



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03
SHEET 1 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 TUBES ON 5/7/2007			START : 5/7/2007			END : 5/9/2007			LOGGERS : N. Jai Zylmick		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC 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"						



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03
SHEET 2 OF 10	
SOIL BORING LOG	

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 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 9/9/07				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		
				50/3 (50/3")					
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' below ground surface				START : 9/7/2007		END : 9/9/2007		LOGGER : 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:

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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
		R Q D (%)	FRACTURES PER FOOT	DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS		SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.	
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS				
-18.0	60.0 R1-NQ 1 ft 100%	100	1	60.45' - Bedding plane, 15 deg, rough, undulating		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 60.7-61.0' - Same as 60.0-60.7' except highly fossiliferous with casts and molds up to 1/2" 61.0-65.3' - light olive gray and moderate olive brown, (5Y 5/2, 5Y 4/4), fine to medium grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids <1/16" with 10% coverage on surface, extremely weak (R0) rock at 61.2' and 63.95', medium strong (R3) at 61.8' No Recovery 65.3-66.0 Limestone 66.0-67.8' - light olive gray, (5Y 5/2), very fine to fine grained, moderate HCl reaction, medium strong to strong (R3 to R4), voids <1/16" with 15% coverage of surface 67.8-69.2' - grayish yellow to dusky yellow, (5Y 8/4, 5Y 6/4), medium grained, mild HCl reaction, medium strong (R3), porous voids <1/16" with 45 to 55% coverage, trace 1/4" cavities, moderately fossiliferous (casts/molds) 69.2-70.2' - Same as 66.0-67.8' except extremely weak to medium strong (R0 to R3) No Recovery 70.2-71.0' Limestone 70.2-71.8' - Same as 66.0-67.8' except trace organics 71.8-72.15' - dusky yellow, (5Y 8/4), fine to medium grained, moderate to strong HCl reaction, extremely weak to weak (R0 to R2), poorly to moderately competent, trace voids <1/16" on surface 72.15-74.15' - Same as 66.0-67.8' 74.15-75.0' - Same as 67.8-69.2' No Recovery 75.0-76.0' Limestone 76.0-80.0' - dusky yellow and yellowish gray, (5Y 6/4 and 5Y 7/2), mild to moderate HCl reaction, medium strong (R3), voids <1/16" covering 45-55% of surface, trace cavities to 1/4", moderately fossiliferous (casts and molds), trace organics	Begin rock coring at 07:47 05/08/2007; water level at 3.9' below ground surface R1: 2 minutes	
	61.0 100%		1	61.2, 63.95' - Mechanical break				
	R2-NQ 5 ft 86%	25		61.7, 62.2' - Fracture, 75 deg, rough, undulating				
			2					
			3			62.8' - Bedding plane, <5 deg, rough, undulating 63.0' - Bedding plane, 35 deg, rough, undulating, open up to 1/4"		
			3			63.15' - Bedding plane, <5 deg, smooth, planar 63.25' - Bedding plane, <5 deg, rough, undulating		
65			0			64.25' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"	R2: 3 minutes	
-23.0	66.0		NR	64.65' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"				
	R3-NQ 5 ft 84%	34	1	64.8' - Fracture, 80 deg, rough, undulating, open				
			>10			66.9' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"	SC-1 collected at 66.0-66.9'	
			>10			67.3-67.5' - Fracture zone, up to 1-1/2" fragments, intersecting fractures 67.95' - Bedding plane, 30 deg, rough, undulating, open up to 1/2"		
			3			68.5' - Bedding plane, <5 deg, smooth to rough, undulating, open up to 1/4"		
70			1			68.6' - Bedding plane, <5 deg, smooth to rough, undulating	R3: 5 minutes	
-28.0	71.0		NR	68.85-69.15' - Fracture zone, fragments to 2", intersecting fractures 69.35, 69.7, 69.95' - Fracture, vertical, rough, undulating				
	R4-NQ 5 ft 80%	7	3	70.1' - Bedding plane, <5 deg, smooth to rough, undulating, open up to 1/4"				
			5		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'			
			>10		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			
75			NR		72.15-72.4' - Fracture zone, 70-80 deg, multiple hairline fractures, branch-like appearance	R4: 10 minutes		
-33.0	76.0			72.8' - Bedding plane, 60 deg, rough to smooth, undulating 73.1-73.3' - Fracture zone, fragments to 2", intersecting fractures				
	R5-NQ 5 ft 80%	53	2	73.5' - Bedding plane, 60 deg, rough to smooth, undulating				
			1		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'			
			1					
80			5					



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03	SHEET 5 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.
-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			>10	79.9' - Fracture, 85 deg, rough, undulating			
-43.0			NR	81.2' - Bedding plane or mechanical break, 40 deg, rough, undulating			
			>10	81.9' - Bedding plane or mechanical break, <5 deg, rough to smooth, undulating to planar			
			NR	82.8' - Fracture, 75 deg, rough, undulating			
			>10	83.8-84.1' - Fracture zone, fragments to 1"			
			>10	84.75' - Fracture, 75 deg, rough, undulating, open up to 1/4"			
			1	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"			
90			NR	89.1' - Bedding plane, 30 deg, rough, undulating			
-48.0			NR	90.2' - Bedding plane, 40 deg, rough, undulating			
			1	91.7' - Fracture, 75 deg, associated with dissolution features or very extensive breaks in softer area, open up to 2"			
			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			1	96.2' - Fracture, 80 deg, rough, undulating, open			
-53.0			3	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			
			1	97.6-97.7' - Fracture (3), 0-10 deg, open to 1/4", 1/4" organic infill			
			0	98.5' - Bedding plane (2), 10 deg and 60 deg, rough to smooth, undulating			
100			0	99.3, 97.6, 99.85' - Mechanical break			



PROJECT NUMBER: 338884.FL	BORING NUMBER: E-03	SHEET 6 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 (%)	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.
-58.0			0			R9: 7 minutes
	101.0		NR		No Recovery 100.6-101.0' Limestone 101.0-104.4' - yellowish gray to dusky yellow, (5Y 7/2, 5Y 6/4), fine to medium grained, strong HCl reaction, very weak (R1), 1/16" voids with 10% coverage, trace cavities to 1/4", trace planar bedding of variable thickness, poorly to moderately fossiliferous, zone of circular discoloration from 103.8-104.2' (possible leaching)	
		R10-NQ 5 ft 68%	19			
			8			
			4			
			4			
			0			
105 -63.0			NR		No Recovery 104.4-106.0'	R10: 4 minutes
	106.0				Limestone 106.0-109.9' - yellowish gray, (5Y 8/1), fine grained, strong HCl reaction, very weak (R1), trace voids <1/16" on surface, laminated bedding	
		R11-NQ 5 ft 78%	43			
			1			
			1			
			>10			
			>10			
110 -68.0			NR		No Recovery 109.9-111.0	R11: 3 minutes
	111.0				Limestone 111.0-116.0' - mottled yellowish gray and yellowish gray, (5Y 7/2 and 5Y 8/1), fine to coarse grained, strong HCl reaction, very weak to weak (R1 to R2), voids <1/16" with 10-20% coverage, cavities to 1/4" with 5-10% coverage decreasing with depth, 1" laminated bedding at 114.0', moderately fossiliferous	
		R12-NQ 5 ft 100%	88			
			1			
			0			
			1			
			1			
115 -73.0			0			R12: 2 minutes
	116.0				Limestone 116.0-121.0' - yellowish gray, (5Y 8/1), fine to coarse grained, strong HCl reaction, weak to medium strong (R2 to R3), laminated bedding at 116.0-116.35', voids <1/16" with 40% coverage, trace cavities to 1/2"-1-1/2" cavity at 117.6', moderately fossiliferous (casts and molds)	
		R13-NQ 5 ft 100%	60			
			4			
			0			
			1			
			3			
120						



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SHEET 7 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.
-78.0			1	119.0-119.1' - Bedding plane, <5 deg, rough to smooth, undulating to planar, open to <1/8"		Limestone 121.0-125.95' - Same as 116.0-121.0' except transitions from coarse to fine grained with depth, percentage of voids and fossils decrease with depth, laminated bedding from 122.6-125.1'	SC-4 collected at 119.7-120.55' R13: 2 minutes
121.0			3	119.05' - Fracture, 85 deg, fracture between two bedding fractures, open up to 1/8"			
			2	120.55' - Bedding plane, <5 deg, rough to smooth, undulating to planar, open to <1/8"			
			1	121.3' - Fracture, 85 deg, rough, undulating, open to <1/8"			
			>10	121.85, 121.9, 122.0' - Bedding plane, <5 deg, smooth to rough, undulating, open up to 1/4"			
125	R14-NQ 5 ft 99%	40	>10	122.2' - Bedding plane, <5 deg, smooth to rough, undulating, open to <1/8"		No Recovery 125.95-126.0' Limestone 126.0-130.85' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), voids <1/16" with 10% coverage, trace voids to 1/4" and voids <1/16" with 30% coverage from 127.2-128.6' and 130.0-130.85', zone of slightly undular laminated bedding from 128.7-129.2'	R14: 2 minutes
-83.0			NR	122.4' - Fractures or mechanical break (2), 75 deg and <5 deg, rough, undulating, high angle fracture intersected by bedding (partial fracture), open up to 1/8"			
			0	123.9, 124.5' - Bedding plane, <5 deg, smooth to rough, undulating, open up to 1/4"			
			1	124.6' - Fracture, 50 deg, rough, undulating, open to <1/4"			
			2	124.65' - Bedding plane, <5 deg, smooth to rough, undulating, open up to 1/4"			
	R15-NQ 5 ft 97%	63	4	124.9-125.8' - Fracture zone, intersecting fractures, fragments to 1-1/2"		No Recovery 130.85-131.0' Limestone 131.0-132.8' - yellowish gray, (5Y 8/1), fine to medium grained, strong HCl reaction, very weak (R1), undular bedding planes (variable thickness 1/2" to 1-1/2"), trace voids to 1/16"	R15: 3 minutes
130			1	127.3' - Bedding plane, 30 deg, rough, undulating, open up to 1/2"			
-88.0			NR	128.4, 128.65' - Mechanical break			
			>10	128.85, 128.9, 129.1, 129.3' - Bedding plane, <5 deg, rough to smooth, undulating, open up to 1/4"; may have associated dissolution cavities at 128.9', 129.1', and 129.3'			
			3	129.5, 129.55' - Bedding plane, <5 deg, smooth, planar to undulating, open to <1/8"			
	R16-NQ 5 ft 78%	0	>10	130.25' - Bedding plane, 20 deg, rough to smooth, undulating, open to <1/8"		No Recovery 132.8-134.9' Limestone 132.8-134.9' - yellowish gray and light olive gray, (5Y 8/1 and 5Y 5/2), fine to medium grained, very weak to weak (R1 to R2), up to 1/16" voids cover 5-10%, wavy laminated bedding transitioning to planar with depth, trace fossils (casts) No Recovery 134.9-136.0' Limestone 136.0-139.6' - yellowish gray, (5Y 7/2, 5Y 8/1), very fine to fine grained, strong HCl reaction, trace fossil casts/molds, elongated voids to 1/2" with 5-10% coverage from 136.0-137.5', voids <1/16" with 10% coverage	R16: 2 minutes
			NR	131.1' - Bedding plane, <5 deg, rough to smooth, organic stain, open up to 1/4"			
			>10	131.2-131.4' - Fracture zone, intersecting fractures, fragments to 1-1/2"			
			NR	131.7' - Fracture, 70 deg, rough, undulating, open, piece of fracture missing, organic staining			
			NR	132.0-132.7' - Fracture zone or bedding plane, <5 deg, rough, undulating, open up to 1/8"			
135			NR	132.7-132.85' - Fracture zone, fragments to 1/2"		No Recovery 139.6-141.0'	
-93.0			>10	133.4, 133.9, 133.95, 134.0, 134.2, 134.6, 134.65' - Fracture zone or bedding plane, <5 deg, rough, undulating, open up to 1/8"			
			3	134.5-134.6' - Fracture zone, fragments to 1/2"			
	R17-NQ 5 ft 72%	13	>10	136.0-136.4' - Fracture zone, intersecting fractures, fragments to 1-1/2"			
			2	136.5, 136.8, 136.9, 137.1' - Bedding plane, <5 deg, rough, undulating, open up to 1/2", associated with dissolution			
140				137.4' - Fracture, 65 deg, rough, undulating, open up to 1"; fossils and voids			



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

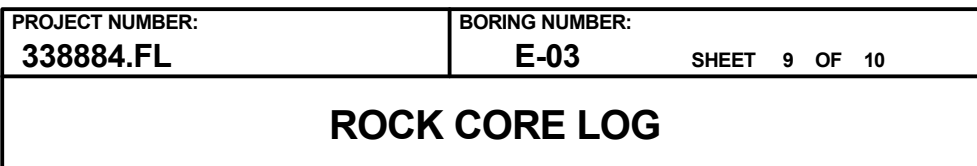
WATER LEVELS : 2.9 ft bgs on 5/07/07

START : 5/7/2007

END : 5/8/2007

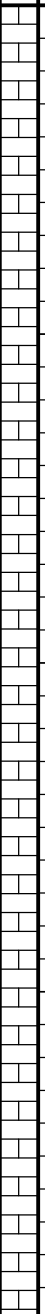
LOGGER : N. Jarzyniecki

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	138.8, 139.1' - Bedding plane, <5 deg, rough, undulating, open up to 1/2", associated with dissolution						
		>10	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")					
		1	1	141.75-142.2' - Fracture zone, intersecting fractures, fragments to 1/2"					
145			NR	142.25, 142.3' - Bedding plane, <5 deg, rough, planar					
-103.0			NR	142.4-143.0' - Fracture zone, fragments to 1-1/2"					
			1	143.1, 143.3' - Bedding plane, open to 1/4"					
			1	143.5' - Mechanical break					
			1	144.1' - Fracture, 75-80 deg, rough, undulating, organic stain or mineralization, open					
	R19-NQ 5 ft 98%	58	3	144.3' - Mechanical break					
			0	146.85' - Fracture, 70 deg, rough, undulating					
150			2	147.75' - Bedding plane, <5 deg, rough, undulating					
-108.0			NR	148.0, 148.6, 148.65, 150.8, 150.9' - Bedding plane, <5 deg, rough, undulating, 1/4" open					
			>10	148.1, 148.5, 149.95' - Mechanical break					
			NR	151.0-151.35' - Fracture zone, intersecting fractures, fragments to 1-1/4", some organic staining					
			2	151.6' - Bedding plane, 15-40 deg, open up to 1"					
			3	152.15, 152.45' - Bedding plane, <5 deg, rough, undulating, open to <1/8"					
	R20-NQ 5 ft 97%	37	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'					
155			1	154.6' - Fracture (2), 65 deg and <5 deg, intersected with bedding fracture, open up to 1/8"					
-113.0			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"					
			>10	156.7' - Bedding plane, 10 deg, rough, undulating, open up to 1"					
	R21-NQ 5 ft 88%	23	>10	157.1' - Bedding plane, <5-35 deg, rough, undulating, open up to 1"					
			4	157.2' - Bedding plane, 35 deg, rough, undulating, open up to 1/8"					
160									



ORIENTATION : Vertical

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									
-118.0	161.0		>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						
		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"			R22: 3 minutes						
			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"									
			>10	160.05' - Bedding plane, 35 deg, rough, undulating, open up to 1/8"									
165 -123.0	166.0		NR	160.1-160.2' - Fracture zone				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"	R22: 3 minutes				
		1	161.05, 161.5, 161.6' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"										
	R23-NQ 5 ft 92%	29	NR	161.75' - Bedding plane, <5 deg, rough, undulating, open up to 1"					SC-6 collected at 166.0-166.85'				
			1	162.6' - Bedding plane, <5 deg, rough, undulating, open to <1/8"									
			2	162.8, 162.9' - Bedding plane, <5 deg, rough, planar, open up to 1/4"									
			>10	163.1' - Fracture, 60 deg, rough, undulating, open to 1/8"									
			4	163.3, 163.4' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"									
			1	163.45' - Fracture, 85 deg, rough to smooth, planar to undulating, intersects bedding plane fracture									
170 -128.0	171.0		NR	163.55, 163.6, 163.65' - 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) No Recovery 174.3-176.0' Limestone 176.0-177.3' - yellowish gray, (5Y 8/1), very fine to medium grained, moderate to strong HCl reaction, medium strong to strong (R3 to R4), moderately fossiliferous (casts, trace molds), voids <1/16" with 10% coverage, cavities to 1/4" with 5% coverage	R23: 3 minutes		
		4	163.9' - Bedding plane, horizontal and 35 deg, open										
	R24-NQ 5 ft 66%	33	>10	164.3, 164.4, 164.6, 164.75, 164.8' - Bedding plane, <5 deg, rough, undulating, open up to 1/4"							R24: 4 minutes		
			>10	165.0-165.2' - Fracture zone, fragments to 1", most to 1/4", intersecting fractures									
			>10	166.85, 167.4, 167.5' - Bedding plane, <15 deg, rough, undulating, open to 1/8"									
			1	168.0' - Fracture, 75 deg, rough, undulating, open up to 1/8"									
			NR	168.25, 168.35, 168.5' - Bedding plane, <15 deg, rough, undulating, open up to 1/8"									
			NR	168.7, 168.85' - Bedding plane, <5 deg, rough, undulating, open to 1/8"									
175 -133.0	176.0			169.1, 169.7, 169.75' - Bedding plane, <5 deg, smooth to rough, planar, open to 1/8"								No Recovery 174.3-176.0' Limestone 176.0-177.3' - yellowish gray, (5Y 8/1), very fine to medium grained, moderate to strong HCl reaction, medium strong to strong (R3 to R4), moderately fossiliferous (casts, trace molds), voids <1/16" with 10% coverage, cavities to 1/4" with 5% coverage	R24: 4 minutes
		3	169.85, 170.35' - Fracture, 55-60 deg, rough, undulating, open to 1/2"										
	R25-NQ 5 ft 95%	18	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									
			3	172.8-178.4' - Fracture zone, intersecting fractures, fragments to 1-1/2"									
			3	173.5, 174.05' - Bedding plane, <5 deg, rough to smooth, planar, open up to 1/4", gray staining at 173.5'									
			6										
180													



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	
		20	4	179.75' - Bedding plane, <5 deg, rough, planar to undulating, open to 1/8"		No Recovery 185.25-186.0'	
			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			R26: 3 minutes
-143.0			NR	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"			