DOWN
Construction Report
Fellsmere Weather Station
Well No. IR-0863
Fellsmere
Indian River County
Florida

SJRWMD PROGRAM NO. 31-51000

Division of Ground Water Programs
Department of Resource Management
St. Johns River Water Management District
Palatka, Florida
September 30, 1996

TABLE OF CONTENTS

I INTRODUCTION 1

A. Purpose 1

B. Scope of Work 1

C. Site Location/Site Description 1

D. Field Services 1

II GEOLOGY 1

A. General 1

B. Site Stratigraphy 3

C. Groundwater Levels 3

D. Ground Water Quality 3

1. Field Analysis 3

2. Laboratory Analysis 3

III SUPPLY WELL CONSTRUCTION 4

APPENDICES

Appendix

A. Project Managers Scope of Work
B. Lithologic Data
C. Completion Reports

FIGURES

FIGURE 1: SITE MAP 2
FIGURE 2: MONITORING WELL IR-0863 5

TABLES

TABLE 1: FIELD GROUND WATER QUALITY DATA 4
TABLE 2: GROUT TABLE 6
TABLE 3: WELL DEVELOPMENT DATA 7

I INTRODUCTION

A. Purpose

The primary objective of the District Observation Well Network (DOWN) Construction program is the safe installation of monitoring wells that meet or exceed design criteria. A conscientious effort shall be made to document all methods, materials and equipment used; and all data shall be collected and recorded in accordance with accepted Quality Assurance and Quality Control (QA/QC) protocols.

B. Scope of Work

The scope of work as provided by the project manager (Appendix A), establishes project objectives and goals and presents recommendations to accomplish tasks. The objectives entailed in this project included a test hole to determine the depth to the top of the Hawthorn Group and the construction of one surficial supply well for the Fellsmere Weather Station.

C. Site Location/Site Description

The site is located at the Fellsmere Weather Station, Fellsmere, Indian River County, Florida south of S.R. 60. The site is in Section 24 of Township 33 South, and Range 36 East as located on the Fellsmere 4 SW, Florida (1953, photorevised 1973) 7.5 minute quadrangle U.S.G.S. topographic map.

The site consists of a 25 foot by 25 foot crushed lime rock pad located down and adjacent to a levee. The site and the lime rock pad are all located within the St. Johns Marsh. Well IR-0863 is located on the south side of the pad approximately three feet from the edge of the pad (
Figure 1). The site is approximately 31 feet above mean sea level (msl) and is surrounded by water on three sides.

D. Field Services

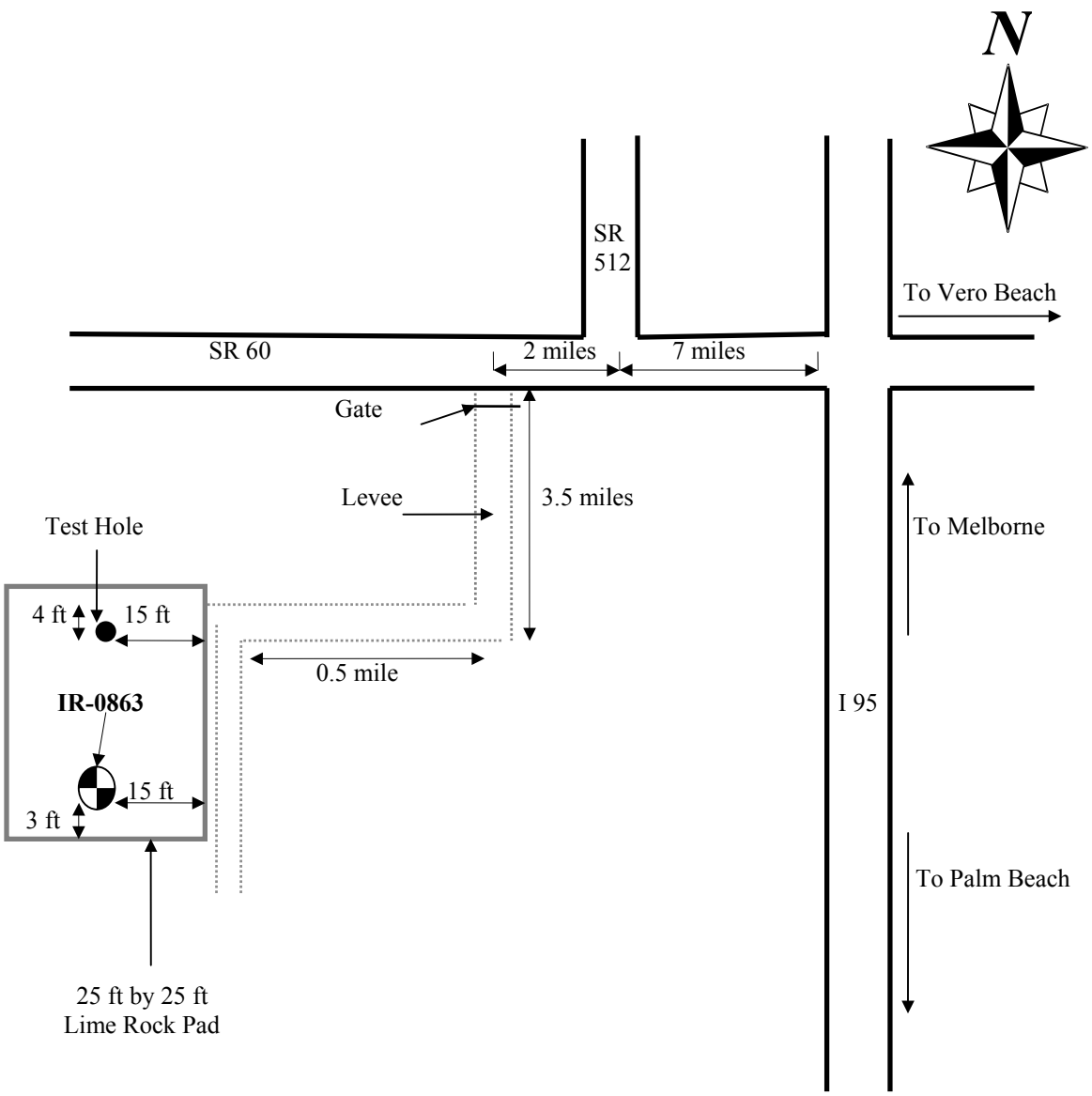
Professional Service Industries (PSI) of Tampa, Florida is the contractor for shallow wells. Field services in support of shallow monitor well construction were provided by St. Johns River Water Management District personnel as listed below.

Project Manager: Mack Woodham
Senior Hydrologist: Nolan Col
Field Support/Coordination: Mark Ward
Field Hydrologist and Report Preparation: Robert Brooks

II GEOLOGY

A. General

Indian River county is a coastal county in the central portion of the Florida peninsula. The topography in the county is a result of marine deposition and sea level fluctuations. The geology (Schiner, Laughlin, and Toth, Geohydrology of Indian River County, Florida, U. S. G. S. WRI 88-4073, 1988, p.14) consists of Eocene age carbonates overlain by Miocene and Plio-Pleistocene to Recent



Project:	Fellsmere Weather Station Fellsmere, Indian River County, Florida	**SJRWMD**
Project No:	31-51000	
Well Completion:	October 20, 1995	**Figure 1. Site Map**
	Not To Scale	

unconsolidated sediments. The Upper Eocene carbonates consist of limestone and dolomite units (the Avon Park Formation and the overlying Ocala Group). Miocene age sediments (Hawthorn Group) which overlie the Ocala Group consist of interbedded sands, clays, silts, carbonates, and phosphatic material. Pliocene sediments (Tamiami Formation) consist of fragmented to cemented coquina and limestone. Pleistocene sediments (Fort Thompson and Anastasia Formations) overlying the Tamiami Formation consist of coquina with variable amounts of sand, silt and organic material. Recent age sediments consist of unconsolidated sands, sandy clays, clays and shells. This project dealt with the geologic units which comprise the surficial, and intermediate aquifer systems. The surficial aquifer is comprised of Recent age sediments which overlie the Hawthorn Group. The Miocene Age Hawthorn Group generally acts as an aquitard, but may also contain sedimentary units capable of producing water.

B. Site Stratigraphy

The lithology encountered during drilling consisted of Recent and Miocene age unconsolidated sediments. The unconsolidated sediments consisted of sands, shells, and clays from ten feet bls to 96 feet bls and silty sand with phosphate pebbles from 99 feet bls to 111 feet bls. Lithologic samples were collected every 5 feet bls starting at ten feet bls via a split spoon sampler. The geologic samples were placed into plastic whirl pack sample bags after field analysis and subsequently shipped to the Florida Geological Survey (FGS). The FGS will complete the sample evaluation and enter the data into an electronic data base (Geosys). Field descriptions of lithologic samples are included in Appendix A.

C. Ground Water Levels

Ground water levels were measured and recorded during well construction. The surficial groundwater depth was initially determined to be less than ten feet via split spoon sampling. An electronic water level indicator meter was used to measure the water levels after construction of the supply well and during well development. The estimated elevation of the site is approximately 31 feet above msl. The inner northside top of casing (T.O.C.) of well IR-0863 as measured in the field is assumed to be 33 feet above msl. The depth to groundwater as measured from the inner northside T.O.C. was 5.3 feet, i.e. 27.7 feet msl.

D. Ground Water Quality

1. Field Analysis

Ground water quality field analysis was performed after development of supply well IR-0863 and consisted of chlorides, conductivity, temperature, and pH (Table 1). Chlorides were analyzed with a HACH Titration Kit via the mercuric nitrate method, conductivity with a YSI Model 33 conductivity meter and pH with a Orion SA 250 pH meter.

2. Laboratory Analysis

Water quality samples were collected from supply well IR-0863 after drilling operations were complete. Ground water samples were collected for laboratory analysis at a depth of 31 feet bls and analyzed for chlorides, sulfate, alkalinity, total dissolved solids, calcium, magnesium, sodium, potassium, iron and strontium. Laboratory analytical results of ground water samples collected from supply well IR-0863 are not included in this report.

Table 1: Field Ground Water Quality Data

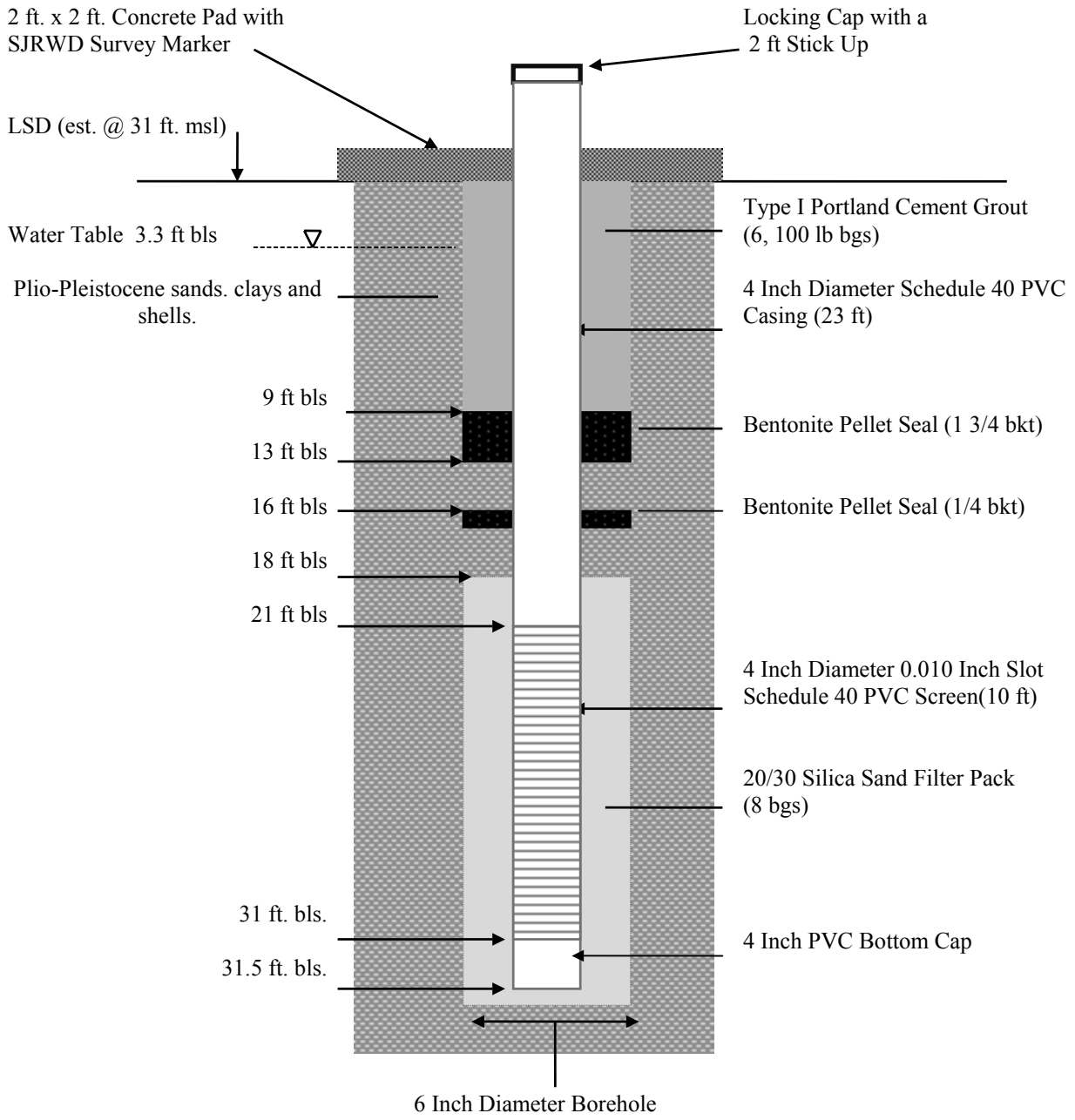
DATE	TIME	DEPTH (FEET, BTOC)	pH	SAMPLE TEMP Deg C	Chlorides mg/L	SPECIFIC CONDUCTANCE US/CM
10/20/95	12:02	33	7.2	24.5	285	1581

Deg C = Degree Celsius
mg/L = Milligrams/Liter
US/CM= MicroSiemens/Centimeter
BTOC = Below Top of Casing, approximate elevation 31' msl. Top of casing not surveyed until after project complete.

III Supply Well Construction

Construction on supply well IR-0863 was started on October 13, 1995 and completed on October 20, 1995. Initially, a test hole was drilled to the top of the Hawthorn Group (110 feet bls) using the mud rotary method and a 3 5/16 inch diameter drill bit. Split spoon samples were taken on five foot centers starting at 10 feet bls. Forty-five feet of removable steel casing was utilized to keep the borehole from collapsing. After determining the depth to the top of the Hawthorn Group (100 feet bls) and after the last split spoon sample (110 feet bls), the test hole was back plugged to the surface with 24 bags of Type I Portland Cement.

Using test hole lithologic data a four inch diameter supply well was constructed. The supply well is approximately 15 feet south of the test hole. Nominal 6 1/4 inch inner diameter hollow stem augers were advanced to 31.5 feet below land surface bls. The supply well was constructed using 10 feet of four inch diameter 0.01 inch machine slotted schedule 40 PVC well screen (with 6" bottom cap) connected flush to 23 feet of four inch diameter schedule 40 PVC riser casing (
Figure 2). The well annulus was filled from 31.5 feet to 20 feet bls using 7 bags of 20/30 silica sand as a filter pack (Table 2). The well annulus was flushed with water to unbridge the sand inside the augers. The return from the flushing yielded native material with an annulus tag of 17 feet bls. One-quarter bucket of bentonite pellets were poured down the annulus to form a protective seal. The bentonite pellets set up in the augers so the remaining 15 feet of augers were removed from the hole and 1 3/4 bucket of bentonite pellets were poured down the annulus resulting in a tag of nine feet bls. Ten feet of augers were then placed back down the hole and the annulus was grouted to the surface with six 100 pound bags of Type I Portland Cement. The well was completed with a two foot stick up, a locking cap with a district lock, and a 2 foot by 2 foot concrete pad with a district survey marker implanted.



Project:	Fellsmere Weather Station Fellsmere, Indian River County, Florida	**SJRWMD**
Project No:	31-51000	
Well Completion:	October 20, 1995 **Not To Scale**	**Figure 2. IR-0863**

Table 2: Grout Table

DATE	TAG DEPTH (Ft, bls)	ANNULUS/ BORE	GROUT/ MATERIAL	VOLUME (YARDS/BAGS)	COMMENTS
10/19/95	31.5	6" -A	20/30 Silica Sand	7 bags	Filter pack from 31.5' bls to 20' bls
10/19/95	20	6" -A	Native Material	Unknown	Native material between filter pack and bentonite seal
10/19/95	17	6" -A	Bentonite	1/4 bucket	Pellets set up in casing
10/19/95	~16	6" -A	Native Material	Unknown	Native material between bentonite seals
10/19/95	~13	6" -A	Bentonite	1 3/4 bucket	Protective seal
10/20/95	9	6" -A	Type I Portland	6, 100 lb bags	Set Casing
10/20/95	LSD	NA	NA	NA	Casing grouted to surface

Ft = Feet
' = Feet
" = Inches
A = Annulus
bls = Below Land Surface
LSD = land surface datum

Following construction the well was surged blocked and then developed using the mud pump on the drill rig. The well was developed at a rate of 15 gallons per minute for one hour discharging a total estimated volume of 960 gallons (Table 3). Ground water levels and discharge flow rates were taken periodically during pumping.

Table 3: Well Development Data

Station Time (HH:MM)	Pumping Rate (GAL/MIN)	Depth to Water (FEET, BTOC)	Ground Water Elevation (FEET, MSL) Approximate
11:02	0	5.3	25.7
11:07	15	6.2	24.8
11:20	15	6.2	24.8
11:30	15	6.3	24.7
11:40	15	6.3	24.7
11:55	15	6.3	24.7
12:05	15	6.3	24.7
12:10	0	5.3	25.7

min = minute
gal = gallon
msl = mean sea level
BTOC = Below Top of Casing, top of casing not surveyed until after this project was completed.

APPENDIX A

PROJECT MANAGERS SCOPE OF WORK

APPENDIX B
Lithologic

WELL NUMBER: IR-0863
TOTAL DEPTH: 31.5 FEET
SAMPLES COLLECTED FROM:
10 - 110 ft. bls Via Split Spoon

COUNTY: Indian River
LOCATION: T: 33S, R: 36E, S: 24
Lat: 27^0 35' 17"
Long: 80^0 41' 13"

COMPLETION DATE: 10/20/95

ELEVATION: 31' MSL

OWNER/DRILLER: SJRWMD/PSI
Samples Worked in Field By: Robert Brooks

Depth (ft, bls)	Lithologic Description
9-11	Organic material
14-16	Sandy clay, light gray
19-21	Same as above (SAA)
24-26	Sand and reworked shell, medium to coarse, light gray
29-31	Sand and shell, coarse, light to dark gray
34-36	Clay with reworked shell, olive gray
39-41	Clay and shell, minor coarse sand, light olive gray
44-46	Clay and shell, minor coarse sand, olive gray
49-51	SAA
54-56	Sand and shell, medium to coarse, minor silty clay, light olive gray
59-61	Clay minor sand, light olive green
64-66	Clay minor sand and shell, light olive green
69-71	Clay minor shell, stiff, light olive green
74-76	SAA
79-81	Sand, silty to clayey, phosphatic, light olive gray
84-86	Sand, silty to very fine, phosphatic, light gray
89-91	SAA
94-96	Sand, silty to very fine, phosphatic, minor shells light gray
99-101	Sand, silty to very fine, phosphatic, phosphate pebbles, minor shell, sharks teeth, olive green
104-105	Sand, silty to very fine, phosphatic, minor shell, sharks teeth, olive green
109-111	Sand, silty to very fine, phosphatic, minor shell and precipitated $CaC0_3$ streaks, sharks teeth, olive green

APPENDIX C
Completion Report