DRILLING AND TESTING

AT

WILLIAMS LITTLE CYPRESS FARM

HENDRY COUNTY, FLORIDA

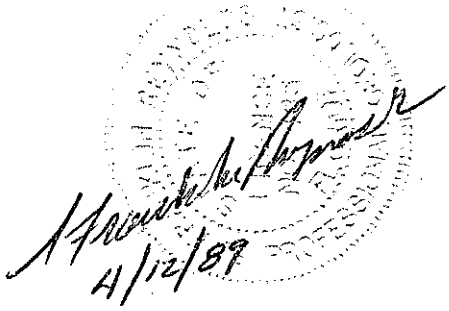
PREPARED FOR

WILLIAMS FARMS
1300 NORTH 15TH STREET
IMMOKALLEE, FL 33934

HENDRY COUNTY

26-8

WATER USE



This Document Has been Prepared Under the Direction of a
Registered Professional Geologist

BY

CH2M HILL
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INTRODUCTION

The Williams Little Cypress Farm is located in eastern Hendry County within Township 46 South and Range 34 East. The farm encompasses all of Sections 19, 20, and 28 and parts of Sections 17, 18, 29, and 30. While future plans call for the eventual agricultural development of the complete property, short term development plans are limited to most of Section 19 and minor areas of Sections 29 and 30. Figure 1 presents a sketch of the farm property.

Step-drawdown testing of production wells is generally required during the consumptive use permitting process for agricultural developments similar in size to the Little Cypress Farm. Upon analysis of the drawdown data, the specific capacity and efficiency of the wells can be determined and a gross estimate of the aquifer's transmissivity can be made. To provide a better estimate of the aquifer's transmissivity, and to obtain estimates of the storage and leakance coefficient, a complete aquifer performance test was conducted on the Williams Farm site.

This report summarizes details of the construction of two test-production wells and three monitor wells on site. In addition, drawdown data and corresponding analyses of the step-drawdown and aquifer performance tests conducted are presented.

WELL CONSTRUCTION

The well construction program at the Williams Little Cypress Farm included the construction of two test-production wells. These wells were designated TP-19 and TP-20, to correspond with the land section in which each was located. The wells

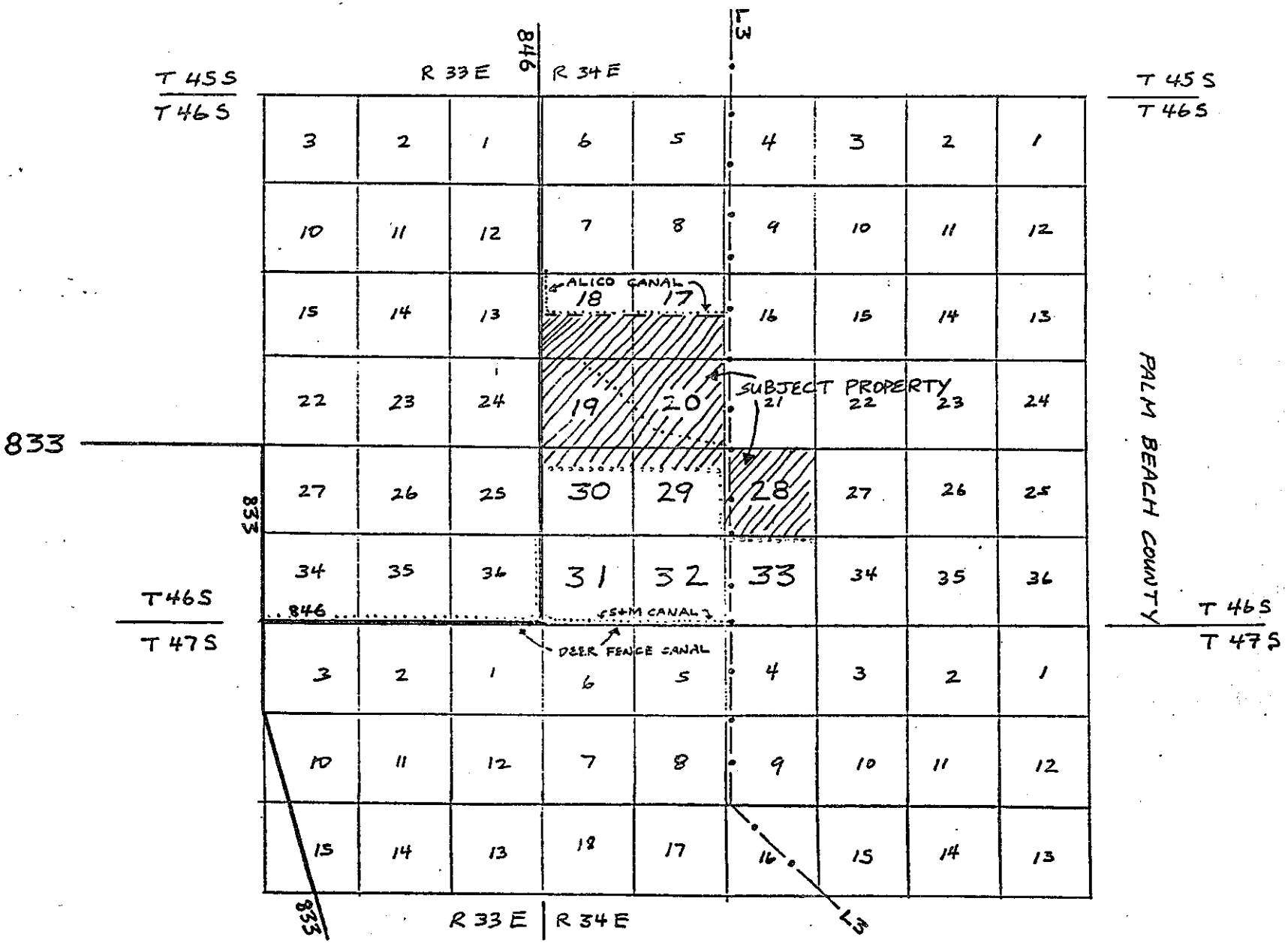

Figure 1 Project Location
Aquifer Test at Williams Little Cypress Farm

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were installed with a 12-inch diameter steel casing into the top of the competent limestone within the lower Tamiami aquifer. The wells were completed open hole through the limestone by the mud rotary method.

Three monitor wells were constructed adjacent to TP-20, in order to monitor water level drawdowns during the three-day aquifer performance test. Wells MW-60 and MW-500, installed within the lower Tamiami aquifer, were respectively located 60 and 500 feet north of TP-20. These four-inch diameter PVC monitor wells were constructed by the mud rotary method.

In addition to the two production zone monitor wells, a shallow well (WT-1) was constructed approximately 10 feet north of TP-20 to observe the reaction of the water table aquifer zone during the aquifer test. The well, installed to a total depth of 20 feet, was completed with 10 feet of 20 slot, 2-inch diameter PVC screen. The screen was gravel packed throughout its length. Five feet of fine sand was installed above the gravel and the remainder of the annulus outside of the 2-inch PVC casing was filled with cement.

During construction, drill cutting samples were collected by a CH2M Hill geologist. A geologic log describing the samples and a summary of the well construction details of each of the wells drilled is contained in Appendix B of this report.

Construction of the wells began on February 27, 1989, with the completion of MW-60. Construction was completed with the drilling of TP-19 on March 9, 1989. A step-drawdown test was performed on TP-20 on March 6, 1989, to test the well's pumping capacity and to provide preliminary drawdown data prior to the aquifer performance test at this location. The step-drawdown test of TP-19 was performed after the aquifer performance test at well site TP-20. A discussion of all pumping tests performed will be described in detail below.

HYDROGEOLOGY

The Williams Little Cypress Farm site is underlain by sediments of the Pleistocene age and older (SFWMD, 1988). The terminology used in describing the site hydrogeology conforms to SFWMD technical publication 88-12. During test drilling at the site, the undifferentiated Pleistocene sediments and most of the Pliocene aged Tamiami Formation were encountered.

The undifferentiated deposits, generally consisting of fine- to medium-grained quartz sand, shell, and limestone comprises the water table aquifer. The upper part of the Tamiami Formation, consisting of silty sand and clayey sand, form the confining beds beneath the water table, termed the Tamiami confining beds.

The lower part of the Tamiami Formation, consisting of gray to bone colored, sandy, permeable limestones, comprise the lower Tamiami aquifer. The hydrogeology will be described in detail below for each of the two test locations.

SECTION 20 TEST SITE

The surface of the Section 20 test site is underlain by 25 feet of sediments within the Pleistocene aged undifferentiated deposits. These sediments are characterized as fine- to medium-grained quartz sand, underlain by iron-rich silty sand, calcareous sandstone, coarse grained quartz sand, and sandy shell. These lithologies are characteristic of the shallow sediments in the Hendry County area.

Beneath these sediments are less permeable sandy clays of the upper portion of the Pliocene aged Tamiami Formation. This unit, generally known as the Tamiami confining beds,

was clearly recognized during the drilling the test production well, TP-20, however, its presence not was clearly evident at the monitor well locations on site (see Appendix B). It is probable that the Tamiami confining beds are thin and not laterally extensive at this location.

Underlying the sandy clays at this site is a unit of calcareous sandstones. This unit is nearly ten feet thick in TP-20. Over 15 feet of medium- to coarse-grained quartz sand underlies the more consolidated sandstone. These units occur within the upper part of the lower Tamiami aquifer.

The more permeable part of the lower Tamiami aquifer, as evidenced by the occurrence of vugs and molds, occurs beneath the unconsolidated sand. This gray to bone colored, well consolidated, sandy and fossiliferous unit was encountered at a depth between 60 and 65 feet in all of the wells at the Section 20 site. Permeable limestones occur to a depth of approximately 145 feet on site, for a total production zone thickness of approximately 80 feet.

Underlying the limestone is an unconsolidated fine- to coarse-grained quartz sand. Less than 10 feet of this sand was penetrated on site. The entire thickness of the lower Tamiami aquifer, however, was not penetrated.

SECTION 19 TEST SITE

The surface of the Section 19 test site is underlain by 20 feet of fine- to medium-grained quartz sand, iron-rich silty sand, and shelly sand. Underlying these sediments are approximately 30 feet of partially consolidated sandy limestones and five feet of fine- to coarse-grained, quartz sands. These sediments comprise the water table aquifer at the site.

The sandy clays encountered at the Section 20 site were not apparent at this site, nevertheless, the lower permeability sand unit may provide some degree of confinement.

Beneath the sand is a permeable, well consolidated gray to bone colored, sandy limestone occurring at a depth of approximately 55 feet. This limestone exhibits a large degree of secondary porosity in the form of vugs and molds, contributing to the high permeability of this unit. This productive unit comprises the lower Tamiami aquifer and extends to a depth of approximately 140 feet for a total thickness of 85 feet (see Appendix B).

An additional ten feet of the lower Tamiami was penetrated below this depth, however, this limestone unit is less consolidated and contains a smaller degree of secondary porosity.

PUMPING TESTS

Two types of pumping tests were performed during this project. A step-drawdown test was performed on the two test- production wells. In addition, an aquifer performance test was conducted by pumping TP-20. All wells were pumped by means of a diesel powered line-shaft turbine pump. These tests will be discussed below.

STEP-DRAWDOWN TESTS

To measure the specific capacity and well efficiency of test-production Wells TP-19 and TP-20, a step-drawdown test was performed on each well. The wells were pumped at five increasingly higher discharge rates or steps, for a period of 60 minutes each, and a total pumping period of approximately 300 minutes.

Periodic water level measurements were taken during each step with an electric tape or m-scope. Well discharge rates were measured with a propeller flowmeter. Instantaneous discharge rates and total discharges were read directly by this flowmeter.

Variations in the pumping rate during the last pumping step of Well TP-19 rendered the data from the fifth and final step unusable. Nevertheless, data obtained during the first four steps of this test were adequate for the analysis performed.

A complete tabulation of the data collected during the step-drawdown testing of both wells is contained in Appendix A, Table A9. Appendix A, Table A9 also presents the complete results of the drawdown analysis. Estimates of the aquifer transmissivity, based on these calculations, were found to be similar to those presented below for the aquifer test.

AQUIFER PERFORMANCE TEST

A three-day, constant rate pumping test was performed at the TP-20 site. TP-20 was pumped at a constant rate of 1,500 GALLONS PER MINUTE (gpm) while water levels were monitored in MW-60, MW-500, and TP-20. The pumping rate was measured using the propeller flowmeter, described above. Well discharges were conveyed away from the well through eight-inch diameter piping and a temporary drainage ditch to a holding pond 400 feet southeast of the well.

Water levels in the pumped Well TP-20 and monitor Wells MW-60 and MW-500 were measured using electrical pressure transducers installed in each well. The output from the transducers were continuously monitored by an Enviro-Labs EL-200 multi-channel data logger. A complete tabulation of

the processed output of this instrument is contained in Appendix A, Tables A5 thru A7.

Water level data were collected from the wells for a 24-hour period prior to the start-up of the pumping test to monitor any regional water level trends. Upon inspection of the data, no regional water level trends were apparent.

During the first few hours of the aquifer test, and then daily thereafter, manual water level measurements were taken of the water table monitor Well WT-1. These water level measurements are tabulated in Appendix A, Table A8. Water levels in this well showed an immediate response to the pumping of TP-20. At the end of three days of pumping, the total drawdown in this well was 1.72 feet. This response is reflective of the leaky character of the sediments overlying the pumped zone.

In addition to the measurements of WT-1, daily manual measurements were taken of the two monitor wells, MW-60 and MW-500, test-production Well TP-19, and existing on-site Wells W-12 and W-25. This data is contained in Appendix A, Table A8. Water levels in TP-19, (located approximately 1/2 mile southwest of TP-20), and W-25, (located approximately 3/4 mile west of TP-20), showed little, if any, water level variation during the three days of pumping. Water levels in well W-12, (located approximately one mile southwest of TP-20), did show some variations during the pumping test, but these variations were most likely the result of unknown offsite pumpages.

The lower Tamiami aquifer production zone responded to the withdrawals during the test characteristically like a leaky or semi-confined artesian aquifer. Water discharged from the aquifer in the early part of the test was released from storage within the aquifer. Leakance of water through the

overlying sediments into the lower Tamiami aquifer, however, was apparent less than an hour of pumping, and a virtual steady state condition within the aquifer was achieved after approximately one day of pumping.

An analysis of the drawdown and recovery data from TP-20, MW-60, and MW-500 was completed using several methodologies. Table 1 presents a summary of the analysis results and Appendix A, Tables A1 through A4, presents the complete aquifer parameter calculations. The plotted data associated with each analysis is presented on Figures 2 through 5. The type curves for a leaky artesian aquifer without water released from storage by the semi-confining bed (Type A curve) were selected for curve matching. Straight line method solutions were also used to calculate aquifer parameters on the early time data, where their limiting conditions permitted their use.

Transmissivity values calculated all range slightly over 200,000 gallons per day per foot. The mean value of transmissivities calculated is 209,000 gallons per day per foot. The storage value and leakance coefficient, obtained from the leaky artesian curve match of data from TP-20, should be largely discounted since the curve is very flat and difficult to accurately match laterally to the type curves. Inspection of the storage coefficient data shows an estimate of storage of between 0.0002 and 0.0007. The leakance coefficient is estimated between 0.03 an 0.08 gallons per day per cubic foot. After visual examination of the permeable limestones occurring within this aquifer zone, this high value for leakance is probably a good estimate.

WATER QUALITY

Water quality samples were collected from Wells TP-20 and TP-19 and analyzed by a certified laboratory. The sample

from TP-20 was collected at the end of the aquifer test, and the one from TP-19 was collected at the end of the step drawdown test. Table 2 presents the results of the analyses.

Table 1
PUMPING TEST ANALYSIS SUMMARY

Method/Well	Transmissivity (gpd/ft)	Storage	Leakance (gpd/ft^3)
Leaky Artesian Curve Match (Lohman)			
TP-20	183,000	0.014	0.72
MW-60	185,000	0.0012	0.082
MW-500	226,000	0.0007	0.036
Semi-Log Drawdown Straight Line Match (Hantush)			
TP-20	202,000	-	-
MW-60	213,000	0.00027	-
Semi-log Recovery Straight Line Match (Theis)			
TP-20	202,000	-	-
MW-60	233,000	0.00018	-
Steady-state Distance Drawdown Match (Walton)			
TP-20, MW-60, MW-500	229,000	-	0.031

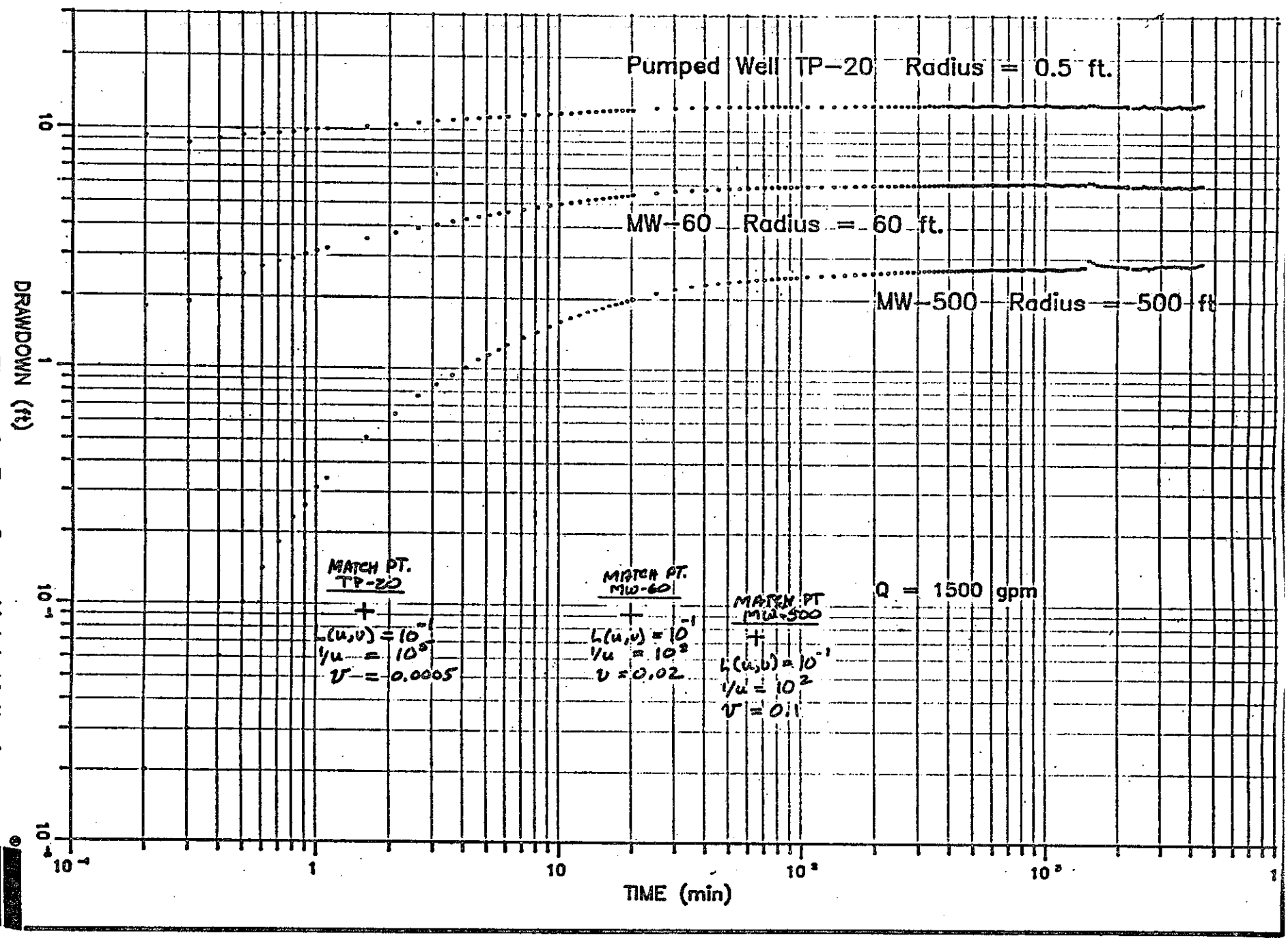

Figure 2 Type Curve Match Method
Aquifer Test at Williams Little Cypress Farm

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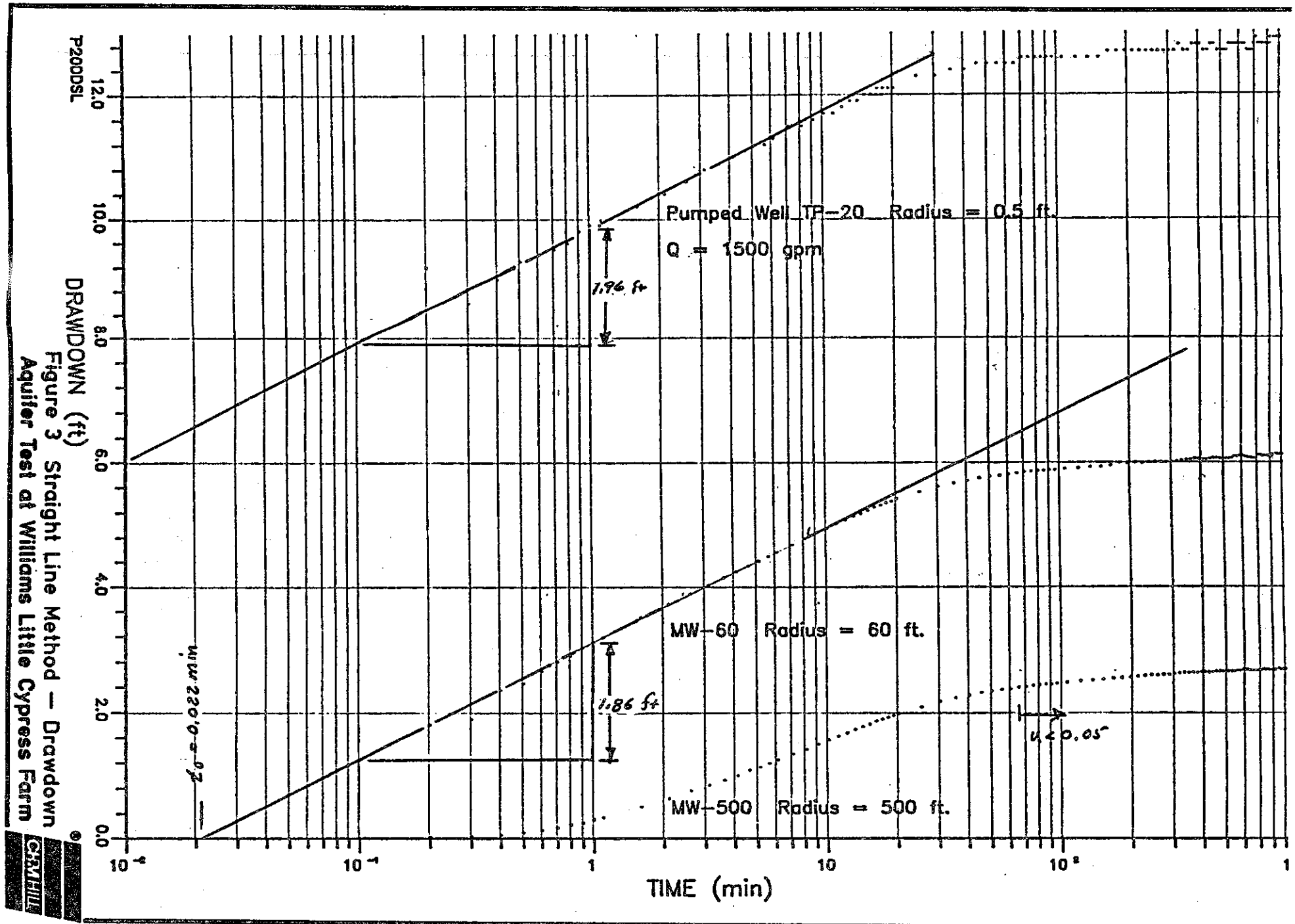

Figure 3 Straight Line Method – Drawdown
Aquifer Test at Williams Little Cypress Farm

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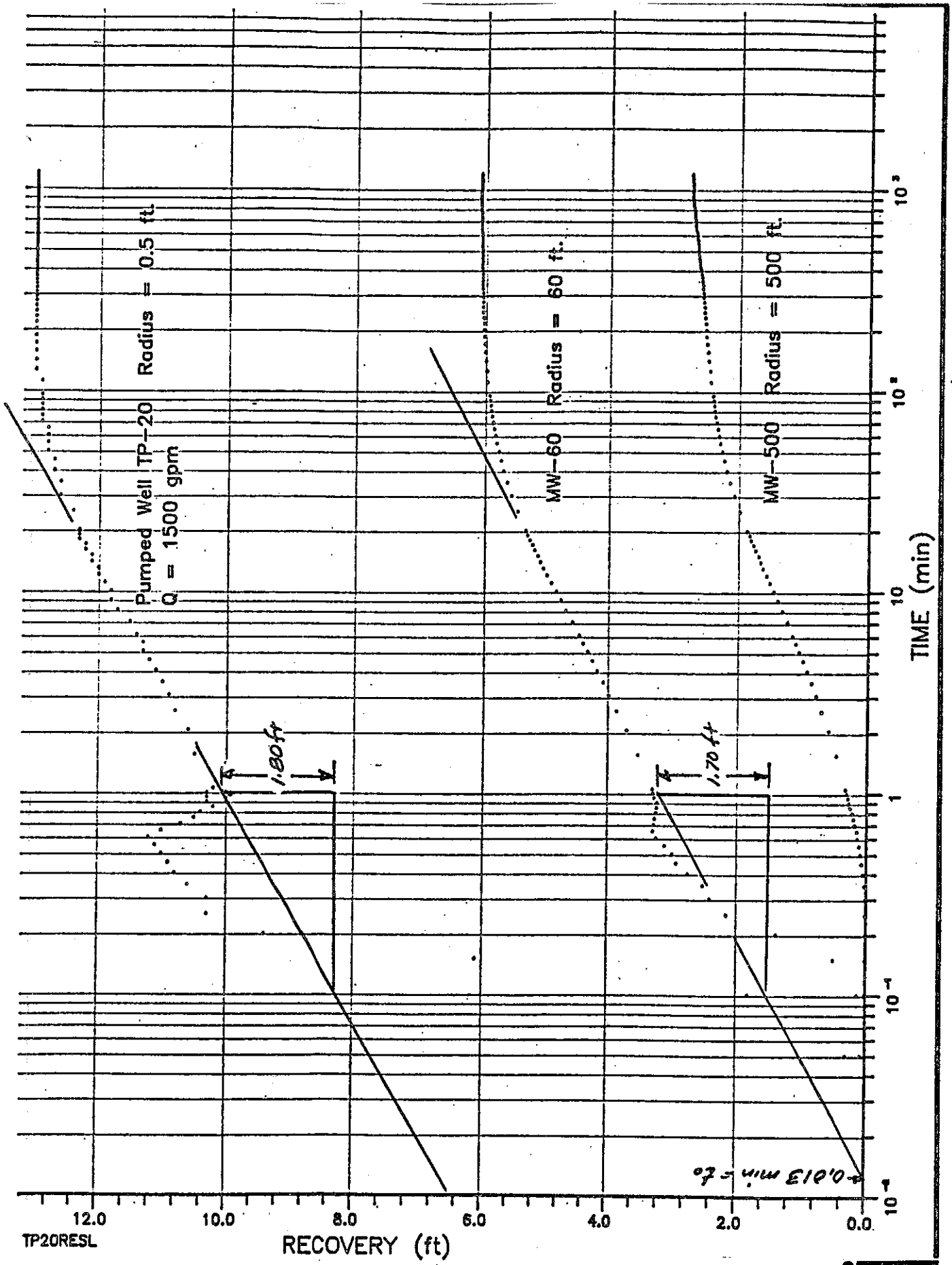

Figure 4 Straight Line Method — Recovery
Aquifer Test at Williams Little Cypress Farm

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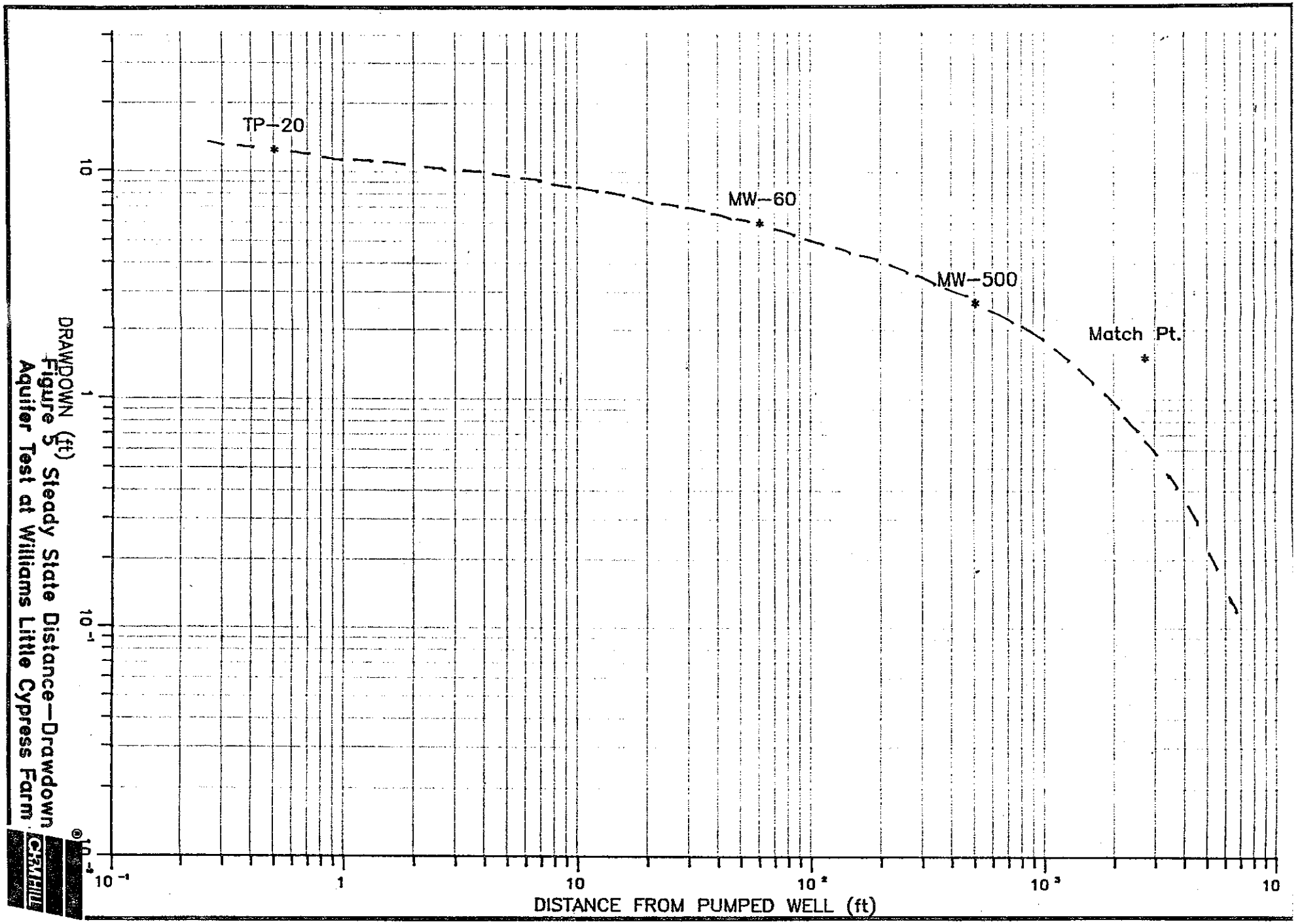

Figure 5 Steady State Distance-Drawdown
Aquifer Test at Williams Little Cypress Farm

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Table 2
WATER QUALITY ANALYSES

Well Name	Chloride (mg/l)	pH	Conductivity (micromhos/cm)	Total Dissolved Solids (mg/l)
TP-19	36	7.6	391	290
TP-20	43	7.4	425	320

APPENDIX A

Table A1
Pumping Test Analysis
Williams Little Cypress Farm
FCR27306.A0

Drawdown Data
Log-Log Match with Type A Curves (Lohman)

Pumping Rate 1500 gpm

DATA FROM PUMPED WELL TP-20

r= 0.5 ft

Match Point: $L(u,v)=10^{-1}$ $1/u=10^{-5}$
s=0.094 ft t=1.6 min
curve v = 0.0005

$$T = \frac{1500 \text{ gal/min} * 1440 \text{ min/day} * 10^{-1}}{4\,TT * 0.094 \text{ ft}} = 183{,}000 \text{ gpd/ft}$$

$$S = \frac{4\,TT * 1.6 \text{ min} * 183{,}000 \text{ gpd/ft}}{10^{5} * (0.5 \text{ ft})^{2} * 1440 \text{ min/day} * 7.48 \text{ gal/ft}^{3}} = .0136$$

$$L = \frac{4 * 183{,}000 \text{ gpd/ft} * (.0005)^{2}}{(0.5 \text{ ft})^{2}} = 0.72 \text{ gpd/ft}^{3}$$

Table A1 (continued)
Pumping Test Analysis
Williams Little Cypress Farm
FCR27306.A0

Drawdown Data
Log-Log Match with Type A Curves (Lohman)

Pumping Rate 1500 gpm

DATA FROM MONITOR WELL MW-60

$r = 60$ feet

Match Point: $L(u,v) = 10^{-1}$ $1/u = 10^{-3}$
$s = 0.093$ ft $t = 20$ min
curve $v = 0.02$

$$T = \frac{1500 \text{ gal/min} * 1440 \text{ min/day} * 10^{-1}}{4\,TT * 0.093 \text{ ft}} = 185{,}000 \text{ gpd/ft}$$

$$S = \frac{4\,TT * 20 \text{ min} * 185{,}000 \text{ gpd/ft}}{10^{3} * (60 \text{ ft})^{2} * 1440 \text{ min/day} * 7.48 \text{ gal/ft}^{3}} = .0012$$

$$L = \frac{4 * 185{,}000 \text{ gpd/ft} * (.02)^{2}}{(60 \text{ ft})^{2}} = 0.082 \text{ gpd/ft}^{3}$$

Table A1 (continued)
Pumping Test Analysis
Williams Little Cypress Farm
FCR27306.A0

Drawdown Data
Log-Log Match with Type A Curves (Lohman)

Pumping Rate 1500 gpm

DATA FROM MONITOR WELL MW-500

r = 500 feet

Match Point: $L(u,v) = 10^{-1}$ $1/u = 10^{-2}$
s = 0.076 ft t = 66 min
curve v = 0.1

$$T = \frac{1500 \text{ gal/min} * 1440 \text{ min/day} * 10^{-1}}{4 \text{ TT} * 0.076 \text{ ft}} = 226{,}000 \text{ gpd/ft}$$

$$S = \frac{4 \text{ TT} * 66 \text{ min} * 226{,}000 \text{ gpd/ft}}{10^{2} * (500 \text{ ft})^{2} * 1440 \text{ min/day} * 7.48 \text{ gal/ft}^{3}} = .0007$$

$$L = \frac{4 * 226{,}000 \text{ gpd/ft} * (.1)^{2}}{(500 \text{ ft})^{2}} = 0.036 \text{ gpd/ft}^{3}$$

Table A2
Pumping Test Analysis
Williams Little Cypress Farm
FCR27306.AO

DRAWDOWN DATA
SEMI-LOG SOLUTION
(Hantush)

Pumping Rate 1500 gpm

DATA FROM PUMPED WELL TP-20

Radius = 0.5 feet

delt s/log cycle = 1.96 ft.

$$T = \frac{2.30 * 1500 \text{ gpm} * 1440 \text{ min/day}}{4\ TT * 1.96 \text{ ft}} = 202{,}000 \text{ gpd/ft}$$

DATA FROM MONITOR WELL MW-60

Radius = 60 feet

delt s/log cycle = 1.86 ft.
t_o = 0.022 min

$$T = \frac{2.30 * 1500 \text{ gpm} * 1440 \text{ min/day}}{4\ TT * 1.86 \text{ ft}} = 213{,}000 \text{ gpd/ft}$$

$$S = \frac{2.25 * 213{,}000 \text{ gpd/ft} * 0.022 \text{ min}}{(60 \text{ ft})^2 * 1440 \text{ min/day} * 7.48 \text{ gal/ft}^3} = 0.00027$$

DATA FROM MONITOR WELL MW-500

Radius = 500 feet

Note: Assuming a transmissivity of 200,000 gpd/ft and a storage coefficient of 0.001, the value of "u" is not below the required value of 0.05 until after 67 minutes at this well. The drawdown observed in MW-500 after this period is heavily influenced by leakance, the "straight line" solution for this data is therefor not possible.

Table A3
Pumping Test Analysis
Williams Little Cypress Farm
FCR27306.A0

RECOVERY DATA
SEMI-LOG SOLUTION
(Theis)

Pumping Rate 1500 gpm

DATA FROM PUMPED WELL TP-20

Radius = 0.5 feet

delt s/log cycle = 1.80 ft.

$$T = \frac{2.30 * 1500 \text{ gpm} * 1440 \text{ min/day}}{4 \text{ TT} * 1.96 \text{ ft}} = 202{,}000 \text{ gpd/ft}$$

DATA FROM MONITOR WELL MW-60

Radius = 60 feet

delt s/log cycle = 1.70 ft.
t_o = 0.013 min

$$T = \frac{2.30 * 1500 \text{ gpm} * 1440 \text{ min/day}}{4 \text{ TT} * 1.70 \text{ ft}} = 233{,}000 \text{ gpd/ft}$$

$$S = \frac{2.25 * 233{,}000 \text{ gpd/ft} * 0.013 \text{ min}}{(60 \text{ ft})^2 * 1440 \text{ min/day} * 7.48 \text{ gal/ft}^3} = 0.00018$$

Table A4
Pumping Test Analysis
Williams Little Cypress Farm
FCR27306.A0

DRAWDOWN DATA
LOG-LOG STEADY STATE SOLUTION
(Walton)

Pumping Rate 1500 gpm

Steady state data

Well	Radius (ft)	Drawdown (ft)
TP-20	0.50	12.3
MW-60	60	5.93
MW-500	500	2.65

Match Point with Bessel function $K_0(r/B)$

$K_0(r/B) = 1.0 \quad r/B = 1.0$

$r = 2{,}700$ ft $\quad s = 1.5$ ft

$$T = \frac{229 * 1500 \text{ gpm} * (1.0)}{1.5 \text{ ft}} = 229{,}000 \text{ gpd/ft}$$

$$L(P'/m') = \frac{229{,}000 \text{ gpd/ft} * (1.0)}{(2{,}700 \text{ ft})^2} = 0.0314 \text{ gpd/ft}^3$$

Table A5
Background Water Level Data

Williams Little Cypress Farm
Project FCR27306.A0

Data from Envirolabs Data Recorder

Values are depth in feet of transducer

DATE	TIME	TP-20	M-60	M-500
08-Mar-89	16:28:00	44.50	19.06	18.99
08-Mar-89	16:43:00	43.60	18.12	18.23
08-Mar-89	16:58:00	44.20	18.81	18.72
08-Mar-89	17:13:00	44.30	18.96	18.87
08-Mar-89	17:28:00	44.40	19.02	18.92
08-Mar-89	17:43:00	44.40	19.05	18.94
08-Mar-89	17:58:00	44.40	19.06	18.96
08-Mar-89	18:13:00	44.40	19.06	18.96
08-Mar-89	18:28:00	44.40	19.07	18.96
08-Mar-89	18:43:00	44.40	19.07	18.97
08-Mar-89	18:58:00	44.40	19.08	18.98
08-Mar-89	19:13:00	44.40	19.08	18.98
08-Mar-89	19:28:00	44.40	19.08	18.98
08-Mar-89	19:43:00	44.40	19.08	18.98
08-Mar-89	19:58:00	44.40	19.08	18.98
08-Mar-89	20:13:00	44.40	19.08	18.99
08-Mar-89	20:28:00	44.40	19.08	18.98
08-Mar-89	20:43:00	44.40	19.08	18.99
08-Mar-89	20:58:00	44.40	19.08	18.99
08-Mar-89	21:13:00	44.40	19.08	18.99
08-Mar-89	21:28:00	44.40	19.08	18.99
08-Mar-89	21:43:00	44.40	19.08	18.99
08-Mar-89	21:58:00	44.40	19.09	19.00
08-Mar-89	22:13:00	44.40	19.08	19.00
08-Mar-89	22:28:00	44.40	19.09	19.00
08-Mar-89	22:43:00	44.40	19.09	19.00
08-Mar-89	22:58:00	44.40	19.09	19.00
08-Mar-89	23:13:00	44.40	19.09	19.00
08-Mar-89	23:28:00	44.40	19.09	19.00
08-Mar-89	23:43:00	44.40	19.09	19.00
08-Mar-89	23:43:00	44.40	19.09	19.00
09-Mar-89	00:13:00	44.40	19.10	19.00
09-Mar-89	00:28:00	44.40	19.09	19.00
09-Mar-89	00:43:00	44.40	19.09	19.00
09-Mar-89	00:58:00	44.40	19.09	19.00
09-Mar-89	01:13:00	44.40	19.09	19.00
09-Mar-89	01:28:00	44.40	19.10	19.01
09-Mar-89	01:43:00	44.40	19.10	19.01
09-Mar-89	01:58:00	44.40	19.10	19.01
09-Mar-89	02:13:00	44.40	19.10	19.01
09-Mar-89	02:28:00	44.40	19.11	19.01
09-Mar-89	02:43:00	44.40	19.11	19.01
09-Mar-89	02:58:00	44.40	19.11	19.02

Table A5 (continued)
Background Water Level Data

Williams Little Cypress Farm
Project FCR27306.A0

Data from Envirolabs Data Recorder

Values are depth in feet of transducer

DATE	TIME	TP-20	M-60	M-500
09-Mar-89	03:13:00	44.40	19.11	19.02
09-Mar-89	03:28:00	44.40	19.11	19.02
09-Mar-89	03:43:00	44.40	19.11	19.02
09-Mar-89	03:58:00	44.40	19.11	19.02
09-Mar-89	04:13:00	44.40	19.11	19.02
09-Mar-89	04:28:00	44.40	19.11	19.02
09-Mar-89	04:43:00	44.40	19.11	19.02
09-Mar-89	04:58:00	44.40	19.11	19.02
09-Mar-89	05:13:00	44.40	19.11	19.02
09-Mar-89	05:28:00	44.40	19.10	19.01
09-Mar-89	05:43:00	44.40	19.10	19.01
09-Mar-89	05:58:00	44.40	19.09	19.01
09-Mar-89	06:13:00	44.40	19.10	19.01
09-Mar-89	06:28:00	44.40	19.10	19.01
09-Mar-89	06:43:00	44.40	19.10	19.01
09-Mar-89	06:58:00	44.40	19.10	19.01
09-Mar-89	07:13:00	44.40	19.10	19.01
09-Mar-89	07:28:00	44.40	19.10	19.01
09-Mar-89	07:43:00	44.40	19.09	19.00
09-Mar-89	07:58:00	44.40	19.10	19.01
09-Mar-89	08:13:00	44.40	19.09	19.00
09-Mar-89	08:28:00	44.40	19.10	19.00
09-Mar-89	08:43:00	44.40	19.10	19.00
09-Mar-89	08:58:00	44.40	19.10	19.00
09-Mar-89	09:13:00	44.40	19.09	19.00
09-Mar-89	09:28:00	44.40	19.10	19.00
09-Mar-89	09:43:00	44.40	19.10	19.00
09-Mar-89	09:58:00	44.40	19.10	19.00
09-Mar-89	09:58:00	44.50	19.10	19.00

Table A6
Pumping Test Drawdown Water Level Data

Williams Little Cypress Farm
Project FCR27306.A0

Data from Envirolabs Data Recorder

Values are depth in feet of transducer
Unless otherwise noted

		Transducer Submergence			Test	TP-20	M-60	M-500
DATE	TIME	TP-20	M-60	M-500	Time (min)	Drawdown (ft)	Drawdown (ft)	Drawdown (ft)
09-Mar-89	10:13:05	44.50	19.10	19.00	0.00	0.00	0.00	0.00
09-Mar-89	10:13:11	40.20	19.01	18.99	0.10	4.30	0.09	0.01
09-Mar-89	10:13:17	35.30	17.30	18.98	0.20	9.20	1.80	0.02
09-Mar-89	10:13:23	35.90	17.21	18.97	0.30	8.60	1.89	0.03
09-Mar-89	10:13:29	35.50	16.75	18.94	0.40	9.00	2.35	0.06
09-Mar-89	10:13:35	35.20	16.64	18.90	0.50	9.30	2.46	0.10
09-Mar-89	10:13:41	35.10	16.45	18.86	0.60	9.40	2.65	0.14
09-Mar-89	10:13:47	35.00	16.30	18.82	0.70	9.50	2.80	0.18
09-Mar-89	10:13:53	34.90	16.21	18.77	0.80	9.60	2.89	0.23
09-Mar-89	10:13:59	34.70	16.08	18.74	0.90	9.80	3.02	0.26
09-Mar-89	10:14:05	34.60	15.99	18.69	1.00	9.90	3.11	0.31
09-Mar-89	10:14:11	34.60	15.92	18.66	1.10	9.90	3.18	0.34
09-Mar-89	10:14:41	34.30	15.60	18.49	1.60	10.20	3.50	0.51
09-Mar-89	10:15:11	34.10	15.38	18.36	2.10	10.40	3.72	0.64
09-Mar-89	10:15:41	33.90	15.22	18.24	2.60	10.60	3.88	0.76
09-Mar-89	10:16:11	33.70	15.08	18.15	3.10	10.80	4.02	0.85
09-Mar-89	10:16:41	33.60	14.96	18.07	3.60	10.90	4.14	0.93
09-Mar-89	10:17:11	33.50	14.86	18.00	4.10	11.00	4.24	1.00
09-Mar-89	10:17:41	33.40	14.77	17.92	4.60	11.10	4.33	1.08
09-Mar-89	10:18:11	33.30	14.69	17.87	5.10	11.20	4.41	1.13
09-Mar-89	10:18:41	33.30	14.61	17.81	5.60	11.20	4.49	1.19
09-Mar-89	10:19:11	33.20	14.54	17.75	6.10	11.30	4.56	1.25
09-Mar-89	10:20:11	33.00	14.42	17.66	7.10	11.50	4.68	1.34
09-Mar-89	10:21:11	33.00	14.32	17.59	8.10	11.50	4.78	1.41
09-Mar-89	10:22:11	32.90	14.23	17.51	9.10	11.60	4.87	1.49
09-Mar-89	10:23:11	32.80	14.15	17.44	10.10	11.70	4.95	1.56
09-Mar-89	10:24:11	32.80	14.08	17.38	11.10	11.70	5.02	1.62
09-Mar-89	10:25:11	32.70	14.02	17.33	12.10	11.80	5.08	1.67
09-Mar-89	10:26:11	32.60	13.96	17.27	13.10	11.90	5.14	1.73
09-Mar-89	10:27:11	32.60	13.92	17.23	14.10	11.90	5.18	1.77
09-Mar-89	10:28:11	32.50	13.87	17.19	15.10	12.00	5.23	1.81
09-Mar-89	10:29:11	32.50	13.82	17.14	16.10	12.00	5.28	1.86
09-Mar-89	10:30:11	32.40	13.79	17.11	17.10	12.10	5.31	1.89
09-Mar-89	10:31:11	32.40	13.75	17.08	18.10	12.10	5.35	1.92
09-Mar-89	10:32:11	32.40	13.73	17.05	19.10	12.10	5.37	1.95
09-Mar-89	10:33:11	32.40	13.69	17.02	20.10	12.10	5.41	1.98
09-Mar-89	10:38:11	32.20	13.58	16.92	25.10	12.30	5.52	2.08
09-Mar-89	10:43:11	32.20	13.49	16.83	30.10	12.30	5.61	2.17
09-Mar-89	10:48:11	32.10	13.44	16.77	35.10	12.40	5.66	2.23
09-Mar-89	10:53:11	32.10	13.40	16.73	40.10	12.40	5.70	2.27

Table A6 (continued)
Pumping Test Drawdown Water Level Data

Williams Little Cypress Farm

DATE	TIME	Transducer Submergence TP-20	M-60	M-500	Test Time (min)	TP-20 Drawdown (ft)	M-60 Drawdown (ft)	M-500 Drawdown (ft)
09-Mar-89	10:58:11	32.00	13.36	16.69	45.10	12.50	5.74	2.31
09-Mar-89	11:03:11	32.00	13.33	16.66	50.10	12.50	5.77	2.34
09-Mar-89	11:08:11	32.00	13.32	16.64	55.10	12.50	5.78	2.36
09-Mar-89	11:13:11	32.00	13.30	16.63	60.10	12.50	5.80	2.37
09-Mar-89	11:18:11	32.00	13.28	16.60	65.10	12.50	5.82	2.40
09-Mar-89	11:23:11	31.90	13.26	16.59	70.10	12.60	5.84	2.41
09-Mar-89	11:28:11	31.90	13.25	16.57	75.10	12.60	5.85	2.43
09-Mar-89	11:33:11	31.90	13.24	16.56	80.10	12.60	5.86	2.44
09-Mar-89	11:38:11	31.90	13.24	16.55	85.10	12.60	5.86	2.45
09-Mar-89	11:43:11	31.90	13.23	16.55	90.10	12.60	5.87	2.45
09-Mar-89	11:48:11	31.90	13.23	16.54	95.10	12.60	5.87	2.46
09-Mar-89	11:58:00	31.90	13.21	16.52	104.92	12.60	5.89	2.48
09-Mar-89	12:13:00	31.90	13.20	16.50	119.92	12.60	5.90	2.50
09-Mar-89	12:28:00	31.90	13.18	16.49	134.92	12.60	5.92	2.51
09-Mar-89	12:43:00	31.90	13.18	16.48	149.92	12.60	5.92	2.52
09-Mar-89	12:58:00	31.80	13.16	16.46	164.92	12.70	5.94	2.54
09-Mar-89	13:13:00	31.80	13.12	16.45	179.92	12.70	5.98	2.55
09-Mar-89	13:28:00	31.80	13.13	16.44	194.92	12.70	5.97	2.56
09-Mar-89	13:43:00	31.80	13.11	16.43	209.92	12.70	5.99	2.57
09-Mar-89	13:58:00	31.80	13.12	16.42	224.92	12.70	5.98	2.58
09-Mar-89	14:13:00	31.80	13.11	16.41	239.92	12.70	5.99	2.59
09-Mar-89	14:28:00	31.80	13.10	16.41	254.92	12.70	6.00	2.59
09-Mar-89	14:43:00	31.80	13.10	16.40	269.92	12.70	6.00	2.60
09-Mar-89	14:58:00	31.80	13.10	16.40	284.92	12.70	6.00	2.60
09-Mar-89	15:13:00	31.80	13.10	16.39	299.92	12.70	6.00	2.61
09-Mar-89	15:28:00	31.80	13.09	16.38	314.92	12.70	6.01	2.62
09-Mar-89	15:43:00	31.70	13.08	16.37	329.92	12.80	6.02	2.63
09-Mar-89	15:58:00	31.80	13.07	16.38	344.92	12.70	6.03	2.62
09-Mar-89	16:13:00	31.80	13.06	16.37	359.92	12.70	6.04	2.63
09-Mar-89	16:28:00	31.70	13.05	16.37	374.92	12.80	6.05	2.63
09-Mar-89	16:43:00	31.70	13.06	16.36	389.92	12.80	6.04	2.64
09-Mar-89	16:58:00	31.70	13.06	16.36	404.92	12.80	6.04	2.64
09-Mar-89	17:13:00	31.80	13.06	16.37	419.92	12.70	6.04	2.63
09-Mar-89	17:28:00	31.80	13.05	16.36	434.92	12.70	6.05	2.64
09-Mar-89	17:43:00	31.70	13.04	16.35	449.92	12.80	6.06	2.65
09-Mar-89	17:58:00	31.70	13.04	16.35	464.92	12.80	6.06	2.65
09-Mar-89	18:13:00	31.80	13.05	16.35	479.92	12.70	6.05	2.65
09-Mar-89	18:28:00	31.80	13.05	16.35	494.92	12.70	6.05	2.65
09-Mar-89	18:43:00	31.80	13.05	16.35	509.92	12.70	6.05	2.65
09-Mar-89	18:58:00	31.80	13.05	16.35	524.92	12.70	6.05	2.65
09-Mar-89	19:13:00	31.70	13.04	16.35	539.92	12.80	6.06	2.65
09-Mar-89	19:28:00	31.70	13.01	16.34	554.92	12.80	6.09	2.66
09-Mar-89	19:43:00	31.70	13.02	16.34	569.92	12.80	6.08	2.66
09-Mar-89	19:58:00	31.70	13.00	16.33	584.92	12.80	6.10	2.67
09-Mar-89	20:13:00	31.70	13.00	16.33	599.92	12.80	6.10	2.67
09-Mar-89	20:28:00	31.70	13.02	16.33	614.92	12.80	6.08	2.67
09-Mar-89	20:43:00	31.70	13.03	16.34	629.92	12.80	6.07	2.66

Table A6 (continued)
Pumping Test Drawdown Water Level Data
Williams Little Cypress Farm

DATE	TIME	Transducer Submergence TP-20	M-60	M-500	Test Time (min)	TP-20 Drawdown (ft)	M-60 Drawdown (ft)	M-500 Drawdown (ft)
09-Mar-89	20:58:00	31.80	13.03	16.34	644.92	12.70	6.07	2.66
09-Mar-89	21:13:00	31.80	13.04	16.34	659.92	12.70	6.06	2.66
09-Mar-89	21:28:00	31.80	13.04	16.34	674.92	12.70	6.06	2.66
09-Mar-89	21:43:00	31.70	13.04	16.34	689.92	12.80	6.06	2.66
09-Mar-89	21:58:00	31.60	12.99	16.33	704.92	12.90	6.11	2.67
09-Mar-89	22:13:00	31.70	12.99	16.32	719.92	12.80	6.11	2.68
09-Mar-89	22:28:00	31.70	13.01	16.33	734.92	12.80	6.09	2.67
09-Mar-89	22:43:00	31.70	13.00	16.32	749.92	12.80	6.10	2.68
09-Mar-89	22:58:00	31.70	13.00	16.33	764.92	12.80	6.10	2.67
09-Mar-89	23:13:00	31.70	13.01	16.33	779.92	12.80	6.09	2.67
09-Mar-89	23:28:00	31.70	13.03	16.34	794.92	12.80	6.07	2.66
09-Mar-89	23:43:00	31.70	13.01	16.33	809.92	12.80	6.09	2.67
09-Mar-89	23:43:00	31.60	12.98	16.32	809.92	12.90	6.12	2.68
10-Mar-89	00:13:00	31.60	12.97	16.31	839.92	12.90	6.13	2.69
10-Mar-89	00:28:00	31.60	12.98	16.32	854.92	12.90	6.12	2.68
10-Mar-89	00:43:00	31.60	12.98	16.32	869.92	12.90	6.12	2.68
10-Mar-89	00:58:00	31.60	12.98	16.32	884.92	12.90	6.12	2.68
10-Mar-89	01:13:00	31.60	12.98	16.32	899.92	12.90	6.12	2.68
10-Mar-89	01:28:00	31.70	13.01	16.33	914.92	12.80	6.09	2.67
10-Mar-89	01:43:00	31.70	13.01	16.33	929.92	12.80	6.09	2.67
10-Mar-89	01:58:00	31.70	13.01	16.34	944.92	12.80	6.09	2.66
10-Mar-89	02:13:00	31.70	13.01	16.34	959.92	12.80	6.09	2.66
10-Mar-89	02:28:00	31.70	13.02	16.34	974.92	12.80	6.08	2.66
10-Mar-89	02:43:00	31.50	12.95	16.31	989.92	13.00	6.15	2.69
10-Mar-89	02:58:00	31.60	12.94	16.31	1004.92	12.90	6.16	2.69
10-Mar-89	03:13:00	31.60	12.96	16.31	1019.92	12.90	6.14	2.69
10-Mar-89	03:28:00	31.60	12.96	16.31	1034.92	12.90	6.14	2.69
10-Mar-89	03:43:00	31.70	12.99	16.32	1049.92	12.80	6.11	2.68
10-Mar-89	03:58:00	31.70	12.99	16.32	1064.92	12.80	6.11	2.68
10-Mar-89	04:13:00	31.70	13.00	16.32	1079.92	12.80	6.10	2.68
10-Mar-89	04:28:00	31.70	13.01	16.33	1094.92	12.80	6.09	2.67
10-Mar-89	04:43:00	31.70	13.00	16.33	1109.92	12.80	6.10	2.67
10-Mar-89	04:58:00	31.70	13.02	16.33	1124.92	12.80	6.08	2.67
10-Mar-89	05:13:00	31.80	13.04	16.34	1139.92	12.70	6.06	2.66
10-Mar-89	05:28:00	31.70	13.03	16.34	1154.92	12.80	6.07	2.66
10-Mar-89	05:43:00	31.80	13.04	16.34	1169.92	12.70	6.06	2.66
10-Mar-89	05:58:00	31.70	13.00	16.32	1184.92	12.80	6.10	2.68
10-Mar-89	06:13:00	31.70	12.98	16.32	1199.92	12.80	6.12	2.68
10-Mar-89	06:28:00	31.60	12.98	16.31	1214.92	12.90	6.12	2.69
10-Mar-89	06:43:00	31.70	12.99	16.31	1229.92	12.80	6.11	2.69
10-Mar-89	06:58:00	31.70	12.98	16.31	1244.92	12.80	6.12	2.69
10-Mar-89	07:13:00	31.60	12.95	16.31	1259.92	12.90	6.15	2.69
10-Mar-89	07:28:00	31.60	12.96	16.30	1274.92	12.90	6.14	2.70
10-Mar-89	07:43:00	31.70	12.98	16.31	1289.92	12.80	6.12	2.69
10-Mar-89	07:58:00	31.60	12.98	16.31	1304.92	12.90	6.12	2.69
10-Mar-89	08:13:00	31.70	13.01	16.31	1319.92	12.80	6.09	2.69
10-Mar-89	08:28:00	31.80	13.02	16.31	1334.92	12.70	6.08	2.69

Table A6 (continued)
Pumping Test Drawdown Water Level Data
Williams Little Cypress Farm

DATE	TIME	Transducer Submergence TP-20	M-60	M-500	Test Time (min)	TP-20 Drawdown (ft)	M-60 Drawdown (ft)	M-500 Drawdown (ft)
10-Mar-89	08:43:00	31.80	13.02	16.31	1349.92	12.70	6.08	2.69
10-Mar-89	08:58:00	31.70	12.98	16.30	1364.92	12.80	6.12	2.70
10-Mar-89	09:13:00	31.70	13.01	16.30	1379.92	12.80	6.09	2.70
10-Mar-89	09:28:00	31.60	12.95	16.28	1394.92	12.90	6.15	2.72
10-Mar-89	09:43:00	31.60	12.96	16.27	1409.92	12.90	6.14	2.73
10-Mar-89	09:58:00	31.70	12.98	16.27	1424.92	12.80	6.12	2.73
10-Mar-89	10:13:00	31.70	13.00	16.29	1439.92	12.80	6.10	2.71
10-Mar-89	10:15:00	31.70	12.99	16.28	1441.92	12.80	6.11	2.72
10-Mar-89	10:17:00	31.70	13.00	16.28	1443.92	12.80	6.10	2.72
10-Mar-89	11:17:00	31.50	12.90	16.07	1503.92	13.00	6.20	2.93
10-Mar-89	12:17:00	31.50	12.92	16.12	1563.92	13.00	6.18	2.88
10-Mar-89	13:17:00	31.60	13.02	16.18	1623.92	12.90	6.08	2.82
10-Mar-89	14:17:00	31.70	13.06	16.20	1683.92	12.80	6.04	2.80
10-Mar-89	15:17:00	31.70	13.04	16.21	1743.92	12.80	6.06	2.79
10-Mar-89	16:17:00	31.70	13.06	16.22	1803.92	12.80	6.04	2.78
10-Mar-89	17:17:00	31.70	13.05	16.22	1863.92	12.80	6.05	2.78
10-Mar-89	18:17:00	31.70	13.09	16.24	1923.92	12.80	6.01	2.76
10-Mar-89	19:17:00	31.70	13.07	16.24	1983.92	12.80	6.03	2.76
10-Mar-89	20:17:00	31.70	13.08	16.24	2043.92	12.80	6.02	2.76
10-Mar-89	21:17:00	31.60	13.06	16.25	2103.92	12.90	6.04	2.75
10-Mar-89	22:17:00	31.60	13.04	16.25	2163.92	12.90	6.06	2.75
10-Mar-89	22:17:00	31.80	13.14	16.28	2163.92	12.70	5.96	2.72
11-Mar-89	00:17:00	31.80	13.14	16.29	2283.92	12.70	5.96	2.71
11-Mar-89	01:17:00	31.80	13.12	16.29	2343.92	12.70	5.98	2.71
11-Mar-89	02:17:00	31.80	13.13	16.29	2403.92	12.70	5.97	2.71
11-Mar-89	03:17:00	31.70	13.12	16.29	2463.92	12.80	5.98	2.71
11-Mar-89	04:17:00	31.50	13.02	16.26	2523.92	13.00	6.08	2.74
11-Mar-89	05:17:00	31.70	13.08	16.26	2583.92	12.80	6.02	2.74
11-Mar-89	06:17:00	31.80	13.13	16.29	2643.92	12.70	5.97	2.71
11-Mar-89	07:17:00	31.70	13.09	16.27	2703.92	12.80	6.01	2.73
11-Mar-89	08:17:00	31.80	13.13	16.27	2763.92	12.70	5.97	2.73
11-Mar-89	09:17:00	31.60	13.09	16.24	2823.92	12.90	6.01	2.76
11-Mar-89	10:17:00	31.70	13.10	16.24	2883.92	12.80	6.00	2.76
11-Mar-89	11:17:00	31.70	13.10	16.22	2943.92	12.80	6.00	2.78
11-Mar-89	12:17:00	31.70	13.09	16.21	3003.92	12.80	6.01	2.79
11-Mar-89	13:17:00	31.80	13.16	16.24	3063.92	12.70	5.94	2.76
11-Mar-89	14:17:00	31.90	13.17	16.24	3123.92	12.60	5.93	2.76
11-Mar-89	15:17:00	31.70	13.10	16.21	3183.92	12.80	6.00	2.79
11-Mar-89	16:17:00	31.80	13.17	16.23	3243.92	12.70	5.93	2.77
11-Mar-89	17:17:00	31.80	13.14	16.22	3303.92	12.70	5.96	2.78
11-Mar-89	18:17:00	31.70	13.11	16.21	3363.92	12.80	5.99	2.79
11-Mar-89	19:17:00	31.70	13.12	16.22	3423.92	12.80	5.98	2.78
11-Mar-89	20:17:00	31.60	13.08	16.22	3483.92	12.90	6.02	2.78
11-Mar-89	21:17:00	31.60	13.09	16.22	3543.92	12.90	6.01	2.78
11-Mar-89	22:17:00	31.70	13.13	16.24	3603.92	12.80	5.97	2.76
11-Mar-89	22:17:00	31.80	13.16	16.25	3603.92	12.70	5.94	2.75
12-Mar-89	00:17:00	31.70	13.11	16.24	3723.92	12.80	5.99	2.76

Table A6 (continued)
Pumping Test Drawdown Water Level Data
Williams Little Cypress Farm

DATE	TIME	Transducer Submergence TP-20	M-60	M-500	Test Time (min)	TP-20 Drawdown (ft)	M-60 Drawdown (ft)	M-500 Drawdown (ft)
12-Mar-89	01:17:00	31.80	13.15	16.25	3783.92	12.70	5.95	2.75
12-Mar-89	02:17:00	31.70	13.13	16.24	3843.92	12.80	5.97	2.76
12-Mar-89	03:17:00	31.90	13.20	16.27	3903.92	12.60	5.90	2.73
12-Mar-89	04:17:00	31.70	13.10	16.24	3963.92	12.80	6.00	2.76
12-Mar-89	05:17:00	31.70	13.10	16.23	4023.92	12.80	6.00	2.77
12-Mar-89	06:17:00	31.80	13.15	16.24	4083.92	12.70	5.95	2.76
12-Mar-89	07:17:00	31.70	13.12	16.23	4143.92	12.80	5.98	2.77
12-Mar-89	08:17:00	31.50	13.06	16.21	4203.92	13.00	6.04	2.79
12-Mar-89	09:17:00	31.60	13.05	16.19	4263.92	12.90	6.05	2.81
12-Mar-89	10:17:00	31.50	13.04	16.18	4323.92	13.00	6.06	2.82
12-Mar-89	11:17:00	31.50	13.04	16.17	4383.92	13.00	6.06	2.83

Table A7
Pumping Test Recovery Water Level Data

Williams Little Cypress Farm
Project FCR27306.A0

Data from Envirolabs Data Recorder

Values are depth in feet of transducer
Unless otherwise noted

		Transducer Submergence			Test Time	Recovery Time	TP-20 Drawdown	M-60 Drawdown	M-500 Drawdown
DATE	TIME	TP-20	M-60	M-500	(min)	(min)	(ft)	(ft)	(ft)
12-Mar-89	12:24:58	31.50	13.04	16.17	4451.88	0.00	0.00	0.00	0.00
12-Mar-89	12:25:01	31.80	13.11	16.17	4451.93	0.05	0.30	0.07	0.00
12-Mar-89	12:25:04	33.30	13.17	16.18	4451.98	0.10	1.80	0.13	0.01
12-Mar-89	12:25:07	37.60	13.55	16.18	4452.03	0.15	6.10	0.51	0.01
12-Mar-89	12:25:10	40.90	14.41	16.18	4452.08	0.20	9.40	1.37	0.01
12-Mar-89	12:25:13	41.80	15.18	16.18	4452.13	0.25	10.30	2.14	0.01
12-Mar-89	12:25:16	41.80	15.44	16.18	4452.18	0.30	10.30	2.40	0.01
12-Mar-89	12:25:19	42.10	15.54	16.20	4452.23	0.35	10.60	2.50	0.03
12-Mar-89	12:25:22	42.30	15.77	16.22	4452.28	0.40	10.80	2.73	0.05
12-Mar-89	12:25:25	42.40	15.95	16.24	4452.33	0.45	10.90	2.91	0.07
12-Mar-89	12:25:28	42.50	16.01	16.26	4452.38	0.50	11.00	2.97	0.09
12-Mar-89	12:25:31	42.60	16.13	16.28	4452.43	0.55	11.10	3.09	0.11
12-Mar-89	12:25:34	42.70	16.26	16.31	4452.48	0.60	11.20	3.22	0.14
12-Mar-89	12:25:37	42.50	16.31	16.32	4452.53	0.65	11.00	3.27	0.15
12-Mar-89	12:25:40	42.20	16.30	16.35	4452.58	0.70	10.70	3.26	0.18
12-Mar-89	12:25:43	42.00	16.28	16.37	4452.63	0.75	10.50	3.24	0.20
12-Mar-89	12:25:46	41.90	16.26	16.39	4452.68	0.80	10.40	3.22	0.22
12-Mar-89	12:25:49	41.70	16.25	16.42	4452.73	0.85	10.20	3.21	0.25
12-Mar-89	12:25:52	41.80	16.25	16.44	4452.78	0.90	10.30	3.21	0.27
12-Mar-89	12:25:55	41.80	16.29	16.46	4452.83	0.95	10.30	3.25	0.29
12-Mar-89	12:25:58	41.80	16.31	16.48	4452.88	1.00	10.30	3.27	0.31
12-Mar-89	12:26:01	41.70	16.32	16.50	4452.93	1.05	10.20	3.28	0.33
12-Mar-89	12:26:31	42.00	16.55	16.65	4453.43	1.55	10.50	3.51	0.48
12-Mar-89	12:27:01	42.10	16.73	16.77	4453.93	2.05	10.60	3.69	0.60
12-Mar-89	12:27:31	42.30	16.89	16.88	4454.43	2.55	10.80	3.85	0.71
12-Mar-89	12:28:01	42.40	17.01	16.96	4454.93	3.05	10.90	3.97	0.79
12-Mar-89	12:28:31	42.50	17.11	17.03	4455.43	3.55	11.00	4.07	0.86
12-Mar-89	12:29:01	42.60	17.21	17.10	4455.93	4.05	11.10	4.17	0.93
12-Mar-89	12:29:31	42.70	17.29	17.16	4456.43	4.55	11.20	4.25	0.99
12-Mar-89	12:30:01	42.80	17.37	17.22	4456.93	5.05	11.30	4.33	1.05
12-Mar-89	12:30:31	42.80	17.44	17.27	4457.43	5.55	11.30	4.40	1.10
12-Mar-89	12:31:01	42.90	17.50	17.32	4457.93	6.05	11.40	4.46	1.15
12-Mar-89	12:32:01	43.00	17.61	17.40	4458.93	7.05	11.50	4.57	1.23
12-Mar-89	12:33:01	43.20	17.72	17.48	4459.93	8.05	11.70	4.68	1.31
12-Mar-89	12:34:01	43.30	17.80	17.55	4460.93	9.05	11.80	4.76	1.38
12-Mar-89	12:35:01	43.30	17.88	17.61	4461.93	10.05	11.80	4.84	1.44
12-Mar-89	12:36:01	43.40	17.96	17.67	4462.93	11.05	11.90	4.92	1.50
12-Mar-89	12:37:01	43.50	18.03	17.72	4463.93	12.05	12.00	4.99	1.55
12-Mar-89	12:38:01	43.50	18.09	17.78	4464.93	13.05	12.00	5.05	1.61
12-Mar-89	12:39:01	43.60	18.14	17.82	4465.93	14.05	12.10	5.10	1.65

Table A7 (continued)
Pumping Test Recovery Water Level Data

Williams Little Cypress Farm

		Transducer Submergence			Test Time	Recovery Time	TP-20 Drawdown	M-60 Drawdown	M-500 Drawdown
DATE	TIME	TP-20	M-60	M-500	(min)	(min)	(ft)	(ft)	(ft)
12-Mar-89	12:40:01	43.60	18.18	17.85	4466.93	15.05	12.10	5.14	1.68
12-Mar-89	12:41:01	43.70	18.23	17.90	4467.93	16.05	12.20	5.19	1.73
12-Mar-89	12:42:01	43.70	18.27	17.93	4468.93	17.05	12.20	5.23	1.76
12-Mar-89	12:43:01	43.80	18.31	17.97	4469.93	18.05	12.30	5.27	1.80
12-Mar-89	12:44:01	43.80	18.35	17.99	4470.93	19.05	12.30	5.31	1.82
12-Mar-89	12:45:01	43.80	18.38	18.03	4471.93	20.05	12.30	5.34	1.86
12-Mar-89	12:50:01	43.90	18.51	18.14	4476.93	25.05	12.40	5.47	1.97
12-Mar-89	12:55:01	44.10	18.61	18.23	4481.93	30.05	12.60	5.57	2.06
12-Mar-89	13:00:01	44.10	18.68	18.30	4486.93	35.05	12.60	5.64	2.13
12-Mar-89	13:05:01	44.20	18.74	18.35	4491.93	40.05	12.70	5.70	2.18
12-Mar-89	13:10:01	44.20	18.78	18.39	4496.93	45.05	12.70	5.74	2.22
12-Mar-89	13:15:01	44.30	18.81	18.42	4501.93	50.05	12.80	5.77	2.25
12-Mar-89	13:20:01	44.30	18.85	18.45	4506.93	55.05	12.80	5.81	2.28
12-Mar-89	13:25:01	44.30	18.87	18.47	4511.93	60.05	12.80	5.83	2.30
12-Mar-89	13:30:01	44.30	18.89	18.49	4516.93	65.05	12.80	5.85	2.32
12-Mar-89	13:35:01	44.40	18.91	18.51	4521.93	70.05	12.90	5.87	2.34
12-Mar-89	13:40:01	44.40	18.93	18.53	4526.93	75.05	12.90	5.89	2.36
12-Mar-89	13:45:01	44.40	18.94	18.54	4531.93	80.05	12.90	5.90	2.37
12-Mar-89	13:50:01	44.40	18.95	18.55	4536.93	85.05	12.90	5.91	2.38
12-Mar-89	13:55:01	44.40	18.96	18.56	4541.93	90.05	12.90	5.92	2.39
12-Mar-89	14:00:01	44.40	18.97	18.57	4546.93	95.05	12.90	5.93	2.40
12-Mar-89	14:16:00	44.40	19.00	18.61	4562.92	111.03	12.90	5.96	2.44
12-Mar-89	14:31:00	44.50	19.01	18.62	4577.92	126.03	13.00	5.97	2.45
12-Mar-89	14:46:00	44.50	19.03	18.64	4592.92	141.03	13.00	5.99	2.47
12-Mar-89	15:01:00	44.50	19.04	18.65	4607.92	156.03	13.00	6.00	2.48
12-Mar-89	15:16:00	44.50	19.05	18.67	4622.92	171.03	13.00	6.01	2.50
12-Mar-89	15:31:00	44.50	19.06	18.68	4637.92	186.03	13.00	6.02	2.51
12-Mar-89	15:46:00	44.50	19.06	18.68	4652.92	201.03	13.00	6.02	2.51
12-Mar-89	16:01:00	44.50	19.06	18.69	4667.92	216.03	13.00	6.02	2.52
12-Mar-89	16:16:00	44.50	19.07	18.70	4682.92	231.03	13.00	6.03	2.53
12-Mar-89	16:31:00	44.50	19.08	18.71	4697.92	246.03	13.00	6.04	2.54
12-Mar-89	16:46:00	44.50	19.08	18.71	4712.92	261.03	13.00	6.04	2.54
12-Mar-89	17:01:00	44.50	19.08	18.72	4727.92	276.03	13.00	6.04	2.55
12-Mar-89	17:16:00	44.50	19.08	18.73	4742.92	291.03	13.00	6.04	2.56
12-Mar-89	17:31:00	44.50	19.08	18.73	4757.92	306.03	13.00	6.04	2.56
12-Mar-89	17:46:00	44.50	19.09	18.74	4772.92	321.03	13.00	6.05	2.57
12-Mar-89	18:01:00	44.50	19.09	18.74	4787.92	336.03	13.00	6.05	2.57
12-Mar-89	18:16:00	44.50	19.09	18.75	4802.92	351.03	13.00	6.05	2.58
12-Mar-89	18:31:00	44.50	19.09	18.75	4817.92	366.03	13.00	6.05	2.58
12-Mar-89	18:46:00	44.50	19.09	18.76	4832.92	381.03	13.00	6.05	2.59
12-Mar-89	19:01:00	44.50	19.09	18.77	4847.92	396.03	13.00	6.05	2.60
12-Mar-89	19:16:00	44.50	19.10	18.78	4862.92	411.03	13.00	6.06	2.61
12-Mar-89	19:31:00	44.50	19.10	18.79	4877.92	426.03	13.00	6.06	2.62
12-Mar-89	19:46:00	44.50	19.09	18.79	4892.92	441.03	13.00	6.05	2.62
12-Mar-89	20:01:00	44.50	19.10	18.80	4907.92	456.03	13.00	6.06	2.63
12-Mar-89	20:16:00	44.50	19.09	18.80	4922.92	471.03	13.00	6.05	2.63
12-Mar-89	20:31:00	44.50	19.10	18.81	4937.92	486.03	13.00	6.06	2.64

Table A7 (continued)
Pumping Test Recovery Water Level Data

Williams Little Cypress Farm

DATE	TIME	Transducer Submergence TP-20	M-60	M-500	Test Time (min)	Recovery Time (min)	TP-20 Drawdown (ft)	M-60 Drawdown (ft)	M-500 Drawdown (ft)
12-Mar-89	20:46:00	44.50	19.09	18.81	4952.92	501.03	13.00	6.05	2.64
12-Mar-89	21:01:00	44.50	19.10	18.81	4967.92	516.03	13.00	6.06	2.64
12-Mar-89	21:16:00	44.50	19.10	18.81	4982.92	531.03	13.00	6.06	2.64
12-Mar-89	21:31:00	44.50	19.10	18.82	4997.92	546.03	13.00	6.06	2.65
12-Mar-89	21:46:00	44.50	19.10	18.82	5012.92	561.03	13.00	6.06	2.65
12-Mar-89	22:01:00	44.50	19.10	18.83	5027.92	576.03	13.00	6.06	2.66
12-Mar-89	22:16:00	44.50	19.10	18.83	5042.92	591.03	13.00	6.06	2.66
12-Mar-89	22:31:00	44.50	19.10	18.83	5057.92	606.03	13.00	6.06	2.66
12-Mar-89	22:46:00	44.50	19.11	18.84	5072.92	621.03	13.00	6.07	2.67
12-Mar-89	23:01:00	44.50	19.11	18.85	5087.92	636.03	13.00	6.07	2.68
12-Mar-89	23:16:00	44.50	19.11	18.85	5102.92	651.03	13.00	6.07	2.68
12-Mar-89	23:31:00	44.50	19.11	18.85	5117.92	666.03	13.00	6.07	2.68
12-Mar-89	23:31:00	44.50	19.11	18.86	5117.92	666.03	13.00	6.07	2.69
13-Mar-89	00:01:00	44.50	19.11	18.86	5147.92	696.03	13.00	6.07	2.69
13-Mar-89	00:16:00	44.50	19.11	18.86	5162.92	711.03	13.00	6.07	2.69
13-Mar-89	00:31:00	44.50	19.11	18.87	5177.92	726.03	13.00	6.07	2.70
13-Mar-89	00:46:00	44.50	19.11	18.87	5192.92	741.03	13.00	6.07	2.70
13-Mar-89	01:01:00	44.50	19.11	18.87	5207.92	756.03	13.00	6.07	2.70
13-Mar-89	01:16:00	44.50	19.11	18.87	5222.92	771.03	13.00	6.07	2.70
13-Mar-89	01:31:00	44.50	19.12	18.87	5237.92	786.03	13.00	6.08	2.70
13-Mar-89	01:46:00	44.50	19.12	18.88	5252.92	801.03	13.00	6.08	2.71
13-Mar-89	02:01:00	44.50	19.12	18.88	5267.92	816.03	13.00	6.08	2.71
13-Mar-89	02:16:00	44.50	19.12	18.89	5282.92	831.03	13.00	6.08	2.72
13-Mar-89	02:31:00	44.50	19.12	18.89	5297.92	846.03	13.00	6.08	2.72
13-Mar-89	02:46:00	44.50	19.12	18.89	5312.92	861.03	13.00	6.08	2.72
13-Mar-89	03:01:00	44.50	19.12	18.89	5327.92	876.03	13.00	6.08	2.72
13-Mar-89	03:16:00	44.50	19.13	18.90	5342.92	891.03	13.00	6.09	2.73
13-Mar-89	03:31:00	44.50	19.12	18.90	5357.92	906.03	13.00	6.08	2.73
13-Mar-89	03:46:00	44.50	19.12	18.90	5372.92	921.03	13.00	6.08	2.73
13-Mar-89	04:01:00	44.50	19.12	18.90	5387.92	936.03	13.00	6.08	2.73
13-Mar-89	04:16:00	44.50	19.12	18.90	5402.92	951.03	13.00	6.08	2.73
13-Mar-89	04:31:00	44.50	19.12	18.90	5417.92	966.03	13.00	6.08	2.73
13-Mar-89	04:46:00	44.50	19.12	18.90	5432.92	981.03	13.00	6.08	2.73
13-Mar-89	05:01:00	44.50	19.12	18.90	5447.92	996.03	13.00	6.08	2.73
13-Mar-89	05:16:00	44.50	19.11	18.90	5462.92	1011.03	13.00	6.07	2.73
13-Mar-89	05:31:00	44.50	19.11	18.90	5477.92	1026.03	13.00	6.07	2.73
13-Mar-89	05:46:00	44.50	19.11	18.90	5492.92	1041.03	13.00	6.07	2.73
13-Mar-89	06:01:00	44.50	19.11	18.90	5507.92	1056.03	13.00	6.07	2.73
13-Mar-89	06:16:00	44.50	19.11	18.90	5522.92	1071.03	13.00	6.07	2.73
13-Mar-89	06:31:00	44.50	19.11	18.90	5537.92	1086.03	13.00	6.07	2.73
13-Mar-89	06:46:00	44.50	19.11	18.91	5552.92	1101.03	13.00	6.07	2.74
13-Mar-89	07:01:00	44.50	19.11	18.91	5567.92	1116.03	13.00	6.07	2.74
13-Mar-89	07:16:00	44.50	19.11	18.90	5582.92	1131.03	13.00	6.07	2.73
13-Mar-89	07:31:00	44.50	19.11	18.91	5597.92	1146.03	13.00	6.07	2.74
13-Mar-89	07:46:00	44.50	19.11	18.91	5612.92	1161.03	13.00	6.07	2.74
13-Mar-89	08:01:00	44.50	19.11	18.91	5627.92	1176.03	13.00	6.07	2.74
13-Mar-89	08:16:00	44.50	19.11	18.91	5642.92	1191.03	13.00	6.07	2.74

Table A8
Misc. Data
Collected During Pumping Test

Williams Little Cypress Farm
FCR27306.A0

Measurements made with chalked steel tape

DATE	TIME	WELL	HOLD (ft)	WET (ft)	DTWL (ft)	DRAWDOWN (ft)	REMARKS
10-Mar-89	09:48	MW-500	158	152.17	5.83		
10-Mar-89	10:13	-	-	-	-		START TEST
11-Mar-89	10:21	MW-500	160	151.40	8.60	2.77	
12-Mar-89	10:47	MW-500	161	152.38	8.62	2.79	
13-Mar-89	12:04	MW-500	163	154.31	8.69	2.86	
13-Mar-89	12:25	-	-	-	-		END TEST
14-Mar-89	09:26	MW-500	158	152.03	5.97		
10-Mar-89	09:50	MW-60	158	152.24	5.76		
10-Mar-89	10:13	-	-	-	-		START TEST
11-Mar-89	10:03	MW-60	164	152.05	11.95	6.19	
12-Mar-89	10:45	MW-60	163	151.16	11.84	6.08	
13-Mar-89	12:07	MW-60	164	152.18	11.82	6.06	
13-Mar-89	12:25	-	-	-	-		END TEST
14-Mar-89	09:24	MW-60	157	151.23	5.77		
10-Mar-89	09:39	TP-19	156	151.24	4.76		
10-Mar-89	10:13	-	-	-	-		START TEST
11-Mar-89	10:30	TP-19	157	152.18	4.82	0.06	
12-Mar-89	10:56	TP-19	156	151.15	4.85	0.09	
13-Mar-89	11:50	TP-19	157	151.60	5.40	0.64	
13-Mar-89	12:25	-	-	-	-		END TEST
14-Mar-89	09:30	TP-19	156	151.16	4.84		

Table A8 (continued)
Misc. Data
Collected During Pumping Test

Williams Little Cypress Farm
FCR27306.A0

DATE	TIME	WELL	HOLD (ft)	WET (ft)	DTWL (ft)	DRAWDOWN (ft)	REMARKS
10-Mar-89	09:55	WT-1	161	156.32	4.68		
10-Mar-89	10:13	-	-	-	-		START TEST
10-Mar-89	10:26	WT-1	157	152.08	4.92	0.24	
10-Mar-89	10:29	WT-1	158	153.07	4.93	0.25	
10-Mar-89	10:36	WT-1	158	153.03	4.97	0.29	
10-Mar-89	10:43	WT-1	158	153.00	5.00	0.32	
10-Mar-89	10:49	WT-1	158	152.99	5.01	0.33	
10-Mar-89	11:07	WT-1	158	152.97	5.03	0.35	
10-Mar-89	11:20	WT-1	158	152.95	5.05	0.37	
11-Mar-89	10:03	WT-1	158	152.43	5.57	0.89	
12-Mar-89	10:43	WT-1	157	151.03	5.97	1.29	
13-Mar-89	12:09	WT-1	158	151.60	6.40	1.72	
13-Mar-89	12:25	-	-	-	-		END TEST
13-Mar-89	12:27	WT-1	158	151.62	6.38	0.02	
13-Mar-89	12:28	WT-1	158	151.66	6.34	0.06	
13-Mar-89	12:30	WT-1	158	151.71	6.29	0.11	
13-Mar-89	12:32	WT-1	158	151.76	6.24	0.16	
13-Mar-89	12:35	WT-1	158	151.80	6.20	0.20	
13-Mar-89	12:39	WT-1	158	151.85	6.15	0.25	
13-Mar-89	12:44	WT-1	158	151.99	6.01	0.39	
13-Mar-89	12:53	WT-1	158	152.19	5.81	0.59	
13-Mar-89	13:03	WT-1	158	152.32	5.68	0.72	
14-Mar-89	09:22	WT-1	156	150.80	5.20		
10-Mar-89	09:33	W-12	160	152.47	7.53		
10-Mar-89	10:13	-	-	-	-		START TEST
12-Mar-89	11:08	W-12	163	152.74	10.26	4.50	
13-Mar-89	11:55	W-12	160	151.60	8.40	2.64	
13-Mar-89	12:25	-	-	-	-		END TEST
14-Mar-89	09:41	W-12	165	153.25	11.75		
10-Mar-89	09:24	W-25	160	154.31	5.69		
10-Mar-89	10:13	-	-	-	-		START TEST
11-Mar-89	10:26	W-25	157	151.13	5.87	0.18	
12-Mar-89	10:52	W-25	157	151.08	5.92	0.23	
13-Mar-89	11:59	W-25	159	153.26	5.74	0.05	
13-Mar-89	12:25	-	-	-	-		END TEST
14-Mar-89	09:35	W-25	158	151.90	6.10		

Table A9
Step-Test Analysis

Williams Little Cypress Farm

WELL TP-19
==========

Step	Pumping Rate (gpm)	Observed Drawdown (ft)	Calculated Specific Drawdown (ft/gpm)	Calculated Well Losses (ft)	Corrected Drawdown (ft)	Corrected Specific Capacity (gpm/ft)	Estimated Transmissivity (gpd/ft)
1	920	9.71	0.0106	1.29	8.4	109	218000
2	1126	12.44	0.0110	1.94	10.5	107	214000
3	1408	15.95	0.0113	3.03	12.9	109	218000
4	1674	19.71	0.0118	4.28	15.4	108	216000

C = 1.527E-06

WELL TP-20
==========

Step	Pumping Rate (gpm)	Observed Drawdown (ft)	Calculated Specific Drawdown (ft/gpm)	Calculated Well Losses (ft)	Corrected Drawdown (ft)	Corrected Specific Capacity (gpm/ft)	Estimated Transmissivity (gpd/ft)
1	800	7.3	0.0091	0.49	6.8	117	234000
2	1000	8.38	0.0084	0.77	7.6	131	262000
3	1200	10.14	0.0085	1.10	9.0	133	266000
4	1400	12.15	0.0087	1.50	10.7	131	262000
5	1600	14.1	0.0088	1.96	12.1	132	264000

C = 7.650E-07

TP-19

STEP-TEST DATA

CH2M HILL

PUMPING TEST REPORT

PROJECT NO. FCR27306.A0

WELL TP-19 PUMPING/~~OBSERVATION~~ WELL

TYPE OF DATA DRAWDOWN/~~RECOVERY~~

PUMPED WELL NO. TP-19 RADIUS 0.50 M.P. FOR WL's TC EL LS ±

PUMPING RATES 920, 1126, 1408, 1674 PUMP ON: DATE 3/14/89 TIME 10 20

HOW Q MEASURED Flowmeter PUMP OFF: DATE 3/24/89 TIME 15 11

HOW WL's MEASURED chalked steel tape COMMENTS

DISTANCE FROM PUMPED WELL

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'		WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAWDOWN (ft)	ADJUSTED DRAWDOWN (ft)	REMARKS
1200	110	50	170	153.19	16.81			
1218	118	58	170	153.16	16.84	12.44		Q/s = 90.5 gpm/ft
1220	120	0						Increase Rate-Step 3
1222:30	122	2.5	175	154.91	20.09			
1224:30	124.5	4.5	175	154.89	20.11			
1226	126	6	175	154.87	20.13			
1230	130	10	175	154.72	20.28			
1235	135	15	175	154.77	20.23			
1240	140	20	175	154.71	20.29			
1250	150	30	175	154.70	20.30			
1300	160	40	175	154.64	20.36			
1310	170	50	175	154.65	20.35	15.95		Q/s = 88.3 gpm/ft
1320	180	0						Start step 4 Increase Rate
1322	182	2	175	153.48	21.52			
1324	184	4	175	150.96	24.09			
1326	186	6	175	150.95	24.05			
1330	190	10	175	150.89	24.11			
1340	200	20	175	150.88	24.12			
1350	210	30	175	150.89	24.11	19.71		Q/s = 84.9
1400	220	40	175	150.89	24.11	19.71		
1412	232	52	175	151.11				
								Engine probs. during 5th Step
								Data unusable

CH2M HILL

PUMPING TEST REPORT

PROJECT NO. FCR27306.A0

WELL TP-19 PUMPING/~~OBSERVATION~~ WELL

TYPE OF DATA DRAWDOWN/~~RECOVERY~~

PUMPED WELL NO. TP-19 RADIUS 0.50 M.P. FOR WL's TC EL LS

PUMPING RATES 920, 1126, 1408, 1674 PUMP ON: DATE 3/24/89 TIME 10:20

HOW Q MEASURED Flowmeter PUMP OFF: DATE 3/24/89 TIME 1511

HOW WL's MEASURED chalked steel tape COMMENTS

DISTANCE FROM PUMPED WELL 0.50

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'		WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
10:20	0	0	160	155.60	4.40	0		STATIC
10:21	1	1	170	157.95	12.55			START STEP 1
10:22	2	2	170	157.15	12.85			
10:24	4	4	170	156.86	13.14			
10:26	6	6	170	156.67	13.33			
10:28	8	8	170	156.55	13.45			
10:30	10	10	170	156.43	13.57			
10:35	15	15	170	156.29	13.71			
10:40	20	20	170	156.17	13.83			
10:45	25	25	170	156.08	13.92			
10:50	30	30	170	156.00	14.00			
11:01	41	41	170	155.92	14.08			
1110	50	50	170	155.89	14.11	9.71		Q/s = 94.7 gpm/ft
1120	60	60						Increase rate Start Step 2
1122	62	2	170	153.60	16.40			
1124	64	4	170	153.55	16.45			
1126	66	6	170	153.42	16.58			
1128	68	8	170	153.45	16.55			
1130	70	10	170	153.43	16.57			
1135	75	15	170	153.39	16.61			
1140	80	20	170	153.30	16.70			
1150	90	30	170	153.33	16.67			
1200	100	40	170	153.25	16.75			

TP-20

STEP-TEST DATA

CH2M HILL

PUMPING TEST REPORT

PROJECT NO. FCR 27306.A0

WELL TP 20 (PUMPING/OBSERVATION WELL)

TYPE OF DATA DRAWDOWN/RECOVERY

PUMPED WELL NO. TWP-20 RADIUS 12"

PUMPING RATES 800, 1000, 1200, 1400, 1600

HOW Q MEASURED Flow meter

HOW WL's MEASURED M-Scope

DISTANCE FROM PUMPED WELL

M.P. FOR WL's 0.7 ft EL ~19.4

PUMP ON: DATE 3-6-89 TIME 1240

PUMP OFF: DATE 3-6-89 TIME 1756

COMMENTS Length of steps - 1 hr
Orifice size 6", discharge pipe ~130'

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
Time Taken				5.06'			STATIC W/L
1250				11.67			START
1300	10			12.08			15 / 2.92
1310	20			12.28			15 / 2.72
1320	30			12.27			15 / 2.73
1330	40			12.40			15 / 2.60
1340	50			12.36	7.30		15 / 2.54
							STEP #2 @ 1000/GPM
1350				13.37			15 / 1.63
1400				13.39			15 / 1.61 wx Lt yellow ∃ nuticable H2S odor
1410				13.40			15 / 1.60
1420				13.47			15 / 1.53
1430				13.45			15 / 1.55
1440				13.44	8.38		15 / 1.56
							STEP #3 @ 1200/GPM
1450				15.30			20 / 4.70
1500				15.34			20 / 4.66
1510				15.23			15 + .23
1520				15.20			15 + .20
1530				15.19			15 + .19 wx Lt yellow
1540				15.2	10.14		15.2 ∃ slight H_2S odor

PUMPING TEST REPORT

PROJECT NO. FCR 27306.A0

WELL TP 20 (PUMPING) OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY

PUMPED WELL NO. TPW 20 RADIUS 12"

PUMPING RATES 800, 1000, 1200, 1400, 1600

HOW Q MEASURED Flow meter

HOW WL's MEASURED M-Scope

DISTANCE FROM PUMPED WELL

M.P. FOR WL's .7' EL ~19.4

PUMP ON: DATE 3-6-89 TIME 1240

PUMP OFF: DATE 3-6-89 TIME 1756

COMMENTS

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAWDOWN (ft)	ADJUSTED DRAWDOWN (ft)	REMARKS
Time Taken							STEP # 4 @ 1400/GPM
1555				17.09			20 / 2.91
1605				17.17			20 / 2.83
1615				17.21			20 / 2.79 wx Lt. yellow & H2S odor
1625			V	17.23			20 / 2.82
1635				17.24			20 / 2.83
1645				17.21	12.15		20 / 2.79
							STEP # 5 @ 1600/GPM
1700				19.12			20 / .88
1711				19.12			20 / .88
1720				19.14			20 / .86
1730				19.15			20 / .85
1740				19.17			20 / .87
1756				19.16	14.10		20 .86
							@ 2000/GPM
1800				23.25			25 / 1.75
							Pumped @ ~2800/GPM
1824				28.62			for 8 min 30 / 1.38
Recovery							
1900				5.6'			

FORM 362

PUMPING TEST REPORT

PROJECT NO. FCR27386A0

WELL MW-60 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY

PUMPED WELL NO. TPW 20 RADIUS 12"

PUMPING RATES 800, 1000, 1200, 1400, 1600

HOW Q MEASURED Flow meter

HOW WL's MEASURED Steel tape

DISTANCE FROM PUMPED WELL 60 ft

M.P. FOR WL's _____ EL ~19.4

PUMP ON: DATE _____ TIME _____

PUMP OFF: DATE _____ TIME _____

COMMENTS _____

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
							STEP #4 @ 1400/GPM
1555				4.74			5/.26
1605				4.75			5/.25
1615				4.77			5/.23
1625				4.78			5/.22
1635				4.78			5/.22
1645				4.79			5/.21
							STEP #5 @ 1400/GPM
1700				4.82			5.18
1712				4.84			5/.16
1722				4.84			5/.16
1733				4.85			5/.15
1746				4.87			5/.13
1756				4.87			5.13
							@ 2000/GPM
				4.95			6/1.05

FORM 362

PUMPING TEST REPORT

PROJECT NO. Fcr 27306 A0

WELL MW-60 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY

PUMPED WELL NO. TPW-20 RADIUS 12"

PUMPING RATES

HOW Q MEASURED Flow meter

HOW WL's MEASURED M-Scope, steel tape

DISTANCE FROM PUMPED WELL 60 ft.

M.P. FOR WL's 1.7 Ft EL ~19.4

PUMP ON: DATE 3.6.89 TIME 1240

PUMP OFF: DATE TIME

COMMENTS

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS (M.P. = 1.7' M.P. not subtracted from DTW)
				6.05			STATIC W/L
12.53				9.10			10/1.9
1305				9.37			10/1.63
1313				9.50			10/1.5
1324				9.56			10/1.44
1331				9.62			10/1.38
				9.64			10/1.36
1350				10.01			11/1.99 STEP # 2 1000/GPM
1401				10.05			11/1.95
1412				10.09			11/1.91
1422				10.09			11/1.91
1432				10.10			11/1.9
1442				10.12			11/1.88
							STEP # 3 1200/GPM
1452				10.80			12/1.2
1500				10.85			12/1.15
1512				10.86			12/1.14
1522				10.87			12/1.13
1530				10.88			12/1.12
1540							12/1.12

PUMPING TEST REPORT

PROJECT NO. FCR27306A0

WELL WT-1 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY

PUMPED WELL NO. TPW-20 RADIUS 12"

M.P. FOR WL's 0.9Pt EL 419.4

PUMPING RATES

PUMP ON: DATE 03-6-89 TIME 1240

HOW Q MEASURED Flow meter

PUMP OFF: DATE TIME

HOW WL's MEASURED Steel tape

COMMENTS S

DISTANCE FROM PUMPED WELL 10 ft. shallow WT well

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAWDOWN (ft)	ADJUSTED DRAWDOWN (ft)	REMARKS (mP = .7; mP not subtracted from DTW)
				4.33			STATIC W/L
1295				4.50			10/.9 5/.5
1302				4.52			5/.48
1312				4.53			5/.47
1322				4.54			5/.46
1330				4.56			5/.44
				4.57			5/.43
1350				4.59			STEP #2 1000/GPM 5/.41
1400				4.54			5/.46
1411				4.61			5/.39
1421				4.62			5/.38
1431				4.62			5/.38
1440				4.62			5/.38
							STEP #3 1200/GPM
1451				4.62			5/.38
1500				4.67			5/.33
1510				4.68			5/.32
1520				4.69			5/.31
1530				4.70			5.3
1540							5/.3

FORM 362

PUMPING TEST REPORT

PROJECT NO. FCR27306.00

WELL WT-1 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY

PUMPED WELL NO. _____ RADIUS _____

PUMPING RATES _____

HOW Q MEASURED _____

HOW WL's MEASURED _____

DISTANCE FROM PUMPED WELL _____

M.P. FOR WL's _____ EL _____

PUMP ON: DATE _____ TIME _____

PUMP OFF: DATE _____ TIME _____

COMMENTS _____

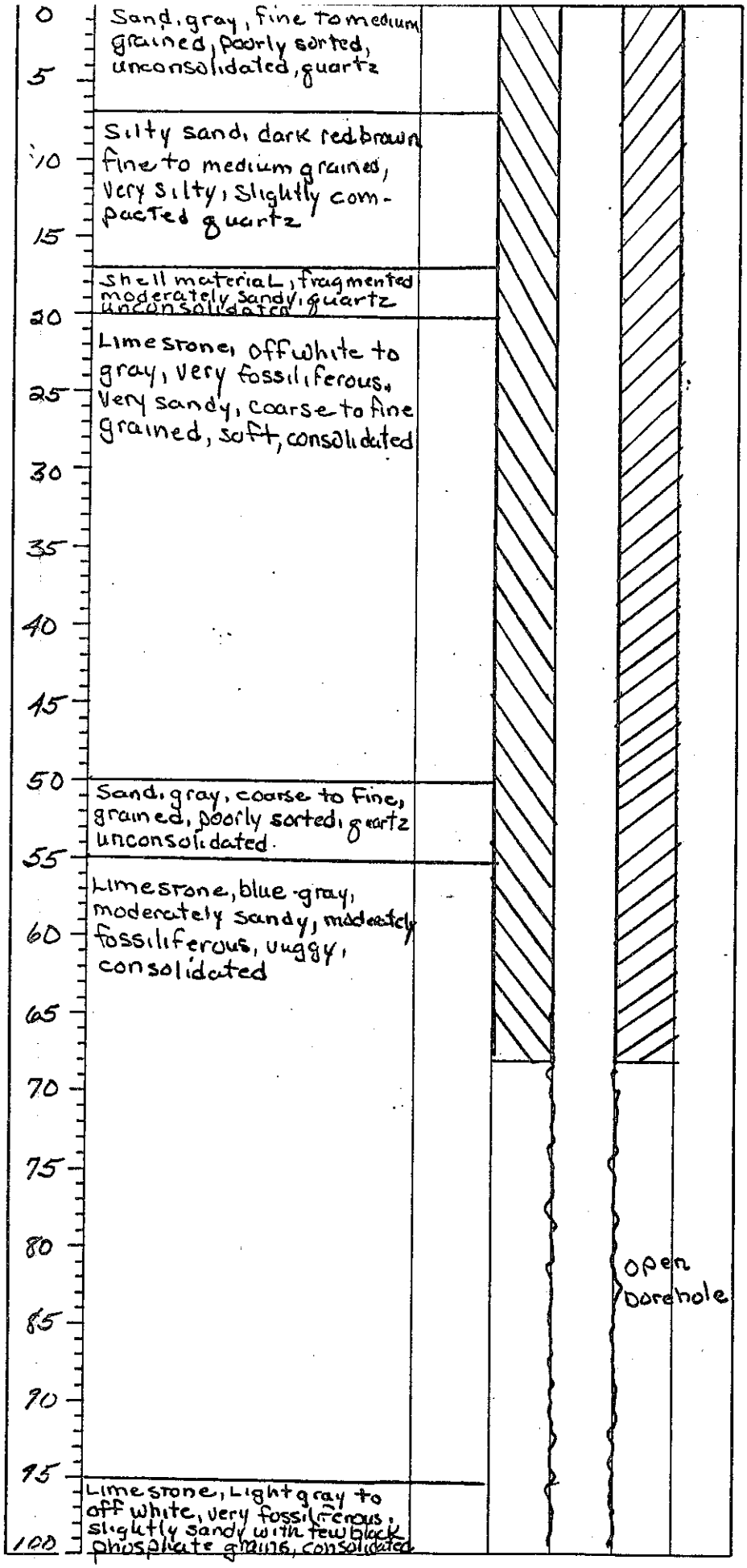
TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
							STEP # 4 @ 1400/GPM
1555				11.60			12/.4
1605				11.62			12/.38
1615				11.62			13/1.38
1625				11.67			13/1.33
1635				11.65			13.0/1.36
1645				11.66			13/1.34
							STEP # 5 @ 1600/GPM
1700				12.41			13/.59
1713				12.45			13/.55
1723				12.43			13/.57
1733				1240			13/.60
1745				12.41			13.59
1755				12.42			13.58
							@ 2000/GPM
				13.88			15.1/1.12

FORM 362

APPENDIX B

TP-19

SOIL BORING LOGS &
WELL DRILLING REPORT



CH2M HILL **WELL DRILLING REPORT**

PROJECT NO. FCR 27306.A2

WELL: TP-19

LOCATION: Williams Farms
Section 19

COUNTY: Hendry STATE: FL

GROUND ELEVATION: _____

DIAMETER: 12"

DEPTH: 150'

STATIC WATER LEVEL: _____

DATE: 3.9.89

CASING: 12" SCH 40 PVC

SCREEN: open borehole

CONSTRUCTION: ROTARY mud / AIR

DRILLER: Bogard Well Drilling
Ft Meyers, FL

DATE FINISHED: 3.9-89

PUMPING TEST

SPECIFIC YIELD _____ gpm/ft @ _____ gpm

WATER ANALYSIS (ppm)

TDS _____

TOTAL HARDNESS[1] _____

M.O. ALKALINITY[1] _____

CHLORIDE Cl _____

IRON Fe _____

SULFATE SO_4 _____

COLOR (APHA) _____

CALCIUM[1] _____

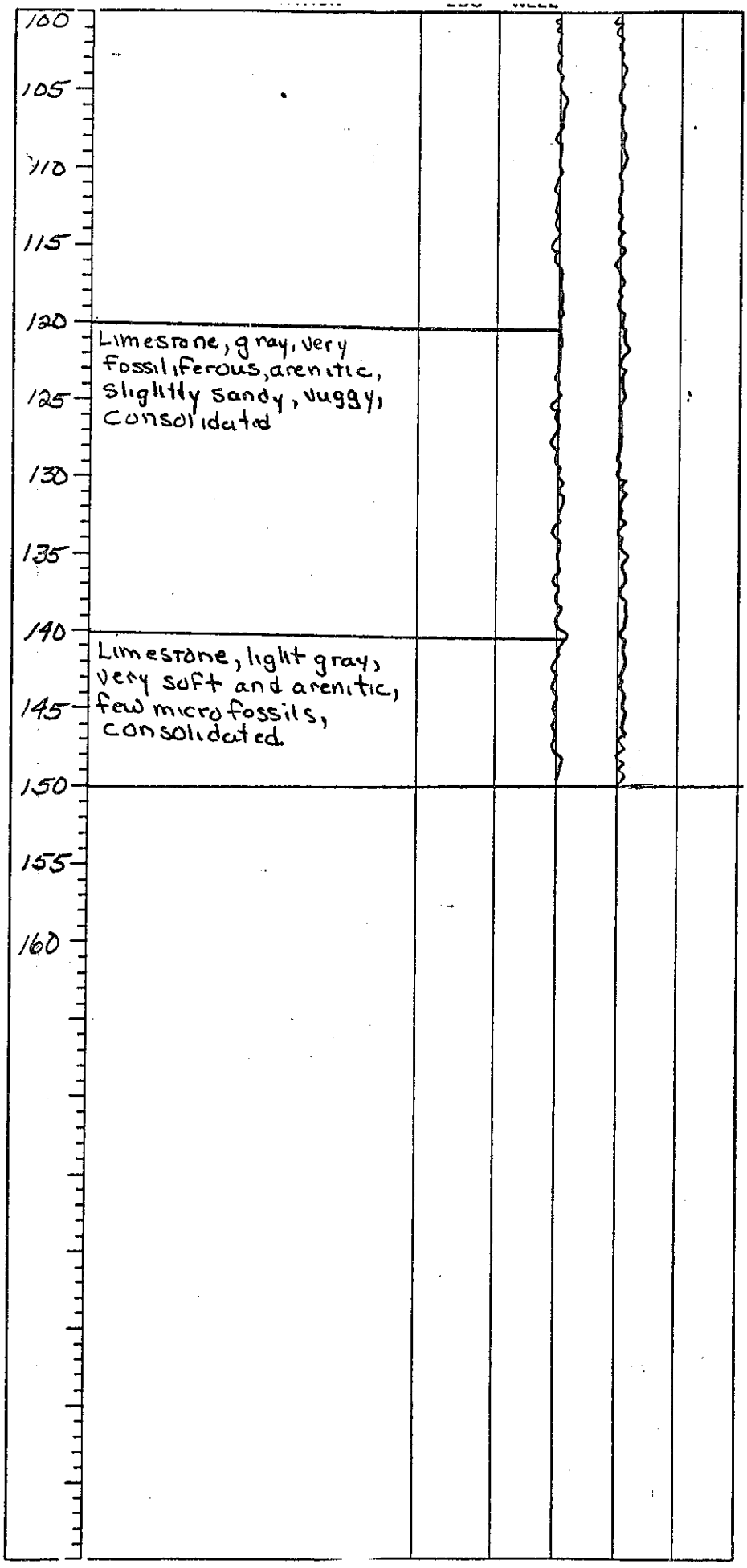
COMMENTS 12" PVC Casing set to 68' BLS Grouted with Portland Type I cement

COMPILED BY P. Trayer

DATE 3.10.89

[1] AS $CaCO_3$

FORM 361



CH2M HILL **WELL DRILLING REPORT**

PROJECT NO. FCR 27306.A

WELL: TP-19

LOCATION: Williams' Farms
Section 19

COUNTY: Hendry STATE: FL

GROUND ELEVATION: _____

DIAMETER: 12"

DEPTH: 150'

STATIC WATER LEVEL: _____

DATE: 3.9.89

CASING: 12" SCH 40 PVC

SCREEN: open borehole

CONSTRUCTION: rotary mud / Air

DRILLER: Bogard Well Drilling
Ft Meyers, FL

DATE FINISHED: 3-9-89

PUMPING TEST

SPECIFIC YIELD _____ gpm/ft @ _____ gpm

WATER ANALYSIS (ppm)

TDS _____

TOTAL HARDNESS[1] _____

M.O. ALKALINITY[1] _____

CHLORIDE Cl _____

IRON Fe _____

SULFATE SO_4 _____

COLOR (APHA) _____

CALCIUM[1] _____

COMMENTS 12" PVC casing
set to 68' BLS

COMPILED BY P. Troyer

DATE 3-10-89

[1] AS $CaCO_3$

FORM 361

CRAHILL

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	TP-19	SHEET 1 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry Co. Sec. 19

ELEVATION _____ DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT Rotary mud Speed STAR 135 ROTARY Rig

WATER LEVEL AND DATE 3-8-89 START 0910 FINISH _____ LOGGER D. Troyer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					Sand, gray, fine to medium grained, poorly sorted, quartz unconsolidated		
5							
	7'				Silty Sand, dark red brown, fine to medium grained, very silty; slightly compacted, quartz.		
10							
	12'				Sand; tan, medium to fine grained, poorly sorted, quartz unconsolidated.		
15							
	17'				Shell material, fragmented, moderately sandy, coarse to fine poorly sorted, quartz, unconsolidated		
20	20'				Limestone; offwhite, very fossiliferous, very sandy, coarse to fine, quartz soft, unconsolidated.		Driller notes Rock @ ~20'
25	25'				limestone, offwhite to gray, very fossiliferous, very sandy, muggy soft, consolidated		Driller calls this soft Rock.
30							

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET
FCR 27306.A0	TP-19	2 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry Co. Sec. 19

ELEVATION _____ DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT ROTARY mud Speed Star 135 ROTARY Rig

WATER LEVEL AND DATE 5-6-89 START 0910 FINISH _____ LOGGER P.T. Troyer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30							
35					Limestone, Light gray, very fossiliferous, very sandy, vuggy consolidated.		
40					Limestone, medium gray, slightly fossiliferous, very sandy, medium to coarse grained, quartz, consolidated		
45					Limestone, medium gray, slightly fossiliferous, very sandy, medium to coarse grained, quartz, consolidated.		
50					Sand, gray, coarse to fine grained, poorly sorted, quartz unconsolidated		
55					Sand. Same as above		
60				Rock	Limestone, blue gray, moderately sandy, moderately fossiliferous, vuggy Consolidated		Driller notes Rock @ ~60'

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET
FCR27306.A0	TP-19	3 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Nendry Co Sec 19

ELEVATION _____ DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT ROTARY Mud - Speed STAR 135 ROTARY Rig

WATER LEVEL AND DATE 3-6-89 START 0910 FINISH _____ LOGGER D. TROYER

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	60					limestone, blue-gray, moderately sandy, moderately fossiliferous, vuggy consolidated		Driller notes this is "blue rock" aquifer formation
	65					limestone, blue, gray, moderately sandy, very fossiliferous, vuggy with a few black phosphate grains, consolidated		Borehole completed to ~68'
	70					limestone, same as above		
	75					limestone, same as above		
	80					Limestone, gray, very fossiliferous, slightly sandy, vuggy, consolidated.		
	85					Limestone, same as above		
	90					Limestone, same as above		

PROJECT NUMBER	BORING NUMBER	
FCR 27306.AC	TP-19	SHEET 4 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Nendry Co. Sec 19

ELEVATION _____ DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT ROTARY mud - Speed STAR 135 ROTARY Rig

WATER LEVEL AND DATE 3-6-89 START 0910 FINISH _____ LOGGER J. Troyer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90					Lime stone, same as above		
95					Limestone, gray to off white, very fossiliferous, slightly sandy consolidated.		
100					Limestone, Light gray to off white, very fossiliferous, slightly sandy, with a few black phosphate grains, consolidated.		
105					Limestone, same as above		
110					Limestone, same as above		
115					Limestone, same as above		
120					Limestone, gray, very fossiliferous, arenitic, slightly sandy with a few black phosphate grains, consolidated		Driller notes increasing amount of water here

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A6	TP-19	SHEET 5 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Nendry Co. Sec 19

ELEVATION _____ DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT Rotary mud Speed STAR 135 ROTARY Rig

WATER LEVEL AND DATE 3-6-89 START 0910 FINISH _____ LOGGER P. Troyer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120					Limestone, gray, very fossiliferous arenitic, slightly sandy, vuggy, consolidated		
125					limestone, same as above		
130					limestone, Light gray, very fossiliferous shell fragments, arenitic, vuggy consolidated.		
135					limestone, same as above		
140					limestone, light gray, arenitic, very fossiliferous, softer, consolidated, shell fragments.		
145					Limestone, Light gray, arenitic slightly fossiliferous, soft consolidated		
150					limestone, Same as above		TD = 150'

REV 11/82 FORM D1586

TP-20

SOIL BORING LOGS &
WELL DRILLING REPORT

Depth	Description	LOG	WELL
0	Sand, light gray, fine to medium, grained, loose dry		
5			
10	Silty Sand, dark red brown fine to medium, grained slightly compacted, quartz		
15	Calcareous Sandstone, gray coarse grained, poorly sorted consolidated		
20	Sand, dark tan, coarse to fine, poorly sorted, small amount of shell fragments unconsolidated, quartz		
25	Shell material, fragmented moderately sandy, coarse to fine quartz, unconsolidated		
30	Clayey Sand, medium tan coarse to fine, small amount of shell fragments calcareous, soft.		
35			
40	Calcareous sandstone, gray coarse to medium grained quartz, consolidated		
45	Sand, greenish gray, medium to coarse grained poorly sorted, small amount of shell fragments few black sand size grains unconsolidated, quartz		
50			
55			
60			
65	Limestone, blue-gray, very fossiliferous, slightly sandy, vuggy, consolidated		
70			steel casing
75			
80			
85			
90	Limestone, gray to off white, very fossiliferous slightly sandy, vuggy, few black phosphate grains, consolidated		open borehole
95			
100			

CH2M HILL **WELL DRILLING REPORT**

PROJECT NO. FCR27306.A0

WELL: TP1-20

LOCATION: Williams Farms
Section 20

COUNTY: Hendry STATE: FL

GROUND ELEVATION: ~ +19.4

DIAMETER: 12" steel to 72'

DEPTH: 154'

STATIC WATER LEVEL:

DATE: 3·2·89

CASING: 12" steel to 71'

SCREEN: open hole

CONSTRUCTION: Cabletool / ROTARY

DRILLER: Bogard Well Drilling
Ft Meyers, FL

DATE FINISHED: 3·2·89

PUMPING TEST

SPECIFIC YIELD _____ gpm/ft @ _____ gpm

WATER ANALYSIS (ppm)

TDS

TOTAL HARDNESS[1]

M.O. ALKALINITY[1]

CHLORIDE Cl

IRON Fe

SULFATE SO_4

COLOR (APHA)

CALCIUM[1]

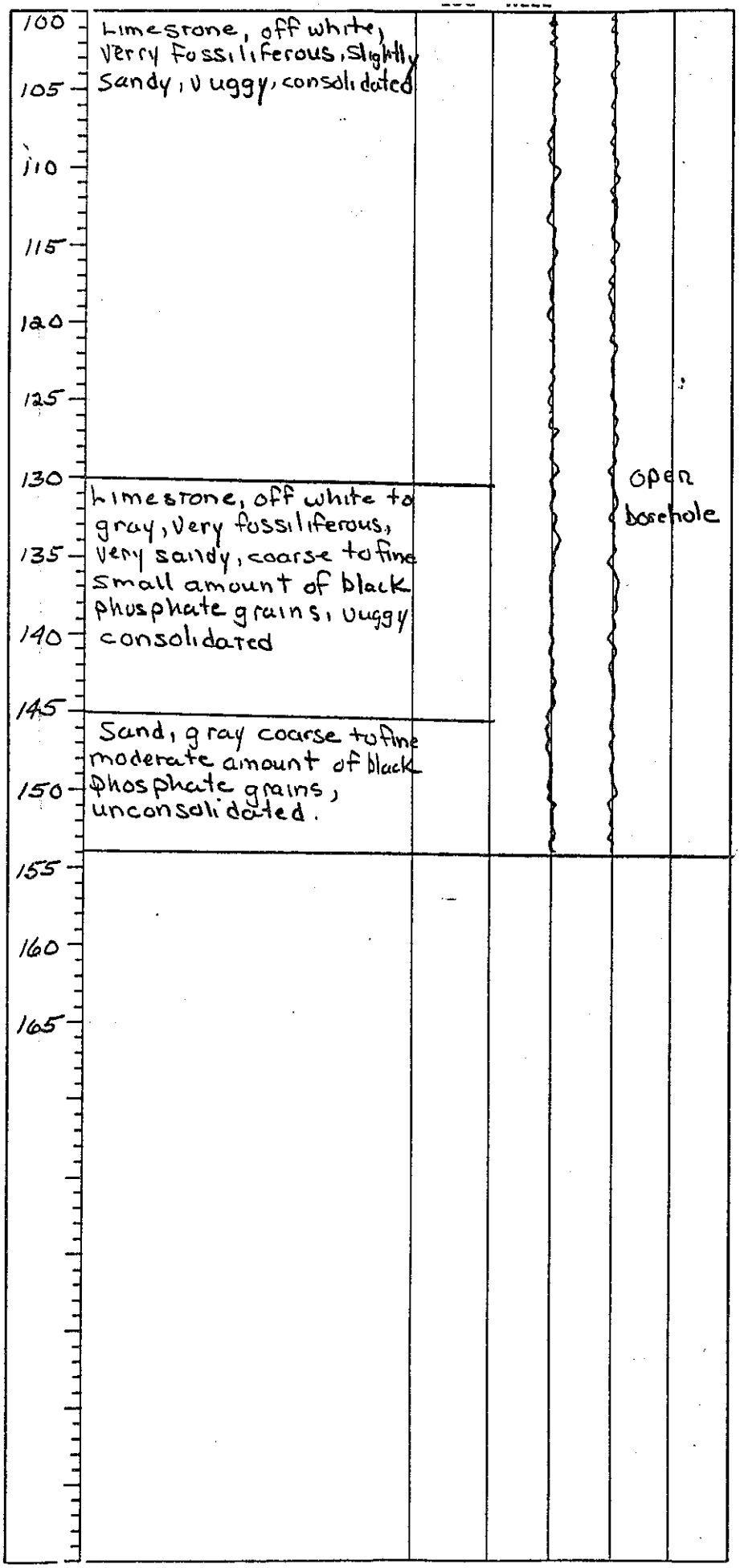
COMMENTS 12" steel casing driven to 71'

COMPILED BY P. Troyer

DATE 3-2-89

[1] AS $CaCO_3$

FORM 361



CH2M HILL **WELL DRILLING REPORT**

PROJECT NO. FCR27306.AC

WELL: TP 20

LOCATION: Williams Farms
Section 20

COUNTY: Hendry STATE: FL

GROUND ELEVATION: ~ +19.4

DIAMETER: 12" steel

DEPTH: 154'

STATIC WATER LEVEL:

DATE: 3.2.89

CASING: 12" steel driven

SCREEN: open hole

CONSTRUCTION: cable tool / rotary

DRILLER: Bogard Well Drilling
Ft. Meyers, FL

DATE FINISHED: 3-2-89

PUMPING TEST

SPECIFIC YIELD _____ gpm/ft @ _____ gpm

WATER ANALYSIS (ppm)

TDS

TOTAL HARDNESS[1]

M.O. ALKALINITY[1]

CHLORIDE Cl

IRON Fe

SULFATE SO_4

COLOR (APHA)

CALCIUM[1]

COMMENTS 12" steel casing driven to 71'

COMPILED BY P. Troyer

DATE 3-2-89

[1] AS $CaCO_3$

FORM 361

CRMHILL

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	TPW 20	SHEET 1 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry County, FL

ELEVATION ~19.4' DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT Cable tool / ROTARY AIR Speed STAR 71 and 135

WATER LEVEL AND DATE 2-28-89 START 1110 FINISH 3-2-89 / 1630 LOGGER P. Troyer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					Sand, light gray, fine to medium grained, loose, dry		
5	6'				Silty Sand, dark red brown, fine to medium grained, slightly compacted, quartz.		
10	10' - 12'				Calcareous sandstone, gray coarse grained, poorly sorted consolidated.		
	13' - 14'				Clayey Sand, greenish gray, soft coarse to fine quartz		
15	15'				Sand, dark tan, coarse to fine poorly sorted, small amount of shell fragments, unconsolidated quartz		
20	20'				Shell material, fragmented, moderately sandy, coarse to fine quartz, unconsolidated		
25	25'				Clayey Sand, medium tan, coarse to fine, few black sand size grains, small amount of shell fragments calcareous, soft		
30							

PROJECT NUMBER	BORING NUMBER	
FCR27306.A0	TP20	SHEET 2 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry County, FL
ELEVATION ~+19.4 DRILLING CONTRACTOR Bogard Well Drilling
DRILLING METHOD AND EQUIPMENT Cable tool/Rotary Air speed star 71 & 135
WATER LEVEL AND DATE 2-28-89 START 1110 FINISH 3-2-89/1630 LOGGER P. Troyer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30					Clayey Sand, same as above		
35	35'				Calcareous Sandstone, gray, coarse to medium grained quartz, consolidated.		
40							
	43'				Sand, gray, coarse to fine, poorly sorted, unconsolidated quartz		
45							
	47'				Sand, greenish gray, medium to coarse grained, poorly sorted Small amount of shell fragments few black sand size grains unconsolidated, quartz		
50							
55					Sand, same as above		
60					Sand, same as above		

PROJECT NUMBER: FCR 27306.A0 | BORING NUMBER: TTP 20 | SHEET 3 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry County, FL

ELEVATION ~+19.4 DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT Cable tool / ROTARY Air, Speed Star 71 & 135

WATER LEVEL AND DATE 2-28-89 START 1110 FINISH 3-2-89/1630 LOGGER P. TROYER

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60	61'				Limestone, blue-gray, very fossiliferous, very sandy, poorly sorted, quartz, vuggy, oolitic, consolidated		
65							
70					Limestone, Same as above		
75		"			Limestone, blue gray, very fossiliferous, slightly sandy, vuggy, consolidated.		
80	80'				limestone, same as above		
85	85'				Limestone, gray to off white, very fossiliferous, slightly sandy, vuggy, few black phosphate grains, consolidated		
90							

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	TP1—20	SHEET 4 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry Co.

ELEVATION ~ + 19.4 DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT cabletool - driven csg, SpeedSTAR 71

WATER LEVEL AND DATE 2-29-89 START 1110 FINISH 3-2-89/1030 LOGGER P. T Royer

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90							
95					Limestone, off white, very fossiliferous, slightly sandy Vuggy consolidated		
100					limestone, same as above		
105							
110					limestone, same as above		
115					limestone, off white, very fossiliferous, moderately sandy Vuggy, consolidated.		
120							

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
FCR 27306, A0	TP -20	SHEET 5 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry Co.

ELEVATION ~ + 19.4 DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT cable tool, driven csg, Speed STAR 71

WATER LEVEL AND DATE 2-29-89 START 1110 FINISH 32-89 1630 LOGGER P. Troyer

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120					Limestone, off white to gray, very fossiliferous, moderately sandy coarse to medium grained, poorly sorted, consolidated, vuggy		
125					Same as above		
130					Limestone, white to gray, very fossiliferous, very sandy, coarse to fine, poorly sorted, consolidated sm amount of black phosphate grains, vuggy		
135					Same as above		
140					Limestone, light gray, very fossiliferous, slightly sandy few black phosphate grains, vuggy/ consolidated.		
145					Sand, gray, coarse to fine, shell fragments, moderate amount of black phosphate grains, unconsolidated		
150							

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
FCR 27306.10	TP -20	6 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Nendry Co.

ELEVATION ~ +19.4 DRILLING CONTRACTOR Bogard Well Drilling

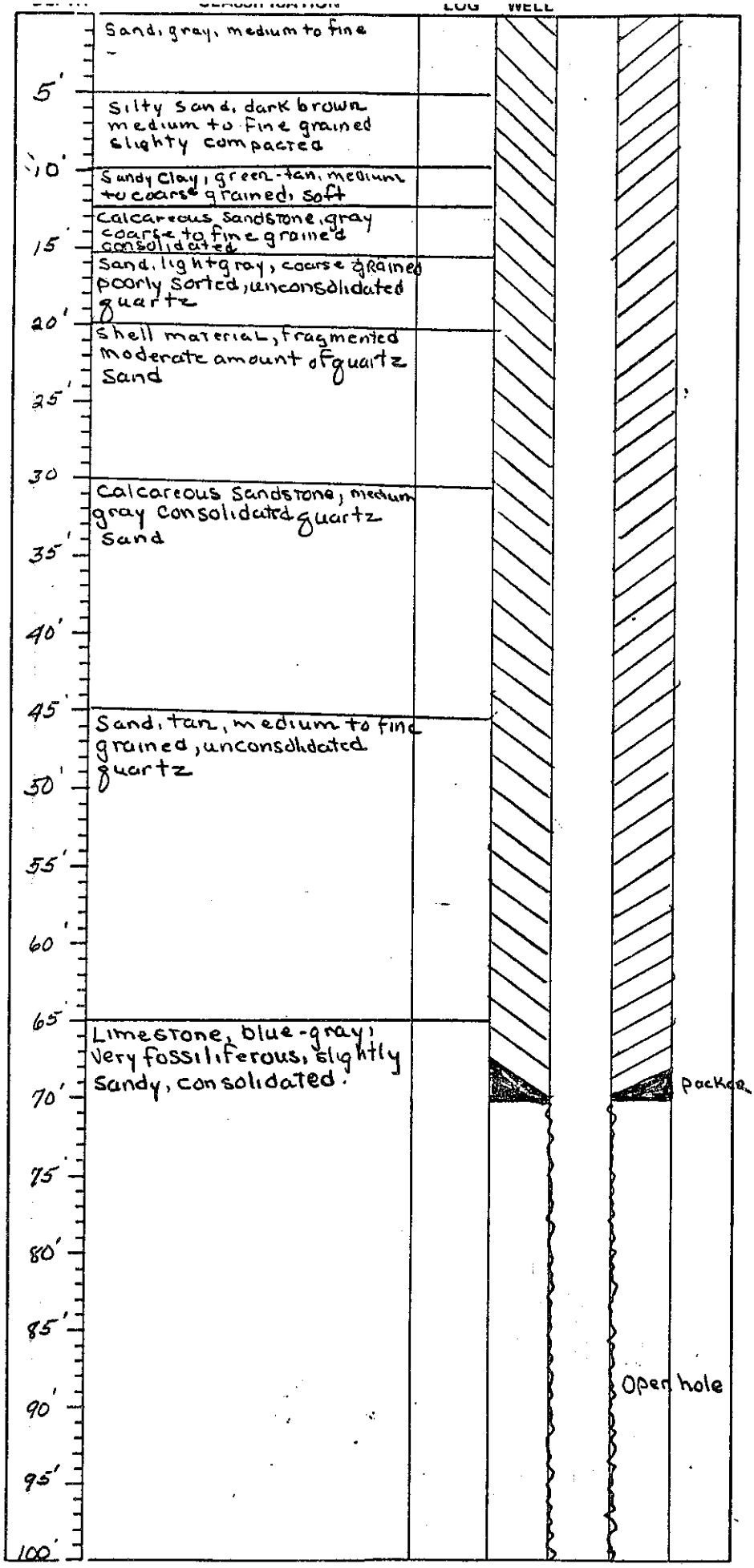
DRILLING METHOD AND EQUIPMENT rotary air - Speed Star 135 ROTARY

WATER LEVEL AND DATE 2-29-89 START 1110 FINISH 3-2-89/1030 LOGGER P. TROYER

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
150							
155					Sand, gray, very fine, well sorted lg. amount black phosphate grains, unconsolidated		
160					Sand, same as above		
	162				TD = 1621'		Drilling completed @ 1630
165							
170							
175							
180							

MW-60

SOIL BORING LOGS &
WELL DRILLING REPORT



CH2M HILL **WELL DRILLING REPORT**

PROJECT NO. FCR27306.Mi

WELL: MW-60

LOCATION: Williams Farms
Hendry County, FL

COUNTY: Hendry STATE: FL

GROUND ELEVATION: +19.4

DIAMETER: 4"

DEPTH: 140

STATIC WATER LEVEL:

DATE: 2-27-89

CASING: 4" SCH 40 PVC

SCREEN: NONE

CONSTRUCTION: Rotary mud

DRILLER: Bogard Well
Drilling, Ft Meyers

DATE FINISHED: 2-27-89

PUMPING TEST

SPECIFIC YIELD — gpm/ft @ — gpm

WATER ANALYSIS (ppm)

TDS —

TOTAL HARDNESS[1] —

M.O. ALKALINITY[1] —

CHLORIDE Cl —

IRON Fe —

SULFATE SO_4 —

COLOR (APHA) —

CALCIUM[1] —

COMMENTS Production zone
65'-140'

COMPILED BY P. Troyer

DATE 2-27-89

[1] AS $CaCO_3$

FORM 361

DEPTH	CLASSIFICATION	LOG	WELL
100	Limestone, gray to off white, very fossiliferous slightly sandy, vuggy with a few black phosphate grains, consolidated.		open hole
105			
110			
115			
120			
125			
130			
135			
140			
145			
150			
155			
160			
165			

CH2M HILL

WELL DRILLING REPORT

PROJECT NO. FCR 27306.A0

WELL: MW-60

LOCATION: Williams Farms
Section 20

COUNTY: Hendry Co STATE: FL

GROUND ELEVATION: ~19.4

DIAMETER: 4"

DEPTH: 140

STATIC WATER LEVEL:

DATE: 2-27-89

CASING: 4" SCH 40 PVC

SCREEN: None

CONSTRUCTION: rotary mud

DRILLER: Bogard Well Drilling
Fort Meyers

DATE FINISHED: 2-27-87

PUMPING TEST

SPECIFIC YIELD _____ gpm/ft @ _____ gpm

WATER ANALYSIS (ppm)

TDS

TOTAL HARDNESS[1]

M.O. ALKALINITY[1]

CHLORIDE Cl

IRON Fe

SULFATE SO_4

COLOR (APHA)

CALCIUM[1]

COMMENTS

COMPILED BY P. Troyer

DATE 2-27-89

[1] AS $CaCO_3$

FORM 361

PROJECT NUMBER	BORING NUMBER		
FCR 27306.A0	MW-60	SHEET 1	OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry Co. Sec 20

ELEVATION ~ +19.4 DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT Rotary mud - Speed Star 135 Rotary Rig

WATER LEVEL AND DATE 2-27-89 START 1106 FINISH 1449 LOGGER P. Troyer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					Sand, medium gray, slightly silty, fine to medium grained unconsolidated, quartz		
5					Silty Sand, dark brown, medium to fine grained, very silty, slightly compacted quartz		Driller calls this hard pan.
10	10 12				Sandy Clay, green-tan, medium to coarse grained, soft moist. (~2')		
					Calcareous Sandstone, gray, coarse to fine grained consolidated (3-4')		Surface Rock
15					Sand, light gray, very coarse poorly sorted, unconsolidated quartz.		
20					Shell material, fragmented, with moderate amount of coarse quartz sand.		
25					Shell material, same as above		
30					Shell material with small amount brown clayey sand.		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	MW-60	SHEET 2 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Nendcy County, FL

ELEVATION ~ + 19.4 DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT Rotary mud - Speed Star 135 Rotary Rig

WATER LEVEL AND DATE 2-27-89 START 1106 FINISH LOGGER P. Troyer

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30					Calcareous sandstone, med gray, consolidated quartz sand.		
35					Calcareous sand stone, coarse to fine, poorly sorted, consolidated mod, med. gray quartz		
40					Calcareous Sandstone, same as above		
45					Sand, tan, medium to fine unconsolidated, quartz		
50					Sand, Same as above		driller notes ~10' of sand.
55					Calcareous Sandstone, gray coarse to fine grained, poorly sorted, quartz consolidated		
60							

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	MW-60	SHEET 3 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry County, FL

ELEVATION ~+19.4 DRILLING CONTRACTOR Larry Bogard

DRILLING METHOD AND EQUIPMENT Rotary mud - Speed Star 135 Rotary Rig

WATER LEVEL AND DATE 2-27-89 START 1106 FINISH LOGGER P. Troyer

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60					Calcareous sandstone, gray consolidated, coarse to medium grained, quartz		
65					limestone, blue-gray, very fossiliferous, slightly sandy consolidated		driller notes this is main water bearing unit.
70					limestone, same as above		
75					limestone, same as above		
80					limestone, blue-gray slightly lighter color than above, fossiliferous, slightly sandy consolidated		
85							
90					limestone, gray less fossils than above, moderately sandy consolidated, slightly vuggy		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	MW-60	SHEET 4 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry County
ELEVATION ~ + 19.4 DRILLING CONTRACTOR Bagard Well Drilling
DRILLING METHOD AND EQUIPMENT Rotary mud - Speed Star 135 Rotary Rig
WATER LEVEL AND DATE 2.27.89 START 1106 FINISH 1449 LOGGER P. Troyer

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90					Limestone, gray, moderate amt Fossils, mod amt sand, consolidated		
95					Limestone, same as above		
100					Limestone, light gray to off white, increasing fossils, slightly sandy, consolidated		Driller notes will drill TPW to <u>below</u> LS into sandy or clay unit . . .
105					Limestone, same as above		
110					Limestone, same as above		
115					Limestone, same as above		
120							

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	MW-60	SHEET 5 OF 6

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry County FL

ELEVATION ~ + 19.4 DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT rotary mud Speed Star 135 Rotary Rig

WATER LEVEL AND DATE 2-27-89 START 1106 FINISH 1449 LOGGER P. Troyer

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120					limestone, off white, very fossiliferous moderately sandy, consolidated		
125							
130					limestone off white, fossiliferous, moderately sandy, consolidated		
135							
140					limestone, same as above		
145							
150					limestone, off white, fossiliferous slightly sandy with a few black phosphate grains, consolidated		

CRMHILL

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	MW-60	SHEET 6 OF 6

SOIL BORING LOG

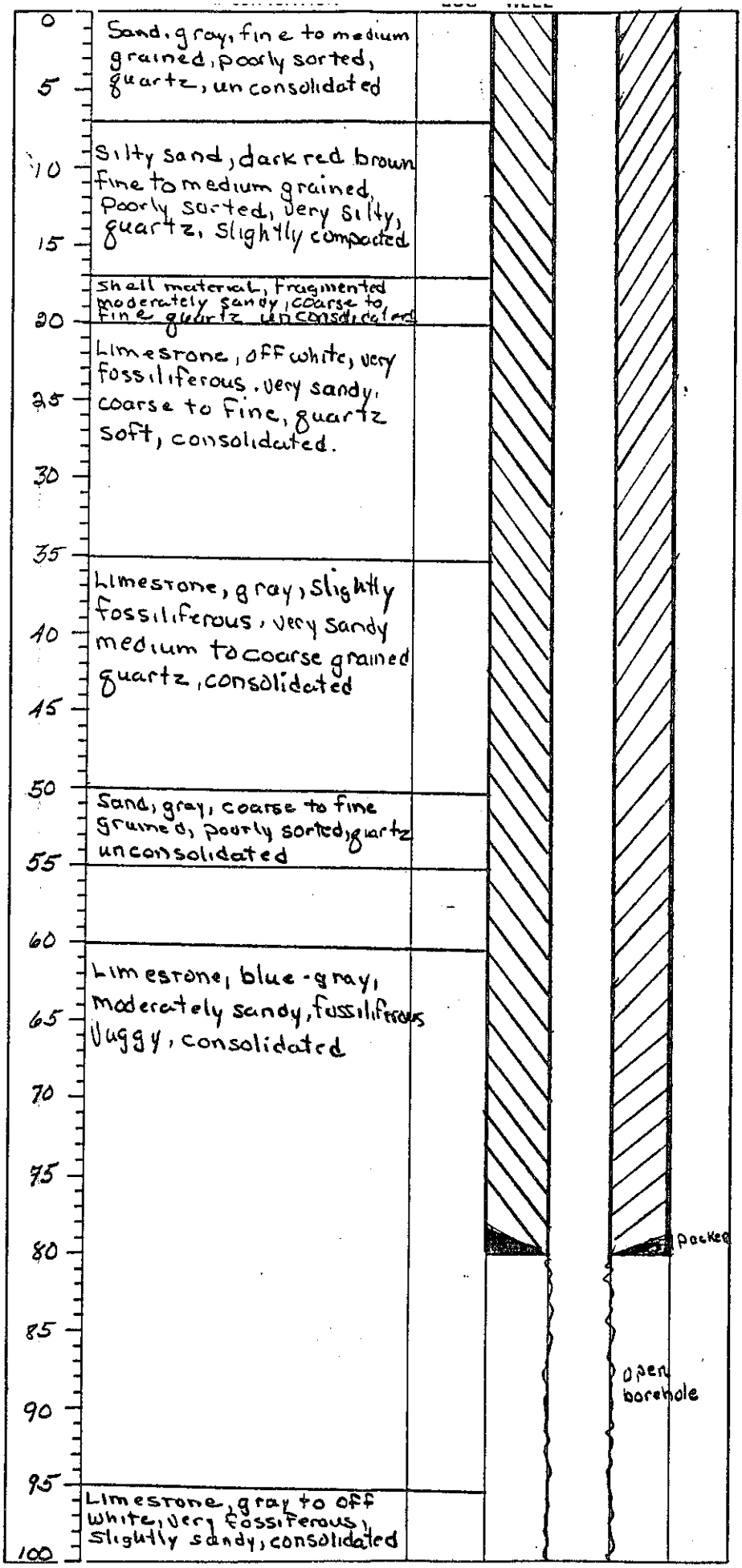
PROJECT Williams Farms Well Testing LOCATION Hendry County FL
ELEVATION ~ +19.9 DRILLING CONTRACTOR Bogard Well Drilling
DRILLING METHOD AND EQUIPMENT ROTARY MUD, Speed STAR 135 Rotary Rig
WATER LEVEL AND DATE 2-27-89 START 1106 FINISH 1449 LOGGER N. Troyer

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
150					Limestone, off white, fossiliferous slightly sandy, with a few black phosphate grains, consolidated		
155							driller notes formation getting softer
160					limestone, same as above		
					TD = 164'		
165							Drilling completed 2-27-89 @ 1449

REV 7/86 FORM D1586

MW-500

SOIL BORING LOGS &
WELL DRILLING REPORT



CH2M HILL **WELL DRILLING REPORT**

PROJECT NO. FCR27306.A0

WELL: MW-500

LOCATION: Williams Farms

Section

COUNTY: Hendry STATE: FL

GROUND ELEVATION: ~ +19.4

DIAMETER: 4"

DEPTH: 122'

STATIC WATER LEVEL:

DATE: 3·4·89

CASING: 4" SCH 40 PVC

SCREEN: open borehole

CONSTRUCTION: rotary mud

DRILLER: Bogard Well Drilling

DATE FINISHED: 3·4·89

PUMPING TEST

SPECIFIC YIELD — gpm/ft @ — gpm

WATER ANALYSIS (ppm)

TDS

TOTAL HARDNESS[1]

M.O. ALKALINITY[1]

CHLORIDE Cl

IRON Fe

SULFATE SO_4

COLOR (APHA)

CALCIUM[1]

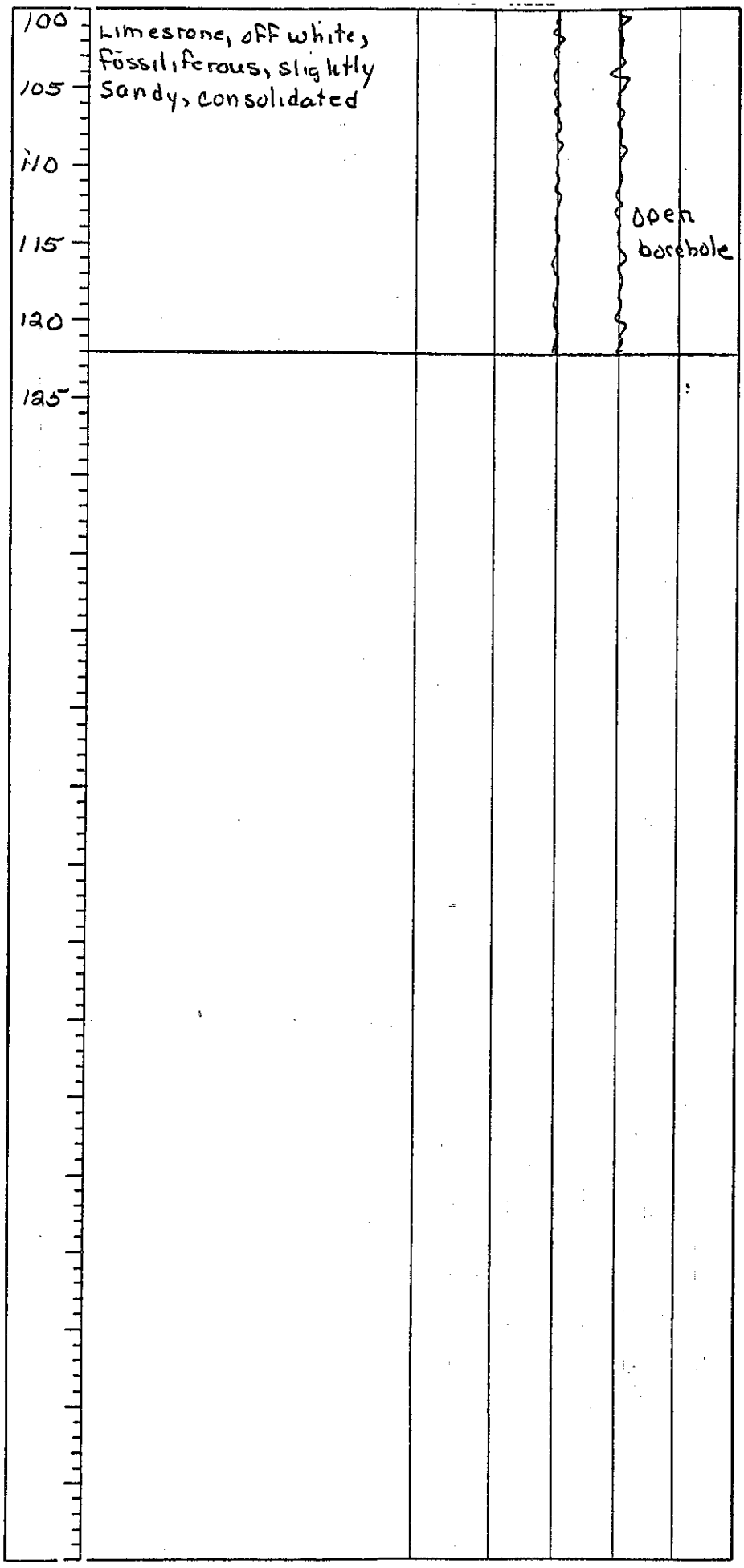
COMMENTS PVC casing set to 80'

COMPILED BY P. Troyer

DATE 3·9·89

[1] AS $CaCO_3$

FORM 361



CH2M HILL **WELL DRILLING REPORT**

PROJECT NO. FCR27306.10

WELL: MW-500

LOCATION: Williams Farms

Section 20

COUNTY: Hendry STATE: FL

GROUND ELEVATION: _____

DIAMETER: 12"

DEPTH: 122'

STATIC WATER LEVEL: _____

DATE: 3·4·89

CASING: 12" Sch 40 PVC

SCREEN: open hole

CONSTRUCTION: Rotary mud/air

DRILLER: Bogard

DATE FINISHED: 3·4·89

PUMPING TEST

SPECIFIC YIELD _____ gpm/ft @ _____ gpm

WATER ANALYSIS (ppm)

TDS _____

TOTAL HARDNESS[1] _____

M.O. ALKALINITY[1] _____

CHLORIDE Cl _____

IRON Fe _____

SULFATE SO_4 _____

COLOR (APHA) _____

CALCIUM[1] _____

COMMENTS PVC casing set To 80'

COMPILED BY P. Troyer

DATE 3·9·89

[1] AS $CaCO_3$

FORM 361

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	MW-500	SHEET 1 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Nendry Co, Section 20

ELEVATION ~ 19.4' DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT ROTARY Mud - Speed STAR 135 ROTARY Rig

WATER LEVEL AND DATE 3-4-89 START 1045 FINISH _____ LOGGER P. TROYER

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					Sand, gray, medium to Fine grained, poorly sorted, quartz unconsolidated.		
5					Silty Sand, dark redbrown, medium to fine grained, very silty, quartz, slightly compacted		
10					Sand, dark tan, coarse to fine grained, poorly sorted, quartz unconsolidated		
15					Shell material, fragmented + small shells, moderately sandy coarse to Fine grained, quartz unconsolidated		Driller notes, very little surficial rock @ this location
20	20				Sandy clay, green, Coarse to fine grained, quartz, soft		
	22				Shell material, fragmented, moderately sandy, coarse to fine grained quartz, unconsolidated		
25					Calcareous sandstone, gray, very sandy, small amount of fossils, consolidated.		
30					Calcareous Sand stone, same as above		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	MW-500	SHEET 2 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry Co., Sec 20

ELEVATION ~19.4' DRILLING CONTRACTOR Bogard Well Drilling

DRILLING METHOD AND EQUIPMENT ROTARY mud, Speed STAR 135

WATER LEVEL AND DATE 3·4·89 START 1045 FINISH _____ LOGGER D Troyer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30					Calcareous sandstone, gray very sandy, coarse to fine, few microfossils, consolidated		
35	35'				Calcareous sandstone, same as above		
40	43'				Sand, tan, medium to fine grained, poorly sorted, quartz unconsolidated		
45							
50					Sand, same as above		
55					Calcareous Sandstone, gray coarse to fine grained, poorly sorted, quartz consolidated		
60							

PROJECT NUMBER	BORING NUMBER	
FCR 27306-A0	MW-500	SHEET 3 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Nendry Co. Sec 20
ELEVATION ~ +19.4 DRILLING CONTRACTOR Bogard Well Drilling
DRILLING METHOD AND EQUIPMENT ROTARY mud - Speed STAR 135 ROTARY Rig
WATER LEVEL AND DATE 3-4-89 START 1045 FINISH LOGGER P. T Royer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60					Calcareous Sandstone, same as above,		
65	65'				Limestone, blue-gray, very fossiliferous, slightly sandy, consolidated		
70	70'				Limestone, same as above		
75	75'				Limestone, same as above		
80	80'				Limestone, blue-gray, lighter color than above, fossiliferous, slightly sandy, consolidated.		
85							
90					Limestone, gray, decreasing fossils moderately sandy, slightly shaggy Consolidated		

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	MW-500	SHEET 1 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry Co. Sec. 20

ELEVATION ~ +19.4' DRILLING CONTRACTOR Boyce Well Drilling

DRILLING METHOD AND EQUIPMENT Rotary mud Speed STAR 135 rotary Rig

WATER LEVEL AND DATE 3-9-89 START 1045 FINISH LOGGER P. TROYER

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90					limestone, gray, moderately fossiliferous, moderately sandy, vuggy, consolidated		
95					limestone, Same as above		
100					limestone, light gray to off white, increasing fossils, slightly Sandy, consolidated		
105					limestone, Same as above		
110					limestone, Same as above		
115					limestone, Same as above		
120					limestone, off white, very fossiliferous moderately sandy, consolidated		

PROJECT NUMBER	BORING NUMBER	
FC27306A0	MW-500	SHEET 5 OF 5

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry Co. Sec 20

ELEVATION ~ +19.4 DRILLING CONTRACTOR Bogard Well Drilling

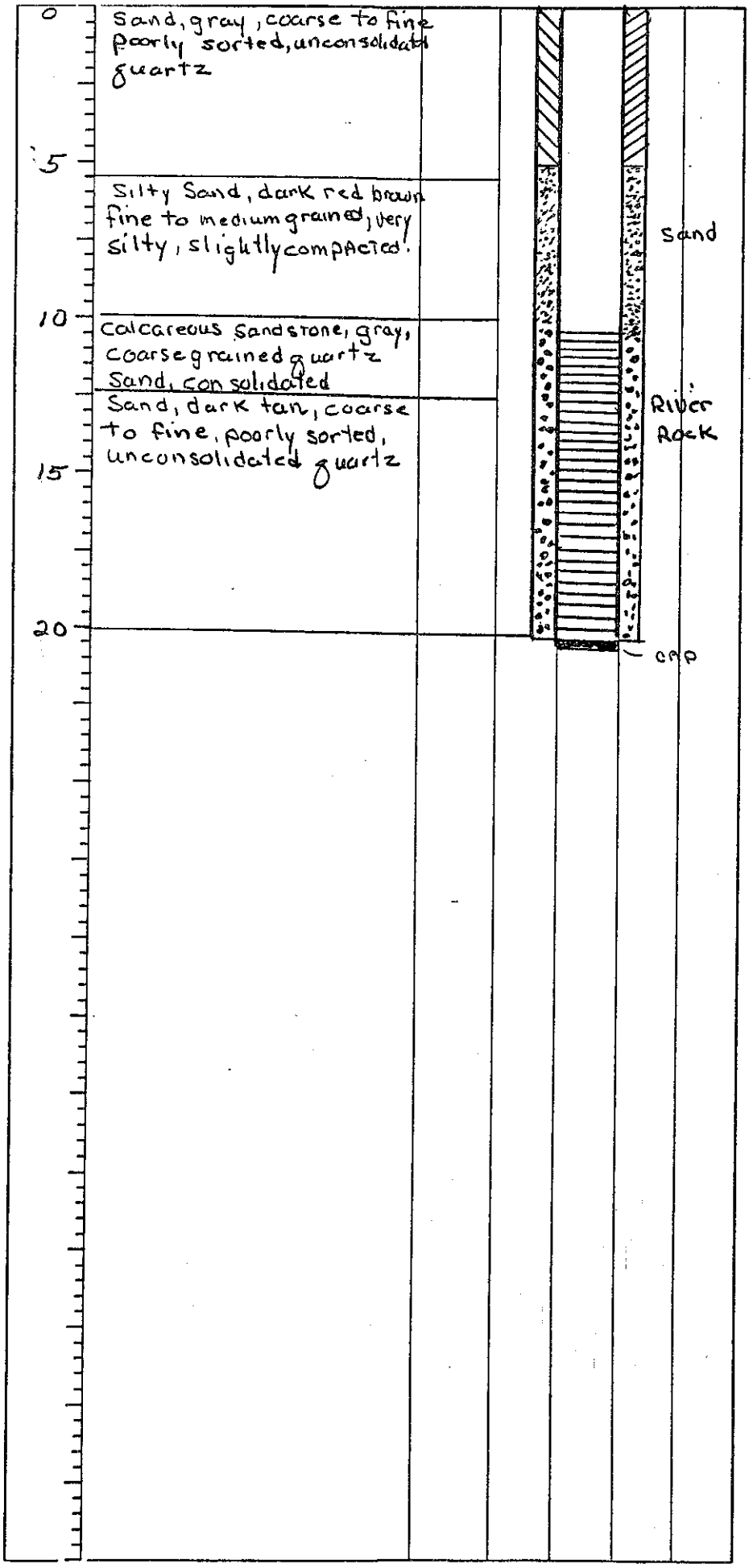
DRILLING METHOD AND EQUIPMENT ROTARY Mud - Speed STAR 135 ROTARY Rig

WATER LEVEL AND DATE 3-9-89 START 1045 FINISH _____ LOGGER P. Troyer

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120					limestone, offwhite, very fossiliferous, moderately sandy consolidated		
125					limestone, same as above		
					TD = 125'		
130							

WT-1

SOIL BORING LOGS &
WELL DRILLING REPORT



CH2M HILL **WELL DRILLING REPORT**

PROJECT NO. FCR27306.A0

WELL: WT-1

LOCATION: Williams Farms

Section 20

COUNTY: Nassau Co STATE: FL

GROUND ELEVATION: ~ +19.4

DIAMETER: 2"

DEPTH: 20'

STATIC WATER LEVEL:

DATE: 3-2-89

CASING: 2" SCH 40 PVC

SCREEN: .020 SLOT PVC

10-20' interval

CONSTRUCTION: rotary wash

DRILLER: Larry Bogard

DATE FINISHED: 3-2-89

PUMPING TEST

SPECIFIC YIELD — gpm/ft @ — gpm

WATER ANALYSIS (ppm)

TDS —

TOTAL HARDNESS[1] —

M.O. ALKALINITY[1] —

CHLORIDE Cl —

IRON Fe —

SULFATE SO_4 —

COLOR (APHA) —

CALCIUM[1] —

COMMENTS water table monitor well, grouted with portland type I cement

COMPILED BY P. Troyer

DATE 3-2-89

[1] AS $CaCO_3$

FORM 361

PROJECT NUMBER	BORING NUMBER	
FCR 27306.A0	WT-1	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Williams Farms Well Testing LOCATION Hendry County
ELEVATION ~+19.4 DRILLING CONTRACTOR Bogard Well Drilling
DRILLING METHOD AND EQUIPMENT ROTARY WASH - Speed STAQ 135 ROTARY Rig
WATER LEVEL AND DATE 3-2-89 START 1256 FINISH 1306 LOGGER P. TROYER

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	0	0				Sand, gray coarse to fine, poorly sorted, unconsolidated quartz.		
		to						
	5	5						
		6'				Silty Sand, dark red brown, fine to med. grained, very silty, slightly compacted @ 6.0'		
		to						
	10	10				Calcareous sandstone, light gray coarse grained sand, consolidated 10-12'		
		to						
		12				Sand, dark tan, coarse to fine poorly sorted, unconsolidated		
		to						
	15							
		16				Sand, same as above		
		to						
	20	20				TD= 20'		3-5g pails River Rock mixed coarse sand above screen I SI 10'-20'
	25							
	30							

APPENDIX C

ESI
GRIDLEY ENVIRONMENTAL SERVICES INC.
12693-110 McGREGOR BLVD. • FT. MYERS, FL 33919 • (813) 481-5878 • FAX 8134810182

Name: CH2M Hill
4415 Metro Parkway
Suite 216
Fort Myers, FL 33916

Attn: S. Frank Reynolds

Sample Number: 890172

FIELD DATA

Date: March 29, 1989
Location: Little Cypress Farm
Collector: F. Reynolds

HRS Certification Numbers: E85094 & 85283

PARAMETERS	RESULTS	METHOD
Cl-	36 mg/L	APHA 407A
pH	7.6	APHA 423
Cond.	391 µMHO/cm	APHA 205
T.D.S.	290 mg/L	APHA 209 B

ESI LABORATORIES, INC.: Charlie Todd **DATE: 03/31/89**

All testing is performed according to APHA Standard Methods or EPA Testing Methods. Results in mg/Liter unless otherwise specified.

ESI
GRIDLEY ENVIRONMENTAL SERVICES INC.
12693-110 McGREGOR BLVD. • FT. MYERS, FL 33919 • (813) 481-5878 • FAX 8134810182

Name: CH2M Hill
4415 Metro Parkway
Suite 216
Fort Myers, FL 33916

Sample Number: 890173

FIELD DATA

Date: March 29, 1989
Location: Little Cypress Farm
Collector: F. Reynolds

HRS Certification Numbers: E85094 & 85283

PARAMETERS	RESULTS	METHOD
Cl-	43 mg/L	APHA 407A
pH	7.4	APHA 423
Cond.	425 µ MHO/cm	APHA 205
T.D.S.	320 mg/L	APHA 209 B

ESI LABORATORIES, INC.: Archie Todd **DATE: 03/31/89**

All testing is performed according to APHA Standard Methods or EPA Testing Methods. Results in mg/Liter unless otherwise specified.

ESI Laboratories
12721 Metro Pkwy. #8
Fort Myers, FL 33912

CHAIN OF CUSTODY RECORD

Page __ of __

PROJECT NO. PROJECT NAME: LITTLE CYPRESS FARM

SAMPLERS (Signature): Frank Hayes

STATION NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Cl	pH	cond	T.O.C.	REMARKS
	3/29			✓	TP-19	2					890172
	3/29			✓	TP-20						890173

Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
F.H.	3/29 14:30	A. Todd			
Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Remarks:
Relinquished by:	Date / Time	Received by:	Received for Laboratory by:		

SAMPLE CUSTODY TRACKING REPORT