

UPPER FLORIDAN AQUIFER
AQUIFER PERFORMANCE TEST REPORT
VOLUME 2 - APPENDICES
INDIANTOWN COGENERATION PROJECT

Prepared for
U.S. GENERATING COMPANY
March 1994



Bechtel Power Corporation
Gaithersburg, Maryland

IPW-2

WELL LOG
Well No. IPW-2

Project: Indiantown Cogeneration
Date Begun: August 9, 1993
Date Completed: October 7, 1993
Drilling Contractor: Diversified Drilling Corp.

Coordinates: N98267.9/E99890.4
Ground Elevation: 33.9 ft. NGVD
Total Depth: 1265 ft.
Logged By: Robert L. Blodnikar

DEPTH	LITHOLOGIC DESCRIPTION	DRILLING CHARACTERISTICS
0.0'-2.0'	Dark reddish brown (10R2/4) SAND FILL - loose, moist, fine-medium grained, subrounded-rounded, slightly silty.	Start drilling pilot hole at 1430 using 12-1/4-in. dia. tricone rock bit. Drilling fluid Baroid Quik-Jel and water from site. Shallow aquifer well from 0' to 831'. Thinz-It added as noted to reduce viscosity and weight of drilling fluid. Additional fluid mixed as hole advanced. Cuttings sample obtained at 10' intervals from shaker screen on mud handling unit. Desander run continuously through upper 186' to clean drilling fluid.
FORT THOMPSON/ANASTASIA FORMATION		
2.0'-10.0'	Pale yellowish brown (10YR6/2) SAND - loose, moist to wet, fine-coarse grained, most medium, subangular-subrounded, quartz, trace shells and organic fragments and black grains (phosphorite?).	
10.0'-20.0'	Pale yellowish brown (10YR6/2) SAND - same as 2.0'-10.0' except saturated.	
20.0'-30.0'	Grayish brown (5YR6/4) to medium gray (N5) SHELLS and SHELL FRAGMENTS - loose, saturated, poorly consolidated, shells to 1.5", most 3/8" to 5/8", predominance of gastropods, trace fine-coarse sand and limestone fragments, very coarse angular fragments, with scattered pelecypods.	
30.0'-40.0'	Light gray (N7) SAND - loose, saturated, fine-coarse grained, most medium, subrounded-rounded, quartz and very fine-fine rounded black grains, trace fines, silty, trace fine shells.	
40.0'-50.0'	Medium gray (N5) to medium dark gray (N4) SAND - loose, fine-medium grained, most fine, subrounded-rounded, quartz and black grains (phosphorite?) trace shells and shell fragments; few fines silty.	
50.0'-60.0'	Medium light gray (N6) SAND - same as 40.0'-50.0'.	
60.0'-70.0'	Medium light gray (N6) SAND - same as 40.0'-50.0'.	
70.0'-80.0'	Medium gray (N5) to medium light gray (N6) SAND - same as 40.0'-50.0' except fine-coarse grained, little tan shells and shell fragments; few fines, silty.	
80.0'-90.0'	Medium gray (N5) SAND - loose, fine-coarse grained, subrounded-rounded, quartz, black grains (phosphorite?) and tan shells and shell fragments; few fines, silty.	89.1': Total depth for shift. 8/10/93 - Fluid level in hole 5'. Condition drilling fluid continue drilling from 89.1'.
CALOOSAHATCHEE MARL		
90.0'-100.0'	Pinkish gray (5YR8/1) and medium light gray (N6) SHELL FRAGMENTS and SHELLS - loose, medium-coarse grained, 1/16"-1/8", with scattered larger fragments, gastropods and pelecypods; few fine-coarse sand, most coarse, trace fines, silty.	
100.0'-110.0'	Very light gray (N8) to pinkish gray (5YR8/1) SAND - loose, fine-coarse grained, most medium-coarse, subrounded-rounded, quartz, shell fragments and black grains (phosphorite?), few fines, silty.	
110.0'-120.0'	Very light gray (N8) to pinkish gray (5YR8/1) SAND - same as 100.0'-110.0'.	

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120.0'-130.0'	Very light gray (N8) to pinkish gray (5YR8/1) SAND - same as 100.0'-110.0'.	
130.0'-140.0'	Very light gray (N8) to pinkish gray (5YR8/1) SAND - same as 100.0'-110.0'.	
TAMIAMI FORMATION		
140.0'-150.0'	Yellowish gray (5Y8/1) SAND - dense, fine-coarse, most fine-medium, subrounded-rounded, quartz, shell fragments and few fine-medium black grains (phosphorite?); little fines, slightly plastic.	
150.0'-160.0'	Yellowish gray (5Y8/1) SAND - same as 140.0'-150.0' except few shell fragments.	
160.0'-170.0'	Yellowish gray (5Y8/1) SAND - same as 140.0'-150.0' except few shell fragments.	
HAWTHORN GROUP - PEACE RIVER FORMATION		
170.0'-180.0'	Olive gray (5Y4/1) to dark olive gray (5Y3/1) CLAY with pinkish gray (5YR8/1) and tan SHELLS AND SHELL FRAGMENTS - clay stiff, highly plastic, few shells mostly shell fragments to 1/4", gastropods and pelecypods.	
180.0'-190.0'	No sample	
190.0'-200.0'	Dark greenish gray (5GY4/1) SANDY CLAY - stiff, moist, plastic, with little sand fine-coarse, most medium-coarse, angular fragments of cream colored weakly cemented limestone, few tan shell fragments.	<p>186': Complete drilling at 1000. Trip out. Add 16" and 23" dia. reaming bits above pilot bit and ream hole to 66'. Add 22" dia. hole reamer to drill string. Total for day.</p> <p>8/11/93 - Fluid level 4' below g.s. Continue reaming hole from 66' to 187'. Set 188.9' of 16" dia. x0.375" steel casing to 186.3' below g.s. 8 centralizers placed at bottom of casing and 3 ea. at 120 deg. near bottom of each casing joint. Annulus grouted with 200 sacks Type 1 cement with 3% bentonite and 7.5 gallons water/sack (yield 1.47 cu.ft. per sack. Grout pumped through 2" dia. steel and PVC pipe from inside 16" casing sealed at surface. Complete at 2000.</p> <p>8/12/93 Grout in annulus 10.3' below g.s. Mix 22 sacks grout and pump in annulus.</p> <p>Remove 2.4' of 16" casing to 0.15' above g.s.</p> <p>8/13/93 - Ream out casing from 181-186'. Remove 15-1/4" dia. reaming bit and advance hole with 12-1/4" dia. pilot bit from 186'.</p>
200.0'-210.0'	Dark olive gray (5Y3/1) SANDY CLAY - clay, stiff, moist, plastic, with little sand, fine-coarse, angular fragments of cream colored, weakly cemented limestone, scattered tan shell fragments, trace 1" + fragments of quartz sandstone.	
210.0'-220.0'	Olive gray (5Y4/1) to dark greenish gray (5GY4/1) SANDY CLAY - dry to moist, stiff, plastic, little sand fine-coarse, angular limestone fragments and quartz, with few cream to tan shells to 1", pelecypods and gastropods.	
220.0'-230.0'	Medium greenish gray (5GY5/1) CLAYEY SAND - dense, wet, sand fine-coarse grained, most medium-coarse, with few fine gravel, angular shell fragments, medium gray (N5) and sandy limestone fragments, tan to dark gray; little fines, plastic.	
230.0'-240.0'	Dark gray (N3) SAND - dense, fine-very coarse, most medium-very coarse, angular-subangular, shell fragments with scattered quartz and limestone grains; few fines, plastic.	
240.0'-250.0'	Medium greenish gray (5GY5/1) CLAYEY SAND - dense, sand fine-very coarse, most medium-very coarse, dark gray (N3) and tan angular shell fragments, with subangular-subrounded limestone and sandstone fragments; little fines, plastic; trace medium light gray (N6) slit lenses.	
250.0'-260.0'	Medium greenish gray (5GY5/1) CLAYEY SAND - same as 240.0'-250.0'.	

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260.0'-270.0'	Medium greenish gray (5GY5/1) to greenish gray (5GY6/1) CLAY - stiff, plastic, trace sand, fine-medium, trace tan shell fragments.	5 gal. Thinz-It used to thin drilling fluid while reaming grout. 186'-214': Avg. drilling rate 6.1 ft./min. 245'-276': Avg. drilling rate 5.6 ft./min.
270.0'-280.0'	Dark greenish gray (5GY4/1), medium greenish gray (5GY5/1) and medium olive gray (5GY5/1) and medium olive gray (5Y5/1) CLAY - stiff, plastic, trace fine sand and shell fragments.	
280.0'-290.0'	Dark greenish gray (5GY4/1), medium greenish gray (5GY5/1) and medium olive gray (5GY5/1) and medium olive gray (5Y5/1) CLAY - same as 270.0'-280.0' with slight increase in silt lenses.	
290.0'-300.0'	Dark greenish gray (5GY4/1), medium greenish gray (5GY5/1) and medium olive gray (5GY5/1) and medium olive gray (5Y5/1) CLAY - same as 270.0'-280.0' with scattered dry, brittle claystone fragments.	
300.0'-310.0'	Dark greenish gray (5GY4/1) and light gray (N7) CLAY - very stiff, moist, highly plastic; trace tan shells.	276'-307': Avg. drilling rate 4.9 ft./min.
310.0'-320.0'	Dark olive gray (5Y3/1) to greenish gray (5GY6/1) CLAY - very stiff, moist, plastic, trace tan to pinkish gray shells, gastropods and pelecypods.	
320.0'-330.0'	Dark olive gray (5Y3/1) to greenish gray (5GY6/1) CLAY - same as 310.0'-320.0'.	
330.0'-340.0'	Dark olive gray (5Y3/1) to greenish gray (5GY6/1) CLAY - same as 310.0'-320.0'.	
340.0'-350.0'	Dark olive gray (5Y3/1) to greenish gray (5GY6/1) CLAY - same as 310.0'-320.0' except few fine sand and shell fragments, slightly softer.	307'-347': Avg. drilling rate 3.3 ft./min. T. D. for shift.
350.0'-360.0'	Dark olive gray (5Y3/1) to greenish gray (5GY6/1) CLAY - same as 310.0'-320.0' except few fine sand and shell fragments and limestone fragments, slightly softer.	8/16/93 - Fluid level 49.4 ' below TOC. Hole squeezing from 330'-340'.
360.0'-370.0'	Dark olive gray (5Y3/1) to greenish gray (5GY6/1) CLAY - same as 310.0'-320.0' except soft, few fine-coarse sand and shell fragments.	347'-370': Avg. drilling rate 1.2 ft./min.
370.0'-380.0'	Dark olive gray (5Y3/1) to greenish gray (5GY6/1) CLAY - same as 310.0'-320.0' except soft, trace fine-coarse sand and shell fragments.	
380.0'-390.0'	Dark olive gray (5Y3/1) to greenish gray (5GY6/1) CLAY - same as 310.0'-320.0' except soft, trace fine-coarse sand and shell fragments, trace medium light gray (N6) siltstone.	
390.0'-400.0'	Dark olive gray (5Y3/1) to dark greenish gray (5GY4/1) CLAY - soft, highly plastic, trace fine grained gray quartz sandstone, trace medium-coarse sand, trace milky white clay.	
400.0'-410.0'	Dark greenish gray (5GY4/1) SANDY CLAY - soft, plastic, little fine to coarse sand, most medium-coarse, subangular-subrounded shell fragments, few coarse sand size phosphate grains, shell fragments to 1/8".	

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DEPTH	LITHOLOGIC DESCRIPTION	DRILLING CHARACTERISTICS
410.0'-420.0'	Dark greenish gray (5GY4/1) SANDY CLAY and grayish black (N2) DOLOMITIC CHERT - soft, plastic, little medium-coarse sand, shells, phosphate grains, light brownish gray (5YR7/1) limestone fragments; chert very hard, microcrystalline, conchoidal fragments.	
420.0'-430.0'	Yellowish gray (5Y8/1) CLAY, light gray (N7) to yellowish gray (5Y8/1) SANDY LIMESTONE and SHELLS - clay stiff, plastic; sandy limestone very fine grained with black phosphate grains, calcareous cement, medium-coarse shell fragments, trace translucent moderate brown (5YR3/4) shells; trace yellowish gray silt lenses.	
430.0'-440.0'	Medium gray (N5) to light gray (N7) SANDY LIMESTONE, yellowish gray (5Y8/1) SANDY CLAY and pinkish gray (5YR8/1) to light gray (N7) SHELLS - sandy limestone medium hard, very fine grained quartz and phosphate grains; sandy clay soft, plastic; shells medium-coarse to 1/8", angular-subangular; scattered grayish black (N2) angular chert fragments and rounded phosphate grains to 1/16".	401'-433': Avg. drilling rate 1.5 ft./min.
440.0'-450.0'	Yellowish gray (5Y8/1) CLAY and light gray (N7) to cream (10YR8/4) SANDY LIMESTONE - clay very soft, plastic; sandy limestone medium hard, weakly cemented, very fine grained, quartz and phosphate in a calcareous matrix; few shells, shell fragments and coarse phosphate grains.	
450.0'-460.0'	Yellowish gray (5Y8/1) CLAY - soft, plastic, trace yellowish gray limestone, hard.	
460.0'-470.0'	Greenish gray (5GY6/1) to yellowish gray (5Y8/1) SANDY CLAY and light gray (N7) to cream (10YR8/4) SANDY LIMESTONE and LIMESTONE - sandy clay soft, plastic, with medium-coarse shells and shell fragments to 1/16"; sandy limestone fine grained, medium soft; limestone medium hard, well cemented, crystalline, trace phosphate grains.	433'-465': Avg. drilling rate 0.7 ft./min. Hole difficult to clean due to clay. 465': Total depth for shift. 8/17/93 - Fluid level 3.4' below TOC. Remove ± 15' of clay. Thin back drill fluid and continue drilling pilot hole.
470.0'-480.0'	Greenish gray (5GY6/1) to yellowish gray (5Y8/1) SANDY CLAY and light gray (N7) to cream (10YR8/4) LIMESTONE - same as 460.0'-470.0' except decrease in sandy limestone.	
480.0'-490.0'	Yellowish gray (5Y8/1) CLAY - soft, plastic, trace medium gray limestone hard, crystalline, trace shells and rounded black grains (phosphorite?).	
490.0'-500.0'	Light olive gray (5Y6/1) SANDY CLAY - stiff, plastic, with medium-coarse shells to 3/8", few rounded subangular-subrounded phosphate grains; scattered light gray (N7) to cream (10YR8/4) sandy limestone and limestone lenses medium soft, trace milky clay; trace yellowish gray (5Y8/1) clay, highly plastic.	465'-496': Avg. drilling rate 0.4 ft./min.
500.0'-510.0'	Medium olive gray (5Y5/1) CLAY - moist, plastic, trace very light gray (N8) shells and light gray limestone; trace very light gray plastic clay.	
510.0'-520.0'	Medium olive gray (5Y5/1) CLAY - and trace very light gray (N8) shells and light gray limestone, same as 500.0'-510.0'.	

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DEPTH	LITHOLOGIC DESCRIPTION	DRILLING CHARACTERISTICS
520.0'-530.0'	Yellowish gray (5Y8/1) CLAY - stiff, plastic, phosphatic; trace cream (10YR8/4) limestone and shell fragments with thin soft lenses of white (N9) chalky clay.	496'-528': Avg. drilling rate 1.2 ft./min.
530.0'-540.0'	Yellowish gray (5Y8/1) CLAY and cream (10YR8/4) CHALKY LIMESTONE and very light gray (N8) CLAY - yellowish gray clay soft, plastic, phosphatic, with medium-coarse shells and shell fragments; tabular fragments of olive gray (5Y4/1) clay and grayish black rounded phosphate grains; chalky limestone soft, milky; clay plastic.	
540.0'-550.0'	Yellowish gray (5Y8/1) CLAY - soft, plastic, phosphatic; trace shells and shell fragments with lenses of light yellowish gray (5Y4/1) SANDY CLAY - sand very fine-medium, subangular-subrounded; scattered thin light gray (N8) chalky, clay lenses.	
550.0'-560.0'	Yellowish gray (5Y8/1) CLAY - soft to stiff, plastic, phosphatic; same as 540.0'-550.0'.	528'-560': Avg. drilling rate 0.8 ft./min.
560.0'-570.0'	Cream (10YR8/4) LIMESTONE - medium hard, weakly cemented, granular, phosphatic; with yellowish gray (5Y8/1) CLAY - soft, plastic, trace shells.	
570.0'-580.0'	Cream (10YR8/4) LIMESTONE with lenses of yellowish gray (5Y8/1) CLAY - limestone medium hard, weakly cemented, granular, phosphatic; clay plastic. with white to light tan shell fragments.	
580.0'-590.0'	Medium olive gray (5Y5/1) CLAY and light yellowish gray (5Y9/1) CLAY - stiff, plastic, light yellowish gray clay chalky with very fine rounded black grains (phosphorite?); scattered cream (10YR8/4) limestone fragments.	
590.0'-600.0'	Medium olive gray (5Y5/1) CLAY and light yellowish gray (5Y9/1) CLAY - stiff, plastic, trace fine sand, phosphatic, chalky; with thin lenses of cream (10YR8/4) limestone fragments.	560'-591': Avg. drilling rate 0.9 ft./min.
600.0'-610.0'	Medium olive gray (5Y5/1) CLAY and light yellowish gray (5Y9/1) CLAY - soft, plastic, chalky; with lenses of very stiff olive gray (5Y4/1) CLAY; trace cream limestone.	
610.0'-620.0'	Yellowish gray (5Y8/1) CLAY - stiff, plastic, phosphatic; trace fine sand and shells and cream limestone fragments; streaks of light gray (N8) chalky clay.	
620.0'-630.0'	Yellowish gray (5Y8/1) CLAY - same as 610.0'-620.0' with streaks of olive gray (5Y4/1) CLAY - very stiff.	591'-622': Avg. drilling rate 0.3 ft./min.
630.0'-640.0'	Yellowish gray (5Y8/1) CLAY and cream (10YR8/1) LIMESTONE - clay very stiff with tabular olive gray (5Y4/1) lenses and streaks of very light gray (N8) chalky clay; limestone hard, fresh, well cemented, reworked limestone grains in calcareous cement, blocky angular pieces; with black rounded grains (phosphorite?).	
640.0'-650.0'	Yellowish gray (5Y8/1) CLAY - very stiff, with tabular olive gray (5Y9/1) lenses and streaks of very light gray (N8) chalky clay; trace sand and shells.	

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DEPTH	LITHOLOGIC DESCRIPTION	DRILLING CHARACTERISTICS
650.0'-660.0'	Yellowish gray (5Y8/1) CLAY - very stiff, chalky, slightly blocky with dark olive and white clay with trace blocky limestone (same as 640.0'-650.0' with trace blocky limestone).	622'-655': Avg. drilling rate 0.5' ft./min. 655': Total depth for shift.
660.0'-670.0'	Yellowish gray (5Y8/1) CLAY - very stiff, plastic, few subrounded shell fragments and rounded phosphate grains; scattered thin lenses of cream (10YR8/4) granular limestone same as 630.0'- 640.0' except mostly clay.	8/18/93 - Fluid level 24' below TOC. Circulate out $\pm 5'$ of clay from bit and collars. Thin drilling fluid.
670.0'-680.0'	Yellowish gray (5Y8/1) and light olive gray (5Y6/1) CLAY - soft to stiff, highly plastic, phosphatic; trace shells and light pinkish gray (5YR9/1) limestone.	
HAWTHORN GROUP - ARCADIA FORMATION		
680.0'-690.0'	Light yellowish gray (5Y9/1) SANDY LIMESTONE, SHELL FRAGMENTS and CLAY - limestone medium hard to hard, fresh, moderate cementation, granular, fine grained, with reworked limestone fragments; few phosphate grains; shells subrounded, some translucent; lenses of clay stiff, plastic, chalky; trace lenses of olive gray (5Y4/1) clay.	655'-689': Avg. drilling rate 0.5 ft./min. Condition drilling fluid with difficulty.
690.0'-700.0'	Light yellowish gray (5Y9/1) SANDY LIMESTONE, SHELL FRAGMENTS and CLAY - same as 680.0'-690.0' except slight increase in olive gray (5Y4/1) clay.	
700.0'-710.0'	Light yellowish gray (5Y9/1) SANDY LIMESTONE, SHELL FRAGMENTS and CLAY - same as 680.0'-690.0' except absence of olive gray clay.	
710.0'-720.0'	Light yellowish gray (5Y8/1) SANDY CLAY with SHELL FRAGMENTS and SANDY LIMESTONE - clay medium stiff, highly plastic, phosphatic, with fine-coarse rounded grayish black (N8) phosphate grains, some grains fine gravel size; shell fragments to 1/8", subangular-subrounded; scattered lenses of sandy limestone hard, scattered small sharks teeth.	689'-716': Avg. drilling rate 1.2 ft./min.
720.0'-730.0'	Light yellowish gray (Y9/1) GRAVELLY CLAY with SHELL FRAGMENTS and SANDY LIMESTONE - clay medium soft, milk; some grayish black (N2) phosphate grains rounded, fine-coarse sand size with fine gravel size to 1/8"; shells to 3/16"; sandy limestone soft, poorly cemented, granular, with some reworked limestone grains.	
SUWANNEE LIMESTONE		
730.0'-740.0'	Very light gray (N8) LIMESTONE and SANDY LIMESTONE - soft to hard, weak to strongly cemented, phosphatic, granular, fine-coarse grained, subrounded-rounded, brownish gray (5YR4/1) to grayish black (N2) fine gravel, grains to 1/8", trace shell fragments; chalky; little sandy/gravelly very light gray (N8) clay with fine-coarse sand size black grains.	
740.0'-750.0'	Very light gray (N8) LIMESTONE and SANDY LIMESTONE with very light gray sandy/gravelly CLAY - same as 730.0'-740.0' with scattered lenses of dark yellowish gray (5Y7/1) sand fine-coarse and fine gravel rounded, rounded limestone grains in a calcareous matrix, chalky.	716'-750': Avg. drilling rate 1.8 ft./min. 750': Total depth for shift. 8/19/93 - Fluid level 48.1' below TOC. Add 15-1/4" in.

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750.0'-760.0'	No sample	reaming bit with 14-in. dia. stabilizer bit and ream from 186'-405'. 4 gallons Thinz-It used to thin drilling fluid. 405': Total reamed for shift. 8/20/93 Fluid level 53.4' below TOC continue reaming hole to 15-1/4". Condition and thin drilling fluid, Use 3 gallons Thinz-It. Ream hole to 503', total for shift. 8/23/93: Fluid level 52.3' below TOC. Continue reaming to 754'. Run caliper log to 744'. Logging stopped by heavy drilling fluid. 8/24/93 Fluid level 54.1' below TOC. Circulate tools through reamed interval. Break down wall cake and thin fluid. Install 750.5 ft. of 10-3/4" dia.x0.25" wall, API 5LB casing with 7.75' of stickup. Run 720' of 2-in. dia. steel and PVC pipe inside 10" casing. Pump 390 sacks Type I cement with 3% bentonite and 7.5 gallons water/sack in sealed casing. Complete grouting at 0800-8/25. 8/25/93 - Run temp. log in casing 16 hrs. following completion of grouting. Grout in annulus at 32.75' below top of 16" casing. 8/27/93 - Casing pressurized with water to 120 psi. Loose 9 psi in 1 hr from fittings and valves. Mix 18 sacks neat cement grout and pump in annulus to fill to top of 16-in. casing. 8/31-9/1/93 - Remove 0.21' of 16" casing to el. 33.87 ft. 10" casing removed to 0.35' above 16". Weld 10" dia. flange to casing. top of flange el. 34.28 ft. Fabricate and install blow out preventor. Go in casing with 9-7/8-in. dia bit to 739'. Thin out drill fluid and drill out ± 7' of cement. Advance hole using mud rotary.
OCALA LIMESTONE		
760.0'-770.0'	Pinkish gray (5YR8/1) to very pale orange (10YR8/2) SANDY LIMESTONE and SHELLS - hard, moderately cemented, granular, fine grained, shell fragments and sand in a calcareous matrix; shells and shell fragments incl. gastropods and pelecypods. (sample mixed with dark gray grout fragments)	
770.0'-780.0'	Pinkish gray (YR8/1) to very pale orange (10YR8/2) SHELLS and SHELL FRAGMENTS and SANDY LIMESTONE - shells very coarse to 1-1/4", most fragments coarse sand-fine gravel size, gastropods and pelecypods, no apparent cementation; sandy limestone medium hard-hard, moderately cemented, sugary texture, very fine grained.	
780.0'-790.0'	Pinkish gray (5YR8/1) to very pale orange (10YR8/2) SHELLS and SHELL FRAGMENTS and SANDY LIMESTONE - same as 770.0'-780.0' with decrease in shell size, most medium-coarse sand size.	
790.0'-800.0'	Pinkish gray (5YR8/1) to very pale orange (10YR8/2) SANDY LIMESTONE, LIMESTONE and SHELL FRAGMENTS - sandy limestone moderately hard to hard, moderately cemented, sugary texture, fine grained; limestone massive, crystalline; some shell fragments most medium sand size.	
800.0'-810.0'	Pinkish gray (5YR8/1) to very pale orange (10YR8/2) SANDY LIMESTONE and SHELL FRAGMENTS - sandy limestone moderately hard-hard, moderately cemented, sugary texture, fine grained, shell fragments and quartz grains in a calcareous matrix; shell fragments mostly medium-coarse sand size, angular-subrounded; trace massive light gray (N7) limestone fragments, small blocky angular.	
810.0'-820.0'	Pinkish gray (5YR8/1) to very pale orange (10YR8/2) SANDY LIMESTONE and SHELL FRAGMENTS and light to medium gray (N7-N5) LIMESTONE - same as pinkish gray limestone and shell fragments 800.0'-810.0'; light medium gray limestone, hard, fresh, well cemented, crystalline.	
820.0'-830.0'	Pinkish gray (5YR8/1) to very pale orange (10YR8/2) SANDY LIMESTONE and SHELL FRAGMENTS and light gray (N7) LIMESTONE - sandy limestone, medium soft to medium hard, moderately cemented, sugary texture, very fine grained, quartz, shell fragments and limestone grains in a calcareous matrix; shell fragments loose, medium-coarse grained incl. gastropods and pelecypods; limestone hard, very fine grained, well cemented.	

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AVON PARK LIMESTONE/LAKE CITY LIMESTONE		
830.0'-840.0'	Light moderate brown (5YR5/4) DOLOMITE, pinkish gray (5YR8/1) to very pale orange (10YR8/2) SANDY LIMESTONE and SHELLS and SHELL FRAGMENTS and light gray (N7) LIMESTONE - sandy limestone and shells same as 820.0'-830.0' with more intact microfossils incl. small conical shells; light gray limestone hard fresh, massive with shell molds and small vugs <0.5 mm dia.; dolomite hard, brittle, sugary texture, very fine grained.	740'-770': Avg. drilling rate 2.9 ft./min. Drill fluid tan color. 770'-800': Avg. drilling rate 2.4 ft./min. 800': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis. 822': Slight rig chatter.
840.0'-850.0'	Pinkish gray (5YR8/1) to light pinkish gray (5YR9/1) CHALKY LIMESTONE and SHELLS and SHELL FRAGMENTS - soft, weak, weakly cemented, granular, very fine grained, slightly clayey, milky; shells and shell fragments incl. small conical shells; scattered light gray limestone fragments, hard, massive, brittle, highly angular.	820'-830': 5,000 gal. fluid take. 827'-830': Rig chatter. 800'-831': Avg. drilling rate 2.2 ft./min. 831': Total depth for shift.
850.0'-860.0'	Pinkish gray (5YR8/1) to light pinkish gray (5YR9/1) CHALKY LIMESTONE and SHELLS and SHELL FRAGMENTS - same as 840.0'-850.0' except decrease in shells.	9/7/93 - Composite water sample, 750'-831', obtained for field water quality analysis; flow approx. 5 gpm. Switch to reverse air rotary and continue hole advancement.
860.0'-870.0'	Pinkish gray (5YR8/1) to light pinkish gray (5YR9/1) LIMESTONE and SHELLS and SHELL FRAGMENTS - limestone medium hard, weakly cemented, massive, slightly clayey, with fossil casts, slightly vuggy, open and irregular shaped; shells and shell fragments sand size incl. small cone shaped fossils and echinoids.	831'-862': Avg. drilling rate 0.8 ft./min. 862': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
870.0'-880.0'	Pinkish gray (5YR8/1) SANDY LIMESTONE, LIMESTONE and SHELLS and SHELL FRAGMENTS - sandy limestone medium soft to medium hard, moderately cemented, sugary texture, shell fragments, quartz and reworked limestone grains; shells and shell fragments incl. small conical shells, gastropods and pelecypods; limestone medium hard, well cemented, massive, oolitic, slightly vuggy; with scattered light gray (N7) limestone fragments.	
880.0'-890.0'	Yellowish gray (5Y7/2) SANDY LIMESTONE, pinkish gray (5YR8/1) SHELLS and SHELL FRAGMENTS and very light gray (N8) LIMESTONE - same as 870.0'-880.0' except limestone lighter color, slightly vuggy.	
890.0'-900.0'	Pinkish gray (5YR8/1) SANDY LIMESTONE, LIMESTONE, SHELLS and SHELL FRAGMENTS - same as 870.0'-880.0'.	862'-893': Avg. drilling rate 1.0 ft./min.
900.0'-910.0'	Light pinkish gray (5YR9/1) SANDY LIMESTONE and SHELLS and SHELL FRAGMENTS - very hard, well cemented, granular to oolitic, trace small vugs; abundant shells and microfossils, mostly varieties of small conical shells, and shell fragments; trace light gray limestone.	893': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
910.0'-920.0'	Light pinkish gray (5YR9/1) SANDY LIMESTONE and SHELLS and SHELL FRAGMENTS - same as 910.0'-920.0' except trace tabular light gray limestone fragments.	
920.0'-930.0'	Yellowish gray (5Y8/1) SANDY LIMESTONE, very light gray (N8) CHALKY LIMESTONE and pinkish gray (5YR8/1) SHELLS and SHELL FRAGMENTS - sandy limestone hard, fresh,	893'-923': Avg. drilling rate 1.0 ft./min. Est. flow rate 80-100 gpm.

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DEPTH	LITHOLOGIC DESCRIPTION	DRILLING CHARACTERISTICS
930.0'-940.0'	Pinkish gray (5YR8/1) to very pale orange (10YR8/2) SANDY LIMESTONE and SHELLY LIMESTONE - sandy limestone hard, moderately cemented, sugary texture, fine grained, most shell fragments and minor quartz in a calcareous matrix, slightly vuggy; shelly limestone medium hard, moderately cemented, massive, very vuggy, <0.05 mm, plucking of grains and shells, trace shells and shell fragments incl. small conical shells.	923': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
940.0'-950.0'	Very pale orange (10YR8/2) SANDY LIMESTONE - medium soft to medium hard, weakly cemented, chalky to sugary texture, non fossiliferous, weak bedding to massive, slightly phosphatic; trace gray (N3) massive limestone.	
950.0'-960.0'	Dark yellowish gray (5Y6/2) SANDY LIMESTONE and very pale orange (10YR8/2) SANDY LIMESTONE - medium hard, yellowish gray limestone weakly cemented, sugary texture, medium grained, vuggy, thin black vein filling and staining; pale orange limestone same as 940.0'-950.0' with scattered shells and shell fragments.	923'-955': Avg. drilling rate 1.4 ft./min. 955': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
960.0'-970.0'	Very pale orange (10YR8/2) SHELLY LIMESTONE and dark yellowish gray (5Y6/2) SANDY LIMESTONE - medium hard to hard, shelly limestone moderately cemented, massive, cemented shells and shell casts, vuggy, chalky; yellowish gray limestone weakly cemented, sugary, fine-medium grained, thin black vein filling; trace shells incl. small conical shells and echinoids.	
970.0'-980.0'	Very pale orange (10YR8/2) SANDY LIMESTONE - moderately hard, weak to moderately cemented, sugary texture, fine-medium grained, fossiliferous incl. small conical shells, echinoids, and gastropods and grains of subrounded limestone in a calcareous matrix.	
980.0'-990.0'	Very pale orange (10YR8/2) SANDY LIMESTONE - same as 970.0'-980.0'	955'-986': Avg. drilling rate 1.4 ft./min., significant flow increase; soft smooth rapid penetration.
990.0'-1000.0'	Very pale orange (10YR8/2) SANDY LIMESTONE - same as 970.0'-980.0' with layers of shelly limestone and light gray (N8) chalky limestone; shelly limestone massive, vuggy, shells and shell fragments in a calcareous matrix, some dissolution of shells, scattered light gray (N7) tabular fragments of massive very fine grained limestone.	986': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
1000.0'-1010.0'	Very pale orange (10YR8/2) SANDY LIMESTONE - moderately hard, weak to moderate cementation, sugary texture, fine grained, fossiliferous incl. small conical shells and echinoids; scattered lenses of weakly cemented chalky limestone with trace shell fragments.	
1010.0'-1020.0'	Very pale orange (10YR8/2) SANDY LIMESTONE - medium soft to medium hard, weak to moderately cemented, sugary texture, fine grained, highly fossiliferous; trace light gray chalky limestone, weakly cemented; scattered tabular fragments of massive limestone.	986'-1016': Avg. drilling rate 1.3 ft./min. 1016': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.

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DEPTH	LITHOLOGIC DESCRIPTION	DRILLING CHARACTERISTICS
1020.0'-1030.0'	Very pale orange (10YR8/2) to grayish orange (10YR7/4) SANDY LIMESTONE with pinkish gray (5YR8/1) CHALKY LIMESTONE - sandy limestone, medium hard to hard, moderately cemented, sugary texture, fine grained, highly fossiliferous with grains of subrounded-rounded limestone in a calcareous matrix; chalky limestone soft, weakly cemented, fine grained; with scattered fragments of dark gray (N3) limestone.	
1030.0'-1040.0'	Grayish orange (10YR7/4) to pinkish gray (5YR8/1) SANDY LIMESTONE - moderately hard, weak to moderately cemented, granular-sugary texture, fine-medium grained, highly fossiliferous incl. small conical shells; grayish orange limestone massive, weakly cemented; trace medium gray limestone fragments.	
1040.0'-1050.0'	Very pale orange (10YR8/2) to pinkish gray (5YR8/1) SANDY LIMESTONE - medium soft, weak calcareous cementation, sugary texture, fine grained, fossiliferous, incl. multiple varieties of small conical shells and other shell fragments, weak grain to grain contact, portions very vuggy; scattered grains of hard dark gray (N3) limestone.	1016'-1047': Avg. drilling rate 1.2 ft./min. 1047': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
1050.0'-1060.0'	Pale orange (10YR7/2) SANDY LIMESTONE - soft, weakly cemented, sugary open structure, fossiliferous incl. small conical shells, weak grain to grain cementation, moderate visible porosity.	750'-1047': Composite water sample obtained for field water quality analysis.
1060.0'-1070.0'	Pale orange (10YR7/2) SANDY LIMESTONE - soft to moderately hard, weak to strongly cemented, sugary to massive texture, fine-medium grained, fossiliferous incl. small conical fossils, coral and shell fragments; portions slightly chalky.	
1070.0'-1080.0	Pale orange (10YR7/2) SANDY LIMESTONE - same as 1060.0'-1070.0' with scattered dark gray limestone fragments.	1047'-1079': Avg. drilling rate 1.2 ft./min.
1080.0'-1090.0'	Pale orange (10YR7/2) to pinkish gray (5YR8/1) SANDY LIMESTONE - moderately hard, moderately cemented, sugary to massive texture, fine-medium grained, fossiliferous incl. varieties of small cone shaped shells, scattered relatively clear secondary calcite grains; trace dark gray (N3) massive hard limestone.	1079': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
1090.0'-1100.0'	Pale orange (10YR7/2) to pinkish gray (5YR8/1) SANDY LIMESTONE - same as 1080.0'-1090.0' except softer, dominantly sugary texture.	
1100.0'-1110.0'	Pale orange (10YR7/2) to pinkish gray (5YR8/1) SANDY LIMESTONE - moderately hard, weak to moderately cemented, granular texture, fine-medium grained, highly fossiliferous incl. varieties of small conical shells, low to moderate porosity; trace thin black vein and fracture filling; scattered clear secondary calcite filling; scattered thin lenses of dark gray (N7) massive crystalline limestone.	1079'-1110': Avg. drilling rate 1.4 ft./min. 1110': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis. 1110': Total depth for shift. Well flow secured.
1110.0'-1120.0'	Pale orange (10YR7/2) to pinkish gray (5YR8/1) SANDY LIMESTONE and LIMESTONE - moderately hard, weak to moderately cemented, granular to massive, fine-medium grained, fossiliferous, mainly small conical shells, low to moderate porosity; trace thin veins of very thin black filling; scattered thin lenses of dark gray (N7) massive crystalline limestone.	9/8/93 - Flow about 200 gpm. Composite water sample, 750'-1110', obtained for field water quality analysis.

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DEPTH	LITHOLOGIC DESCRIPTION	DRILLING CHARACTERISTICS
1120.0'-1130.0'	Pale orange (10YR7/2) to pinkish gray (5YR8/1) SANDY LIMESTONE and LIMESTONE - same as 1110.0'-1120.0' except interval predominantly massive limestone medium hard, and thin lenses of gray fine grained chalky limestone.	
1130.0'-1140.0'	Pale orange (10YR7/2) to pinkish gray (5YR8/1) SANDY LIMESTONE and LIMESTONE - same as 1110.0'-1120.0' except lenses of yellowish brown (10YR5/2) DOLOMITE, hard, brittle, well cemented, massive, crystalline.	
1140.0'-1150.0'	Moderate brown (5YR4/4) to pale yellowish brown (10YR6/2) SANDY LIMESTONE - medium soft, weak to moderately cemented, sugary texture, very fine grained, slightly vuggy, some plucking of grains.	1110'-1141': Avg. drilling rate 1.1 ft./min. 1141': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
1150.0'-1160.0'	Moderate brown (5YR4/4) and very pale orange (10YR8/2) SANDY LIMESTONE and LIMESTONE - sandy limestone medium soft, weakly cemented, very fine grained, slightly vuggy, some dissolution of grains and plucking of grains; limestone hard, massive, sugary, cemented grains of subrounded limestone in a calcareous matrix; with scattered lenses of grayish black (N2) limestone.	
1160.0'-1170.0'	Pale orange (10YR7/2) to pinkish gray (5YR8/1) SANDY LIMESTONE and LIMY SILTSTONE - sandy limestone moderately hard, weak to moderately cemented, granular texture, fine-medium grained, fossiliferous mainly small conical shells, with trace thin veins of black filling; limy siltstone, medium soft, weakly cemented, very fine grained, faint layering, shaley; trace medium dark gray (N4) limestone hard, massive.	
1170.0'-1180.0'	Pale orange (10YR7/2) to pinkish gray (5YR8/1) SANDY LIMESTONE and LIMESTONE - Sandy limestone medium hard, weak to moderately cemented, sugary, fine-medium grained, open honeycomb structure, some dissolution of grains, fossiliferous incl. small conical shells, moderate visible porosity; limestone hard, granular to massive, low visible porosity.	1141'-1172': Avg. drilling rate 0.7 ft/min. 1172': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis. 750'-1172': Composite water sample obtained for field water quality analysis.
1180.0'-1190.0'	Pinkish gray (5YR8/1) LIMESTONE and moderate grayish brown (5YR4/2) DOLOMITE - limestone medium hard, weak to moderately cemented, granular, fine grained, fossiliferous incl. small conical shells; dolomite hard, crystalline, brittle, massive.	
1190.0'-1200.0'	Very pale orange (10YR8/2) SANDY LIMESTONE - medium hard, weak cementation, sugary, fine-medium grained, fossiliferous, numerous shell molds, very vuggy, moderate visible porosity	
1200.0'-1210.0'	Mixed very pale orange (10YR8/2) pinkish gray (5YR8/1) and light gray (N7) SANDY LIMESTONE - medium hard, weak to moderate cementation, granular, fine-medium grained, highly fossiliferous incl. small conical shells, moderate dissolution of limestone grains and shells, vuggy, moderate to high visible porosity.	1172'-1203': Avg. drilling rate 1.4 ft./min. 1203': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis. 750'-1203': Composite water sample obtained for field water quality analysis.

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DEPTH	LITHOLOGIC DESCRIPTION	DRILLING CHARACTERISTICS
1210.0'-1220.0'	Grayish orange (10YR7/4) SHELLY LIMESTONE and pinkish gray (5YR8/1) LIMESTONE - shelly limestone medium soft, weakly cemented, sugary to granular, fine-medium grained, highly fossiliferous incl. small conical shells, moderate porosity; limestone medium soft, moderate cementation, granular, fine-medium grained, some secondary calcite filling; with lenses of dark gray (N3) siltstone, soft, moderately cemented, very fine grained.	
1220.0'-1230.0'	Grayish orange (10YR7/4) SHELLY LIMESTONE and pinkish gray (5YR8/1) LIMESTONE - same as 1210.0'-1220.0' except decrease in limestone; trace pale orange (10YR7/2) chert layers - hard, massive, microcrystalline.	1203'-1223': Avg. drilling rate 1.1 ft./min. 1223': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
1230.0'-1240.0'	Grayish orange (10YR7/4) SHELLY LIMESTONE and light pinkish gray (5YR9/1) CHALKY LIMESTONE - shelly limestone medium soft, weakly cemented, granular, fine-medium grained, shells and shell fragments with subrounded limestone grains, weak grain to grain cementation, moderate porosity; chalky limestone medium hard, well cemented, dense, brittle, milky, slightly vuggy; trace medium light gray (N6) limestone.	1223'-1265': Avg. drilling rate 1.4 ft./min. 1265': Water sample obtained from drill rod discharge, after clearing, for field water quality analysis.
1240.0'-1250.0'	Pinkish gray (5YR8/1) SANDY LIMESTONE - medium hard to hard, well cemented, granular to massive, fine-medium grained, slightly chalky, fossiliferous incl. small conical shells; trace medium light gray (N6) limestone.	750'-1265': Composite water sample obtained for field water quality analysis.
1250.0'-1260.0'	Pinkish gray (5YR8/1) SANDY LIMESTONE - same as 1240.0'-1250.0' except increase in medium light gray (N6) limestone; trace of crystalline amber color crystalline granules, trace black staining in veins and planar surfaces.	1265': Total depth for shift and well. Flow measured at 440-455 gpm. Well shut in. 9/9/93 - Composite water sample, 750'-1265', obtained for field water quality analysis.
1260.0'-1265.0'T.D.	Dark gray (N3) SILTSTONE - medium soft to medium hard, moderately cemented, dense, massive, very fine grained, trace of fine sand; with lenses of pinkish gray (5YR8/1) SANDY LIMESTONE - same as 1250.0'-1260.0'	Well developed with compressed air for approx. 6 hrs. Pull drill rods. Secure well with blind flange. 9/15/93 - 10-in. dia. Tee added to well head. Geophysical log suite run in flowing well. Log suite run incl. spontaneous potential, long and short normal resistivity, temperature, conductivity, gamma, flow meter, caliper, cement bond and acoustic velocity. 10/07/93 - 10-in. gate valve and monitoring points for piezometric head and quality sampling added to well head.