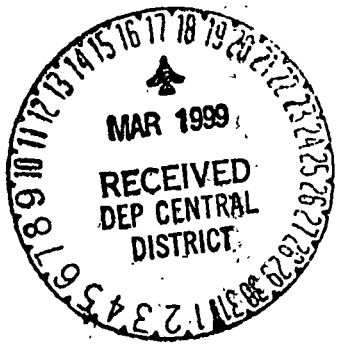
CH2M HILL
3011 S.W. Williston Road
Gainesville, FL
32608-3928
Mailing address:
P.O. Box 147009
Gainesville, FL
32614-7009
Tel 352.335.7991
Fax 352.335.2959

CH2MHILL



March 16, 1999

Mr. Duane Watroba, UIC TAC Chairman
Florida Department of Environmental Protection - Central District
3319 Maguire Boulevard
Suite 232
Orlando, FL 32803-3767

Subject: Cocoa – Drilling and Testing Report for New ASR Wells

Dear Mr. Watroba:

On behalf of the City of the Cocoa, we are submitting to the TAC four copies of our report entitled "Results of Aquifer Storage and Recovery Well Drilling and Testing – Wells R-7, R-8, R-9 and R-10." The report documents the construction and aquifer testing of four new ASR wells drilled under UIC permit no. UC48-294600.

As described in the report, we propose to do an initial performance acceptance test (PAT) of the four well system in June 1999, as part of the start up of the entire Dyal plant expansion project. A more extensive "Cycle Test" or "Operational Test" is proposed for October 1999.

The initial performance acceptance test, and the cycle testing to be conducted in October, will serve as the "step injection tests" described in the UIC permit. A cycle testing plan will be submitted to FDEP after completion of the PAT. Written notice will be provided to FDEP for both tests.

Please contact me if you have any questions or concerns regarding this report.

Sincerely,

CH2M HILL

A. Ross Sproul

For
D. Edward Davis, P.E.
Project Manager

GNVDocument3
c: Ed Wegerif/Cocoa
Carl Larrabee/Cocoa
Mike Dykes/CH2M HILL
Ross Sproul/CH2M HILL

Results of Aquifer Storage and Recovery Well Drilling and Testing

Wells R-7, R-8, R-9, and R-10

Prepared for the

CITY OF COCOA FLORIDA

Prepared by

CH2MHILL

March 1999
140312.A1.AS

Contents

Exhibits

Exhibits, Continued

Appendixes

Acronyms and Abbreviations

ASR	aquifer storage and recovery
AWWA	American Water Works Association
bls	below land surface
btoc	below top of casing
City	City of Cocoa
CUP	Consumptive Use Permit
DO	dissolved oxygen
FDEP	Florida Department of Environmental Protection
ft	feet
GST	ground storage tank
LSN	long-short normal
mgd	million gallons per day
mg/L	milligrams per liter
msl	mean sea level
NTU	nephelometric turbidity units
O&M	operations and maintenance
OD PVC	outside diameter polyvinyl chloride
PAT	performance acceptance test
ppm	parts per million
psi	pounds per square inch
PVC	polyvinyl chloride
SCADA	Supervisory Control and Data Acquisition
SJRWMD	St. Johns River Water Management District
WTP	water treatment plant

1. Introduction

1.1 Scope

This report documents the construction and testing of four new ASR wells at the City of Cocoa's Claude H. Dyal Water Treatment Plant (WTP). The new ASR wells, designated R-7, R-8, R-9, and R-10, were constructed under Florida Department of Environmental Protection Underground Injection Control (FDEP UIC) Permit No. UC48-294600.

1.2 Project Background

Aquifer storage and recovery (ASR) is a water management technology in which freshwater is stored in a local aquifer, and later recovered for use. Typically, storage and recovery cycles are seasonal. Water is injected into the aquifer, via the ASR wells, whenever water availability exceeds water demand. The water is recovered, via the same wells, during periods of peak demand.

The first phase of ASR development for the City of Cocoa (the City) consisted of one ASR well (R-1) at the Claude H. Dyal Water Treatment Plant (WTP) site, with a recovery capacity of approximately 1.5 million gallons per day (mgd). In 1988, FDEP permitted this well for operational use.

In 1990, the ASR system was expanded to include five additional wells (R-2, R-3, R-4, R-5, and R-6). This six-well system was permitted in 1992 for a recovery capacity of approximately 8.0 mgd, and it continues to help the City meet peak demands.

In 1993, the City obtained Consumptive Use Permit (CUP) No. 2-097-0024ANG from the St. Johns River Water Management District (SJRWMD) to develop nearby Taylor Creek Reservoir for use as a water supply. The CUP also authorized construction of four additional ASR wells (R-7, R-8, R-9, and R-10) for use in conjunction with reservoir withdrawals..

1.3 Location and Site Description

The Dyal WTP is located on State Road 520 in Orange County, Florida. The six existing ASR wells are located on the Dyal plant site. Southwest of the plant site, the City acquired a 26-acre ASR parcel to accommodate the four new ASR wells. The location of the Cocoa ASR system is shown in Exhibit 1-1.

The site is located on the coastal lowlands of Florida, within the St. Johns River Valley. Surrounding topography is mostly sandy prairie and wetland marsh. Vegetation is mostly grasses, saw palmetto, palm, oak, myrtle, and cypress. The former owner, Deseret Ranches of Florida, used the 26-acre parcel for grazing cattle.

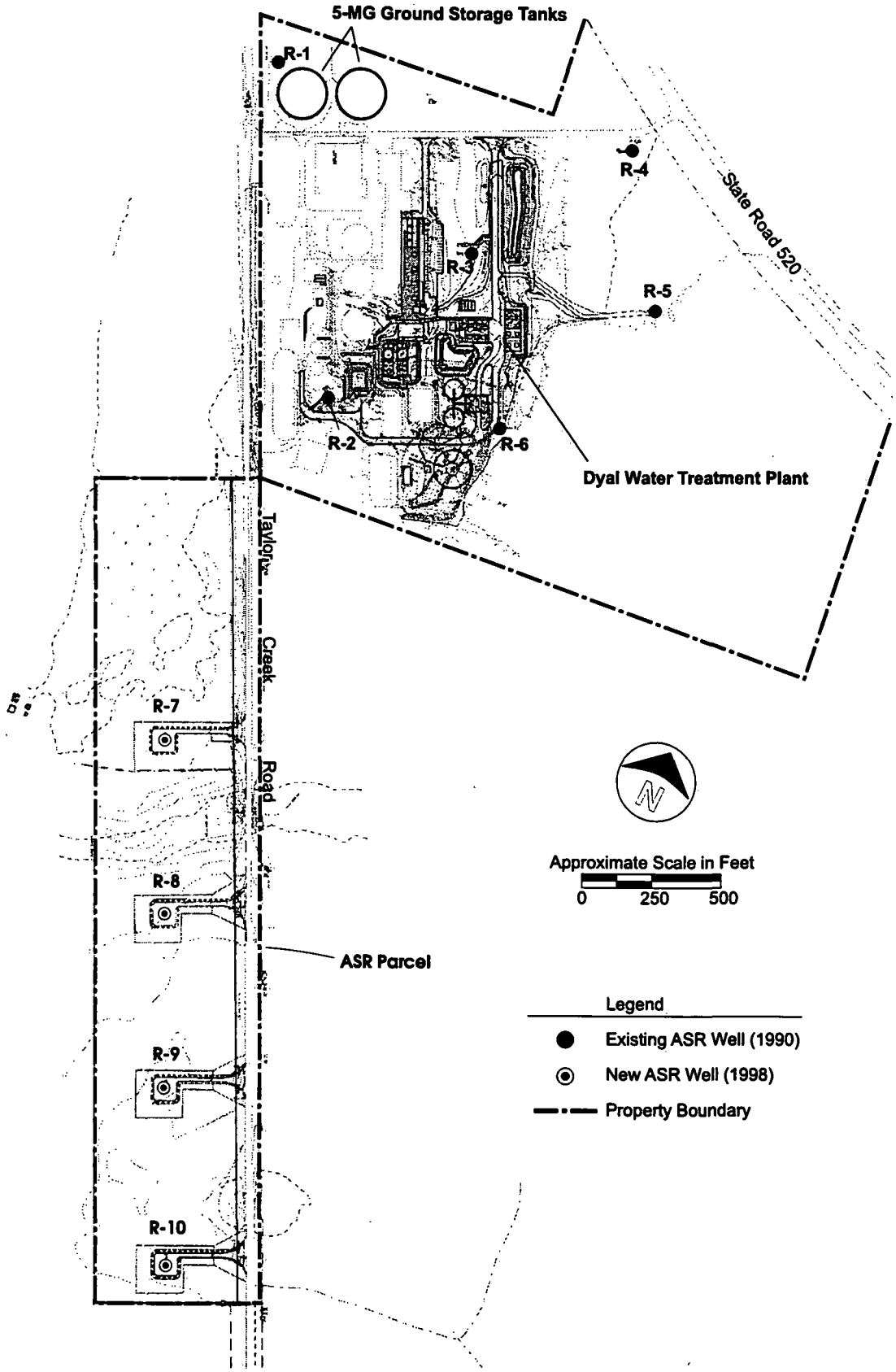


Exhibit 1-1. Cocoa ASR System.

1.4 Local Geology

The local geology beneath the Cocoa Dyal plant site was described in *Aquifer Storage Recovery Feasibility Investigation – Final Report* (CH2M HILL, 1988) and in *Results of Aquifer Storage Recovery Well Drilling and Testing* (CH2M HILL, 1990). This section briefly summarizes related information contained in these reports.

Site geology consists of Eocene-age carbonate rocks overlain by Miocene-age clay and marl, and Pleistocene to Recent unconsolidated sand and shell. The surficial sediments consist of interbedded sand, silt, shell, and clay, extending from land surface to approximately 120 feet below land surface (bls).

The Hawthorn group underlies the surficial surface, and consists of interbedded sand, clay, shell, marl, and limestone. It is characterized by abundant phosphate in both consolidated and unconsolidated deposits. It grades from dense gray-green clay to interbedded carbonates with sand and clay. It extends from approximately 120 feet bls to 250 feet bls. The Hawthorn group forms the upper confining bed of the ASR storage zone.

Below the Hawthorn group, the Ocala formation is characterized by chalky, fossiliferous limestones of the upper Eocene age. The upper part of this formation comprises the storage zone of the Cocoa ASR facility. The less pervious lower section, which was not penetrated during drilling, forms the lower confining unit for the ASR zone.

The interface between the Ocala formation and the Hawthorn group exists as an unconformity, with varying elevation across the site. The top of the Ocala formation ranges from approximately 240 to 280 feet bls, and extends to approximately 500 feet bls. Below this depth lies the porous Avon Park formation, which contains solution cavities. The Avon Park formation is the main water-producing zone in the City's raw water wellfield, located approximately 10 to 13 miles west of the Dyal WTP.

2. ASR Facility Expansion Construction

2.1 Summary of Construction Program

The four additional ASR wells were constructed as part of a major expansion of the City's Dyal WTP. The expansion includes an intake structure and raw water pump station at Taylor Creek Reservoir, a transmission pipeline, and a separate surface water treatment train on the grounds of the Dyal plant. The prime contractor for the plant expansion was the Poole and Kent Company of Miami, Florida. The subcontractor for the construction of the ASR wells was Meridith Environmental, Inc. of Orlando, Florida. On September 12, 1997, the City obtained from FDEP a UIC permit to construct the ASR wells and surface facilities. Construction activities began shortly thereafter, and all four wells were completed and tested by May 7, 1998.

2.2 Summary of Construction Methods

The mud rotary method was used to drill through the unconsolidated formations and into the upper portion of the Ocala formation. A temporary 36-inch pit casing was driven into place to seal off the first 40 feet at each borehole. Surface casing of 26-inch diameter steel with 0.312-inch wall thickness was then installed and grouted in approximately the first 120 feet of each well to stabilize the surficial formations.

After drilling had advanced to the top of the storage zone, the final casing string was installed and grouted. The final casing was approximately 300 feet of 17.4-inch outside diameter (OD) polyvinyl chloride (PVC) pipe with 1.024-inch wall thickness, manufactured by Certain-Teed Corporation. The pipe was joined with the Certa-Lok method using PVC couplings and graphite splines inserted into machined grooves in each casing joint.

Following the PVC casing's setting, cementing, and pressure testing, drilling resumed using the mud rotary method. This method continued only until enough water was produced from the borehole to sustain reverse-air drilling. The reverse-air circulation drilling method was typically started within 15 to 20 feet below the bottom of the PVC casing. During reverse-air drilling, water quality samples were obtained and then analyzed in the Cocoa WTP laboratory.

Following borehole completion, each well was acidized and then developed with air lifting. The wells were then temporarily capped until pump testing was conducted. The performance of each well was evaluated with a variable rate step test, followed by a constant rate pumping test. The pump testing is further discussed in Section 3.

Following the pumping tests, the final PVC wellheads were installed. The wellhead excavations were backfilled and compacted, and the wells were checked for plumbness and alignment in accordance with American Water Works Association (AWWA) A100. Each well was swabbed and disinfected with a chlorine solution in excess of 50 parts per million

(ppm) chlorine. The solution was allowed to remain in the well for a minimum of 12 hours before removal by pumping.

2.3 Construction of Well R-7

Construction of Well R-7 began on September 22, 1997, and was completed on November 14, 1997. Construction began with the installation of a temporary 36-inch pit casing to 38 feet. Drilling of a 9 7/8-inch pilot hole resumed to 122 ft bls. The pilot hole was then reamed to a diameter of 32 inches. After reaming, 120 feet of 26-inch surface casing was installed and grouted in place with 300 sacks of neat cement. The temporary pit casing was then removed. Pilot hole drilling resumed to a depth of 305 feet, and competent limestone was encountered at a depth of approximately 280 feet. The pilot hole was then reamed to a 25-inch diameter, and 300 feet of PVC casing was grouted in place. The grouting was completed in three stages of 126, 121, and 100 sacks of cement, respectively. The first stage was completed with neat cement, and the two remaining stages were completed with an 8 percent bentonite-cement blend.

After the cement plug was drilled out, the pilot hole drilling resumed at 310 feet. The pilot hole was advanced to 370 feet in soft to medium hard fossiliferous limestone and was then reamed to a 15-inch diameter. The well was developed by airlifting through the drill string. Well R-7 was then acidized with 3,000 gallons of 28 percent hydrochloric acid and redeveloped by airlifting and surging.

After pump testing and wellhead installation, the straightness and alignment test was conducted, which showed no significant deviations. Well R-7 was then disinfected and capped.

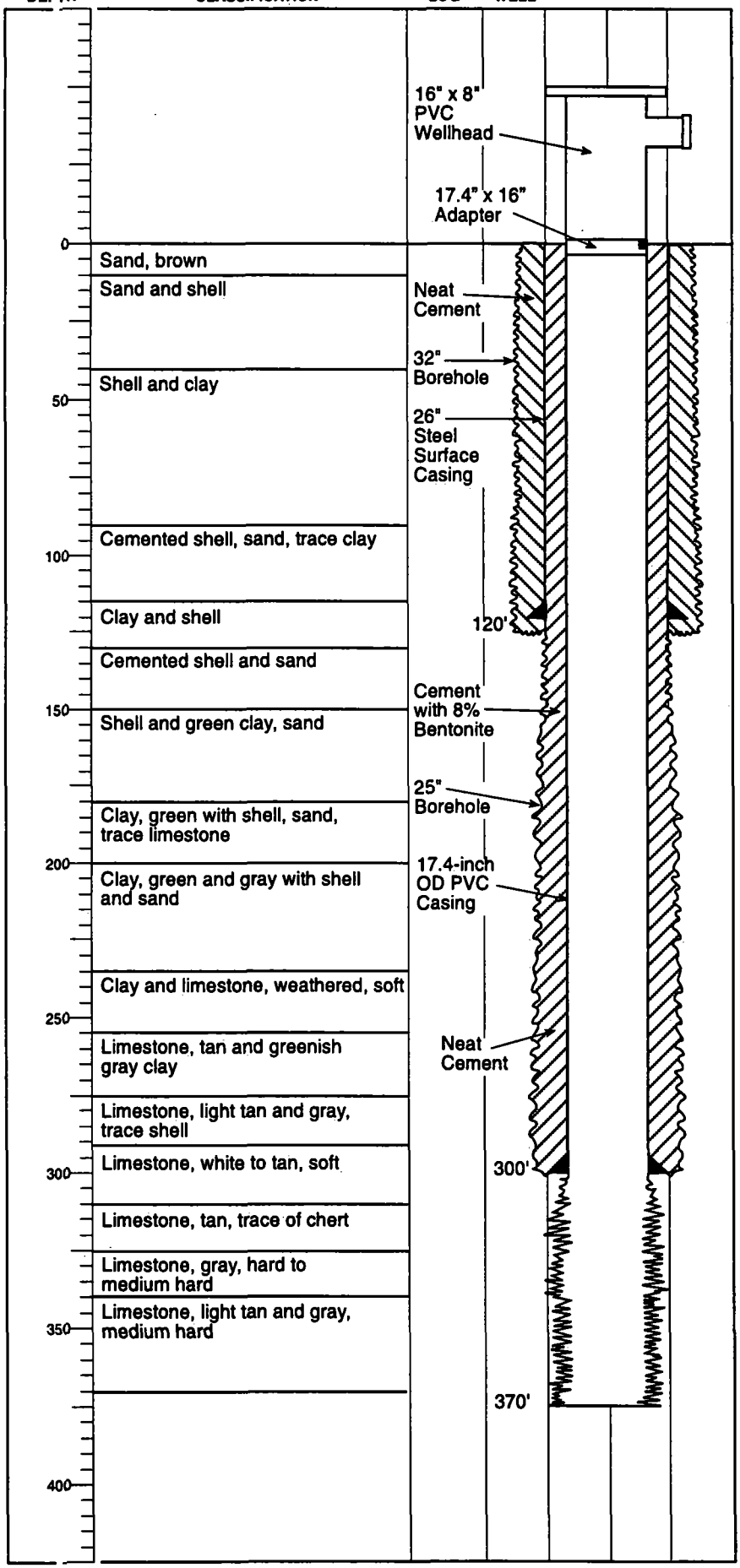
Exhibit 2-1 illustrates completion details for Well R-7.

2.4 Construction of Well R-8

Construction of Well R-8 began on November 17, 1997, and was completed on December 22, 1997. Construction began with the installation of a temporary 36-inch pit casing to 40 feet. Drilling of a 9 7/8-inch pilot hole resumed to 122 ft bls. The pilot hole was then reamed to a 32-inch diameter. After reaming, 120 feet of 26-inch surface casing was installed and grouted in place with 300 sacks of neat cement. The pilot hole was resumed to a depth of 305 feet and competent limestone was encountered at a depth of approximately 290 feet. The pilot hole was then reamed to a 25-inch diameter and 300 feet of PVC casing was grouted in place. The grouting was completed in three stages of 126, 91,and 60 sacks of cement, respectively. The first stage was completed with neat cement, and the two remaining stages were completed with an 8 percent bentonite-cement blend.

After the cement plug was drilled out, the pilot hole drilling resumed at 310 feet. At 317 feet, the well produced sufficient water to sustain reverse-air drilling. The pilot hole was advanced to 370 feet in tan to light gray, soft to medium hard fossiliferous limestone, and was then reamed to a 15-inch diameter. The well was developed by airlifting through the drill string. Well R-8 was then acidized with 3,000 gallons of 28 percent hydrochloric acid and redeveloped by airlifting and surging.

140312.A1.AS 1/99 GNV



CH2MHILL

WELL DRILLING REPORT

PROJECT NO. 140312.A1.AS

WELL: Cocoa, R-7

LOCATION: Dyal WTP

Sec. 20, T24S, R 34 E

COUNTY: Orange STATE: FL

GROUND ELEVATION: ± 42 ft msl

DIAMETER: 16 inch

DEPTH: 370 ft bls

STATIC WATER LEVEL: 8.7 ft btoc

DATE: May 5, 1998

CASING: 0-300 ft bls, PVC Certa-Lok 15.3" I.D.

SCREEN: N/A

CONSTRUCTION: Mud-Rotary, Reverse-Air

DRILLER: Meredith Environmental

Orlando, Florida

DATE FINISHED: November 14, 1997

PUMPING TEST

SPECIFIC YIELD 12.9 gpm/ft @ 960 gpm

WATER ANALYSIS (ppm)

TDS	1,140
TOTAL HARDNESS[1]	450
M.O. ALKALINITY[1]	162
CHLORIDE Cl	500
IRON Fe	0.031
SULFATE SO_4	34.9
COLOR (ALPHA)	10
CALCIUM[1]	306

COMMENTS Field Parameters

D.O. = 1.7

Turbidity = 0.14

H_2S = 2.1

COMPILED BY R.J. Petersen

DATE May 21, 1998

[1] AS $CaCO_3$

Exhibit 2-1. Completion Details for Well R-7.

After pump testing and wellhead installation, the straightness and alignment test was conducted, which showed no significant deviations. Well R-8 was then disinfected and capped.

Exhibit 2-2 illustrates completion details for Well R-8.

2.5 Construction of Well R-9

Construction of Well R-9 began on January 5, 1998, and was completed on February 29, 1998. Construction began with the installation of a temporary 36-inch pit casing to 40 feet. Drilling of a 9 7/8-inch pilot hole resumed to 122 ft bls. The pilot hole was then reamed to a 32-inch diameter. After reaming, 120 feet of 26-inch surface casing was installed and grouted in place with 300 sacks of neat cement. The pilot hole was resumed to a depth of 305 feet, and competent limestone was encountered at a depth of approximately 285 feet. The pilot hole was then reamed to a 25-inch diameter, and 300 feet of PVC casing was grouted in place. The grouting was completed in three stages of 126, 120, and 120 sacks of cement, respectively. The first stage was completed with neat cement, and the two remaining stages were completed with an 8 percent bentonite-cement blend.

After the cement plug was drilled out, the pilot hole drilling resumed at 310 feet. At 315 feet, the well produced sufficient water to sustain reverse-air drilling. The pilot hole was advanced to 370 feet in tan to light gray, soft to medium fossiliferous limestone and then reamed to a 15-inch diameter. The well was developed by airlifting through the drill string. Well R-9 was then acidized with 3,000 gallons of 28 percent hydrochloric acid and redeveloped by airlifting and surging.

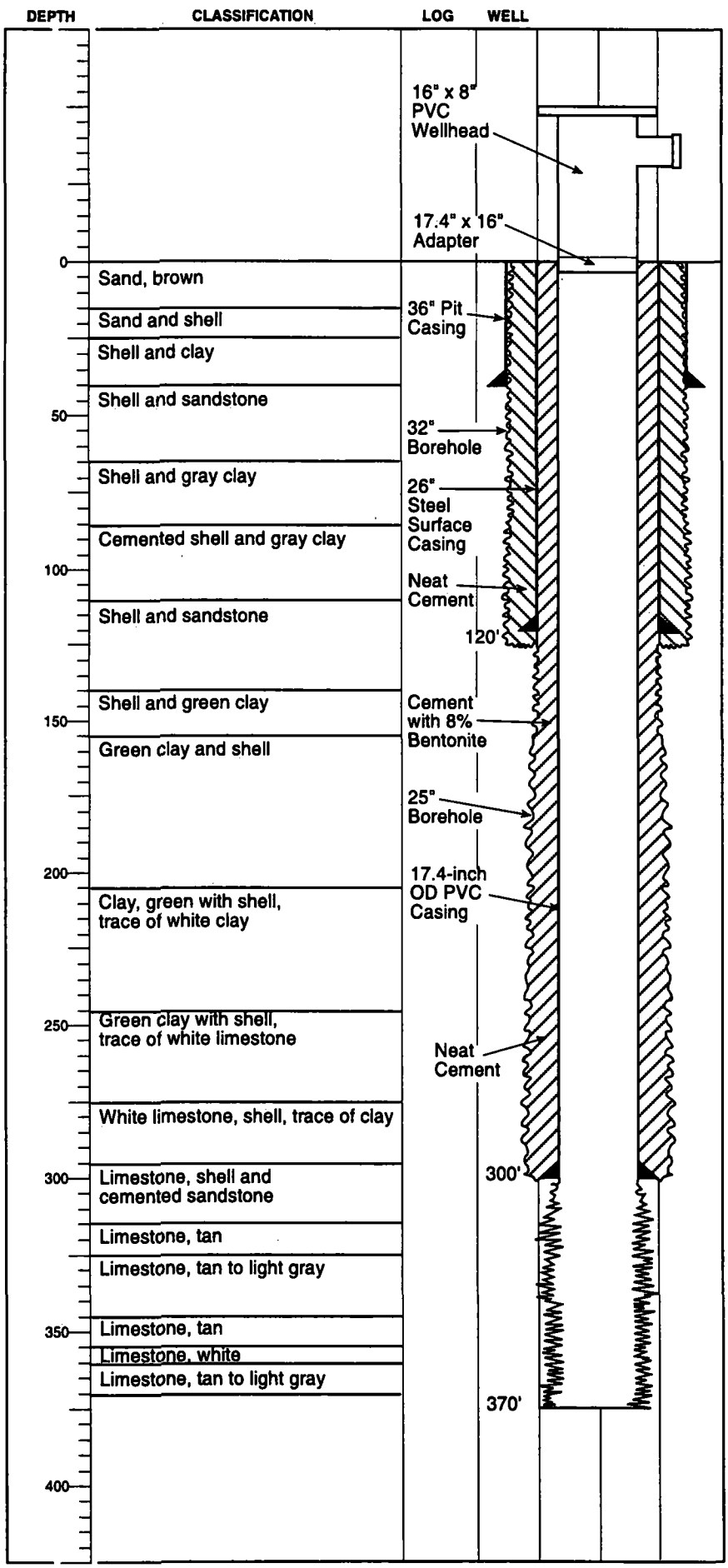
After pump testing and wellhead installation, the straightness and alignment test was conducted and showed no significant deviations. Well R-9 was then disinfected and capped.

Exhibit 2-3 illustrates completion details for Well R-9.

2.6 Construction of Well R-10

Construction of Well R-10 began on March 20, 1998, and was completed on April 10, 1998. Construction began with the installation of a temporary 36-inch pit casing to 40 feet. Drilling of a 9 7/8-inch pilot hole to was resumed to 122 ft bls. The pilot hole was then reamed to a 32-inch diameter. After reaming, 120 feet of 26-inch surface casing was installed and grouted in place with 303 sacks of neat cement. The pilot hole was resumed to a depth of 305 feet, and competent limestone was encountered at a depth of approximately 290 feet. The pilot hole was then reamed to a 25-inch diameter and 300 feet of PVC casing was grouted in place. The grouting was completed in two stages of 100 and 175 sacks of cement, respectively. The first stage was completed with neat cement, and the final stage was completed with an 8 percent bentonite-cement blend.

After the cement plug was drilled out, the pilot hole drilling resumed at 310 feet. At 316 feet, the well produced sufficient water to sustain reverse-air drilling. The pilot hole was advanced to 370 feet in tan to light gray, soft to medium fossiliferous limestone and then reamed to a 15-inch diameter. The well was developed by airlifting through the drill string.



WELL DRILLING REPORT

CH2MHILL

PROJECT NO. 140312.A1.AS

WELL: Cocoa, R-8

LOCATION: Dyal WTP

Sec. 20, T24S, R 34 E

COUNTY: Orange STATE: FL

GROUND ELEVATION: ± 43 ft msl

DIAMETER: 16 inch

DEPTH: 370 ft bls

STATIC WATER LEVEL: 8.6 ft btoc

DATE: April 27, 1998

CASING: 0-300 ft bls, PVC Certa-Lok 15.3" I.D.

SCREEN: N/A

CONSTRUCTION: Mud-Rotary, Reverse-Air

DRILLER: Meredith Environmental

Orlando, Florida

DATE FINISHED: December 23, 1997

PUMPING TEST

SPECIFIC YIELD 11.6 gpm/ft @ 920 gpm

WATER ANALYSIS (ppm)

TDS	1,070
TOTAL HARDNESS[1]	388
M.O. ALKALINITY[1]	146
CHLORIDE Cl	422
IRON Fe	0.018
SULFATE SO_4	78.3
COLOR (ALPHA)	7
CALCIUM[1]	290

COMMENTS Field Parameters

D.O. = 1.3

Turbidity = 0.4

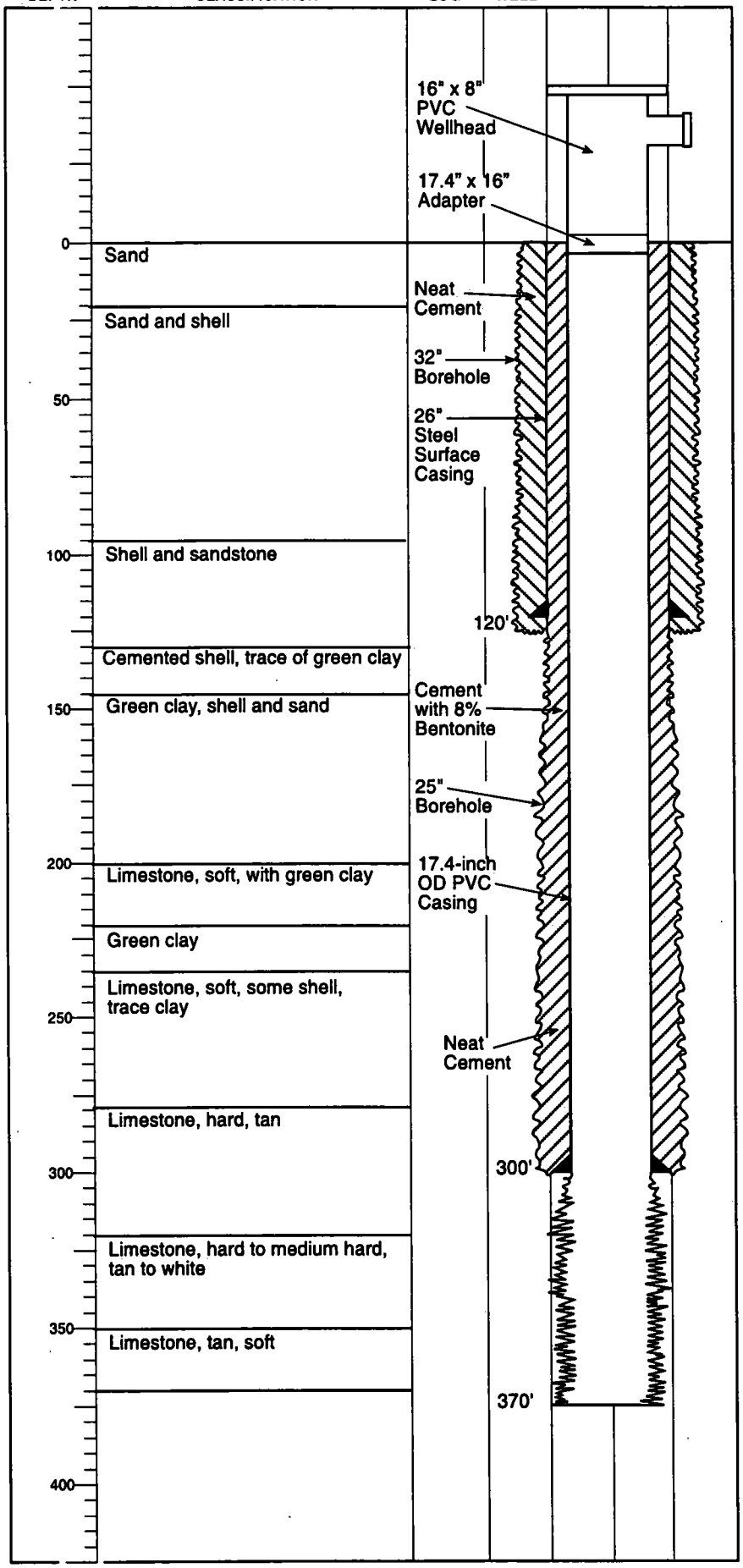
H_2S = 1.9

COMPILED BY R.J. Petersen

DATE May 22, 1998

[1] AS $CaCO_3$

Exhibit 2-2. Completion Details for Well R-8.



CH2MHILL

WELL DRILLING REPORT

PROJECT NO. 140312.A1.AS

WELL: Cocoa, R-9

LOCATION: Dyal WTP

Sec. 20, T24S, R 34 E

COUNTY: Orange STATE: FL

GROUND ELEVATION: ±45.0 ft msl

DIAMETER: 16 inch

DEPTH: 370 ft bls

STATIC WATER LEVEL: 9.5 ft btoc

DATE: April 15, 1998

CASING: 0-300 ft bls, PVC Certa-Lok 15.3" I.D.

SCREEN: N/A

CONSTRUCTION: Mud-Rotary, Reverse-Air

DRILLER: Meredith Environmental

Orlando, Florida

DATE FINISHED: February 29, 1998

PUMPING TEST

SPECIFIC YIELD 17.0 gpm/ft @ 1,060 gpm

WATER ANALYSIS (ppm)

TDS	934
TOTAL HARDNESS[1]	394
M.O. ALKALINITY[1]	144
CHLORIDE Cl	417
IRON Fe	0.027
SULFATE SO_4	75.4
COLOR (ALPHA)	10
CALCIUM[1]	258

COMMENTS Field Parameters

H_2S = 3.3

D.O. = 1.2

Turbidity = 0.8

COMPILED BY R.J. Petersen

DATE May 26, 1998

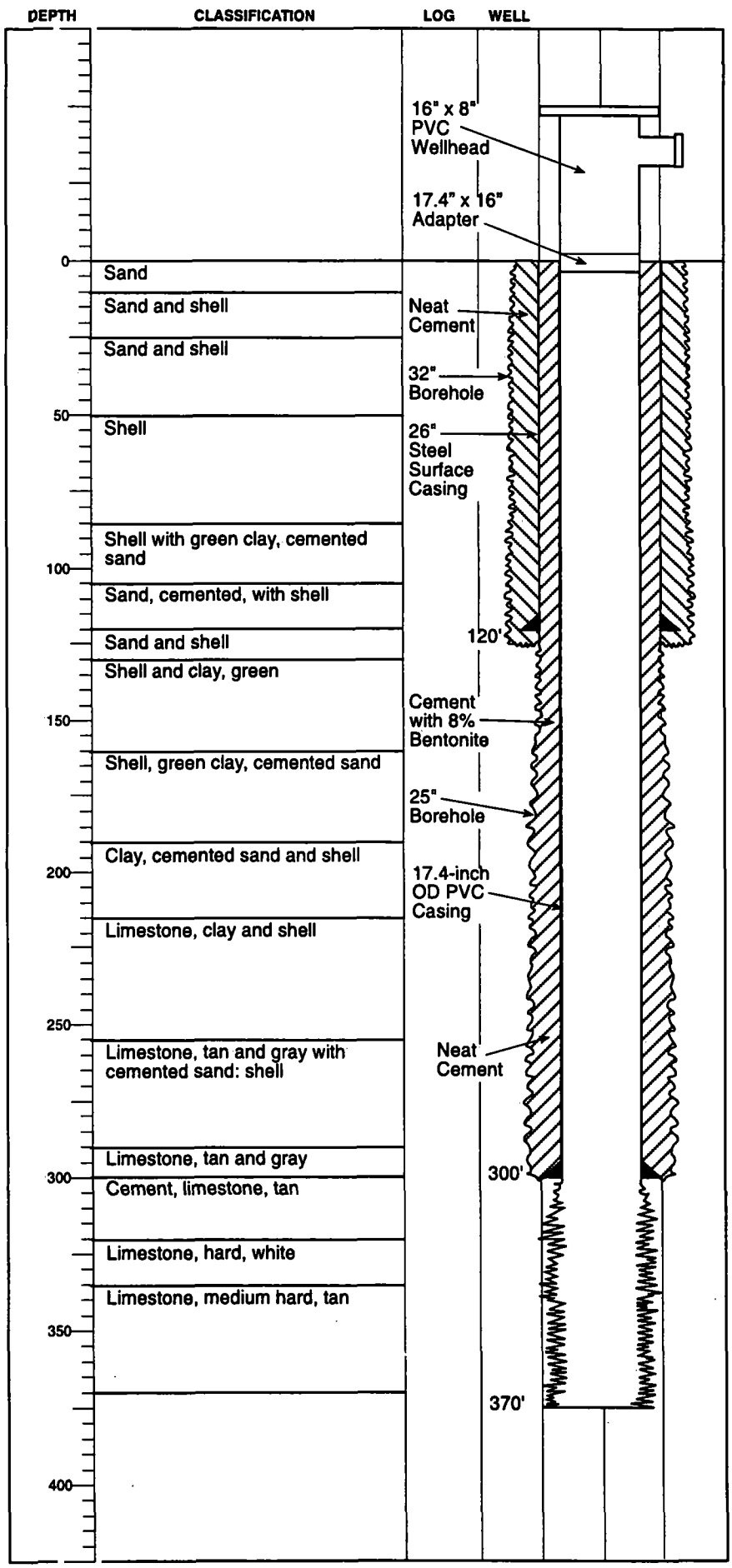
[1] AS $CaCO_3$

Exhibit 2-3. Completion Details for Well R-9.

Well R-10 was then acidized with 3,000 gallons of 28 percent hydrochloric acid and redeveloped by airlifting and surging.

After pump testing and wellhead installation, the straightness and alignment test was conducted, which showed no significant deviations. Well R-10 was then disinfected and capped.

Exhibit 2-4 illustrates completion details for Well R-10.



CH2MHILL

WELL DRILLING REPORT

PROJECT NO. 140312.A1.AS

WELL: Cocoa, R-10

LOCATION: Dyal WTP

Sec. 20, T24S, R 34 E

COUNTY: Orange STATE: FL

GROUND ELEVATION: ±45.0 ft msl

DIAMETER: 16 inch

DEPTH: 370 ft bls

STATIC WATER LEVEL: 10.1 ft btoc

DATE: April 20, 1998

CASING: 0-300 ft bls, PVC Certa-Lok 15.3" I.D.

SCREEN: N/A

CONSTRUCTION: Mud-Rotary, Reverse-Air

DRILLER: Meredith Environmental

Orlando, Florida

DATE FINISHED: April 10, 1998

PUMPING TEST

SPECIFIC YIELD 66.3 gpm/ft @ 1,220 gpm

WATER ANALYSIS (ppm)

TDS	1,120
TOTAL HARDNESS[1]	516
M.O. ALKALINITY[1]	166
CHLORIDE Cl	572
IRON Fe	0.039
SULFATE SO_4	83.1
COLOR (ALPHA)	10
CALCIUM[1]	358

COMMENTS Field Parameters

H_2S = 2.6

D.O. = 2.1

Turbidity = 6.6 NTU

COMPILED BY R.J. Petersen

DATE May 27, 1998

[1] AS $CaCO_3$

Exhibit 2-4. Completion Details for Well R-10.

3. Well Performance Testing

3.1 Description of Testing

Well performance testing was conducted after all four wells had been acidized and developed. Each well was first tested with a variable rate pumping test, followed by a constant rate pumping test.

Step-injection tests will be conducted following installation of wellhead piping and instrumentation, now anticipated to be completed in early June, 1999. The step-injection tests will be conducted in conjunction with the system performance acceptance tests. Proposed procedures for conducting the system performance acceptance and step-injection tests are described in Section 5 of this report.

The variable rate pumping test (step pumping test) was conducted primarily to evaluate each well's drawdown characteristics. The information obtained from this type of test is used for proper sizing of each well's final pump. The constant rate testing was conducted to evaluate aquifer parameters and the hydraulic interference among the four new ASR wells. The City plans to operate these wells as a separate recharge and recovery system. For this reason, a limited amount of data was collected at the six ASR existing wells.

All testing was conducted with a contractor-supplied submersible pump that was powered by a portable generator. Flow rates were measured with a 6-inch propeller flowmeter. During each pumping test, electronic data loggers monitored water levels in the pumping well and in the other three new ASR wells. Water levels were also measured in selected existing ASR wells.

During each of the step tests and constant rate pumping tests, water samples were obtained for water quality analysis. The analyses included field parameters and FDEP primary and secondary drinking water scans.

3.2 Step Pumping Tests

The step pumping tests consisted of pumping each well in a series of three increasing pumping rates (steps) and measuring the resultant water level drawdown in the pumping well. Each step of the test lasted approximately two hours. Water levels in the other three new ASR wells were monitored during this time to obtain a preliminary understanding of the pumping well's effect on the local potentiometric surface. These measurements were primarily used to set up the data loggers for the constant rate tests, and are included in Appendix B.

Step test results of the four new ASR wells are presented in Exhibit 3-1. For each pumping step, drawdowns in the pumping well are reported.

EXHIBIT 3-1
Summary of Six-Hour Step Test Results

	ASR Well R7[a]		
	Step Pumping Rate (gpm)	Drawdown[b] (feet)	Specific Capacity (gpm/ft)
	330	22.4	**14.7**
	530	40.1	**13.2**
	960	73.9	**13.0**
Design Rate	700	53.0	**13.2**

	ASR Well R8[c]		
	Step Discharge Rate (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft)
	290	22.4	**12.9**
	570	45.9	**12.4**
	940	79.9	**11.8**
Design Rate	700	58.0	**12.1**

	ASR Well R9[d]		
	Step Discharge Rate (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft)
	300	14.0	**21.4**
	600	31.5	**19.0**
	1,070	58.0	**18.4**
Design Rate	700	34.0	**20.6**

	ASR Well R10[e]		
	Step Discharge Rate (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft)
	320	2.2	**145.5**
	590	5.9	**100.0**
	1,200	18.5	**64.9**
Design Rate	700	9.0	**77.8**

[a]May 5, 1998; static water level was 9.51 ft below temporary MP.
[b]Drawdown at design rate is interpolated for each well; it does not include effects of interference.
[c]April 22, 1998; static water level was 8.33 ft below temporary MP.
[d]April 13, 1998; static water level was 9.50 ft below temporary MP.
[e]April 17, 1998; static water level was 8.75 ft below temporary MP.

MP measuring point
gpm gallons per minute

3.3 Constant Rate Pumping Tests

The constant rate pumping tests were performed to investigate the hydraulic properties of the aquifer in the vicinity of each new well. Testing involved pumping each well at a constant rate for approximately 24 hours. Test results were used to estimate the recharge and recovery rates for each well.

During each constant rate test, drawdowns were recorded for the pumping well, each new ASR well, and selected existing ASR wells. Drawdown data from the pumping well were analyzed using the Cooper and Jacob method (1946). Drawdown data from the other three new wells (used as observation wells) were analyzed using the Hantush and Jacob method (1955) for semi-confined aquifers. The results of these analyses are summarized in Exhibits 3-2 through 3-6.

The appearance of the pumping well's drawdown curves suggests that a recharge boundary was encountered soon after pumping started. This is evident by the pronounced decrease in the slope of the drawdown curves. This effect was observed in the drawdown curves of the observation wells, indicating that steady-state conditions were reached.

The aquifer's response to the pump tests indicates that an effective recharge source exists in the vicinity of the wells. The large variations in the calculated aquifer transmissivity may reflect the proximity of each well to the recharge source. The results indicate wells R-7 and R-8 have similar transmissivity values, but are much lower than wells R-9 and R-10. The calculated aquifer parameters are summarized in Exhibit 3-2. Drawdown data for each test is summarized in Exhibits 3-2 through 3-6.

3.4 Geophysical Logging

Geophysical logging provides information on the subsurface hydrogeology and documents borehole conditions before recharge and recovery operations are conducted. After acidization, geophysical logging was conducted on each ASR well before and during pumping tests. Gamma, long-short normal (LSN) electric, spontaneous potential, temperature, fluid resistivity, and caliper logs were conducted under static conditions. Temperature, fluid resistivity, and flowmeter logs were obtained under pumping conditions.

The logs indicate that most water production originates in the borehole section between the casing bottom (300 feet), approximately 330 ft bls. A summary of the logging conducted on each well is presented in Exhibits 3-7 through 3-10. Geophysical logs are presented in their entirety in Appendix C.

3.5 Water Quality Testing

Water quality samples were obtained from the four new wells during reverse-air drilling of the open hole sections. During drilling, the water samples were obtained from the drilling discharge at 10-feet-deep intervals. These samples were analyzed for standard parameters in the Cocoa Dyal WTP laboratory and are contained in Appendix A-1.

EXHIBIT 3-2
Summary of Calculated Aquifer Properties – Pump Tests of New ASR Wells

Parameter	ASR Well			
	R7	R8	R9	R10
Transmissivity Average gal/day/ft	19,750	26,250	70,000	175,333
Storage Coeficient Average (Dimensionless)	0.0002	0.0001	0.0002	0.0005
Leakance Average ft/day	0.0053	0.0053	0.0060	0.0138

gal/day/ft gallons per day per feet

EXHIBIT 3-3
Summary of 24-Hour Constant Rate Pumping Test – ASR Well R7 (Pumping Rate 880 GPM)

Observation Point	Distance from Pumped Well (feet)	Drawdown at End of Test (feet)	Calculated Transmissivity (gal/day/ft)	Calculated Storage Coefficient	Calculated Leakance/Day
R-7	--	74.2	23,000	NC	NC
R-1	2,170	0.55	NC	NC	NC
R-2	1,210	1.03	NC	NC	NC
R-3	1,830	0.73	NC	NC	NC
R-6	1,460	1.10	NC	NC	NC
R-8	555	5.76	31,000	0.0002	0.0034
R-9	1,110	2.09	86,000	0.0002	0.0023
R-10	1,665	0.22	NC	NC	NC

NC not calculated

Water samples were also obtained during the step tests and the constant rate pumping tests. Samples were collected at selected intervals for field analysis including conductivity, chloride, pH, dissolved oxygen (DO), and turbidity. The results are also presented in Appendix A-1.

At the end of the constant rate tests, an additional sample was collected from each well to conduct an FDEP primary and secondary drinking water quality scan (excluding asbestos and primary pesticides). The results are summarized in Section 4, and copies of the complete analyses are presented in Appendix A-2.

EXHIBIT 3-4
Summary of 24-Hour Constant Rate Pumping Test – ASR Well R8 (Pumping Rate 920 GPM)

Observation Point	Distance from Pumped Well (feet)	Drawdown at End of Test (feet)	Calculated Transmissivity (gal/day/ft)	Calculated Storage Coefficient	Calculated Leakance/Day
R-8	--	79.50	24,000	NC	NC
R-1	2,730	0.13	NC	NC	NC
R-2	1,730	0.13	NC	NC	NC
R-3	2,320	0.14	NC	NC	NC
R-6	1,880	0.15	NC	NC	NC
R-7	555	6.37	31,000	0.0002	0.0033
R-9	555	7.57	39,000	0.0001	0.0015
R-10	1,110	0.79	180,000	0.0005	0.0095

EXHIBIT 3-5
Summary of 24-Hour Constant Rate Pumping Test – ASR Well R9 (Pumping Rate 1,060 GPM)

Observation Point	Distance from Pumped Well (feet)	Drawdown at End of Test (feet)	Calculated Transmissivity (gal/day/ft)	Calculated Storage Coefficient	Calculated Leakance/Day
R-9	--	61.9	27,000	NC	NC
R-1	3,280	0.13	NC	NC	NC
R-2	2,260	0.13	NC	NC	NC
R-3	2,820	0.14	NC	NC	NC
R-6	2,360	0.15	NC	NC	NC
R-7	1,110	2.80	34,000	0.0002	0.0037
R-8	555	9.11	24,000	0.0001	0.0026
R-10	555	1.87	130,000	0.0004	0.014

EXHIBIT 3-6
Summary of 24-Hour Constant Rate Pumping Test – ASR Well R10 (Pumping Rate 1,220 GPM)

Observation Point	Distance from Pumped Well (feet)	Drawdown at End of Test (feet)	Calculated Transmissivity (gal/day/ft)	Calculated Storage Coefficient	Calculated Leakance/Day
R-10	--	18.3	181,000	NC	NC
R-1	NM	NM	NC	NC	NC
R-2	NM	NM	NC	NC	NC
R-3	NM	NM	NC	NC	NC
R-6	NM	NM	NC	NC	NC
R-7	1,665	0.49	25,000	0.0004	0.0110
R-8	1,110	1.4	22,000	0.0001	0.0094
R-9	555	2.33	124,000	0.0003	0.013

NM not measured

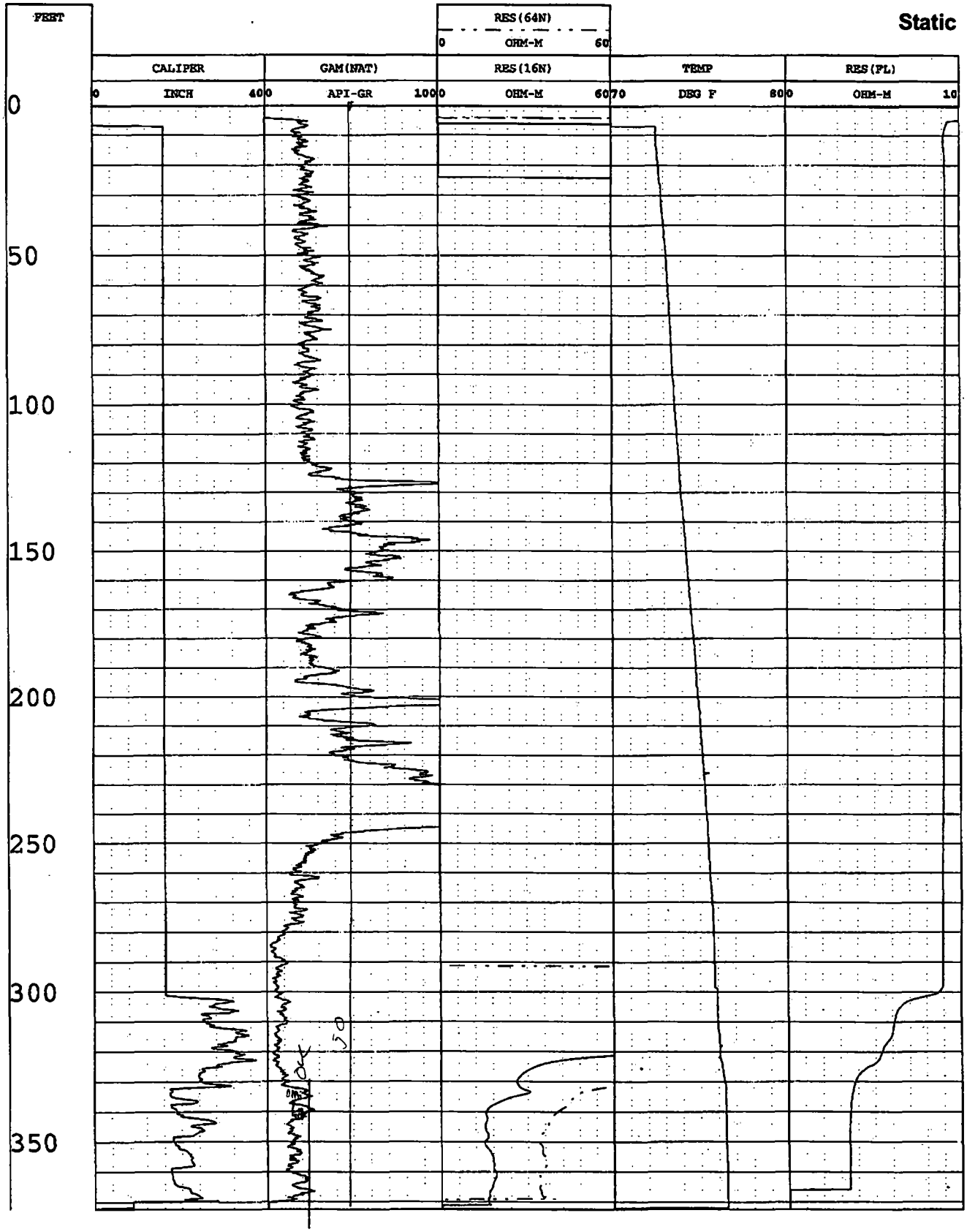


Exhibit 3-7 (1 of 2). Summary of Geophysical Logs for Well R-7.

Pumping

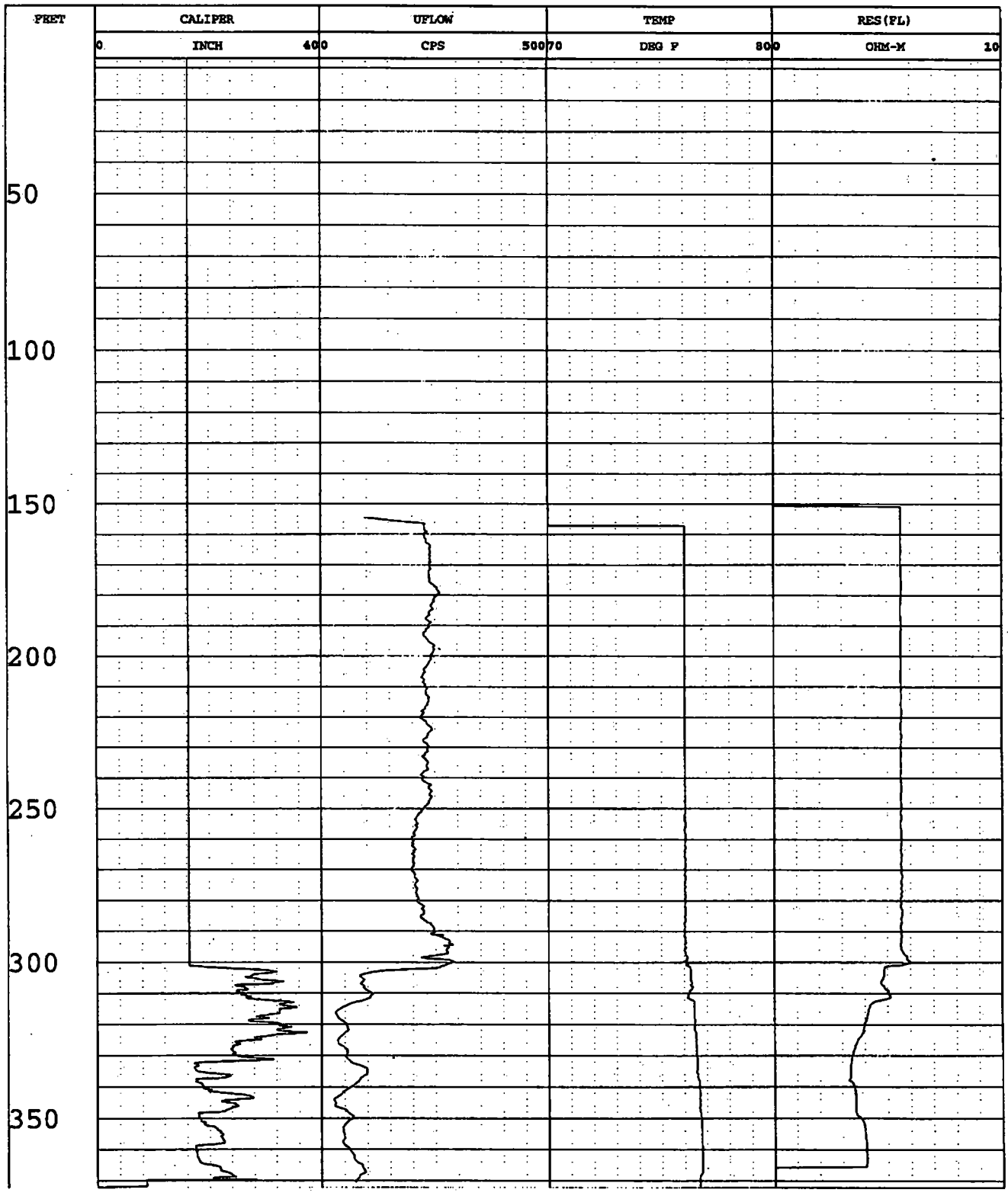


Exhibit 3-7 (2 of 2). Summary of Geophysical Logs for Well R-7.

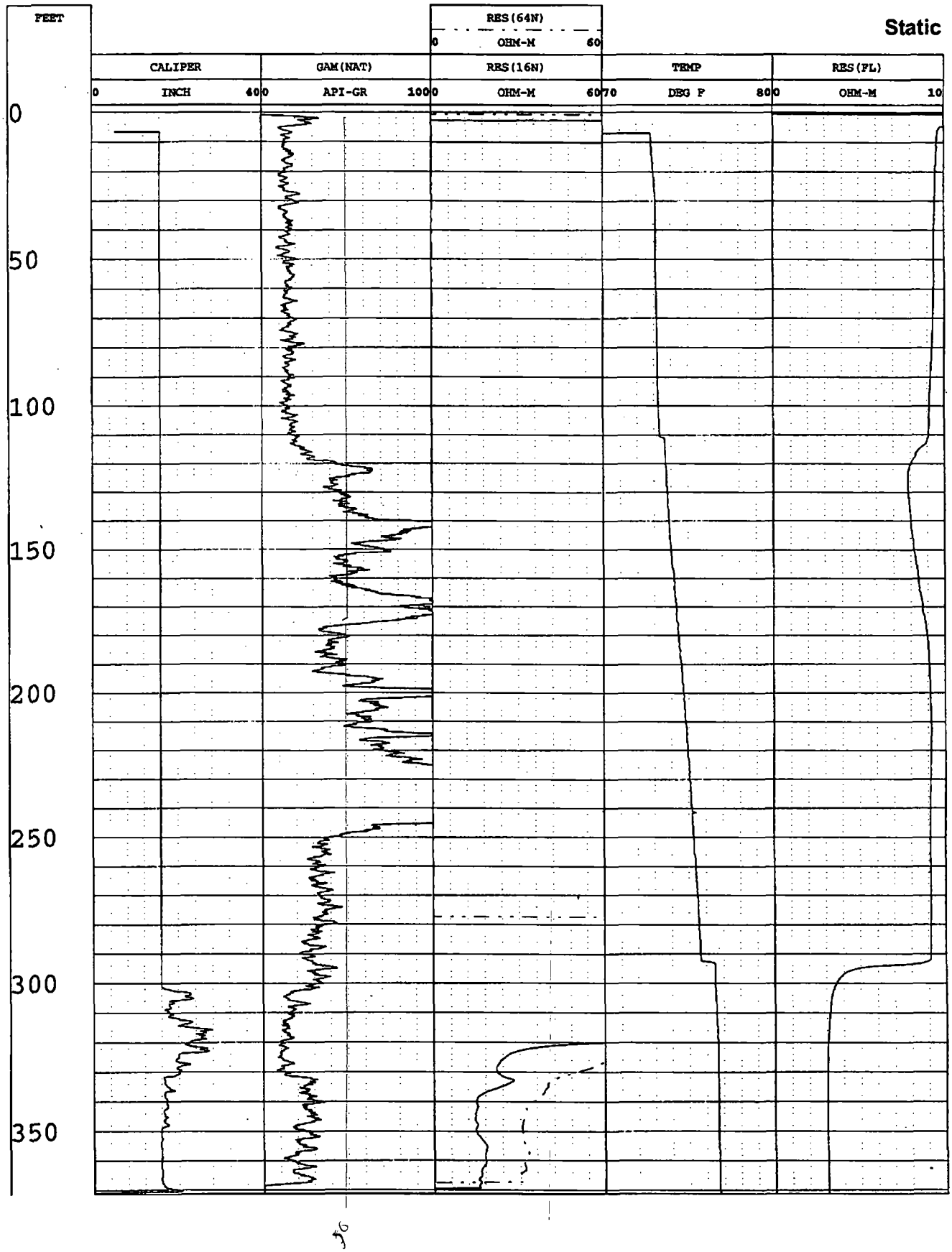


Exhibit 3-8 (1 of 2). Summary of Geophysical Logs for Well R-8.

Pumping

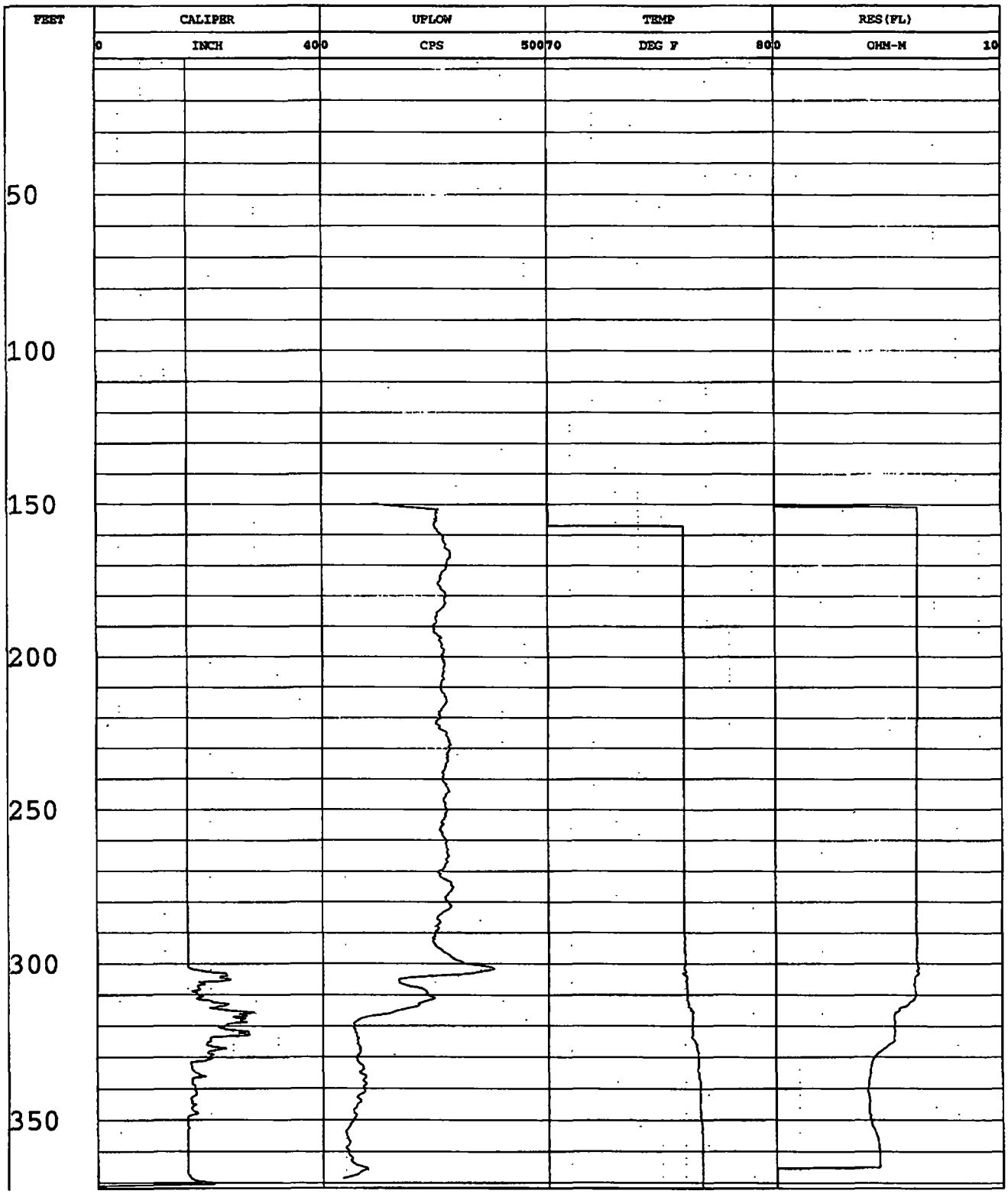


Exhibit 3-8 (2 of 2). Summary of Geophysical Logs for Well R-8.

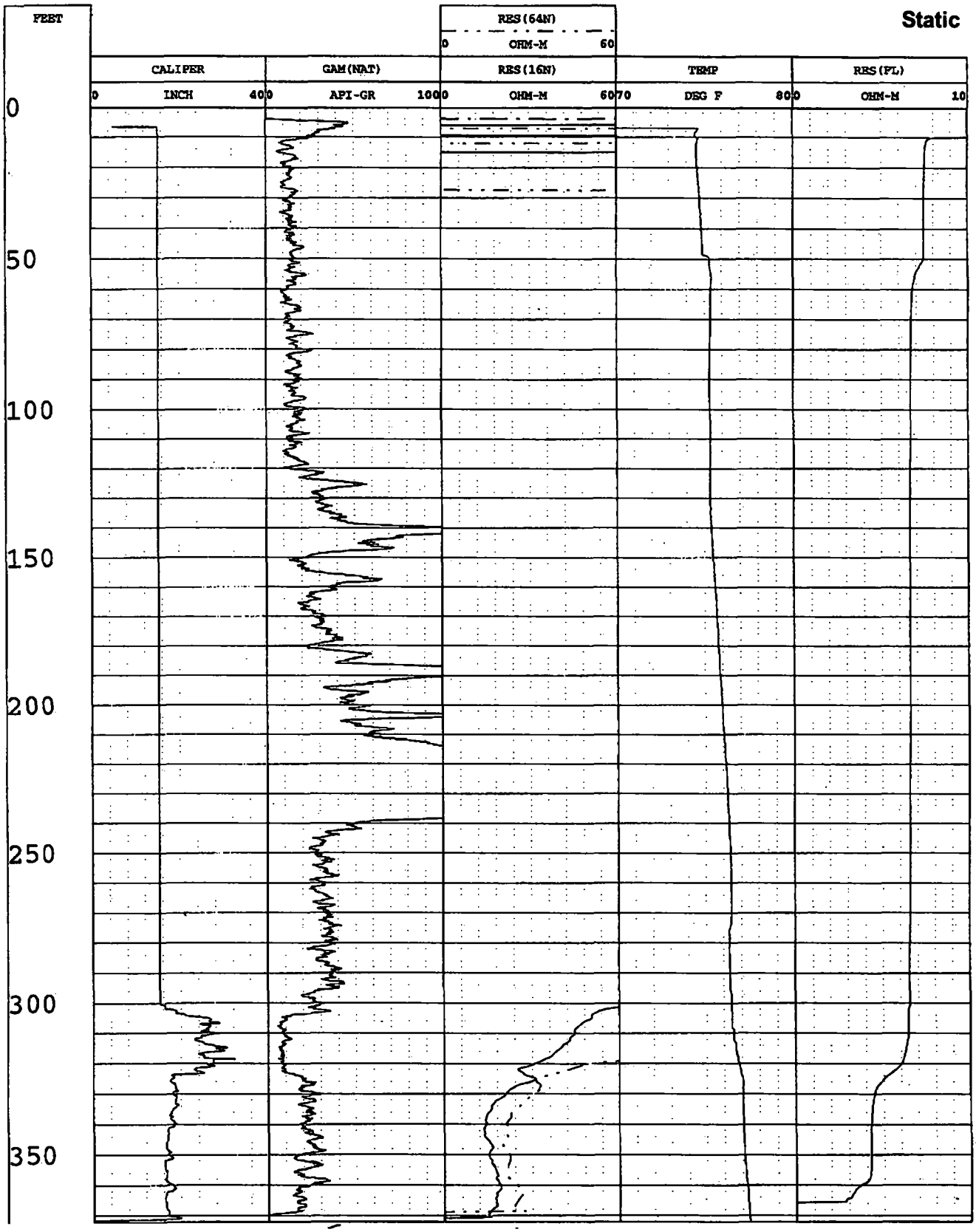


Exhibit 3-9 (1 of 2). Summary of Geophysical Logs for Well R-9.

Pumping

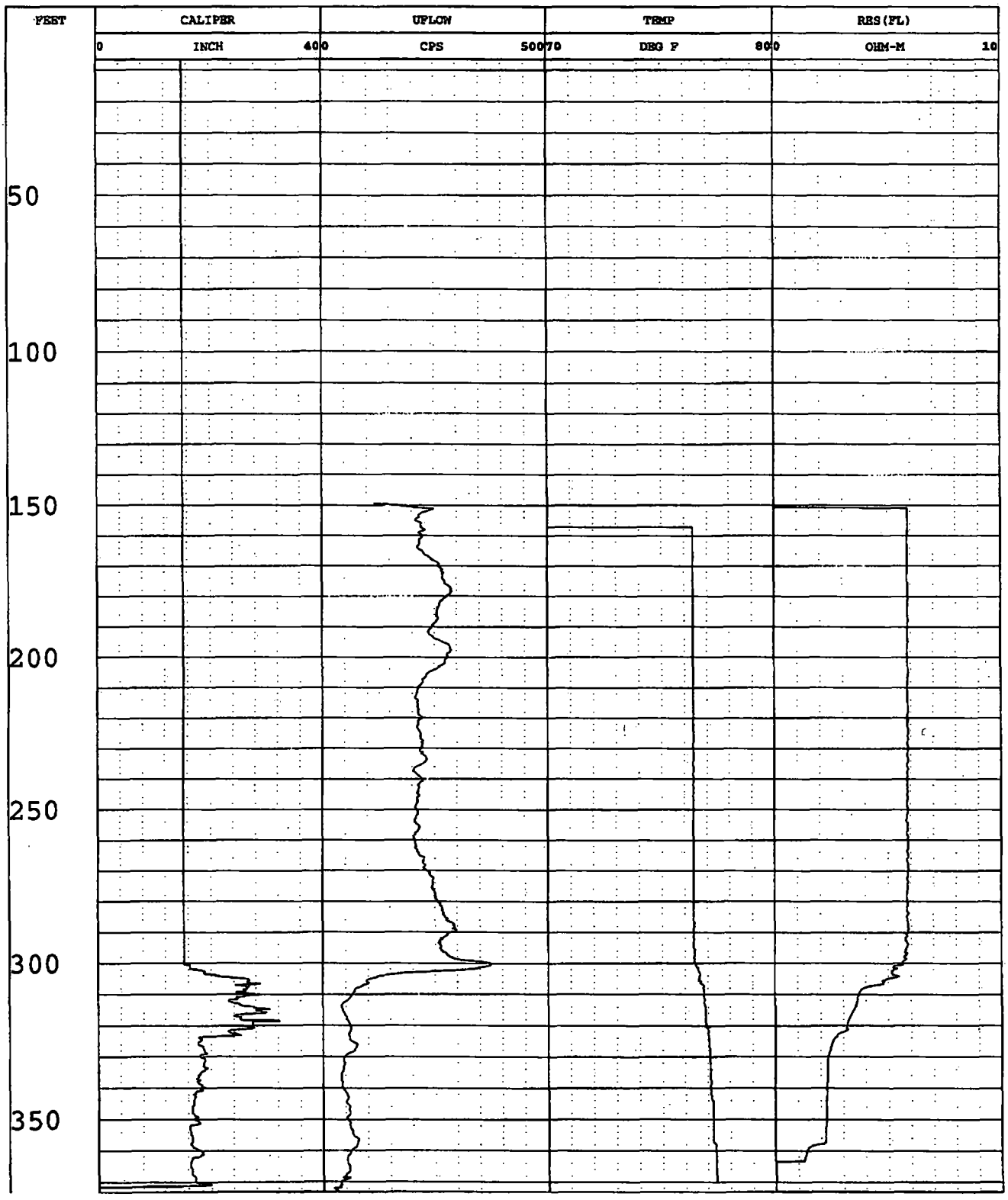


Exhibit 3-9 (2 of 2). Summary of Geophysical Logs for Well R-9.

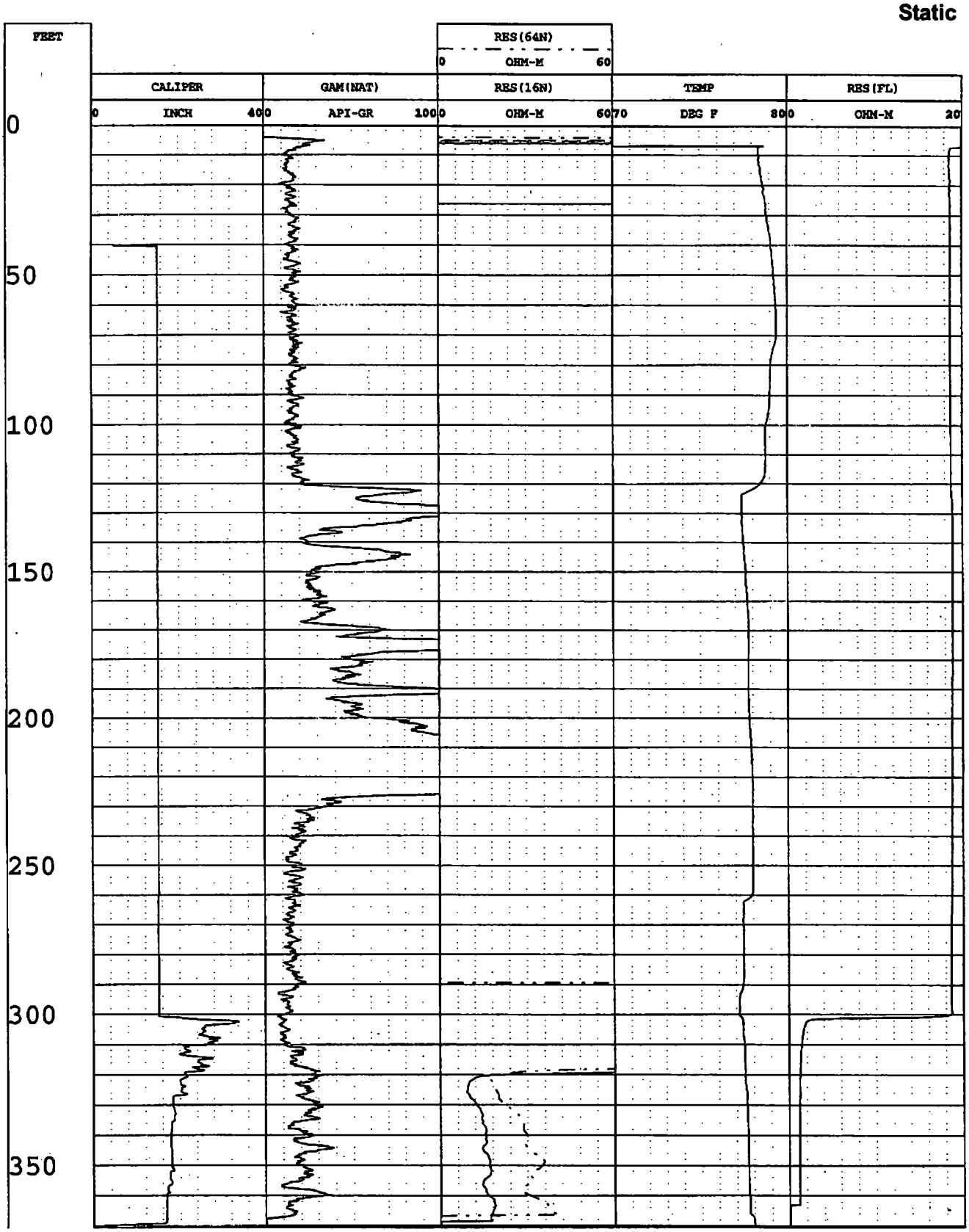


Exhibit 3-10 (1 of 2). Summary of Geophysical Logs for Well R-10.

Pumping

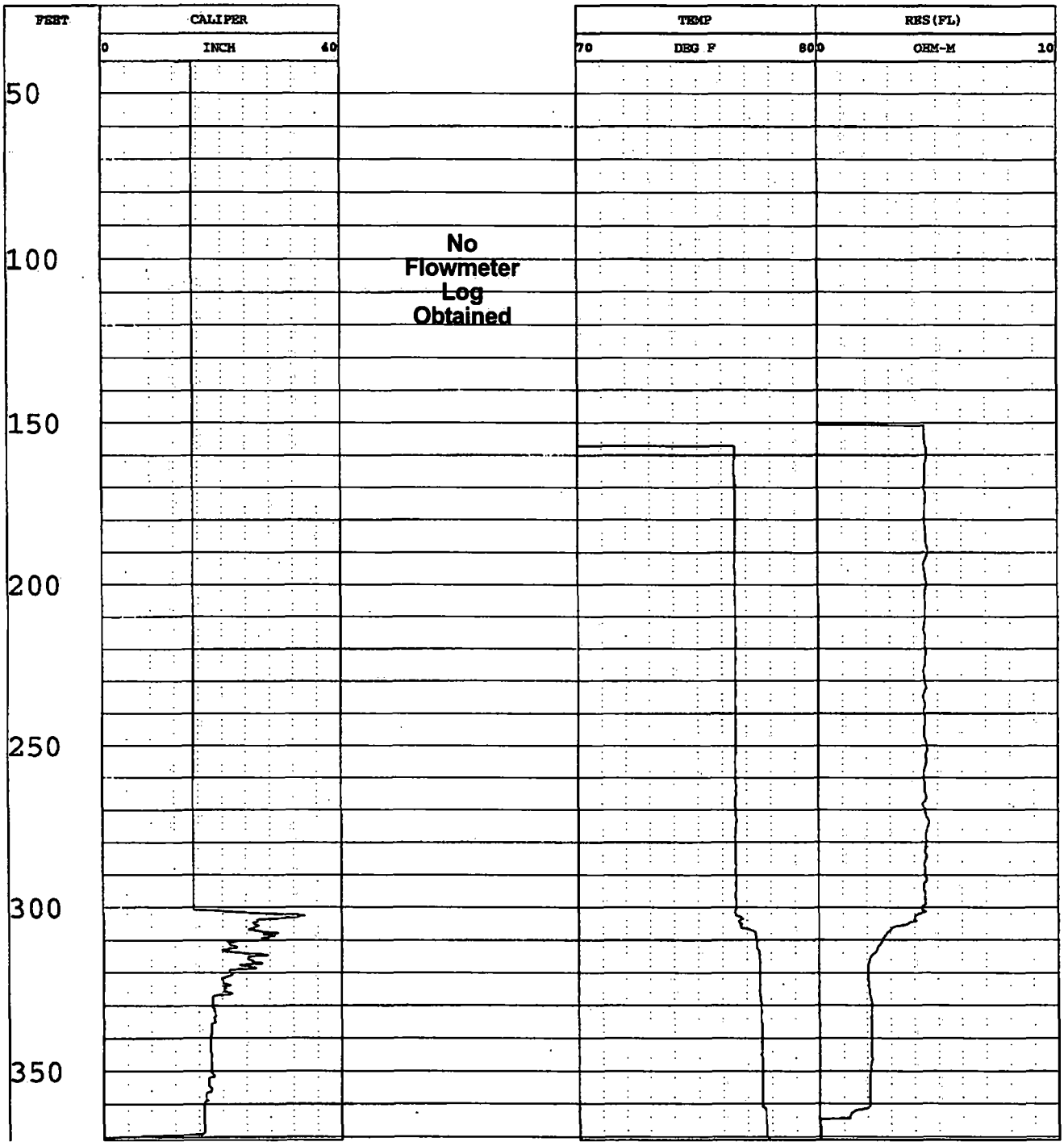


Exhibit 3-10 (2 of 2). Summary of Geophysical Logs for Well R-10.

4. Summary and Discussion of Results

Four ASR wells were drilled and tested at the City of Cocoa Dyal WTP as part of its existing ASR facility expansion. Each well is complete with a final casing string of nominal 16-inch-diameter PVC casing set into the top of the Floridan aquifer. Each well is of open hole construction. The construction described in this report includes only the wells and the uppermost portion of the wellheads.

Pumping tests were conducted on each well, and aquifer parameters were calculated. In addition, water samples were obtained from each well location to determine water quality. Results from this project phase, and the step-injection tests to be conducted in June, 1999,will be used to obtain FDEP authorization for operational testing. The initial operational ASR cycle test is expected to begin in October, 1999.

4.1 Hydraulic Response of the Aquifer

The results of the testing indicate that the selected storage zone is semiconfined. Wells R-7, R-8, and R-9 generally exhibit transmissivities lower than the six existing ASR wells. The exception is Well R-10, where a higher transmissivity was observed. The minimal amount of drawdown observed in existing ASR wells R-1, R-2, R-3, and R-6 during constant rate testing indicates insignificant mutual interference between the two systems.

In the wells, pump test water level measurements were used to calculate drawdown and interference effects at design rates of recharge and recovery. These calculations were used to predict the recharge and recovery water levels in the new ASR wells, which are shown in Exhibit 4-1.

EXHIBIT 4-1
Target Recharge and Recovery Rates

Well	Estimated Recovery Rate (gpm)	Estimated Drawdown[a] (feet)	Estimated Recharge Rate[b] (gpm)	Estimated Wellhead Pressure (psi)
R-7	700	108	290	11
R-8	700	118	270	11
R-9	700	90	350	9
R-10	700	22	350	1
Total	**2,800 (4.0 mgd)**		**1,260 (1.8 mgd)**	

[a]Drawdowns account for well interference; assume all wells pump at 700 gpm for 90 days.
[b]Actual recharge and recovery rates will vary as a result of hydraulic variations in the system.

4.2 Water Quality Observations

Native water quality in the ASR storage zone was observed to be fairly consistent at the four new well sites. Well R-10 exhibited the highest concentrations of dissolved constituents, with a chloride concentration of 572 milligrams per liter (mg/L) and a total dissolved solids concentration of 1,120 mg/L. The remaining wells exhibited water quality similar to existing ASR wells R-2 and R-3. Exhibit 4-2 presents a summary of each well's observed native water quality.

Water samples taken during the pumping tests indicate that water quality improved early in the pumping tests, reaching equilibrium before completion of pumping. This response is considered a result of a minimal acidization residual in the wells at the start of pumping tests. By test end, all acidization byproducts were purged from the wells.

The water produced from well R-10 exhibited elevated levels of turbidity during the step tests and the constant rate tests. At the end of the 24-hour test, the turbidity level measured 6.6 NTU, which exceeds the drinking water standard of 1.0 NTU. It is expected that turbidity levels in this well will reduce to acceptable standards with extended pumping.

4.3 Assessment of ASR Potential

Testing results indicate that the newly constructed wells are generally compatible with the ASR concept. The storage zone exhibits a satisfactory degree of confinement, and the overall aquifer response indicates a range of transmissivities acceptable for the intended recharge and recovery flows. The background water quality has apparently reached equilibrium at the pumping test rates, which further indicates adequate confinement of the storage zone.

The water quality and aquifer hydraulics near wells R-7, R-8, and R-9 appear similar to existing ASR wells R-3 and R-6. For this reason, potable water storage and recovery in these new wells is expected to be similar to wells R-3 and R-6. The water quality and aquifer hydraulics near well R-10 appear similar to existing well R-2. For this reason, the performance of well R-10 is expected to be similar to the performance of well R-2. Well R-10's relatively high specific capacity may require throttling of recharge and recovery flows.

EXHIBIT 4-2
Summary of Water Quality Testing of New ASR Wells

Parameter	ASR Well			
	R-7	R-8	R-9	R-10
pH	7.33	7.97	7.65	7.09
Total Alkalinity (as CaCo3)	162	146	144	166
Total Hardness (as CaCo3)	450	388	394	516
Non-Carbonate Hardness (as CaCo3)	288	242	250	350
Turbidity (NTU)	0.14	0.4	0.8	6.6
Chloride (mg/L)	500	422	417	572
Sulfate (mg/L)	34.9	78.3	75.4	83.1
Calcium (mg/L)	306	290	258	358
Magnesium (mg/L)	144	98	136	158
Sodium (mg/L)	240	225	232	292
Total Dissolved Solids (mg/L)	1,140	1,070	934	1,120
Iron (mg/L)	0.031	0.018	0.027	0.039
Color (mg/L)	10	7	10	10
Fluoride (mg/L)	0.6	1.0	1.1	0.9
Conductivity (µmho/cm)	1,838	1,625	1,779	2,240
Field Hydrogen Sulfide (mg/L)	2.1	1.9	3.3	2.6
Field Dissolved Oxygen (mg/L)	1.7	1.3	1.2	2.1

CaCo3	calcium carbonate
µmho/cm	micromhos per centimeter
mg/L	milligrams per liter
NTU	nephelometric turbidity unit

5. Recommendations

As noted previously, the four new wells are part of the Dyal WTP expansion currently under construction. Following completion of piping, pump installation, wellhead facilities, and the plantwide SCADA (Supervisory Control and Data Acquisition) system, well R-10 should be pumped to waste for one to three days to reduce turbidity levels. During this time, water quality should be frequently monitored for turbidity.

As described in CH2M HILL's *Application to Construct Four Class V, Group 7 ASR Wells – City of Cocoa Dyal WTP* (September 1996), a common piping manifold connected to Dyal plant piping will connect the four wells. The new ASR wells will use low-pressure, gravity-fed recharge flows from the available head at the ground storage tanks (GST) located on the Dyal plant site's northern side. Upon completion of these facilities, an initial system performance acceptance test (PAT) and step-injection tests of the new wells will be conducted. The system performance acceptance and step-injection testing is designed to verify overall system operation and well performance; completion will require three to five days. The tests will represent initial operation and will be designed to verify the predicted behavior of the new systems.

During testing, recharge will occur for about four hours under gravity flow from the GSTs; recovery will begin immediately after recharge. All recovered flows will be diverted to the Dyal WTP's raw water intake. Following written approval from FDEP, an initial ASR cycle testing program will be conducted.

An initial target volume of potable water will be injected to establish a water quality buffer, followed by the first cycle storage volume. The injected water will be obtained from the onsite GSTs, and will be injected by gravity flow into the four new wells over a four- to five-week span. Following a few days of storage in the aquifer, the storage volume will be recovered to the Dyal WTP's raw water intake. Water quality will be monitored daily during the initial recovery cycle, until 100 percent recovery of the storage volume is reached. Estimates of buffer, storage, and recovery volumes will be developed following the completion of the PATs, and will be provided in the cycle test plan.

The test cycle will demonstrate each new ASR well's hydraulic and water quality response to recharge and recovery of potable water. During this time, adjustments may need to be made to the system hydraulics and control values within the piping system. The observed recovery water quality response for the wells will be used to finalize the operation plan for the ASR facility.

As per the UIC permit, an engineering report must be submitted to FDEP upon completion of testing. It must include a detailed analysis of all cycle testing, an operations and maintenance (O&M) section, with conclusions and recommendations and estimated ASR capacities for the wells.

Following FDEP acceptance of this report, it is anticipated that an "Authorization to Use Class V Well" will be issued to the City to allow routine operation of the new ASR wells as part of the public water supply system.

6. Works Cited

CH2M HILL. *Application to Construct Four Class V, Group 7 ASR Wells – City of Cocoa Dyal WTP*. September 1996.

CH2M HILL. *Aquifer Storage Recovery Feasibility Investigation – Final Report*. 1988.

CH2M HILL. *Results of Aquifer Storage Recovery Well Drilling and Testing*. 1990.

Cooper, H. H., Jr. and C.E. Jacob. A Generalized Graphical Method for Evaluating Fomation Constants and Summarizing Well Field History. *Transaction, American Geophysical Union*. Vol.27. No. 4. 1946.

Hantush, M. S. and C. E. Jacob. Non-Steady Radial Flow in an Infinite Leaky Aquifer. *Transaction, American Geophysical Union*. Vol. 35. No. 6. 1955.

CITY OF COCOA FLORIDA

Appendix A-1
Water Quality Results During Drilling and Pumping Tests

CITY OF COCOA
ASR SYSTEM EXPANSION
WATER QUALITY DURING DRILLING

ASR WELL R-7

Date	Depth	Chlorides	Conductivity	pH	Alkalinity	Total Hardness	Calcium Hardness	Sulfates
Nov-6,1997	317	444	1698	8.00	136	378	280	N/A
	327	464	1709	8.02	140	376	240	40.1
	337	460	1752	8.24	134	356	248	43.4
	347	464	1692	8.12	130	376	282	39.1
	357	464	1689	8.10	130	366	266	75.9
	370	464	1681	8.10	136	370	246	33.9

CITY OF COCOA
ASR SYSTEM EXPANSION
WATER QUALITY DURING DRILLING

ASR WELL R-8

Date	Depth	Chlorides	Conductivity	pH	Alkalinity	Total Hardness	Calcium Hardness	Sulfates
Dec. 12-1997	317	438	1417	9.35	48	276	220	53.2
	327	447	1553	7.84	120	360	234	44.8
	337	450	1566	7.76	130	376	238	135
	347	460	1428	7.73	138	374	206	50.5
	357	434	1407	7.75	124	352	220	46.2
	370	450	1407	8.16	138	360	238	43.1

CITY OF COCOA
ASR SYSTEM EXPANSION
WATER QUALITY DURING DRILLING

ASR WELL R-9

Date	Depth	Chlorides	Conductivity	pH	Alkalinity	Total Hardness	Calcium Hardness	Sulfates
2/18/98	317	442	1728	8.16	132	346	240	34.75
	327	445	1775	7.81	146	374	246	39.7
	337	432	1743	7.90	130	356	224	38.47
	347	427	1715	7.98	118	354	248	36.72
	357	432	1704	8.09	110	340	256	38.45
	370	436	1889	8.07	154	376	256	28.89

CITY OF COCOA
ASR SYSTEM EXPANSION
WATER QUALITY DURING DRILLING

ASR WELL R-10

Date	Depth	Chlorides	Conductivity	pH	Alkalinity	Total Hardness	Calcium Hardness	Sulfates
4/6/98	317	530	1905	7.86	140	412	210	52.55
	327	532	1916	7.79	130	400	262	44.05
	337	530	1901	7.91	136	412	260	49.3
	347	560	1750	7.87	134	420	250	46.65
	357	540	1741	7.87	136	414	268	49.3
	370	508	1798	7.90	134	406	242	45.85

Cocoa ASR Expansion
April - May 1998
Pump Testing Water Quality

Well R-7

Step Test - May 5, 1998

Hours Pumping	Chlorides (mg/l)	Conductivity (umhos)	Turbidity (ntu)	pH
2	780	2570	4.9	6.7
4	760	2440	8.7	6.7
6	592	2232	1.7	6.7

24 Hour Constant Rate Test - May 5-6, 1998

Hours Pumping	Chlorides (mg/l)	Conductivity (umhos)	Turbidity (ntu)	pH	D.O.
2	580	2262	3.3	6.7	
6	562	1916	0.88	6.8	
12	534	1826	6.5	7.0	
18	508	1782	8.9	7.1	
22	518	1756	1.65	7.1	
24	524	1838	0.14	7.2	1.7

Cocoa ASR Expansion
April - May 1998
Pump Testing Water Quality

Well R-8

Step Test - April 22, 1998

Hours Pumping	Chlorides (mg/l)	Conductivity (umhos)	Turbidity (ntu)	pH
2	616	2690	3.9	6.7
4	554	2360	2	6.8
6	532	2150	0.44	6.9

24 Hour Constant Rate Test - April 27-28, 1998

Hours Pumping	Chlorides (mg/l)	Conductivity (umhos)	Turbidity (ntu)	pH	D.O.
6	496	1828	0.34	7.2	
12	480	1767	0.72	7.2	
18	480	1729	5.47	7.3	
22	476	1700	0.18	7.4	
24	458	1625	0.4	7.5	1.3

Cocoa ASR Expansion
April - May 1998
Pump Testing Water Quality

Well R-9

Step Test - April 13, 1998

Hours Pumping	Chlorides (mg/l)	Conductivity (umhos)	Turbidity (ntu)
2	680	2900	3.4
4	662	2450	2.9
5	628	2200	1.6

24 Hour Constant Rate Test - April 14-15, 1998

Hours Pumping	Chlorides (mg/l)	Conductivity (umhos)	Turbidity (ntu)	pH	D.O.
6	492	2050	0.8	7.1	
12	476	1860	0.8	7.2	
18	460	1828	1.1		
22	462	1782	0.9		
24	462	1779	0.8	7.4	1.2

Cocoa ASR Expansion
April - May 1998
Pump Testing Water Quality

Well R-10

Step Test - April 17, 1998

Hours Pumping	Chlorides (mg/l)	Conductivity (umhos)	Turbidity (ntu)
2	836	3040	478
4	942	3190	39
6	850	3120	105

24 Hour Constant Rate Test - April 20-21, 1998

Hours Pumping	Chlorides (mg/l)	Conductivity (umhos)	Turbidity (ntu)	pH	D.O
8	630	2516	19	6.7	
12	624	2504	6.6	6.9	
16	597	2376	17.4	7.1	
20	578	NA	NA	7.1	
22	576	NA	5.2	NA	
23	586	2280	5.8	NA	
24	610	2240	6.6	7.1	2.1

CITY OF cocoa FLORIDA

Appendix A-2
FDEP Primary and Secondary Drinking Water Analyses

LAB FORMAT FOR REPORTING DRINKING WATER ANALYSES

PUBLIC WATER SYSTEM INFORMATION (to be completed by system or lab)

System Name: CITY OF COCA I.D. #: 3050223

A: 600 SCHOOL ST, COCOA, FL 32922 Phone #: 568-5867

Type (check one) (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION (to be completed by sampler)

Sample Date (MMDDYY): 05/07/98 Sample Time: 0845

Sample Location (be specific): (R-7)

Sampler Name and Phone: MARY KRALJ

Sampler's Signature: Mary Kralj Title: Laboratory Technician

Check Types(s)
( ) Distribution ( ) Recheck of MCL ( ) Resample of Lab Invalidated Sample
( ) Clearance ( ) Thm Max Res Time ( ) Plant Tap
( ) Distrib entry pt (X) Raw ( ) Composite of Multiple Sites--Attach a format for each site

LABORATORY CERTIFICATION INFORMATION (to be completed by lab) -- attach HRS Analyte Sheet *

Lab Name: BIONOMICS LABORATORY HRS#: 83331 Expiration Date: 06/30/98

Address: 4310 E. Anderson Rd., Orlando, FL 32812 Phone: 851-2560

Subcontracted Lab HRS#: 83141 --ATTACH HRS ANALYTE SHEET FOR SUBCONTRACTED LAB, TOO *

ANALYSIS INFORMATION: (to be completed by lab) Work Order Number: B805110-01

Date Sample(s) Received: 05/07/98 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

( ) Nitrate Only ( ) Nitrite Only ( ) Asbestos Only ( ) Trihalomethanes

Inorganics--		Volatile Organics--		Secondaries--		Pesticide/PCBs--	
( ) All 17	(X) Partial	(X) All 21	( ) Partial	( ) All	(X) Partial	( ) All 30	(X) Partial

Group I Unregulateds--		Group II Unregulateds--		Group III Unregulateds--		Radiochemicals--	
( ) All 13	( ) Partial	( ) All 23	( ) Partial	( ) All	( ) Partial	(X) Single Sample	
						( ) Qtrly Composite **	

**Provide radiochemical sample dates & locations for each quarter

I, MARK RUSLER, do HEREBY CERTIFY that all attached analytical data are correct.

Signature Mark Rusler

Title: CHEMIST Date: 6/1/98

COMPLIANCE INFORMATION (to be completed by State)

Sample Collection Satisfactory: _____ Sample Analysis Satisfactory: _____

Resample Requested For: _____ Reason: _____

Person Notified to resample: _____ Date Notified: _____

DEP/HRS Reviewing Official: _____

*All HRS lab #s and their HRS Analyte Sheet for labs performing the attached water analyses must be provided. Failure to do so will result in rejection of the analyses and possible enforcement against the public water system for failure to sample.

BIONOMICS LABORATORY
4310 E. Anderson Rd.
Orlando, FL 32812
DHRS/DEP #83331; E83012
(407) 851-2560 FAX:(407) 856-0886

For Lab Use Only

Date Received: 05/07/98
Time Received: 0955
Signature of Lab Official: Mark Linder

DRINKING WATER BACTERIOLOGICAL ANALYSIS

System Name: CITY OF COCOA System ID #: 3050223 System Phone#: (407)568-5867

Address: 600 SCHOOL ST. County: _____ DEP District: _____

Collector: MARY KRALJ Collector Phone#: (407)568-5867

Sample Site (locality or subdivision): R-7

Date and Time Collected: 05/7/98 @ 0845

Type of Supply: Community water system Noncommunity water system Nontransient-noncommunity water sys.
Private well Swimming pool Bottled water Other public water system

Type of Sample: (circle one) Compliance (check box) Repeat Replacement (check box) Main Clearance Well Survey Other: _____ (specify)
[ ] Distribution [ ] TNTC or C
[ ] Raw [ ] Turbid

Remarks:

BE COMPLETED BY COLLECTOR OF SAMPLE

Coll No:	Sample Point (Specific Address)	Cl Res	pH
	R-7		

TO BE COMPLETED BY LAB:

Date & time of analysis: 05/07/98 @ 1759 by: LH

Analysis Method: MF MTF MMO-MUG PA

Sample Number:	Non Coliform	*Total	Confirm Total	Confirm Fecal
B805110-01		A		

* Results in this column are preliminary. Fecal coliform confirmation on community and noncommunity water systems and total coliform confirmation on all types of water systems will follow in 24-48 hours.

P - Coliforms are present C - Confluent growth TA - Turbid, Absence of gas or acid
A - Coliforms are absent TNTC - Too numerous to count

INTERPRETATIONS - REMARKS BY PROGRAM REVIEWER

Name and Mailing Address of Person/Firm to Receive Report:

CITY OF COCOA
600 SCHOOL ST.
COCOA, FL 32922
ATTN: MARY KRALJ

[ ]
[ ] Satisfactory
[ ] Incomplete collection information
[ ] Repeat samples
[ ] Replacement samples

Reviewing Official: _____

Title: _____

COCO5110.XLS

INORGANIC ANALYSIS

62-550-310(1)

(PWS030)

ID	Name	(MCL mg/L)	Sample Number	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
1005	Arsenic	(0.05)	B805110-01	< 0.0034	U	200.9	5/11/98	0.0034	83331
1010	Barium	(2)	B805110-01	0.05		200.7	5/11/98	0.002	83331
1015	Cadmium	(.005)	B805110-01	< 0.0001		200.9	5/11/98	0.0001	83331
1020	Chromium	(0.1)	B805110-01	< 0.0002	U	200.9	5/11/98	0.0002	83331
1024	Cyanide	(0.2)	B805110-01	< 0.006	U	SM4500CN E	5/11/98	0.006	83331
1025	Fluoride	(4)	B805110-01	0.606		SM 4500F C	5/7/98	0.027	83331
1030	Lead	(0.015)	B805110-01	< 0.001	U	200.9	5/11/98	0.001	83331
1035	Mercury	(0.002)	B805110-01	< 0.00005		245.1	5/12/98	0.00005	83331
1036	Nickel	(0.1)	B805110-01	< 0.012	U	200.7	5/12/98	0.012	83331
1040	Nitrate	(10)	B805110-01	< 0.006	U	300.0A	5/7/98	0.006	83331
1041	Nitrite	(1)	B805110-01	< 0.004	U	300.0A	5/7/98	0.004	83331
1045	Selenium	(0.05)	B805110-01	< 0.002	U	200.9	5/11/98	0.002	83331
1052	Sodium	(160)	B805110-01	240		200.7	5/12/98	0.1	83331
1074	Antimony	(0.006)	B805110-01	0.002	I	200.9	5/12/98	0.0017	83331
1075	Beryllium	(0.004)	B805110-01	0.0013		200.7	5/11/98	0.0003	83331
1085	Thallium	(0.002)	B805110-01	< 0.0006	U	200.9	5/12/98	0.0006	83331
1094	Asbestos	(7 MFL)				NA			

SECONDARY CHEMICAL ANALYSIS

62-550.320

(PWS031)

ID	Name	(MCL mg/L)	Sample Number	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
1002	Aluminum	(0.2)	B805110-01	< 0.036	U	200.7	5/11/98	0.036	83331
1017	Chloride	(250)	B805110-01	500		300.0A	5/7/98	0.074	83331
1022	Copper	(1)	B805110-01	< 0.004	U	200.7	5/12/98	0.004	83331
1025	Fluoride	(2.0)	B805110-01	0.606		SM 4500F C	5/7/98	0.027	83331
1028	Iron	(0.3)	B805110-01	0.031		200.7	5/12/98	0.006	83331
1032	Manganese	(0.05)	B805110-01	< 0.002	U	200.7	5/12/98	0.002	83331
1050	Silver	(0.1)	B805110-01	< 0.009	U	200.7	5/11/98	0.009	83331
1055	Sulfate	(250)	B805110-01	34.9		300.0A	5/7/98	0.03	83331
1095	Zinc	(5)	B805110-01	0.006	I	200.7	5/12/98	0.006	83331
1905	Color	(15color units)	B805110-01	10		SM2120B	5/7/98	5	83331
1920	Odor	(3 T.O.N.)	B805110-01	> 32		SM2150B	5/7/98	1	83331
1925	pH	(6.5-8.5)	B805110-01	7.33		150.1	5/7/98		83331
19	Total Dissolved Solids	(500)	B805110-01	1140		SM2540C	5/12/98	4.41	83331
2	Foaming Agents	(0.5)	B805110-01	< 0.02	U	SM5540C	5/9/98	0.02	83331

TRIHALOMETHANE ANALYSIS

62-550-310(a)

(PWS027)

IL	Name	Sample Number	CL Resid	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
2950	Total THMs					524.2		0.0011	

RADIOCHEMICAL ANALYSIS*

62-550.310(5)

(PWS033)

ID	Name	Sample Number	Analysis Result(pCi/l)	Analysis Method	Analysis Date	Error	Lab ID
4000	Gross Alpha	B805110-01	4.4	900.0	5/14/98	±2.7	83141
4012	Photon Emitters						
4020	Radium-226	B805110-01	1.1	903.1	5/18/98	±0.2	83141
4030	Radium-228	B805110-01	< 0.9	RA-5	5/18/98	±0.6	83141
4101	Man-made beta						

*(Gross alpha generally only requirement, see 62-550.519,(FAC)

VOLATILE ORGANIC ANALYSIS

62-550.310(2)(b)

(PWS028)

I'	Name	(MCL ug/L)	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
23?o	1,2,4-Trichlorobenzene	(70)	B805110-01	< 0.22	U	524.2	5/7/98	0.22	83331
2380	Cis-1,2-dichlorethylene	(70)	B805110-01	< 0.03	U	524.2	5/7/98	0.03	83331
2955	Xylenes (total)	(10000)	B805110-01	< 0.24	U	524.2	5/7/98	0.24	83331
2964	Dichloromethane	(5)	B805110-01	< 0.31	U	524.2	5/7/98	0.31	83331
2968	O-dichlorobenzene	(600)	B805110-01	< 0.05	U	524.2	5/7/98	0.05	83331
2969	Para-dichlorobenzene	(75)	B805110-01	< 0.02	U	524.2	5/7/98	0.02	83331
2976	Vinyl Chloride	(1)	B805110-01	< 0.29	U	524.2	5/7/98	0.29	83331
2977	1,1-dichloroethylene	(7)	B805110-01	< 0.02	U	524.2	5/7/98	0.02	83331
2979	Trans-1,2-dichloroethylene	(100)	B805110-01	< 0.12	U	524.2	5/7/98	0.12	83331
2980	1,2-dichloroethane	(3)	B805110-01	< 0.02	U	524.2	5/7/98	0.02	83331
2981	1,1,1-trichloroethane	(200)	B805110-01	< 0.21	U	524.2	5/7/98	0.21	83331
2982	Carbon tetrachloride	(3)	B805110-01	< 0.29	U	524.2	5/7/98	0.29	83331
2983	1,2-dichloropropane	(5)	B805110-01	< 0.33	U	524.2	5/7/98	0.33	83331
2984	Trichloroethylene	(3)	B805110-01	< 0.02	U	524.2	5/7/98	0.02	83331
2985	1,1,2-trichloroethane	(5)	B805110-01	< 0.23	U	524.2	5/7/98	0.23	83331
2987	Tetrachloroethylene	(3)	B805110-01	< 0.21	U	524.2	5/7/98	0.21	83331
2989	Monochlorobenzene	(100)	B805110-01	< 0.23	U	524.2	5/7/98	0.23	83331
2990	Benzene	(1)	B805110-01	< 0.05	U	524.2	5/7/98	0.05	83331
2991	Toluene	(1000)	B805110-01	< 0.41	U	524.2	5/7/98	0.41	83331
;	Ethylbenzene	(700)	B805110-01	< 0.47	U	524.2	5/7/98	0.47	83331
2990	Styrene	(100)	B805110-01	< 0.2	U	524.2	5/7/98	0.2	83331

PESTICIDE/PCB CHEMICAL ANALYSIS

62-550-310(2)(c)

(PWS029)

ID	Name	(MCL ug/L)	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2005	Endrin	(2)				508		0.002	
2010	Lindane	(.2)				508		0.002	
2015	Methoxychlor	(40)				508		0.052	
2020	Toxaphene	(3)				508		0.309	
2031	Dalapon	(200)				515.1		0.036	
2032	Diquat	(20)				549.1		0.26	
2033	Endothall	(100)				548.1		15.4	
2034	Glyphosate	(700)				547		9.44	
2035	Di(2-ethylhexyl)adipate	(400)				525.2		0.71	
2036	Oxamyl (Vydate)	(200)				531.1		2.57	
2037	Simazine	(4)				507		0.078	
2039	Di(2-ethylhexyl)phthalate	(6)				525.2		1.15	
2040	Picloram	(500)				515.1		0.029	
2041	Dinoseb	(7)				515.1		0.055	
2042	Hexachlorocyclopentadiene	(50)				525.2		0.292	
2046	Carbofuran	(40)				531.1		7.04	
2050	Atrazine	(3)				507		0.035	
2051	Alachlor	(2)				507		0.012	
2063	2,3,7,8-TCDD(Dioxin)	(.00003)	---			---			
2065	Heptachlor	(.4)				508		0.004	
2067	Heptachlor Epoxide	(.2)				508		0.002	
21	2,4-D	(70)				515.1		0.026	
2	2,4,5-TP (Silvex)	(50)				515.1		0.017	
2274	Hexachlorobenzene	(1)				508		0.008	
2306	Benzo(a)pyrene	(.2)				550.1		0.013	
2326	Pentachlorophenol	(1)				515.1		0.007	
2383	PCB	(.5)	B805110-01	< 0.1	U	508	5/27/98	0.1	83331
2931	Dibromochloropropane	(.2)				504.1		0.004	
2946	Ethylene Dibromide	(.02)				504.1		0.006	
2959	Chlordane	(2)				508		0.446	

UNREGULATED GROUP I ANALYSIS

62-550.405

(PWS035)

ID	Name	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2021	Carbaryl				531.1		3.89	
2022	Methomyl				531.1		3.20	
2043	Aldicarb Sulfoxide				531.1		1.88	
2044	Aldicarb Sulfone				531.1		5.57	
2045	Metolachlor				507		0.108	
2047	Aldicarb				531.1		5.95	
2066	3-Hydroxycarbofuran				531.1		3.35	
20	Butachlor				507		0.021	
2	Propachlor				508		0.110	
23	Aldrin				508		0.003	
2364	Dieldrin				508		0.002	
2440	Dicamba				515.1		0.005	
2595	Metribuzin				507		0.024	

LAB FORMAT FOR REPORTING DRINKING WATER ANALYSES

PUBLIC WATER SYSTEM INFORMATION (to be completed by system or lab)

System Name: CITY OF COCA I.D. #: 3050223

Address: 600 SCHOOL ST, COCOA, FL 32922 Phone #: 407-568-5867

Type (check one) (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION (to be completed by sampler)

Sample Date (MMDDYY): 04/28/98 Sample Time: 1120

Sample Location (be specific): (R-8)

Sampler Name and Phone: MARY KRALJ

Sampler's Signature: Mary Kralj Title: Laboratory Technician

Check Types(s) ( ) Distribution ( ) Recheck of MCL ( ) Resample of Lab Invalidated Sample
( ) Clearance ( ) Thm Max Res Time ( ) Plant Tap
( ) Distrib entry pt (X) Raw ( ) Composite of Multiple Sites--Attach a format for each site

LABORATORY CERTIFICATION INFORMATION (to be completed by lab) -- attach HRS Analyte Sheet *

Lab Name: BIONOMICS LABORATORY HRS#: 83331 Expiration Date: 06/30/98

Address: 4310 E. Anderson Rd., Orlando, FL 32812 Phone: 851-2560

Subcontracted Lab HRS#: 83141 --ATTACH HRS ANALYTE SHEET FOR SUBCONTRACTED LAB, TOO *

ANALYSIS INFORMATION: (to be completed by lab) Work Order Number: B804622-01

Date Sample(s) Received: 04/28/98 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

( ) Nitrate Only ( ) Nitrite Only ( ) Asbestos Only ( ) Trihalomethanes

Inorganics--	Volatile Organics--	Secondaries--	Pesticide/PCBs--
( ) All 17 (X) Partial	(X) All 21 ( ) Partial	( ) All (X) Partial	( ) All 30 (X) Partial

Group I Unregulateds--	Group II Unregulateds--	Group III Unregulateds--	Radiochemicals--
( ) All 13 ( ) Partial	( ) All 23 ( ) Partial	( ) All ( ) Partial	(X) Single Sample
			( ) Qtrly Composite **

**Provide radiochemical sample dates & locations for each quarter

I, MARK RUSLER, do HEREBY CERTIFY that all attached analytical data are correct.

Signature: Mark Rusler

Title: CHEMIST Date: 5/18/98

COMPLIANCE INFORMATION (to be completed by State)

Sample Collection Satisfactory: _____ Sample Analysis Satisfactory: _____

Re[illegible]le Requested For: _____ Reason: _____

[illegible]otified to resample: _____ Date Notified: _____

DEP/HRS Reviewing Official: _____

*All HRS lab #s and their HRS Analyte Sheet for labs performing the attached water analyses must be provided. Failure to do so will result in rejection of the analyses and possible enforcement against the public water system for failure to sample.

COCO4622.XLS

INORGANIC ANALYSIS

62-550-310(1)

(PWS030)

ID	Name	(MCL mg/L)	Sample Number	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
1005	Arsenic	(0.05)	B804622-01	< 0.0034	U	200.9	5/5/98	0.0034	83331
1010	Barium	(2)	B804622-01	0.403		200.7	4/30/98	0.002	83331
1015	Cadmium	(.005)	B804622-01	< 0.0001		200.9	5/4/98	0.0001	83331
1020	Chromium	(0.1)	B804622-01	< 0.0002	U	200.9	5/4/98	0.0002	83331
1024	Cyanide	(0.2)	B804622-01	< 0.006	U	SM4500CN E	4/30/98	0.006	83331
1025	Fluoride	(4)	B804622-01	1		SM 4500F C	5/5/98	0.027	83331
1030	Lead	(0.015)	B804622-01	< 0.001	U	200.9	5/4/98	0.001	83331
1035	Mercury	(0.002)	B804622-01	< 0.00005		245.1	4/30/98	0.00005	83331
1036	Nickel	(0.1)	B804622-01	< 0.012	U	200.7	5/1/98	0.012	83331
1040	Nitrate	(10)	B804622-01	< 0.006	U	300.0A	4/29/98	0.006	83331
1041	Nitrite	(1)	B804622-01	< 0.004	U	300.0A	4/29/98	0.004	83331
1045	Selenium	(0.05)	B804622-01	0.003	I	200.9	5/5/98	0.002	83331
1052	Sodium	(160)	B804622-01	225		200.7	5/1/98	0.1	83331
1074	Antimony	(0.006)	B804622-01	0.002	I	200.9	5/5/98	0.0017	83331
1075	Beryllium	(0.004)	B804622-01	0.0012		200.7	5/4/98	0.0003	83331
1085	Thallium	(0.002)	B804622-01	< 0.0006	U	200.9	5/5/98	0.0006	83331
1094	Asbestos	(7 MFL)				NA			

SECONDARY CHEMICAL ANALYSIS

62-550.320

(PWS031)

ID	Name	(MCL mg/L)	Sample Number	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
1002	Aluminum	(0.2)	B804622-01	< 0.036	U	200.7	5/4/98	0.036	83331
1017	Chloride	(250)	B804622-01	422		300.0A	4/29/98	0.074	83331
1022	Copper	(1)	B804622-01	< 0.004	U	200.7	5/1/98	0.004	83331
1025	Fluoride	(2.0)	B804622-01	1		SM 4500F C	5/5/98	0.027	83331
1028	Iron	(0.3)	B804622-01	0.018	I	200.7	5/1/98	0.006	83331
1032	Manganese	(0.05)	B804622-01	< 0.002	U	200.7	5/1/98	0.002	83331
1050	Silver	(0.1)	B804622-01	0.04		200.7	4/30/98	0.009	83331
1055	Sulfate	(250)	B804622-01	78.3		300.0A	4/29/98	0.03	83331
1095	Zinc	(5)	B804622-01	< 0.006	U	200.7	5/1/98	0.006	83331
1905	Color	(15color units)	B804622-01	7		SM2120B	4/28/98	5	83331
1920	Odor	(3 T.O.N.)	B804622-01	> 32		SM2150B	4/28/98	1	83331
1925	pH	(6.5-8.5)	B804622-01	7.97		150.1	4/28/98		83331
1	Total Dissolved Solids	(500)	B804622-01	1070		SM2540C	5/1/98	4.41	83331
2	Foaming Agents	(0.5)	B804622-01	< 0.02	J3	SM5540C	4/30/98	0.02	83331

TRIHALOMETHANE ANALYSIS

62-550-310(a)

(PWS027)

Lc	Name	Sample Number	CL Resid	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
2950	Total THMs					524.2		0.0011	

RADIOCHEMICAL ANALYSIS*

62-550.310(5)

(PWS033)

ID	Name	Sample Number	Analysis Result(pCi/l)	Analysis Method	Analysis Date	Error	Lab ID
4000	Gross Alpha	B804622-01	4.2	900.0	4/30/98	±2.1	83141
4012	Photon Emitters						
4020	Radium-226	B804622-01	1.1	903.1	5/5/98	±0.2	83141
4030	Radium-228	B804622-01	< 0.9	RA-5	5/5/98	±0.5	83141
4101	Man-made beta						

*(Gross alpha generally only requirement, see 62-550.519,(FAC)

VOLATILE ORGANIC ANALYSIS

62-550.310(2)(b)

(PWS028)

I	Name	(MCL ug/L)	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2378	1,2,4-Trichlorobenzene	(70)	B804622-01	< 0.22	U	524.2	4/30/98	0.22	83331
2380	Cis-1,2-dichlorethylene	(70)	B804622-01	< 0.03	U	524.2	4/30/98	0.03	83331
2955	Xylenes (total)	(10000)	B804622-01	< 0.24	U	524.2	4/30/98	0.24	83331
2964	Dichloromethane	(5)	B804622-01	< 0.31	U	524.2	4/30/98	0.31	83331
2968	O-dichlorobenzene	(600)	B804622-01	< 0.05	U	524.2	4/30/98	0.05	83331
2969	Para-dichlorobenzene	(75)	B804622-01	< 0.02	U	524.2	4/30/98	0.02	83331
2976	Vinyl Chloride	(1)	B804622-01	< 0.29	U	524.2	4/30/98	0.29	83331
2977	1,1-dichloroethylene	(7)	B804622-01	< 0.02	U	524.2	4/30/98	0.02	83331
2979	Trans-1,2-dichloroethylene	(100)	B804622-01	< 0.12	U	524.2	4/30/98	0.12	83331
2980	1,2-dichloroethane	(3)	B804622-01	< 0.02	U	524.2	4/30/98	0.02	83331
2981	1,1,1-trichloroethane	(200)	B804622-01	< 0.21	U	524.2	4/30/98	0.21	83331
2982	Carbon tetrachloride	(3)	B804622-01	< 0.29	U	524.2	4/30/98	0.29	83331
2983	1,2-dichloropropane	(5)	B804622-01	< 0.33	U	524.2	4/30/98	0.33	83331
2984	Trichloroethylene	(3)	B804622-01	< 0.02	U	524.2	4/30/98	0.02	83331
2985	1,1,2-trichloroethane	(5)	B804622-01	< 0.23	U	524.2	4/30/98	0.23	83331
2987	Tetrachloroethylene	(3)	B804622-01	< 0.21	U	524.2	4/30/98	0.21	83331
2989	Monochlorobenzene	(100)	B804622-01	< 0.23	U	524.2	4/30/98	0.23	83331
2990	Benzene	(1)	B804622-01	< 0.05	U	524.2	4/30/98	0.05	83331
2	Toluene	(1000)	B804622-01	< 0.41	U	524.2	4/30/98	0.41	83331
:	Ethylbenzene	(700)	B804622-01	< 0.47	U	524.2	4/30/98	0.47	83331
2996	Styrene	(100)	B804622-01	< 0.2	U	524.2	4/30/98	0.2	83331

PESTICIDE/PCB CHEMICAL ANALYSIS

62-550-310(2)(c)

(PWS029)

ID	Name	(MCL ug/L)	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2005	Endrin	(2)				508		0.002	
2010	Lindane	(.2)				508		0.002	
2015	Methoxychlor	(40)				508		0.052	
2020	Toxaphene	(3)				508		0.309	
2031	Dalapon	(200)				515.1		0.036	
2032	Diquat	(20)				549.1		0.26	
2033	Endothall	(100)				548.1		15.4	
2034	Glyphosate	(700)				547		9.44	
2035	Di(2-ethylhexyl)adipate	(400)				525.2		0.71	
2036	Oxamyl (Vydate)	(200)				531.1		2.57	
2037	Simazine	(4)				507		0.078	
2039	Di(2-ethylhexyl)phthalate	(6)				525.2		1.15	
2040	Picloram	(500)				515.1		0.029	
2041	Dinoseb	(7)				515.1		0.055	
2042	Hexachlorocyclopentadiene	(50)				525.2		0.292	
2046	Carbofuran	(40)				531.1		7.04	
2050	Atrazine	(3)				507		0.035	
2051	Alachlor	(2)				507		0.012	
2063	2,3,7,8-TCDD(Dioxin)	(.00003)	—			—			
2065	Heptachlor	(.4)				508		0.004	
2067	Heptachlor Epoxide	(.2)				508		0.002	
?	2,4-D	(70)				515.1		0.026	
?	2,4,5-TP (Silvex)	(50)				515.1		0.017	
2274	Hexachlorobenzene	(1)				508		0.008	
2306	Benzo(a)pyrene	(.2)				550.1		0.013	
2326	Pentachlorophenol	(1)				515.1		0.007	
2383	PCB	(.5)	B804622-01	< 0.1	U	508	5/8/98	0.1	83331
2931	Dibromochloropropane	(.2)				504.1		0.004	
2946	Ethylene Dibromide	(.02)				504.1		0.006	
2959	Chlordane	(2)				508		0.446	

UNREGULATED GROUP I ANALYSIS

62-550.405

(PWS035)

ID	Name	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2021	Carbaryl				531.1		3.89	
2022	Methomyl				531.1		3.20	
2043	Aldicarb Sulfoxide				531.1		1.88	
2044	Aldicarb Sulfone				531.1		5.57	
2045	Metolachlor				507		0.108	
2047	Aldicarb				531.1		5.95	
2066	3-Hydroxycarbofuran				531.1		3.35	
?	Butachlor				507		0.021	
?	Propachlor				508		0.110	
2356	Aldrin				508		0.003	
2364	Dieldrin				508		0.002	
2440	Dicamba				515.1		0.005	
2595	Metribuzin				507		0.024	

REPORT COMMENTS

CASE NARRATIVE

WE ARE EXPERIENCING A PROBLEM WITH THE RECOVERY OF THE THE STANDARDS (CCVs) FOR MBAS. THE STOCK STANDARD USED TO MAKE THE WORKING STANDARD MAY HAVE BEEN CONTAMINATED OR HAS GONE BAD. THE RESULTS REPORTED HAVE BEEN QUALIFIED WITH A "J3" INDICATING THE ASSOCIATED QC FAILS TO MEET ESTABLISHED CRITERIA. THE REPORTED RESULTS MAY BE LOWER THAN ANTICIPATED.

THE CORRECTIVE ACTION, ALREADY IN PLACE, IS THE USE OF A NEW MBAS STOCK SOLUTION AND TO GENERATE A NEW 10 POINT CURVE. WE FEEL THESE MEASURES WILL ELIMINATE ANY FURTHER PROBLEMS.

NOTE: RADIOCHEMICAL ANALYSIS SUBCONTRACTED TO FL DW LAB ID #83141

BIONOMICS LABORATORY
4310 E. Anderson Rd.
Orlando, FL 32812
DHRS/DEP #83331; E83012
(407) 851-2560 FAX:(407) 856-0886

For Lab Use Only

Date Received: 04/28/98
Time Received: 1220
Signature of Lab Official: Mark Ruder

DRINKING WATER BACTERIOLOGICAL ANALYSIS

System Name: CITY OF COCOA System ID #: 3050223 System Phone#: (407)568-5867

Address: 600 SCHOOL ST. County: _____ DEP District: _____

Collector: MARY KRALJ Collector Phone#: (407)568-5867

Sample Site (locality or subdivision): R-8

Date and Time Collected: 04/28/98 @ 1120

Type of Supply: Community water system Noncommunity water system Nontransient-noncommunity water sys.
Private well Swimming pool Bottled water Other public water system

Type of Sample: (circle one) Compliance Repeat Replacement Main Clearance Well Survey Other: _____ (specify)
(check box) [ ] Distribution [ ] Raw
(check box) [ ] TNTC or C [ ] Turbid

Remarks:

TO BE COMPLETED BY COLLECTOR OF SAMPLE

No:	Sample Point (Specific Address)	Cl Res	pH
	R-8		

TO BE COMPLETED BY LAB:

Date & time of analysis: 04/28/98 @ 1750 by: LH

Analysis Method: MF MTF MMO-MUG PA

Sample Number:	Non Coliform	*Total	Confirm Total	Confirm Fecal
B804622-01		P	P	A

* Results in this column are preliminary. Fecal coliform confirmation on community and noncommunity water systems and total coliform confirmation on all types of water systems will follow in 24-48 hours.

P - Coliforms are present
A - Coliforms are absent
C - Confluent growth
TNTC - Too numerous to count
TA - Turbid, Absence of gas or acid

INTERPRETATIONS - REMARKS BY PROGRAM REVIEWER

Name and Mailing Address of Person/Firm to Receive Report:

CITY OF COCOA
600 SCHOOL ST.
COCOA, FL 32922
ATTN: MARY KRALJ

[ ]
[ ] Satisfactory
[ ] Incomplete collection information
[ ] Repeat samples
[ ] Replacement samples

Reviewing Official: _____

Title: _____

LAB FORMAT FOR REPORTING DRINKING WATER ANALYSES

PUBLIC WATER SYSTEM INFORMATION (to be completed by system or lab)

System Name: CITY OF COCA I.D. #: 3050223

600 SCHOOL ST, COCOA, FL 32922 Phone #: 568-5867

Type (check one) (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION (to be completed by sampler)

Sample Date (MMDDYY): 04/15/98 Sample Time: 0900

Sample Location (be specific): R-9

Sampler Name and Phone: MARY KRALJ

Sampler's Signature: Mary Kralj Title: Laboratory Technician

Check Types(s) ( ) Distribution ( ) Recheck of MCL ( ) Resample of Lab Invalidated Sample

( ) Clearance ( ) Thm Max Res Time ( ) Plant Tap

( ) Distrib entry pt (X) Raw ( ) Composite of Multiple Sites--Attach a format for each site

LABORATORY CERTIFICATION INFORMATION (to be completed by lab) -- attach HRS Analyte Sheet *

Lab Name: BIONOMICS LABORATORY HRS#: 83331 Expiration Date: 06/30/98

Address: 4310 E. Anderson Rd., Orlando, FL 32812 Phone: 851-2560

Subcontracted Lab HRS#: 83141 --ATTACH HRS ANALYTE SHEET FOR SUBCONTRACTED LAB, TOO *

ANALYSIS INFORMATION: (to be completed by lab) Work Order Number: B804357-01

Date Sample(s) Received: 04/15/98 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

( ) Nitrate Only ( ) Nitrite Only ( ) Asbestos Only ( ) Trihalomethanes

Inorganics--		Volatile Organics--		Secondaries--		Pesticide/PCBs--	
( ) All 17	(X) Partial	(X) All 21	( ) Partial	(X) All	( ) Partial	( ) All 30	(X) Partial

Group I Unregulateds--		Group II Unregulateds--		Group III Unregulateds--		Radiochemicals--
( ) All 13	( ) Partial	( ) All 23	( ) Partial	( ) All	( ) Partial	(X) Single Sample
						( ) Qtrly Composite **

**Provide radiochemical sample dates & locations for each quarter

I, MARK RUSLER, do HEREBY CERTIFY that all attached analytical data are correct.

Signature Mark Rusler

Title: CHEMIST Date: 6/2/98

COMPLIANCE INFORMATION (to be completed by State)

Sample Collection Satisfactory: _____ Sample Analysis Satisfactory: _____

Resample Requested For: _____ Reason: _____

Notified to resample: _____ Date Notified: _____

DEP/HRS Reviewing Official: _____

*All HRS lab #s and their HRS Analyte Sheet for labs performing the attached water analyses must be provided. Failure to do so will result in rejection of the analyses and possible enforcement against the public water system for failure to sample.

INORGANIC ANALYSIS

62-550-310(1)

(PWS030)

ID	Name	(MCL mg/L)	Sample Number	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
1005	Arsenic	(0.05)	B804357-01	< 0.0034	U	200.9	4/17/98	0.0034	83331
1010	Barium	(2)	B804357-01	0.014		200.7	4/21/98	0.002	83331
1015	Cadmium	(.005)	B804357-01	< 0.0001	U	200.9	4/20/98	0.0001	83331
1020	Chromium	(0.1)	B804357-01	< 0.0002	U	200.9	4/20/98	0.0002	83331
1024	Cyanide	(0.2)	B804357-01	< 0.006	U	SM4500CN E	4/24/98	0.006	83331
1025	Fluoride	(4)	B804357-01	1.1		SM 4500F C	4/20/98	0.027	83331
1030	Lead	(0.015)	B804357-01	< 0.001	U	200.9	4/20/98	0.001	83331
1035	Mercury	(0.002)	B804357-01	< 0.00005	U	245.1	4/22/98	0.00005	83331
1036	Nickel	(0.1)	B804357-01	< 0.012	U	200.7	4/20/98	0.012	83331
1040	Nitrate	(10)	B804357-01	< 0.006	U	300.0A	4/15/98	0.006	83331
1041	Nitrite	(1)	B804357-01	< 0.004	U	300.0A	4/15/98	0.004	83331
1045	Selenium	(0.05)	B804357-01	0.003	I	200.9	4/17/98	0.002	83331
1052	Sodium	(160)	B804357-01	232		200.7	4/20/98	0.1	83331
1074	Antimony	(0.006)	B804357-01	< 0.0017	U	200.9	4/27/98	0.0017	83331
1075	Beryllium	(0.004)	B804357-01	< 0.0003	U	200.7	4/21/98	0.0003	83331
1085	Thallium	(0.002)	B804357-01	< 0.0006	U	200.9	4/17/98	0.0006	83331
1094	Asbestos	(7 MFL)				NA			

SECONDARY CHEMICAL ANALYSIS

62-550.320

(PWS031)

ID	Name	(MCL mg/L)	Sample Number	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
1002	Aluminum	(0.2)	B804357-01	< 0.036	U	200.7	4/21/98	0.036	83331
1017	Chloride	(250)	B804357-01	417		300.0A	4/15/98	0.074	83331
1022	Copper	(1)	B804357-01	< 0.004	U	200.7	4/20/98	0.004	83331
1025	Fluoride	(2.0)	B804357-01	1.1		SM 4500F C	4/20/98	0.027	83331
1028	Iron	(0.3)	B804357-01	0.027	I	200.7	4/20/98	0.006	83331
1032	Manganese	(0.05)	B804357-01	< 0.002	U	200.7	4/20/98	0.002	83331
1050	Silver	(0.1)	B804357-01	< 0.009	U	200.7	4/21/98	0.009	83331
1055	Sulfate	(250)	B804357-01	75.4		300.0A	4/15/98	0.03	83331
1095	Zinc	(5)	B804357-01	0.026		200.7	4/20/98	0.006	83331
1905	Color	(15color units)	B804357-01	10		SM2120B	4/15/98	5	83331
1920	Odor	(3 T.O.N.)	B804357-01	32		SM2150B	4/15/98	1	83331
1925	pH	(6.5-8.5)	B804357-01	7.65		150.1	4/15/98		83331
1	Total Dissolved Solids	(500)	B804357-01	934		SM2540C	4/20/98	4.41	83331
2	Foaming Agents	(0.5)	B804357-01	0.02	I	SM5540C	4/16/98	0.02	83331

TRIHALOMETHANE ANALYSIS

62-550-310(a)

(PWS027)

L	Name	Sample Number	CL Resid	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
2950	Total THMs					524.2		0.0011	

RADIOCHEMICAL ANALYSIS*

62-550.310(5)

(PWS033)

ID	Name	Sample Number	Analysis Result(pCi/l)	Analysis Method	Analysis Date	Error	Lab ID
4000	Gross Alpha	B804357-01	< 4.6	900.0	4/21/98	±2.9	83141
4012	Photon Emitters						
4020	Radium-226	B804357-01	1.9	903.1	4/21/98	±0.3	83141
4030	Radium-228	B804357-01	< 0.9	RA-5	4/21/98	±0.6	83141
4101	Man-made beta						

*(Gross alpha generally only requirement, see 62-550.519,(FAC)

VOLATILE ORGANIC ANALYSIS

62-550.310(2)(b)

(PWS028)

I	Name	(MCL ug/L)	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2	1,2,4-Trichlorobenzene	(70)	B804357-01	< 0.22	U	524.2	4/20/98	0.22	83331
2380	Cis-1,2-dichlorethylene	(70)	B804357-01	< 0.03	U	524.2	4/20/98	0.03	83331
2955	Xylenes (total)	(10000)	B804357-01	< 0.24	U	524.2	4/20/98	0.24	83331
2964	Dichloromethane	(5)	B804357-01	< 0.31	U	524.2	4/20/98	0.31	83331
2968	O-dichlorobenzene	(600)	B804357-01	< 0.05	U	524.2	4/20/98	0.05	83331
2969	Para-dichlorobenzene	(75)	B804357-01	< 0.02	U	524.2	4/20/98	0.02	83331
2976	Vinyl Chloride	(1)	B804357-01	< 0.29	U	524.2	4/20/98	0.29	83331
2977	1,1-dichloroethylene	(7)	B804357-01	< 0.02	U	524.2	4/20/98	0.02	83331
2979	Trans-1,2-dichloroethylene	(100)	B804357-01	< 0.12	U	524.2	4/20/98	0.12	83331
2980	1,2-dichloroethane	(3)	B804357-01	< 0.02	U	524.2	4/20/98	0.02	83331
2981	1,1,1-trichloroethane	(200)	B804357-01	< 0.21	U	524.2	4/20/98	0.21	83331
2982	Carbon tetrachloride	(3)	B804357-01	< 0.29	U	524.2	4/20/98	0.29	83331
2983	1,2-dichloropropane	(5)	B804357-01	< 0.33	U	524.2	4/20/98	0.33	83331
2984	Trichloroethylene	(3)	B804357-01	< 0.02	U	524.2	4/20/98	0.02	83331
2985	1,1,2-trichloroethane	(5)	B804357-01	< 0.23	U	524.2	4/20/98	0.23	83331
2987	Tetrachloroethylene	(3)	B804357-01	< 0.21	U	524.2	4/20/98	0.21	83331
2989	Monochlorobenzene	(100)	B804357-01	< 0.23	U	524.2	4/20/98	0.23	83331
2990	Benzene	(1)	B804357-01	< 0.05	U	524.2	4/20/98	0.05	83331
2991	Toluene	(1000)	B804357-01	< 0.41	U	524.2	4/20/98	0.41	83331
2	Ethylbenzene	(700)	B804357-01	< 0.47	U	524.2	4/20/98	0.47	83331
2	Styrene	(100)	B804357-01	< 0.2	U	524.2	4/20/98	0.2	83331

PESTICIDE/PCB CHEMICAL ANALYSIS

62-550-310(2)(c)

(PWS029)

I	Name	(MCL ug/L)	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2005	Endrin	(2)				508		0.002	
2010	Lindane	(.2)				508		0.002	
2015	Methoxychlor	(40)				508		0.052	
2020	Toxaphene	(3)				508		0.309	
2031	Dalapon	(200)				515.1		0.036	
2032	Diquat	(20)				549.1		0.26	
2033	Endothall	(100)				548.1		15.4	
2034	Glyphosate	(700)				547		9.44	
2035	Di(2-ethylhexyl)adipate	(400)				525.2		0.71	
2036	Oxamyl (Vydate)	(200)				531.1		2.57	
2037	Simazine	(4)				507		0.078	
2039	Di(2-ethylhexyl)phthalate	(6)				525.2		1.15	
2040	Picloram	(500)				515.1		0.029	
2041	Dinoseb	(7)				515.1		0.055	
2042	Hexachlorocyclopentadiene	(50)				525.2		0.292	
2046	Carbofuran	(40)				531.1		7.04	
2050	Atrazine	(3)				507		0.035	
2051	Alachlor	(2)				507		0.012	
2063	2,3,7,8-TCDD(Dioxin)	(.00003)	---			---			
2065	Heptachlor	(.4)				508		0.004	
2067	Heptachlor Epoxide	(.2)				508		0.002	
2	2,4-D	(70)				515.1		0.026	
2	2,4,5-TP (Silvex)	(50)				515.1		0.017	
22	Hexachlorobenzene	(1)				508		0.008	
2306	Benzo(a)pyrene	(.2)				550.1		0.013	
2326	Pentachlorophenol	(1)				515.1		0.007	
2383	PCB	(.5)	B804357-01	< 0.1	U	508	4/25/98	0.1	83331
2931	Dibromochloropropane	(.2)				504.1		0.004	
2946	Ethylene Dibromide	(.02)				504.1		0.006	
2959	Chlordane	(2)				508		0.446	

UNREGULATED GROUP I ANALYSIS

62-550.405

(PWS035)

ID	Name	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2021	Carbaryl				531.1		3.89	
2022	Methomyl				531.1		3.20	
2043	Aldicarb Sulfoxide				531.1		1.88	
2044	Aldicarb Sulfone				531.1		5.57	
2045	Metolachlor				507		0.108	
2047	Aldicarb				531.1		5.95	
2066	3-Hydroxycarbofuran				531.1		3.35	
2	Butachlor				507		0.021	
	Propachlor				508		0.110	
2	Aldrin				508		0.003	
2364	Dieldrin				508		0.002	
2440	Dicamba				515.1		0.005	
2595	Metribuzin				507		0.024	

BIONOMICS LABORATORY
4310 E. Anderson Rd.
Orlando, FL 32812
DHRS/DEP #83331; E83012
(407) 851-2560 FAX:(407) 856-0886

For Lab Use Only

Date Received: 04/15/98
Time Received: 1005
Signature of Lab Official: _____

DRINKING WATER BACTERIOLOGICAL ANALYSIS

System Name: CITY OF COCOA System ID #: 3050223 System Phone#: (407)568-5867

Address: 600 SCHOOL ST. County: _____ DEP District: _____

Collector: MARY KRALJ Collector Phone#: (407)568-5867

Sample Site (locality or subdivision): R-9

Date and Time Collected: 04/15/98 @ 0900

Type of Supply: Community water system Noncommunity water system Nontransient-noncommunity water sys.
Private well Swimming pool Bottled water Other public water system

Type of Sample: (circle one) Compliance Repeat Replacement Main Clearance Well Survey Other: _____ (specify)
(check box)
[ ] Distribution
[ ] Raw
(check box)
[ ] TNTC or C
[ ] Turbid

Remarks:

TO BE COMPLETED BY COLLECTOR OF SAMPLE

Sample No:	Sample Point (Specific Address)	Cl Res	pH
	R-9		

TO BE COMPLETED BY LAB:

Date & time of analysis: 4/15/98 @ 1058 by: LH

Analysis Method: MF MTF MMO-MUG PA

Sample Number:	Non Coliform	*Total	Confirm Total	Confirm Fecal
B804357-01		A		

* Results in this column are preliminary. Fecal coliform confirmation on community and noncommunity water systems and total coliform confirmation on all types of water systems will follow in 24-48 hours.

P - Coliforms are present
A - Coliforms are absent
C - Confluent growth
TNTC - Too numerous to count
TA - Turbid, Absence of gas or acid

INTERPRETATIONS - REMARKS BY PROGRAM REVIEWER

Name and Mailing Address of Person/Firm to Receive Report:

CITY OF COCOA
600 SCHOOL ST.
COCOA, FL 32922
ATTN: MARY KRALJ

[ ]
[ ] Satisfactory
[ ] Incomplete collection information
[ ] Repeat samples
[ ] Replacement samples

Reviewing Official: _____

Title: _____

LAB FORMAT FOR REPORTING DRINKING WATER ANALYSES

PUBLIC WATER SYSTEM INFORMATION (to be completed by system or lab)

System Name: CITY OF COCA I.D. #: 3050223

Ad 600 SCHOOL ST, COCOA, FL 32922 Phone #: 407-568-5867

Type (check one) (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION (to be completed by sampler)

Sample Date (MMDDYY): 04/21/98 Sample Time: 1000

Sample Location (be specific): R-10

Sampler Name and Phone: MARY KRALJ

Sampler's Signature: Mary Kralj Title: Laboratory Technician

Check Types(s) ( ) Distribution ( ) Recheck of MCL ( ) Resample of Lab Invalidated Sample
( ) Clearance ( ) Thm Max Res Time ( ) Plant Tap
( ) Distrib entry pt (X) Raw ( ) Composite of Multiple Sites--Attach a format for each site

LABORATORY CERTIFICATION INFORMATION (to be completed by lab) -- attach HRS Analyte Sheet *

Lab Name: BIONOMICS LABORATORY HRS#: 83331 Expiration Date: 06/30/98

Address: 4310 E. Anderson Rd., Orlando, FL 32812 Phone: 851-2560

Subcontracted Lab HRS#: 83141 --ATTACH HRS ANALYTE SHEET FOR SUBCONTRACTED LAB, TOO *

ANALYSIS INFORMATION: (to be completed by lab) Work Order Number: B804478-01

Date Sample(s) Received: 04/21/98 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

( ) Nitrate Only ( ) Nitrite Only ( ) Asbestos Only ( ) Trihalomethanes

Inorganics--		Volatile Organics--		Secondaries--		Pesticide/PCBs--	
( ) All 17	(X) Partial	(X) All 21	( ) Partial	( ) All	(X) Partial	( ) All 30	(X) Partial

Group I Unregulateds--		Group II Unregulateds--		Group III Unregulateds--		Radiochemicals--
( ) All 13	( ) Partial	( ) All 23	( ) Partial	( ) All	( ) Partial	(X) Single Sample
						( ) Qtrly Composite **

**Provide radiochemical sample dates & locations for each quarter

I, MARK RUSLER, do HEREBY CERTIFY that all attached analytical data are correct.

Signature Mark Rusler

Title: CHEMIST Date: 5/18/98

COMPLIANCE INFORMATION (to be completed by State)

Sample Collection Satisfactory: Sample Analysis Satisfactory:

Resample Requested For: Reason:

Person notified to resample: Date Notified:

DEP/HRS Reviewing Official:

*All HRS lab #s and their HRS Analyte Sheet for labs performing the attached water analyses must be provided. Failure to do so will result in rejection of the analyses and possible enforcement against the public water system for failure to sample.

COCO4478.XLS

INORGANIC ANALYSIS

62-550-310(1)

(PWS030)

ID	Name	(MCL mg/L)	Sample Number	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
1005	Arsenic	(0.05)	B804478-01	< 0.0034	U	200.9	4/22/98	0.0034	83331
1010	Barium	(2)	B804478-01	0.104		200.7	4/30/98	0.002	83331
1015	Cadmium	(.005)	B804478-01	< 0.0001		200.9	4/27/98	0.0001	83331
1020	Chromium	(0.1)	B804478-01	< 0.0002	U	200.9	4/27/98	0.0002	83331
1024	Cyanide	(0.2)	B804478-01	< 0.006	U	SM4500CN E	4/24/98	0.006	83331
1025	Fluoride	(4)	B804478-01	0.878		SM 4500F C	4/28/98	0.027	83331
1030	Lead	(0.015)	B804478-01	< 0.001	U	200.9	4/27/98	0.001	83331
1035	Mercury	(0.002)	B804478-01	< 0.00005		245.1	4/30/98	0.00005	83331
1036	Nickel	(0.1)	B804478-01	< 0.012	U	200.7	5/1/98	0.012	83331
1040	Nitrate	(10)	B804478-01	< 0.006	U	300.0A	4/22/98	0.006	83331
1041	Nitrite	(1)	B804478-01	< 0.004	U	SM4500NO2B	4/22/98	0.004	83331
1045	Selenium	(0.05)	B804478-01	0.003	I	200.9	4/22/98	0.002	83331
1052	Sodium	(160)	B804478-01	292		200.7	5/1/98	0.1	83331
1074	Antimony	(0.006)	B804478-01	< 0.0017	U	200.9	4/27/98	0.0017	83331
1075	Beryllium	(0.004)	B804478-01	0.0004	I	200.7	4/28/98	0.0003	83331
1085	Thallium	(0.002)	B804478-01	0.0006	I	200.9	4/27/98	0.0006	83331
1094	Asbestos	(7 MFL)				NA			

SECONDARY CHEMICAL ANALYSIS

62-550.320

(PWS031)

ID	Name	(MCL mg/L)	Sample Number	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
1002	Aluminum	(0.2)	B804478-01	< 0.036	U	200.7	4/28/98	0.036	83331
1017	Chloride	(250)	B804478-01	572		300.0A	4/22/98	0.074	83331
1022	Copper	(1)	B804478-01	< 0.004	U	200.7	5/1/98	0.004	83331
1025	Fluoride	(2.0)	B804478-01	0.878		SM 4500F C	4/28/98	0.027	83331
1028	Iron	(0.3)	B804478-01	0.039		200.7	5/1/98	0.006	83331
1032	Manganese	(0.05)	B804478-01	0.005	I	200.7	5/1/98	0.002	83331
1050	Silver	(0.1)	B804478-01	< 0.009	U	200.7	4/30/98	0.009	83331
1055	Sulfate	(250)	B804478-01	83.1		300.0A	4/22/98	0.03	83331
1095	Zinc	(5)	B804478-01	0.01	I	200.7	5/1/98	0.006	83331
1905	Color	(15color units)	B804478-01	10		SM2120B	4/21/98	5	83331
1920	Odor	(3 T.O.N.)	B804478-01	> 32		SM2150B	4/21/98	1	83331
1925	pH	(6.5-8.5)	B804478-01	7.09		150.1	4/21/98		83331
1[illegible]	Total Dissolved Solids	(500)	B804478-01	1120		SM2540C	4/22/98	4.41	83331
2.	Foaming Agents	(0.5)	B804478-01	< 0.02	J3	SM5540C	4/30/98	0.02	83331

TRIHALOMETHANE ANALYSIS

62-550-310(a)

(PWS027)

ID	Name	Sample Number	CL Resid	Analysis Result(mg/L)	Q	Analysis Method	Analysis Date	MDL(mg/L)	Lab ID
2950	Total THMs					524.2		0.0011	

RADIOCHEMICAL ANALYSIS*

62-550.310(5)

(PWS033)

ID	Name	Sample Number	Analysis Result(pCi/l)	Analysis Method	Analysis Date	Error	Lab ID
4000	Gross Alpha	B804478-01	< 4.9	900.0	4/26/98	±2.9	83141
4012	Photon Emitters						
4020	Radium-226	B804478-01	2.2	903.1	4/30/98	±0.3	83141
4030	Radium-228	B804478-01	1.1	RA-5	4/30/98	±2.9	83141
4101	Man-made beta						

*(Gross alpha generally only requirement, see 62-550.519,(FAC)

VOLATILE ORGANIC ANALYSIS

62-550.310(2)(b)

(PWS028)

ID	Name	(MCL ug/L)	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2[illegible]	1,2,4-Trichlorobenzene	(70)	B804478-01	< 0.22	U	524.2	4/24/98	0.22	83331
2380	Cis-1,2-dichlorethylene	(70)	B804478-01	< 0.03	U	524.2	4/24/98	0.03	83331
2955	Xylenes (total)	(10000)	B804478-01	< 0.24	U	524.2	4/24/98	0.24	83331
2964	Dichloromethane	(5)	B804478-01	< 0.31	U	524.2	4/24/98	0.31	83331
2968	O-dichlorobenzene	(600)	B804478-01	< 0.05	U	524.2	4/24/98	0.05	83331
2969	Para-dichlorobenzene	(75)	B804478-01	< 0.02	U	524.2	4/24/98	0.02	83331
2976	Vinyl Chloride	(1)	B804478-01	< 0.29	U	524.2	4/24/98	0.29	83331
2977	1,1-dichloroethylene	(7)	B804478-01	< 0.02	U	524.2	4/24/98	0.02	83331
2979	Trans-1,2-dichloroethylene	(100)	B804478-01	< 0.12	U	524.2	4/24/98	0.12	83331
2980	1,2-dichloroethane	(3)	B804478-01	< 0.02	U	524.2	4/24/98	0.02	83331
2981	1,1,1-trichloroethane	(200)	B804478-01	< 0.21	U	524.2	4/24/98	0.21	83331
2982	Carbon tetrachloride	(3)	B804478-01	< 0.29	U	524.2	4/24/98	0.29	83331
2983	1,2-dichloropropane	(5)	B804478-01	< 0.33	U	524.2	4/24/98	0.33	83331
2984	Trichloroethylene	(3)	B804478-01	< 0.02	U	524.2	4/24/98	0.02	83331
2985	1,1,2-trichloroethane	(5)	B804478-01	< 0.23	U	524.2	4/24/98	0.23	83331
2987	Tetrachloroethylene	(3)	B804478-01	< 0.21	U	524.2	4/24/98	0.21	83331
2989	Monochlorobenzene	(100)	B804478-01	< 0.23	U	524.2	4/24/98	0.23	83331
2990	Benzene	(1)	B804478-01	< 0.05	U	524.2	4/24/98	0.05	83331
2991	Toluene	(1000)	B804478-01	< 0.41	U	524.2	4/24/98	0.41	83331
[illegible]	Ethylbenzene	(700)	B804478-01	< 0.47	U	524.2	4/24/98	0.47	83331
2[illegible]	Styrene	(100)	B804478-01	< 0.2	U	524.2	4/24/98	0.2	83331

PESTICIDE/PCB CHEMICAL ANALYSIS

62-550-310(2)(c)

(PWS029)

E	Name	(MCL ug/L)	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2005	Endrin	(2)				508		0.002	
2010	Lindane	(.2)				508		0.002	
2015	Methoxychlor	(40)				508		0.052	
2020	Toxaphene	(3)				508		0.309	
2031	Dalapon	(200)				515.1		0.036	
2032	Diquat	(20)				549.1		0.26	
2033	Endothall	(100)				548.1		15.4	
2034	Glyphosate	(700)				547		9.44	
2035	Di(2-ethylhexyl)adipate	(400)				525.2		0.71	
2036	Oxamyl (Vydate)	(200)				531.1		2.57	
2037	Simazine	(4)				507		0.078	
2039	Di(2-ethylhexyl)phthalate	(6)				525.2		1.15	
2040	Picloram	(500)				515.1		0.029	
2041	Dinoseb	(7)				515.1		0.055	
2042	Hexachlorocyclopentadiene	(50)				525.2		0.292	
2046	Carbofuran	(40)				531.1		7.04	
2050	Atrazine	(3)				507		0.035	
2051	Alachlor	(2)				507		0.012	
2063	2,3,7,8-TCDD(Dioxin)	(.00003)	—			—			
2065	Heptachlor	(.4)				508		0.004	
2067	Heptachlor Epoxide	(.2)				508		0.002	
2	2,4-D	(70)				515.1		0.026	
2	2,4,5-TP (Silvex)	(50)				515.1		0.017	
2274	Hexachlorobenzene	(1)				508		0.008	
2306	Benzo(a)pyrene	(.2)				550.1		0.013	
2326	Pentachlorophenol	(1)				515.1		0.007	
2383	PCB	(.5)	B804478-01	< 0.1	U	508	4/25/98	0.1	83331
2931	Dibromochloropropane	(.2)				504.1		0.004	
2946	Ethylene Dibromide	(.02)				504.1		0.006	
2959	Chlordane	(2)				508		0.446	

UNREGULATED GROUP I ANALYSIS

62-550.405

(PWS035)

ID	Name	Sample Number	Analysis Result(µg/L)	Q	Analysis Method	Analysis Date	MDL(µg/L)	Lab ID
2021	Carbaryl				531.1		3.89	
2022	Methomyl				531.1		3.20	
2043	Aldicarb Sulfoxide				531.1		1.88	
2044	Aldicarb Sulfone				531.1		5.57	
2045	Metolachlor				507		0.108	
2047	Aldicarb				531.1		5.95	
2066	3-Hydroxycarbofuran				531.1		3.35	
2	Butachlor				507		0.021	
2	Propachlor				508		0.110	
2356	Aldrin				508		0.003	
2364	Dieldrin				508		0.002	
2440	Dicamba				515.1		0.005	
2595	Metribuzin				507		0.024	

BIONOMICS LABORATORY
4310 E. Anderson Rd.
Orlando, FL 32812
DHRS/DEP #83331; E83012
(407) 851-2560 FAX:(407) 856-0886

For Lab Use Only

Date Received: 04/21/98
Time Received: 1107
Signature of Lab Official: Mark Ruler

DRINKING WATER BACTERIOLOGICAL ANALYSIS

System Name: CITY OF COCOA System ID #: 3050223 System Phone#: (407)568-5867

Address: 600 SCHOOL ST. County: _____ DEP District: _____

Collector: MARY KRALJ Collector Phone#: (407)568-5867

Sample Site (locality or subdivision): R-10

Date and Time Collected: 04/21/98 @ 1000

Type of Supply: Community water system Noncommunity water system Nontransient-noncommunity water sys.
Private well Swimming pool Bottled water Other public water system

Type of Sample: Compliance Repeat Replacement Main Clearance Well Survey Other: _____ (specify)
(circle one)
(check box)
[ ] Distribution
[ ] Raw
(check box)
[ ] TNTC or C
[ ] Turbid

Remarks:

BE COMPLETED BY COLLECTOR OF SAMPLE

Coll No:	Sample Point (Specific Address)	Cl Res	pH
	R-10		

TO BE COMPLETED BY LAB:

Date & time of analysis: 04/21/98 @ 1225 by: LH

Analysis Method: MF MTF MMO-MUG PA

Sample Number:	Non Coliform	*Total	Confirm Total	Confirm Fecal
B804478-01		A		

* Results in this column are preliminary. Fecal coliform confirmation on community and noncommunity water systems and total coliform confirmation on all types of water systems will follow in 24-48 hours.

P - Coliforms are present
A - Coliforms are absent
C - Confluent growth
TNTC - Too numerous to count
TA - Turbid, Absence of gas or acid

INTERPRETATIONS - REMARKS BY PROGRAM REVIEWER

Name and Mailing Address of Person/Firm to Receive Report:

CITY OF COCOA
600 SCHOOL ST.
COCOA, FL 32922
ATTN: MARY KRALJ

[ ]
[ ] Satisfactory
[ ] Incomplete collection information
[ ] Repeat samples
[ ] Replacement samples

Reviewing Official: _____

Title: _____

COCO4778.XLS

CITY OF cocoa FLORIDA

Appendix B-1
FDEP Certification of Class V Well Construction Completion

CH2M HILL
3011 S.W. Williston Road
Gainesville, FL
32608-3928
Mailing address:
P.O. Box 147009
Gainesville, FL
32614-7009
Tel 352.335.7991
Fax 352.335.2959

CH2MHILL

June 4, 1998

Duane Watroba, TAC Chairman
Florida Department of Environmental Protection
Central District
3319 Maguire Boulevard
Suite 232
Orlando, Fl 32803-3767

Subject: Cocoa ASR Facility – UIC Permit UC48-294600

Dear Mr. Watroba:

In accordance with Specific Condition E, page 7, of the City of Cocoa's UIC permit, we are submitting the Certification of Class V Well Construction Completion and SJRWMD well construction permits and well completion reports for the four newly completed ASR wells – R-7, R-8, R-9, and R-10. At this time, no wellhead facilities have been constructed. Final construction of the Dyal Water Treatment Plant expansion, including the wellhead facilities and the SCADA system are expected to be complete in the next 12-18 months.

As we recently discussed on the telephone, we are requesting that signed and sealed as-built drawings be submitted when wellhead facilities are completed and operational cycle testing of the four new wells has been conducted. This is in accordance with UIC permit specific condition D(3), page 10.

Please call if you have any questions .

Sincerely,

CH2M HILL

Michael B. Dykes

Michael B. Dykes, P.E.
Project Manager

GNV\Document2
c: Ed Wegerif, City of Cocoa
Ed Davis, CH2M HILL

Department of
Environmental Protection

DEP Form No.:	62-528.900(4)
Form Title:	Certification of Class V Well Construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Management District.

DEP Construction Permit No. UC48-294600, issued on 9/12/97 (Date). County Orange

Owner's Name City of Cocoa

Owner's Address 600 School Street, Cocoa, FL 32922
(Street) (City) (State) (Zip Code)

Well Contractor's Name Meridith Environmental (Title) No.: 2200 (State License No.)

Well Contractor's Address 5654 N. Apopka Vineland, Orlando, FL 32858-5648
(Street) (City) (State) (Zip Code)

Well Location Well R-7, Dyal Water Treatment Plant

Deviations from the application and plans approved by the Department:

None Noted

Actual Dimensions:

Diameter	16	inches
Well depth	370' BLS	feet
Casing depth	300' BLS	feet

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 3-095-0820-AWG, dated 7/13/97.

Date: May 28, 1998

Michael B. Dykes
~~(Contractor's Signature)~~
(Engineer's Signature)

STATE OF FLOR . PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

- ☐ Southwest
- ☐ Northwest
- ☒ St. Johns River
- ☐ South Florida
- ☐ Suwannee River

CHECK BOX FOR APPROPRIATE DISTRICT. ADDRESS ON BACK OF PERMIT FORM.

THIS FORM *MUST* BE FILLED OUT COMPLETELY.

The water well contractor is responsible for completing this form and forwarding the permit to the appropriate delegated county where applicable.

Permit No. 3-095-0820AWG
Florida Unique I.D. _____
Permit Stipulations Required (See attached)
62-524 well ☐
CUP/WUP Application No. _____

ABOVE THIS LINE FOR OFFICIAL USE ONLY

Fold at this line in order that address is visible through envelope window

1. City of Cocoa | 155 North Wilson Avenue | Cocoa | 32922 | 352-639-7651
   Owner, Legal Name of Entity if Corporation | Address | City | Zip | Telephone Number
2. Claude H. Dyal Water Treatment Plant | 28400 S.R. 520 | Orange County
   Well Location — Address, Road Name or Number, City
3. Meridith Environmental Services, Inc. | 2200 | 407-291-4755
   Well Drilling Contractor | License No. | Telephone No.
   P.O. Box 585648
   Address
   Orlando, FL 32858-5648
   City | State | Zip

4. NE (smallest) 1/4 of NW (biggest) 1/4 of Section 20
5. Township 24 Range 34

(Indicate Well on Chart)

NW NE SW SE

6. Orange
   County | Subdivision Name | Lot | Block | Unit

7. Number of proposed wells 1 Check the use of well: (See back of permit for additional choices) _____ Domestic Monitor (type) _____
   _____ Irrigation (type) (See Back) Public Water Supply (type) ASR (community) (See Back) List Other _____
   Distance from septic system n/a ft. Description of facility R7 Estimated start of construction date 7-23-97

8. Application for: XX New Construction _____ Repair/Modify _____ Abandonment _____
   (Reason for Abandonment)

9. Estimated: Well Depth 370 Casing Depth 300 Borehole 26" Screen Interval from _____ to _____
   Casing Material: ~~Blk-Steel/Gal~~ / PVC Casing Diameter 16" Seal Material _____

RECEIVED
JUN 25 1997
PDS
ORLANDO

If applicable: Proposed Grouting Interval
From 300 to 0 Seal Material neat cement grout
From _____ to _____ Seal Material _____
From _____ to _____ Seal Material _____

11. Telescope Casing _____ or Liner _____ (check one) Diameter _____
    Blk-Steel / Galvanized / PVC Other (specify): _____

12. Method of Construction: X Rotary _____ Cable Tool _____ Combination
    _____ Auger _____ Other (specify:) _____

13. Indicate total No. of wells on site n/a List number of unused wells on site _____.

14. Is this well or any other well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ___No ___Yes
    (If yes, complete the following) CUP/WUP No. ~~U018294600~~ 2-095-0005AUGMR
    District well I.D. No. 3048M05271
    Latitude 28° 23' 00"N Longitude 81° 56' 00"W
    Data obtained from GPS ___ or map ___ or survey ___ (*map datum NAD 27*___ *NAD 83*___)

Draw a map of well location and indicate well site with at least 2 identifiable roads and landmarks; provide distances between well and landmarks.

North
West
East
South

15. I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided on this application is accurate and that I will obtain necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well completion report to the District within 30 days after drilling or the permit expiration, whichever occurs first.

Signature of Contractor | 2200 License No.

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of his responsibilities as stated above. Owner consents to personnel of the WMD or a representative access to the well site.

CITY OF COCOA Owner's or Agent's Signature | 6-24-97 Date

DO NOT WRITE BELOW THIS LINE — FOR OFFICIAL USE ONLY

Approval Granted By: Engr - Energy Admin. Issue Date: 7/17/97 Hydrologist Approval _____ Initials

Owner Number: _____ Fee Received: $ 120.00 Receipt No.: 21022 Check No.: 15465

THIS PERMIT NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD. IT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL DRILLING OPERATIONS. ***This permit is valid for 90 days from date of issue.***

WHITE: ORIGINAL FILE
YELLOW: DRILLING CONTRACTOR
PINK: OWNER

FORM 41.10 – 410 (1) REV. 4/95

WELL COMPLETION REPORT (Please complete in black ink or type.)

PERMIT # 3-095-0820WG CUP # _____ DID # _____
Number of wells drilled 1 /WUP # _____
Indicate remaining wells to be cancelled _____
(All wells drilled need an individual completion report.)
WATER WELL CONTRACTOR'S SIGNATURE _____ License # 2200
I certify that the information provided on this report is accurate and true)

OWNER'S NAME City of Cocoa R-7

COMPLETION DATE 11-14-98 Florida Unique I.D. _____

WELL USE: DEP/Public X Irrigation _____ Domestic _____ Monitor _____
HRS Limited ASR 62-524 _____ Other _____

DRILL METHOD ☒ Rotary ☐ Cable Tool ☐ Combination
☐ Jet ☐ Auger Other _____

Grout	No. of Bags	From (ft.)	To (ft.)
Neat Cement:	438	26", 0-120	16", 300-0
Bentonite:	270		

Measured Static Water Level 8' Measured Pumping Water Level 78'
After 24 Hours at 880 G.P.M. Measuring Pt. (Describe): _____
Which is ____ Ft. ☐ Above ☐ Below Land Surface
Casing: ☐ Black Steel ☐ Galv. ☒ PVC Other _____

WELL LOCATION: Site Address 28400 SR 520 County Orange
Qtr: ____ Qtr: ____ Sec: 20 Twp: 24 Rge: 34
Latitude _____ Longitude _____

DATE STAMP

Official Use Only

CHEMICAL ANALYSIS

Iron: ____ ppm Sulfate: ____ ppm
Chlorides: _____ppm
[ ] Lab Test [ ] Field Test Kit
Pump Type
[ ] Centrifugal [ ] Jet [ ] Submersible
[ ] Turbine
Horsepower _____ Capacity _____ G.P.M. _____
Pump Depth _____ Ft. Intake Depth _____ Ft.

Sketch of well location on property N

Give distances from septic tank and house or other reference points

☒ Open Hole ☐ Screen	Depth 300 (Ft.) 370		DRILL CUTTINGS LOG Examine cuttings every 20 ft. or at formation changes. Give color, grain size, and type of material. Note cavities, depth to producing zones.
Casing Diameter & Depth (Ft.)	From	To	
Diameter 26"			
From 120			
To 0			
Diameter 16"			
From 0			
To 300			
			see attached
Liner ☐ or Casing ☐			
Diameter ___ ___			
From _____			
To _____			

Driller's Name: *(print or type)* David Adkins

MERIDITH ENVIRONMENTAL SERVICES, INC.

JOB NAME:__POOLE AND KENT_____ P.O.#____8188_____

JOB LOCATION:__WELL R-7____COMPLETED 11-14-98_____

DIAMETER OF CASINGS:___9 5/8"_____ STATIC WATER LEVEL:___6'5"___

TOTAL DEPTH OF WELL: 370'_____ TOTAL DEPTH OF CASING: 300' OF 16" PVC

FROM FEET	TO FEET	TYPE MATERIAL ENCOUNTERED
0	10	SAND
10	12	WHITE CLAY
12	18	SAND, SHELL
18	40	CEMENT, SHELL
40	90	SHELL, CLAY
90	92	ROCK
92	114	SHELL, SAND, LITTLE CLAY
114	126	CLAY, SHELL
126	140	SHELL, CEMENT
140	145	SHELL, CEMENT, CEMENTED SANDSTONE
145	170	SHELL, CEMENT, TRACES GREEN CLAY, CEMENTED SANDSTONE
170	175	SHELL, GREEN CLAY, CEMENTED SANDSTONE
175	185	SHELL, GREEN CLAY, CEMENTED SANDSTONE, TRACES OF WHITE
185	195	SHELL, GREEN CLAY, CEMENTED SANDSTONE, TRACES WHITE & GRAY
195	205	GREEN & GRAY CLAY, CEMENTED SANDSTONE, SOME SHELL
205	215	GREEN & GRAY CLAY, TRACES OF WHITE CLAY, CEMENTED SANDSTONE, SOME SHELL

COCA R-7

215	220	GRAY & WHITE CLAY, SOME GREEN, CEMENTED SANDSTONE, SOME SHELL
220	235	WHITE LIME ROCK, GRAY SANDSTONE, SOME WHITISH CLAY, SOME SHELL
235	245	GRAYISH WHITE SANDSTONE, SOME WHITISH TAN CLAY, GRAY LIMESTONE, SOME SHELL
245	255	LIGHT TAN & GRAY LIMESTONE, GREENISH GRAY CLAY, WHITISH GRAY SANDSTONE, SHELL
255	260	LIGHT TAN & GRAY LIMESTONE, GRAY SANDSTONE, GREENISH GRAY CLAY, TRACE OF BROWN
260	270	LIGHT TAN & GRAY LIMESTONE, GRAY SANDSTONE, GREENISH GRAY CLAY, GRAYISH WHITE CLAY, SHELL
270	280	LIGHT TAN & GRAY LIMESTONE, GRAY SANDSTONE, GRAYISH WHITE CLAY, SHELL
280	285	LIGHT TAN & GRAY LIMESTONE, GRAYISH WHITE SANDSTONE, SHELL, BROWN LIMESTONE
285	305	SOFT WHITE TO LIGHT TAN LIMESTONE, GRAYISH SANDSTONE, SHELL
305	310	SOFT LIGHT TAN LIMESTONE
310	320	SOFT LIGHT TAN LIMESTONE, TRACES OF CHIRT
320	325	HARD LIGHT TAN LIMESTONE
325	330	MEDIUM HARD LIGHT GRAY LIMESTONE, TRACES OF LIGHT TAN
330	335	MEDIUM HARD LIGHT TAN LIME, TRACES OF LIGHT GRAY
335	340	MEDIUM HARD LIGHT TAN AND LIGHT GRAY LIMESTONE
340	345	MEDIUM HARD LIGHT TAN AND GRAY LIMESTONE

Cores R-7

345	355	MEDIUM HARD LIGHT GRAY TO TAN LIMESTONE
355	360	MEDIUM HARD WHITE LIME, TRACES OF LIGHT GRAY AND TAN
360	370	MEDIUM HARD TAN, LIGHT TAN, LIGHT GRAY LIMESTONE

Department of
Environmental Protection

DEP Form No.:	62-528.900(4)
Form Title:	Certification of Class V Well Construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Management District.

DEP Construction Permit No. UC48-294600, issued on 9/12/97 (Date). County Orange

Owner's Name City of Cocoa

Owner's Address 600 School Street, Cocoa, FL 32922
(Street) (City) (State) (Zip Code)

Well Contractor's Name Meridith Environmental (Title) No.: 2200 (State License No.)

Well Contractor's Address 5654 N. Apopka Vineland, Orlando, FL 32858-5648
(Street) (City) (State) (Zip Code)

Well Location Well R-8, Dyal Water Treatment Plant

Deviations from the application and plans approved by the Department:

None Noted

Actual Dimensions:

Diameter	16	inches
Well depth	370' BLS	feet
Casing depth	300' BLS	feet

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 3-095-0819-AWG, dated 9/30/97.

Date: May 28, 1998

M. David B Dyal
~~(Contractor's Signature)~~
(Engineer's Signature)

STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

- ☐ Southwest
- ☐ Northwest
- ☒ St. Johns River
- ☐ South Florida
- ☐ Suwannee River

CHECK BOX FOR APPROPRIATE DISTRICT. ADDRESS ON BACK OF PERMIT FORM.

THIS FORM ***MUST*** BE FILLED OUT COMPLETELY.

The water well contractor is responsible for completing this form and forwarding the permit to the appropriate delegated county where applicable.

Permit No. 3-095-0819AWG
Florida Unique I.D. _____
Permit Stipulations Required (See attached)
62-524 well ☐
CUP/WUP Application No. _____

ABOVE THIS LINE FOR OFFICIAL USE ONLY

Fold at this line in order that address is visible through envelope window

1. City of Cocoa — 155 North Wilson Avenue — Cocoa — 32922 — 352-639-7651
   Owner, Legal Name of Entity if Corporation | Address | City | Zip | Telephone Number
2. Claude H. Dyal Water Treatement Plant — 28400 S.R. 520 — Orange County
   Well Location — Address, Road Name or Number, City
3. Meridith Environmental Services, Inc. — 2200 — 407-291-4755
   Well Drilling Contractor | License No. | Telephone No.
   P.O. Box 585648
   Address
   Orlando, FL 32858-5648
   City | State | Zip
4. NE (smallest) 1/4 of NW (biggest) 1/4 of Section 20
   (Indicate Well on Chart)
5. Township 24 Range 34

NW NE SW SE

6. Orange
   County | Subdivision Name | Lot | Block | Unit

7. Number of proposed wells 1 Check the use of well: (See back of permit for additional choices) _____ Domestic Monitor (type) _____
   _____ Irrigation (type) (See Back) Public Water Supply (type) ASR (community) (See Back) List Other _____
   Distance from septic system n/a ft. Description of facility R8 Estimated start of construction date 7-23-97

8. Application for: X New Construction _____ Repair/Modify _____ Abandonment _____ (Reason for Abandonment)

9. Estimated: Well Depth 370 Casing Depth 300 - 26" Borehole Screen Interval from _____
   Casing Material: ~~Blk Steel/Gal~~ / PVC Casing Diameter 16" Seal Material _____

RECEIVED
JUN 25 1997
PDS
SJRWMD

   If applicable: Proposed Grouting Interval From 300 to 0 Seal Material neat cement grout
   From _____ to _____ Seal Material _____
   From _____ to _____ Seal Material _____

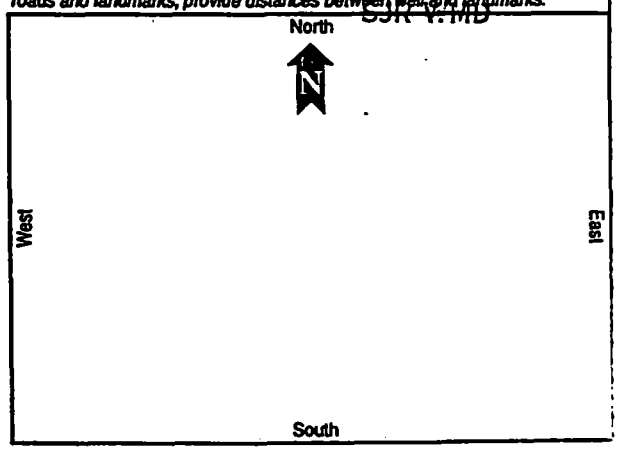
11. Telescope Casing ____ or Liner ____ (check one) Diameter _____
    Blk-Steel / Galvanized / PVC Other (specify): _____

12. Method of Construction: X Rotary ____ Cable Tool ____ Combination
    ____ Auger ____ Other (specify:) _____

13. Indicate total No. of wells on site n/a List number of unused wells on site ____.

14. Is this well or any other well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ___No ___Yes
    (If yes, complete the following) CUP/WUP No. ~~U048294600~~ 2-095-0005AUGMR
    District well I.D. No. 3048M05271
    Latitude 28° 23' 00"N Longitude 81° 56' 00"W
    Data obtained from GPS ___ or map ___ or survey ___ (*map datum NAD 27*___ *NAD 83*___)

Draw a map of well location and indicate well site with an "X", identify known roads and landmarks; provide distances between well and landmarks.



15. I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided on this application is accurate and that I will obtain necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well completion report to the District within 30 days after drilling or the permit expiration, whichever occurs first.

Signature of Contractor — License No. 2200

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of his responsibilities as stated above. Owner consents to personnel of the WMD or a representative access to the well site.

CITY OF COCOA Owner's or Agent's Signature — Date 6-24-97

DO NOT WRITE BELOW THIS LINE — FOR OFFICIAL USE ONLY

Approval Granted By: EC Issue Date: 9/30/97 Hydrologist Approval _____ Initials

Owner Number: _____ Fee Received: $ 120.00 Receipt No.: 21022 Check No.: 15465

THIS PERMIT NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD. IT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL DRILLING OPERATIONS. ***This permit is valid for 90 days from date of issue.***

WHITE: ORIGINAL FILE
YELLOW: DRILLING CONTRACTOR
PINK: OWNER

FORM 41.10 – 410 (1) REV. 4/95

Palatka Printing Co., Inc

WELL COMPLETION REPORT (Please complete in black ink or type.)

PERMIT # 3-095-0819WC WUP # _____ DID # _____
Number of wells drilled 1 /WUP # _____
Indicate remaining wells to be cancelled _____
(All wells drilled need an individual completion report)
WATER WELL CONTRACTOR'S _____
SIGNATURE _____ License # 2200
I certify that the information provided in this report is accurate and true

OWNER'S NAME City of Cocoa R-8

COMPLETION DATE 1-25-98 Florida Unique I.D. _____

WELL USE: DEP/Public ASR X Irrigation _____ Domestic _____ Monitor _____
HRS Limited _____ 62-524 _____ Other _____

DRILL METHOD ☒ Rotary ☐ Cable Tool ☐ Combination
☐ Jet ☐ Auger Other _____

Grout	No. of Bags	From (ft.)	To (ft.)
Neat Cement:	437	26", 0-120	16", 300-0
Bentonite:	240		

Measured Static Water Level 7 Measured Pumping Water Level 87
After 24 Hours at 920 G.P.M. Measuring Pt. (Describe): _____
Which is ____ Ft. ☐ Above ☐ Below Land Surface
Casing: ☐ Black Steel ☐ Galv. ☒ PVC Other _____

WELL LOCATION: Site Address 28400 SR 520 County Orange
Qtr: ____ Qtr: ____ Sec: 20 Twp: 24 Rge: 34
Latitude _____ Longitude _____

DATE STAMP

Official Use Only

CHEMICAL ANALYSIS

Iron: ____ ppm Sulfate: ____ ppm
Chlorides: ____ppm
[ ] Lab Test [ ] Field Test Kit
Pump Type
[ ] Centrifugal [ ] Jet [ ] Submersible
[ ] Turbine
Horsepower ____ Capacity ____ G.P.M. ____
Pump Depth ____ Ft. Intake Depth ____ Ft.

Sketch of well location on property N

Give distances from septic tank and house or other reference points

☒ Open Hole ☐ Screen — Depth (Ft.) 300 - 370

Casing Diameter & Depth (Ft.)	From	To
Diameter 26"		
From 0		
To 120		
Diameter 16"		
From 0		
To 300		
Liner ☐ or Casing ☐		
Diameter ___ ___		
From _____		
To _____		

DRILL CUTTINGS LOG Examine cuttings every 20 ft. or at formation changes. Give color, grain size, and type of material. Note cavities, depth to producing zones.

see attached

Driller's Name: David Adkins
(print or type) _____

MERIDITH ENVIRONMENTAL SERVICES, INC.

JOB NAME: POOLE AND KENT P.O.# 8188

JOB LOCATION: Well #8 COCOA COMPLETED _____

DIAMETER OF CASINGS: 9" PILOT HOLE _____ STATIC WATER LEVEL: _____

TOTAL DEPTH OF WELL: _____ TOTAL DEPTH OF CASING: 40'

FROM FEET	TO FEET	TYPE MATERIAL ENCOUNTERED
0	5	BROWN SAND & BARK
5	10	BROWN SANDSTONE & BARK
10	15	BROWN SANDSTONE
15	20	BROWN SANDSTONE & SOME SHELL
20	25	SHELL & SOME CLAY
25	30	SHELL & SOME CLAY
30	35	SHELL & SOME CLAY
35	40	SHELL & SOME CLAY
40	45	SHELL, SOME CLAY & SANDSTONE
45	50	SHELL & TRACES OF SANDSTONE
50	55	SHELL & TRACES OF SANDSTONE
55	60	SHELL & TRACES OF SANDSTONE
60	65	SHELL & TRACES OF SANDSTONE
65	70	SHELL, SANDSTONE, TRACES OF CLAY
70	75	SHELL & GRAY CLAY
75	80	SHELL & GRAY CLAY
80	85	SHELL & GRAY CLAY
85	90	SHELL, SANDSTONE & GRAY CLAY
90	95	SHELL, SANDSTONE & GRAY CLAY

Coon R-6

95	100	SHELL, SANDSTONE & GRAY CLAY
100	105	SHELL, SANDSTONE, & SOME GRAY CLAY
105	110	SHELL, SANDSTONE, & SOME GRAY CLAY
110	115	SHELL & SANDSTONE
115	120	SHELL & CEMENTED SANDSTONE
120	125	SHELL & CEMENTED SANDSTONE
125	128	SHELL & CEMENTED SANDSTONE

MERIDITH ENVIRONMENTAL SERVICES, INC.

JOB NAME:__POOLE AND KENT_____ P.O.#____8188_____

JOB LOCATION:__WELL R-8____COMPLETED 12-10-97_____

DIAMETER OF CASINGS:___9 5/8"_____ STATIC WATER LEVEL:___0___

TOTAL DEPTH OF WELL:_____ TOTAL DEPTH OF CASING: 300' OF 16" PVC

FROM FEET	TO FEET	TYPE MATERIAL ENCOUNTERED
125	130	CEMENT, SHELL, CEMENTED SANDSTONE
130	135	CEMENT, SHELL, CEMENTED SANDSTONE
135	140	DIRT, CEMENT, SHELL, CEMENTED SANDSTONE
140	155	SHELL, GREEN CLAY, CEMENTED SANDSTONE, CEMENT
155	160	GREEN CLAY, SHELL, CEMENTED SANDSTONE
160	190	SHELL, GREEN CLAY, CEMENTED SANDSTONE
190	205	GREEN CLAY, SOME SHELL AND CEMENTED SANDSTONE
205	240	GREEN CLAY, SOME SHELL AND CEMENTED SANDSTONE, TRACES OF WHITE CLAY
240	250	GREEN CLAY, SOME SHELL AND CEMENTED SANDSTONE, TRACES OF WHITE LIMESTONE
250	260	GREEN CLAY, SHELL AND CEMENTED SANDSTONE, TRACE OF WHITE LIMESTONE
260	275	SHELL, GREEN CLAY, CEMENTED SANDSTONE, SOME WHITE LIMESTONE
275	285	SHELL, SANDSTONE, SOME WHITE LIMESTONE

285	290	SHELL, WHITE LIMESTONE, CEMENTED SANDSTONE, GREEN AND GRAY CLAY
290	295	SHELL, WHITE LIMESTONE, CEMENTED SANDSTONE, TRACES OF GREENISH CLAY
295	305	WHITE LIMESTONE, SHELL AND CEMENTED SANDSTONE
305	315	TAN LIMESTONE AND CEMENT
315	325	TAN LIMESTONE
325	330	TAN AND LIGHT GRAY LIMESTONE
330	345	WHITE AND LIGHT GRAY LIMESTONE
345	350	TAN AND LIGHT GRAY LIMESTONE WITH SOME WHITE LIMESTONE
350	355	TAN AND LIGHT GRAY LIMESTONE
355	360	WHITE LIMESTONE
360	370	TAN AND LIGHT GRAY LIMESTONE

Department of
Environmental Protection

DEP Form No.:	62-528.900(4)
Form Title:	Certification of Class V Well Construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Management District.

DEP Construction Permit No. UC48-294600, issued on 9/12/97 (Date). County Orange

Owner's Name City of Cocoa

Owner's Address 600 School Street, Cocoa, FL 32922
(Street) (City) (State) (Zip Code)

Well Contractor's Name Meridith Environmental (Title) No.: 2200 (State License No.)

Well Contractor's Address 5654 N. Apopka Vineland, Orlando, FL 32858-5648
(Street) (City) (State) (Zip Code)

Well Location R-9, Dyal Water Treatment Plant

Deviations from the application and plans approved by the Department:

None Noted

Actual Dimensions:

Diameter	16	inches
Well depth	370' BLS	feet
Casing depth	300' BLS	feet

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 3-095-0817-AWG, dated 9/30/97.

Date: May 28, 1998

Michael B. Roth
~~(Contractor's Signature)~~
(Engineer's Signature)

STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

☐ Southwest
☐ Northwest
XX St. Johns River
☐ South Florida
☐ Suwannee River

CHECK BOX FOR APPROPRIATE DISTRICT. ADDRESS ON BACK OF PERMIT FORM.

THIS FORM *MUST* BE FILLED OUT COMPLETELY.

The water well contractor is responsible for completing this form and forwarding the permit to the appropriate delegated county where applicable.

Permit No. 3-095-0817AMS
Florida Unique I.D. _____
Permit Stipulations Required (See attached)
62-524 well ☐
CUP/WUP Application No. _____

ABOVE THIS LINE FOR OFFICIAL USE ONLY

Fold at this line in order that address is visible through envelope window

1. City of Cocoa | 155 North Wilson Avenue | Cocoa | 32922 | 352-639-7651
Owner, Legal Name of Entity if Corporation | Address | City | Zip | Telephone Number

2. Claude H Dyal Water Treatment Plant | 28400 S.R. 520 | Orange County
Well Location — Address, Road Name or Number, City

3. Meridith Environmental Services, Inc. | 2200 | 407-291-4755
Well Drilling Contractor | License No. | Telephone No.

P.O. Box 585648
Address

Orlando, FL 32858-5648
City | State | Zip

4. NE (smallest) 1/4 of NW (biggest) 1/4 of Section 20
(Indicate Well on Chart)

5. Township 24 Range 34

NW NE SW SE

6. Orange | | | | |
County | Subdivision Name | Lot | Block | Unit

7. Number of proposed wells 1 Check the use of well: (See back of permit for additional choices) _____ Domestic Monitor (type) _____
_____ Irrigation (type) (See Back) Public Water Supply (type) ASR (community) (See Back) List Other _____
Distance from septic system n/a ft. Description of facility R9 Estimated start of construction date 7-23-97

8. Application for: XX New Construction _____ Repair/Modify _____ Abandonment _____
(Reason for Abandonment)

9. Estimated: Well Depth 370 Casing Depth 300-~~26"~~ Screen Interval from _____ to _____
Casing Material: ~~Blk Steel~~/Gal / PVC Casing Diameter 16" Seal Material _____

If applicable: Proposed Grouting Interval From 300 to 0 Seal Material neat cement grout
From _____ to _____ Seal Material _____
From _____ to _____ Seal Material _____

RECEIVED
JUN 25 1997
PDS
ORLANDO
(Date Stamp)

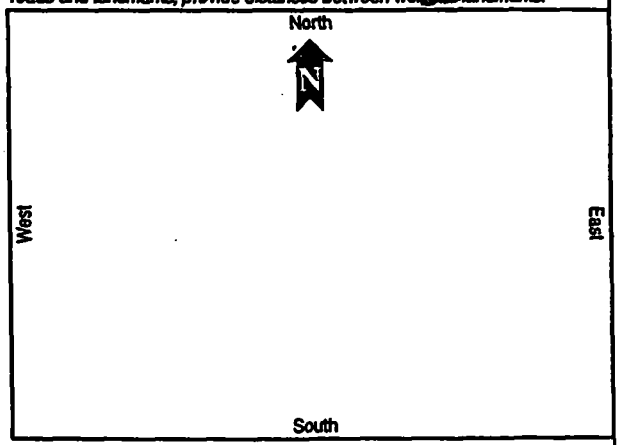
11. Telescope Casing _____ or Liner _____ (check one) Diameter _____
Blk-Steel / Galvanized / PVC Other (specify): _____

12. Method of Construction: X Rotary _____ Cable Tool _____ Combination
_____ Auger _____ Other (specify:) _____

13. Indicate total No. of wells on site n/a List number of unused wells on site _____.

14. Is this well or any other well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ___No ___Yes
(If yes, complete the following) CUP/WUP No. ~~U048294600~~
District well I.D. No. 3048M05271 2-095-0005AMGMR
Latitude 28° 23' 00"N Longitude 81° 56' 00"W
Data obtained from GPS ___ or map ___ or survey ___ (*map datum NAD 27*___ *NAD 83*___)

Draw a map of well location and indicate well site with at least 3 identifiable roads and landmarks; provide distances between well and landmarks.



15. I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided on this application is accurate and that I will obtain necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well completion report to the District within 30 days after drilling or the permit expiration, whichever occurs first.

Signature of Contractor | License No. 2200

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of his responsibilities as stated above. Owner consents to personnel of the WMD or a representative access to the well site.

City of Cocoa Owner's or Agent's Signature | 6-24-97 Date

DO NOT WRITE BELOW THIS LINE — FOR OFFICIAL USE ONLY

Approval Granted By: _____ Issue Date: 9/30/97 Hydrologist Approval _____
Owner Number: _____ Fee Received: $ 120.00 Receipt No.: 21022 Check No.: 15465

THIS PERMIT NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD. IT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL DRILLING OPERATIONS. ***This permit is valid for 90 days from date of issue.***

WHITE: ORIGINAL FILE
YELLOW: DRILLING CONTRACTOR
PINK: OWNER

FORM 41.10 – 410 (1) REV. 4/95

WELL COMPLETION REPORT (Please complete in black ink or type)

PERMIT # 3-095-0817WG CUP # _____ DID # _____
Number of wells drilled 1 /WUP # _____
Indicate remaining wells to be cancelled _____
(All wells drilled need an individual completion report)
WATER WELL CONTRACTOR _____ License # 2200
SIGNATURE _____

Grout	No. of Bags	From (ft.)	To (ft.)
Neat Cement:	441	26", 120-0	16", 300-0
Bentonite:	187		

WELL LOCATION: Site Address 28400 SR 520 County Orange
Qtr: ____ Qtr: ____ Sec: 20 Twp: 24 Rge: 34
Latitude _____ Longitude _____

DATE STAMP

Official Use Only

CHEMICAL ANALYSIS

Iron: ____ ppm Sulfate: ____ ppm
Chlorides: ____ ppm
[ ] Lab Test [ ] Field Test Kit
Pump Type
[ ] Centrifugal [ ] Jet [ ] Submersible
[ ] Turbine
Horsepower _____ Capacity _____ G.P.M. _____
Pump Depth _____ Ft. Intake Depth _____ Ft.

Sketch of well location on property N

Give distances from septic tank and house or other reference points

OWNER'S NAME City of Cocoa R-9
COMPLETION DATE 3-18-98 Florida Unique I.D. _____
WELL USE: DEP/Public X Irrigation ____ Domestic ____ Monitor ____
ASR
HRS Limited ____ 62-524 ____ Other _____
DRILL METHOD [X] Rotary [ ] Cable Tool [ ] Combination
[ ] Jet [ ] Auger Other _____

Measured Static Water Level 9 Measured Pumping Water Level 71
After 24 Hours at 1060 G.P.M. Measuring Pt. (Describe): _____
Which is ____ Ft. [ ] Above [ ] Below Land Surface
Casing: [ ] Black Steel [ ] Galv. [X] PVC Other _____

[X] Open Hole [ ] Screen	300 Depth 370 (Ft.)		DRILL CUTTINGS LOG Examine cuttings every 20 ft. or at formation changes. Give color, grain size, and type of material. Note cavities, depth to producing zones.
Casing Diameter & Depth (Ft.)	From	To	
Diameter 26"			
From 0			
To 120			
Diameter 16"			
From 0			
To 300			see attached
Liner [ ] or Casing [ ]			
Diameter ___ ___			
From _____			
To _____			

Driller's Name:
(print or type) David Adkins

Meridith Environmental Services, Inc.
P.O. Box 585468
Orlando, FL 32858-5648

JOB NAME:_____Poole and Kent_____ P.O.#____8188_____

JOB LOCATION:_____Claude Dyal Water Treatment Plant R-9

DIAMETER OF CASINGS:_____ STATIC WATER LEVEL:_____

TOTAL DEPTH OF WELL:_____ TOTAL DEPTH OF CASING:_____

FROM FEET	TO FEET	TYPE MATERIAL ENCOUNTERED
0	20	SAND
20	30	SHELL
30	95	SHELL
95	130	SHELL AND SANDSTONE
130	145	CEMENT, SHELL, SANDSTONE, TRACES OF GREEN CLAY
145	150	CEMENT, GREEN CLAY, SHELL, AND SANDSTONE
150	155	GREEN CLAY, SHELL, SANDSTONE
155	200	GREEN CLAY AND SANDSTONE
200	215	SANDSTONE, SOFT LIMESTONE, CLAY
215	230	GREEN CLAY, SANDSTONE, LIMESTONE
230	245	SANDSTONE, SOFT LIMESTONE
245	250	LIMESTONE AND SANDSTONE
250	280	LIMESTONE, SANDSTONE AND SHELL
280	285	SANDSTONE AND SOFT LIMESTONE
285	310	LIMESTONE

Meridith Environmental Services, Inc.
P.O. Box 585468
Orlando, FL 32858 5648

JOB NAME:_____City of Cocoa / Poole and Kent_____ P.O.#____8188_____

JOB LOCATION:_____R-9 Claude Dyal WTP_____

DIAMETER OF CASINGS:_____ STATIC WATER LEVEL:___52"_____

TOTAL DEPTH OF WELL:___370'____ TOTAL DEPTH OF CASING:____300'_____

FROM FEET	TO FEET	TYPE MATERIAL ENCOUNTERED
310	320	CEMENT, TAN LIME
320	330	HARD WHITE LIME
330	350	MEDIUM HARD TAN LIME
350	370	SOFT TAN LIME

Department of
Environmental Protection

DEP Form No.:	62-528.900(4)
Form Title:	Certification of Class V Well Construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Management District.

DEP Construction Permit No. UC48-294600, issued on 9/12/97 (Date). County Orange

Owner's Name City of Cocoa

Owner's Address 600 School Street, Cocoa, FL 32922
(Street) (City) (State) (Zip Code)

Well Contractor's Name Meridith Environmental (Title) No.: 2200 (State License No.)

Well Contractor's Address 5654 N. Apopka Vineland, Orlando, FL 32858-5648
(Street) (City) (State) (Zip Code)

Well Location Well R-10, Dyal Water Treatment Plant

Deviations from the application and plans approved by the Department:

None Noted

Actual Dimensions:

Diameter	16	inches
Well depth	370' BLS	feet
Casing depth	300' BLS	feet

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 3-095-0818-AWG, dated 9/30/97.

Date: May 28, 1998

Michael B. Roffs
~~(Contractor's Signature)~~
(Engineer's Signature)

STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

- ☐ Southwest
- ☐ Northwest
- ☒ St. Johns River
- ☐ South Florida
- ☐ Suwannee River

CHECK BOX FOR APPROPRIATE DISTRICT. ADDRESS ON BACK OF PERMIT FORM.

THIS FORM *MUST* BE FILLED OUT COMPLETELY.

The water well contractor is responsible for completing this form and forwarding the permit to the appropriate delegated county where applicable.

Permit No. 3-095-0818AWG
Florida Unique I.D. _____
Permit Stipulations Required (See attached)
62-524 well ☐
CUP/WUP Application No. _____

ABOVE THIS LINE FOR OFFICIAL USE ONLY

1. City of Cocoa | 155 North Wilson Avenue | Cocoa | 32922 | 352-639-7651
   Owner, Legal Name of Entity if Corporation | Address | City | Zip | Telephone Number
2. Claude H. Dyal Water Treatment Plant 28400 S.R. 520, Orange County, FL
   Well Location — Address, Road Name or Number, City
3. Meridith Environmental Services, Inc. 2200 407-291-4755
   Well Drilling Contractor | License No. | Telephone No.

P.O. Box 585648
Address
Orlando, FL 32858-5648
City | State | Zip

4. NE (smallest) 1/4 of NW (biggest) 1/4 of Section 20
   (Indicate Well on Chart)
5. Township 24 Range 34

NW NE SW SE

6. Orange
   County | Subdivision Name | Lot | Block | Unit

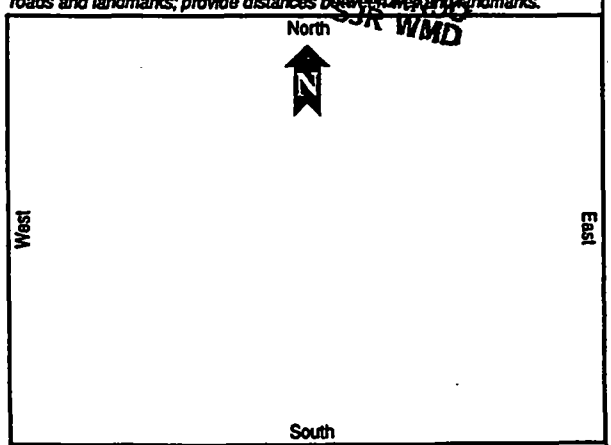
Fold at this line in order that address is visible through envelope window

7. Number of proposed wells 1 Check the use of well: (See back of permit for additional choices) _____ Domestic Monitor (type) _____
   _____ Irrigation (type) (See Back) Public Water Supply (type) XX community (See Back) List Other _____
   Distance from septic system n/a ft. Description of facility ASR R10 Estimated start of construction date 7-23-97
8. Application for: X New Construction ___ Repair/Modify ___ Abandonment _____ (Reason for Abandonment)
9. Estimated: Well Depth 370 Casing Depth 300-26" to RBHole Screen Interval from _____ to _____
   Casing Material: ~~Blk-Steel~~ / PVC Casing Diameter 16" Seal Material _____
   If applicable: Proposed Grouting Interval From 300 to 0 Seal Material neat cement grout
   From _____ to _____ Seal Material _____
   From _____ to _____ Seal Material _____

RECEIVED
JUN 25 1997
SJR WMD

Date Stamp

Draw a map of well location and indicate well site with an "X". Identify known roads and landmarks; provide distances between roads and landmarks.



11. Telescope Casing ___ or Liner ___ (check one) Diameter _____
    Blk-Steel / Galvanized / PVC Other (specify): _____
12. Method of Construction: X Rotary ___ Cable Tool ___ Combination
    ___ Auger ___ Other (specify:) _____
13. Indicate total No. of wells on site n/a List number of unused wells on site n/a
14. Is this well or any other well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ___No ___Yes
    (If yes, complete the following) CUP/WUP No. ~~3-095-0005AWGMR~~ 3-095-0005AWGMR
    District well I.D. No. 3048M05271
    Latitude 28°23'00"N Longitude 81°56'00"W
    Data obtained from GPS ___ or map ___ or survey ___ (*map datum NAD 27*___ *NAD 83*___)

15. I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided on this application is accurate and that I will obtain necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well completion report to the District within 30 days after drilling or the permit expiration, whichever occurs first.

Signature of Contractor | 2200 License No.

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of his responsibilities as stated above. Owner consents to personnel of the WMD or a representative access to the well site.

CITY OF COCOA Owner's or Agent's Signature | 6-24-97 Date

DO NOT WRITE BELOW THIS LINE — FOR OFFICIAL USE ONLY

Approval Granted By: _____ Issue Date: 9/30/97 Hydrologist Approval _____ Initials

Owner Number: _____ Fee Received: $ 120.00 Receipt No.: 21022 Check No.: 15465

THIS PERMIT NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD. IT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL DRILLING OPERATIONS. ***This permit is valid for 90 days from date of issue.***

WHITE: ORIGINAL FILE
YELLOW: DRILLING CONTRACTOR
PINK: OWNER

FORM 41.10 – 410 (1) REV. 4/95

Patatta Printing Co., Inc.

WELL COMPLETION REPORT (Please complete in black ink or type.)

PERMIT # 3-095-0818WG CUP # _____ DID # _____
Number of wells drilled 1 /WUP # _____
Indicate remaining wells to be cancelled _____
(All wells drilled need an individual completion report)
WATER WELL CONTRACTOR _____
SIGNATURE _____ License # 2200
I certify that the information provided in this report is accurate and true)

Grout	No. of Bags	From (ft.)	To (ft.)
Neat Cement:	437	26", 0-120	16", 300-0
Bentonite:	157		

WELL LOCATION: Site Address 28400 SR 520 County Orange
Qtr: _____ Qtr: _____ Sec: 20 Twp: 24 Rge: 34
Latitude _____ Longitude _____

DATE STAMP

Official Use Only

CHEMICAL ANALYSIS

Iron: ____ ppm Sulfate: ____ ppm
Chlorides: _____ppm
[ ] Lab Test [ ] Field Test Kit
Pump Type
[ ] Centrifugal [ ] Jet [ ] Submersible
[ ] Turbine
Horsepower _____ Capacity _____ G.P.M. _____
Pump Depth _____ Ft. Intake Depth _____ Ft.

Sketch of well location on property N

Give distances from septic tank and house or other reference points

OWNER'S NAME City of Cocoa R-10

COMPLETION DATE 4-21-98 Florida Unique I.D. _____

WELL USE: DEP/Public X ASR Irrigation ____ Domestic ____ Monitor ____
HRS Limited ____ 62-524 ____ Other _____

DRILL METHOD ☒ Rotary ☐ Cable Tool ☐ Combination
☐ Jet ☐ Auger Other _____

Measured Static Water Level 10 Measured Pumping Water Level 28
After 24 Hours at 1220 G.P.M. Measuring Pt. (Describe): _____
Which is ____ Ft. ☐ Above ☐ Below Land Surface
Casing: ☐ Black Steel ☐ Galv. ☒ PVC Other _____

☒ Open Hole ☐ Screen	300 Depth (Ft.)	370	DRILL CUTTINGS LOG Examine cuttings every 20 ft. or at formation changes. Give color, grain size, and type of material. Note cavities, depth to producing zones.
Casing Diameter & Depth (Ft.)	From	To	
Diameter 26"			
From 0			
To 120			
Diameter 16"			
From 0			
To 300			see attached
Liner ☐ or Casing ☐			
Diameter ___ ___			
From _____			
To _____			

Driller's Name: David Adkins
(print or type) _____

Meridith Environmental Services, Inc.
P.O. Box 585468
Orlando, FL 32858-5648

JOB NAME: Poole and Kent P.O.# 8188

JOB LOCATION: Claude Dyal Water Treatment Plant R-10

DIAMETER OF CASINGS: _____ STATIC WATER LEVEL: _____

TOTAL DEPTH OF WELL: _____ TOTAL DEPTH OF CASING: _____

FROM FEET	TO FEET	TYPE MATERIAL ENCOUNTERED
0	10	SAND
10	20	SAND AND SHELL STRINGERS
20	25	SHELL WITH SAND STRINGERS
25	50	SHELL WITH CEMENTED SAND STRINGERS
50	80	SHELL
80	85	SHELL WITH SANDSTONE STRINGERS
85	90	SHELL WITH GREEN CLAY STRINGERS AND CEMENTED SAND STRINGERS
90	105	SHELL STRINGERS, GREEN CLAY, CEMENTED SAND STRINGERS
105	120	GRAY CEMENTED SAND AND SOME SHELL
120	125	CEMENT, CLAY
125	130	SANDSTONE, SHELL, CEMENT
130	160	SANDSTONE, SHELL, CLAY
160	165	CEMENT, SHELL, CLAY, CEMENTED SANDSTONE
165	190	SHELL, CLAY, CEMENTED SANDSTONE
190	215	CLAY, CEMENTED SANDSTONE, SHELL

Cocoa R-10

215	235	WHITE LIMESTONE, SANDSTONE, CLAY, SHELL
235	245	SANDSTONE, CLAY, SHELL, LIMESTONE
245	255	LIMESTONE, CLAY, SANDSTONE, SHELL
255	290	TAN AND GRAY LIMESTONE, TAN AND GRAY SANDSTONE, SHELL
290	305	TAN AND GRAY LIMESTONE, TAN AND GRAY SANDSTONE
305	320	CEMENT, TAN LIME
320	330	HARD WHITE LIME
330	350	MEDIUM HARD TAN LIME
350	370	SOFT TAN LIME

CITY OF cocoa FLORIDA

Appendix B-2 Alignment and Pressure Testing Data

MERIDITH ENVIRONMENTAL SERVICES, INC.

PLUMBNESS AND ALIGNMENT TEST
COCOA WELL R-7

DEPTH	PLUMBNESS
10'	CENTER
20'	CENTER
30'	CENTER
40'	CENTER
50'	CENTER
60'	0" X 1/4" EAST
70'	0" X 1/4" EAST
80'	0" X 1/2" EAST
90'	0" X 3/4" EAST
100	0" X 3/4" EAST
110'	0" X 3/4" EAST
120'	0" X 3/4" EAST
130'	0" X 3/4" EAST
140'	0" X 7/8" EAST
150'	0" X 1" EAST

MERIDITH ENVIRONMENTAL SERVICES, INC.

PLUMBNESS AND ALIGNMENT TEST
COCOA WELL R-8

DEPTH	PLUMBNESS
10'	CENTER
20'	CENTER
30'	CENTER
40'	CENTER
50'	CENTER
60'	CENTER
70'	CENTER
80'	CENTER
90'	CENTER
100	1/2" SOUTH X 0"
110'	1/2" SOUTH X 0"
120'	1/2" SOUTH X 1/4" WEST
130'	3/4" SOUTH X 1/4" WEST
140'	7/8" SOUTH X 1/2" WEST
150'	1" SOUTH X 1/2" WEST

MERIDITH ENVIRONMENTAL SERVICES, INC.

PLUMBNESS AND ALIGNMENT TEST
COCOA WELL R-9

DEPTH	PLUMBNESS
10'	CENTER
20'	CENTER
30'	1/2" NORTH X 0"
40'	1/2" NORTH X 0"
50'	1/2" NORTH X 0"
60'	1/2" NORTH X 0"
70'	1/2" NORTH X 0"
80'	1/2" NORTH X 0"
90'	1/2" NORTH X 0"
100	1/2" NORTH X 0"
110'	1/2" NORTH X 0"
120'	1/2" NORTH X 0"
130'	3/4" NORTH X 0"
140'	1/2" NORTH X 0"
150'	1/2" NORTH X 0"

MERIDITH ENVIRONMENTAL SERVICES, INC.

PLUMBNESS AND ALIGNMENT TEST
COCOA WELL R-10

DEPTH	PLUMBNESS
10'	CENTER
20'	CENTER
30'	1/4" EAST X 1/4" SOUTH
40'	1/4" EAST X 1/4" SOUTH
50'	1/2" EAST X 1/2" SOUTH
60'	1/2" EAST X 1/2" SOUTH
70'	3/8" EAST X 3/8" SOUTH
80'	1/4" EAST X 3/8" SOUTH
90'	1/4" EAST X 1/4" SOUTH
100	0" X 1/2" SOUTH
110'	1/4" EAST X 1/2" SOUTH
120'	1/4" EAST X 1/2" SOUTH
130'	1/2" EAST X 1/2" SOUTH
140'	1/2" EAST X 1/4" SOUTH
150'	3/4" EAST X 1/4" SOUTH

Cocoa ASR Wells R-7, R-8, R-9 & R-10
Final Casing Pressure Testing

Well R-7
Date of Test: Nov. 3, 1997

Time (mins.	Casing Pressure (psi)
0	77
10	75
20	73
30	71
40	71
50	71
60	70

Well R-8
Date of Test: Dec. 15, 1997

Time (mins.	Casing Pressure (psi)
0	76
10	75
20	74
30	72
40	72
50	72
60	71

Well R-9
Date of Test: Feb. 16, 1998

Time (mins.	Casing Pressure (psi)
0	75
10	75
20	74
30	72
40	71
50	70
60	70

Well R-10
Date of Test: April 2, 1998

Time (mins.	Casing Pressure (psi)
0	78
10	75
20	73
30	73
40	72
50	71
60	71

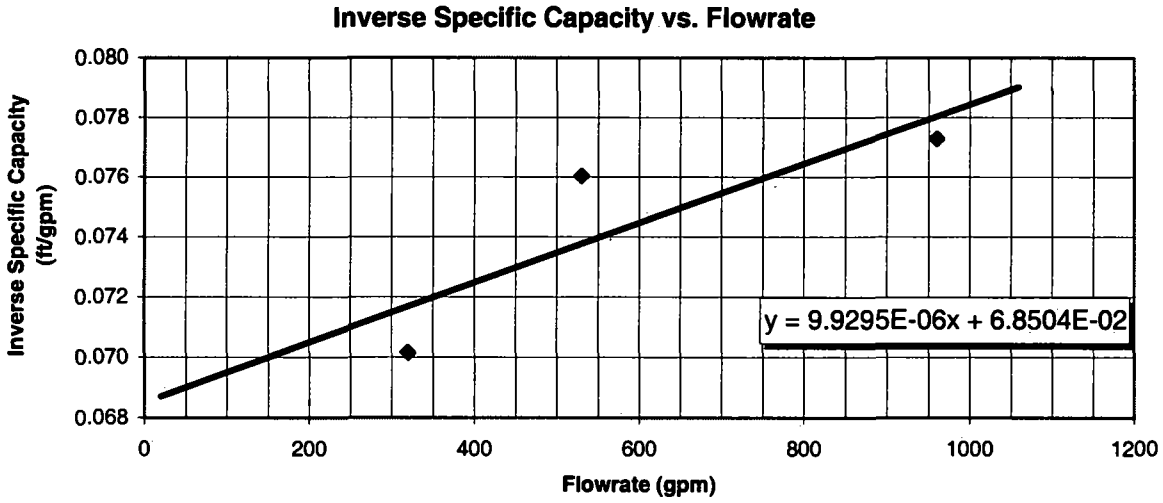
CITY OF COCOA FLORIDA

Appendix B-3
Step Test Results

New ASR Well R-7 Step-Drawdown Test

Test Performed May 5, 1998

Step	Pumping Rate, Q (gpm)	Observed Drawdown, s (ft.)	Specific Capacity (gpm/ft)	1/Specific Capacity (ft/gpm)
1	320	22.5	14.3	0.0702
2	530	40.3	13.2	0.0760
3	960	74.2	12.9	0.0773



From Inverse Specific Capacity vs. Flowrate chart (above):

Turbulent Drawdown Coefficient, C= 9.93 (10^{-6}) ft/gpm^2

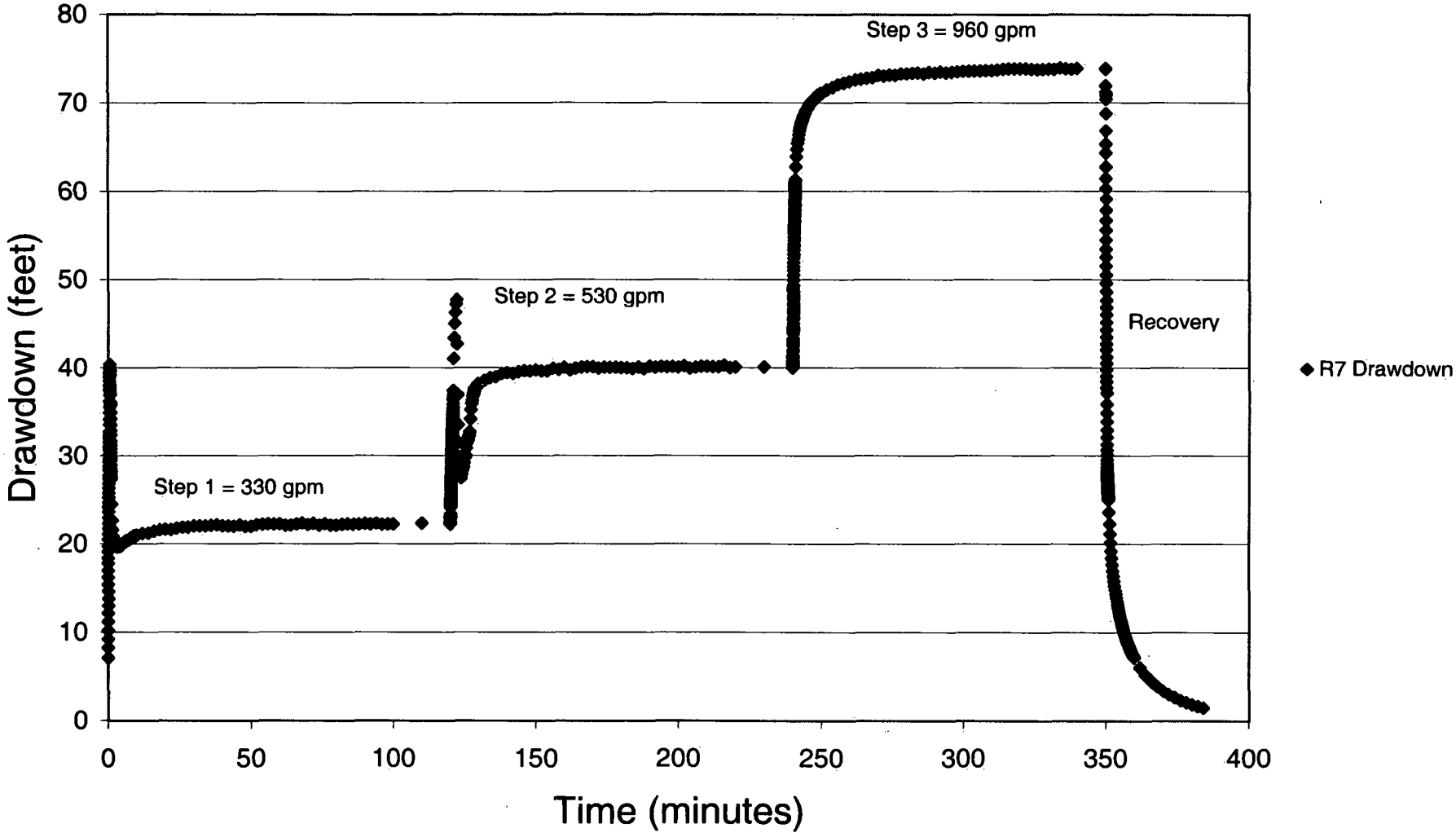
Laminar Drawdown Coefficient, B= .0685 ft/gpm

Step	[1]Turbulent Component of Drawdown, CQ^2 (ft)	[2]Laminar Component of Drawdown, BQ (ft)	Percent of Drawdown Attributable of Laminar Flow 100% X BQ/(CQ^2 + BQ)
1	1.02	21.9	95.6%
2	2.79	36.3	92.9%
3	9.15	65.8	87.8%

Note 1 This is the Well Loss term of Jacob (1946) where drawdown = CQ^2 + BQ

Note 2 This is the Laminar term of Jacob (1946) where drawdown = CQ^2 + BQ

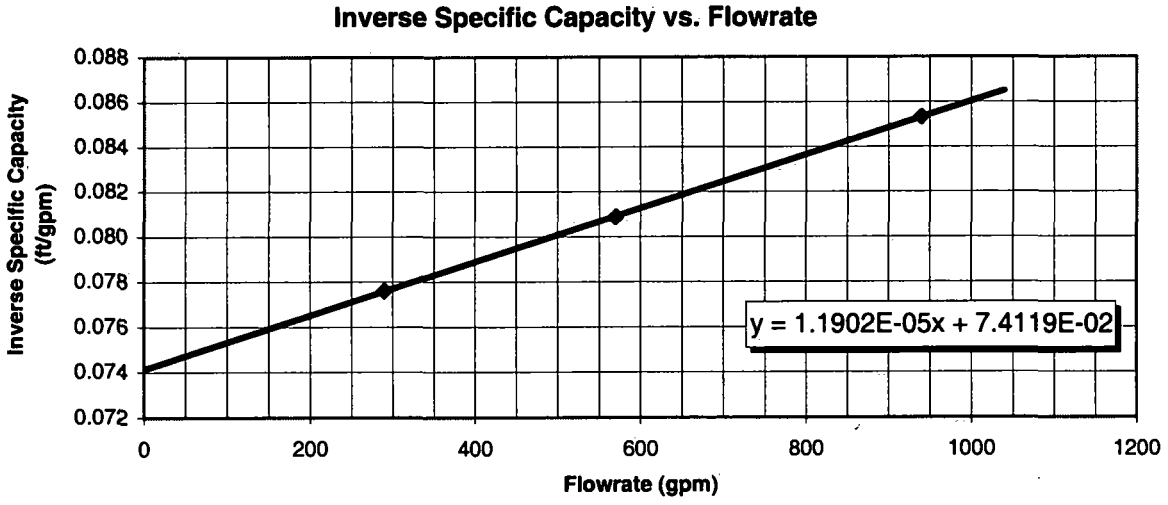
ASR R7 Step Test



New ASR Well R-8 Step-Drawdown Test

Test Performed April 22, 1998

Step	Pumping Rate, Q (gpm)	Observed Drawdown, s (ft.)	Specific Capacity (gpm/ft)	1/Specific Capacity (ft/gpm)
1	290	22.5	12.9	0.0776
2	570	46.1	12.4	0.0809
3	940	80.2	11.7	0.0853



From Inverse Specific Capacity vs. Flowrate chart (above):

Turbulent Drawdown Coefficient, C= 1.19 (10^{-5}) ft/gpm^2

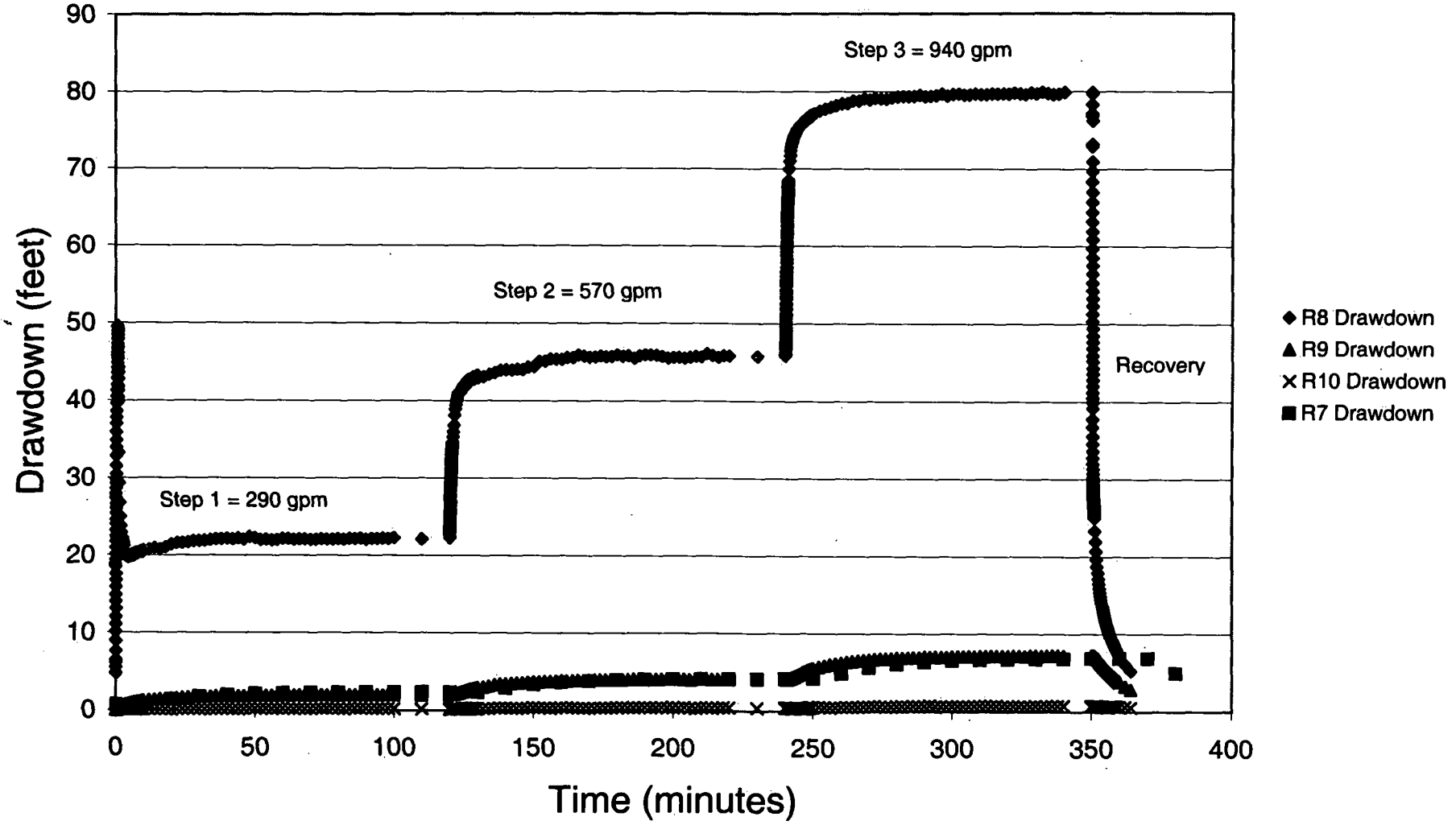
Laminar Drawdown Coefficient, B= .0741 ft/gpm

Step	[1]Turbulent Component of Drawdown, CQ^2 (ft)	[2]Laminar Component of Drawdown, BQ (ft)	Percent of Drawdown Attributable of Laminar Flow 100% X BQ/(CQ^2 + BQ)
1	1.0	21.5	95.6%
2	3.9	42.2	91.6%
3	10.5	69.7	86.9%

Note 1 This is the Well Loss term of Jacob (1946) where drawdown = CQ^2 + BQ

Note 2 This is the Laminar term of Jacob (1946) where drawdown = CQ^2 + BQ

ASR R8 Step Test

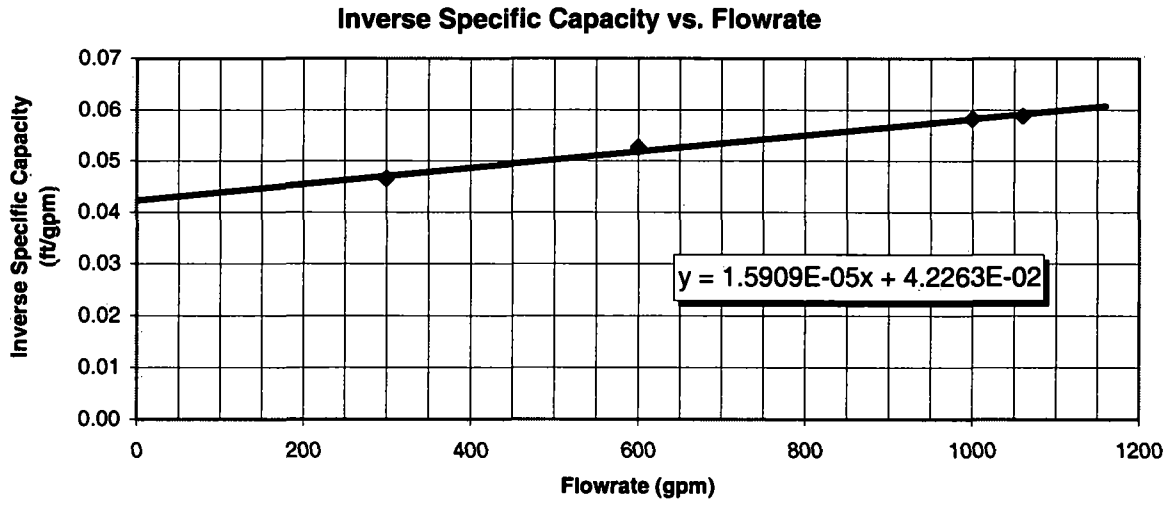


New ASR Well R-9 Step-Drawdown Test

Test Performed April 4, 1998

Step	Pumping Rate, Q (gpm)	Observed Drawdown, s (ft.)	Specific Capacity (gpm/ft)	1/Specific Capacity (ft/gpm)
1	300	14.0	21.5	0.0465
2	600	31.6	19.0	0.0526
3	1000	58.2	17.2	0.0582
4[A]	1060	62.3	17.0	0.0588

Note A: Drawdown from constant-rate test substituted for 4th step of the step-test



From Inverse Specific Capacity vs. Flowrate chart (above):

Turbulent Drawdown Coefficient, C= 1.59 (10^{-5}) ft/gpm^2

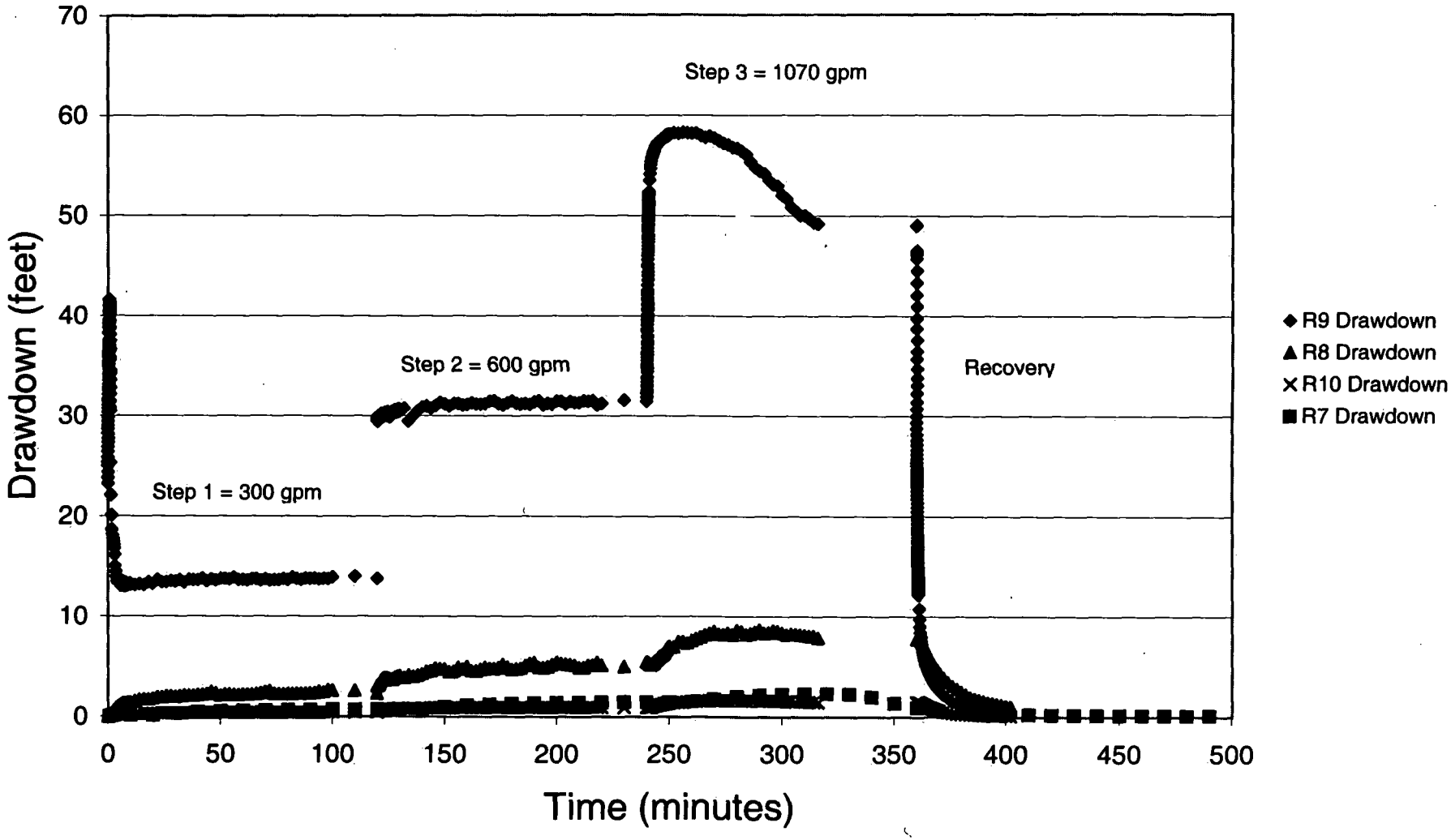
Laminar Drawdown Coefficient, B= .0423 ft/gpm

Step	[1]Turbulent Component of Drawdown, CQ^2 (ft)	[2]Laminar Component of Drawdown, BQ (ft)	Percent of Drawdown Attributable of Laminar Flow $100\% \times BQ/(CQ^2 + BQ)$
1	1.4	12.7	89.9%
2	5.7	25.4	81.6%
3	15.9	42.3	72.7%
4[A]	17.9	44.8	71.5%

Note 1 This is the Well Loss term of Jacob (1946) where drawdown = $CQ^2 + BQ$

Note 2 This is the Laminar term of Jacob (1946) where drawdown = $CQ^2 + BQ$

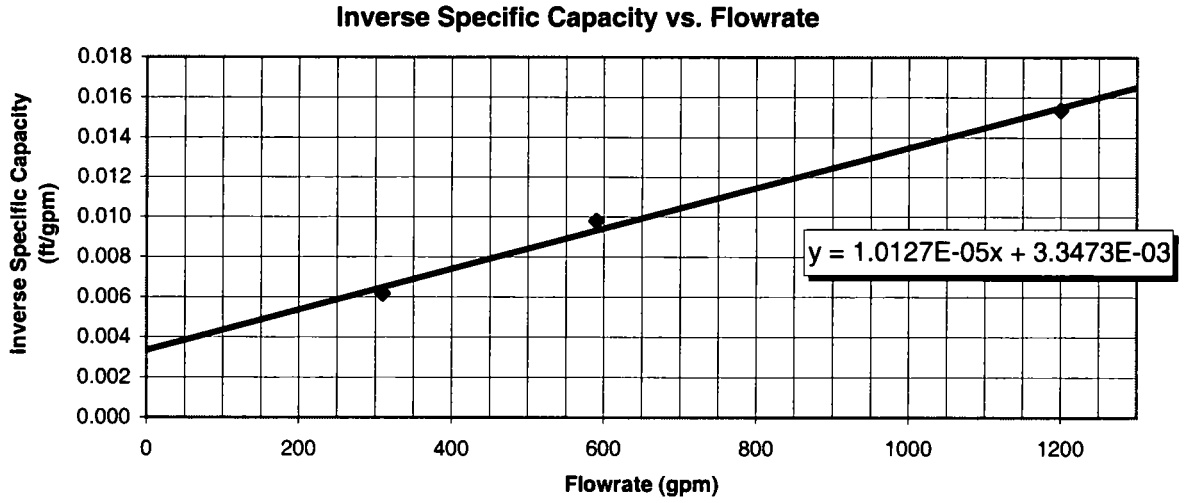
ASR R9 Step Test



New ASR Well R-10 Step-Drawdown Test

Test Performed April 17, 1998

Step	Pumping Rate, Q (gpm)	Observed Drawdown, s (ft.)	Specific Capacity (gpm/ft)	1/Specific Capacity (ft/gpm)
1	310	1.9	162.3	0.0062
2	590	5.8	102.1	0.0098
3	1200	18.4	65.1	0.0154



From Inverse Specific Capacity vs. Flowrate chart (above):

Turbulent Drawdown Coefficient, C= 1.01 (10^{-5}) ft/gpm^2

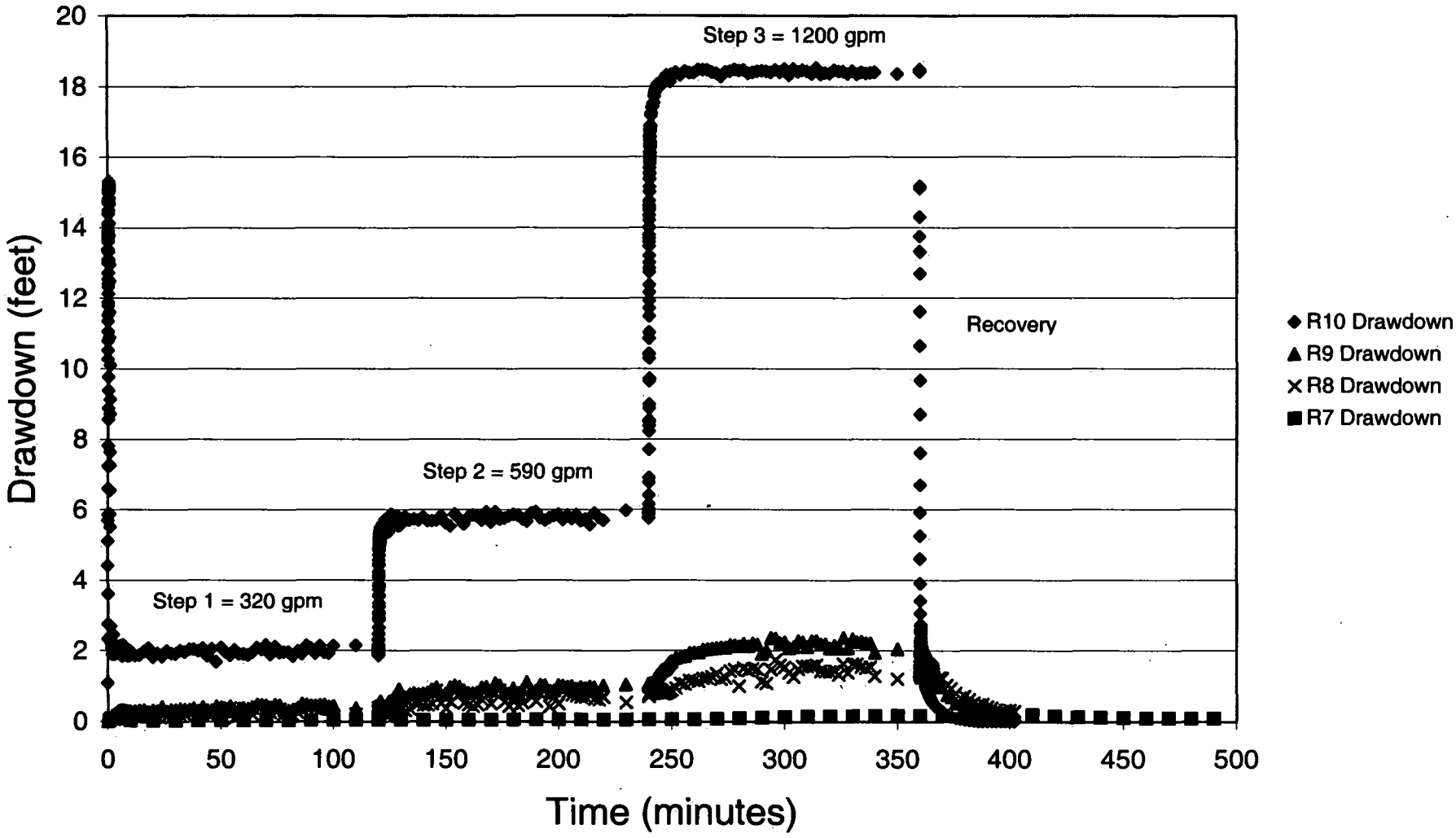
Laminar Drawdown Coefficient, B= .00335 ft/gpm

Step	[1]Turbulent Component of Drawdown, CQ^2 (ft)	[2]Laminar Component of Drawdown, BQ (ft)	Percent of Drawdown Attributable of Laminar Flow 100% X BQ/(CQ^2 + BQ)
1	0.973	1.04	51.6%
2	3.53	1.97	35.9%
3	14.6	4.02	21.6%

Note 1 This is the Well Loss term of Jacob (1946) where drawdown = CQ^2 + BQ

Note 2 This is the Laminar term of Jacob (1946) where drawdown = CQ^2 + BQ

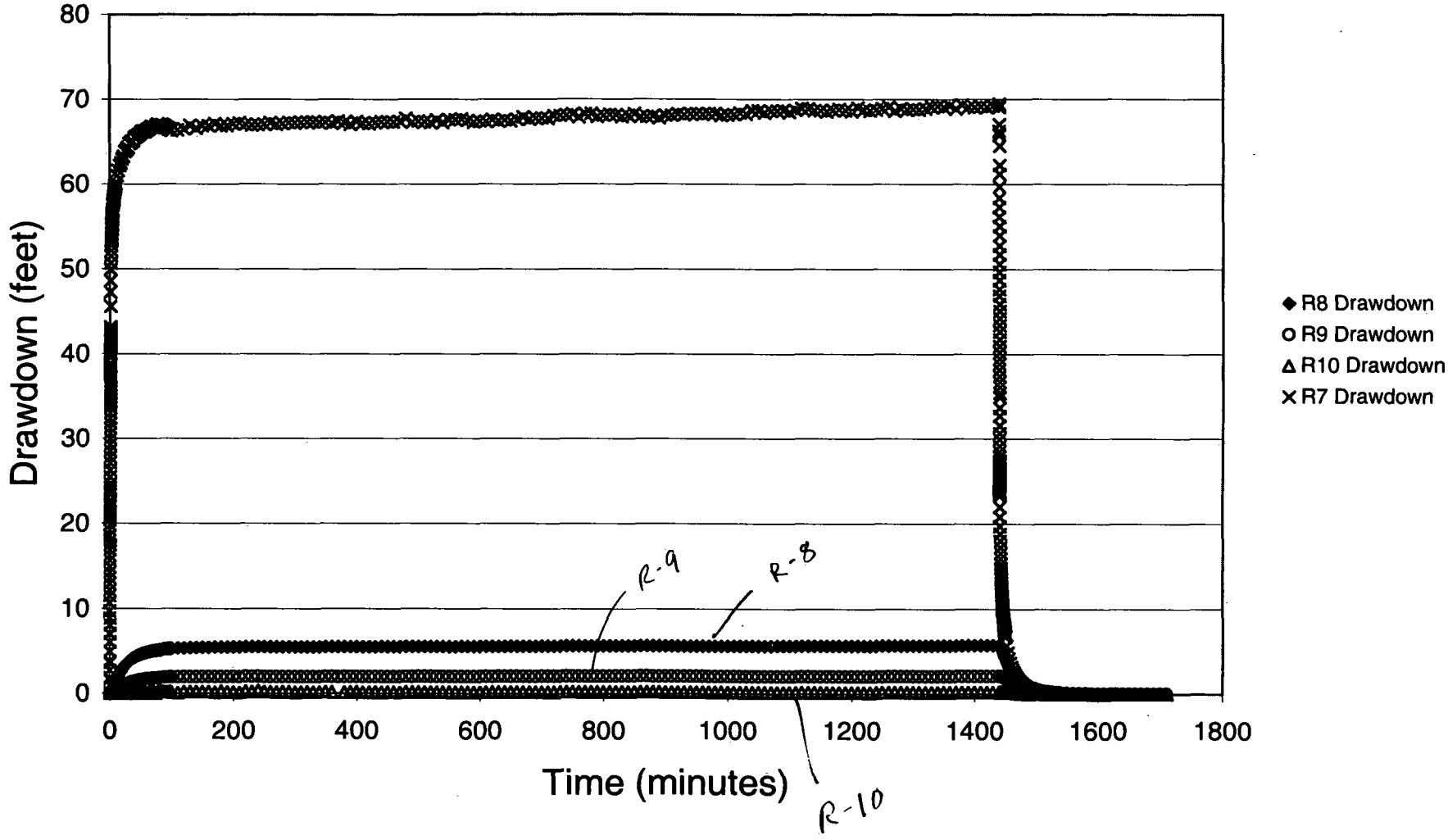
ASR R10 Step Test



CITY OF COCOA FLORIDA

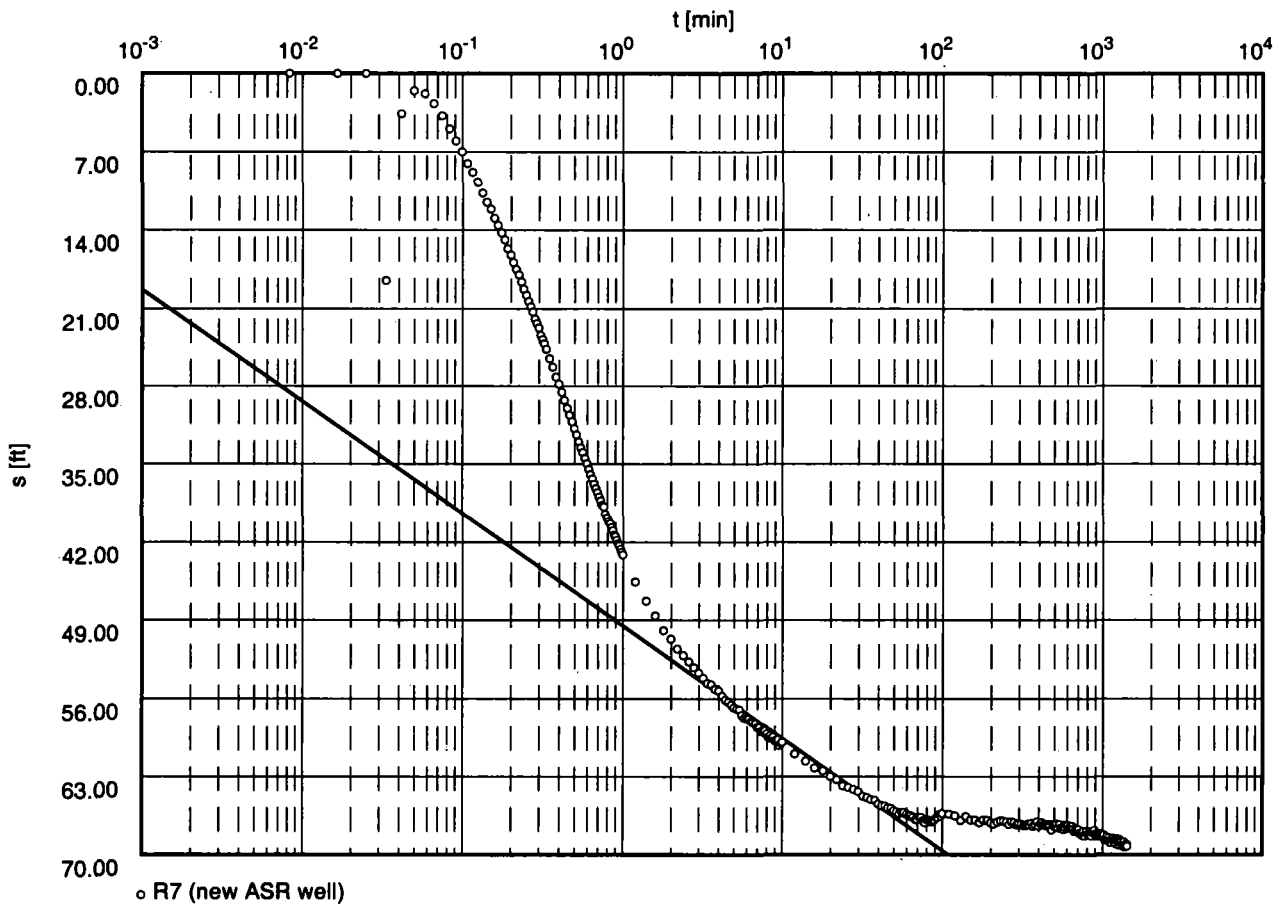
Appendix B-4
Constant Rate Test Results

ASR R7 Pump Test



CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: May 12, 1998	Page 1
		Project: City of Cocoa, Florida	
		Evaluated by: M. Weatherby	

Pumping Test No. Test 1	Test conducted on: May 6, 1998
New ASR Well - R7	
Discharge 880.00 U.S.gal/min	



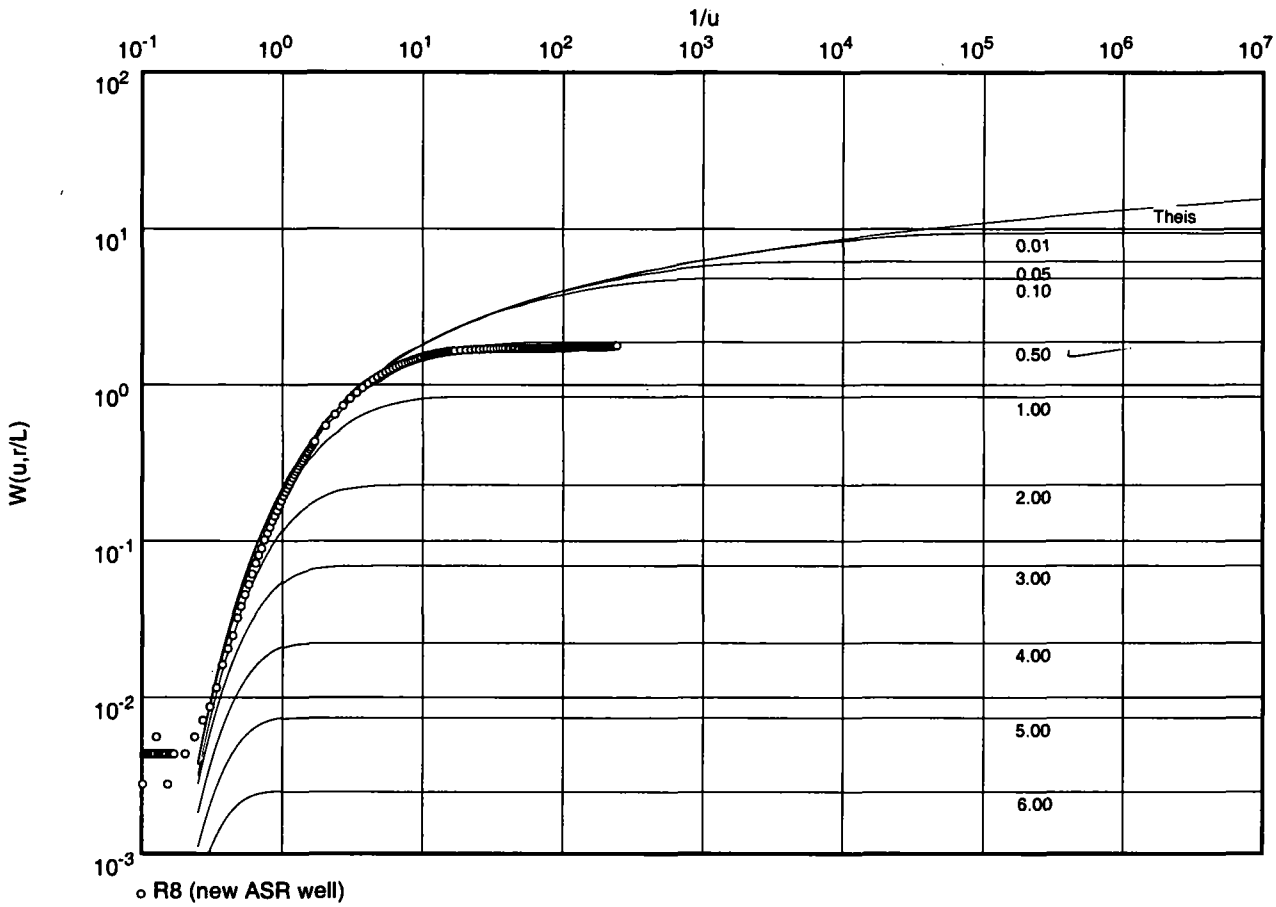
Transmissivity [ft²/min]: 2.13×10^{0}

Storativity: 1.49×10^{-4}

Transmissivity [gpd/ft]: 22,942

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 12, 1998 Page 1 Project: City of Cocoa, Florida Evaluated by: M. Weatherby

Pumping Test No. Test 1	Test conducted on: May 6, 1998
New ASR Well - R7	
Discharge 880.00 U.S.gal/min	



o R8 (new ASR well)

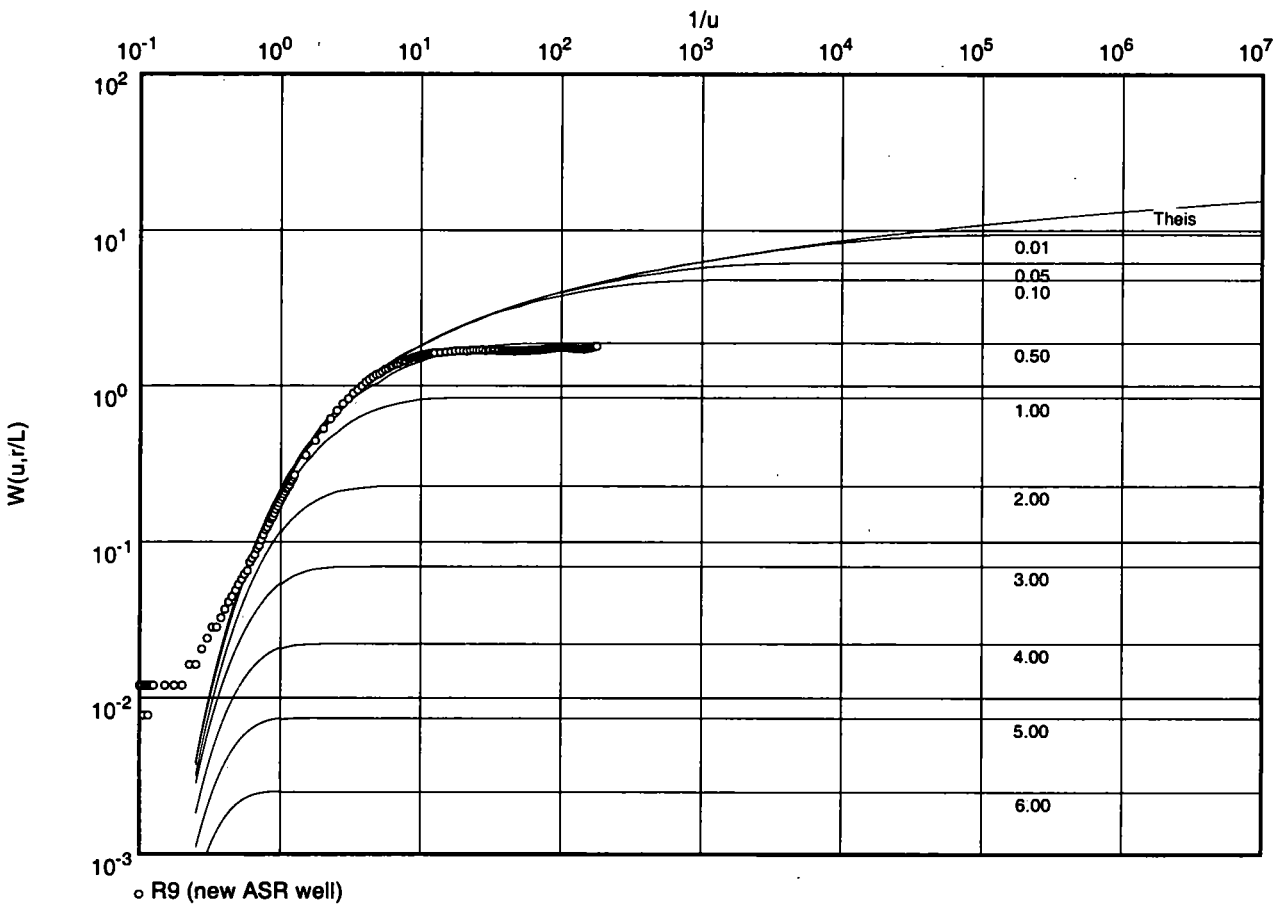
Transmissivity [ft²/min]: 2.90×10^{0}

Storativity: 2.21×10^{-4}

Transmissivity [gpd/ft]: 31,236

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 12, 1998 Page 1 Project: City of Cocoa, Florida Evaluated by: M. Weatherby

Pumping Test No. Test 1	Test conducted on: May 6, 1998
New ASR Well - R7	
Discharge 880.00 U.S.gal/min	

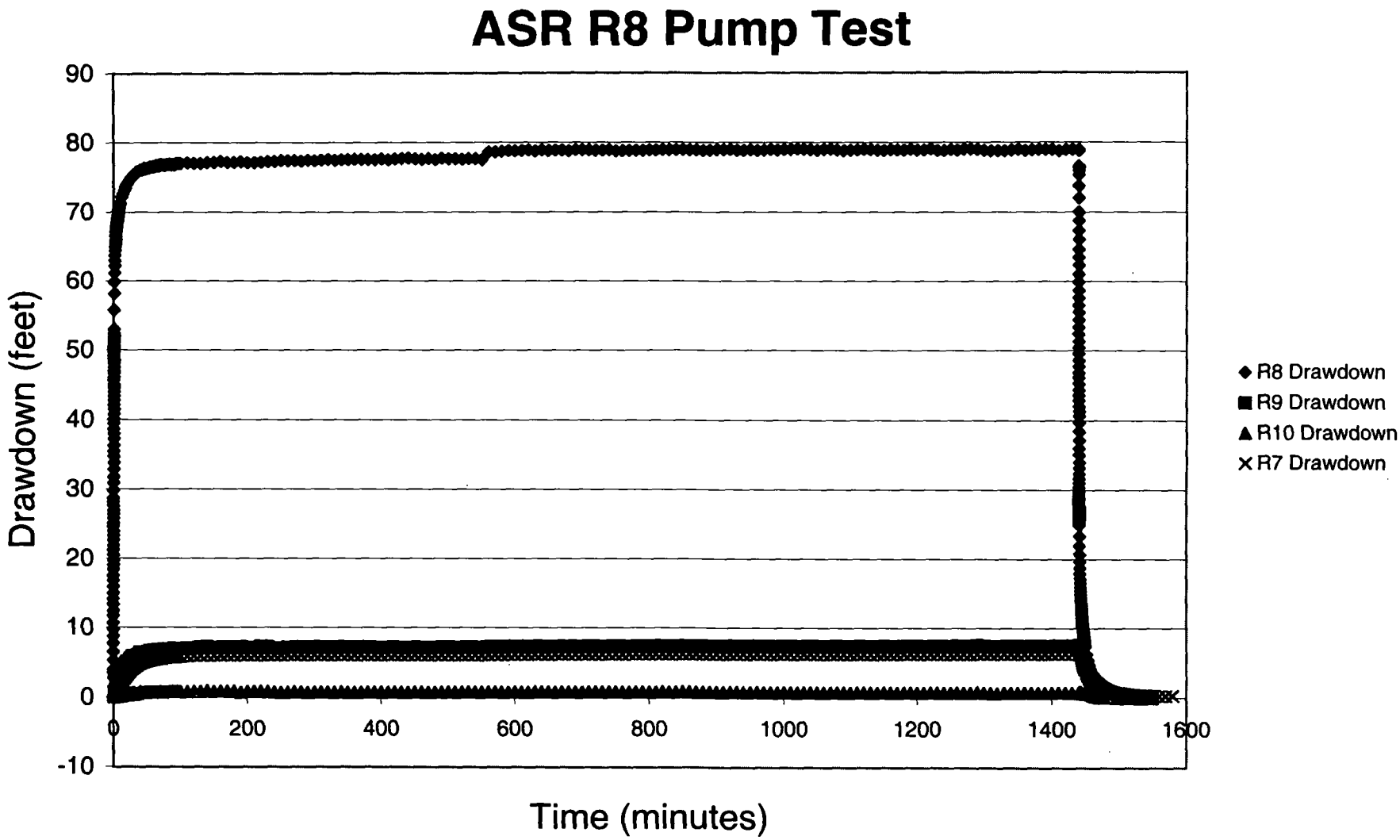


o R9 (new ASR well)

Transmissivity [ft²/min]: 8.02×10^{0}

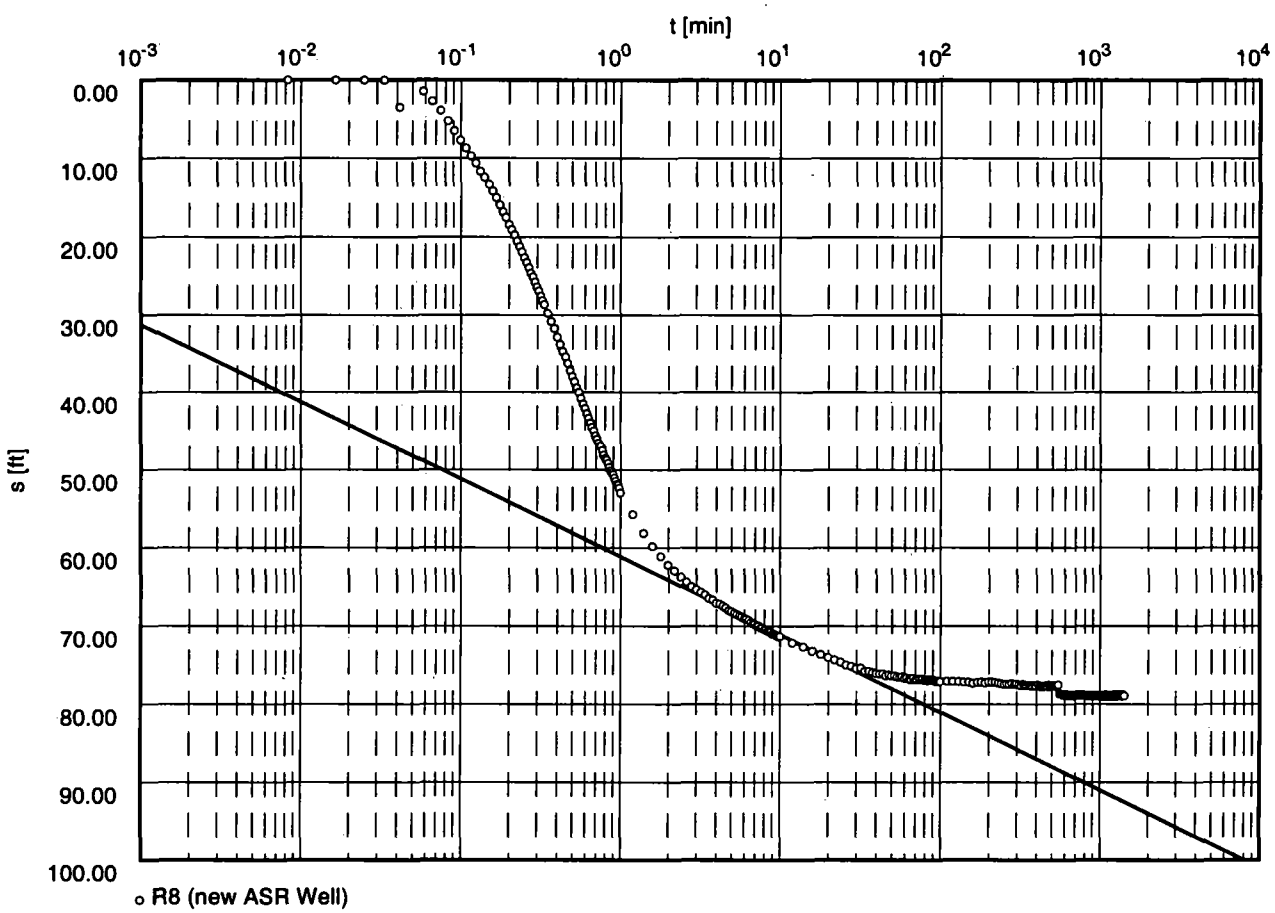
Storativity: 2.07×10^{-4}

Transmissivity [gpd/ft]: 86,385


ASR R8 Pump Test
Drawdown (feet)
90
80
70
60
50
40
30
20
10
0
-10
0
200
400
600
800
1000
1200
1400
1600
Time (minutes)
R8 Drawdown
R9 Drawdown
R10 Drawdown
R7 Drawdown

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: May 12, 1998 Page 1 Project: City of Cocoa, Florida Evaluated by: M. Weatherby

Pumping Test No. Test 1	Test conducted on: April 27, 1998
New ASR Well - R8	
Discharge 920.00 U.S.gal/min	



o R8 (new ASR Well)

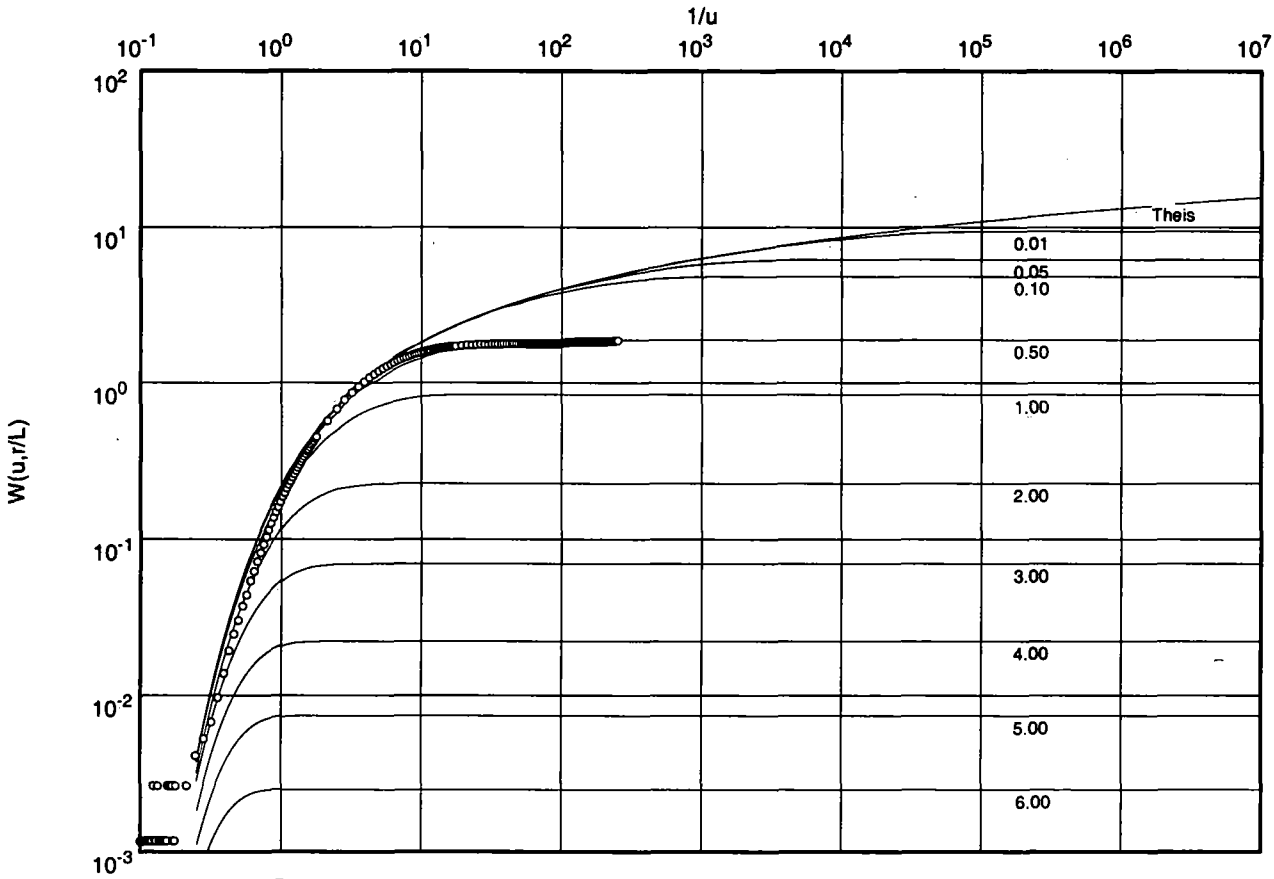
Transmissivity [ft²/min]: 2.26×10^{0}

Storativity: 9.39×10^{-6}

Transmissivity [gpd/ft]: 24,343

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 12, 1998 Page 1 Project: City of Cocoa, Florida Evaluated by: M. Weatherby

Pumping Test No. Test 1	Test conducted on: April 27, 1998
New ASR Well - R8	
Discharge 920.00 U.S.gal/min	



o R7 (new ASR well)

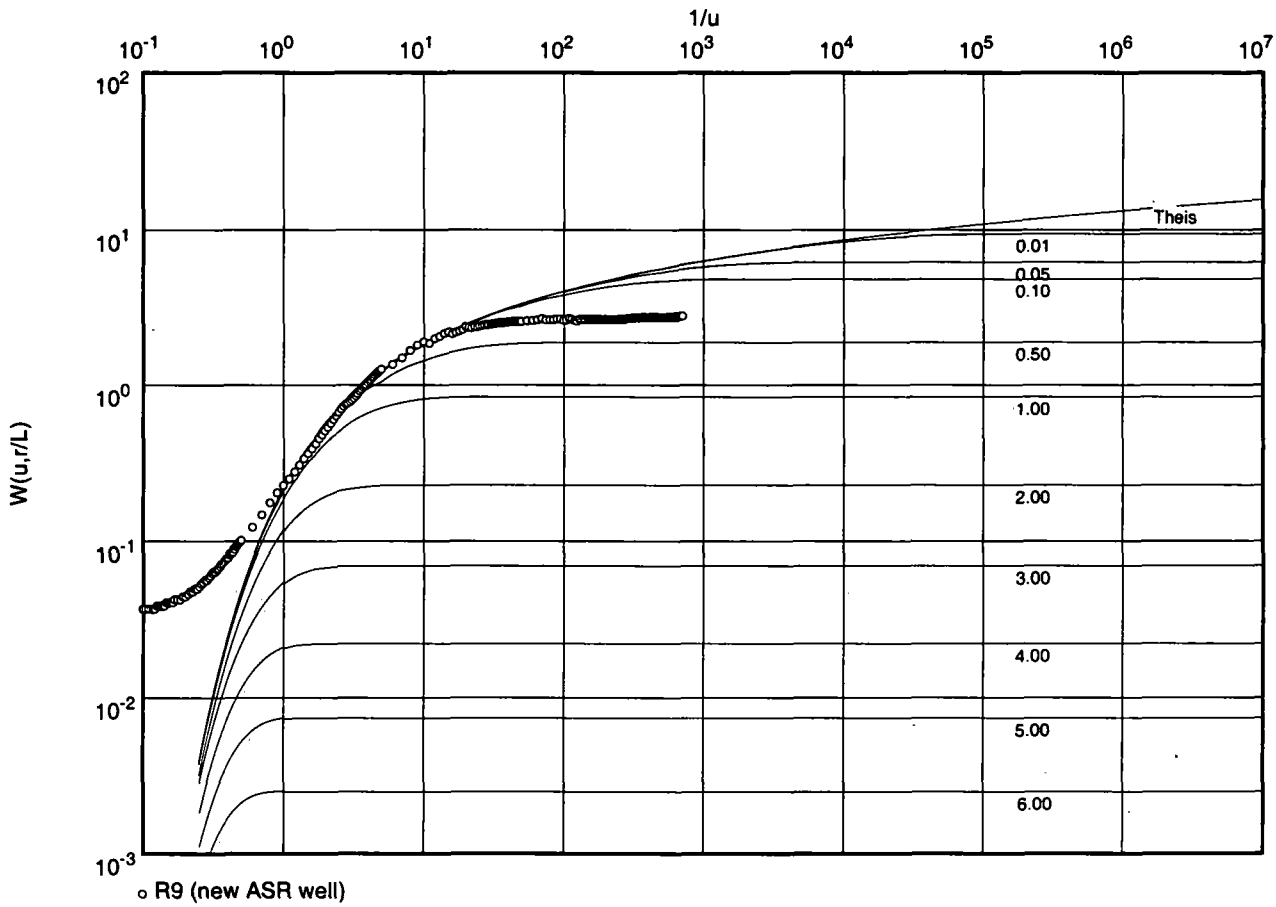
Transmissivity [ft²/min]: 2.86×10^{0}

Storativity: 2.09×10^{-4}

Transmissivity [gpd/ft]: 30,806

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 12, 1998 Page 1 Project: City of Cocoa, Florida Evaluated by: M. Weatherby

Pumping Test No. Test 1	Test conducted on: April 27, 1998
New ASR Well - R8	
Discharge 920.00 U.S.gal/min	



o R9 (new ASR well)

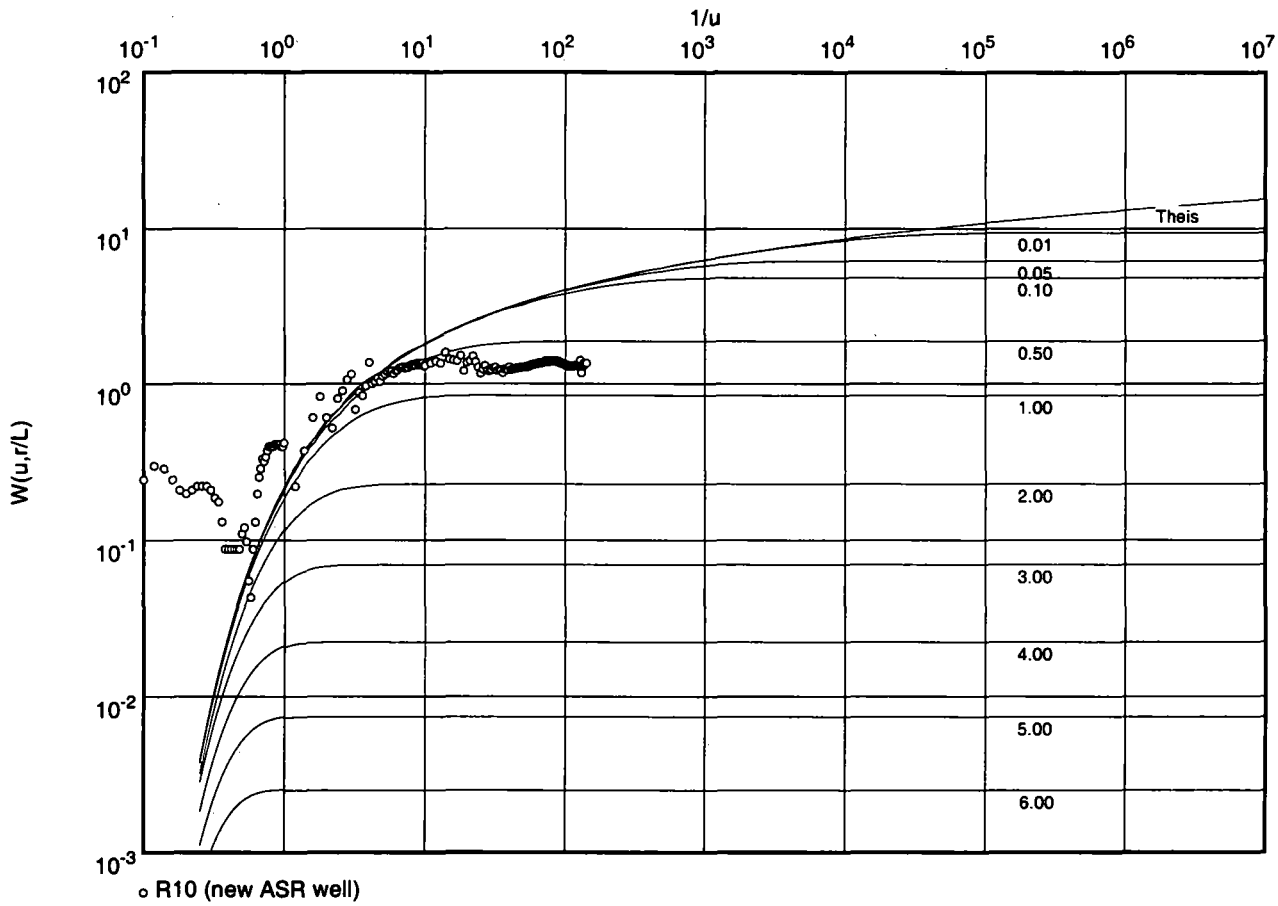
Transmissivity [ft²/min]: 3.60×10^{0}

Storativity: 9.34×10^{-5}

Transmissivity [gpd/ft]: 38,776

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 12, 1998	Page 1
		Project: City of Cocoa, Florida	
		Evaluated by: M. Weatherby	

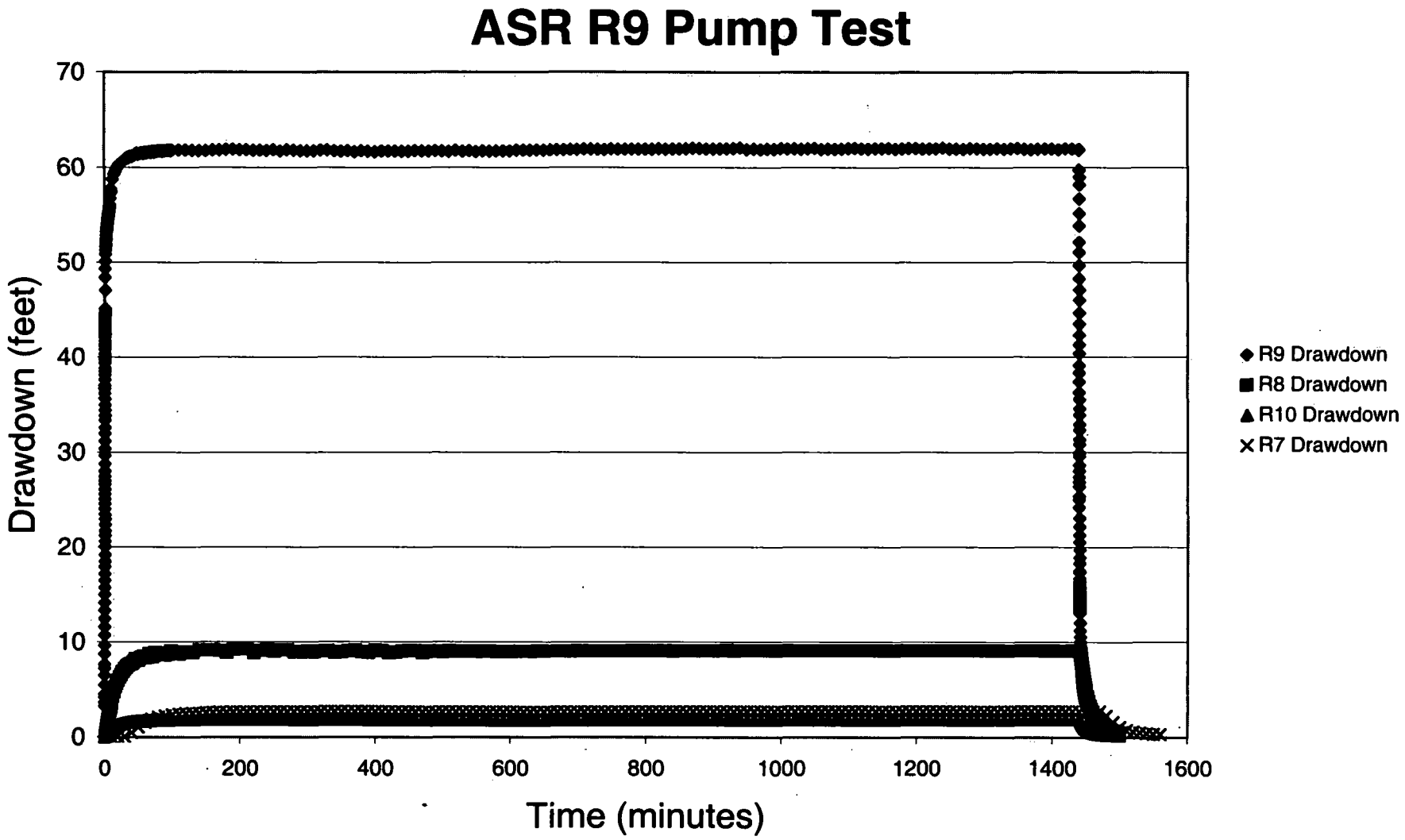
Pumping Test No. Test 1	Test conducted on: April 27, 1998
New ASR Well - R8	
Discharge 920.00 U.S.gal/min	



Transmissivity [ft²/min]: 1.67×10^{1}

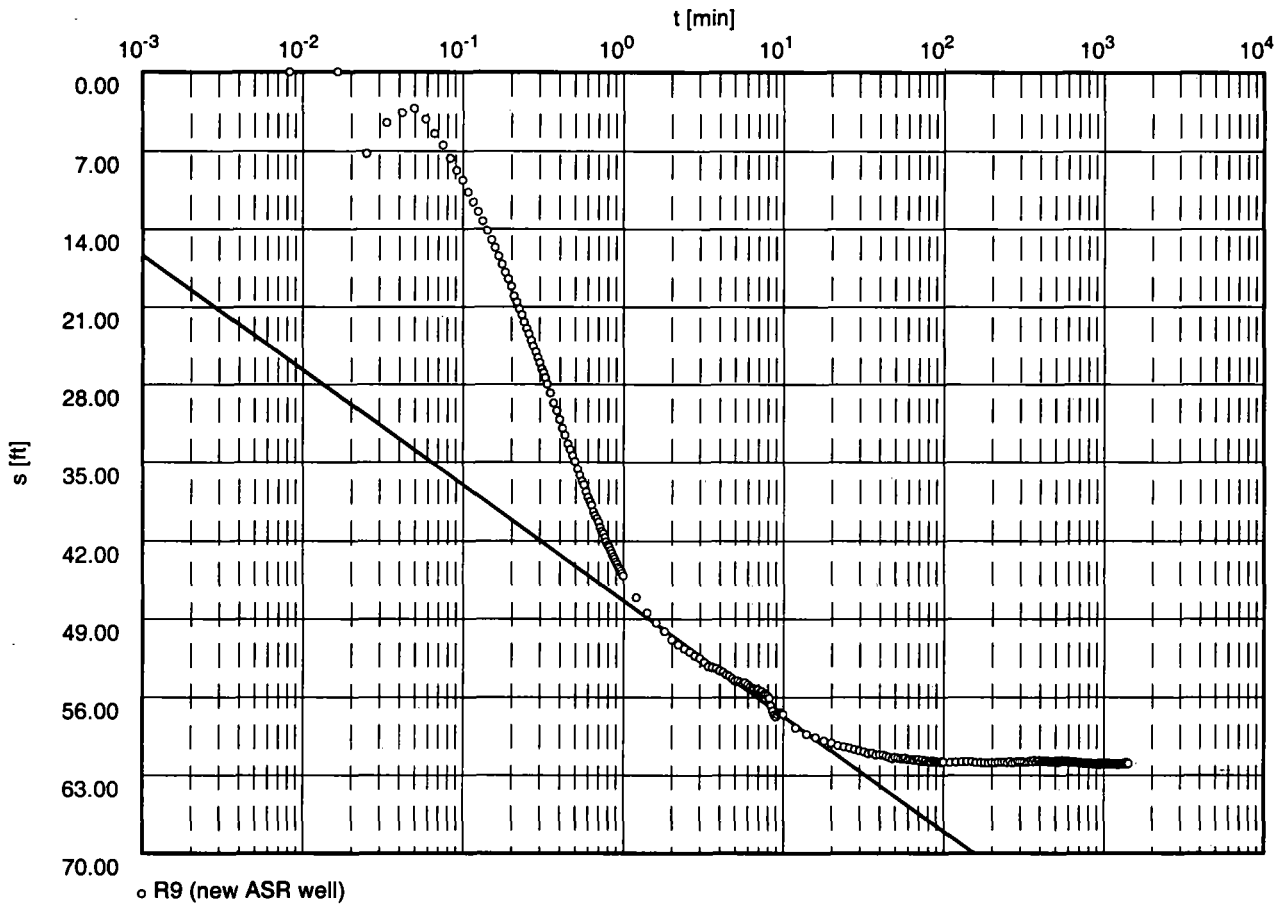
Storativity: 5.43×10^{-4}

Transmissivity [gpd/ft]: 179,879


ASR R9 Pump Test
Drawdown (feet)
70
60
50
40
30
20
10
0
0
200
400
600
800
1000
1200
1400
1600
Time (minutes)
R9 Drawdown
R8 Drawdown
R10 Drawdown
R7 Drawdown

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: May 12, 1998	Page 1
		Project: City of Cocoa, Florida	
		Evaluated by: M. Weatherby	

Pumping Test No. Test 1	Test conducted on: April 14, 1998
New ASR Well - R9	
Discharge 1060.00 U.S.gal/min	



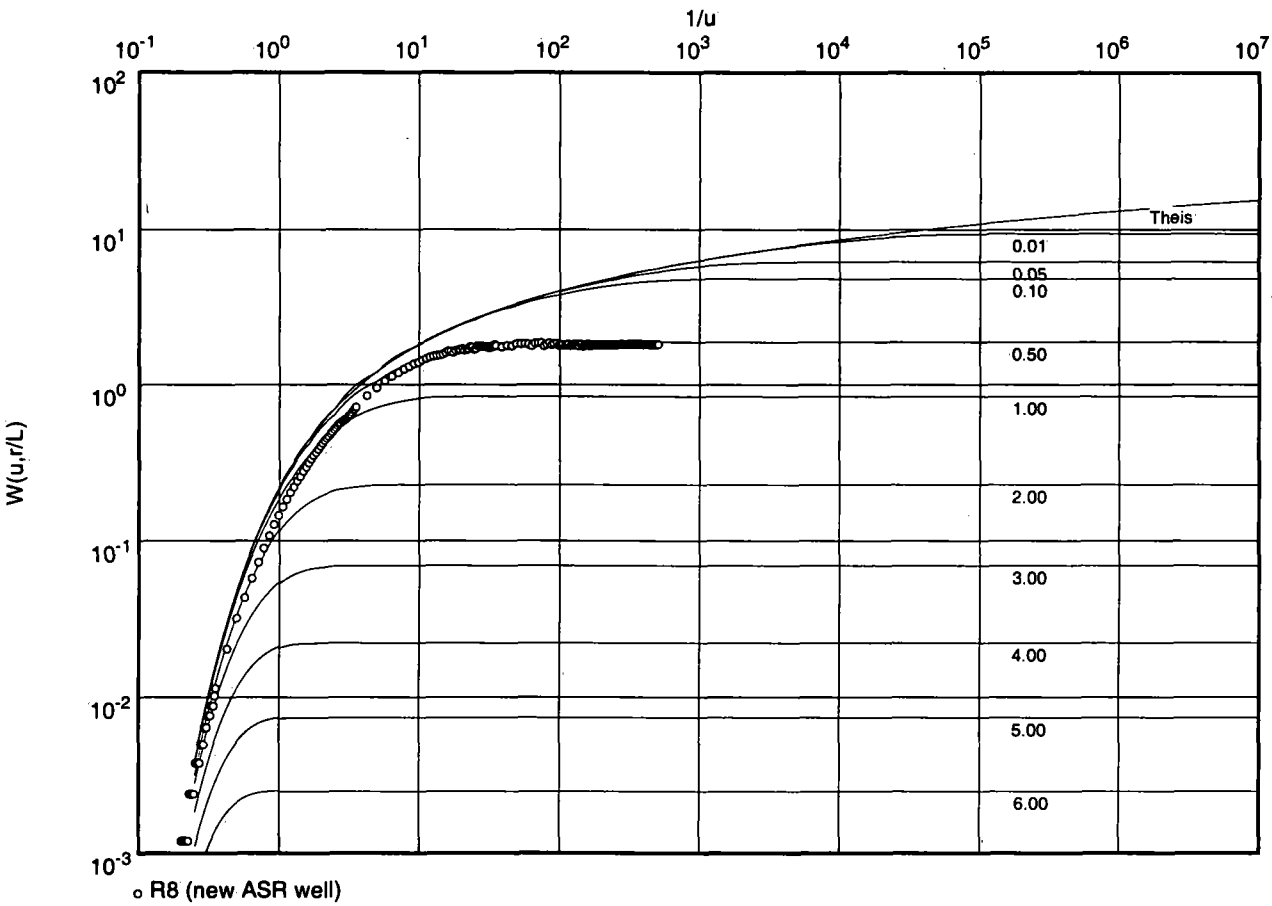
Transmissivity [ft²/min]: 2.50×10^{0}

Storativity: 3.79×10^{-4}

Transmissivity [gpd/ft]: 26,928

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 12, 1998 Page 1 Project: City of Cocoa, Florida Evaluated by: M. Weatherby

Pumping Test No. Test 1	Test conducted on: April 14, 1998
New ASR Well - R9	
Discharge 1060.00 U.S.gal/min	



o R8 (new ASR well)

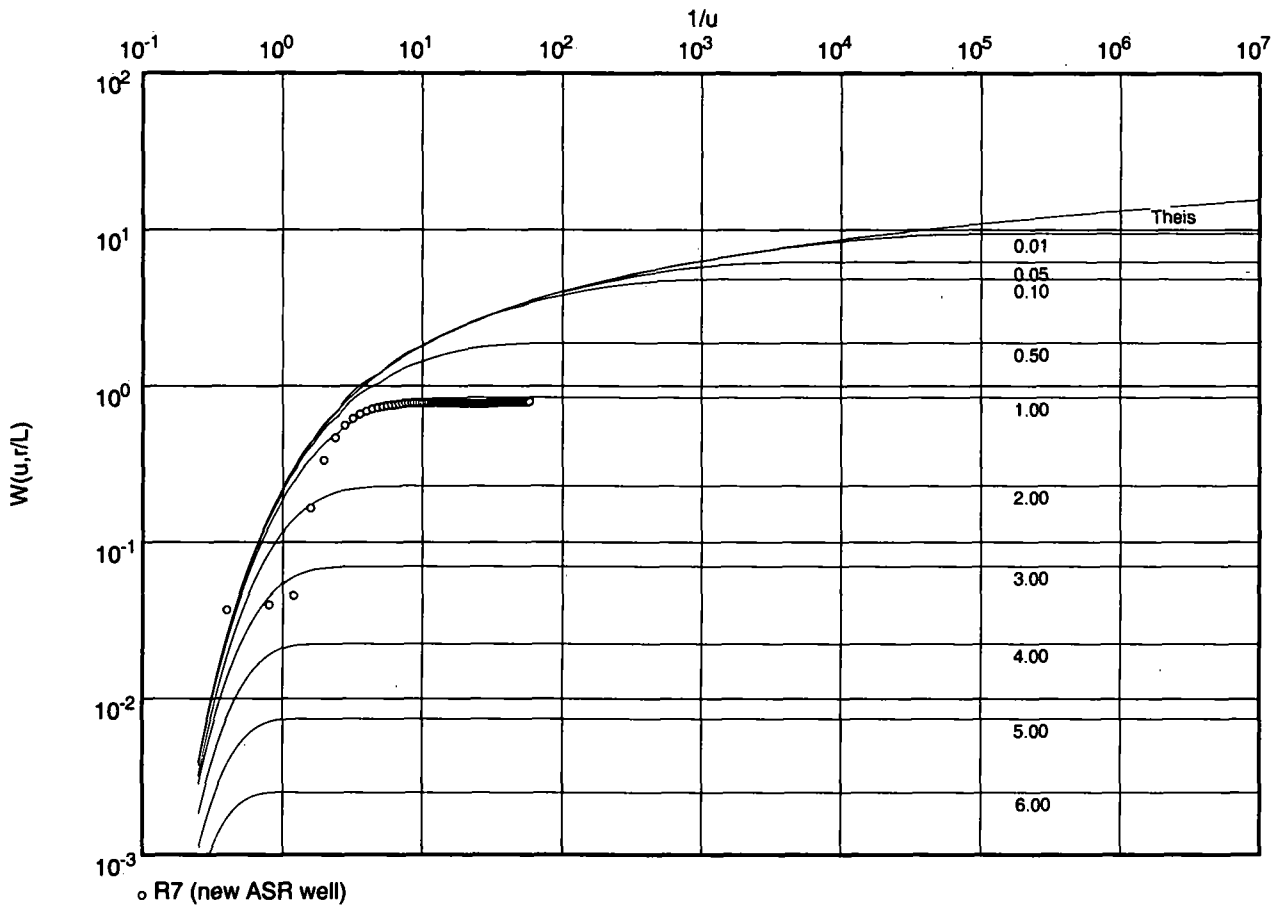
Transmissivity [ft²/min]: 2.24×10^{0}

Storativity: 8.23×10^{-5}

Transmissivity [gpd/ft]: 24,127

CH2MHILL 3011 S.W. Williston Road Gainesville, Florida 32608 ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 12, 1998	Page 1
		Project: City of Cocoa, Florida	
		Evaluated by: M. Weatherby	

Pumping Test No. Test 1	Test conducted on: April 14, 1998
New ASR Well - R9	
Discharge 1060.00 U.S.gal/min	



o R7 (new ASR well)

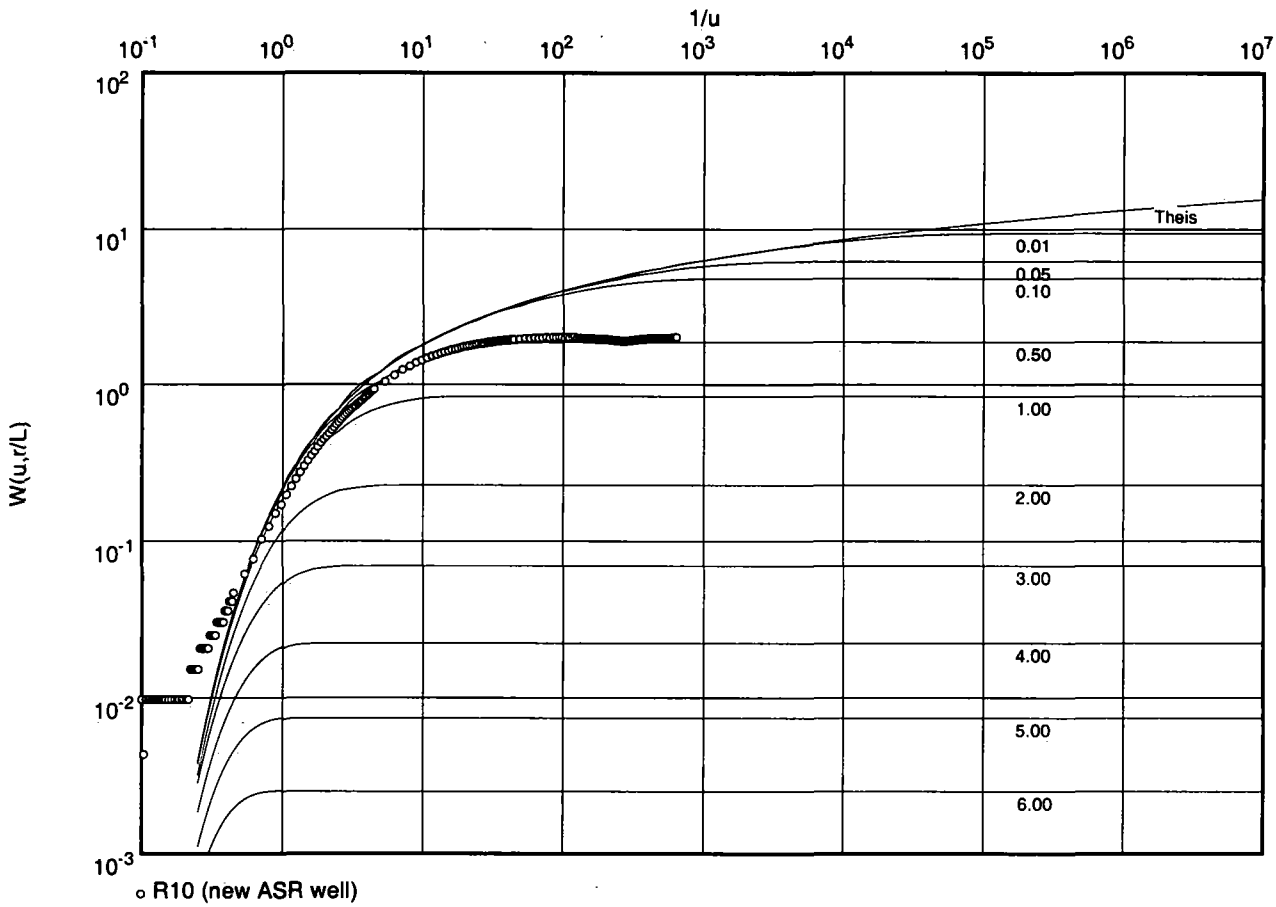
Transmissivity [ft²/min]: 3.17×10^{0}

Storativity: 2.59×10^{-4}

Transmissivity [gpd/ft]: 34,144

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 12, 1998 Page 1 Project: City of Cocoa, Florida Evaluated by: M. Weatherby

Pumping Test No. Test 1	Test conducted on: April 14, 1998
New ASR Well - R9	
Discharge 1060.00 U.S.gal/min	

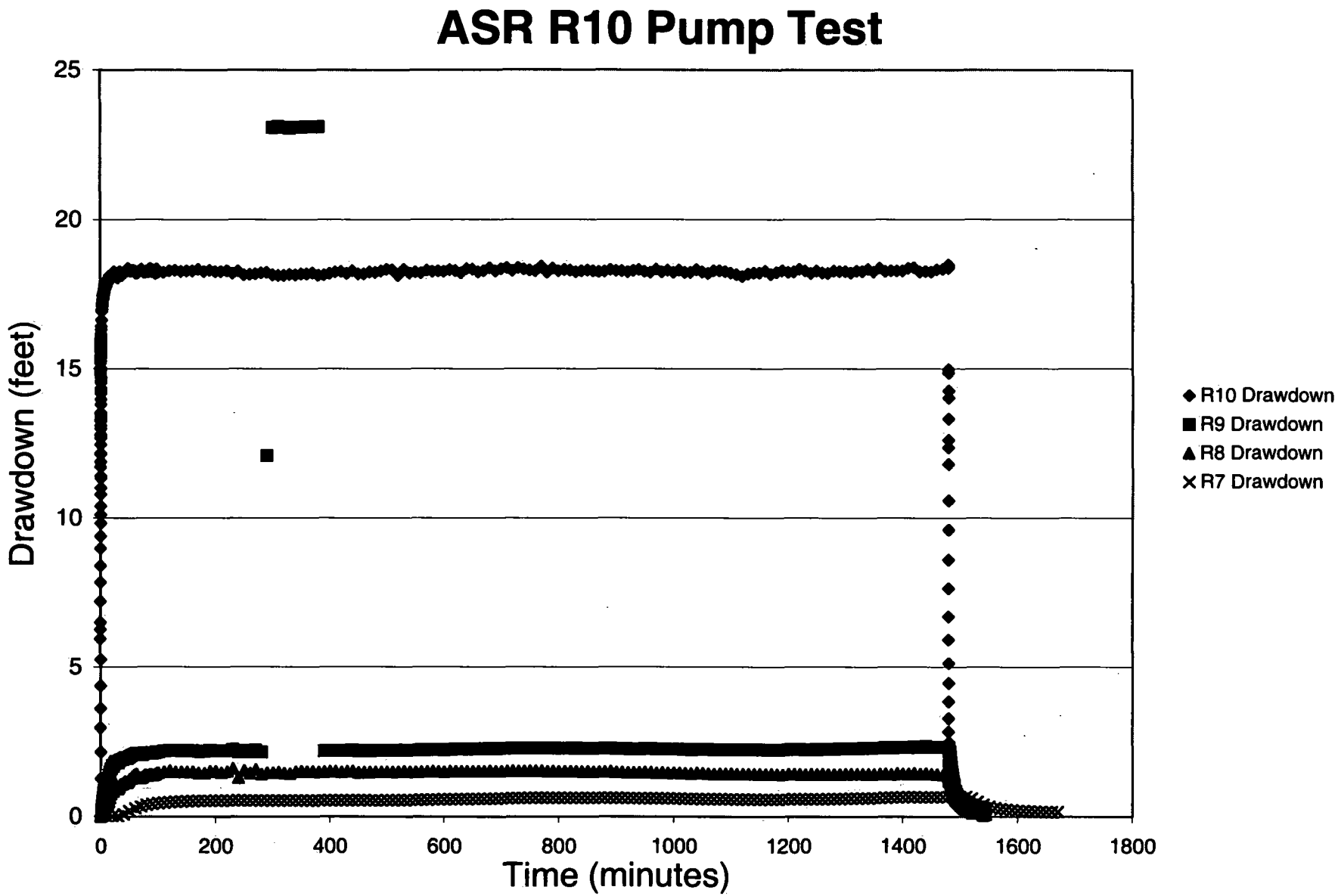


o R10 (new ASR well)

Transmissivity [ft²/min]: 1.21×10^{1}

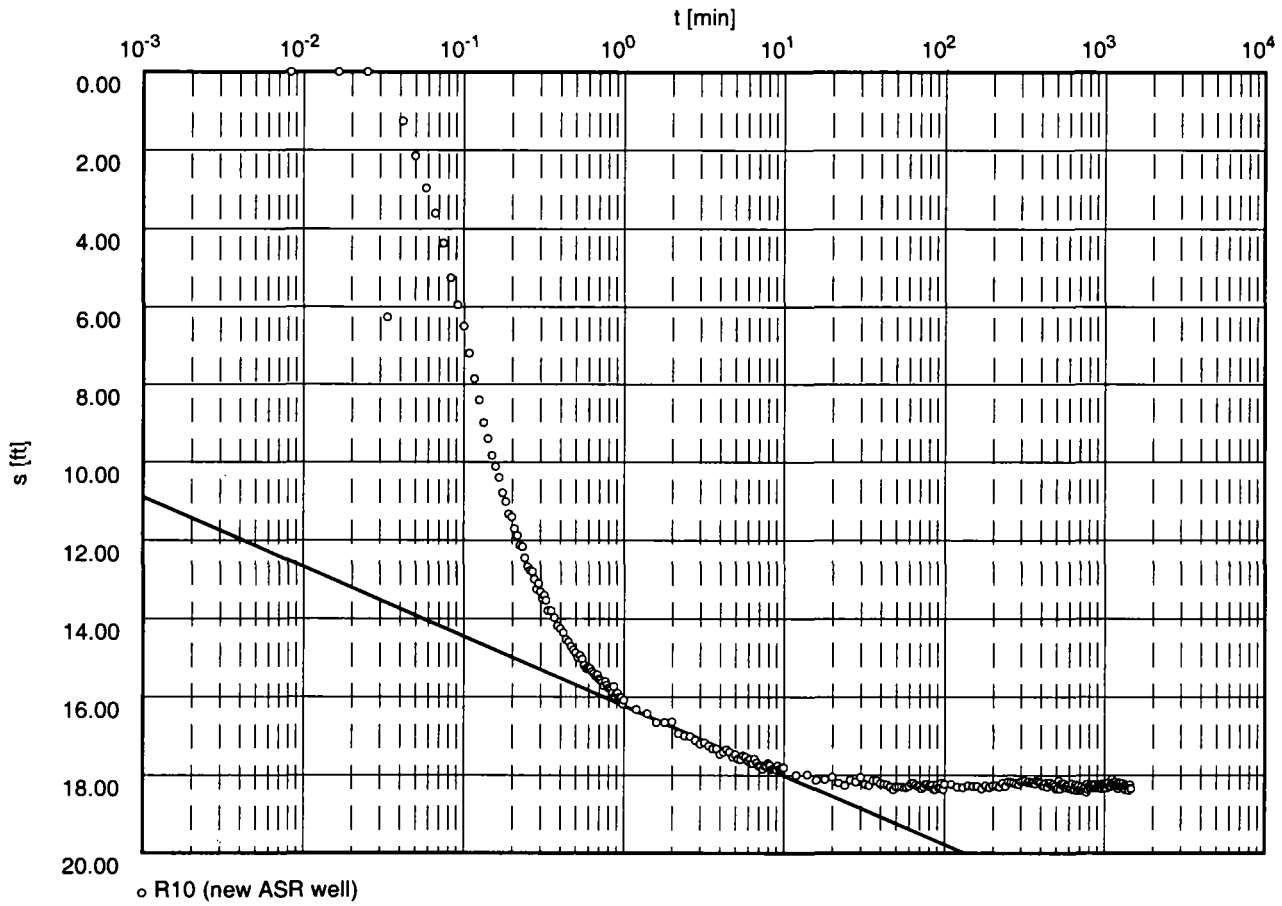
Storativity: 3.53×10^{-4}

Transmissivity [gpd/ft]: 130,331


ASR R10 Pump Test
Drawdown (feet)
25
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
Time (minutes)
R10 Drawdown
R9 Drawdown
R8 Drawdown
R7 Drawdown

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: May 13, 1998	Page 1
		Project: City of Cocoa, Florida	
		Evaluated by: M. Weatherby	

Pumping Test No. Test 1	Test conducted on: April 20, 1998
New ASR Well - R10	
Discharge 1220.00 U.S.gal/min	



o R10 (new ASR well)

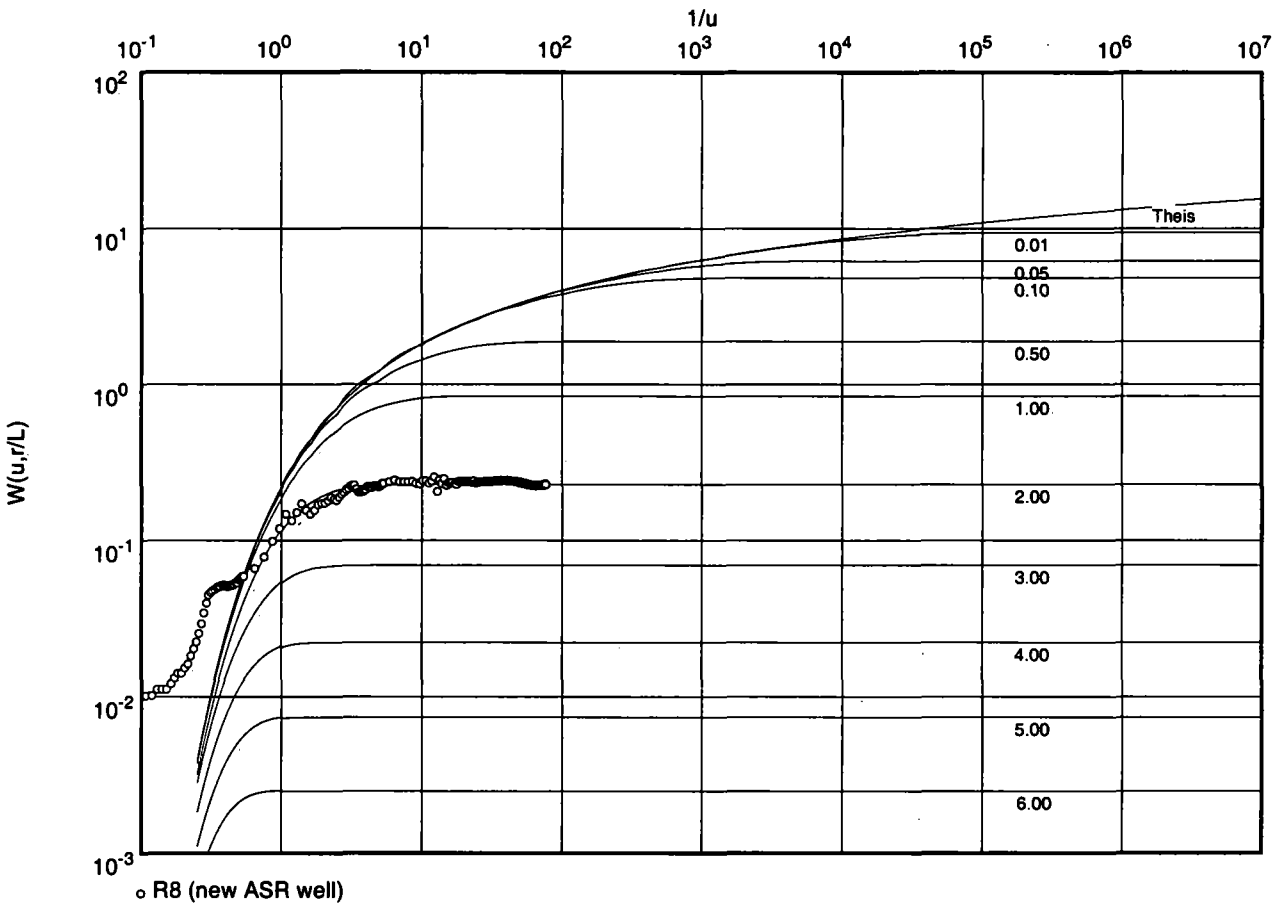
Transmissivity [ft²/min]: 1.68×10^{1}

Storativity: 7.17×10^{-8}

Transmissivity [gpd/ft]: 180,956

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 13, 1998 Page 1 Project: City of Cocoa, Florida Evaluated by: M. Weatherby

Pumping Test No. Test 1	Test conducted on: April 20, 1998
New ASR Well - R10	
Discharge 1220.00 U.S.gal/min	



o R8 (new ASR well)

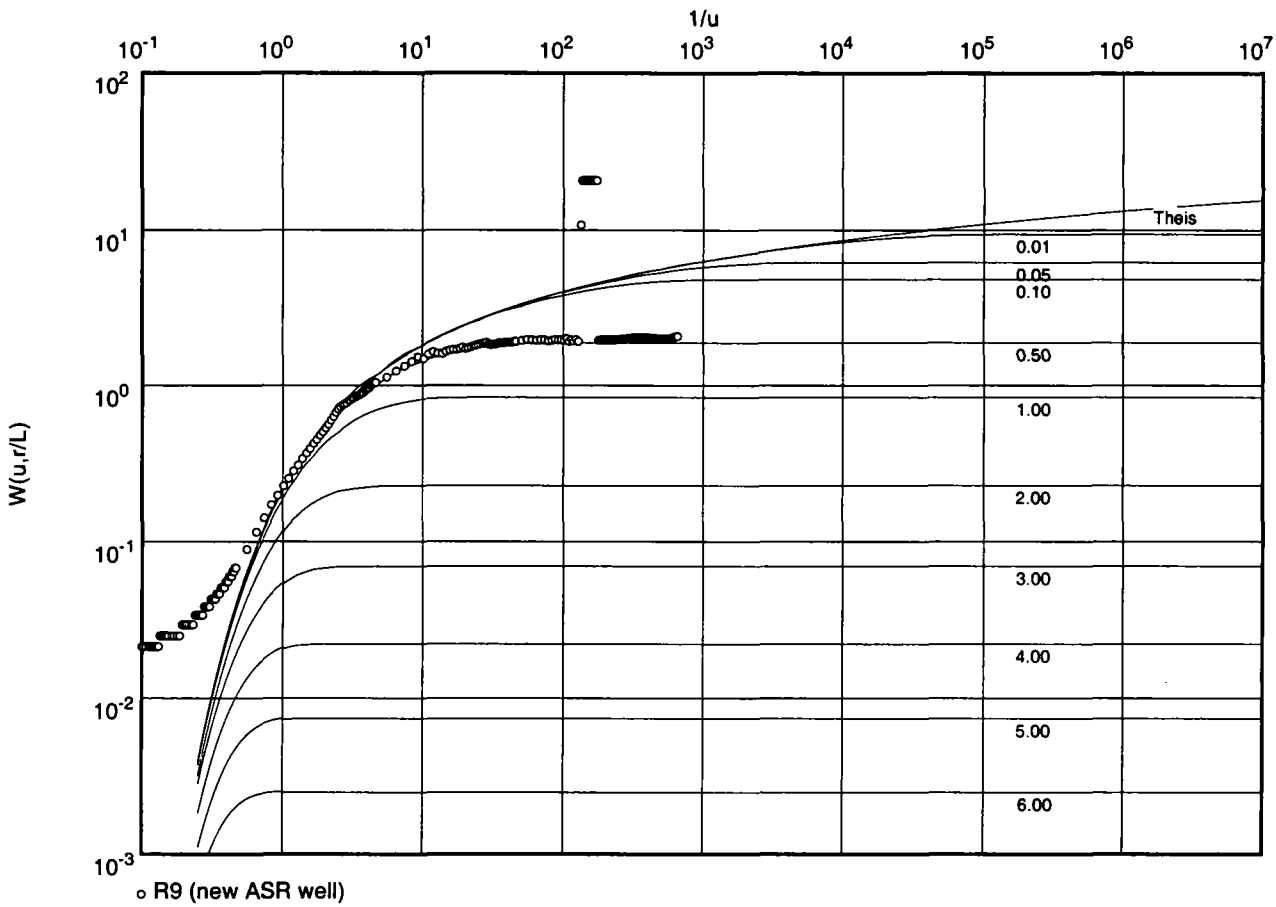
Transmissivity [ft²/min]: 2.05×10^{0}

Storativity: 1.23×10^{-4}

Transmissivity [gpd/ft]: 22,081

CH2M HILL 3011 S.W. Williston Road Gainesville, Florida ph.(352) 335-7991	Pumping test analysis HANTUSH's method Leaky aquifer, no aquitard storage	Date: May 13, 1998 Page 1 Project: City of Cocoa, Florida Evaluated by: M. Weatherby

Pumping Test No. Test 1	Test conducted on: April 20, 1998
New ASR Well - R10	
Discharge 1220.00 U.S.gal/min	



Transmissivity [ft²/min]: 1.15×10^{1}

Storativity: 3.23×10^{-4}

Transmissivity [gpd/ft]: 123,869

The logs that came with this document are to be filed in OCULUS as follows:

Catalog **Underground Injection Control**
Profile **Permitting_Authorization**
County **BREVARD**
District **CD**
Facility-Site ID **16670 - CITY OF COCOA, CLAUDE H. DYAL (ASR)**
Document Date **03-16-1999**
Received Date **03-17-1999**
Document Type **ENGINEERING REPORTS**
Contractor ID
PSD Number
Permit Type **CONSTRUCTION**
Facility Type **CLASS V - ASR**
Application Number
Permit Number

Document Subject ***Log Type LOG ID Log Date*** **Eng RPT ASR Wells 1999**