WELL COMPLETION REPORT

HUNTERS CREEK POTABLE WELL FIELD

JAMMAL & ASSOCIATES, INC. Consulting Engineers

MEMBER

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1675 Lee Road, 32789 ■ P.O. Box 339, Winter Park, Florida 32790 ■ Telephone (305) 645-5560

JAMMAL & ASSOCIATES, INC. Consulting Engineers

March 25, 1985
Project No. 84-03013

TO: South Florida Water Management District
P. O. Box B
West Palm Beach, Florida 33402

Attention: Dr. Patrick Gleason, Director
Water Use Division

SUBJECT: Hunters Creek Potable Well Field, Well Completion Report

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Dear Dr. Gleason:

Enclosed are 4 copies of the above referenced well completion report for 2 potable wells recently installed at the Hunters Creek site. Well construction and pumping tests were conducted under the supervision of our firm for Genstar Southern Development. Enclosed within the attached report are FDER Well Completion Reports, Water Quality Testing Results, Geophysical Logs, and step-drawdown testing results.

A detailed hydrogeologic assessment of the Hunters Creek site was incorporated in the Hunters Creek Water Use Permit Application previously transmitted to your office. We are pleased to submit this report for your review and should you

Geotechnical Engineers, Hydrogeologic Consultants & Materials Testing Engineers
1675 Lee Road, 32789 ■ P.O. Box 339, Winter Park, Florida 32790 ■ Telephone (305) 645-5560
Regional Offices: *West Palm Beach, Ormond Beach, Tampa, Florida*

have any questions or require clarification regarding the material contained herein, please contact our office.

Sincerely,

JAMMAL & ASSOCIATES, INC.

Robert Oros, P.G.
Senior Hydrogeologist

Philip B. Hildebrand, Ph.D.
Senior Project Manager

RO/PBH:jch
0046J

cc: Genstar Southern Development
Attn: Roger Gatlin

Bowyer, Singleton & Associates
Attn: Leroy Turja

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INTRODUCTION

Hunters Creek is a residential planned unit development located in south central Orange County (Figure 1). The potable well field site is located in the east central portion of the property (Figure 2). A detailed illustration of the well field and water treatment facility parcel is illustrated on Figure 3. Two 18" potable water supply wells were installed at the well field site between December, 1984 and February, 1985. These wells were installed to a depth of 600 ft. and tap the upper production zone of the regional Floridan aquifer.

Following well installation and development, step-drawdown testing was conducted on both wells. A suite of geophysical logs was conducted on well No. 1 and water quality testing was conducted on both wells.

WELL INSTALLATIONS

The wells were rotary drilled with the casing seated into the uppermost limestone unit of the Floridan aquifer. An open hole section was drilled from the casing seat to the completion depth. The well casing was grouted in place from the casing seat to the land surface with neat cement grout. A detailed description of well construction for both wells is listed as follows:

Well Specifications

	Well #1	Well #2
Casing Size	18 in. O.D.	18 in. O.D.
Wall Thickness	0.375 in.	0.375 in.
Casing Length	206 ft.	201 ft.
Open Hole Section	206 ft.-600 ft.	201 ft.-600 ft.

STRATIGRAPHY

During the course of well construction, cuttings were collected at 10 foot intervals for geologic identification. A drillers log contained in the FDER Well Completion Report is enclosed in Appendix A. The site stratigraphy to a depth of 600 feet was evaluated by physical examination of drill cuttings, evaluation of bore hole geophysical logs (Appendix B) and review of the drillers logs. From this evaluation a generalized geologic profile was prepared and is presented on Figure 4. A detailed geologic profile for this site was prepared by physical examination of drill cuttings from well No. 1 and is included in Appendix C. The geologic formations and stratagraphic profile are typical of the regional geology and consistent with published information. As shown on Figure 4, three geologic formations were penetrated during well construction and are described below in order of occurrence from land surfaced to depth:

DEPTHS	DESCRIPTION
0 - 40 feet	Pliocene to recent age undifferentiated clastic deposits composed primarily of fine to medium grain sands with traces of silt.

DEPTHS	DESCRIPTION
40 - 190 feet	Miocene age, Hawthorn Formation; a hetrogenious unit comprised primarily of fine grained sand, silt and clay.
190 - 600 feet	Eocene age Avon Park Limestone, composed primarily of tan to brown and gray pourous fossiliferous limestone with an increasingly larger proportion of dolomite with depth.

AQUIFER TESTING

Step-drawdown Testing

Step-drawdown tests were conducted on both well No. 1 and well No. 2 following development. Both wells were pumped in four steps corresponding to approximately 50%, 65%, 85%, and 100% of the maximum pumping rate. During each step of the test, the wells were pumped at the appropriate rate for 30 minutes and then allowed to recover for 30 minutes before proceeding with the next step. The results of the step-drawdown tests are presented graphically for both well No. 1 and well No. 2 in Figures 5 and 6 respectively. The results of the step-drawdown tests at both wells indicate that well No. 1 had a specific capacity of 114 gpm/ft at a pumping rate of 2,815 gpm and well No. 2 had a specific capacity of 204 gpm/ft at a pumping rate of 2,973 gpm.

The results of the step-drawdown tests conducted on both wells were used to estimate the aquifer transmissivity according to a

method described in Walton (1970). For this analysis, the lowest pumping rate that was conducted at each of the wells during the step-drawdown test and the subsequent drawdown that occurred were used in making these transmissivity estimations. Observed drawdown was adjusted for friction loss in the well casing for the appropriate pumping rates. As a result of this analysis, the transmissivity as estimated from the step-drawdown tests at well No. 1 is estimated to be 366,000 gpd/ft. The estimated transmissivity at well No. 2 was 654,000 gpd/ft. The numerical average of the estimated transmissivity for both wells is 510,000 gpd/ft. A storativity value of 1.0×10^{-4} was assumed for both of these analyses. Field data collected during the step-drawdown tests at both wells is included in Appendix D of the report.

GEOPHYSICAL LOGGING

A suite of geophysical logging was conducted at well No. 2. Caliper, gamma, spontaneous potential, and single point resistivity logging was conducted. An analysis of the spontaneous potential and single point resistivity logs indicates that the producing zones of the open bore hole occur between depths of 206 to 240 feet, from 320 to 380 feet, from 410 to 460 feet, and from 530 to 550 feet. Based on this analysis, approximately 41% of the open bore hole is producing significant quantities of water.

WATER QUALITY RESULTS

Upon completion of well construction and well development, groundwater samples were collected from each well for laboratory analysis. The analytical paramaters used for testing included

the State of Florida, primary organic and inorganic and secondary drinking water standards. The results of the laboratory analysis are included in Appendix E of this report. The results of the laboratory testing indicate that the water from both wells is of potable quality and does not exceed the recommended upper limit for any of the paramaters tested.

SUMMARY

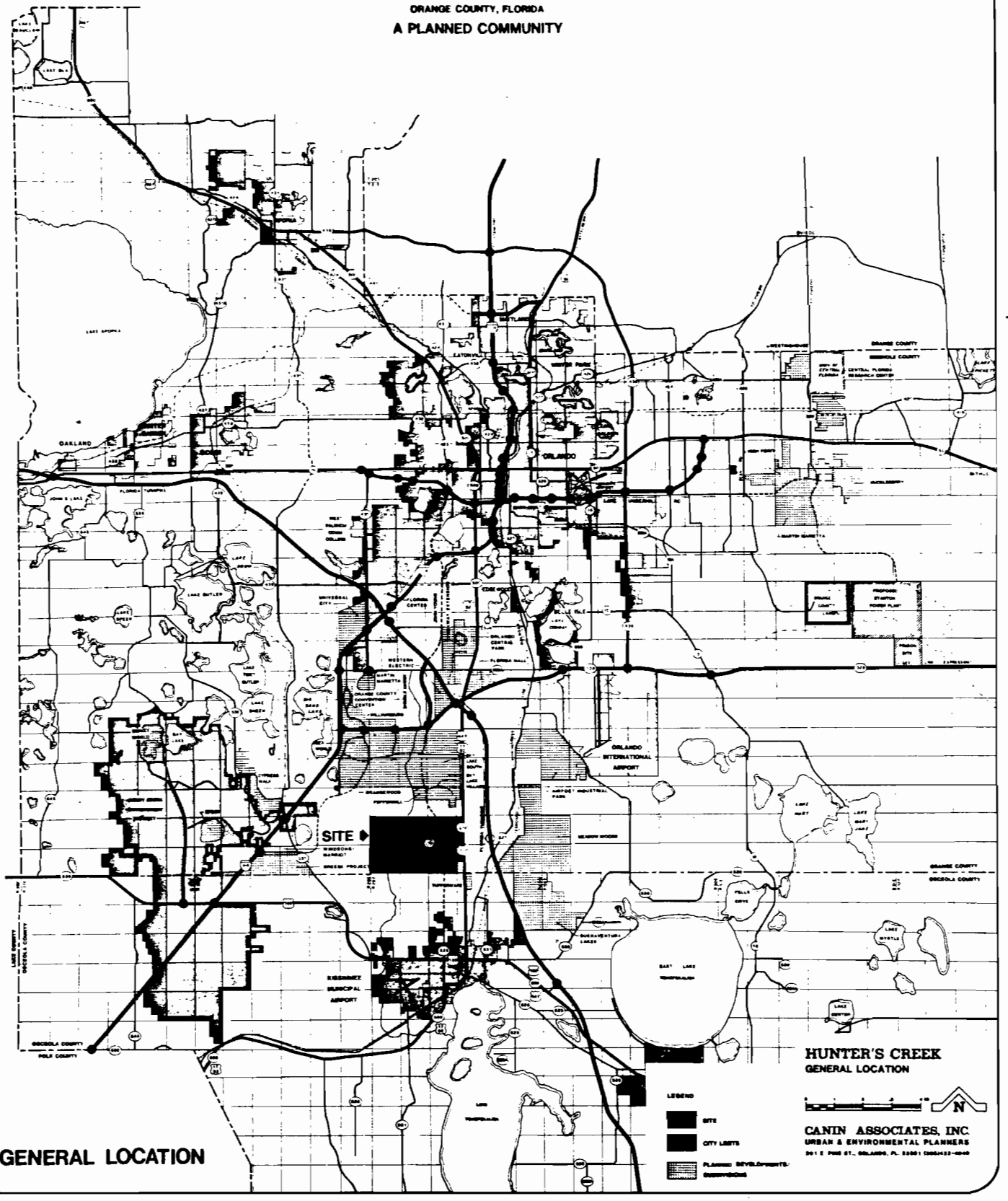
Two 18" potable water supply wells were constructed and aquifer testing completed at the Hunters Creek site. Both of these wells were installed into the upper production zone of the Floridan aquifer. A detailed geologic log was prepared, bore hole geophysical logging was conducted, and water quality sampling/testing was conducted. The results of this investigation, indicate that the aquifer is sufficiently transmissive and has a suitable water quality such that these wells may be used on a long term basis to supply potable quality water for the Hunters Creek development.

In the previous impact analysis prepared for the Hunters Creek Water Use Permit Application, a transmissivity of 600,000 gpd/ft was used for numerical modeling. Based on our estimation of transmissivity from the step-drawdown tests conducted during the course of well installation, we consider that the previously modeled impact analysis will be substantially the same based on our more recent data from step-drawdown testing. Transmissivity valued estimated from specific capacity data collected during the step-drawdown tests indicate that transmissivity ranges from 366,000 gpd/ft to 654,000 gpd/ft and is within the same range as the aquifer paramaters used for the previous impact analysis. Therefore, our site specific testing results corroborates the previous estimates used in the Water Use Permit Application.

HUNTER'S CREEK

ORANGE COUNTY, FLORIDA

A PLANNED COMMUNITY



GENERAL LOCATION

JAMMAL & ASSOCIATES, INC. Consulting Engineers

Project No. 84-03013

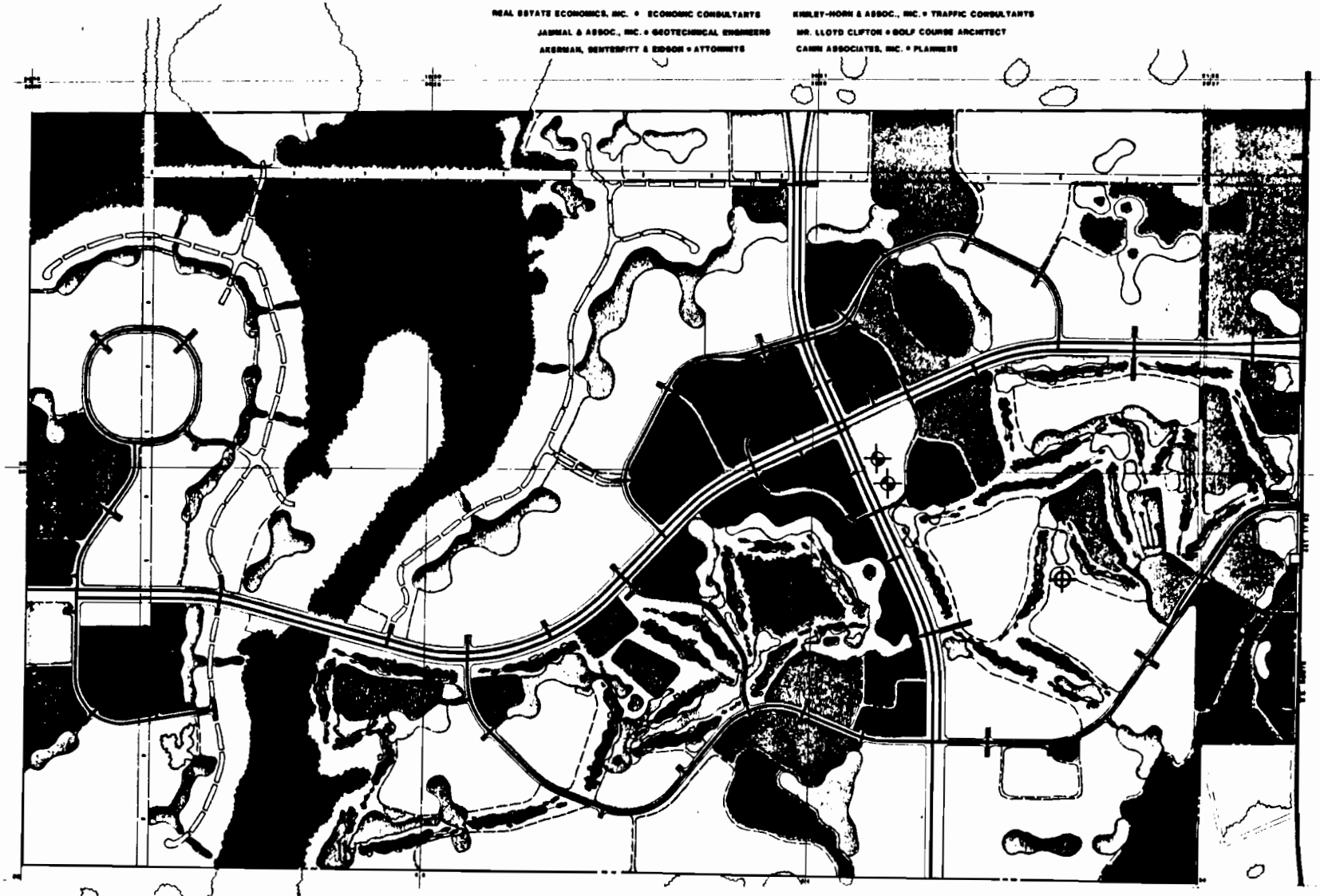
Figure No. 1

HUNTER'S CREEK

ORANGE COUNTY, FLORIDA

A PLANNED COMMUNITY

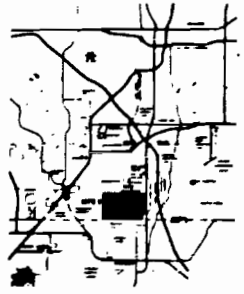
SOWTER-SINGLETON & ASSOC. • ENGINEERS & SURVEYORS
REAL ESTATE ECONOMICS, INC. • ECONOMIC CONSULTANTS
JAMMAL & ASSOC., INC. • GEOTECHNICAL ENGINEERS
AKERMAN, SENTERFITT & EDISON • ATTORNEYS
BREEDLOVE ASSOC., INC. • ENVIRONMENTAL CONSULTANTS
KIMLEY-HORN & ASSOC., INC. • TRAFFIC CONSULTANTS
MR. LLOYD CLIFTON • GOLF COURSE ARCHITECT
CANIN ASSOCIATES, INC. • PLANNERS



GENERAL NOTES

1. RESIDENTIAL PARCEL LAND USE MAY BE INTERCHANGED PROVIDING TOTAL RESIDENTIAL PROGRAM REMAINS IN BALANCE
2. AS FINAL P.D. SUBDIVISION AND SITE PLAN SHALL BE SUBJECTED TO RECEIVING DENSITY
3. EXACT LOCATION OF OPEN SPACE ACCESS POINTS, LANDS & TRACT BOUNDARIES TO BE DETERMINED ON FINAL P.D. SUBDIVISIONS
4. DEVELOPMENT MAY PROCEED CONCURRENTLY WITHIN PARCELS BEING CONVEYED TO DIFFERENT BUILDERS HOWEVER THE NECESSARY SUPPORT SERVICES SHALL BE PROVIDED TO ENSURE THAT EACH DEVELOPMENT PHASE CAN EXIST AS AN INDEPENDENT UNIT
5. VARIANCES FROM THE SUBDIVISION ORDINANCES SHALL BE REQUESTED AT FINAL PLAT SUBDIVISION. VARIANCES SHALL NOT BE GRANTED CONFLICTING WITH P.D. GOALS

VICINITY MAP



LAND USE

	UNITS PER ACRE MIN.	UNITS PER ACRE MAX.
SINGLE FAMILY ESTATES	1.0	1.99
SINGLE FAMILY	2.0	4.99
MULTI-FAMILY #1	5.0	10.0
MULTI-FAMILY #2	10.0	15.0
COMMERCIAL		
OFFICE/INDUSTRIAL		
UTILITIES (SITE)		
LAKES & OPEN SPACES		
SCHOOLS		
GOLF COURSE		
WETLANDS (NET)		

400 FEET/IN.

HUNTER'S CREEK
DEVELOPMENT PLAN

CANIN ASSOCIATES, INC.
URBAN & ENVIRONMENTAL PLANNERS

POTABLE WELL FIELD
IRRIGATION WELL

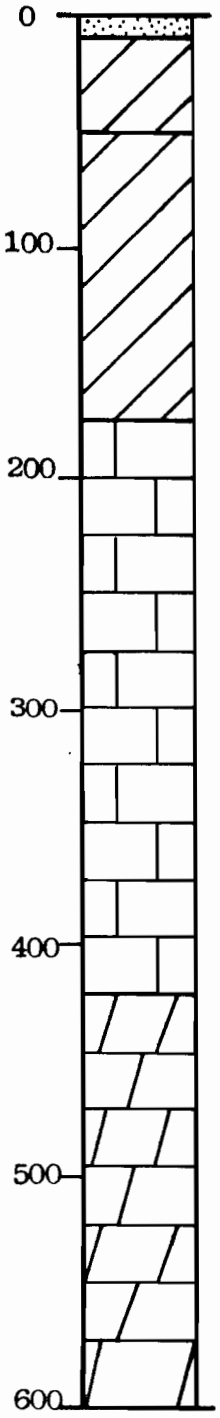
DEVELOPMENT PLAN

JAMMAL & ASSOCIATES, INC. Consulting Engineers

Project No. 84-03013

Figure No. 2

AF 38037B



UNDIFFERENTIATED CLASTICS (PLIOCENE TO RECENT)	SAND, SILT
HAWTHORN FORMATION (MIOCENE)	PREDOMINATELY FINE SAND, SILT AND CLAY
AVON PARK LIMESTONE (EOCENE)	PREDOMINATELY LIMESTONE AND DOLESTONE

KEY

- SAND
- SILT, CLAY
- LIMESTONE
- DOLESTONE

GENERAL STRATIGRAPHY: WELL NO. 2

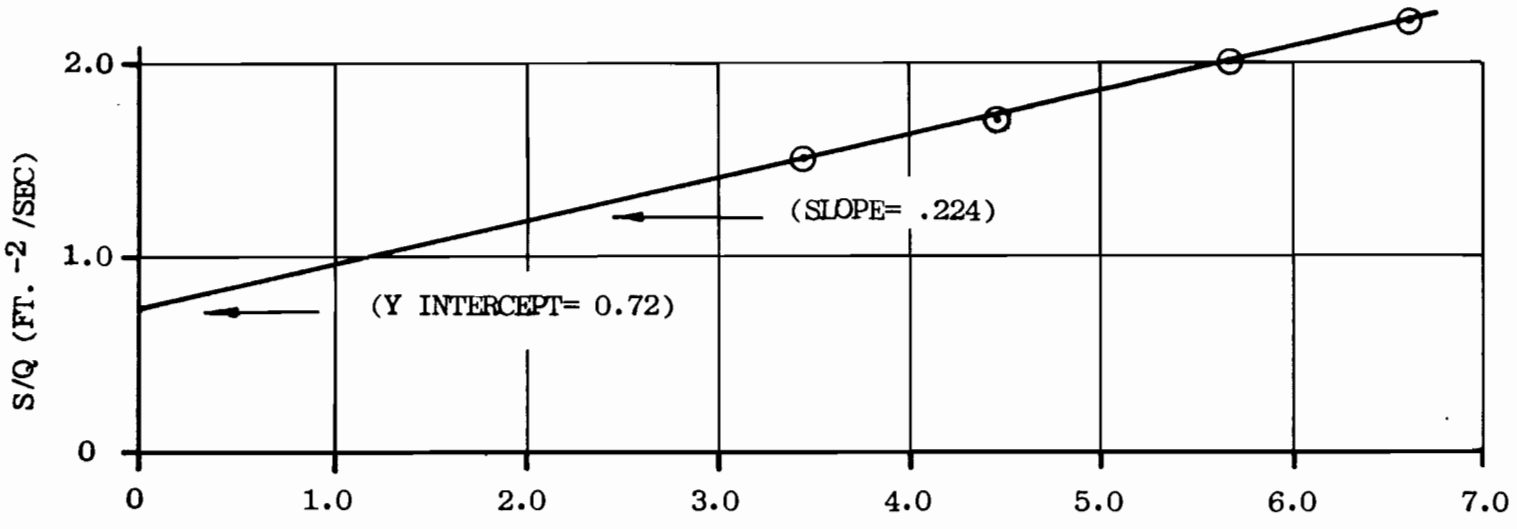
HUNTER'S CREEK

ORANGE COUNTY, FLORIDA

JAMMAL & ASSOCIATES, INC. Consulting Engineers

DRAWN: PJZ	SCALE: NTS	PROJ NO: 84-03013
CHKD: RO	DATE: 3-85	FIGURE 4

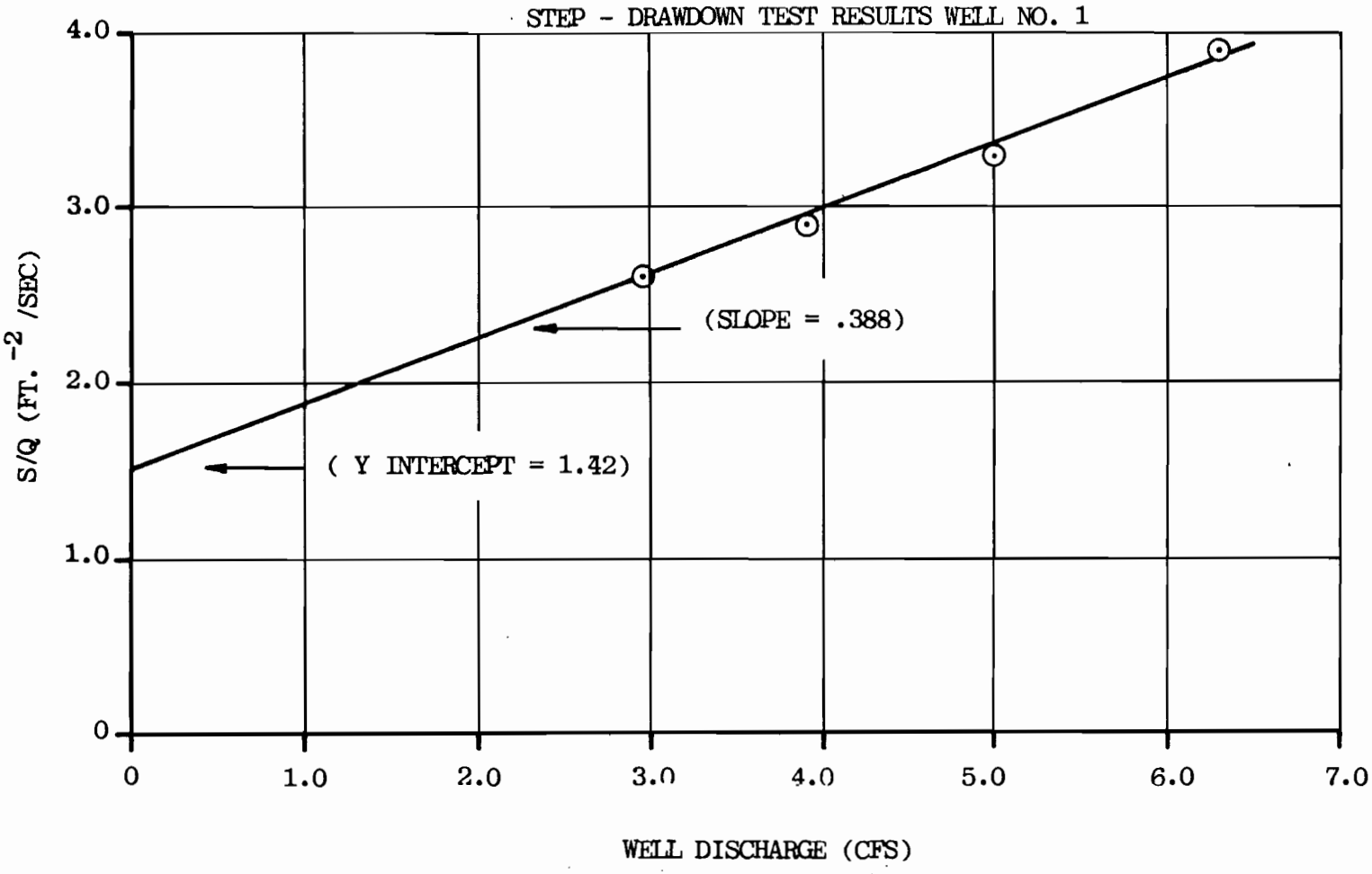
STEP - DRAWDOWN TEST RESULTS WELL NO. 2



DISCHARGE Q GPM	DISCHARGE Q CFS	DRAWDOWN S FT	S/Q FT^{-2} /SEC	FORMATION LOSS FT	WELL LOSS FT	WELL EFFICIENCY %
1547	3.45	5.1	1.5	2.5	2.6	49
2000	4.46	7.7	1.7	3.2	4.5	42
2550	5.68	11.1	2.0	4.1	7.0	37
2973	6.62	14.6	2.2	4.8	9.8	33

PROJECT NO. 84-03013 FIGURE 6

AF 38037C



DISCHARGE Q GPM	DISCHARGE Q CFS	DRAWDOWN S FT.	S/Q FT. $^{-2}$/SEC	FORMATION LOSS FT.	WELL LOSS FT.	WELL EFFICIENCY %
1320	2.94	7.5	2.6	4.2	3.3	56
1740	3.88	11.3	2.9	5.5	5.8	49
2255	5.02	16.6	3.3	7.1	9.5	43
2815	6.27	24.7	3.9	8.9	15.8	36

JAMMAL & ASSOCIATES, INC.

PROJECT NO. 84-03013

FIGURE 5

APPENDIX A

FDER WELL COMPLETION REPORTS

WELL NOS. 1 AND 2

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
WELL COMPLETION REPORT

OWNER: GENSTAR SOUTH DEV.
Last Name / First Name / Initial

7600 SOUTHLAND BOULEVARD
Number / Street

ORLANDO FLORIDA
City / State

305 859 8330 / 32809
Area Code / Phone Number / Zip Code

WELL LOCATION:
¼ ¼ ¼ of Section 22
24 S (N-S) 29 E (E-W)
Township / Range
Latitude 28 Deg. 27 Min. 30 Sec. N
Longitude 80 Deg. 25 Min. 0 Sec. W
Locate in Section

HUNTER'S CREEK DEVELOPMENT
Number / Street/Road

Lot No. / Subdivision

City / County

OWNER WELL NUMBER OR NAME: #1

DRILL METHOD: [X] Rotary [ ] Cable Tool [ ] Jet [ ] Auger
[ ] Other:

SURFACE CASING, CASING, AND LINER MATERIAL:

Steel Dia. (In.) Black	Galv.	S. Steel	Steel Wt. (lb./ft.)	Dia. (In.) PVC	Other¹	From (Ft.)	To (Ft.)	Schedule No.	Joints²
24			95			0	53		W
18			71			0	206		W

¹ Describe Material:
² TC = Threaded and Coupled, TCW = Threaded, Coupled, and Welded, W = Welded, B = Bonded (PVC), O = Other:

GROUT: [ ] None [X] Neat Cement [ ] Other:

Type and Percent of Additives and Grout Volume or Number of 94 lb. Sacks	From (Ft.)	To (Ft.)
90 SACKS OUTSIDE 24"	0	53
139 SACKS OUTSIDE 18"	0	206

FINISH: [X] Open Hole [ ] Perforated or Slotted Casing [ ] Gravel Pack
[ ] Sandpoint or Screen Attached to Well Casing [ ] Sandpoint or Screen Telescoped with Packer Inside Casing (Packer Material:)

Sandpoint/Screen Material	Dia. (In.)	Slot Size (In.)	From (Ft.)	To (Ft.)

[ ] Other Finish:

QUALITY TEST: [ ] None [ ] Bacteria X [ ] Chemical 1/10/85 Date
By: [ ] Health Dept. [ ] USGS [ ] Other PBS&J LABS
[X] Clear [ ] Colored [ ] Sulphur [ ] Salty [ ] Iron [ ] Other
Conductance (Micromhos) Chloride ppm
Hardness ppm as calcium carbonate pH Temp °F
Well Disinfected: [ ] No [X] Yes 1-21-85 (Date)

WELL TEST, by: [ ] Natural Flow 2815 G.P.M. [ ] Airlift
[ ] Bailer [ ] Permanent Pump [X] Test Pump [ ] None
Discharge Measured By: [ ] Bailer [ ] Estimated [X] Current Meter
[X] Orifice [ ] Trajectory [ ] Venturi [ ] Volumetric [ ] Other

Measured Static Water Level [ ] + [ ] - 35 Ft.
Measured Pumping Water Level [ ] + [ ] - 60 Ft.
After 6.5 Hours At 2815 G.P.M.
Specific Capacity G.P.M./Ft. of Drawdown
Measuring Pt. (Describe): GROUND LEVEL
Which is Ft. [ ] Above [ ] Below Land Surface
Elevation of Measuring Pt. = Ft. [ ] Above [ ] Below MSL

WELL EQUIPMENT: [ ] Open [X] Capped [ ] Valved
[ ] Permanent Pump [ ] Temporary Pump
Type Pump: [ ] Centrifugal [ ] Cylinder [ ] Jet [ ] Submersible
[ ] Turbine [ ] Other:
Power: [ ] Diesel [ ] Electric [ ] Gasoline [ ] Other:
Horsepower Capacity G.P.M.
Intake/Injection Depth Ft.

DER Form PERM 13-10 (Oct 77)

TYPE OF WORK:
[X] New Construction [ ] Repair
[ ] Deepening [ ] Plugging
[ ] Other:

WW48-089265

WELL NUMBER
#1

TYPE OF WELL: [X] Water Well [ ] Test Well [ ] Recharge [ ] Drainage
[ ] Waste Disposal [ ] Observation [ ] Other

USE: [ ] Domestic [ ] Irrigation [ ] Industrial [ ] Livestock [X] Public Supply
[ ] Other:

SKETCH LOCATION OF WELL in relation to local landmarks, giving distance and direction from nearest town, road, or other reference point.

North

GEOPHYSICAL LOGS: Type: — By:

WELL LOG

Bore Hole (In.)	Casing Size (In.)	Depth (Ft.) From	To	Examine cuttings at 20 ft. or smaller intervals and at changes. Give color, grain-size and type of material. Note any cavities. Indicate producing zones. Attach additional sheets if necessary.
30	24	0	5	SANDY TOP SOIL
"	"	5	12	BLACK + TAN SAND
"	"	12	53	VARIOUS COLORS of SANDY CLAY
23	18	53	68	GREEN CLAY
"	"	68	147	SHELL + GREEN CLAY
"	"	147	185	RIVER ROCK, CLAY + SHELL
"	"	185	203	WHITE LIMESTONE
"	"	203	206	HARD WHITE LIME
17	—	206	332	" " "
"		332	353	BR. + WHITE LIME
"		353	363	BR. LIME SOME POROUS
"		363	370	LT. GRAY LIMESTONE
"		370	412	SOFT WHITE LIME
"		412	415	BROWN LIMESTONE
"		415	417	GRAY LIMESTONE
"		417	422	BROWN LIMESTONE
"		422	423	DARK BROWN LIME
"		423	434	BROWN + GRAY LIME
"		434	436	BROWN + GRAY CLAY
"		436	439	BROWN + GRAY LIME
"		439	465	BROWN LIMESTONE
"		465	490	TAN LIMESTONE
"		490	493	BLACK LIME (DOLOMITE)
"		493	500	BROWN + GRAY LIME
"		500	600	TAN & WHITE LIME

Total Depth 600 Ft. Producing Zone Material: [ ] Sand [ ] Shell
[ ] Broken Shell [X] Limestone [X] Other: DOLOMITE
Top of Producing Zone 206 Ft., Bottom of Producing Zone 600 Ft.
[X] Drill Cuttings Sent to Bureau of Geology

2302 H.T. Chitton / Layne-Atlantic Co.
License No. / Contractor Signature / Position
12 17 84 Tom Terrell
Completion Date / Driller Signature

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
WELL COMPLETION REPORT

PERMIT NUMBER: WW48-089266

OWNER: ORANGE COUNTY ... DEV (Last Name / First Name / Initial)
7100 SOUTHLAND BOULEVARD (Number / Street)
ORLANDO FLORIDA (City / State)
305 859 8330 (Area Code / Phone Number) 32809 (Zip Code)

TYPE OF WORK: [X] New Construction [ ] Repair [ ] Deepening [ ] Plugging [ ] Other:

WELL NUMBER: #2

TYPE OF WELL: [X] Water Well [ ] Test Well [ ] Recharge [ ] Drainage [ ] Waste Disposal [ ] Observation [ ] Other

USE: [ ] Domestic [ ] Irrigation [ ] Industrial [ ] Livestock [X] Public Supply [ ] Other:

WELL LOCATION: ¼ ¼ ¼ of Section 28
Township 24 S (N-S) Range 29 E (E-W)
Latitude 28 Deg. 24 Min. 30 Sec. N
Longitude 80 Deg. 25 Min. 0 Sec. W
Locate in Section

SKETCH LOCATION OF WELL in relation to local landmarks, giving distance and direction from nearest town, road, or other reference point. North ↑

HUNTER'S CREEK DEVELOPMENT (Number / Street/Road)
Lot No. / Subdivision
City / County

OWNER WELL NUMBER OR NAME: #2

DRILL METHOD: [X] Rotary [ ] Cable Tool [ ] Jet [ ] Auger [ ] Other:

SURFACE CASING, CASING, AND LINER MATERIAL:

Steel Dia. (In.) Black	Galv.	S. Steel	Steel Wt. (lb /ft.)	Dia. (In.) PVC	Other†	From (Ft.)	To (Ft.)	Schedule No.	Joints*
24			95			0	38		W
18			71			0	201		W

† Describe Material:
* TC = Threaded and Coupled, TCW = Threaded, Coupled, and Welded, W = Welded, B = Bonded (PVC), O = Other:

GROUT: [ ] None [X] Neat Cement [ ] Other:

Type and Percent of Additives and Grout Volume or Number of 94 lb. Sacks	From (Ft.)	To (Ft.)
104 SACKS OUTSIDE 24"	0	38
183 SACKS OUTSIDE 18"	0	201

FINISH: [X] Open Hole [ ] Perforated or Slotted Casing [ ] Gravel Pack [ ] Sandpoint or Screen Attached to Well Casing [ ] Sandpoint or Screen Telescoped with Packer Inside Casing (Packer Material:)

Sandpoint/Screen Material	Dia. (In.)	Slot Size (In.)	From (Ft.)	To (Ft.)

[ ] Other Finish:

QUALITY TEST: [ ] None [ ] Bacteria X [X] Chemical 1/23/85 (Date)
By: [ ] Health Dept. [ ] USGS [ ] Other PBS+J LABS
[X] Clear [ ] Colored [ ] Sulphur [ ] Salty [ ] Iron [ ] Other
Conductance (Micromhos) Chloride ppm
Hardness ppm as calcium carbonate pH Temp °F
Well Disinfected: [ ] No [X] Yes 1-28-85 (Date)

WELL TEST, by: [ ] Natural Flow 3015 G.P.M. [ ] Airlift [ ] Bailer [ ] Permanent Pump [X] Test Pump [ ] None
Discharge Measured By: [ ] Bailer [ ] Estimated [ ] Current Meter [ ] Orifice [ ] Trajectory [ ] Venturi [ ] Volumetric [ ] Other
Measured Static Water Level + - 36 Ft.
Measured Pumping Water Level + - 57 Ft.
After 1.5 Hours At 3015 G.P.M.
Specific Capacity G.P.M./Ft. of Drawdown
Measuring Pt. (Describe): GROUND LEVEL
Which is Ft. [ ] Above [ ] Below Land Surface
Elevation of Measuring Pt. = Ft. [ ] Above [ ] Below MSL

WELL EQUIPMENT: [ ] Open [X] Capped [ ] Valved
[ ] Permanent Pump [ ] Temporary Pump
Type Pump: [ ] Centrifugal [ ] Cylinder [ ] Jet [ ] Submersible [ ] Turbine [ ] Other:
Power: [ ] Diesel [ ] Electric [ ] Gasoline [ ] Other:
Horsepower Capacity G.P.M.
Intake/Injection Depth Ft.

GEOPHYSICAL LOGS: Type: — By: —

WELL LOG

Bore Hole (In.)	Casing Size (In.)	Depth (Ft.) From	To	Examine cuttings at 20 ft. or smaller intervals and at changes. Give color, grain-size and type of material. Note any cavities. Indicate producing zones. Attach additional sheets if necessary.
30	24	0	5	TOP SOIL
"	"	5	12	BLACK SAND
"	"	12	16	BROWN SANDY CLAY
"	"	16	19	White SANDY CLAY
"	"	19	35	GRAY CLAY
"	"	35	38	Light Green Gray clay
23	18	38	79	" " " "
"	"	79	98	Shell + Green Clay
"	"	98	140	Green clay + shell
"	"	140	157	RIVER ROCK + SHELL
"	"	157	185	Green clay, Shell + R. ROCK
"	"	185	189	White Lime, White clay
"	"	189	201	SOFT White + TAN LIME
17	—	201	298	" " "
"	—	298	300	BROWN LIMESTONE
		300	335	SOFT TO MED. TAN LIME
		335	340	HARD BROWN LIMEROCK
		340	414	MEDIUM TAN TO BROWN LIME
		414	425	BROWN + GREEN LIME
		425	426	BROWN CLAY
		426	435	BR. TO DK. BR. LIME
		435	440	GRAY CLAY + WH. LIME
		440	448	TAN TO DK. BR. LIME
		448	458	BROWN LIMESTONE
		458	600	TAN TO BROWN LIME

Total Depth 600 Ft. Producing Zone Material: [ ] Sand [ ] Shell [ ] Broken Shell [X] Limestone [X] Other: DOLOMITE
Top of Producing Zone 201 Ft., Bottom of Producing Zone 600 Ft.
[X] Drill Cuttings Sent to Bureau of Geology
2304 (License No.) [signature] (Contractor Signature) LAYNE-ATLANTIC Co. (Position)
1 / 23 / 85 (Completion Date) Tom Verrill (Driller Signature)

DER Form PERM 13-10 (Oct 77)

APPENDIX B

GEOPHYSICAL LOGS

SOUTHERN RESOURCE EXPLORATION
P.O. Box 14311
Gainesville, FL 32604
904-372-5950

CALIPER LOG

OWNER HUNTER'S CREEK	LOCATION	DATE 8 Feb. 1985
CLIENT Jammal & Assoc. HOLE NO 1	SECTION TWP RNG	OPERATOR(S) J. Price
CLIENT REPRESENTATIVE B. Oros	COUNTY Orange STATE Fla.	BOREHOLD FLUID Water
DRILLED DEPTH 601 FT. ELEVATION FT	CASING DIAMETER 18 IN DEPTH 205 FT	MEASURING POINT Land Surface
HOLE DIAMETER 16 IN.	WALL THICKNESS IN	DEPTH LOGGED 601 ft.

NUCLEAR RADIATION

RUN NUMBER	1	2	3
DEPTH (INTERVAL) FT.			
RANGE C.P.S.			
TIME CONSTANT SEC.			
LOGGING SPEED Ft/Min			
VERTICAL SCALE Ft/In			
WATER LEVEL FT			
DIGITAL RECORD			

ELECTRIC LOG

DEPTH	Ft
RESISTIVITY	Ohms
S.P.	M V
VERTICAL SCALE	Ft In

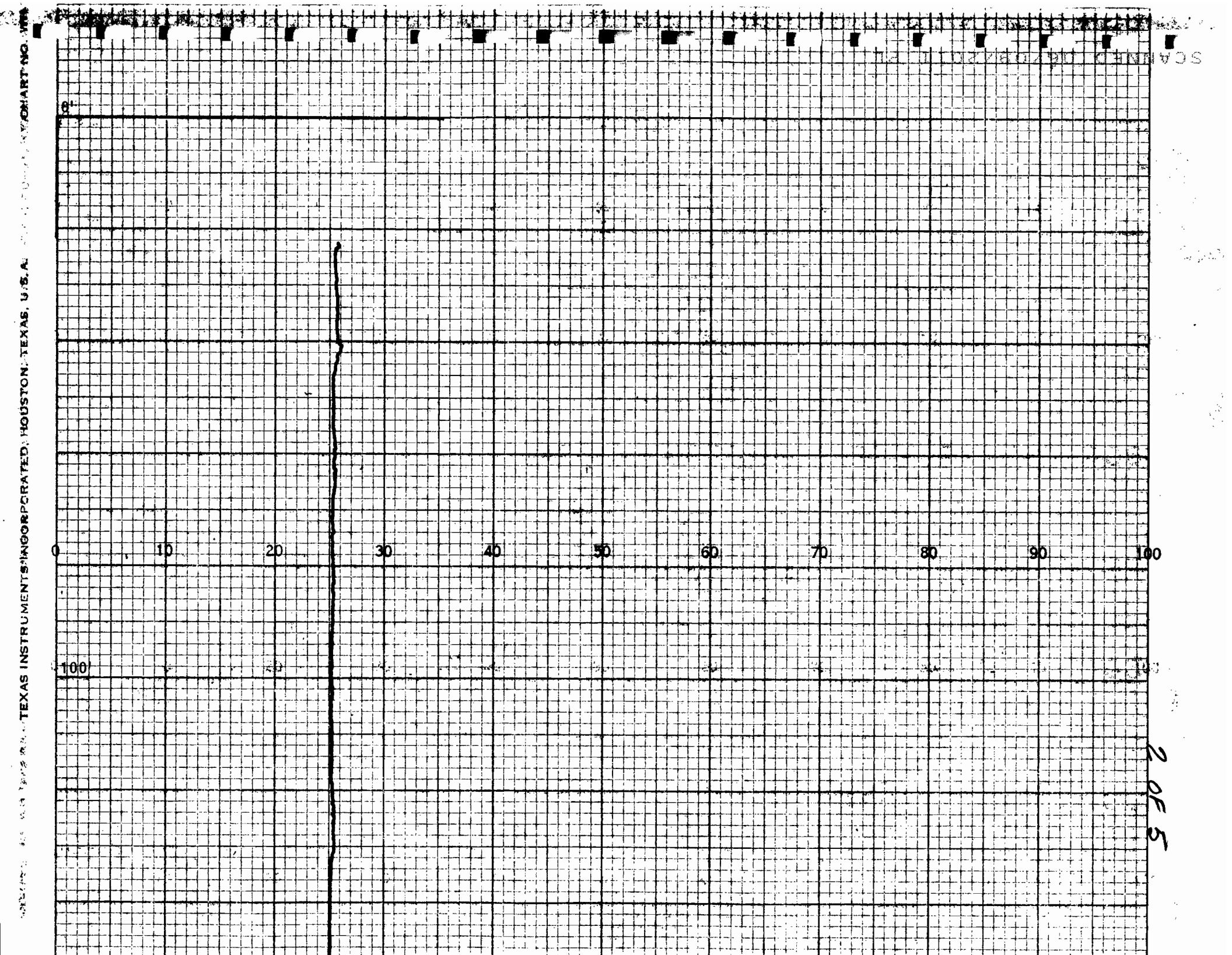
CALIPER

VERTICAL SCALE	20/1 Ft In
HORIZONTAL SCALE	4/1 In In

remarks

OTHER LOGS

1 of 5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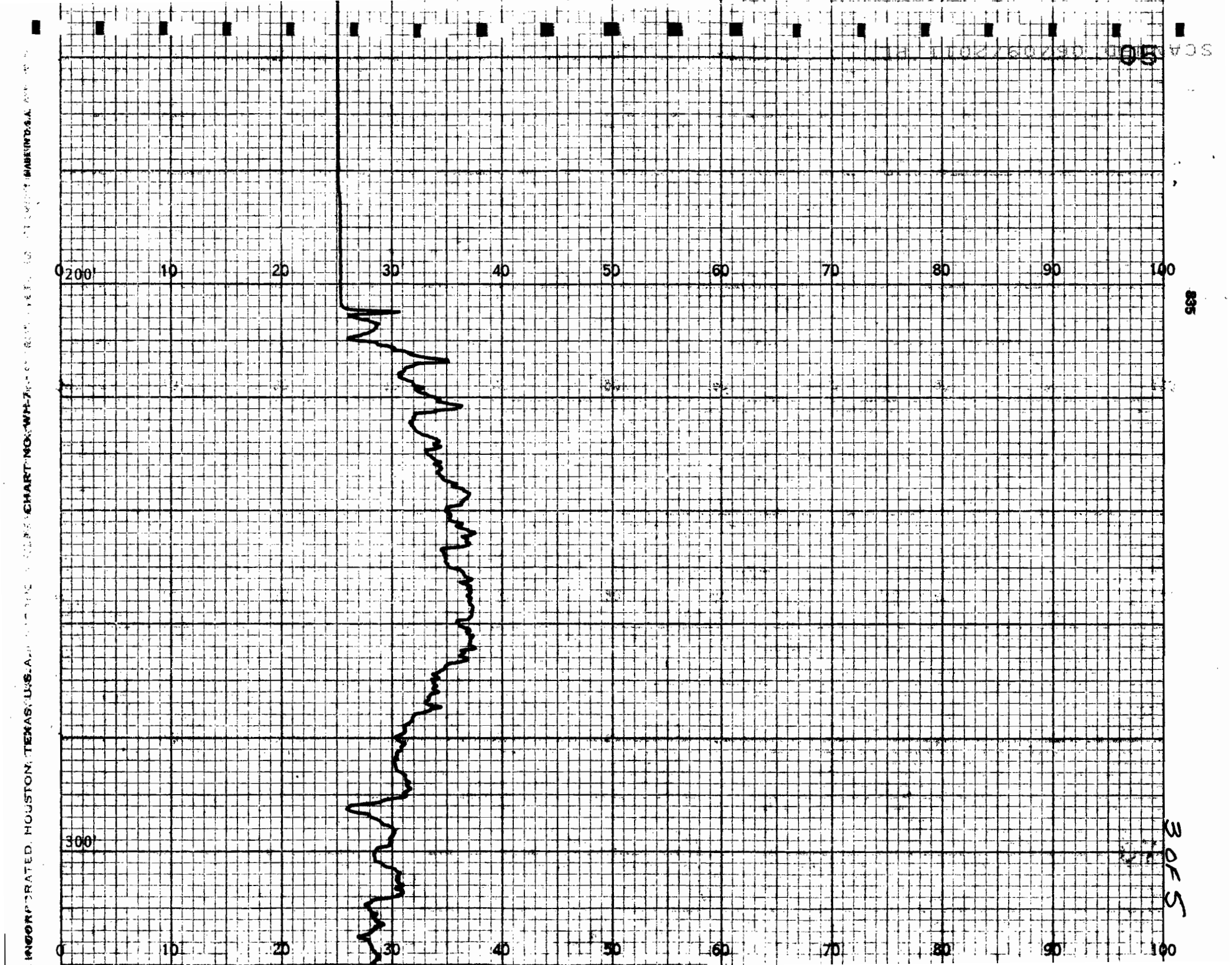
2 OF 5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200'
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300'
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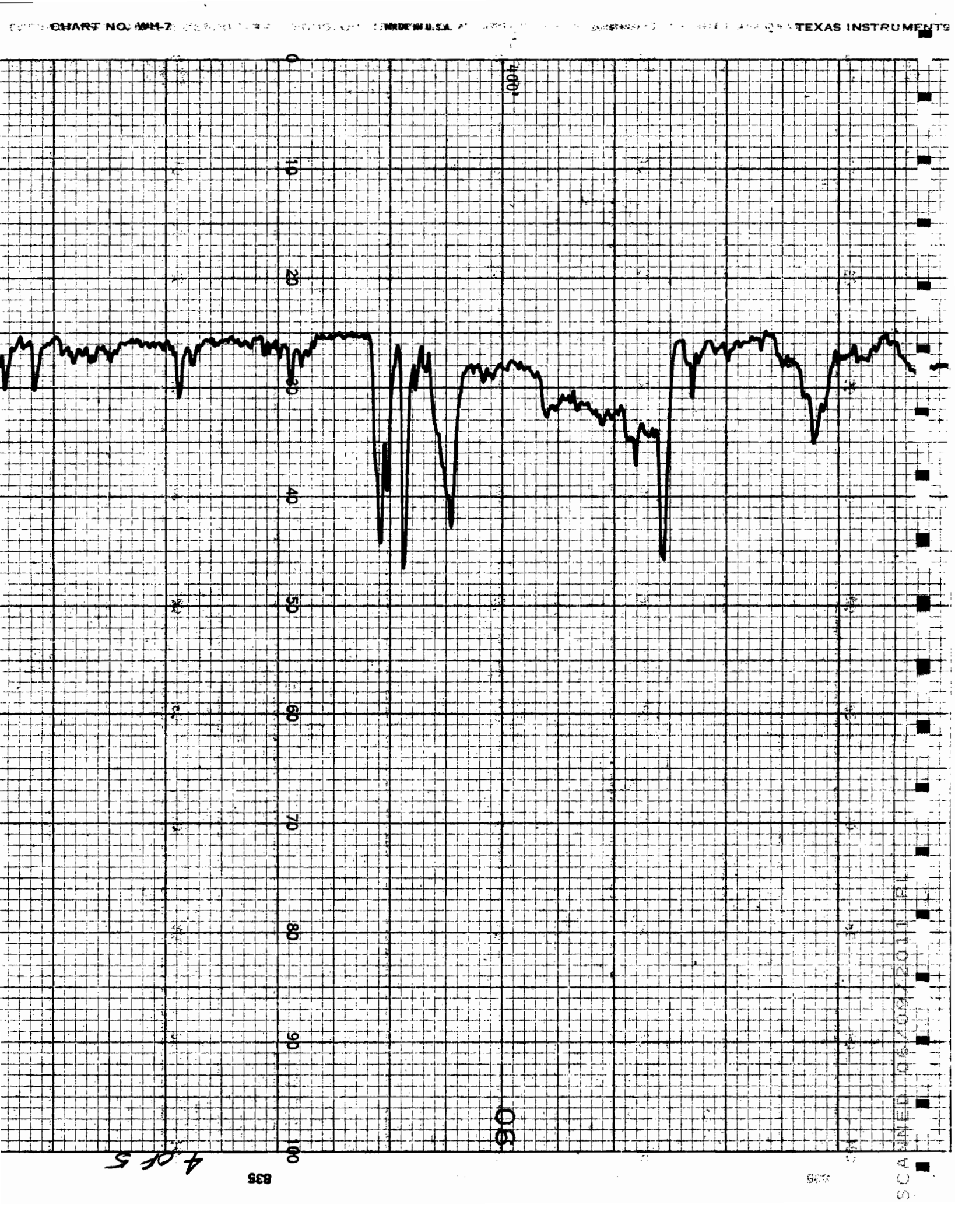
80
90
100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MADE IN U.S.A.
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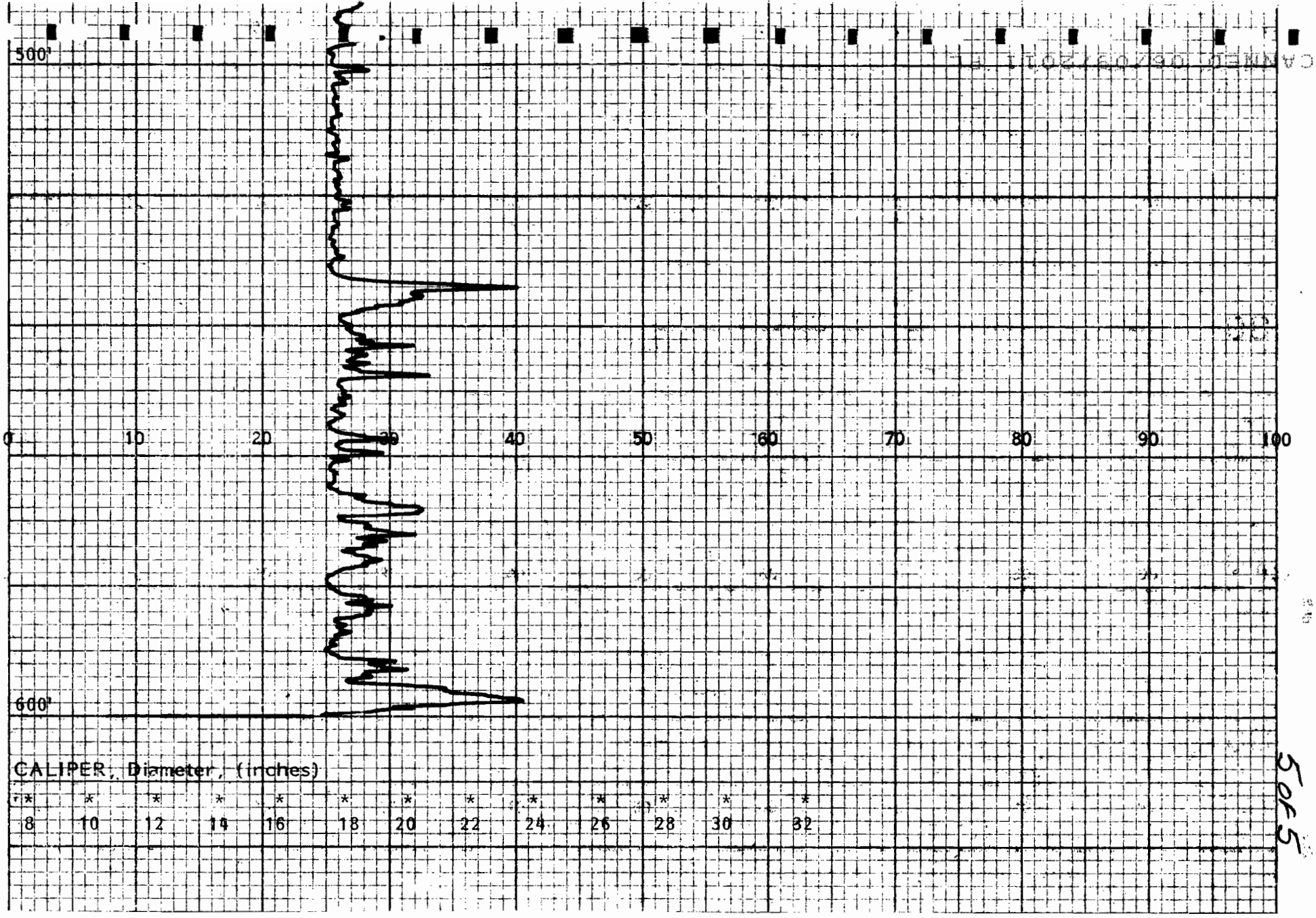
835



5 of 5

SOUTHERN RESOURCE EXPLORATION
P.O. Box 14311
Gainesville, FL 32604
904-372-5950

NATURAL GAMMA, S.P., & RESISTANCE

OWNER HUNTER'S CREEK	LOCATION	DATE 8 Feb. 1985
CLIENT Jammal & Assoc. HOLE NO. 1	SECTION TWP RNG.	OPERATOR(S) J. Price
CLIENT REPRESENTATIVE B. Oros	COUNTY Orange STATE Fla.	BOREHOLD FLUID Water
DRILLED DEPTH 601 FT. ELEVATION FT.	CASING DIAMETER 18 IN DEPTH 205 FT	MEASURING POINT Land Surface
HOLE DIAMETER 16 IN.	WALL THICKNESS IN	DEPTH LOGGED 601 ft.

NUCLEAR RADIATION

RUN NUMBER	1 GAMMA	2	3
DEPTH (INTERVAL) FT.	601		
RANGE C.P.S.	50/5"		
TIME CONSTANT SEC.	4		
LOGGING SPEED Ft/Min	30		
VERTICAL SCALE Ft/In	20/1		
WATER LEVEL Ft			
DIGITAL RECORD			

ELECTRIC LOG

DEPTH	601 Ft	
RESISTIVITY	50 ohms/5"	Ohms
S. P	200 mv./5"	MV
VERTICAL SCALE	20/1	Ft/In

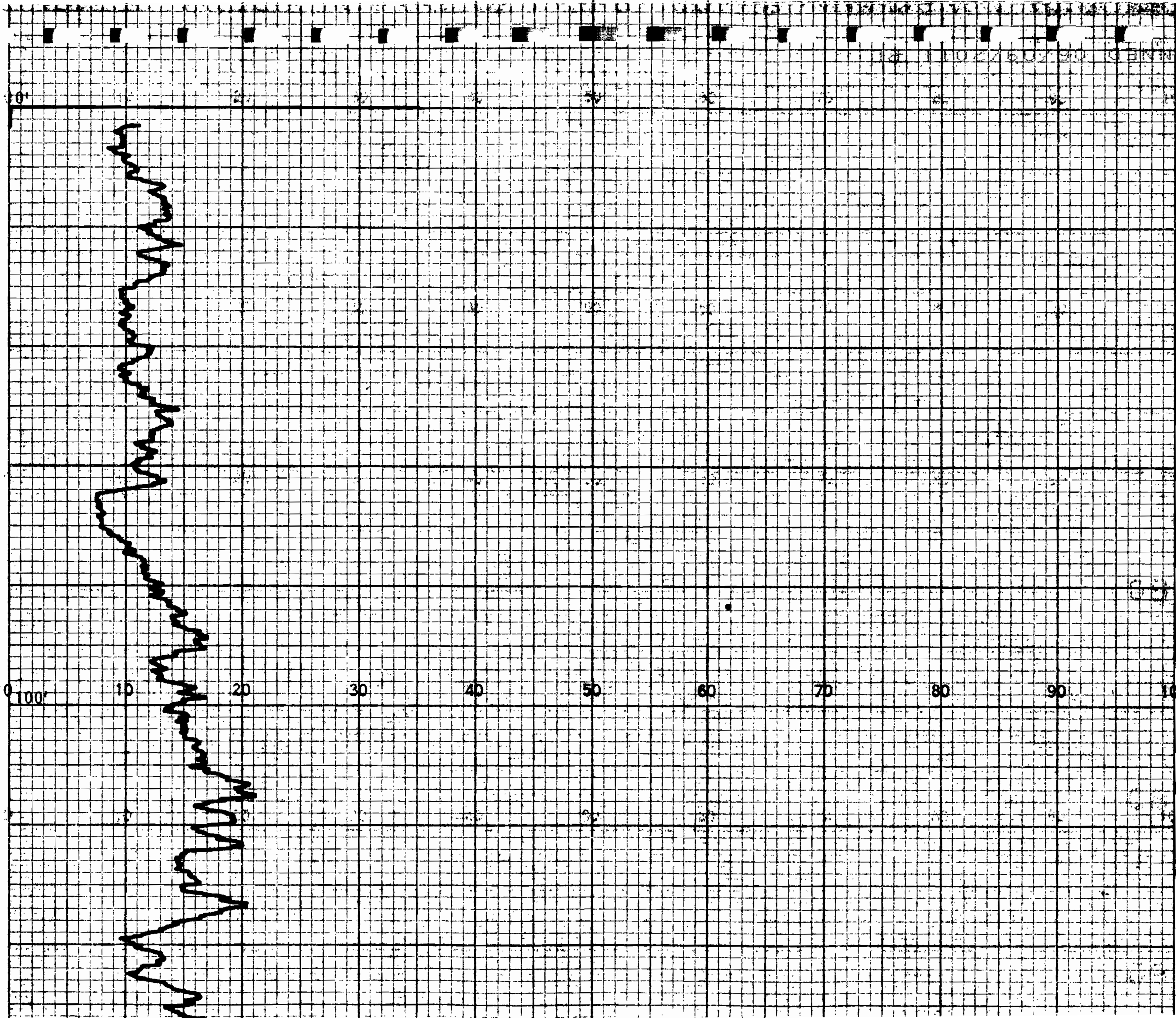
CALIPER

VERTICAL SCALE		Ft/In
HORIZONTAL SCALE		In/In

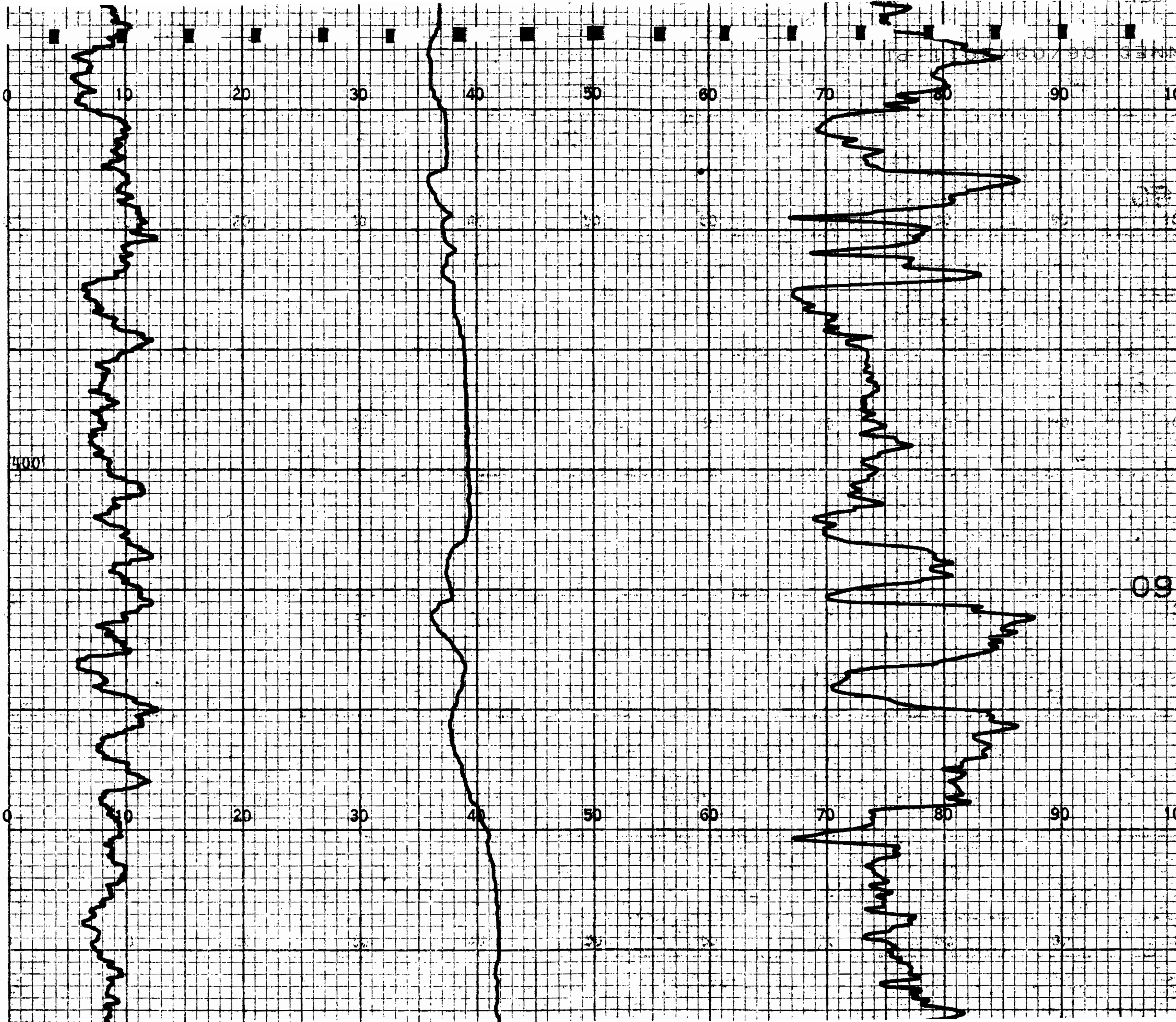
Remarks:

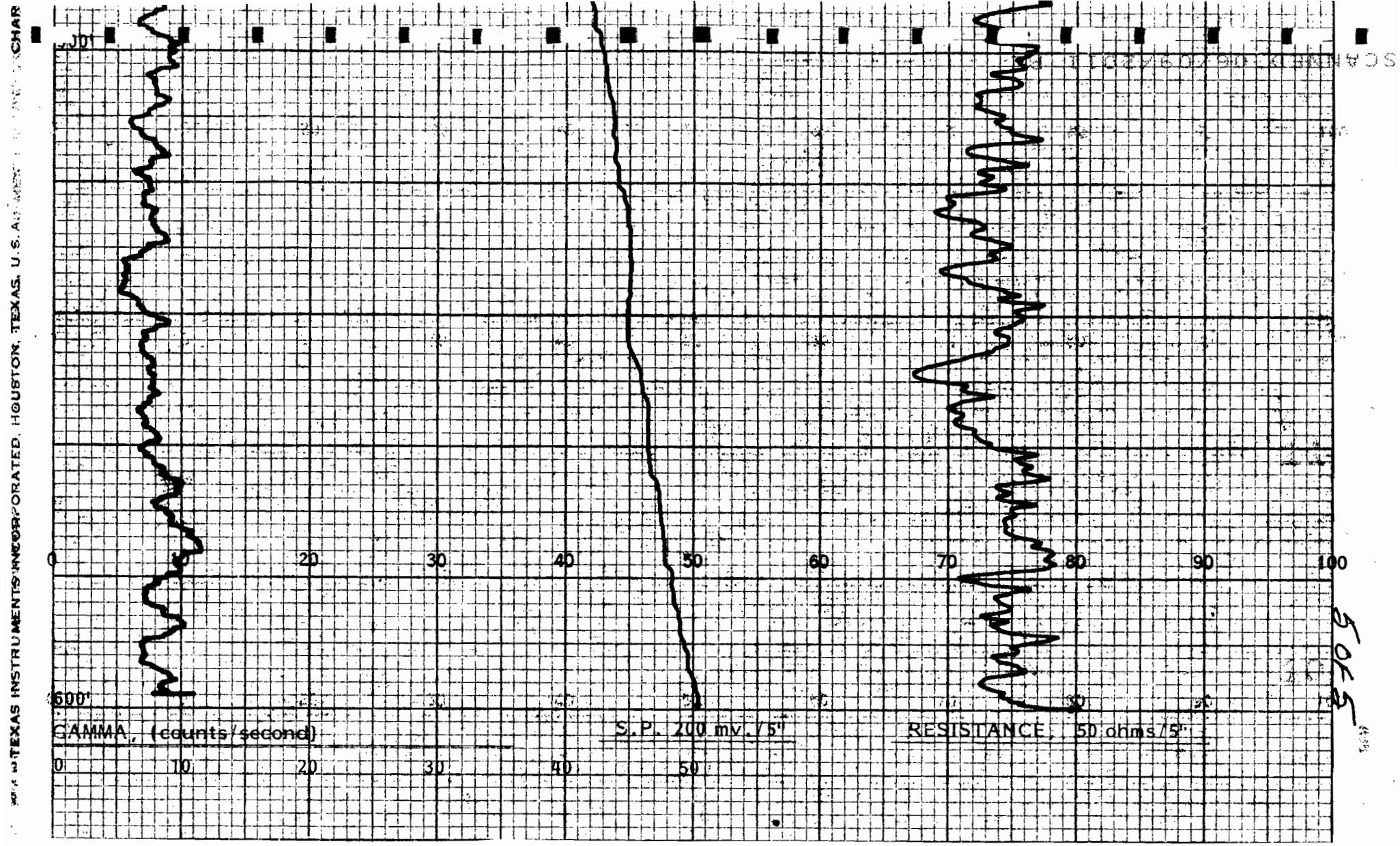
OTHER LOGS

1 of 5



200'
Casing
0
10
20
30
40
50
60
70
80
90
100
300'


0 10 20 30 40 50 60 70 80 90 100
400
60
4 of 5
835


TEXAS INSTRUMENTS INCORPORATED, HOUSTON, TEXAS, U.S.A.
J01
0
20
30
40
50
60
70
80
90
100
500'
GAMMA, (counts/second)
0
10
20
30
40
50
S.P. 200 mv./5"
RESISTANCE, 50 ohms/5"
5 of 5

APPENDIX C

GEOLOGIC LOGS

APPENDIX C

GEOLOGIC LOG
HUNTER'S CREEK
WELL #2

Material Type	Depth	Geologic Description
SP	0- 10'	Sand, brown, predominantly fine grained silica with some silt.
SP-SM	10'- 20'	Silty sand, brown, fine grained sand with silt.
CL-SM	20'- 30'	Silty clay, brown, with trace of fine grained sand.
SM	30'- 40'	Silt, brown, with trace of fine grained sand and phosphate grains.
SM	40'- 50'	Silt, dark grayish-green with traces of fine grained sand and phosphate grains.
SM	50'- 60'	Silt, dark grayish-green with traces of fine grained sand and phosphate grains.
SM	60'- 70'	Silt, dark grayish-green with traces of fine grained sand and phosphate grains.
SM	70'- 80'	Silt, dark grayish-green with traces of fine graine sand and phosphate grains.
SM	80'- 90'	Silt, grayish-green calcareous silt with some very fine grained silica sand, trace clay, phosphate grains and small shell fragments.
SM	90'-100'	Silt, grayish-green calcareous silt with some very fine grained silica sand, trace clay, phosphate grains and small shell fragments.

SM	100'-110'	Silt, grayish-green calcareous silt with some very fine grained silica sand, trace clay, phosphate grains and small shell fragments.
SM	110'-120'	Silt, grayish-green calcareous silt with some very fine grained silica sand, trace clay, phosphate grains and small shell fragments.
SM	120'-130'	Silt, grayish-green calcareous silt with some very fine grained silica sand, trace clay, phosphate grains and small shell fragments.
SM	130'-140'	Silt, grayish-green calcareous silt with some very fine grained silica sand, trace clay, phosphate grains and small shell fragments.
SP-SM	140'-150'	Sand, grayish-green fine to medium grained silica sand with trace silt, clay, phosphate grains and shell fragments.
SP-SM	150'-160'	Sand, grayish-green fine to medium grained silica sand with trace silt, clay, phosphate grains and shell fragments.
SP-SM	160'-170'	Sand, grayish-green fine to medium grained silica sand with trace silt, clay, phosphate grains and shell fragments.
SP-SM	170'-180'	Sand, grayish-green fine to medium grained silica sand with trace silt, clay, phosphate grains and shell fragments.
SP-SM	180'-190'	Sand, grayish-green fine to medium grained silica sand with trace silt, clay, phosphate grains and shell fragments.
L.S.	190'-200'	Limestone, (calcarenite) grayish-brown to tan, soft, low visible porosity.
L.S.	200'-210'	Limestone, (calcarenite) grayish-brown to tan, soft, somewhat porous chalky limestone with some fossils (echinoids).

L.S.	210'-220'	Limestone, (calcarenite and calcilutite) light gray to light brown dense microcrystalline and soft fossiliferous (echinoids) limestone with phosphate, clay cobbles and traces of silica sand.
L.S.	220'-230'	Limestone, (calcarenite and calcilutite) light gray to light brown dense microcrystalline and soft fossiliferous (echinoids) limestone with phosphate, clay cobbles and traces of silica sand.
L.S.	230'-240'	Limestone, (calcarenite and calcilutite) light gray to light brown dense microcrystalline and soft fossiliferous (echinoids) limestone with phosphate, clay cobbles and traces of silica sand.
L.S.	240'-250'	Limestone, (calcarenite and calcilutite) light gray to light brown dense microcrystalline and soft fossiliferous (echinoids) limestone with phosphate, clay cobbles and traces of silica sand.
L.S.	250'-260'	Limestone, (calcarenite and calcilutite) light gray, dense microcrystalline and soft fossiliferous (echinoids and foramanifera) limestone.
L.S.	260'-270'	Limestone (calcarenite) light gray soft limestone with fossils (echinoids) with some dolostone.
L.S.	270'-280'	Limestone (calcarenite) light gray to tan, soft somewhat porous limestone.
L.S.	280'-290'	Limestone (calcarenite) light gray to tan, soft somewhat porous limestone.
L.S.	290'-300'	Limestone (calcilutite) light grayish-brown well indurated dense crystalline limestone with low visible porosity.
L.S.	300'-310'	Limestone (calcarenite) light brown to tan soft chalky, fossiliferous limestone with moderately visible porosity.

L.S.	310'-320'	Limestone (calcarenite) light brown to tan soft chalky, fossiliferous limestone with moderately visible porosity.
L.S.	320'-330'	Limestone (calcarenite) light brown to tan soft chalky, fossiliferous limestone with moderately visible porosity.
L.S.	330'-340'	Limestone (calcilutite) light grayish-brown well indurated dense crystalline limestone with low visible porosity.
L.S.	340'-350'	Limestone (calcarenite) light brown to tan soft chalky, fossiliferous limestone with moderately visible porosity.
L.S.	350'-360'	Limestone (calcarenite) light brown to tan soft chalky, fossiliferous limestone with moderately visible porosity.
L.S.	360'-370'	Limestone (calcilutite) light grayish-brown moderately indurated crystalline limestone with low visible porosity.
L.S.	370'-380'	Limestone (calcilutite) light grayish-brown moderately indurated crystalline limestone with low visible porosity.
L.S.	390'-400'	Limestone (calcarenite) light brown to gray moderately hard limestone with moderately visible porosity.
L.S.	400'-410'	Limestone (calcarenite) light brown to gray moderately hard limestone with moderately visible porosity.
D.S.	410'-420'	Dolostone, (calcilutite) light brown hard, microcrystalline texture, low visible porosity.
D.S.	420'-430'	Dolostone, (calcilutite) light brown hard, microcrystalline texture, low visible porosity.
D.S.	430'-440'	Dolostone, (calcilutite) light brown hard, microcrystalline texture, low visible porosity.

D.S.	440'-450'	Dolostone, (calcilutite) light brown hard, microcrystalline texture, low visible porosity.
D.S.	450'-460'	Dolostone, (calcilutite) light brown hard, microcrystalline texture, low visible porosity.
D.S.	460'-470'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	470'-480'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	480'-490'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	490'-500'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	500'-510'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	510'-520'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	520'-530'	Dolostone (calcilutite) white to gray, well indurated, hard, microcrystalline texture, moderately visible porosity.
D.S.	530'-540'	Dolostone (calcilutite) white to gray, well indurated, hard, microcrystalline texture, moderately visible porosity.
D.S.	540'-550'	Dolostone (calcilutite) white to gray, well indurated, hard, microcrystalline texture, moderately visible porosity.

D.S.	550'-560'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	560'-570'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	570'-580'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	580'-590'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.
D.S.	590'-600'	Dolostone (calcarenite and calcilutite) light gray, moderately hard, microcrystalline texture, moderately visible porosity.

APPENDIX D

STEP-DRAWDOWN TEST RESULTS

AQUIFER TEST DATA

WELL OR HOLE 1
PAGE 1 OF 2

PROJECT HUNTERS CREEK 84-03013
LOCATION ORANGE COUNTY, FLA
PERSONNEL RECORDED BY B. POTTER

PUMP ON DATE 12-17 TIME 1207
PUMP OFF DATE 12-17 TIME 1607
DURATION OF AQUIFER TEST 4 HR
12-17-84

HOW W.L.'s MEASURED M-SLOPE
DISTANCE FROM PUMPING WELL N.A.
MEASURING POINT TOP OF CASING
ELEVATION MEASURING POINT

HOW Q MEASURED FLOW METER
DEPTH OF PUMP/AIRPIPE ~ 100 FT.
TYPE OF TEST STEP-DRAWDOWN
PREVIOUS PUMPING 12-14-84

TIME 1 @ 30 MIN AT 1' @ 0 | WATER LEVEL DATA SWL 35.2' | DISCHARGE DATA

DATE	CLOCK TIME	PUMPING ELAPSED TIME t	RECOVERY ELAPSED TIME t'			READING FT. BELOW T.O.C.	CORRECTION OR CONVERSION	WATER LEVEL	W.L. CHANGE s or s' FT.		READING	RATE (GPM X LPS) GPM		COMMENTS
12-17	1207	0				35.2			0			0		
	1212	5				42.5			7.3			1320		
	1217	10				42.5			7.3			"		@ Q = 1320
	1222	15				42.6			7.4			"		GPM
	1227	20				42.7			7.5			"		s = 7.5 FT.
	1232	25				42.7			7.5			"		
	1237	30	0			42.7			7.5			0		-
	1242		5			35.4			0.2			"		
	1247		10			35.4			0.2			"		
	1252		15			35.3			0.2			"		
	1257		20			35.3			0.2			"		
	1302		25			35.2			0			"		
	1307	0	30			35.2			0			"		
	1312	5				46.1			10.9			1740		
	1317	10				46.2			11.0			"		@ Q = 1740
	1322	15				46.3			11.1			"		GPM
	1327	20				46.4			11.2			"		s = 11.3 FT.
	1332	25				46.5			11.3			"		
	1337	30	0			46.5			11.3			0		
	1342		5			35.5			0.3			"		
	1347		10			35.4			0.2			"		
	1352		15			35.3			0.1			"		
	1357		20			35.2			0			"		
	1402		25			35.2			0			"		
	1407	0	30			35.2			0			"		
	1412	5				51.1			15.9			2255		
	1417	10				51.4			16.2			"		@ Q = 2255
	1422	15				51.6			16.4			"		GPM
	1427	20				51.7			16.5			"		s = 16.6 FT.
	1432	25				51.7			16.5			"		
	1437	30	0			51.8			16.6			0		
	1442		5			35.7			0.5			"		
	1447		10			35.5			0.3			"		
	1452		15			35.4			0.2			"		
	1457		20			35.4			0.2			"		
	1502		25			35.3			0.1			"		
	1507		30			35.2			0			"		

AQUIFER TEST DATA

WELL OR HOLE 1
PAGE 2 OF 2

PROJECT HUNTERS CREEK 84-03013
LOCATION ORANGE COUNTY, FLA
PERSONNEL RECORDED BY B. POTTER

PUMP ON DATE 12-17 TIME 1207
PUMP OFF DATE 12-17 TIME 1607
DURATION OF AQUIFER TEST 4 HR.
12-17-84

HOW W.L.'s MEASURED M-SCOPE
DISTANCE FROM PUMPING WELL N.A.
MEASURING POINT TOP OF CASING
ELEVATION MEASURING POINT

HOW Q MEASURED FLOW METER
DEPTH OF PUMP/AIRPIPE ~100 FT.
TYPE OF TEST STEP-DRAWDOWN
PREVIOUS PUMPING 12-14-84

TIME 1"=30MIN AT 1'=0 | WATER LEVEL DATA SWL 35.2 | DISCHARGE DATA | COMMENTS

DATE	CLOCK TIME	PUMPING ELAPSED TIME t'	RECOVERY ELAPSED TIME t'			READING FT. BELOW T.O.C.	CORRECTION OR CONVERSION	WATER LEVEL	W.L. CHANGE s or s' FT.		READING	RATE (GPM X LPS) GPM		COMMENTS
12-17	1507	0				35.2			0			2815		
	1512	5				58.8			23.6			"		@ Q=2815
	1517	10				59.2			24.0			"		GPM
	1522	15				59.4			24.2			"		S=24.7 FT.
	1527	20				59.6			24.4			"		
	1532	25				59.8			24.6			"		
	1537	30	0			59.9			24.7			0		—
	1542		5			35.9			0.7			"		
	1547		10			35.7			0.5			"		
	1552		15			35.6			0.4			"		
	1557		20			35.5			0.3			"		
	1602		25			35.5			0.3			"		
	1607		30			35.4			0.2			"		EST. TRANSMISS ≈ 366,000 GPD/FT

AQUIFER TEST DATA

WELL OR HOLE 2
PAGE 1 OF 2

PROJECT HUNTERS CREEK 84-0303
LOCATION ORANGE COUNTY, FLA
PERSONNEL RECORDED BY B. POTTER

PUMP ON DATE 1-28 TIME 1030
PUMP OFF DATE 1-28 TIME 1430
DURATION OF AQUIFER TEST 4 HR
1-28-85

HOW W.L.'s MEASURED M-SCOPE
DISTANCE FROM PUMPING WELL N.A.
MEASURING POINT TOP OF CASING
ELEVATION MEASURING POINT

HOW Q MEASURED FLOW METER
DEPTH OF PUMP/AIRPIPE ~100 FT
TYPE OF TEST STEP-DRAWDOWN
PREVIOUS PUMPING 1-25-85

TIME 1 • 30 MIN. AT 1' • 0 | WATER LEVEL DATA SWL 36.1' | DISCHARGE DATA | COMMENTS

DATE	CLOCK TIME	PUMPING ELAPSED TIME t	RECOVERY ELAPSED TIME t'			READING FT. BELOW T.O.C.	CORRECTION OR CONVERSION	WATER LEVEL	W.L. CHANGE s or s' FT.		READING TIME IN SEC. 500 GAL	RATE (GPM X LPS) GPM	Q 30 MIN. AVG.	
1-28	1030	0				36.1			0		0	0		
	1035	5				—			—		18.86	1591		
	1040	10				41.0			4.9				1547	@ Q = 1547
	1045	15				41.0			4.9		19.15	1566		GPM
	1050	20				41.1			5.0		19.29	1555		s = 5.1 FT.
	1055	25				41.2			5.1		19.23	1560		
	1100	30	0			41.2			5.1			0		—
	1105		5			36.5			0.4			0		
	1110		10			36.4			0.3			0		
	1115		15			36.4			0.3			0		
	1120		20			36.3			0.2			0		
	1125		25			36.3			0.2			0		
	1130	0	30			36.3			0.2			0		
	1135	5				43.6			7.5		14.93	2010		
	1140	10				43.7			7.6		14.83	2023		
	1145	15				43.8			7.7		14.95	2007	2000	@ Q = 2000
	1150	20				43.8			7.7		14.94	2008		GPM
	1155	25				43.8			7.7		14.96	2005		s = 7.7 FT.
	1200	30	0			43.8			7.7		14.92	2011		
	1205		5			36.6			0.5			0		
	1210		10			36.5			0.4			0		
	1215		15			36.5			0.4			0		
	1220		20			36.4			0.3			0		
	1225		25			36.4			0.3			0		
	1230	0	30			36.4			0.3			0		
	1235	5				47.0			10.9		11.69	2566		
	1240	10				47.0			10.9		11.65	2575		
	1245	15				47.2			11.1		11.66	2573	2550	@ Q = 2550
	1250	20				47.2			11.1		11.61	2584		GPM
	1255	25				47.2			11.1		11.74	2555		s = 11.1 FT.
	1300	30	0			47.2			11.1		11.73	2558		
	1305		5			36.8			0.7			0		
	1310		10			36.7			0.6			0		
	1315		15			36.6			0.5			0		
	1320		20			36.6			0.5			0		
	1325		25			36.5			0.4			0		
	1330		30			36.4			0.3			0		

AQUIFER TEST DATA

WELL OR HOLE 2
PAGE 2 OF 2

PROJECT HUNTERS CREEK 84-03013
LOCATION ORANGE COUNTY, FLA
PERSONNEL RECORDED BY B. POTTER

PUMP ON DATE 1-28 TIME 1030
PUMP OFF DATE 1-28 TIME 1430
DURATION OF AQUIFER TEST 4 HR
1-28-85

HOW WL's MEASURED M-SCOPE
DISTANCE FROM PUMPING WELL N.A.
MEASURING POINT TOP OF CASING
ELEVATION MEASURING POINT

HOW Q MEASURED FLOW METER
DEPTH OF PUMP/AIRPIPE ~100 FT
TYPE OF TEST STEP-DRAWDOWN
PREVIOUS PUMPING 1-25-85

TIME 1" = 30 MIN AT 1" = 0 | WATER LEVEL DATA SWL 36.1' | DISCHARGE DATA | COMMENTS

DATE	CLOCK TIME	PUMPING ELAPSED TIME -	RECOVERY ELAPSED TIME -			READING FT. BELOW T.O.C.	CORRECTION OR CONVERSION	WATER LEVEL	WL CHANGE ' or ' FT.		READING TIME IN SEC 500 GAL	RATE GPM (LPS) GPM	Q 30 MIN AVG.	
1-28	1330	0				36.4			0.3			0		
	1335	5				50.0			13.9		10.08	2976		
	1340	10				50.3			14.2		9.95	3015		
	1345	15				50.5			14.5		10.01	2997	2973	Q Q = 2973 GPM
	1350	20				50.5			14.5		9.97	3009		
	1355	25				50.6			14.6		9.99	3003		S = 14.6 FT.
	1400	30	0			50.6			14.6		10.02	2994		
	1405		5			37.0			0.9			0		
	1410		10			36.8			0.7			0		
	1415		15			36.7			0.6			0		
	1420		20			36.7			0.6			0		
	1425		25			36.6			0.5			0		
	1430		30			36.6			0.5			0		EST. TRANSMISS. 654,000 GPD/FT

APPENDIX E

WATER QUALITY TESTING RESULTS

WELL #1

PAGE 1 PBSJ LABORATORY REPORT LAB # 84-12-088 WELL #1

RECEIVED: 12/18/84 01/14/85 14:12:52

REPORT TO: Layne Atlantic Company
1107 S. Orange Blossom Trail
Orlando, Florida 32805

ATTEN: Hal Chittum

CLIENT: LAYNE ATLANT SAMPLES: 1
COMPANY: Layne Atlantic Company
FACILITY:

PREPARED BY: PBS&J Laboratory
889 N. Orange Ave.
Orlando, Florida 32801
DHRS# 83170, AIHA# 213

ATTEN: Scott W. Rampenthal
PHONE: (305) 423-7275

CERTIFIED BY

CONTACT RAMPENTHAL

We are pleased to provide this report of analysis. If you have any questions regarding this report or further analysis please feel free to telephone.

WORK ID: HUNTER CREEK OR-0853
TAKEN:
TRANS:
TYPE:
P.O. #: 84-OR-0853
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01 HUNTER CREEK RAW WATER

PBSJ LABORATORY TEST CODES and NAMES used on this report

245	2/4/5-TP(SILVEX)
24D	2/4 D
AG	SILVER
AS F	ARSENIC FURNACE METHOD
BA I	BARIUM ICP METHOD
CA I	CALCIUM ICP METHOD
CD I	CADMIUM ICP METHOD
CL	CHLORIDE
COL	COLOR
CR I	CHROMIUM ICP METHOD
CU I	COPPER ICP METHOD
EDB	ETHYLENE DIBROMIDE
END	ENDRIN
F	FLUORIDE
FE I	IRON ICP METHOD
HG F	MERCURY FURNACE METHOD
LIN	LINDANE
LI COR	Langelier Index of Corr.
MG I	MAGNESIUM ICP METHOD
MN I	MANGANESE ICP METHOD
NA I	SODIUM ICP METHOD
NO3	NITRATE
ODR	ODOR
OXY	METHOXYCHLOR
PB	LEAD
PH	pH
PHS	CaCO3 Saturation Index
S2	SULFIDE
SE F	SELENIUM FURNACE METHOD
SO4	SULFATE
SUR	SURFACTANTS
TAK	TOTAL ALKALINITY
TB	TURBIDITY
TDS	TOTAL DISSOLVED SOLIDS
TEMIK	TEMIK
THA	TOTAL HARDNESS
TOX	TOXAPHENE
ZN I	ZINC ICP METHOD

 PBSJ LABORATORY REPORT LAB # 84-12-088

RECEIVED: 12/18/84 RESULTS BY TEST

TEST CODE default units	Sample 01 (entered units)
245 mg/l	<0.001
24D mg/l	<0.01
AG mg/l	<0.03
AS_F mg/l	<0.05
BA_I mg/l	<0.15
CA_I mg/l	38.50
CD_I mg/l	<0.01
CL mg/l	6.0
COL PT_CO_units	5
CR_I mg/l	<0.04
CU_I mg/l	<0.03
EDB ug/l	<0.02
END mg/l	<0.0001
F mg/l	0.14

PBSJ LABORATORY REPORT
RESULTS BY TEST

LAB # 84-12-088
CONTINUED FROM ABOVE

RECEIVED: 12/18/84

FE_I mg/l	0.060
HG_F mg/l	<0.0002
LIN mg/l	<0.001
LI_COR s.u.	0.12
MG_I mg/l	6.060
MN_I mg/l	<0.02
NA_I mg/l	6.030
NO3 mg/l as N	<0.02
ODR TON	1
OXY mg/l	<0.01
PB mg/l	<0.05
PH pH units	7.93
PHS S.U.	7.81
S2 mg/l	1.15
SE_F mg/l	<0.01
SO4 mg/l	1.61

SUR mg/l	<0.025
TAK mg/l CaCO3	129.0
TB NTU	0.61
TDS mg/l	146
TEMIK ug/l	<1
THA mg/l as CaCO3	124.0
TOX mg/l	<0.001
ZN_I mg/l	<0.01

 PBSJ LABORATORY REPORT LAB # 84-12-088

RECEIVED: 12/18/84 RESULTS BY TEST

SAMPLE Sample Id	Test: PH pH units	Test: PHS S.U.	Test: S2 mg/l	Test: SE F mg/l	Test: SO4 mg/l
01 HUNTER CREEK RA	7.93	7.81	1.15	<0.01	1.61

SAMPLE Sample Id	Test: SUR mg/l	Test: TAK mg/l CaCO3	Test: TB NTU	Test: TDS mg/l	Test: TEMIK ug/l
01 HUNTER CREEK RA	<0.025	129.0	0.61	146	<1

SAMPLE Sample Id	Test: THA mg/l as CaCO3	Test: TOX mg/l	Test: ZN I mg/l
01 HUNTER CREEK RA	124.0	<0.001	<0.01

SAMPLE ID HUNTER CREEK RAW WATER SAMPLE # 01 FRACTIONS: A,B,C,D,E
Date & Time Collected 12/18/84 Category

245 <0.001 mg/l	24D <0.01 mg/l	AG <0.03 mg/l	AS_F <0.05 mg/l	BA_I <0.15 mg/l	CA_I 38.50 mg/l
CD_I <0.01 mg/l	CL 6.0 mg/l	COL 5 PT_CO_units	CR_I <0.04 mg/l	CU_I <0.03 mg/l	EDB <0.02 ug/l
END <0.0001 mg/l	F 0.14 mg/l	FE_I 0.060 mg/l	HG_F <0.0002 mg/l	LIN <0.001 mg/l	LI_COR 0.12 s.u.
MG_I 6.060 mg/l	MN_I <0.02 mg/l	NA_I 6.030 mg/l	NO3 <0.02 mg/l as N	ODR 1 TON	OXY <0.01 mg/l
PB <0.05 mg/l	PH 7.93 pH units	PHS 7.81 S.U.	S2 1.15 mg/l	SE_F <0.01 mg/l	SO4 1.61 mg/l
SUR <0.025 mg/l	TAK 129.0 mg/l CaCO3	TB 0.61 NTU	TDS 146 mg/l	TEMIK <1 ug/l	THA 124.0 mg/l as CaCO3
TOX <0.001 mg/l	ZN_I <0.01 mg/l				

WELL #2

PAGE 1 PBSJ LABORATORY REPORT LAB # 85-01-134 WELL #2

RECEIVED: 01/28/85 02/28/85 09:23:53

REPORT TO: Layne Atlantic Company
1107 S. Orange Blossom Trail
Orlando, Florida 32805

ATTEN: Hal Chittum

CLIENT: LAYNE ATLANT SAMPLES: 1
COMPANY: Layne Atlantic Company
FACILITY:

PREPARED BY: PBS&J Laboratory
889 N. Orange Ave.
Orlando, Florida 32801
DHRS# 83170, AIHA# 213

ATTEN: Scott W. Rampenthal
PHONE: (305) 423-7275

CERTIFIED BY

CONTACT FRENCH

We are pleased to provide this report of analysis. If you have any questions regarding this report or further analysis please feel free to telephone.

WORK ID: HUNTERS CREEK OR-0853
TAKEN:
TRANS TYPE:
P. O. #: 84-OR-0853
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01 HUNTERS CREEK OR-0853

PBSJ LABORATORY TEST CODES and NAMES used on this report

245	2/4/5-TP(SILVEX)
24D	2/4 D
AG	SILVER
AS F	ARSENIC FURNACE METHOD
BA I	BARIUM ICP METHOD
CA I	CALCIUM ICP METHOD
CD I	CADMIUM ICP METHOD
CL	CHLORIDE
COL	COLOR
CR I	CHROMIUM ICP METHOD
CU I	COPPER ICP METHOD
EDB	ETHYLENE DIBROMIDE
END	ENDRIN
F	FLUORIDE
FE I	IRON ICP METHOD
GAW	GROSS ALPHA IN WATER
HG F	MERCURY FURNACE METHOD
LIN	LINDANE
LI COR	Langelier Index of Corr.
MG I	MAGNESIUM ICP METHOD
MN I	MANGANESE ICP METHOD
NA I	SODIUM ICP METHOD
NO2	NITRITE
NO3	NITRATE
ODR	ODOR
OXY	METHOXYCHLOR
PB	LEAD
PH	pH
S2	SULFIDE
SE F	SELENIUM FURNACE METHOD
SO4	SULFATE
SUR	SURFACTANTS
TAK	TOTAL ALKALINITY
TB	TURBIDITY
TDS	TOTAL DISSOLVED SOLIDS
TEMIK	TEMIK
THA	TOTAL HARDNESS
THM	TRIHALOMETHANES
TOX	TOXAPHENE
ZN I	ZINC ICP METHOD

PBSJ LABORATORY REPORT

LAB # 85-01-134

RECEIVED: 01/28/85

RESULTS BY TEST

TEST CODE default units	Sample 01 (entered units)
245 mg/l	<0.001
24D mg/l	<0.01
AG mg/l	<0.03
AS_F mg/l	<0.05
BA_I mg/l	<0.15
CA_I mg/l	28.20
CD_I mg/l	<0.01
CL mg/l	6.7
COL PT_CO_units	5
CR_I mg/l	<0.04
CU_I mg/l	<0.03
EDB ug/l	<0.02
END mg/l	<0.0001
F mg/l	0.17

PBSJ LABORATORY REPORT
RESULTS BY TEST

LAB # 85-01-134
CONTINUED FROM ABOVE

RECEIVED: 01/28/85

FE_I mg/l	0.060
GAW pCi/l	2.7+/-2.1
HG_F mg/l	<0.0002
LIN mg/l	<0.001
LI_COR s.u.	-0.17
MG_I mg/l	7.210
MN_I mg/l	<0.02
NA_I mg/l	10.200
NO2 mg/l as N	0.01
NO3 mg/l as N	<0.02
ODR TON	0
OXY mg/l	<0.01
PB mg/l	<0.05
PH pH units	8.15
S2 mg/l	1.15
SE_F mg/l	<0.01

PBSJ LABORATORY REPORT
RESULTS BY TEST

LAB # 85-01-134
CONTINUED FROM ABOVE

RECEIVED: 01/28/85

SO4 mg/l	4.15
SUR mg/l	0.050
TAK mg/l CaCO3	98.6
TB NTU	0.22
TDS mg/l	101
TEMIK ug/l	<1
THA mg/l as CaCO3	109.0
THM ug/l	<0.1 mg/l
TOX mg/l	<0.001
ZN_I mg/l	<0.01

PBSJ LABORATORY REPORT

LAB # 85-01-134

RECEIVED: 01/28/85

RESULTS BY TEST

SAMPLE Sample Id	Test: 245 mg/l	Test: 24D mg/l	Test: AG mg/l	Test: AS F mg/l	Test: BA I mg/l
01 HUNTERS CREEK O	<0.001	<0.01	<0.03	<0.05	<0.15

SAMPLE Sample Id	Test: CA I mg/l	Test: CD I mg/l	Test: CL mg/l	Test: COL PT CO units	Test: CR I mg/l
01 HUNTERS CREEK O	28.20	<0.01	6.7	5	<0.04

SAMPLE Sample Id	Test: CU I mg/l	Test: EDB ug/l	Test: END mg/l	Test: F mg/l	Test: FE I mg/l
01 HUNTERS CREEK O	<0.03	<0.02	<0.0001	0.17	0.060

SAMPLE Sample Id	Test: GAW pCi/l	Test: HG F mg/l	Test: LIN mg/l	Test: LI COR s.u.	Test: MG I mg/l
01 HUNTERS CREEK O	2.7+/-2.1	<0.0002	<0.001	-0.17	7.210

SAMPLE Sample Id	Test: MN I mg/l	Test: NA I mg/l	Test: NO2 mg/l as N	Test: NO3 mg/l as N	Test: ODR TON
01 HUNTERS CREEK O	<0.02	10.200	0.01	<0.02	0

PBSJ LABORATORY REPORT

LAB # 85-01-134

RECEIVED: 01/28/85

RESULTS BY TEST

SAMPLE Sample Id	Test: OXY mg/l	Test: PB mg/l	Test: PH pH units	Test: S2 mg/l	Test: SE F mg/l
01 HUNTERS CREEK O	<0.01	<0.05	8.15	1.15	<0.01

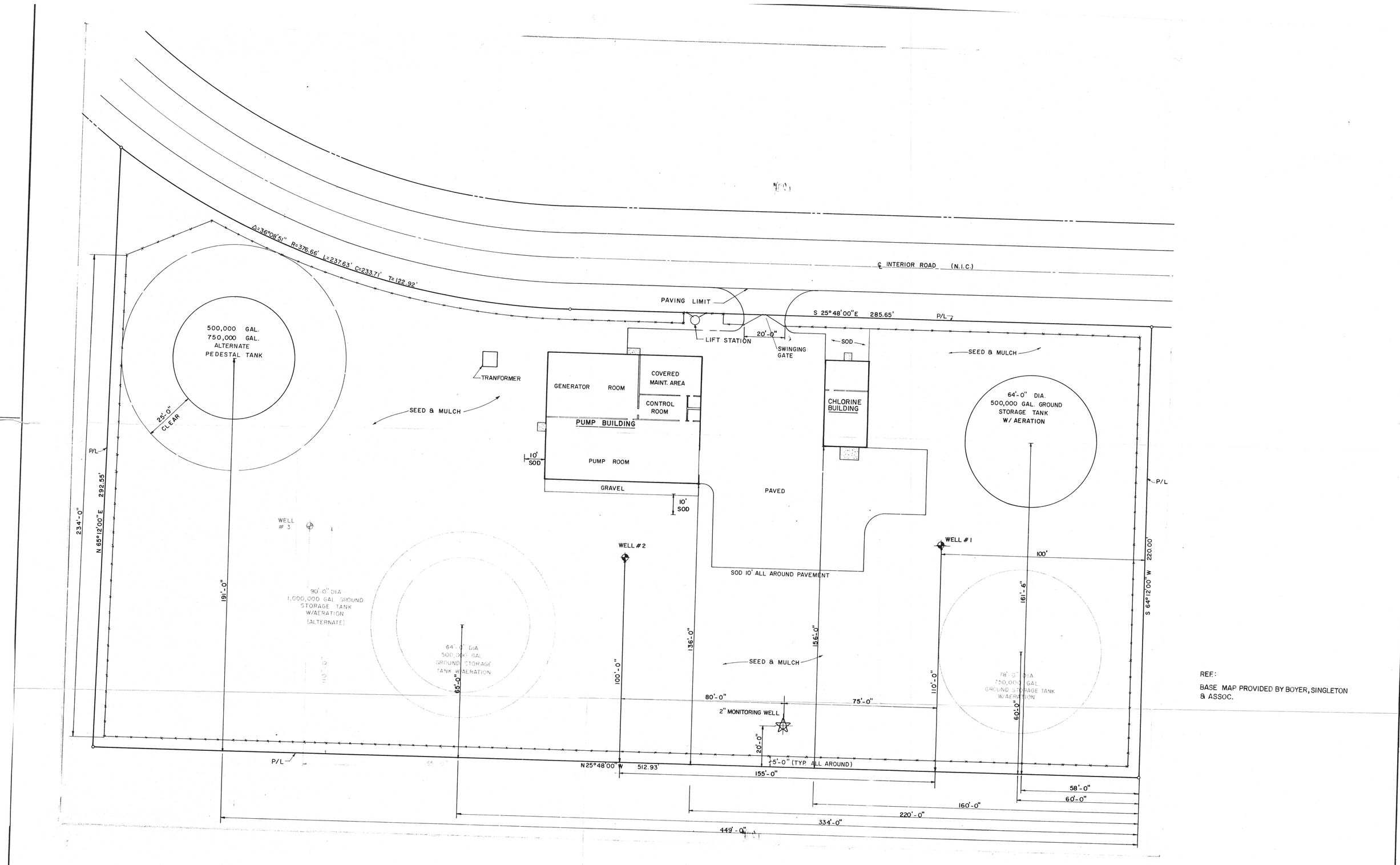
SAMPLE Sample Id	Test: SO4 mg/l	Test: SUR mg/l	Test: TAK mg/l CaCO3	Test: TB NTU	Test: TDS mg/l
01 HUNTERS CREEK O	4.15	0.050	98.6	0.22	101

SAMPLE Sample Id	Test: TEMIK ug/l	Test: THA mg/l as CaCO3	Test: THM ug/l	Test: TOX mg/l	Test: ZN I mg/l
01 HUNTERS CREEK O	<1	109.0	<0.1 mg/l	<0.001	<0.01

 PBSJ LABORATORY REPORT LAB # 85-01-134
RECEIVED: 01/28/85 Results by Sample

SAMPLE ID HUNTERS CREEK OR-0853 SAMPLE # 01 FRACTIONS: A, B, C, D, E, F, G, H
Date & Time Collected 01/28/85 Category

245 <0.001 mg/l	24D <0.01 mg/l	AG <0.03 mg/l	AS_F <0.05 mg/l	BA_I <0.15 mg/l	CA_I 28.20 mg/l
CD_I <0.01 mg/l	CL 6.7 mg/l	COL 5 PT_CO_units	CR_I <0.04 mg/l	CU_I <0.03 mg/l	EDB <0.02 ug/l
END <0.0001 mg/l	F 0.17 mg/l	FE_I 0.060 mg/l	GAW 2.7+/-2.1 pCi/l	HG_F <0.0002 mg/l	LIN <0.001 mg/l
LI_COR -0.17 s.u.	MG_I 7.210 mg/l	MN_I <0.02 mg/l	NA_I 10.200 mg/l	NO2 0.01 mg/l as N	NO3 <0.02 mg/l as N
ODR 0 TON	OXY <0.01 mg/l	PB <0.05 mg/l	PH 8.15 pH units	S2 1.15 mg/l	SE_F <0.01 mg/l
SO4 4.15 mg/l	SUR 0.050 mg/l	TAK 98.6 mg/l CaCO3	TB 0.22 NTU	TDS 101 mg/l	TEMIK <1 ug/l
THA 109.0 mg/l as CaCO3	THM <0.1 mg/l	TOX <0.001 mg/l	ZN_I <0.01 mg/l		



REF:

BASE MAP PROVIDED BY BOYER, SINGLETON & ASSOC.

FIELD:	———
DRAWN:	PJZ
CHKD:	RO
APPVD:	PBH
HORIZ. SCALE:	1"=20'
VERT. SCALE:	———

DATE	BY	REVISION

WELL FIELD AND WATER TREATMENT PLANT SITE PLAN

HUNTER S CREEK

ORANGE COUNTY, FLA.

JAMMAL & ASSOCIATES, INC. Consulting Engineers

DATE: 3-85 | PROJ. NO: 84-03013 | FIGURE : 3