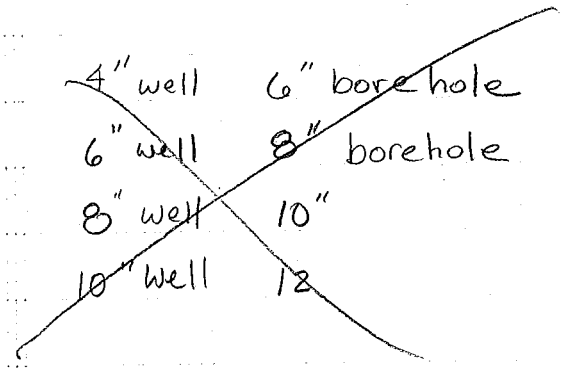
4-14-93

< 4" ⇒ 1" grout chapt 40E-3 p.3-9
≥ 4" = 2" grout



GROUTING Requirements

Pilot wells:
- 4" well _ 7 7/8 bore hole
- THROUGH Hawthorn ⇒ Log
- Consolidated LS
  - 2" bore hole to TD
-

Production Well — 8-inch well
10 - bore hole
- Casing set to TOP of FORMATION
- drilled to bottom of production Zone w/in FORMATION

MONITORING wells FOR PRODUCTION WELL:
2-inch well
4- inch Bore hole
- CASING AND TOTAL DEPTH Duplicates production Well.

How far w/ reverse AIR ? 1000' 4" - 120 gpm

Swannee CAVING INN? consolidated.

8" Production well	4" MONITORING	8" Production
INTERMEDIATE	Swannee	upper floridan
CASED = 110'	CASED = 380	CASED = 460
TOTAL DEPTH = 165' 55	TOTAL DEPTH = 460	TOTAL DEPTH = 850 330

4" monitoring - Swannee

UPPER FLORIDAN PRODUCTION

STEPS

① Mud Rotery : SURFACE CASING TO 380' bls

10 ~~8~~" well (4" or 6" well will be used)

8" SET CASING 140' - 10"

↳ LOOK @ DAVE'S well Construction - 8"

② REVERSE AIR 380' bls to 460' / 80' of swannee

DEVELOPE

TRIP OUT

③ Specific CAPACITY TEST ON SWANNEE

A) NEED 4 or 6" PUMP

B) 2 DAYS MAXIMUM

④ REVERSE AIR 460' to 850' / ~~390~~ ~~470~~ open hole

A) 8" pump will be used

OSE

6" pump motor THAT pumps either 6 or 8" Casing.

INTERMEDIATE PRODUCTION

STEPS

① Mud Rotery FROM LAND SURFACE TO 165' (MIOCENE CLASTICS)

A) SET 8 inch PVC CASING with 55 ft of 8 inch Screen.

B) Screen INTERVAL 110' TO 165'

② MID – HAWTHORN 4" MONITORING WELL

AVON PARK - 7TH site

		TOP (Casing Depth)	bottom (TOTAL Depth)	THICKNESS
Surficial		N/A	N/A	
INTERMEDIATE				
Primary	Upper HAWTHORN	110'	165'	
~~Secondary~~	~~Middle HAWTHORN~~	~~218'~~	~~240'~~	
Upper FLORIDAN				
5-8"	SWANNEE	380'	460'	80'
14-16"	OCALA	460'	530'	70'
	AVON PARK	530'	850'	320'
				Σ 470'
LOWER FLORIDAN				
	AVON PARK	1010'	1037'	

TOLD TONY 6-1-93 THIS WAS NOT A CONCERN because of the 10 HAWTHORN. However, According to Tony THIS INTERVAL WAS NOT observed in pilot well AVPK-1B.

FORM RP-59
July 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT Glades/Highlands WELL NO. AUPK-1 DATE 2-3-93

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
START Time 0830 2-3-93	13 7/8 Tri-cone Bit
0-3'	(NO SAMPLE) Missing due to mud pit construction, however surface sample indicate fine to medium brown to Lt gray, medium to fine grained SAND w/ intersperse organic material
3-12'	Lt gray to tan colored, fine SAND to silt size quartz grains w moderate Amount of clay material
12-19'	Lt gray to Lt green clay w/ moderate volume of silt to fine grained quartz grains, becoming more clayey towards the bottom
19-20'	Lt green clay, plastic, dense 20-25' min to go through 3', Clay contains minor Amount of silt & fine sand.
20'-30'	Bluish-green clay, dense, plastic, minor Amount of silt material
30'-37'	Bluish-green lotense w/ green clay, dense w/ minor Amount of silt. increase Amount of shell fragment starting @ Approx 36-37'
37-43'	Light-gray shell hash, with Abondant mollusk shell fragments interspersed w/ Lightlt-bluish-green clay.
2-4-94	
43-47'	Lt-greenish-gray clay w/ Approx 25% shell fragments shell fragment are predom. molluscs. (clams)
47-55'	DK gray, dense, plastic Clay w/ Approx 25% shell fragments
55-64'	Lt-greenish-gray clay w/ Approx 35-40% shell fragment slighly higher Amounts of shell fragment towards the bottom of this interval (higher drilling rates) from 55 to 64'
64'-75'	Moderate green sandy-clay w/ Approx 30% shell fragment Also fragments of moderate indurated siltstone w/ Approx 1-2% silt to fine sand phosphate grains
75'-79-	dk green sandy-clay w/ shell fragments & whole clam shells Also moderately indurated siltstone (dolosilt) w/ 1-2% phosphate
79'-84'	dkgreen to drab-olive green sandy-clay w/ 30% Shell fragment and internal molds. w/ moderately indurate siltstone. - 1-2% phosp.
84-90	Olive-green sandy-clay w/ 20% shell fragments / mod. ind. dolosilt.
90-97'	decreasing sand content ~~toward~~ From 87-90' - 1-2% phosphate Olive-green clay w/ minor sand & shell content, minor Amount of moderately indurated dolosilt. 1-2% phosphate content.

(Installed 10" PVC Casing to 97')
surface

FORM RP-59
July 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

7:50 A START DRILLING

PROJECT Highland Glades WELL NO. AuPK-1 Pilot well DATE 2/9/93 (2)

Drilling w/ 5 7/8" bit

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
90-97	OLIVE - gr. CLAY w/ MINOR SAND & shell Content, MINOR AMT of Moderately
(CONT)	indurated dolosilt 1-2 % phosphate Contents
97-100	olive-gr. clay w/ 30% shell 35% phosphate pepples Lg gr. SAND
100-105	olive-gr. Slurry Sand 20% shell 20% phosphate Pebbles,
	TRACES
105-110	SAME AS above
110-115	60% shell & olive-gr. clay w/ 20% lg qtz granuds and
	Phosphate Pepples,
115-123	clear-frosted qtz granules w/ subround phosphate Pebbles and
	50% shell frag.
127-130	gr. Ls and subrounded qtz granules w/ frag of shell, and 20% Phosphate Pebbles
130-135	gray to gr. CLAY
135-140	clear-frost subrounded qtz granules w/ sm. phosphate Pebbles
	and shell frag.
140-145	SAME AS above
145-147	60% clear-frosted Subrounded Qtz granules w/ gray
	LS(?) & frag. of Shell HASH
147-150	SAME AS above V. little return
150-155	clear to frosted subrounded qtz 10% phosphate Pebbles
	w/ frag. Shell lt. gray LS(?)
155-163	gray sandy cemented LS(?) (siltstone) w/ 20% subround qtz. and
	gray shell hash frag.
163-170	DK. gray to clear subrounded qtz sand w/ frag Mollusk shell and sm. to Lg
	Phos. granules.
170-175	SAME AS Above
175-180	DK. gray to Light gray clay, 35% qtz sand w/ shell frag and phos.
	granuals, Phos. grains
180-183	H. gry to DK gry. Ls w/ frag mollusk shell and sandy clay
183-185	SAME AS Above
185-190	SAME AS Above w/ gr. Silty-clay

description by M.B.

M. KNAPP Miocene Quartz clastics

FORM RP 59
JULY 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT Highland GLADES WELL NO. AVPK-1 DATE 2·11·93

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
(4) 503-523	Limestone cream to tan v. granular chalky, porous,
(5) 523-543	SAME AS Above, There is evidence of white soft Ls balls. v. soft and porous
(6) 543-563	SAME AS Above w/o soft Ls Balls. Phos. is present (FR. Above)
(7) 563-583	SAME AS Above LAG TIME = 6min
(8) 583-603	SAME Drill Time = 6min. Cutting removal = 27min
(9) 603-623	Same while drilling there Appears to be hard stringer; NO EVIDENCE of this w/ Cutting
623-633	Limestone, Light tan to cream sandy v. Porous and soft, granular, w/ spiral
	shells and Shell frags.
633-643	Lt. tan to BRWN granular Limestone, harder calcite granules. w/ Echinoid
	Spin's, Dictyoconus cookei, COSKINOLINA, w/ shell frag.
643-653	Lt. Brown granular Ls. to cream Ls. calciteous
653-663	same as above w/ v. fine grain LS. echinoid spins present
663-673	Lt Brown Ls w/ Calcite cream hard granular w/ some crystalline
	Ls. INDICATOR of Vulgs
673-683	SAME AS Above
683-703	SAME AS above w/ forams present white to cream balls of soft Ls w/ sticky
	Ls CLAY (?) Miliolids present (?)
703-723	Lt Brown to cream hard chalky Ls w/ abundant Cones (Textularia Coryensis) Milliods ?
	2·12·93 Drilled 400' 2·11·93
723-743	Lt tan to cream chalky Ls
743-748	cream to Lt Brown, hard w/ some tan dense crystalline Ls.
	bottom of 748' hard Formation was incountered LAG TIME = 7.5
748-763	Cream to Lt Brown, soft to hard, w/ hard crystalline Ls.
763-770	Lt. tan to Cream Ls w/ abundant Cones
770-775	Lt. Brown hard to SOFT w/ Lt. gray Ls. Lt. Brown is crystalline

4min

Avon PK

FORM 98-59
JULY 1979

Sun screen
Plastic Bags

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT *Highland GLADES* WELL NO. *AvPK-1* DATE *2·10·93*

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
363 - 365	White clayey Ls. w/ sand size grains and crystalline gray Ls. green clay balls and phos. granules and frag of shell
365 - 370	Ls. DK. grn. v. hard fine grain w/ white Micritic Ls w/ phos. w/ frag shell
370 - 375	White Micritic Ls w/ gr. clay and ~~tan~~ buff color Ls. (chert?)
375 - 383	Ls Dk. gr. v. hard w/ sand, quartz tan gray limestone (chert some clay Present (10%)
383 - 403 ✱	V. FAST DRilling (6min/20ft) tan sand BUFF color Ls (TOP INTERVAL) w/ white flakes of Ls and 25% shell frag. ~~IF I didn't know any better it appear~~ to have Lipidocylina (OCALA) and Miliolids, reef Material
403 - 423	Swannee Ls (?) dense Cream Porcelaneous Ls. SOFT chalky, Porous
443 / 263 / 180 423 - 443	SAME AS Above
AV. 120' / 523	2·11·93 DRilled 180' 2·10·93
① 443 - 453	SAME AS Above, w/ phos. Pebbles, maybe FROM Above. ALSO EVIDENCE OF cherty gray Ls w/ Phos. sand
453 - 463	SAME AS above w/ More gray hard Ls w/ Phos. sand 30% Lg Phos. Pebbles also present. / DRilling WAS SLOWER AT THE END of this Rod
10:00 ② 463 - 473	SAME AS Above
475 ✱	Contact w/ OCALA FORMATION (?)
475 - 483	Ls. sandy tan, Porous w/ Lipidocylina w/ shell frag gray clay balls are present (from Above) white chauky Ls v. SOFT foraminiferal coquina.
③ 483 - 493	SAME AS above Phos. Pebbles are present (from Above?)
493 - 503	Limestone cream, chauky v. soft w/ Lg. forams and spiral worm casings V. Porous

FORM RP 59
JULY 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT ______ WELL NO. AVPK-1 DATE 2.9.93

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
190-195	tan to dk. gray Mollusks frag. w/ qtz. sand. traces of gr. CLAY
195-200	same as above
203-207	GRAY to DK. GRAY Subrounded Qtz and Phos. granules w/
	traces of 30% shell frag. (hash)
207-210	SAME AS above w/ clay balls
35 min 210-215	" "
215-220	SAME AS above w/ Larger phos. granules and sm. sand size
	phos. in LS (?) 50% shell hash and Rounded Quartz. Sand
220-223	DK. to tan shell hash, w/ Phos. pebbles and Mollusk
	shell 25% Blue-green clay balls present
223-225	V. Little return
225-230	Blue-green CLAY balls w/ shell frag. and Phos. granules to v. fine
	phos. size. This 20' section very slow drilling rate ≈ 1 1/2 hours
230-235	65% Blue green clay w/ 30% shell frag and clear, rounded Quartz
	sand. v. sm. phos. grains also tan to gr. silt size Clay.
235-243	95% Blue green clay w/ tan clay Clay is peppered w/ Phos.
243	w/ wt. shell frag. v. STICKY (MICACEOUS)
146 243-245	Blue-green to Lt. gray Micrite CLAY w/ frag. shell
245-250	SAME AS Above w/ greater frag. of shell
250-255	Chatter, hard Fm. V. hard DK. GRAY peppered LS. AND Phos. CLAY
255-263	LAST 8 ft Drill stem appears to have gone through several STRINGER
	of the above. This maybe silt stone (?) or LS. w/ peppered
	phosphorite.

FORM RP 59
JULY 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT Highlands-Glades WELL NO. A.I.P.U. Pilot Well DATE 2-10-93

10 TOTAL Rods [illegible]

6

Rods	DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
①	263-273	Blue-gr. CLAY. v. STICKY and plastic. Peppered w/ phos. Phosphate
1 1½ hours		Pebbles and 20% Shell fragments. 15% sand [illegible]
	273-283	As above but w/ more [illegible] [illegible] and shell Frag.
②	283-290	As above
	290-295	CLAY white w/ slightly green Color. white Crystalline Ls. and peppered
		w/ phos. sand sized, CLAY is STICKY, Contains shell frag.
1.5 hrs	295-303	SAME AS Above w/ Larger Amt of gray Ls and Larger Phos. Pebbles.
		the white clay appears to Contain Larger Amt of peppered phos.
③	303-313	Cream to green (drilling Mud?) clay w/ Frag of olive Ls. Clay Contains sand size phos.
		Pebble sized phos. and frag. of shell and sand. white chunky Ls. also present
1.75 hrs		in trace amts.
	313-315	SAME As above w/ greener Appearance from clay.
	315-323	olive-green clay w/ white clay balls both Clay Contains Phos. gray and
		Cream Color Ls. w/ frag of shell. gray Ls is v. fine Crystaline matrix and
		v. hard. (≈321')
④ 1300 start 45 min	323-325 chatter	SAME AS Above. Color is slightly changing to more Cream/TAN.
	325-335	Tan-gr. sandy clay w/ phos. bottom of this mark drill stem started
		to chatter
	335-343	SAME AS Above, chatter is due to stringers of Sandy Tan Ls.
1350 ⑤	343-347	SAME AS Above
1 hr.	347-352	Limestone cream to tan w/ 60% clay and phos. Sand Size grains
	352-355 Drill stem chatter	Limestone, white and buff Color. Sandy phos. w/ 50% white clay and frag. Shell
	355-360	Limestone v. fine grain green-gray. w/ gr. clay and frag. shell w/ phos.
	360-363	Ls, white to buff w/ hard Chert like Ls. and sm. grain phos. w/
		shell frag.

FORM RP 59
JUL 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT Glades/Highlands WELL NO. APH 1 DATE 2-17-93

Avon Park Bombing Range)

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
775-783	65-70% Lt Brown Crystalline Ls. w/ less tan soft Ls.
783-803	Cream to Lt tan soft to hard, chalky granular Ls. w/ dense tan-gray Ls.
803-815	Cream to Lt tan moderately indorated LS w/ Lt gray micritic Lime mud Lens interspersed
815-823	Lt Brown to brown well indorated LS/Dolomite (?) w/ minor Amounts of Lt gray micritic mud interspersed (Alot of Bit Chatter)
823-828	Lt gray micrite w/ lens of poorly indorated LS cream to Lt brown Limestone
828-843	cream to Lt. Brown poorly indorated, granular Limestone interspersed w/ brown dolomitic and gray to black dolostone Layers (intermittant bit chatter but really fast drilling from 828-843 (15 minutes)
843-853	cream to Lt Brown poorly indorated, granular Limestone interspersed w/ Lt gray micritic mud w/ minor amount of dolostone (poorly indorated)
853-863	Lt Brown poorly indorated, granular limestone w/ minor Amount of micritic w/ gray to Lt black dolostone (poorly indorated (drilling time for 843 to 863 interval (16 minutes)
863-873	Lt gray to cream (Lt. Brown) poorly indorated Limestone (well indorated from 866'-869' (high degree of bit chatter minor Amount of coarse-grained grayish-green to black dolomite fragments.
873-883'	Lt gray to Lt Brown poorly indorated Limestone w/ minor Amounts of coarse-grained fragments of brown dolomite (drilling rate for 863 to 883 – 14 minutes.)

FORM AP 59
July 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT Glades/Highland WELL NO. AP # 1 DATE 2-17-93

(Avon Park Bombing Range)

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
883-893	Lt gray to Tan poorly indurate, granular Limestone w/ minor amount of Light brown moderately indurate Limestone & Lt gray micrite interspersed through out this interval.
893-903	SAME AS Above
	Drilling rate for interval 883-903 - 13 minutes
	STOPPED DRILLING 1500 2-17-93
2-18 0800 903-913	Cream to Lt tan poorly indurated, granular Limestone w/ Large Amount of Clayey (micritic Layer interspersed within this interval
913-923	cream to Lt brown poorly to moderately indurated, granular Limestone w/ decrease volume of micritic material interspersed with the last 5 to 7 feet of this interval (Drilling Rate for this interval 20 minutes)
923-933	Lt tan to Brown moderately to well indurated, granular Limestone interspersed w/ 40-50% Amounts of Lt. gray micrite and poorly indurated Lt brown Limestone
933-943	Same as Above (Drilling Rate 25 minutes; higher degree of bit chatter throughout this interval strings of well indurate, hard material.)
943-953	Tan to Lt Brown, soft poorly to moderately indurated granular Limestone w/ Approx. 30-40% Lt gray micrite w/ minor Amounts of mollusk (?) shell fragments ~~and white ... (2)~~
953-963-	SAME AS Above w/ slight decrease in Lt gray micrite content 25-35% (Drilling Rate 18 minutes intermittent bit chatter - 0.5-1.0 harder denser Limestone stringers thrown within this interval.

FORM SF 53
JULY 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT Glades / Highlands WELL NO. APT#1 DATE 2-18-93

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
963-969	Cream to Lt brown poorly to moderately indurated Ls w/ 40-50% Lt gray micrite mud interspersed, chalky textore
969-983	brown, dense, hard Limestone moderately to well indurated w/ small % of gray moderately indurated Limestone only minor Amount of Lt gray micrite within this interval; high degree of bit chatter from 969 to 973 and 979'-983 indicating relatively hard, dense material (drilling time 30 minutes; primarily from 969 to 983)
983-993	brown, well to moderately indurated Limestone w/ small Amounts of greenish-black to black fragment of very hard & dense dolomite; shell fragments and minor amouts of Lt gray micrite
993-1003	same As Abae (Drilling rate for 983-1003 30 minutes with high degree of bit chatter @ 987, 993 and 997' for 1 foot intervals. probably indicating the presence of black, hard, dense dolomite stringers;
1003-1019	Brown, moderately indurated Limestone w/ 15-20% Light gray micrite and minor amount of black dolomitic fragments (last Drilling
1019-1023	Brown, moderately to well indurated w/ minor Amount of Black dolomitic material and very decrease content of micrite from the interval (1003-1019) high degree of bit chatter & slower drilling through this interval (Drilling Rates 20 minutes w/ 10 minute for the last 3 feet.
1023-1027	Brown, moderately indurated granular limestone w/ Approx 40-50% Lt gray micrite & minor Amounts of dolomite fragments Black well indurated
1027-	Cryptocrystalline, Chocolate-Brown, very well indurated Limestone, with minor Amount of Black dolomite NO Lt gray micrite Drilling Rate 1 hr 20 min before remixing mud pit doe borehole taking water starting @ 1027

FORM SF 53
JULY 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT Glades/Highlands WELL NO. Ap# 1 DATE 2-18-93

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
	Drilling was stopped to allow material to fall back into the bore-hole to allow for the cuttings to settle-out to reduce the permeability of the chocolate-brown Limestone, Drilling ceased @ 1630 - Total Depth 1030'
	MECHANICAL PROBLEMS W/ DRILL RIG. CLUTCH APPEARS TO BE SLIPPING NEEDS REPLACEMENT.
	2-25-93
	RESTART @ 1042' CONVERSATION W/ TONY SUGGEST @ 1020 (APPROX) THERE IS A SAND LAYER W/ SAND sized phos. granules.
1022 - 1043'	SLOW DRILLING, LT. TO DK BROWN HARD Recrystalized LS (Dolomite) W/ Mixed GRAY LS. Mollusk frag. present W/ Lt gray LS. @ botm of Rod 1.5' WAS V. SOFT (SAND?) (TAKING WATER) 130 min/10'
1046 - 1047	LOST CIRCULATION V. QUICKLY

FORM RP 59
JULY 1979

KADE MC HARGUE,
5620 E ARBUCKLE Rd
AVON PK

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT AVPK-1B WELL NO. #2 DATE 5-4-93

THIS LOG CONTINUES FROM PILOT WELL AVPK-1

DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
	AVPK-1B WELL was required to Replace AVPK-1 therefore this well 50 ft
	North and 24 ft NE of Original WELL AVPK1.
1003 - 1013	TAN TO CREAM porous LS, indurated w/ frag of recrytaline
	dk. brown color dolomitic ls.
1013 - 1023	AS Above, more dk. brown dolomitic LS than the pourous
	tan to cream LS.
1015 - 1017	ALOT of Chatter, LOST circulation for short while
1027'	LOST circulation w/ 1.4' void.
1028 - 1031	
1031 - 1033	