 1N HCl when powdered. 185.8-186.2' As above except intensely fractured/rubble.		
	186					186.2-186.5' DOLOMITE, light olive gray (5Y 6/1) to moderate yellowish brown (10YR 5/4), moderately soft, banded apperance.		
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745		NOTES: Used NWJ for SPT sampling.	
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring		RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody			
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offset Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. O-4

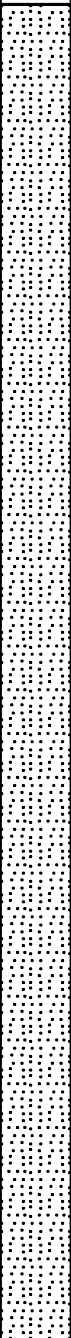
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
187.5		R-25	90% (70%)	4.5		friable, moderately to severely weathered, pitted/porous, thin to medium bedded, undulating abrupt basal contact. 186.5-192.9' Alternating bands of crystalline DOLOMITE (0.2- 0.3' thick), slightly fractured (bedding planes) and fossiliferous weathered DOLOMITE (0.3-0.8' thick). Crystalline DOLOMITE, hard, light gray (N7), fresh, pitted in very thin bands, strong reaction to 1N HCl when dry. Fossiliferous DOLOMITE, yellowish gray (5Y 7/2), moderately hard, pitted/porous, moderately weathered, weak to moderate reaction to 1N HCl when powdered.		
189								
190.5								
192		R-26	96% (72%)	4.8		192.9-193.6' DOLOMITE as at 186.2-186.5' except moderately fractured.		Run-26: Drilling Pressure: 200-250 psi Kelly Bar RPM: 216 Enginer RPM: 1300-1400 Drill Time: 14min 52sec 0.3' rubble Circ. Loss: 100%
193.5						193.6-195' DOLOMITE, light olive gray (5Y 6/1) to medium light gray (N6), slightly to moderately weathered, vuggy, pitted/porous in bands, moderate to strong reaction to 1N HCl when powdered, thick bedded, moderately fractured (bedding planes).		
195						195-196.9' DOLOMITE, moderately soft to moderately hard, pitted/porous, moderately weathered, dark yellowish orange (10YR 6/6), thin banded/laminated apperance, moderate to strong reaction to 1N HCl when powdered, few fossils with few thin bands of crystalline dolomite, undulating abrupt basal contact, moderately fractured (bedding planes).		Run-27: Drilling Pressure: 250-300 psi Kelly Bar RPM: 206 Enginer RPM: 1200-1300 Drill Time: 8min 55sec Circ. Loss: 100%
196.5			100%			196.9-200' DOLOMITE, moderately hard, yellowish gray (5Y 7/2), moderately to intensely fractured, pitted, vuggy, some fossils, thick bedded, slightly to moderately weathered, strong reaction to 1N HCl		
DATE STARTED: 10/6/09 DATE COMPLETED: 10/12/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745 GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750 DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring	NOTES: Used NWJ for SPT sampling.		
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody	RIG: Failing 1500		

LNP- Offset Boring Program						PROJECT NO. 07-3935		
LOG OF BORING NO. O-4								
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1722990.9 E 458053.5 SURFACE EL: 42.3	USCS SYMBOL	REMARKS
						DESCRIPTION		
-162.7	198	R-27	(28%)	5.0		when powdered, silty texture in weathered areas, with very thin pockets of medium light gray (N6) material.		Run-28: Drilling Pressure: 250 psi Kelly Bar RPM: 196 Engineer RPM: 1200-1300 Drill Time: 13min 33sec 0.3' rubble Circ. Loss: 100%
	199.5					200-202.3' DOLOMITE, as at 195-196.9'.		
	201		R-28	90% (24%)	4.5		202.3-205' Crystalline DOLOMITE, moderately hard to hard, intensely fractured, light olive gray (5Y 6/1) to very light gray (N8), fresh to slightly weathered, pitted/vuggy in very thin bands, strong reaction to 1N HCl when dry/powdered.	
	202.5							
	204							
	205.5					BOTTOM OF BORING 205'		
	207							
DATE STARTED: 10/6/09					GWL: DEPTH: 5.1' DATE/TIME: 10/7/09 @ 0745			NOTES: Used NWJ for SPT sampling.
DATE COMPLETED: 10/12/09					GWL: DEPTH: 5.4' DATE/TIME: 10/13/09 @ 0750			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/Continuous SPT/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500
DRILLING CO.: HUSS								

LNP- Offest Boring Program

LOG OF BORING NO. 0-5

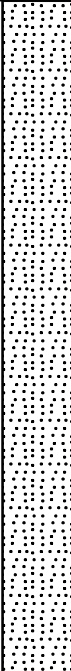
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
	0					0.0-22.0' SAND.	sp	0-22' destructive drilling, log based on cuttings.
	2							
	4							
	6							
	8							
	10							
	12							
	14							
DATE STARTED: 10/19/09					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750			NOTES: NA
DATE COMPLETED: 10/28/09					GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015			
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/PQ3 coring			RIG: Failing 1500
CHECKED BY: JLO					DRILLER: Eddie Palmer HELPER: Chad/Cody			
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offest Boring Program

LOG OF BORING NO. 0-5

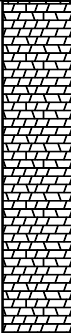
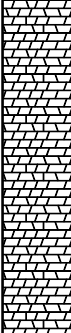
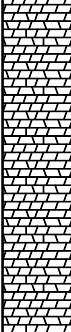
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
20.6	16	OB-1	84% (32%)	4.2		22.0-23.0' DOLOMITE, soft, highly weathered, slightly fractured, thin bedded, weak reaction to 1N HCl, olive gray (5Y 3/2). 23.0-27.0' DOLOMITE, soft to moderately soft, highly weathered, weak reaction to 1N HCl, grayish orange (10YR 7/ 4) to very pale orange (10YR 8/2), moderately fractured. 25.6-25.9' Very soft. 27.0-30.0' As above except intensely fractured.		Drillers Notes: circulation loss at 15'. <

LNP- Offest Boring Program

PROJECT NO. 07-3935

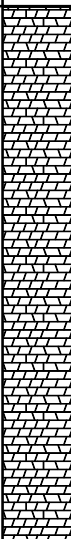
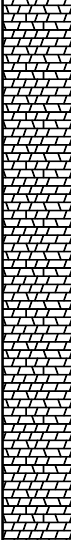
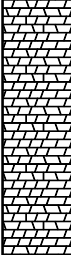
LOG OF BORING NO. 0-5

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
	30	OB-3	36% (0%)	1.8		30.0-33.0' DOLOMITE, very weathered-soft drilling, no recovery of material but cuttings, similar to material above.		OB-3: Drilling Pressure: 200 psi Kelly Bar RPM: 204 Engine RPM: 1200-1300 Drill Time: 13min 32sec 2" of material fall in from above. Driller Notes: very soft from 130'-133'
	32					33.0-35.0' DOLOMITE, very weathered, intensely fractured (bedding planes), no reaction to 1N HCl, moderate reaction when powdered, moderately hard to hard, grayish orange (10YR 7/4).		
	34					35.0-37.0' DOLOMITE, moderately weathered, moderately fractured (bedding planes), no reaction to 1N HCl, moderately hard to hard, light olive gray (5Y 5/2).		
	36	OB-4	28% (14%)	1.4		37.0-45.0' DOLOMITE, intensely weathered, soft, no recovery of material but cuttings similar to material above.		OB-4: Drilling Pressure: 250 psi Kelly Bar RPM: 200 Engine RPM: 1200-1300 Drill Time: 10min 43sec Circulation loss: 90%
	38							
	40	OB-5	0% (0%)	0.0				OB-5: Drilling Pressure: 200 psi Kelly Bar RPM: 214 Engine RPM: 1300-1400 Drill Time: 2min 23sec Circulation loss: 100 % NOTE: No picture taken since no sample recovered.
	42							
DATE STARTED: 10/19/09					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750			NOTES: NA
DATE COMPLETED: 10/28/09					GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015			
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/PQ3 coring			RIG: Failing 1500
CHECKED BY: JLO								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			
DRILLING CO.: HUSS								

LNP- Offest Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. 0-5

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS	
						DESCRIPTION			
	44	OB-6	16% (0%)	0.8		45.0-50.0' DOLOMITE, soft, intensely weathered, intensely fractured, no reaction to 1N HCl, moderate reaction when powdered, light olive gray (5Y 5/2) to olive gray (5Y 3/2).		OB-6: Drilling Pressure: 200 psi Kelly Bar RPM: 199 Engine RPM: 1200-1300 Drill Time: 4min 13sec Circulation loss: 100%	
	46								
	48								
	50	OB-7	92% (80%)	4.6		50.0-52.8' DOLOMITE, moderately hard, light olive gray (5Y 5/2), argillaceous, thick bedded, slightly fractured (horizontal-bedding planes), moderately weathered, no reaction to 1N HCl. 50.2' Horizontal fracture.		OB-7: Drilling Pressure: 400 psi Kelly Bar RPM: 200 Engine RPM: 1200-1300 Drill Time: 15min 57sec Circulation loss: None Water level 10/20/09 @ 0750 5.9'.	
	52					51.7' Horizontal fracture.			
	54					52.8-55.0' DOLOMITE, soft, moderate yellowish brown (10YR 5/4), sandy, thinly bedded, slightly fractured, moderately to intensely weathered, no reaction to 1N HCl, moderate reaction when powdered.			
	56	OB-8	80% (74%)	4.0		55.0-58.8' DOLOMITE, moderately soft, light olive gray (5Y 5/2), sandy, thick bedded, slightly fractured (horizontal-bedding planes), moderately weathered, no reaction to 1N HCl, moderate reaction when powdered.		OB-8: Drilling Pressure: 300 psi Kelly Bar RPM: 206 Engine RPM: 1200-1300 Drill Time: 26min 17sec Circulation loss: None 1" of material fall in from above. Driller Notes: soft from 57.8-58.8'.	
	58								
DATE STARTED: 10/19/09					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750			NOTES: NA	
DATE COMPLETED: 10/28/09					GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015				
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/PQ3 coring			RIG: Failing 1500	
CHECKED BY: JLO									
APPROVED BY:									
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody				

LNP- Offest Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. 0-5

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
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BORING NO. 0-5

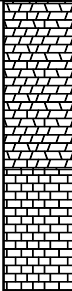
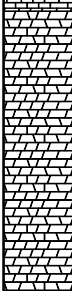
APPENDIX 2BB-1232

SHEET 5 OF 17 Rev. 4

LNP- Offest Boring Program

PROJECT NO. 07-3935


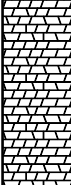
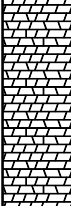
LOG OF BORING NO. 0-5

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
-32.4	74	R-4	100% (52%)	5.0		74.6-75.0' DOLOMITE, moderately hard, moderate yellowish brown (10YR 5/4), some vugs and pits, thinly bedded, weak reaction to 1N HCl, intensely fractured.		Run 4: Drilling Pressure: 300 psi Kelly Bar RPM: 213 Engine RPM: 1300-1400 Drill Time: 35min 53sec (75.0-77.5') 24min 40sec (77.5-80.0') Circulation loss: None Note: Picture in tray mislabeled- shows RUN 3.
-34.5	76					75.0-77.1' LIMESTONE, very hard, crystalline, thick bedded, very light gray (N8), 75-75.6' some pitting, slightly fractured (horizontal-bedding planes), moderate to strong reaction to 1N HCl.		
	78					77.1-77.5' DOLOMITE, moderately soft, thinly bedded, moderate yellowish brown (10YR 5/4), intensely fractured, no reaction to 1N HCl. 77.5-79.3' Same as 75.0-77.1' except slightly pitted, moderately fractured.		
	80					79.3-80.0' DOLOMITE, moderately soft, thinly bedded to laminated, pitted, moderate yellowish brown (10YR 5/4), moderately fractured, no reaction to 1N HCl. 80.0-80.7' As above except moderate yellowish brown (10YR 5/4) and light gray (N7). 80.7-81.3' As above except intensely fractured.		
	82	R-5	100% (84%)	5.0		81.3-85.9' DOLOMITE, thick bedded, moderately hard, pitted, few small vugs, light gray (N7), very slightly fractured (horizontal break at 84'), no reaction to 1N HCl, weak reaction when powdered.		Run 5: Drilling Pressure: 250 psi Kelly Bar RPM: 201 Engine RPM: 1200-1300 Drill Time: 16min 24sec Circulation loss: none
	84	R-6	100% (62%)	5.0		85.9-86.5' As above except intensely fractured.		
	86					86.5-87.5' DOLOMITE, moderately soft, thinly bedded, pitted, very pale orange (10YR 8/2), slightly fractured, no reaction to 1N HCl, slight reaction when powdered, moderately weathered.		
						87.5-89.1' DOLOMITE, hard, thinly bedded, some pits, dark yellowish		
DATE STARTED: 10/19/09					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750			NOTES: NA
DATE COMPLETED: 10/28/09					GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015			
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/PQ3 coring			
CHECKED BY: JLO								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500
DRILLING CO.: HUSS								

LNP- Offest Boring Program

PROJECT NO. 07-3935








LOG OF BORING NO. 0-5

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
	88	R-7	86% (32%)	4.3		brown (10YR 4/2), no reaction to 1N HCl, weak reaction when powdered, slightly weathered. 88.4' Fracture, filled with organics, no odor.		Run-7: Drilling Pressure: 200 psi Kelly Bar RPM: 204 Engine RPM: 1200-1300 Drill Time: 41min 29sec Circulation loss: None Driller Notes: soft 94-95'.
	90					89.1-90.0' DOLOMITE, soft, thin bedded, very pale orange (10YR 8/2), no reaction to 1N HCl, moderately to severely weathered, moderately fractured. 90.0-91.8' DOLOMITE, thick bedded, hard, very pale orange (10YR 8/2), unfractured, some pits filled with dolomite (grayish orange (10YR 7/4)) and a fewer thin streaks (dusky yellowish brown (10YR 2/2)), strong reaction to 1N HCl, fresh to slightly weathered.		
	92					91.8'-92.3' DOLOMITE, moderately soft, thick bedded, pale yellowish brown (10YR 6/2), slightly fractured, severely weathered, no reaction to 1N HCl. 92.3-93.2' Same as 90.0-91.8' except intensely fractured.		
	94					93.2-95.7' DOLOMITE, moderately soft, thin bedded, dark yellowish brown (10YR 4/2) with black (N1) streaks, severely weathered, intensely fractured, no reaction to 1N HCl, slight reaction when powdered, pitted.		
	96	R-8	100% (22%)	5.0		95.7-100.0' DOLOMITE, moderately soft, thick bedded, moderately to intensely fractured (vertical), moderately weathered, few pits, very pale orange (10YR 8/2), no reaction to 1N HCl, moderate reaction when powdered.		Run-8: Drilling Pressure: 250 psi Kelly Bar RPM: 203 Engine RPM: 1200-1300 Drill Time: 15min 9sec Circulation loss: None Material from above: 2"
	98							
	100					100.0-102.9' As above except slightly fractured (bedding planes).		
	102							Run-9: Drilling Pressure: 250 psi Kelly Bar RPM: 221 Engine RPM: 1400-1500 Drill Time: 15min 50sec Circulation loss: 100%
DATE STARTED: 10/19/09					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750		NOTES: NA	
DATE COMPLETED: 10/28/09					GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015			
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/PQ3 coring			
CHECKED BY: JLO								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
DRILLING CO.: HUSS								

LNP- Offest Boring Program

LOG OF BORING NO. 0-5








PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
	104	R-9	98% (66%)	4.9		102.9-105.0' As above except moderately to intensely fractured.		Run-10: Drilling Pressure: 200 psi Kelly Bar RPM: 205 Engine RPM: 1200-1300 Drill Time: 18min 15sec Circulation loss: partial Catcher malfunction, 0.4' added to R-10 from R-11.
	106					105.0-112.9' As above except slightly fractured (vertical fractures at 106-106.3' and 106.8-107.5').		
	108	R-10	100% (78%)	5.0				
	110							
	112							
	114	R-11	100% (78%)	5.0		112.9-115.9' DOLOMITE, grayish orange (10YR 7/4), moderately soft, thin bedded, moderately fractured, severely weathered, pitted, vuggy, no reaction to 1N HCl, moderate reaction when powdered, sandy.		Run-11: Drilling Pressure: 150 psi Kelly Bar RPM: 214 Engine RPM: 1300-1400 Drill Time: 7min 29sec Circulation loss: 30% Material from above: 0.4' Note solid core from above core run (added to Run-10).
	116					115.9-116.9' DOLOMITE, moderately soft, pale yellowish brown (10YR 6/2), sandy, thinly bedded, slightly weathered, moderately fractured, no reaction to 1N HCl, moderate reaction when powdered.		Run-12: Drilling Pressure: 400 psi Kelly Bar RPM: 211 Engine RPM: 1300-1400 Drill Time: 8min 23sec Circulation loss: 50% Water level 10/26/09 @ 0830 6.5'. Picture taken in tray has incorrect
DATE STARTED: 10/19/09 DATE COMPLETED: 10/28/09 FIELD GEOLOGIST: WDS CHECKED BY: JLO APPROVED BY:					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750 GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015 DRILLING METHOD: Mud Rotary/PQ3 coring			NOTES: NA
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500

LNP- Offest Boring Program

PROJECT NO. 07-3935




LOG OF BORING NO. 0-5

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
	118	R-12	100% (62%)	5.0		116.9-117.4' DOLOMITE, moderately hard, very pale orange (10YR 8/2), crystalline, thin bedded, slightly weathered, moderately fractured, moderate reaction to 1N HCl. 117.4-118.7' DOLOMITE, moderately soft, grayish orange (10YR 7/4), sandy, thin bedded, moderately weathered, slightly fractured, no reaction to 1N HCl. 118.7-120.0' DOLOMITE, moderately soft, pale yellowish brown (10YR 6/2), pitted, fossiliferous, moderately to severely weathered, thin bedded, intensely fractured, no reaction to 1N HCl.		date.
	120					120.0-120.5' DOLOMITE, moderately hard, grayish orange (10YR 7/4), crystalline to sandy, thin bedded, slightly weathered, unfractured, no reaction to 1N HCl, moderate reaction when powdered. 120.5-121.5' As above except intensely fractured-vertical fracture from 120.5-122.0'.		Run-13: Drilling Pressure: 350 psi Kelly Bar RPM: 202 Engine RPM: 1200-1300 Drill Time: 11min 45sec Circulation loss: 50% Driller Notes: end of core fell in hole as he was bringing core out. NOTE: picture shows 84% recovery since it was taken before the following core run retrieved the fallen piece. Picture in tray has incorrect date.
	122	R-13	96% (52%)	4.8		121.5-122.4' As above except slightly fractured.		
	124					122.4-126.2' DOLOMITE, moderately hard, crystalline, very pale orange (10YR 8/2), pitted, slightly weathered, unfractured, no reaction to 1N HCl, moderate reaction when powdered.		
	126					126.2-126.6' Same as above except laminated, moderately fractured, very pale orange (10YR 8/2), no pits. 126.6-127.0' DOLOMITE, soft, pitted, fossiliferous, pale yellowish brown (10YR 6/2), severely weathered, intensely fractured, moderate reaction to 1N HCl. 127.0-128.0' Same as 126.2-126.6'.		Run-14: Drilling Pressure: 250 psi Kelly Bar RPM: 201 Engine RPM: 1200-1300 Drill Time: 9min 54sec Circulation loss: 50% Material from above: 0.6' Picture in tray shows incorrect date.
	128	R-14	96% (66%)	4.8		128.0-130.0' DOLOMITE, moderately soft, pale yellowish brown (10YR 6/2), pitted, fossiliferous, moderately weathered, slightly fractured, no reaction to 1N HCl, weak reaction when powdered.		
	130					130.0-132.7' DOLOMITE, moderately soft, thinly laminated, grayish orange (10YR 7/4), layers of dark yellowish brown (10YR 4/2), very pale orange (10YR 8/2), and pale yellowish brown (10YR 6/2), some pits and fossils, slightly to moderately weathered, slightly fractured (horizontal-bedding planes), no reaction to 1N HCl, moderate reaction when powdered.		Run-15: Drilling Pressure: 250 psi Kelly Bar RPM: 206 Engine RPM: 1200-1300 Drill Time: 10min 50sec Circulation loss: 50%
DATE STARTED: 10/19/09 DATE COMPLETED: 10/28/09 FIELD GEOLOGIST: WDS CHECKED BY: JLO APPROVED BY:					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750 GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015 DRILLING METHOD: Mud Rotary/PQ3 coring		NOTES: NA	
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	

LNP- Offest Boring Program

LOG OF BORING NO. 0-5

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
132		R-15	100% (74%)	5.0		132.7-136.4' DOLOMITE, moderately hard, thinly bedded, sandy to crystalline, pale yellowish brown (10YR 8/2), some pits, slightly weathered, slightly to moderately fractured (horizontal-bedding planes), no reaction to 1N HCl, moderate reaction when powdered, some laminations-dark yellowish brown (10YR 4/2) at 134.7'.		Picture in tray shows incorrect date.
134								
136		R-16	100% (32%)	5.0		136.4-136.9' As above except pale yellowish brown (10YR 6/2), unfractured. 136.9-140.0' DOLOMITE, hard, crystalline, thick bedded, pale yellowish brown (10YR 6/2) and moderate yellowish brown (10YR 5/4), pitted, some vugs, moderately weathered, intensely fractured, no reaction to 1N HCl, some fossils.		Run-16: Drilling Pressure: 300 psi Kelly Bar RPM: 213 Engine RPM: 1300-1400 Drill Time: 30min 42sec Circulation loss: 50%
138								
140		R-17	100% (100%)	5.0		140.0-141.8' DOLOMITE, very hard, pale yellowish brown (10YR 6/2) with medium gray (N5) bands, laminated, some pits, slightly weathered at 141.6' (moderate yellowish brown (10YR 5/4) and more pitted), slightly fractured, crystalline, no reaction to 1N HCl, moderate reaction when powdered.		Run-17: Drilling Pressure: 250 psi Kelly Bar RPM: 217 Engine RPM: 1300-1400 Drill Time: 28min 24sec Circulation loss: 50% Material from above: 5"
142						141.8-145.8' DOLOMITE, moderately hard, very pale orange (10YR 8/2) and pale yellowish brown (10YR 6/2), sandy to crystalline, thin bedded, unfractured, very slightly weathered, no reaction to 1N HCl, moderate reaction when powdered.		
144								
146						145.8-148.1' DOLOMITE, very hard, pale yellowish brown (10YR 6/2), crystalline, few fossils, more pitted at 147.7' to 148.1', unfractured,		Run-18: Drilling Pressure: 250 psi Kelly Bar RPM: 208 Engine RPM: 1200-1300 Drill Time: 19min 50sec
DATE STARTED: 10/19/09					GWL: DEPTH: 5.9'	DATE/TIME: 10/20/09 @ 0750	NOTES: NA	
DATE COMPLETED: 10/28/09					GWL: DEPTH: 6.3'	DATE/TIME: 10/28/09 @ 1015		
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/PQ3 coring			
CHECKED BY: JLO								
APPROVED BY:					DRILLER: Eddie Palmer	HELPER: Chad/Cody	RIG: Failing 1500	
DRILLING CO.: HUSS								

LNP- Offest Boring Program

PROJECT NO. 07-3935


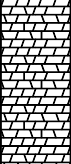



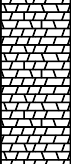

LOG OF BORING NO. 0-5

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS		
						DESCRIPTION				
-114.7	148	R-18	86% (74%)	4.3		very slightly weathered, thin bedded, no reaction to 1N HCl, moderate to high reaction when powdered.		Circulation loss: 50% Material from above: 3"		
						148.1-148.7' DOLOMITE, moderately soft, moderate yellowish brown (10YR 5/4), sandy, thinly laminated, severely weathered, moderately fractured along bedding planes, pitted, no reaction to 1N HCl. 148.7-150.0' DOLOMITE, moderately hard, thinly laminated, very pale orange (10YR 8/2) with light gray (N7) bands, moderately weathered, unfractured, weak reaction to 1N HCl.				
	150					150.0-150.3' As above except pale yellowish brown (10YR 6/2). 150.3-152.1' As above except grayish orange (10YR 7/4).				
	152	R-19	100% (92%)	5.0		152.1-153.0' As above except pitted, grayish orange (10YR 7/4).				
						153.0-154.0' As above except not pitted, pale yellowish brown (10YR 6/2).				
	154					154.0-154.6' DOLOMITE, hard, thinly laminated, crystalline, yellowish gray (5Y 8/1) and light gray (N7), fresh, moderately fractured, no reaction to 1N HCl, slight reaction when powdered. 154.6-155.0' Same as 153.0'-154.0'.				
						155.0-156.2' DOLOMITE, moderately hard, very pale orange (10YR 8/2) to grayish orange (10YR 7/4), sandy to crystalline, pitted, slightly weathered, unfractured, weak reaction to 1N HCl.				
	156					156.2-156.6' As above except pale yellowish brown (10YR 6/2), unfractured. 156.6-157.3' Same as 155.0-156.2'.				
						157.3-160.0' LIMESTONE, moderately hard, sandy to crystalline, very pale orange (10YR 8/2) with light gray (N7), slightly weathered, moderately fractured, medium to strong reaction to 1N HCl.				
	158	R-20	100% (72%)	5.0						
						160.0-161.2' As above except unfractured.				
	160									
	DATE STARTED: 10/19/09					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750		NOTES: NA		
	DATE COMPLETED: 10/28/09					GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015				
	FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/PQ3 coring				
CHECKED BY: JLO										
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500			
DRILLING CO.: HUSS										

LNP- Offest Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. 0-5

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
-118.6	162	R-21	92% (50%)	4.6		161.2-161.9' DOLOMITE, hard, crystalline, medium light gray (N6), intensely fractured along bedding planes, fresh, no reaction to 1N HCl, moderate reaction when powdered. 161.9-163.0' DOLOMITE, moderately hard, sandy, pale yellowish brown (10YR 6/2) and light gray (N7), moderately weathered, moderately to intensely fractured along bedding planes, no reaction to 1N HCl, some pits. 163.0-163.8' DOLOMITE, moderately soft, sandy, dark yellowish brown (10YR 4/2), pitted, moderately weathered, moderately fractured, no reaction to 1N HCl, thin bedded. 163.8-165.0' DOLOMITE, hard, pitted with some vugs, thinly laminated, moderate yellowish brown (10YR 5/4), moderately weathered, moderately fractured along bedding planes, no reaction to 1N HCl. 165.0-166.4' DOLOMITE, moderately hard, thinly bedded, organic, sandy to crystalline, very pale orange (10YR 8/2), slightly pitted, slightly weathered, moderately fractured along bedding planes, no reaction to 1N HCl, weak reaction when powdered.		Drill Time: 19min 54sec Circulation loss: 50% Run-22: Drilling Pressure: 300 psi Kelly Bar RPM: 195 Engine RPM: 1200-1300 Drill Time: 11min 48sec Circulation loss: 50%
	164					166.4-166.5' Same as 161.2-161.9'. 166.5-169.3' Same as 165-166.4' except very pale orange (10YR 8/2) and moderate yellowish brown (10YR 4/2), thinly laminated from 169-169.3'.		
	166	R-22	100% (54%)	5.0		169.3-170.0' DOLOMITE, hard, sandy to crystalline, pale yellowish brown (10YR 6/2), some pits, moderately fractured (vertical fractures), slightly weathered, no reaction to 1N HCl, weak reaction when powdered. 170.0-172.2' Vertical fracture.		
	168					172.2-172.4' Same as 161.2' to 161.9' except unfractured. 172.4-172.7' DOLOMITE, moderately hard, thinly laminated, moderate yellowish brown (10YR 5/4) with black (N1) bands (perpendicular to bedding), moderately to severely weathered, moderately fractured along bedding planes, sandy, no reaction to 1N HCl. 172.7-173.1' Same as 170.0-172.2'. 173.1-173.5' Same as 172.4-172.7' except intensely fractured. 173.5-175.3' DOLOMITE, hard, thin bedded, crystalline, pale yellowish brown (10YR 6/2), moderate yellowish brown (10YR 5/4) filled vugs, light gray (N7) beds, pitted, slightly weathered, moderately fractured, no reaction to 1N HCl, weak reaction when powdered.		
	170					175.3-176.9' DOLOMITE, hard, thin bedded, broken at 175.3' and		Run-23: Drilling Pressure: 250 psi Kelly Bar RPM: 200 Engine RPM: 1200-1300 Drill Time: 20min 44sec Circulation loss: 50% AIRLIFT at 170.0'
	172	R-23	98% (46%)	4.9				Run-24: Drilling Pressure: 300 psi
	174							
DATE STARTED: 10/19/09					GWL: DEPTH: 5.9'	DATE/TIME: 10/20/09 @ 0750	NOTES: NA	
DATE COMPLETED: 10/28/09					GWL: DEPTH: 6.3'	DATE/TIME: 10/28/09 @ 1015		
FIELD GEOLOGIST: WDS					DRILLING METHOD: Mud Rotary/PQ3 coring			
CHECKED BY: JLO								
APPROVED BY:					DRILLER: Eddie Palmer	HELPER: Chad/Cody	RIG: Failing 1500	
DRILLING CO.: HUSS								

BORING NO. 0-5

APPENDIX 2BB-1239

SHEET 12 OF 17 Rev. 4

LNP- Offest Boring Program

PROJECT NO. 07-3935




LOG OF BORING NO. 0-5

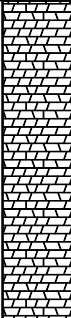

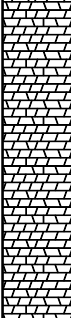
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
176 <								

LNP- Offest Boring Program

LOG OF BORING NO. 0-5

PROJECT NO. 07-3935

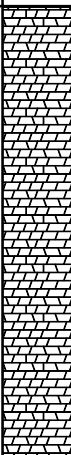

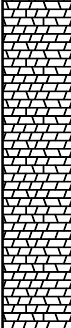
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
-153.0	192	R-27	92% (12%)	4.6		bedded, very pale orange (10YR 8/2), sandy to crystalline, slightly weathered, moderately fractured (angular and vertical), no reaction to 1N HCl, weak reaction when powdered.		Drilling Pressure: 200 psi Kelly Bar RPM: 201 Engine RPM: 1200-1300 Drill Time: 6min 7sec Circulation loss: 100% Material from above: 4"
						192.0-192.2' Same as above except crushed.		
		R-28	79% (8%)	3.9		192.2-194.2' DOLOMITE, moderately hard, sandy, pitted, pale yellowish brown (10YR 6/2), thin bedded to laminated at 194.0-194.2', moderately weathered, moderately fractured, no reaction to 1N HCl.		
	194					194.2-195.0' DOLOMITE, moderately hard, thinly laminated, sandy to crystalline, pale yellowish brown (10YR 6/2) with dark yellowish brown (10YR 4/2) bands, slightly weathered, slightly fractured, no reaction to 1N HCl.		
						195.0-195.3' Same as 188.3-190.0'.		
						195.3-195.6' Same as above except intensely fractured and broken.		
	196					195.6-197.0' DOLOMITE, moderately hard, thin bedded, intensely fractured, slightly weathered, sandy to crystalline, pale yellowish brown (10YR 6/2), no reaction to 1N HCl.		Run-28: Drilling Pressure: 200 psi Kelly Bar RPM: 225 Engine RPM: 1400-1500 Drill Time: 8min 8sec Circulation loss: 100% Material from above: 0.8"
						197.0-201.0', DOLOMITE, hard, sandy, pitted, slightly fractured, thin bedded, moderate yellowish brown (10YR 5/4), moderately weathered, no reaction to 1N HCl.		
	198							
	200	R-29	72% (20%)	3.6		201.0-202.6' DOLOMITE, moderately hard, sandy, intensely fractured, moderately weathered, light olive gray (5Y 6/1), no reaction to 1N HCl.		Run-29: Drilling Pressure: 250 psi Kelly Bar RPM: 199 Engine RPM: 1200-1300 Drill Time: 10min 40sec Circulation loss: 100% Material from above: 0.4"
	202					202.6-202.8' Same as above except very soft.		
						202.8-203.4' DOLOMITE, hard, sandy to crystalline, thinly laminated, yellowish gray (5Y 8/1), slightly weathered, moderately fractured (vertical fracture), no reaction to 1N HCl, moderate reaction when powdered.		
	204					203.4-205.0' Same as 195.3-195.6'.		
DATE STARTED: 10/19/09 DATE COMPLETED: 10/28/09 FIELD GEOLOGIST: WDS CHECKED BY: JLO APPROVED BY:					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750 GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015 DRILLING METHOD: Mud Rotary/PQ3 coring			NOTES: NA
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500

LNP- Offest Boring Program						PROJECT NO. 07-3935		
LOG OF BORING NO. 0-5								
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
	206	R-30	66% (0%)	3.3		205.0-208.2' DOLOMITE, broken, intensely fractured/rubble, pitted, medium light gray (N6) and pale yellowish brown (10YR 6/2), weathered, crystalline to sandy, no reaction to 1N HCl.		Run-30 Drilling Pressure: 450 psi Kelly Bar RPM: 195 Engine RPM: 1200-1300 Drill Time: 2min 58sec (205-208') 4min 52sec (208-210') Circulation loss: 100% Material from above: 5" Driller Notes: soft drilling from 205'-208', chattering.
	208							
	210							
	212	R-31	90% (48%)	4.5		208.2-208.7' DOLOMITE, soft, powdery, very pale orange (10YR 8/2) with pale yellowish brown (10YR 6/2), thin bedded, severely weathered, intensely fractured, no reaction to 1N HCl. 208.7-210.9' DOLOMITE, moderately hard, sandy, pitted, pale yellowish brown (10YR 6/2), moderately weathered, moderately to intensely fractured, no reaction to 1N HCl.		Run-31: Drilling Pressure: 250 psi Kelly Bar RPM: 201 Engine RPM: 1200-1300 Drill Time: 9min 5sec Circulation loss: 100%
	214							
	216							
	218	R-32	66% (0%)	3.3		210.9-211.6' DOLOMITE, moderately soft, laminated, very pale orange (10YR 8/2) and pale yellowish brown (10YR 6/2), some pits, powdery, moderately weathered, unfractured, no reaction to 1N HCl. 211.6-212.4' As above except fossiliferous.		R-32: Drilling Pressure: 250 psi Kelly Bar RPM: 215 Engine RPM: 1300-1400 Drill Time: 6min 42sec (215-217') 2min 28sec (217-220') Circulation loss: 100% Material from above: 0.4' from first drill run. 0.6' from second drill run.
DATE STARTED: 10/19/09				GWL: DEPTH: 5.9'		DATE/TIME: 10/20/09 @ 0750	NOTES: NA	
DATE COMPLETED: 10/28/09				GWL: DEPTH: 6.3'		DATE/TIME: 10/28/09 @ 1015		
FIELD GEOLOGIST: WDS				DRILLING METHOD: Mud Rotary/PQ3 coring				
CHECKED BY: JLO								
APPROVED BY:				DRILLER: Eddie Palmer		HELPER: Chad/Cody	RIG: Failing 1500	
DRILLING CO.: HUSS								

LNP- Offest Boring Program

LOG OF BORING NO. 0-5


PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS
						DESCRIPTION		
	220	R-33	78% (18%)	3.9		219.3-221.1' DOLOMITE, moderately hard, sandy to crystalline, slightly weathered, intensely fractured, grayish orange (10YR 7/4), thick bedded, no reaction to 1N HCl.		R-33: Drilling Pressure: 250 psi Kelly Bar RPM: 214 Engine RPM: 1300-1400 Drill Time: 3min 35sec Circulation loss: 100% Material from above: 0.4'
	222					221.1-222.0' DOLOMITE, moderately soft, sandy, grayish orange (10YR 7/4), thin bedded, severely weathered, unfractured, no reaction to 1N HCl.		
	224					222.0-222.5' DOLOMITE, soft, sandy, severely weathered, pale yellowish brown (10YR 6/2), intensely fractured, thin bedded, no reaction to 1N HCl. 222.5-223.1' DOLOMITE, moderately hard, thinly laminated, grayish orange (10YR 7/4) and very pale orange (10YR 8/2), sandy, slightly weathered, moderately fractured, no reaction to 1N HCl. 223.1-223.3' As above except intensely fractured/crushed. 223.3-228.0' DOLOMITE, soft, sandy, severely weathered, intensely fractured, moderate yellowish brown (10YR 5/4), pitted, no reaction with 1N HCl.		
	226							
	228	R-34	74% (18%)	3.7		228.0-228.3' As above except very soft. 228.3-230.0' As above except moderately soft.		Run-34: Drilling Pressure: 250 psi Kelly Bar RPM: 201 Engine RPM: 1200-1300 Drill Time: 1min 29sec Circulation loss: 100% Material from above: 0.6'
	230					230.0-234.5' DOLOMITE as above.		
	232	R-35	8% (0%)	0.4				Run-35: Drilling Pressure: 250 psi Kelly Bar RPM: 207 Engine RPM: 1200-1300 Drill Time: 4min 48sec Circulation loss: 100% Material from above: 0.4' Driller Notes: very soft except last 6". Possibly piece stuck in bottom of shoe affected recovery. Drillers had to AIRLIFT two times to clean hole of cuttings from soft dolomite.
	234							
DATE STARTED: 10/19/09 DATE COMPLETED: 10/28/09 FIELD GEOLOGIST: WDS CHECKED BY: JLO APPROVED BY:					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750 GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015 DRILLING METHOD: Mud Rotary/PQ3 coring		NOTES: NA	
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	

LNP- Offest Boring Program

PROJECT NO. 07-3935

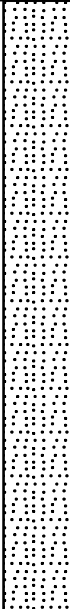

LOG OF BORING NO. 0-5

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724150.2 E 457769.9 SURFACE EL: 42.6	USCS SYMBOL	REMARKS						
						DESCRIPTION								
-197.4	236	R-36	86% (40%)	4.3		234.5-235.0' DOLOMITE, very hard, fresh, crystalline, intensely fractured, thick bedded, grayish orange (10YR 7/4), no reaction to 1N HCl.		Run-36 Drilling Pressure: 350 psi Kelly Bar RPM: 194 Engine RPM: 1200 Drill Time: 4min 54sec Circulation loss: 100% Material from above: 0.6' NOTE: Includes a large piece of hard dolomite which had been stuck in core barrel. This was affecting the recovery from above based on drillers statement. Water level 10/28/09 @ 1015 6.3'						
	235.0-237.4' DOLOMITE, moderately hard, hard at 236.7', sandy to crystalline, pale yellowish brown (10YR 6/2), slightly to moderately fractured along bedding planes, slightly weathered, broken at 235.8' and 236.6', no reaction to 1N HCl, thick bedded.													
	237.4-240.0' DOLOMITE, moderately soft, thinly laminated, grayish orange (10YR 7/4) to moderate yellowish brown (10YR 5/4), sandy, intensely fractured, intensely weathered, no reaction to 1N HCl.													
	BOTTOM OF BORING 240'													
	242													
	244													
	246													
	248													
	DATE STARTED: 10/19/09					GWL: DEPTH: 5.9' DATE/TIME: 10/20/09 @ 0750			NOTES: NA					
	DATE COMPLETED: 10/28/09					GWL: DEPTH: 6.3' DATE/TIME: 10/28/09 @ 1015								
FIELD GEOLOGIST: WDS			DRILLING METHOD: Mud Rotary/PQ3 coring											
CHECKED BY: JLO														
APPROVED BY:			DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500								
DRILLING CO.: HUSS														

LNP- Offset Boring Program

LOG OF BORING NO. O-6

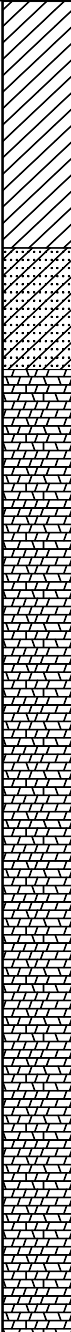
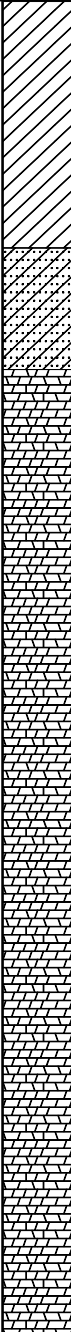
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
37.2	0					0.0-5.0' POORLY GRADED SAND (sp), fine grained, well sorted.	sp	0-14' Drilled destructively-log based on cuttings.
	1.5							
	3							
	4.5							
	5							
	6					5.0-13.0' SANDY CLAY (cl), low plasticity, sand-fine grained (40%), clay (60%).	cl	
	7.5							
	9							
	10.5							
DATE STARTED: 10/29/09				GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745		NOTES: NA		
DATE COMPLETED: 11/2/09				GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845				
FIELD GEOLOGIST: JLO				DRILLING METHOD: Mud Rotary/PQ3 Coring		RIG: Failing 1500		
CHECKED BY: WDS								
APPROVED BY:				DRILLER: Eddie Palmer HELPER: Chad/Cody				
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-6



PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
29.2	12	OB-1	76% (34%)	3.8		13.0-14.0' CLAYEY SAND.	sc	Switched to Coring OB-1: Drilling Pressure: 250-300 psi Kelly Bar RPM: 202 Engine RPM: 1200-1300 Drill Time: 15min 8sec Circ. Loss: None Driller Notes: 14.8-16.0' core loss zone.
28.2	13.5					TOP OF AVON PARK FORMATION 14.0-19.0' DOLOMITE, moderately hard, grayish orange (10YR 7/4), weak reaction to 1N HCl when powdered, fresh to slightly weathered, slightly pitted, few vugs, slightly fractured (horizontal-bedding planes), thick bedded, coarse grained.		
15	16.5					17.6-19' Vertical fracture, becomes moderately soft.		
19.5	18					19.0-22.3' DOLOMITE, as above except fossiliferous, slightly to moderately weathered, slightly fractured (horizontal).		
21	19.5	OB-2	92% (54%)	4.6				OB-2: Drilling Pressure: 250 psi Kelly Bar RPM: 207 Engine RPM: 1200-1300 Drill Time: 27min 44sec Circ. Loss: None NOTE: Lots of rig chatter, 0.1' fall-in from above.
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745		NOTES: NA	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
APPROVED BY:								
DRILLING CO.: HUSS								

LNP- Offset Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. O-6

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS	
						DESCRIPTION			
	22.5	OB-3	72% (46%)	3.6		22.3-22.5' Rubble zone. 22.5-24' DOLOMITE, as above except moderately hard to hard, few fossils, vertical fracture 22.5-24.0', more crystalline.		OB-3: Drilling Pressure: 200-250 psi Kelly Bar RPM: 211 Engine RPM: 1300-1400 Drill Time: 20min 6sec Circ. Loss: None NOTE: lots of rig chatter approximately halfway through run	
	24					24-29' DOLOMITE, moderately hard to moderately soft, moderately weathered, pitted/porous, some fossils, thick bedded, slightly fractured (bedding planes), grayish orange (10YR 7/4) to dark yellowish orange (10YR 6/6), moderate to strong reaction to 1N HCl when powdered, coarse grained, friable.			
	25.5								
	27								
	28.5	OB-4	58% (32%)	2.9		29-30' DOLOMITE, moderately hard, unfractured, thick bedded, slightly weathered, fossiliferous, few vugs, weak reaction to 1N HCl when powdered, grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2).		OB-4: Drilling Pressure: 150-200 psi Kelly Bar RPM: 217 Engine RPM: 1300-1400 Drill Time: 10min 45sec Circ. Loss: None NOTE: Picture for OB-4 not taken in tray before being put into box.	
	30					30.0-34.0' DOLOMITE, same as 24.0-29.0'.			
	31.5								
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8'		DATE/TIME: 10/30/09 @ 0745		NOTES: NA
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7'		DATE/TIME: 11/2/09 @ 0845		
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring				
CHECKED BY: WDS									
APPROVED BY:					DRILLER: Eddie Palmer		HELPER: Chad/Cody		RIG: Failing 1500
DRILLING CO.: HUSS									

LNP- Offset Boring Program

LOG OF BORING NO. O-6



PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS	
						DESCRIPTION			
	33	OB-5	94% (72%)	4.7		34.0-39.0' DOLOMITE, pale yellowish brown (10YR 6/2), moderately hard, slightly weathered, some fossils, slightly fractured (horizontal-bedding planes), few vugs, moderate to strong reaction to 1N HCl when powdered, thick bedded.		OB-5: Drilling Pressure: 250 psi Kelly Bar RPM: 211 Engine RPM: 1300-1400 Drill Time: 39min 8sec Circ. Loss: None NOTE: 0.2' fall-in from above.	
	34.5								
	36								
	37.5								
	39	OB-6	100% (70%)	1.0		39-40' DOLOMITE, moderately hard to moderately soft, pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), strong reaction to 1N HCl when powdered, thick bedded, with thin lenses of dark yellowish brown (10YR 4/2), moderately weathered, pitted, sandy texture, moderately fractured (bedding planes). 40.0-41.0' DOLOMITE, as at 34.0-39.0'.		OB-6: Drilling Pressure: 300 psi Kelly Bar RPM: 214 Engine RPM: 1300-1400 Drill Time: 1min 40sec Circ. Loss: None Set casing to 40'. Run-1: Drilling Pressure: 250-300 psi Kelly Bar RPM: 192 Engine RPM: 1100-1200 Drill Time: 8min 20sec Circ. Loss: None	
	40.5	R-1	52% (0%)	2.6		41.0-41.4' Degraded DOLOMITE, pale yellowish brown (10YR 6/2), 80% silt, 20% dolomite gravel, no plasticity, gravel crushes easily. 41.4-50.0' DOLOMITE, pale yellowish brown (10YR 6/2), moderately soft, pitted/porous, moderately to severely weathered, coarse grained, few vugs, some fossils, medium bedded, intensely fractured, moderate to strong reaction to 1N HCl when powdered.			
	42								
	43.5								
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745			NOTES: NA	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring				
CHECKED BY: WDS									
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500	
DRILLING CO.: HUSS									

LNP- Offset Boring Program

LOG OF BORING NO. O-6

PROJECT NO. 07-3935



ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
	45	R-2	60% (18%)	3.0		45.0' Becomes moderately fractured (horizontal).		Run-2: Drilling Pressure: 200 psi Kelly Bar RPM: 209 Engine RPM: 1300 Drill Time: 10min 20sec Circ. Loss: None 0.2' Fall-in from above.
	46.5							
	48							
	49.5	R-3	90% (30%)	4.5		50.0-55.0' DOLOMITE, moderately hard, moderately weathered, pitted/porous, pale yellowish brown (10YR 6/2) and dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), moderately fractured (vertical fractures 50.9-51.6' and 53-53.8'), thick bedded, weak to moderate reaction to 1N HCl when powdered, some fossils.		Run-3: Drilling Pressure: 200-250 psi Kelly Bar RPM: 197 Engine RPM: 1200-1300 Drill Time: 13min 1sec Circ. Loss: None Water level 10/30/09 @ 0745 5.8'.
	51							
	52.5							
	54							
DATE STARTED: 10/29/09 DATE COMPLETED: 11/2/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745 GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845 DRILLING METHOD: Mud Rotary/PQ3 Coring			NOTES: NA
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500

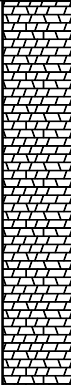
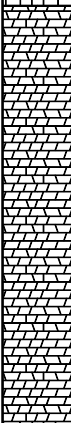

LNP- Offset Boring Program

LOG OF BORING NO. O-6

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
	55.5 <							

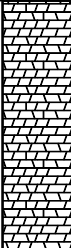
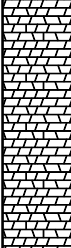
LNP- Offset Boring Program							PROJECT NO. 07-3935	
LOG OF BORING NO. O-6								
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
	66	R-6	100% (32%)	5.0		66.4-69.1' DOLOMITE, moderately hard to moderately soft, pale yellowish brown (10YR 6/2) to grayish orange (10YR 7/4), thick bedded, moderately weathered, pitted/porous, few vugs, few very thin black organic lenses, few fossils, moderately fractured-mostly horizontal along bedding planes (67.7-68' and 68.7-69.1' intensely fractured), moderate to strong reaction to 1N HCl when powdered.		Drill Time: 9min 42sec Circ. Loss: None
	67.5					69.1-69.5' As above except very pitted/fossiliferous. 69.5-70.0' DOLOMITE, as at 65.0-66.4'.		
	69					70.0-71.0' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), slightly to moderately weathered, pitted/porous, few vugs, some fossils, thick bedded, unfractured (1 horizontal break at 70.7'), moderate to strong reaction to 1N HCl when powdered. 71.0-72.0' As above except with lenses/very thin layers of crystalline dolomite, intensely fractured.		
	70.5	R-7	72% (44%)	3.6		72.0-72.5' Crystalline DOLOMITE, pale yellowish brown (10YR 6/2) to medium light gray (N6), moderately hard to hard, strong reaction to 1N HCl when dry, pitted in very thin bands, no fossils, intensely fractured. 72.5-75.0' DOLOMITE, same as 71.0-72.0' except slightly fractured.		Run-7: Drilling Pressure: 200 psi Kelly Bar RPM: 197 Engine RPM: 1200-1300 Drill Time: 22min 10sec (70-72.5') 2.4' recovery 22min 21sec (72.5-75') Circ. Loss: None Driller Notes: soft at 72.5'
	72					75.0-75.5' DOLOMITE, moderately hard, moderately weathered, pitted/porous, fossiliferous, few vugs, medium bedded, few very thin black organic lenses, moderately fractured (horizontal break at 75.3'), moderate to strong reaction to 1N HCl when powdered. 75.5-80.0' Crystalline DOLOMITE, pale yellowish brown (10YR 6/2) to light olive gray (5G 6/1), moderately to intensely fractured, pitted/fossiliferous in bands, strong reaction to 1N HCl when dry, fresh to slightly weathered, thick bedded.		
	73.5							
	75							Run-8: Drilling Pressure: 150 psi Kelly Bar RPM: 209 Engine RPM: 1300 Drill Time: 45min 14sec Circ. Loss: None NOTE: 0.5' fall-in from above.
	76.5							
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745		NOTES: NA	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
DRILLING CO.: HUSS								

LNP- Offset Boring Program						LOG OF BORING NO. O-6		PROJECT NO. 07-3935		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2		USCS SYMBOL	REMARKS	
						DESCRIPTION				
-37.8	78	R-8	74% (14%)	3.7		76.9' Becomes moderately weathered (dark yellowish orange (10YR 6/6)), friable in very thin zones.			Run-9: Drilling Pressure: 200 psi Kelly Bar RPM: 208 Engine RPM: 1300 Drill Time: 36min 10sec Circ. Loss: None NOTE: 0.8' fall-in from above.	
	79.5			80.0-81.5' LIMESTONE, very light gray (N8) to light olive gray (5Y 6/1), moderately hard, medium bedded, with some light gray (N7) lenses, strong reaction to 1N HCl, vug at 80.5-80.6'-not continuous, fresh to slightly weathered, slightly fractured, pitted/fossiliferous in thin bands, 81.2-81.5', intensely fractured.						
	-39.3	81				81.5-81.8' Crystalline DOLOMITE as at 75.5-80.0'. 81.8-85' DOLOMITE, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), moderately hard, moderately weathered, pitted/porous, fossiliferous, thick bedded, slightly fractured (horizontal-bedding planes only), strong reaction to 1N HCl when powdered, few vugs.				
	82.5	R-9	80% (42%)	4.0		85.0-88.2' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2), slightly weathered, pitted, fossiliferous, few vugs, thick bedded, slightly to moderately fractured (vertical fractures 86.5-87.2' and 87.5-88.1'), few thin pockets of black organic material, strong reaction to 1N HCl when powdered.			Run-10: Drilling Pressure: 150 psi Kelly Bar RPM: 212 Engine RPM: 1300-1400 Drill Time: 23min 32sec Circ. Loss: None NOTE: 0.1' fall-in from above.	
	84									
	85.5									
	87	R-10	92% (52%)	4.6						
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745				NOTES: NA	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845					
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring				RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody					
APPROVED BY:										
DRILLING CO.: HUSS										

LNP- Offset Boring Program

LOG OF BORING NO. O-6


PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS	
						DESCRIPTION			
	88.5	R-11	100% (50%)	5.0		88.1-88.2' Crushed zone. 88.2-90.0' DOLOMITE, moderately hard to moderately soft, yellowish gray (5Y 8/1) to very pale orange (10YR 8/2), mottled with light bluish gray (5B 7/1), strong reaction to 1N HCl when powdered, slightly to moderately weathered, medium to thick bedded, slightly fractured (horizontal fracture at 89.0').		Run-11: Drilling Pressure: 200 psi Kelly Bar RPM: 205 Engine RPM: 1200-1300 Drill Time: 37min 45sec Circ. Loss: None	
	90					90.0-91.9' DOLOMITE, dark yellowish orange (10YR 6/6) to pale yellowish brown (10YR 6/2), moderately hard, moderately weathered, pitted, fossiliferous, thick bedded, slightly fractured (horizontal-bedding planes only), few very thin black organic lenses, strong reaction to 1N HCl when powdered.			
	91.5					91.9-93.0' Transitional zone, mix of DOLOMITE as above and DOLOMITE, yellowish gray (5Y 7/2), moderately soft, fresh to slightly weathered, no fossils, silty texture when weathered, strong reaction to 1N HCl when powdered, few pits, medium to thick bedded, unfractured.			
	93					93.0-95.0' DOLOMITE (yellowish gray (5Y 7/2) as above) except with very thin laminae of medium light gray (N6).			
	94.5					94.1-95.0' Becomes moderately to intensely fractured.			
		R-12	100% (50%)	5.0		95.0-95.8' DOLOMITE, as above except intensely fractured- vertical fractures.		Run-12: Drilling Pressure: 200 psi Kelly Bar RPM: 211 Engine RPM: 1300-1400 Drill Time: 10min 25sec Circ. Loss: None	
	96					95.8-96.2' Very thinly laminated DOLOMITE and black organic material, moderately soft to soft, moderately weathered, moderately to intensely fractured (vertical fracture 95.8-96.8'), strong reaction to 1N HCl when powdered.			
	97.5					96.2-100.0' DOLOMITE, yellowish gray (5Y 7/2), moderately hard to moderately soft, moderately weathered, pitted/porous, fossiliferous, some vugs, strong reaction to 1N HCl when powdered, thick bedded, slightly fractured, some black organic material (vertical orientation).			
						98.6-99.1' Becomes slightly weathered, slightly pitted.			
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745			NOTES: NA	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845				
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			RIG: Failing 1500	
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody				
APPROVED BY:									
DRILLING CO.: HUSS									

LNP- Offset Boring Program

LOG OF BORING NO. O-6

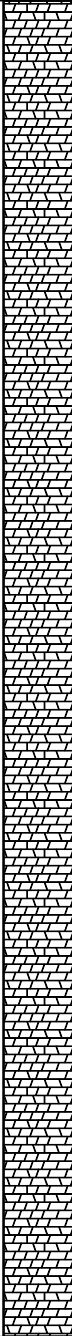
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS		
						DESCRIPTION				
	99	R-13	94% (46%)	4.7		100.0-106.1' DOLOMITE, moderately hard to moderately soft, moderately weathered, pitted, fossiliferous, yellowish gray (5Y 7/2), thick bedded, slightly fractured (vertical fracture 101.1-101.9'), few very thin black organic layers, strong reaction to 1N HCl when powdered.		Run-13: Drilling Pressure: 200 psi Kelly Bar RPM: 205 Engine RPM: 1200-1300 Drill Time: 9min 38sec Circ. Loss: None		
	100.5					102.1- 102.7' Intensely fractured.				
	102									
	103.5									
	105	R-14	86% (17%)	4.3		106.1-107.5' DOLOMITE, as above except intensely fractured.				Run-14: Drilling Pressure: 200 psi Kelly Bar RPM: 202 Engine RPM: 1200-1300 Drill Time: 10min 23sec Circ. Loss: None
	106.5					107.5-108.0' As above except moderately fractured (vertical fracture 107-110').				
	108					108.0-110.0' As above except not as pitted, silty texture at weathered zones.				
	109.5									
DATE STARTED: 10/29/09				GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745		NOTES: NA				
DATE COMPLETED: 11/2/09				GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845						
FIELD GEOLOGIST: JLO				DRILLING METHOD: Mud Rotary/PQ3 Coring						
CHECKED BY: WDS										
APPROVED BY:				DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500			
DRILLING CO.: HUSS										

LNP- Offset Boring Program

LOG OF BORING NO. O-6

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS			
						DESCRIPTION					
	111	R-15	92% (40%)	4.6		110.0-115.0' DOLOMITE, moderately soft to moderately hard, yellowish gray (5Y 7/2), slightly weathered, slightly fractured, strong reaction to 1N HCl when powdered, slightly pitted, few fossils, few healed vertical fractures throughout, black infilling, thick bedded.		Run-15: Drilling Pressure: 200 psi Kelly Bar RPM: 202 Engine RPM: 1200-1300 Drill Time: 9min 40sec Circ. Loss: None			
	112.5					113.1-115.0' Vertical fracture-open.					
	114										
	115.5	115-116.6' DOLOMITE, moderately soft, yellowish gray (5Y 7/2), moderately weathered, sandy texture, thick bedded, moderately fractured (115-155.3' intensely fractured), strong reaction to 1N HCl when powdered, some fossils, coarse grained.	Run-16: Drilling Pressure: 200 psi Kelly Bar RPM: 216 Engine RPM: 1300-1400 Drill Time: 4min 17sec Circ. Loss: None NOTE: 0.4' fall-in from above. Water level 10/31/09 @ 0755 6.3'.								
	117	116.6-118.1' DOLOMITE as above except fossiliferous, pitted/vuggy.									
	118.5	118.1-118.4' DOLOMITE, same as 115-116.6'. 118.4-119.5' DOLOMITE, same as 116.6-118.1'.									
		119.5-121.3' DOLOMITE, as at 115-116.6'.									
	120										
DATE STARTED: 10/29/09						GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745			NOTES: NA		
DATE COMPLETED: 11/2/09						GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845					
FIELD GEOLOGIST: JLO						DRILLING METHOD: Mud Rotary/PQ3 Coring			RIG: Failing 1500		
CHECKED BY: WDS					DRILLER: Eddie Palmer HELPER: Chad/Cody						
APPROVED BY:											
DRILLING CO.: HUSS											

LNP- Offset Boring Program

LOG OF BORING NO. O-6

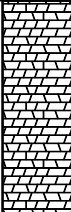
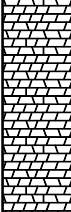

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
	121.5 							

LNP- Offset Boring Program

LOG OF BORING NO. O-6

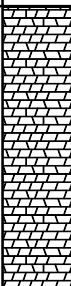
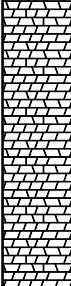
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
	132	R-19	94% (32%)	4.7		133.0-135.0' DOLOMITE, same as 130.2-130.8', thinly laminated in zones with black organic layers.		
	133.5							
	135							
	136.5	R-20	96% (70%)	4.8		135.0-135.8' DOLOMITE, moderately hard to moderately soft, yellowish gray (5Y 7/2), coarse grained, thinly laminated, moderately weathered, moderately fractured (horizontal- bedding planes), some fossils, strong reaction to 1N HCl when powdered. 135.8-137.7' DOLOMITE, yellowish gray (5Y 8/1), moderately hard to moderately soft, slightly to moderately weathered (silty texture in weathered zones), pitted, some fossils, few vugs, slightly fractured (horizontal-bedding planes), thick bedded, strong reaction to 1N HCl when powdered.		Run-20: Drilling Pressure: 200 psi Kelly Bar RPM: 196 Engine RPM: 1200-1300 Drill Time: 17min 26sec Circ. Loss: None NOTE: 0.2' from previous run, 0.4' fall-in (re-drill marks).
	138							
	139.5							
	141	R-21	96%	4.8		137.7-137.9' DOLOMITE, moderately hard to moderately soft, slightly weathered, light olive gray (5Y 5/2), with very thin bands of DOLOMITE as at 135-135.8', thin bedded, strong reaction to 1N HCl when powdered, unfractured. 137.9-139.3' DOLOMITE, moderately hard, yellowish gray (5Y 8/1) as at 135.8-137.7' except with pockets of light bluish gray (5B 7/1) limestone (possible rip-up clasts). 139.3-143.0' Crystalline DOLOMITE, continuous vugs, grayish orange (10YR 7/4) to yellowish gray (5Y 7/2), hard, strong reaction to 1N HCl, some fossils, pitted in bands, thick bedded, fresh to slightly weathered, slightly to moderately fractured.		Run-21: Drilling Pressure: 200 psi Kelly Bar RPM: 202 Engine RPM: 1200-1300 Drill Time: 44min 6sec Circ. Loss: None
	142.5							
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745		NOTES: NA	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring		RIG: Failing 1500	
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-6


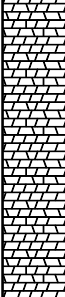
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
	144	R-22	(60%)	5.0		143.0-143.5' Crystalline DOLOMITE, yellowish gray (5Y 7/2), thin to medium bedded, no fossils, fresh, pitted in very thin bands, unfractured. 143.5-145.0' DOLOMITE, moderately hard, pale yellowish brown (10YR 6/2) to yellowish gray (5Y 7/2), strong reaction to 1N HCl when powdered, thick bedded, fossiliferous, unfractured, slightly weathered.		Run-22: Drilling Pressure: 200 psi Kelly Bar RPM: 200 Engine RPM: 1200-1300 Drill Time: 12min 2sec Circ. Loss: None 0.2' Fall-in from above.
	145.5					145.0-150.0' DOLOMITE, moderately hard, yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), some fossils to fossiliferous, slightly fractured (vertical fracture 146.6-147'), all others horizontal-bedding planes), thinly bedded/ laminated appearance, moderately weathered, strong reaction to 1N HCl when powdered.		
	147							
	148.5		100% (80%)					
	150	R-23		5.0		149.5-149.7' With thin beds of crystalline DOLOMITE. 150.0-151.9' DOLOMITE, moderately hard to hard, yellowish gray (5Y 7/2), few vugs, some fossils, fresh, unfractured, thick bedded, moderate to strong reaction to 1N HCl when powdered.		Run-23: Drilling Pressure: 200 psi Kelly Bar RPM: 193 Engine RPM: 1200 Drill Time: 22min 17sec Circ. Loss: None
	151.5					151.9-153.0' Becomes thinly laminated, yellowish gray (5Y 7/2), grayish yellow (5Y 8/4) to light olive gray (5Y 5/2) moderately fractured (horizontal).		
	153		100% (50%)			153.0-153.5' Becomes soft, friable, intensely fractured (approximately 45° en-echelon).		
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745		NOTES: NA	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring		RIG: Failing 1500	
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody			
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-6

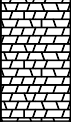


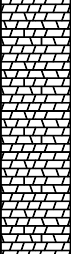
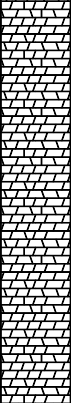
PROJECT NO. 07-3935

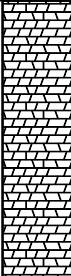
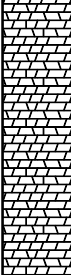
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
	154.5	R-24	98% (68%)	4.9		153.5-154.0' DOLOMITE as at 150-151.9' except pale yellowish brown (10YR 6/2). 154.0-155.0' DOLOMITE as at 153-153.5'. 155.0-155.2' DOLOMITE, moderately hard, fossiliferous, coarse grained, thin bedded, unfractured, moderately weathered, yellowish gray (5Y 8/1), strong reaction to 1N HCl when powdered. 155.2-156.1' DOLOMITE, moderately hard to moderately soft, coarse grained, pitted/porous, moderately weathered, slightly fractured, thin to medium bedded, with few layers of crystalline DOLOMITE (very thin bands), strong reaction to 1N HCl when powdered, pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), some fossils. 156.1-156.5' Crystalline DOLOMITE, very light gray (N8), hard, fresh, intensely fractured, no fossils, pitted in very thin bands, thin bedded, strong reaction to 1N HCl when powdered. 156.5-160.0' DOLOMITE as at 155.2-156.1' except yellowish gray (5Y 7/2), fossiliferous, no crystalline dolomite bands, thick bedded, slightly fractured. 160.0-160.5' DOLOMITE, as at 155.2-156.1'. 160.5-163.1' DOLOMITE, moderately hard to moderately soft, yellowish gray (5Y 8/1), moderately weathered, moderately fractured (vertical fracture 161.2-162.0'), strong reaction to 1N HCl when powdered, some fossils in bands, thick bedded. 163.1-163.4' DOLOMITE as above except moderately to severely weathered, intensely fractured/crushed. 163.4-165.0' Crystalline DOLOMITE, medium light gray (N6) to light olive gray (5Y 6/1), hard, strong reaction to 1N HCl when dry, thin to medium bedded, pitted in bands, no fossils, fresh, moderately fractured.		Run-24: Drilling Pressure: 300 psi Kelly Bar RPM: 210 Engine RPM: 1300 Drill Time: 12min 40sec Circ. Loss: None Water level 11/2/09 @ 0845 5.7'.
	156							
	157.5							
	159							
	160.5	R-25	80% (22%)	4.0				Run-25: Drilling Pressure: 250-300 psi Kelly Bar RPM: 199 Engine RPM: 1200-1300 Drill Time: 11min 44sec Circ. Loss: None
	162							
	163.5							
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745		NOTES: NA	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845			
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer HELPER: Chad/Cody		RIG: Failing 1500	
DRILLING CO.: HUSS								

LNP- Offset Boring Program

PROJECT NO. 07-3935

LOG OF BORING NO. O-6




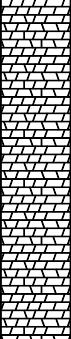

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
-123.4 -123.8	165 166.5 168 169.5 171 172.5 174 175.5	R-26	90% (40%)	4.5	  	165.0-165.2' DOLOMITE, same as 163.1-163.4'. 165.2-165.6' Crystalline DOLOMITE, slightly weathered, light olive gray (5Y 6/1), hard, pitted, strong reaction to 1N HCl when powdered, unfractured, medium bedded. 165.6-166.0' ROD DROP. 166.0-166.2' Crystalline DOLOMITE as above except fresh. 166.2-167.1' DOLOMITE, moderately hard, moderately weathered, pitted/porous, fossiliferous, strong reaction to 1N HCl when powdered, thick bedded, coarse grained, slightly fractured (horizontal-bedding planes only), dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4). 167.1-167.5' DOLOMITE, hard, light gray (N7) to light olive gray (5Y 6/1), with lenses of medium light gray (N6) throughout, pitted, some fossils and vugs, medium bedded, fresh to slightly weathered, moderate to strong reaction to 1N HCl when powdered. 167.5-170.0' Alternating beds (0.1-0.3' thick) of DOLOMITE as at 166.2-167.1' and crystalline DOLOMITE.		Run-26: Drilling Pressure: 300 psi Kelly Bar RPM: 198 Engine RPM: 1200-1300 Drill Time: 4min 37sec (165-167") 8min 8sec (167-170') 3.0' recovery Circ. Loss: None Driller Notes: Rod drop of 6-8" about 6" into run. NOTE: Recovery percentage mislabeled in picture (tray).
						170.0-175.0' Same as 167.5-170.0' except beds are 0.7-1.0' thick, slightly fractured (horizontal-bedding planes only). 170.0-170.2' Intensely fractured/crushed zone. 170.2-170.6' Vertical fracture-open.		Run-27: Drilling Pressure: 200-250 psi Kelly Bar RPM: 196 Engine RPM: 1200-1300 Drill Time: 13min 10sec Circ. Loss: None NOTE: Lots of rig chatter, 0.3' fall-in from above.
		R-27	94% (46%)	4.7		175.0-178.1' Alternating layer of moderately weathered DOLOMITE and crystalline DOLOMITE as above.		Run-28: Drilling Pressure: 200 psi Kelly Bar RPM: 197
DATE STARTED: 10/29/09 DATE COMPLETED: 11/2/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:					GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745 GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845 DRILLING METHOD: Mud Rotary/PQ3 Coring			NOTES: NA
DRILLING CO.: HUSS					DRILLER: Eddie Palmer HELPER: Chad/Cody			RIG: Failing 1500

LNP- Offset Boring Program						PROJECT NO. 07-3935		
LOG OF BORING NO. O-6								
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	REMARKS	
						DESCRIPTION		
	177	R-28	90% (16%)	4.5		178.1-178.7' DOLOMITE, moderately weathered, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), moderately hard, sandy texture in weathered areas, larger vugs- almost continuous, coarse grained, intensely fractured, strong reaction to 1N HCl when powdered. 178.7-179.0' As above except no vugs. 179.0-180.0' DOLOMITE as at 178.7-179.0' except intensely fractured (rubble-like).	Engine RPM: 1200-1300 Drill Time: 14min 22sec Circ. Loss: None NOTE: Moderate rig chatter in zones during drilling. 0.3' fall-in from above. Last 3-4" of run mechanically broken trying to remove from shoe (destroyed).	
	178.5							
	180					180.0-181.6' Alternating layers of moderately weathered DOLOMITE and crystalline DOLOMITE as at 175.1-178.1'.	Run-29: Drilling Pressure: 250 psi Kelly Bar RPM: 185 Engine RPM: 1100-1200 Drill Time: 14min 54sec Circ. Loss: None NOTE: Lots of rig chatter near end of run.	
	181.5	R-29	96% (40%)	4.8		181.6-182.7' DOLOMITE, moderately hard to moderately soft, coarse grained, medium yellowish brown (10YR 5/4), medium bedded to thinly laminated near the basal contact (mottled with dark yellowish brown (10YR 4/2)), moderately fractured-vertical fracture 181.6-182.4', weak to moderate reaction to 1N HCl when powdered, sandy texture, pitted/porous, moderately weathered. 182.7-184.1' DOLOMITE, hard, fossiliferous, slightly to moderately weathered, medium to thick bedded, unfractured (183.6-183.8' crushed), light gray (N7) to light olive gray (5Y 6/1).		
	183							
	184.5					184.1-184.4' Crystalline DOLOMITE. 184.4-185.6' DOLOMITE as at 182.7-184.1' except thinly laminated (fissile-like).		
	186					185.6-185.9' Fossiliferous DOLOMITE as at 182.7-184.1'. 185.9-188.4' Alternating layers of moderately weathered DOLOMITE and crystalline DOLOMITE as at 180.0' (layers 0.7- 1.3' thick).	Run-30: Drilling Pressure: 200 psi Kelly Bar RPM: 211 Engine RPM: 1300-1400 Drill Time: 14min 50sec Circ. Loss: None NOTE: 0.2' fall-in from above.	
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8'		DATE/TIME: 10/30/09 @ 0745	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7'		DATE/TIME: 11/2/09 @ 0845	
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			NOTES: NA
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer		HELPER: Chad/Cody	
DRILLING CO.: HUSS								RIG: Failing 1500

LNP- Offset Boring Program

LOG OF BORING NO. O-6

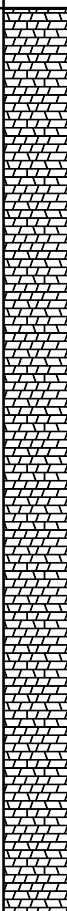
PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS
						DESCRIPTION		
187.5		R-30	100% (34%)	5.0		188.4-189.9' DOLOMITE, moderately hard, possibly friable, thinly laminated, light olive gray (5Y 6/1), grayish orange (10YR 7/4) and dark yellowish brown (10YR 4/2), slightly to moderately weathered, pitted, no fossils, unfractured, strong reaction to 1N HCl when powdered, sandy/silty texture.		Run-31: Drilling Pressure: 250 psi Kelly Bar RPM: 201 Engine RPM: 1200-1300 Drill Time: 6min 36sec Circ. Loss: None
189						189.9-190.0' Crystalline DOLOMITE as above. 190.0-191.0' Crystalline DOLOMITE as above except moderately weathered.		
190.5						191.0-192.0' DOLOMITE same as at 188.4-189.9'.		Run-32: Drilling Pressure: 400 psi Kelly Bar RPM: 209 Engine RPM: 1300 Drill Time: 9min 15sec Circ. Loss: None
192		R-31	100% (18%)	5.0		192.0-195.0' DOLOMITE, moderately hard, yellowish gray (5Y 8/1), intensely fractured, slightly weathered, pitted, some fossils, strong reaction to 1N HCl when powdered, few vugs (weathered-out fossils), thick bedded.		
193.5						195.0-197.5' DOLOMITE, moderately hard, moderately weathered, pitted/porous, coarse grained, fossiliferous, grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2), moderate to strong reaction to 1N HCl when powdered, thick bedded, with few very thin layers of finer grained DOLOMITE, slightly fractured, intensely fractured from 197.3-197.5'.		
195			80%					
196.5								
DATE STARTED: 10/29/09					GWL: DEPTH: 5.8'	DATE/TIME: 10/30/09 @ 0745	NOTES: NA	
DATE COMPLETED: 11/2/09					GWL: DEPTH: 5.7'	DATE/TIME: 11/2/09 @ 0845		
FIELD GEOLOGIST: JLO					DRILLING METHOD: Mud Rotary/PQ3 Coring			
CHECKED BY: WDS								
APPROVED BY:					DRILLER: Eddie Palmer	HELPER: Chad/Cody	RIG: Failing 1500	
DRILLING CO.: HUSS								

LNP- Offset Boring Program

LOG OF BORING NO. O-6

PROJECT NO. 07-3935

ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 1724065.3 E 457853.4 SURFACE EL: 42.2	USCS SYMBOL	REMARKS				
						DESCRIPTION						
-162.8	198	R-32	(34%)	4.0		197.5-200.0' Crystalline DOLOMITE, very light gray (N8) to light olive gray (5Y 6/1), hard, strong reaction to 1N HCl when dry, intensely fractured, no fossils, medium bedded, fresh to slightly weathered, pitted in bands.		Run-33: Drilling Pressure: 200 psi Kelly Bar RPM: 193 Engine RPM: 1200 Drill Time: 6min 47sec Circ. Loss: None				
	199.5					200.0-201.6' Crystalline DOLOMITE as above except moderately to intensely fractured, with few very thin black organic (possibly) laminations.						
	201					201.6-205.0' DOLOMITE, moderately hard, yellowish gray (5Y 8/1) to light olive gray (5Y 6/1), coarse grained, some fossils to fossiliferous, moderate to strong reaction to 1N HCl when powdered, moderately weathered, moderately to intensely fractured, pitted/porous, sandy texture, thick bedded.						
	202.5	R-33	100% (20%)	5.0								
	204											
	205.5											
	207											
	BOTTOM OF BORING 205'											
	DATE STARTED: 10/29/09 DATE COMPLETED: 11/2/09 FIELD GEOLOGIST: JLO CHECKED BY: WDS APPROVED BY:								GWL: DEPTH: 5.8' DATE/TIME: 10/30/09 @ 0745 GWL: DEPTH: 5.7' DATE/TIME: 11/2/09 @ 0845 DRILLING METHOD: Mud Rotary/PQ3 Coring		NOTES: NA	
	DRILLER: Eddie Palmer HELPER: Chad/Cody								RIG: Failing 1500			
DRILLING CO.: HUSS												