Surveyor's Report

Chapman, KRDR-02, and PC-62 Monitoring Wells

NMI Project No. 1078.017

Report Date: January 8th, 2007

Submittal: Final

Prepared for:

South Florida Water Management District

NICK MILLER, INC.

2560 RCA Boulevard, Suite 105 ● Palm Beach Gardens, Florida 33410
ph: 561.627.5200 ● fax: 561.627.0983 ● email: info@nickmillerinc.com
www.nickmillerinc.com

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OVERVIEW OF THE PROJECT

PURPOSE

The purpose of the Chapman, KRDR-02, and PC-62 Monitoring Well Project is to establish vertical control marks near each monitoring well. The project tests the application of Federal Geodetic Control Subcommittee (FGCS) Second-Order, Class II leveling procedures with Third-Order equipment. The goal of this hybrid pairing of procedures and equipment is to produce leveling measurements that will be acceptable to the National Geodetic Survey (NGS) and used in future vertical adjustments throughout the District.

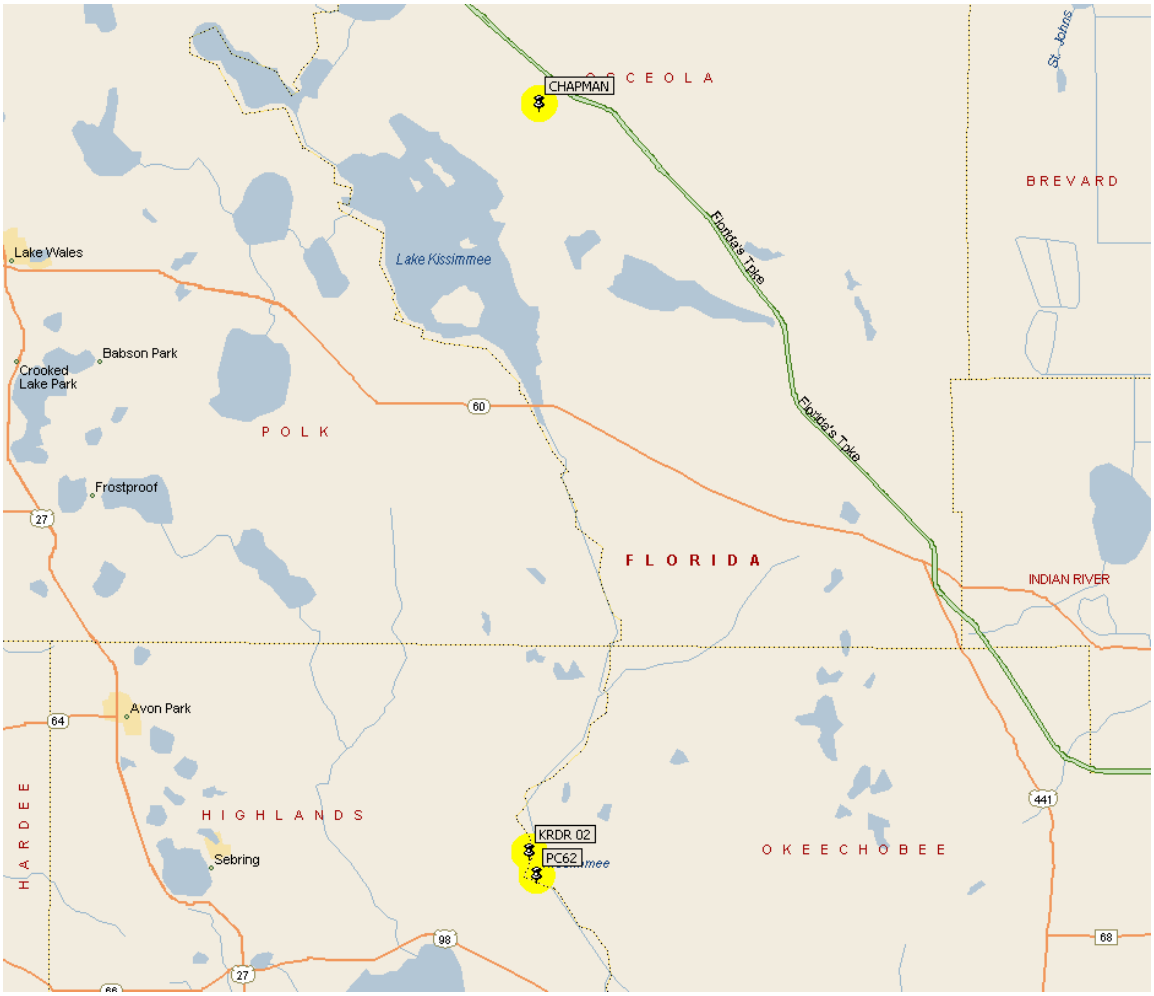
This project utilizes uncalibrated "off-the-shelf" fiberglass level rods. Such rods are not currently approved by NGS for precise leveling (Second-Order Class II and above) for three primary reasons:

1. The fiberglass material used to construct the rods is less dimensionally stable than rods constructed of Invar metal.
2. The fiberglass rods are not individually calibrated by the manufacturer to identify scale errors across the length of the rod.
3. The fiberglass rods are a three-section snap-together style that will, over time, wear at the connection points creating error in measurements on the top two sections.

While these limitations make the rods unsuitable for the extreme precision required in First-Order and Second-Order, Class I leveling, it is the hypothesis of this project that such rods can deliver Second-Order, Class II precisions. Fiberglass rods are commonly used by surveyors today. In contrast, Invar level rods are expensive and specialized equipment only used by surveyors working on the highest precision vertical control surveys. By demonstrating that fiberglass level rods such as those used in this project are suitable for Second-Order, Class II leveling the District will benefit from the increased number of consultants using these rods. As a result, more level lines run within the District should meet NGS's requirements for inclusion in future vertical adjustments, further refining the elevation models used for water control.

LOCATION OF PROJECT

This project is located in Highlands and Osceola Counties. Following is a vicinity map.



ITEMS DELIVERED TO THE CLIENT

The following items are delivered to the client with this report. Neither the report nor the items listed below are complete without the other.

1. Paper and electronic copy of field notes
2. Paper and electronic copy of all computation sheets
3. CORPSMET file for each site
4. Paper and electronic copy of site photographs
5. Paper copy of South Florida Water Management District Benchmark Description
6. Paper and electronic copy of NGS Blue Book submittal

VERTICAL DATUM FOR THE PROJECT

The vertical datum for the project is the North American Vertical Datum of 1988. For correlation with older data sets, the elevations of the benchmarks are also shown in the National Geodetic Vertical Datum (NGVD) of 1929. The NGVD 29 elevations were derived using data provided by the South Florida Water Management District in a file named

"NGVD29.ABS" when applicable, otherwise NGS superseded values were used. The linear unit for all elevations is the meter unless otherwise stated.

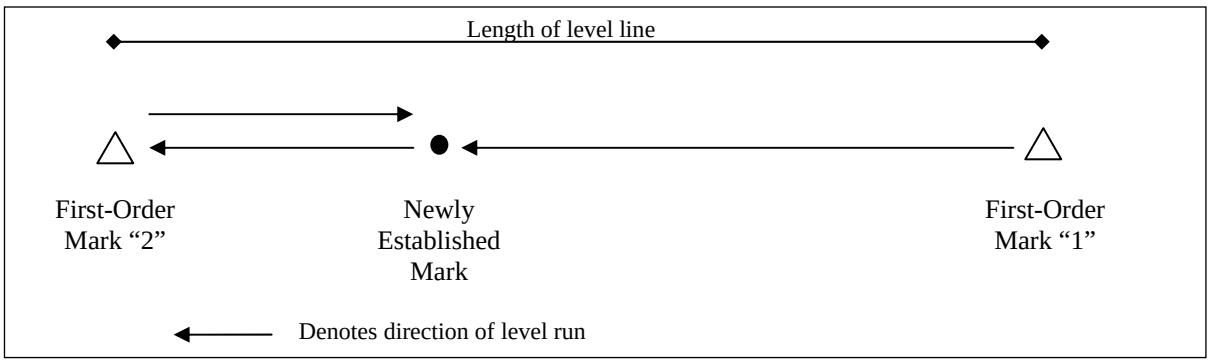
LEVELING METHODS

CONFIGURATION OF LEVEL RUNS

The leveling for the project was performed in accordance with the Federal Geodetic Control Subcommittee standard for Second-Order, Class II geodetic leveling. A brief description of the procedures used follows.

For each level line, two existing First or Second Order vertical marks were used. The run was started at one of the First or Second Order marks and continued through the newly established mark near the structure and closed on the second First or Second Order vertical mark. The run was then looped back from the second First or Second Order mark to the newly established mark (see Figure 1 below).

Figure 1 Typical Level Run Pattern



The FGCS maximum allowable misclosure for this type of run is eight millimeters multiplied by the length of the line in kilometers.

EQUIPMENT USED

All leveling during the project was performed with a Leica DNA03 digital level and Leica three-section, fiberglass bar-code level rods. Information and technical specification for the Leica DNA03 digital level are available at http://www.leica-geosystems.com.

RESULTS

Chapman had a total distance of 2.57 km having a maximum misclosure of 12 mm. The total distance between the two known benchmarks was 1.28 km having a maximum misclosure of 9 mm and our closure was 5 mm.

GPS METHODS

INTRODUCTION

Due to the remote locations along the Kissimmee River, it was decided to derive elevations using GPS observations.

The GPS observations for the project were performed in accordance with the Guidelines for Establishing GPS-Derived Ellipsoidal Heights (National Geodetic Survey Technical Memorandum NOS NGS-58).

GPS observations were conducted over one day:

- Tuesday, December 19th, 2006

The following instrumentation was used for the GPS observations:

(1) Trimble 4700 receiver/antennas
(1) Trimble 5800 receiver/antenna
(2) Trimble R8 receiver/antennas

DATA PROCESSING

Data Acquisition

Data was downloaded from receivers to a desktop computer through the Trimble Geomatics Office software, version 1.63 (TGO).

Data Quality

The quality of the data was checked using the Timeline feature in the TGO software. Areas of the data that showed cycle slips were disabled. Due to minor problems with baseline processing, the Signal-to-Noise Ratio (SNR) was investigated for each satellite during each observation. Areas of data that had high SNR were removed before processing the baselines.

Baseline Processing

Baselines were processed using TGO. For each session, (n-1) baselines were selected that produced fixed integer solutions with the lowest possible RMS values.

Adjustment

The ADJUST software package from NGS was used for the network adjustment. The B-file, G-file and Serfil were exported from TGO. Initial positions and ellipsoidal heights of new marks were supplied in the creation of the B-file. Both the B-file and G-file were checked using the file-checking utilities that are a part of the ADJUST software package. The B-file was edited to conform to the structure and data content necessary to remove any errors found in the file-checking utilities. This included using NAVD88 as the vertical datum and GEOID03 for the geoid.

After all files were checked and found to be satisfactory, a minimally-constrained adjustment was performed with no weighting applied. The ellipsoid and orthometric heights of the non-fixed control points were then checked against their published values. When these heights did not correlate well with the published values, they were removed from the adjustment.

Using the standard deviation of unit weight from the first minimally-constrained adjustment, standard errors were scaled using the MODGEE program. A second minimally-constrained adjustment was performed with satisfactory results.

For the constrained horizontal adjustment, the published horizontal position and orthometric height for the control stations were fixed. The modified G-file, using the scaled standard errors, was used for this adjustment. The network adjustment was performed and no major shifts in position were found.

A minimally-constrained vertical adjustment was performed, with the horizontal position and orthometric height of a single control station being fixed. Again, the scaled G-file was used for this vertical adjustment. The orthometric heights of the non-fixed control points were checked against their published values.

A fully-constrained vertical adjustment was then performed with the published horizontal position and orthometric height of all accepted control stations being fixed.

Lastly, a final minimally-constrained adjustment with accuracies was performed, with little change in the statistics.

PROJECT RESULTS

The following tables list the elevations established for each new mark, the level run misclosure, "to-reach" description for each mark and a photo of the mark. All elevations are in US Survey Feet.

CHAPMAN	Elevation:	**67.29 ft**	(NAVD 88)	68.50 ft	(NGVD 29)
Bench Mark 1:	OSC 1 FLDNR	75.41 ft	(NAVD 88)	76.62 ft	(NGVD 29)
Bench Mark 2:	OS 61 SFLWMD	74.51 ft	(NAVD 88)	75.72 ft	(NGVD 29)
Ground Elevation:		67.92 ft	(NAVD 88)	69.13 ft	(NGVD 29)
Monitoring Well # 1:		69.93 ft	(NAVD 88)	71.14 ft	(NGVD 29)
Monitoring Well # 2:		69.92 ft	(NAVD 88)	71.13 ft	(NGVD 29)
Monitoring Well # 3:		69.91 ft	(NAVD 88)	71.12 ft	(NGVD 29)
Monitoring Well # 4:		69.93 ft	(NAVD 88)	71.14 ft	(NGVD 29)

To Reach CHAPMAN:

FROM THE INTERSECTION OF SR 60 AND US HIGHWAY 441. HEAD NORTH ON US 441 FOR 14.3 MILES TO CR-523 (CANOE CREEK ROAD). GO WEST ON CR-523 AND HEAD WESTERLY AND NORTHERLY FOR 16.3 MILES TO DIRT ROAD. MAKE LEFT AND HEAD WESTERLY AND SOUTHERLY ON DIRT ROAD FOR 0.55 MILE TO MARK ON RIGHT. MARK IS LOCATED 218.0 FEET WEST OF THE CENTER OF A METAL GATE, 24.3 FEET NORTH OF THE CENTERLINE OF DIRT ROAD, 6.1 FEET SOUTH OF FOUR MONITORING WELL PIPES. MAGNET SET 1 FOOT NORTH OF MONUMENT.

KRDR-02		Elevation:	**43.94 ft**	(NAVD 88)	45.08 ft	(NGVD 29)
Bench Mark 1:	W 462		61.71 ft	(NAVD 88)		(NGVD 29)
Bench Mark 2:	E 555		48.19 ft	(NAVD 88)		(NGVD 29)
Bench Mark 3:	KRR PC 25		49.04 ft	(NAVD 88)		(NGVD 29)
Bench Mark 4:	H 555		44.02 ft	(NAVD 88)		(NGVD 29)
Monitoring Well:	KRDR 02		47.64 ft	(NAVD 88)	48.78 ft	(NGVD 29)
Monitoring Well:	KRDR		43.81 ft	(NAVD 88)	44.95 ft	(NGVD 29)

To Reach KRDR-02:

FROM INTERSECTION OF US HIGHWAY 98 AND BLUFF HAMMOCK ROAD. HEAD NORTH ON BLUFF HAMMOCK ROAD FOR 4.9 MILES TO GRASS ROAD WITH A LOCKED SFWMD WOODEN GATE. HEAD EAST THROUGH LOCKED SFWMD GATE ON GRASS ROAD FOR 0.3 MILE TO A DIRT DOCKING AREA (ACCESS ROUTE TO KISSISSMEE RIVER). WITH AN AIRBOAT HEAD EAST THROUGH CREEK WATERWAY FOR 0.3 MILE TO KISSISSIMEE RIVER. HEAD SOUTH ON KISSISSIMEE RIVER FOR 1.1 MILES TO MARK ON RIGHT. MARK IS LOCATED 6.5 FEET SOUTH OF SOLAR PANEL/RADIO ANTENNA'S METAL POST, 3.5 FEET SOUTH OF MONITORING WELL'S 1 FOOT DIAMETER CORRIGATED PIPE, 1.0 FOOT WEST OF SOUTHEAST CORNER OF WOODEN PLATFORM. MAGNET SET INSIDE PVC CASING.

PC-62		Elevation:	**44.65 ft**	(NAVD 88)	45.79 ft	(NGVD 29)
Bench Mark 1:	W 462		61.71 ft	(NAVD 88)		(NGVD 29)
Bench Mark 2:	E 555		48.19 ft	(NAVD 88)		(NGVD 29)
Bench Mark 3:	KRR PC 25		49.04 ft	(NAVD 88)		(NGVD 29)
Bench Mark 4:	H 555		44.02 ft	(NAVD 88)		(NGVD 29)
Monitoring Well:			48.22 ft	(NAVD 88)	49.37 ft	(NGVD 29)

To Reach PC-62:

FROM INTERSECTION OF US HIGHWAY 98 AND BLUFF HAMMOCK ROAD. HEAD NORTH ON BLUFF HAMMOCK ROAD FOR 4.9 MILES TO GRASS ROAD WITH A LOCKED SFWMD WOODEN GATE. HEAD EAST THROUGH LOCKED SFWMD GATE ON GRASS ROAD FOR 0.3 MILE TO A DIRT DOCKING AREA (ACCESS ROUTE TO KISSISSMEE RIVER). WITH AN AIRBOAT HEAD EAST THROUGH CREEK WATERWAY FOR 0.3 MILE TO KISSISSIMEE RIVER. HEAD NORTH ON KISSISSIMEE RIVER FOR 0.25 MILE TO MARK ON RIGHT. MARK IS LOCATED 2.4 FEET EAST OF SOLAR PANEL'S METAL POST, 5.10 FEET SOUTHEAST OF MONITORING WELL'S 1 FOOT DIAMETER CORRIGATED PIPE, 6.6 FEET SOUTHWEST OF RADIO ANTENNA'S METAL POST. MAGNET SET INSIDE PVC CASING.

The combination of Second-Order, Class II methods and Third-Order fiberglass level rods produced errors of closure within the FGCS standard for Second-Order, Class II geodetic leveling. The data gathered during this project has been submitted to Mr. Ronnie Taylor, NGS Advisor for the State of Florida for further analysis and recommendations.

SURVEYOR'S CERTIFICATION

In my professional opinion, this report of survey meets applicable portions of the Minimum Technical Standards set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 61-G17, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

NICK MILLER, INC.
DBPR Authorization No. 4318

January 8th, 2007
Date of Survey

By: _____
Stephen M. Gordon, PSM
Professional Surveyor and Mapper
State of Florida
Certificate No. 5974

1078.017 LEVEL RUN SFWMD

0561 SFLWMD → 0SC1 FLDNR

G. RAGER III MON. DEC. 11TH 2006
A. APONTE
M. KHAN

SFWMD-18, 21

	+	H.I.	−	ELEV.
	1.6238			22.710m.
1	[69.34]		1.2915	
			[69.53]	
	1.4665			
2	[69.27]		1.3821	
			[69.55]	
	1.3788			
3	[68.88]		1.2678	
			[69.06]	
	1.3271			
4	[68.20]		1.3302	
			[68.33]	
	1.3364			
5	[68.53]		1.3206	
			[68.09]	
	1.3368			
6	[68.48]		1.3089	
			[68.35]	
	1.4152			
7	[69.39]		1.4412	
			[69.20]	

DESC.

CHECK & ADJUST: -3.3

B.M. 0561 SFLWMD
SET 60 D NAIL ON NW SIDE OF CR-523

1078.017 LEVEL RUN SFWMD

OS61 SFLWMD → OSC1 FLDNR (CONT.)

	+	H.I.	−	ELEV.
	1.3469			
8	[68.57]		1.3399	
			[68.11]	
	1.2736			
9	[59.06]		1.5221	
			[58.28]	
	1.5177			
10	[31.42]		1.5403	
			[31.27]	

G. RAGER III MON DEC. 11TH 2006
A. APONTE
N. KHAN

SFWMD-18, 22

DESC.
SET 60D NAIL ON NE SIDE OF CR-523

B.M. OSC1 FLDNR

TOTAL DIST: 1.28093
✓ 4.2mm

1078.017 MONITORING WELL SFWMD
CHAPMAN

G.RAGER III
A.APONTE
N.KHAN

MON. DEC. 11TH 2006

- SET POURED IN PLACE CONCRETE MONUMENT WITH ALUMINUM DISK STAMPED: CHAPMAN 2006

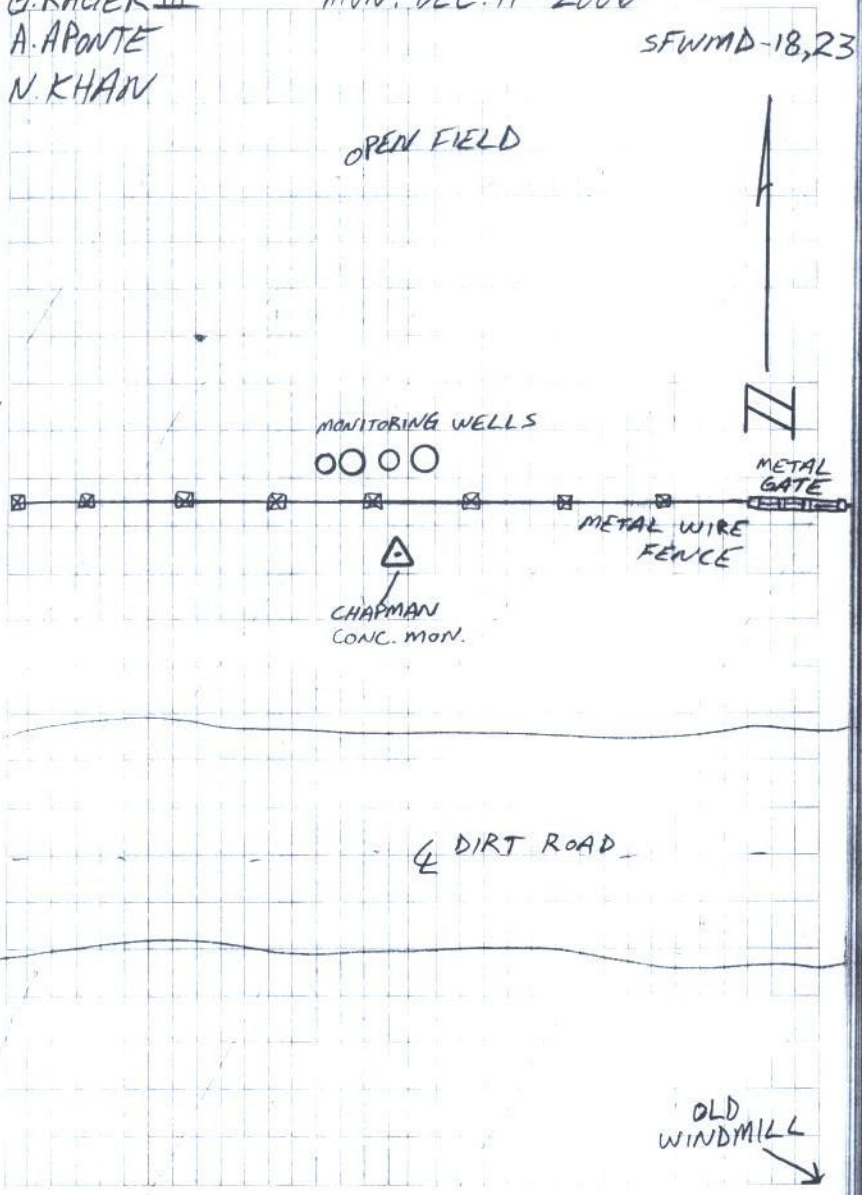
- COORDINATES ON MONITORING WELL
  LAT: 28° 00' 05" N
  LONG: 081° 11' 38" W

- COORDINATES ON MONUMENT
  LAT: 28° 00' 05" N
  LONG: 081° 11' 38" W

- TIES ON MONUMENT:
  218.0' WEST OF THE CENTER OF A METAL GATE
  24.3' NORTH OF THE CENTERLINE DIRT RD
  6.1' SOUTH OF MONITORING WELLS.

- A MAGNET WAS SET 1.0' NORTH OF MONUMENT

- PICTURES TAKEN OF MONUMENT AND MONITORING WELLS:
  #'S 101-0221 - 101-0233
  SONY CYBER-SHOT



1078.017 LEVEL RUN SFWMD

OSC1 → CHAPMAN

G. RAGER III TUES. DEC. 12TH 2006
A. APONTE SFWMD-18, 24
N KHAN

CHECK & ADJUST: -2.5

	+	H.I.	−	ELEV.
				22.984m
	1.8804			
1	[30.68]		1.7184	
			[29.46]	
	1.4317			
2	[67.60]		1.4606	
			[68.41]	
	1.3778			
3	[69.53]		1.2753	
			[69.39]	
	1.3803			
4	[69.49]		1.3648	
			[69.11]	
	1.3025			
5	[67.96]		1.3193	
			[68.30]	
	1.2804			
6	[68.10]		1.2414	
			[68.91]	
	1.4315			
7	[68.26]		1.3306	
			[68.86]	

DESC.

B.M. OSC 1 FLDNR
SET 60 D NAIL ON SW SIDE OF CR-523

1078.017 LEVEL RUN SFWMD

OSC 1 ⟶ CHAPMAN (CONT.)

	+	H.I	−	ELEV.
8	1.399Z [69.13]			
			1.3709 [68.9Z]	
9	1.2880 [68 35]			
			1.5715 [68.26]	
10	1.4247 [6899]			
			1.6532 [69.16]	
11	1.1571 [69.58]			
			1.6153 [69.12]	
12	1.4529 [69.09]			
			1.4295 [69.27]	
13	1.2022 [68 49]			
			1.5125 [68.3Z]	
14	1 3011 [68.99]			
			1.7308 [68.45]	

G. RAGER III TUES. DEC. 12TH 2006

A. APONTE SFWMD-18,25

N. KHAN

DESC.

SET 60D NAIL ON SW SIDE OF CR-523

" " "

" " "

" " "

" " "

" " "

" " "

" " "

" " "

" " "

" " "

" " "

" " "

" " "

SET IRON ROD ON NW SIDE DIRT RD.

1078.017 LEVEL RUN SFWMD

OSC1 → CHAPMAN (CONT.)

	+	HI.	−	ELEV.
	1.5949			
15	[69.22]		1.4855	
			[69.28]	
	1.0864			
16	[68.23]		1.7911	
			[68.62]	
	1.2523			
17	[69.46]		1.5134	
			[69.31]	
	1.4289			
18	[68.80]		1.5110	
			[68.74]	
	1.3970			
19	[~~69.98~~ 69.28]		1.5270	
			[68.68]	
	1.4749			
20	[16.47]		1.5965	20.5096
			[15.93]	

G. RAGER III TUES. DEC. 12TH 2006

A. APONTE

N. KHAN

SFWMD - 18,26

DESC.

SET IRON ROD ON NW SIDE OF DIRT RD.

" " "

" " "

" " "

SET 60D NAIL IN OPEN FIELD

" " "

" " "

" " "

" " "

" " "

B.M. CHAPMAN

TOTAL DIST: 2.57020 KM

1078.017 LEVEL LOOP SFWMD

CHAPMAN MONITORING WELLS

G. RAGER III TUES. DEC. 12TH 2006
A. APONTE SFWMD-18, 27
N. KHAN

+	H.I.	−	ELEV.	DESC.
5.385	21.385		16.000	B.M. CHAPMAN (ASSUMED 16.000)
		4.760	16.625	GROUND SHOT
		2.750	18.635	WELL #1
		2.755	18.630~~18.600~~	WELL #2
		2.770	18.615	WELL #3
		2.750	18.635	WELL #4
2.675	21.310		18.635	WELL #4
		2.690	18.620	WELL #3
		2.680	18.630	WELL #2
		2.680	18.630	WELL #1
		5.305	16.005	B.M. CHAPMAN

1078.017 LEVEL RUN SFWMD

CHAPMAN → OSC1

	+	H.I	−	ELEV
	1.5769			20.5096m
1	[68.41]		1.3712	
			[67.92]	
	1.5434			
2	[68.74]		1.4978	
			[69.29]	
	1.5632			
3	[68.15]		1.3275	
			[68.52]	
	1.7595			
4	[67.11]		1.0762	
			[67.66]	
	1.7469			
5	[68.63]		1.5595	
			[68.27]	
	1.3753			
6	[68.71]		1.2246	
			[68.27]	
	1.5974			
7	[68.37]		1.2439	
			[67.79]	

G.RAGER III TUES. DEC 12TH 2006

A.APONTE

N KHAN

SFWMD-18,28

DESC.

B.M. CHAPMAN

SET 60D NAIL IN OPEN FIELD

SET 60D NAIL NW SIDE OF DIRT RD.

SET 60D NAIL ON SW SIDE OF CR-523

1078.017 LEVEL RUN

SFWMD G.RAGER III TUES. DEC. 12TH 2006
A.APONTE
N.KHAN

SFWMD-18,29

CHAPMAN → OSC 1 (CONT.)

	+	HI	−	ELEV.	DESC.
					SET 60D NAIL ON SW SIDE OF CR-523
8	1.4407 [67.10]		1.4420 [68.09]		
9	1.6192 [69.18]		1.2688 [69.03]		
10	1.6296 [68.93]		1.2636 [68.97]		
11	1.5079 [69.25]		1.2674 [69.00]		
12	1.4824 [68.94]		1.5052 [68.98]		
13	1.5095 [67.72]		1.4575 [65.85]		
14	1.2844 [68.00]		1.5780 [69.12]		

1078.017 LEVEL RUN SFWMD G. RAGER III TUES. DEC. 12TH 2006
A. APONTE
N. KHAN
SFWMD-18,30

CHAPMAN → OSC1 (CONT.)

	+	H.I.	−	ELEV.	DESC.
					SET 60D NAIL ON SW SIDE OF CR-523
8 15	1.5204 [68.79]		1.3525 [68.20]		〃 〃 〃
9 16	1.3495 [67.38]		1.4247 [68.38]		〃 〃 〃
10 17	1.3804 [68.70]		1.3799 [67.70]		〃 〃 〃
11 18	1.3385 [69.04]		1.4050 [69.67]		〃 〃 〃
12 19	1.4759 [52.66]		1.5415 [52.79]		〃 〃 〃
13 20	1.5176 [18.59]		1.5596 [18.14]		B.M. OSC 1 FLD NR
14					TOTAL DIST: 2.60403 km ✓ 2.2 mm

MONITORING WELL

1078.017 PC-62 SFWMD

SET STEEL ROD TO REFUSAL

- ROD DEPTH @ 46.57'
- SET STAINLESS STEEL ROD TO REFUSAL WITH 6" PVC CASING & SFWMD ALUM. LOGO CAP.
- MAGNET SET INSIDE PVC CASING.

STAMPING - SOUTH FLORIDA WATER MANGENENT DISTRICT

TIES

- SET MONUMENT 5.10' SE OF MONITORING WELL'S 1' DIA. CORRIGATED PIPE.
- " " 2.4' EAST OF SOLAR PANEL POST.
- " " 6.6' SW OF RADIO TOWER

(PC-62)

COORDINATES ON MONITORING WELL & MONUMENT

WGS 84

N. ~~27° 29' 09.9"~~ 27° 30' 05"

W. ~~81° 11' 49.6"~~ 81° 12' 07"

* REFERENCE MARK ON MONITORING WELL IS 3.575' ABOVE BENCHMARK
* REFERENCE MARK ON MONITORING WELL IS 3.66' ABOVE TOP OF WOODEN PLATFORM

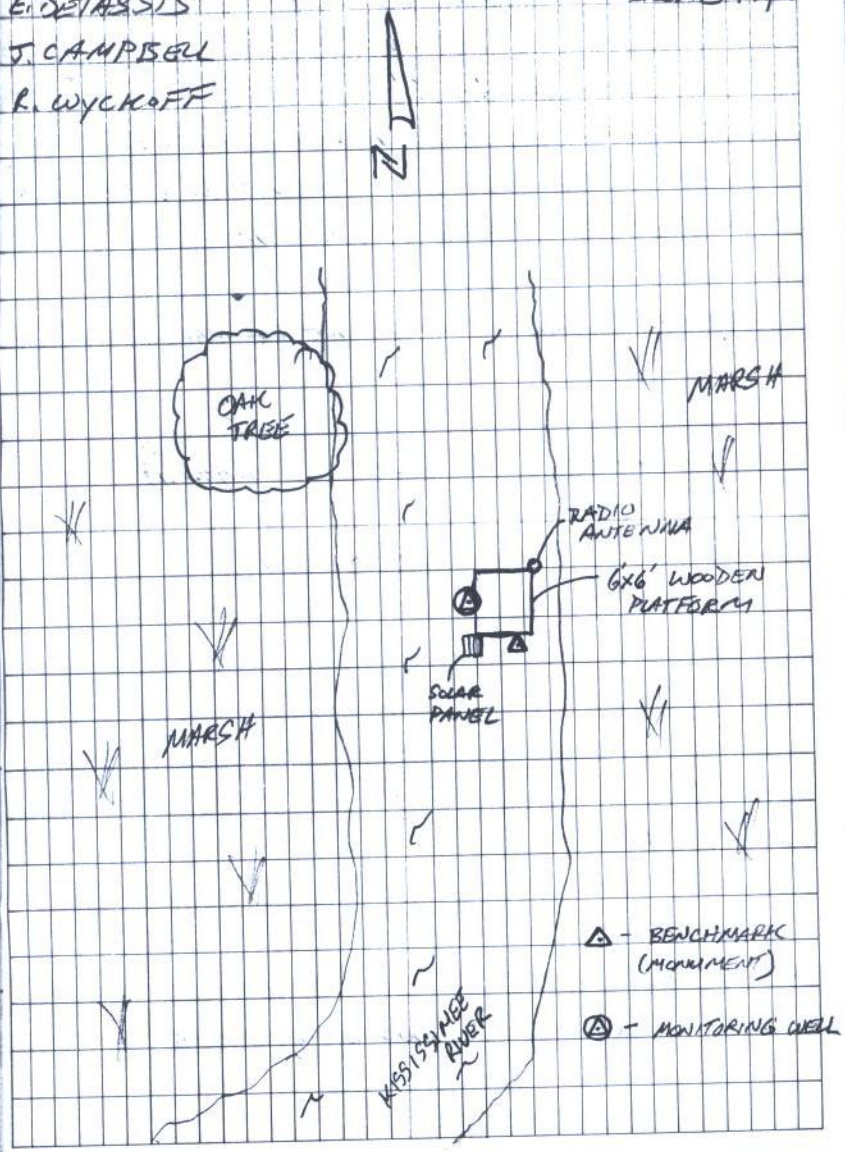
MON. DEC. 18, 2006

E. DETASSIS

J. CAMPBELL

R. WYCKOFF

SFWMD 19, 9



1078.017

MONITORING WELL
KRDR 02

SFWMD

SET ROD TO REFUSAL

- ROD DEPTH @ 45.13'
- SET STAINLESS STEEL ROD TO REFUSAL WITH 6" PVC CASING & SFWMD LOGO CAP (ALUM.)
- MAGNET SET INSIDE PVC CASING

STAMPING - SOUTH FLORIDA WATER MANAGEMENT DISTRICT

TIES

- SET MONUMENT 6.5' SOUTH OF RADIO/SOLAR TOWER
- " " 3.5' SOUTH OF MONITORING WELL'S 1' DIA. CORRIGATED PIPE
- " " 1.0' WEST OF SE CORNER OF WOODEN PLATFORM.

COORDINATES ON MONITORING WELL AND BENCHMARK (KRDR 02)

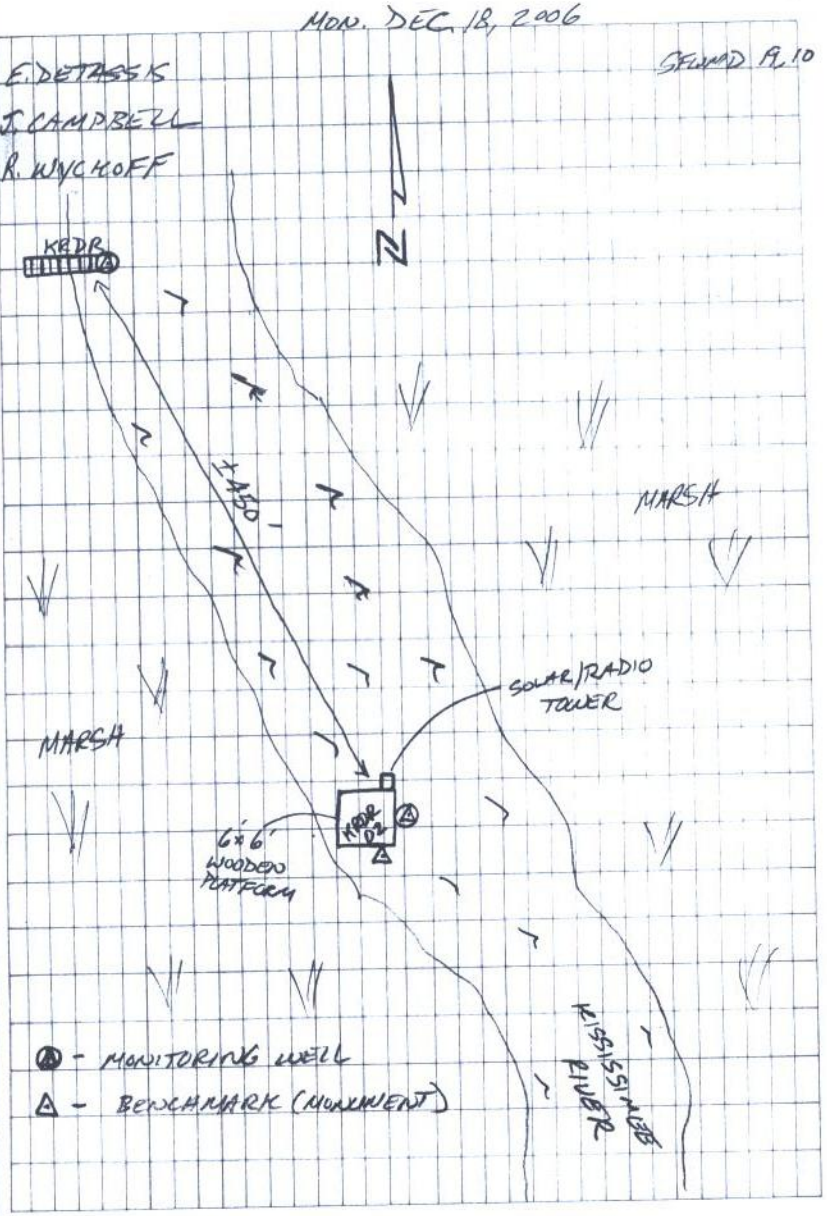
WGS 84
N. 27° 29' 09"
W. 81° 11' 44"

* REFERENCE MARK ON MONITORING WELL IS 3.86' ABOVE TOP OF WOODEN PLATFORM

MON. DEC. 18, 2006

SFWMD A, 10

E. DETASSIS
J. CAMPBELL
R. WYCKOFF



1078.017 ELEVATE WELLS SFWMD

FOR KRDR AND KRDR-02

+	H.I.	−	EL.
5.02			
		1.32	
		5.15	
5.30			
		1.47	
		5.17	

MON. DEC. 18, 2006

E. DETASSIS SFWMD 19, 11

J. CAMPBELL

R. WYCKOFF

DESC.

KRDR-02 BM

KRDR-02 REFERENCE MARK

KRDR REFERENCE MARK

" " "

KRDR-02 REFERENCE MARK

KRDR-02 BM

Chapman

Nick Miller, Inc.
Date of Photo: December 11, 2006
View: Looking at the wells facing north

Chapman

Nick Miller, Inc.
Date of Photo: December 11, 2006
View: Close-up of the well #1 showing the contractor's markings

Chapman

Nick Miller, Inc.
Date of Photo: December 11, 2006
View: Close-up of the well #2 showing the contractor's markings

Chapman

Nick Miller, Inc.
Date of Photo: December 11, 2006
View: Close-up of the well #3 showing the contractor's markings

Chapman

Nick Miller, Inc.
Date of Photo: December 11, 2006
View: Close-up of the well #4 showing the contractor's markings

Chapman

Nick Miller, Inc.
Date of Photo: December 11, 2006
View: Looking at the benchmark facing north

Chapman

Nick Miller, Inc.
Date of Photo: December 11, 2006
View: A top view of the benchmark

CHAPMAN

OSC 1 FLDNR

OS 61 SFLWMD

Legend

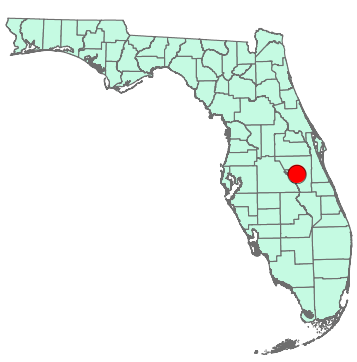
- 1st Order Control
- 2nd Order Control
- Monument Location

0 700 1,400 2,800 4,200 Feet

1 inch equals 1,320 feet

N

Location Sketch



CHAPMAN

South Florida Water Management District
Kissimmee River Wells

NICK MILLER, INC.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

COUNTY OSCEOLA	**PROJECT Hydrology - Kissimmee River and Lake Marian Wells**	**DESIGNATION CHAMPMAN**
SECTION 35	**TOWNSHIP 28 SOUTH**	**RANGE 31 EAST**

GEOGRAPHIC INDEX OF QUAD

Established by Nick Miller Inc. **Recovered by**	**NAME OF QUADRANGLE** **HOLOPAW SW**
SURVEYOR Stephen M. Gordon **DATE** 12/11/2006	**FIELD BOOK** 18 **PAGE** 23

HORIZONTAL DATUM: **1927** (**1983**) **Other**_____ (circle one) ZONE (**E**) or **W**

STATE PLANE COORDINATES	**E 593,601 ft**	**N 1,333,259 ft**
LATITUDE: N 28.00138°	**LONGITUDE: W 81.19389°**	
VERTICAL DATUM: MSL **1929** (**1988**) **Other** _____ (circle one)		**EL. 67.29 ft**
VERTICAL DATUM: MSL (**1929**) **1988 Other** _____ (circle one)		**EL. 68.50 ft**

CONTROL ACCURACY: HORIZONTAL 1 2 3 (SUB-METER) (circle one) **VERTICAL 1 2 (3)**

DESCRIPTION

To Reach:

FROM THE INTERSECTION OF SR 60 AND US HIGHWAY 441. HEAD NORTH ON US 441 FOR 14.3 MILES TO CR-523 (CANOE CREEK ROAD). GO WEST ON CR-523 AND HEAD WESTERLY AND NORTHERLY FOR 16.3 MILES TO DIRT ROAD. MAKE LEFT AND HEAD WESTERLY AND SOUTHERLY ON DIRT ROAD FOR 0.55 MILE TO MARK ON RIGHT. MARK IS LOCATED 218.0 FEET WEST OF THE CENTER OF A METAL GATE, 24.3 FEET NORTH OF THE CENTERLINE OF DIRT ROAD, 6.1 FEET SOUTH OF FOUR MONITORING WELL PIPES. MAGNET SET 1 FOOT NORTH OF MONUMENT.

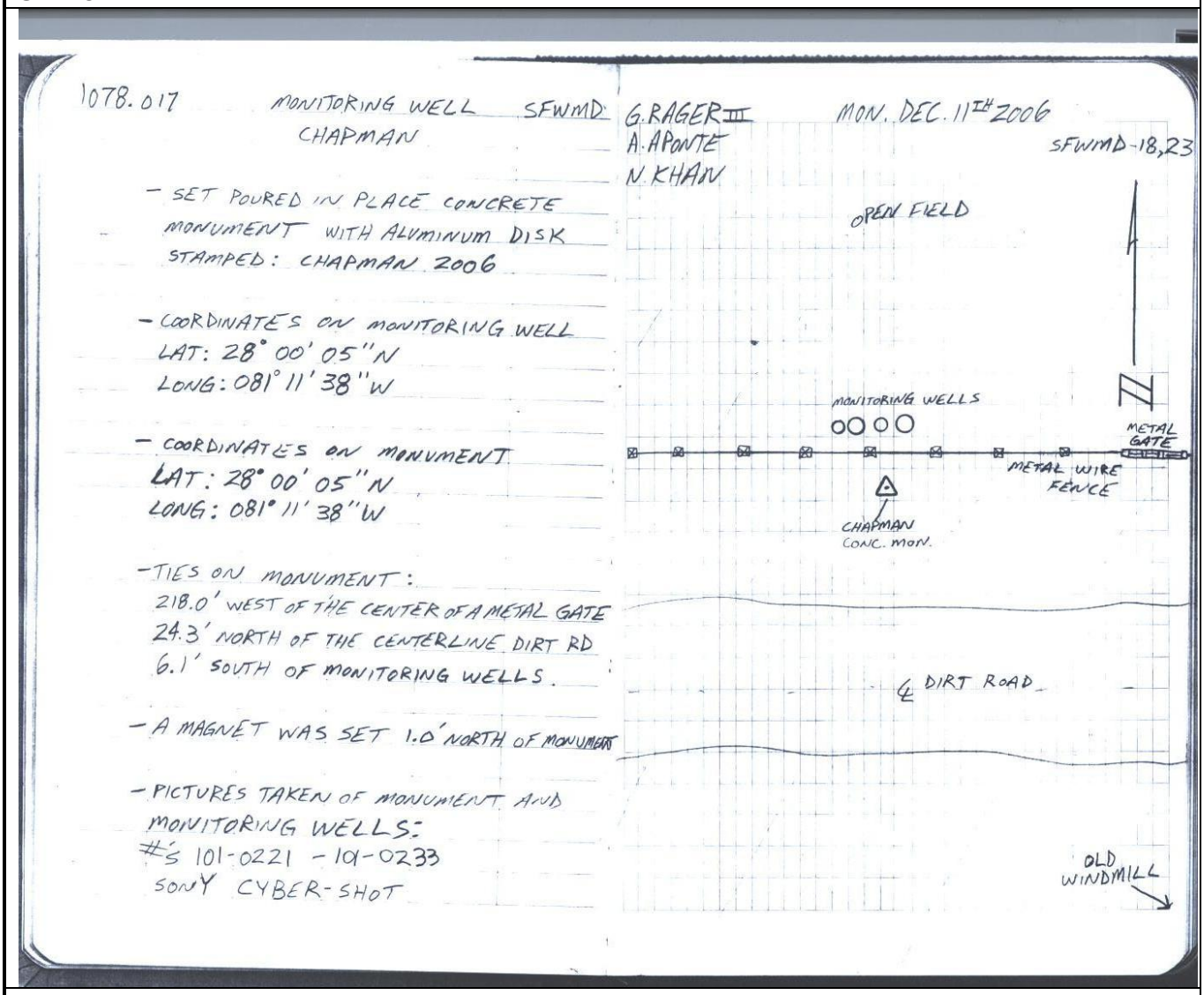
Benchmarks Used: OSC 1 FLDNR & OS 61 SFLWMD

Notable Land marks:

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

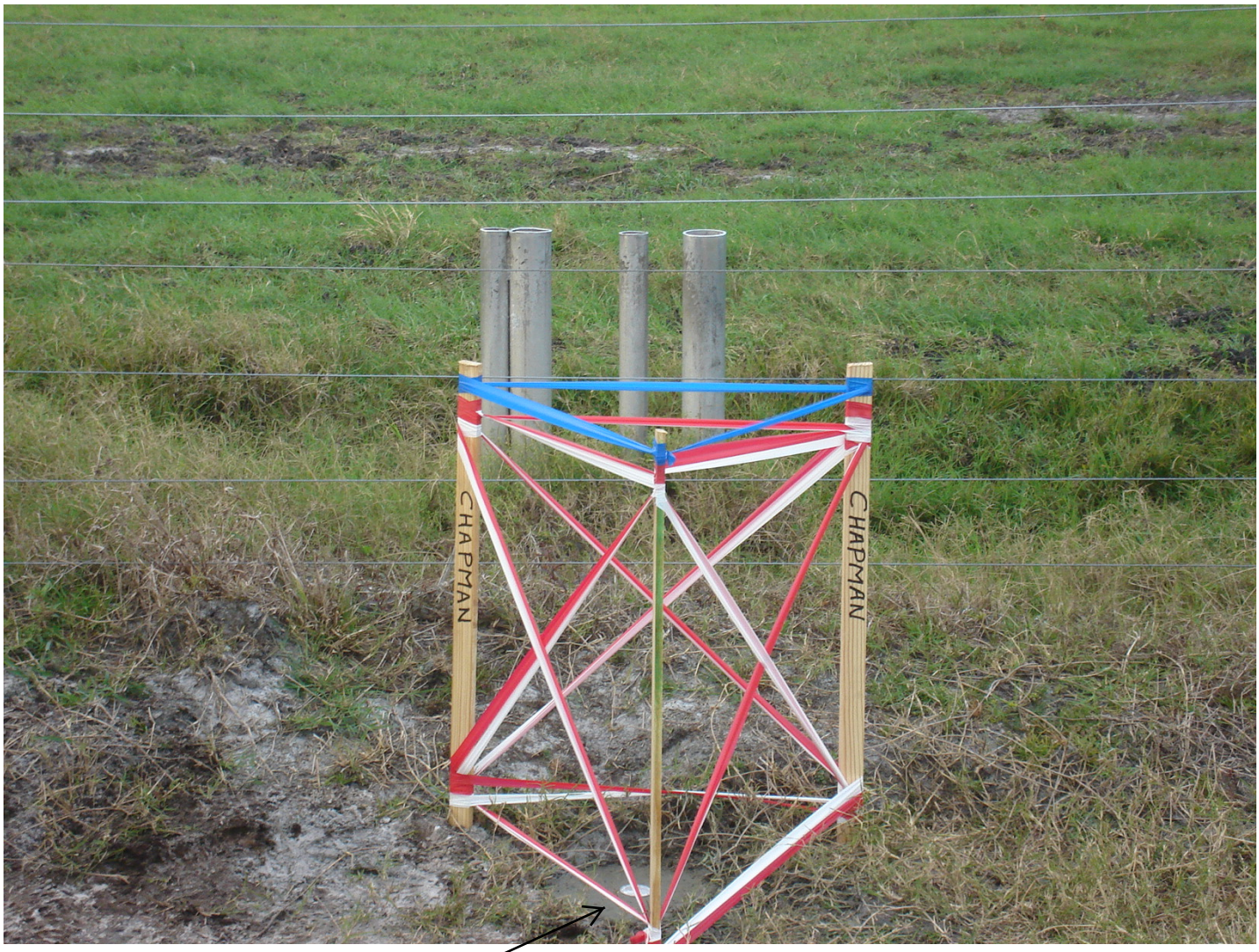
Rev. 4/01

SKETCH



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01



The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.8
1         National Geodetic Survey,   Retrieval Date = APRIL 12, 2016
 AF7103 ***********************************************************************
 AF7103  DESIGNATION -  OSC 1 FLDNR
 AF7103  PID         -  AF7103
 AF7103  STATE/COUNTY-  FL/OSCEOLA
 AF7103  COUNTRY     -  US
 AF7103  USGS QUAD   -  LAKE MARIAN NW (1972)
 AF7103
 AF7103                        *CURRENT SURVEY CONTROL
 AF7103  ______________________________________________________________________
 AF7103* NAD 83(2011) POSITION- 27 59 38.54521(N) 081 10 34.97841(W)   ADJUSTED
 AF7103* NAD 83(2011) ELLIP HT-    -4.572 (meters)        (06/27/12)   ADJUSTED
 AF7103* NAD 83(2011) EPOCH    -  2010.00
 AF7103* NAVD 88 ORTHO HEIGHT -    22.984 (meters)       75.41   (feet) ADJUSTED
 AF7103  ______________________________________________________________________
 AF7103  NAD 83(2011) X  -    864,527.863 (meters)                     COMP
 AF7103  NAD 83(2011) Y  - -5,569,324.864 (meters)                     COMP
 AF7103  NAD 83(2011) Z  -  2,975,919.976 (meters)                     COMP
 AF7103  LAPLACE CORR    -         -1.10  (seconds)                    DEFLEC12B
 AF7103  GEOID HEIGHT    -        -27.565 (meters)                     GEOID12B
 AF7103  DYNAMIC HEIGHT  -         22.950 (meters)       75.30   (feet) COMP
 AF7103  MODELED GRAVITY -    979,146.9   (mgal)                       NAVD 88
 AF7103
 AF7103  VERT ORDER      -  SECOND    CLASS II
 AF7103
 AF7103  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AF7103  Standards:
 AF7103         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AF7103            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
 AF7103  ------------------------------------------------------------------
 AF7103  NETWORK    1.14   1.59          0.41   0.51   0.81     -0.04752022
 AF7103  ------------------------------------------------------------------
 AF7103  Click here for local accuracies and other accuracy information.
 AF7103
 AF7103
 AF7103.The horizontal coordinates were established by GPS observations
 AF7103.and adjusted by the National Geodetic Survey in June 2012.
 AF7103
 AF7103.NAD 83(2011) refers to NAD 83 coordinates where the reference
 AF7103.frame has been affixed to the stable North American tectonic plate. See
 AF7103.NA2011 for more information.
 AF7103
 AF7103.The horizontal coordinates are valid at the epoch date displayed above
 AF7103.which is a decimal equivalence of Year/Month/Day.
 AF7103
 AF7103.The orthometric height was determined by differential leveling and
 AF7103.adjusted by the NATIONAL GEODETIC SURVEY
 AF7103.in June 1991.
 AF7103
 AF7103.Significant digits in the geoid height do not necessarily reflect accuracy.
```

```
AF7103.GEOID12B height accuracy estimate available here.
AF7103
AF7103.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AF7103
AF7103.The Laplace correction was computed from DEFLEC12B derived deflections.
AF7103
AF7103.The ellipsoidal height was determined by GPS observations
AF7103.and is referenced to NAD 83.
AF7103
AF7103.The dynamic height is computed by dividing the NAVD 88
AF7103.geopotential number by the normal gravity value computed on the
AF7103.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AF7103.degrees latitude (g = 980.6199 gals.).
AF7103
AF7103.The modeled gravity was interpolated from observed gravity values.
AF7103
AF7103. The following values were computed from the NAD 83(2011) position.
AF7103
AF7103;                    North         East     Units Scale Factor Converg.
AF7103;SPC FL E     -   405,561.113   182,650.700   MT  0.99994489   -0 04 58.0
AF7103;SPC FL E     - 1,330,578.42    599,246.50    sFT  0.99994489   -0 04 58.0
AF7103;UTM  17      - 3,096,554.719   482,656.620   MT  0.99960371   -0 04 58.0
AF7103
AF7103!             -  Elev Factor  x  Scale Factor =   Combined Factor
AF7103!SPC FL E     -   1.00000072  x   0.99994489  =   0.99994561
AF7103!UTM  17      -   1.00000072  x   0.99960371  =   0.99960443
AF7103
AF7103                          SUPERSEDED SURVEY CONTROL
AF7103
AF7103  NAD 83(2007)-  27 59 38.54541(N)    081 10 34.97965(W) AD(2002.00) 0
AF7103  ELLIP H (02/10/07)   -4.579  (m)                       GP(2002.00)
AF7103  NAD 83(1999)-  27 59 38.54536(N)    081 10 34.97932(W) AD(       ) 1
AF7103  ELLIP H (01/28/04)   -4.578  (m)                       GP(       ) 3 1
AF7103  NAVD 88 (01/28/04)   22.98   (m)          75.4    (f) LEVELING    3
AF7103  NGVD 29 (09/01/92)   23.353  (m)          76.62   (f) ADJUSTED    2 2
AF7103
AF7103.Superseded values are not recommended for survey control.
AF7103
AF7103.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AF7103.See file dsdata.txt to determine how the superseded data were derived.
AF7103
AF7103_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML8265696554(NAD 83)
AF7103
AF7103_MARKER: DB = BENCH MARK DISK
AF7103_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AF7103_STAMPING: OSC 1 1983 BSM
AF7103_MARK LOGO: FLDNR
AF7103_PROJECTION: FLUSH
AF7103_MAGNETIC: O = OTHER; SEE DESCRIPTION
AF7103_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AF7103+STABILITY: SURFACE MOTION
AF7103_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AF7103+SATELLITE: SATELLITE OBSERVATIONS - March 06, 2005
AF7103
AF7103  HISTORY     - Date     Condition        Report By
AF7103  HISTORY     - 1983     MONUMENTED       FLDNR
AF7103  HISTORY     - 20030429 GOOD             FLDEP
AF7103  HISTORY     - 20050306 GOOD             GEOCAC
AF7103
AF7103                          STATION DESCRIPTION
```

```
AF7103
AF7103'DESCRIBED BY FL DEPT OF NAT RES 1983
AF7103'14.75 MI WNW FROM KENANSVILLE.
AF7103'BEGIN AT THE INTERSECTION OF U.S. HIGHWAY 441 AND STATE ROAD 523
AF7103'(CANOE CREEK ROAD) IN KENANSVILLE, GO 14.75 MILES NORTH AND WEST
AF7103'ALONG STATE ROAD 523 TO THE
AF7103'INTERSECTION OF JOE OVERSTREET ROAD AND THE MARK.  THE MARK BEARS
AF7103'26.0 FEET SOUTHEAST OF THE CENTERLINE OF JOE OVERSTREET ROAD, 48.0
AF7103'FEET SOUTHWEST OF THE CENTERLINE OF STATE ROAD 523, 8.1 FEET
AF7103'SOUTHEAST OF A STOP SIGN/STREET SIGN, AND 2.0 FEET EAST OF A CORNER
AF7103'FENCE POST WITH A WITNESS SIGN ATTACHED.
AF7103'THE MARK IS 0.2 FT BELOW GROUND.
AF7103
AF7103                          STATION RECOVERY (2003)
AF7103
AF7103'RECOVERY NOTE BY FL DEPT OF ENV PRO 2003 (BPJ)
AF7103'THE MARK IS ABOUT 18.0 MI SOUTH-SOUTHEAST OF ST. CLOUD IN SECTION 1,
AF7103'TOWNSHIP 29 SOUTH,
AF7103'RANGE 31 EAST.
AF7103'
AF7103'TO REACH THE MARK FROM THE INTERSECTION OF THE FLORIDA TURNPIKE (STATE
AF7103'ROAD 91)
AF7103'UNDERPASS AND STATE ROAD 523, ABOUT 11.0 MI SOUTH OF ST. CLOUD, GO
AF7103'SOUTHEAST ON STATE ROAD 523(CANOE CREEK ROAD) FOR 8.0 MI TO THE
AF7103'JUNCTION OF JOE OVERSTREET ROAD ON THE RIGHT AND THE MARK ON THE
AF7103'RIGHT, SET IN THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE
AF7103'GROUND AND ABOUT 1.0 FT BELOW THE LEVEL OF JOE OVERSTREET ROAD.
AF7103'
AF7103'LOCATED 47.7 FT WEST-SOUTHWEST OF THE APPROXIMATE CENTERLINE OF STATE
AF7103'ROAD 523, 28.8 FT SOUTHEAST OF THE APPROXIMATE CENTERLINE OF JOE
AF7103'OVERSTREET ROAD, 10.2 FT SOUTH OF A STOP SIGN, 2.5 FT NORTHWEST OF A
AF7103'CARSONITE WITNESS POST, 1.8 FT SOUTH OF A WOODEN FENCE CORNER POST AND
AF7103'1.5 FT SOUTH-SOUTHWEST OF A CARSONITE WITNESS POST.
AF7103'
AF7103'NOTE UNKNOWN MAGNETISM.
AF7103
AF7103                          STATION RECOVERY (2005)
AF7103
AF7103'RECOVERY NOTE BY GEOCACHING 2005 (MAG)
AF7103'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:02
```

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.8
1         National Geodetic Survey,   Retrieval Date = APRIL 12, 2016
 AF7104 ***********************************************************************
 AF7104  DESIGNATION -  OS 61 SFLWMD
 AF7104  PID         -  AF7104
 AF7104  STATE/COUNTY-  FL/OSCEOLA
 AF7104  COUNTRY     -  US
 AF7104  USGS QUAD   -  LAKE MARIAN NW (1972)
 AF7104
 AF7104                         *CURRENT SURVEY CONTROL
 AF7104  ______________________________________________________________________
 AF7104* NAD 83(1986) POSITION- 27 59 06.      (N) 081 10 04.      (W)    SCALED
 AF7104* NAVD 88 ORTHO HEIGHT -     22.710 (meters)        74.51   (feet) ADJUSTED
 AF7104  ______________________________________________________________________
 AF7104  GEOID HEIGHT    -        -27.549 (meters)                       GEOID12B
 AF7104  DYNAMIC HEIGHT  -         22.676 (meters)        74.40   (feet) COMP
 AF7104  MODELED GRAVITY -    979,146.6   (mgal)                         NAVD 88
 AF7104
 AF7104  VERT ORDER      -  SECOND    CLASS II
 AF7104
 AF7104.The horizontal coordinates were scaled from a topographic map and have
 AF7104.an estimated accuracy of +/- 6 seconds.
 AF7104.
 AF7104.The orthometric height was determined by differential leveling and
 AF7104.adjusted by the NATIONAL GEODETIC SURVEY
 AF7104.in June 1991.
 AF7104
 AF7104.Significant digits in the geoid height do not necessarily reflect accuracy.
 AF7104.GEOID12B height accuracy estimate available here.
 AF7104
 AF7104.The dynamic height is computed by dividing the NAVD 88
 AF7104.geopotential number by the normal gravity value computed on the
 AF7104.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AF7104.degrees latitude (g = 980.6199 gals.).
 AF7104
 AF7104.The modeled gravity was interpolated from observed gravity values.
 AF7104
 AF7104;                     North         East      Units  Estimated Accuracy
 AF7104;SPC FL E     -   404,560.      183,500.      MT  (+/- 180 meters Scaled)
 AF7104
 AF7104                           SUPERSEDED SURVEY CONTROL
 AF7104
 AF7104  NGVD 29 (09/01/92)    23.079  (m)             75.72    (f) ADJUSTED    2 2
 AF7104
 AF7104.Superseded values are not recommended for survey control.
 AF7104
 AF7104.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 AF7104.See file dsdata.txt to determine how the superseded data were derived.
 AF7104
 AF7104_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML835955(NAD 83)
 AF7104
```

AF7104_MARKER: DB = BENCH MARK DISK
AF7104_SETTING: 32 = SET IN A RETAINING WALL OR CONCRETE LEDGE
AF7104_SP_SET: CONCRETE CULVERT
AF7104_STAMPING: SFWM LINE-9 OS-61 BM
AF7104_MARK LOGO: SFLWMD
AF7104_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AF7104+STABILITY: SURFACE MOTION
AF7104_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AF7104+SATELLITE: SATELLITE OBSERVATIONS - July 16, 2005
AF7104

AF7104 HISTORY	- Date	Condition	Report By
AF7104 HISTORY	- UNK	MONUMENTED	SFLWMD
AF7104 HISTORY	- 1983	GOOD	FLDNR
AF7104 HISTORY	- 20050716	GOOD	GEOCAC

AF7104
AF7104 STATION DESCRIPTION
AF7104
AF7104'DESCRIBED BY FL DEPT OF NAT RES 1983
AF7104'14.0 MI WNW FROM KENANSVILLE.
AF7104'BEGIN AT THE INTERSECTION OF U.S. HIGHWAY 441 AND STATE
AF7104'ROAD 523 (CANOE CREEK ROAD) IN KENANSVILLE, GO 14.0 MILES
AF7104'NORTH AND WEST ALONG STATE ROAD 523 TO THE MARK.
AF7104'THE MARK IS SET FLUSH IN A CONCRETE CULVERT. THE MARK BEARS
AF7104'20.4 FEET NORTHEAST OF THE CENTERLINE OF STATE ROAD 523,
AF7104'8.2 FEET NORTHWEST OF THE SOUTHWEST END OF THE CULVERT, AND
AF7104'7.8 FEET SOUTHWEST OF THE NORTHWEST END OF THE CULVERT. THE
AF7104'SURVEY DISK IS 1.25 INCHES IN DIAMETER.
AF7104
AF7104 STATION RECOVERY (2005)
AF7104
AF7104'RECOVERY NOTE BY GEOCACHING 2005 (MAG)
AF7104'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:02

Windows Abstra Version 2.3 -- Jan 1, 2004 Tue Jan 16 21:20:37 2007

-*- FIELD ABSTRACT -*-

061211-061212 HGZ L10785 8.0 MM ORDER 2 CLASS 2 PAGE 1

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ESTABLISH BENCH MARKS NEAR MONITORING WELLS IN
OKEECHOBEE, OSCEOLA, AND ST. LUCIE COUNTIES

FROM / TO	START	F/B	DIST TOTAL (KM)	ELEV DIFF (MT)		-(F+B) TOTAL (MM)	MEAN DIFF FLD ELEV (MT)	I C
0102 OSC 1 FLDNR							22.98400	
0102 OSC 1 FLDNR	12111305	B	1.28	0.27825	*	0.00	-0.27825	1
0101 OS 61 SFLWMD								
	SL 1		1.28			0.00	22.70575	
0102 OSC 1 FLDNR	12120830	F	2.57	-2.47461	*	2.30	-2.47346	1
0103 CHAPMAN	12121300	B	2.60	2.47231	*			1
			2.57			2.30	20.51054♀	

ELEVATION REJECTION AND ERROR CODES

C - section elevation difference was rejected for cause
ie. *43* record rejection code set to "F"
R - section elevation difference was rejected by Halperin rejection algorithm
@ - section elevation difference does not include refraction correction
* - section elevation difference does not include rod correction

♀

INSTRUMENT CODE	INSTRUMENT	RODS	
1	243 - 331132	396 - 555	396 - 666

♀

LEVEL LINE SECTION RUNNING TREE

0102 (0101)
0103♀

FROM	TO	N. LATITUDE	W. LONGITUDE	FIELD DISTANCE	VS. COMPUTED	
	0102	275939	0811035	0.00	0.00	
0102	0101	275906	0811004	1.28	1.32	
0102	0103	280005	0811138	2.57	1.90	**♀

Windows Abstra Version 2.3 -- Jan 1, 2004 -- Tue Jan 16 21:20:37 2007

SECTION FROM	TO	E R R O R M E S S A G E S
0102	0103	*** Field distance exceeds computed distance by more than 0.50 KM!

KRDR-02

Nick Miller, Inc.
Date of Photo: December 18, 2006
View: Looking at the well on structure facing east

KRDR-02

Nick Miller, Inc.
Date of Photo: December 18, 2006
View: Close-up of the well showing the contractor's markings

KRDR-02

Nick Miller, Inc.
Date of Photo: December 18, 2006
View: Looking at the benchmark facing south

KRDR-02

Nick Miller, Inc.
Date of Photo: December 18, 2006
View: A top view of the benchmark

KRDR

Nick Miller, Inc.
Date of Photo: December 18, 2006
View: Looking at the well on structure facing east

KRDR

Nick Miller, Inc.
Date of Photo: December 18, 2006
View: Close-up of the well showing the contractor's markings

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

COUNTY HIGHLANDS	**PROJECT Hydrology - Kissimmee River & Lake Marian Wells**	**DESIGNATION KRDR 02**
SECTION 26	**TOWNSHIP 34 SOUTH**	**RANGE 31 EAST**

GEOGRAPHIC INDEX OF QUAD

Established by Nick Miller Inc. **Recovered by**	**NAME OF QUADRANGLE** **BASINGER NW**
SURVEYOR Stephen M. Gordon **DATE** 12/28/2006	**FIELD BOOK** 19 **PAGE** 10

HORIZONTAL DATUM: **1927** (**1983**) **Other**_____ (circle one) ZONE (**E**) or **W**

STATE PLANE COORDINATES	**E 592,765 ft**	**N 1,145,831 ft**
LATITUDE: N 27.48583°	**LONGITUDE: W 81.19556°**	
VERTICAL DATUM: MSL **1929** (**1988**) **Other** _____ (circle one)		**EL. 43.94 ft**
VERTICAL DATUM: MSL (**1929**) **1988 Other** _____ (circle one)		**EL. 45.08 ft**

CONTROL ACCURACY: HORIZONTAL 1 2 3 (SUB-METER) (circle one) **VERTICAL 1 2 (3)**

GPS Derived Elevation

DESCRIPTION

To Reach:

FROM INTERSECTION OF US HIGHWAY 98 AND BLUFF HAMMOCK ROAD. HEAD NORTH ON BLUFF HAMMOCK ROAD FOR 4.9 MILES TO GRASS ROAD WITH A LOCKED SFWMD WOODEN GATE. HEAD EAST THROUGH LOCKED SFWMD GATE ON GRASS ROAD FOR 0.3 MILE TO A DIRT DOCKING AREA (ACCESS ROUTE TO KISSISSMEE RIVER). WITH AN AIRBOAT HEAD EAST THROUGH CREEK WATERWAY FOR 0.3 MILE TO KISSISSIMEE RIVER. HEAD SOUTH ON KISSISSIMEE RIVER FOR 1.1 MILES TO MARK ON RIGHT. MARK IS LOCATED 6.5 FEET SOUTH OF SOLAR PANEL/RADIO ANTENNA'S METAL POST, 3.5 FEET SOUTH OF MONITORING WELL'S 1 FOOT DIAMETER CORRIGATED PIPE, 1.0 FOOT WEST OF SOUTHEAST CORNER OF WOODEN PLATFORM. MAGNET SET INSIDE PVC CASING.

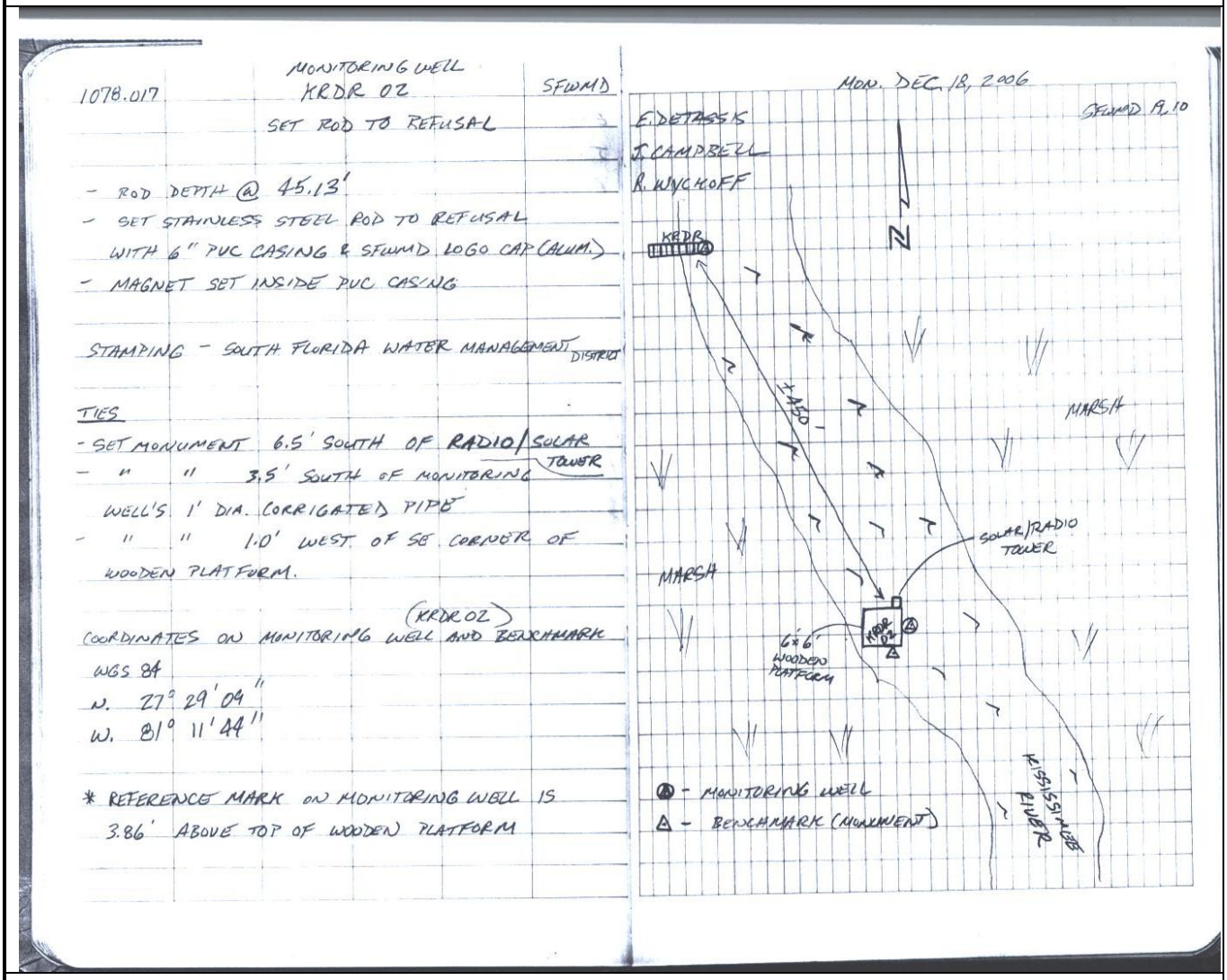
Benchmarks Used: E 555, H 555, KRR PC 25, W 462

Notable Land marks:

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

SKETCH



The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.8
1         National Geodetic Survey,   Retrieval Date = APRIL 12, 2016
 DF8364 ***********************************************************************
 DF8364  DESIGNATION -  H 555
 DF8364  PID         -  DF8364
 DF8364  STATE/COUNTY-  FL/OKEECHOBEE
 DF8364  COUNTRY     -  US
 DF8364  USGS QUAD   -  FORT KISSIMMEE (1972)
 DF8364
 DF8364                         *CURRENT SURVEY CONTROL
 DF8364  ______________________________________________________________________
 DF8364* NAD 83(1986) POSITION- 27 32 10.      (N) 081 11 54.      (W)    SCALED
 DF8364* NAVD 88 ORTHO HEIGHT -     13.418 (meters)        44.02  (feet) ADJUSTED
 DF8364  ______________________________________________________________________
 DF8364  GEOID HEIGHT    -        -26.185 (meters)                       GEOID12B
 DF8364  DYNAMIC HEIGHT  -         13.397 (meters)        43.95  (feet) COMP
 DF8364  MODELED GRAVITY -    979,138.4   (mgal)                         NAVD 88
 DF8364
 DF8364  VERT ORDER      -  SECOND    CLASS I
 DF8364
 DF8364.The horizontal coordinates were scaled from a topographic map and have
 DF8364.an estimated accuracy of +/- 6 seconds.
 DF8364.
 DF8364.The orthometric height was determined by differential leveling and
 DF8364.adjusted by the NATIONAL GEODETIC SURVEY
 DF8364.in May 2004.
 DF8364
 DF8364.Significant digits in the geoid height do not necessarily reflect accuracy.
 DF8364.GEOID12B height accuracy estimate available here.
 DF8364
 DF8364.The dynamic height is computed by dividing the NAVD 88
 DF8364.geopotential number by the normal gravity value computed on the
 DF8364.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DF8364.degrees latitude (g = 980.6199 gals.).
 DF8364
 DF8364.The modeled gravity was interpolated from observed gravity values.
 DF8364
 DF8364;                    North         East     Units  Estimated Accuracy
 DF8364;SPC FL E     -   354,820.      180,410.      MT  (+/- 180 meters Scaled)
 DF8364
 DF8364                          SUPERSEDED SURVEY CONTROL
 DF8364
 DF8364.No superseded survey control is available for this station.
 DF8364
 DF8364_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML804458(NAD 83)
 DF8364
 DF8364_MARKER: DD = SURVEY DISK
 DF8364_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 DF8364_STAMPING: H 555 2001
 DF8364_MARK LOGO: FLDEP
 DF8364_PROJECTION: FLUSH
```

DF8364_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
DF8364_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
DF8364+STABILITY: SURFACE MOTION
DF8364_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DF8364+SATELLITE: SATELLITE OBSERVATIONS - November 18, 2009
DF8364
DF8364 HISTORY - Date Condition Report By
DF8364 HISTORY - 20011006 MONUMENTED FLDEP
DF8364 HISTORY - 20050629 GOOD MACTEC
DF8364 HISTORY - 20091118 GOOD PICKET
DF8364
DF8364 STATION DESCRIPTION
DF8364
DF8364'DESCRIBED BY FL DEPT OF ENV PRO 2001 (JLM)
DF8364'THE MARK IS ABOUT 33.3 MI NORTHWEST OF OKEECHOBEE, 15.5 MI NORTHWEST
DF8364'OF BASINGER, IN
DF8364'ESTIMATED SECTION 11, TOWNSHIP 34 SOUTH, RANGE 31 EAST.
DF8364'
DF8364'TO REACH THE MARK FROM THE INTERSECTION OF U.S. HIGHWAY 441 (PARROTT
DF8364'STREET) AND U.S.
DF8364'HIGHWAY 98 (STATE HIGHWAY 70, PARK STREET) IN OKEECHOBEE, GO WEST ON
DF8364'U.S. HIGHWAY 98
DF8364'(STATE HIGHWAY 70, PARK STREET) FOR 1.15 MI TO THE JUNCTION OF U.S.
DF8364'HIGHWAY 98 NORTH ON
DF8364'THE RIGHT, TURN RIGHT ON U.S. HIGHWAY 98 AND GO NORTHWESTERLY FOR 0.65
DF8364'MI TO THE
DF8364'RAILROAD TRACKS, CONTINUE NORTHWESTERLY ON U.S. HIGHWAY 98 FOR 11.9 MI
DF8364'TO THE JUNCTION
DF8364'OF COUNTY ROAD 68 EAST ON THE RIGHT, CONTINUE NORTHWESTERLY ON U.S.
DF8364'HIGHWAY 98 FOR
DF8364'1.85 MI TO THE JUNCTION OF NORTHWEST 176TH AVENUE (COUNTY ROAD 700-A)
DF8364'ON THE RIGHT,
DF8364'CONTINUE NORTHWESTERLY ON U.S. HIGHWAY 98 FOR 1.7 MI TO THE JUNCTION
DF8364'OF NORTHWEST
DF8364'203RD AVENUE (MICCO BLUFF ROAD) ON THE RIGHT, TURN RIGHT ON NORTHWEST
DF8364'203RD AVENUE
DF8364'(MICCO BLUFF ROAD) AND GO NORTH-NORTHWESTERLY FOR 0.2 MI TO THE
DF8364'JUNCTION OF
DF8364'NORTHWEST 160TH DRIVE (MICCO BLUFF ROAD, COUNTY ROAD 68), TURN LEFT ON
DF8364'NORTHWEST
DF8364'160TH DRIVE (MICCO BLUFF ROAD, COUNTY ROAD 68) AND GO
DF8364'WEST-NORTHWESTERLY FOR 6.15 MI
DF8364'TO THE END OF THE PAVED ROAD AND THE JUNCTION OF A DIRT ROAD LEADING
DF8364'NORTHWEST AND
DF8364'THE BEGINNING OF NORTHWEST 285TH DRIVE (A DIRT ROAD LEADING
DF8364'NORTHWESTERLY), BEAR
DF8364'RIGHT ON NORTHWEST 285TH DRIVE AND GO NORTHWESTERLY FOR 2.8 MI TO AN
DF8364'EAST-WEST
DF8364'FENCELINE OPENING AND THE JUNCTION OF A DIRT ROAD ON THE LEFT LEADING
DF8364'WEST, PASSING
DF8364'THROUGH THE OPENING CONTINUE NORTHWEST ON THE DIRT ROAD (NORTHWEST
DF8364'285TH DRIVE)
DF8364'FOR 0.7 MI TO AN EAST-WEST FENCELINE OPENING WITH ONE 25.0 FT CONCRETE
DF8364'POLE ON BOTH
DF8364'SIDES OF THE ROAD, CONTINUE NORTHWEST ON THE DIRT ROAD FOR 0.7 MI TO
DF8364'THE INTERSECTION
DF8364'OF AN EAST-WEST DIRT ROAD, CONTINUE NORTHWEST ON THE DIRT ROAD FOR 2.3
DF8364'MI TO A METAL
DF8364'GATE, CONTINUE NORTHWEST ON THE DIRT ROAD FOR 1.25 MI TO A LOCKED
DF8364'GATE, CONTINUE

DF8364'NORTHWEST ON THE DIRT ROAD FOR 1.4 MI TO A BARBWIRE GATE AND THE MARK
DF8364'ON THE LEFT, SET
DF8364'IN THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND AND
DF8364'LEVEL WITH THE
DF8364'ROAD.
DF8364'
DF8364'LOCATED 61.0 FT SOUTHEAST OF THE SOUTH END OF A 24-INCH STEEL PIPE,
DF8364'26.0 FT
DF8364'SOUTH-SOUTHWEST OF THE APPROXIMATE CENTERLINE OF A ROAD AND BARBWIRE
DF8364'FENCE AND 1.3
DF8364'FT EAST-SOUTHEAST OF A CARSONITE WITNESS POST IN THE BARBWIRE
DF8364'FENCELINE.
DF8364'
DF8364'NOTE A MAGNET WAS IMBEDDED IN GROUND ON THE SOUTH SIDE OF THE
DF8364'MONUMENT.
DF8364'
DF8364'NOTE AUTHORIZED PERSONNEL ONLY BEYOND THIS POINT.
DF8364'
DF8364'NOTE FOR KEY CONTACT SOUTH FLORIDA WATER MANAGEMENT DISTRICT.
DF8364
DF8364 STATION RECOVERY (2005)
DF8364
DF8364'RECOVERY NOTE BY MACTEC ENGINEERING AND CONSULTING 2005 (CBG)
DF8364'RECOVERED AS DESCRIBED
DF8364
DF8364 STATION RECOVERY (2009)
DF8364
DF8364'RECOVERY NOTE BY PICKETT AND ASSOCIATES 2009 (JM)
DF8364'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:02

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.8
1        National Geodetic Survey,   Retrieval Date = APRIL 12, 2016
 AH8815 ***********************************************************************
 AH8815  DESIGNATION -  W 462
 AH8815  PID         -  AH8815
 AH8815  STATE/COUNTY-  FL/HIGHLANDS
 AH8815  COUNTRY     -  US
 AH8815  USGS QUAD   -  BASINGER NW (1972)
 AH8815
 AH8815                        *CURRENT SURVEY CONTROL
 AH8815  ______________________________________________________________________
 AH8815* NAD 83(1986) POSITION- 27 28 10.      (N) 081 13 22.      (W)    SCALED
 AH8815* NAVD 88 ORTHO HEIGHT -     18.808 (meters)        61.71   (feet) ADJUSTED
 AH8815  ______________________________________________________________________
 AH8815  GEOID HEIGHT    -        -26.087 (meters)                       GEOID12B
 AH8815  DYNAMIC HEIGHT  -         18.779 (meters)        61.61   (feet) COMP
 AH8815  MODELED GRAVITY -    979,130.7   (mgal)                         NAVD 88
 AH8815
 AH8815  VERT ORDER      -  SECOND    CLASS I
 AH8815
 AH8815.The horizontal coordinates were scaled from a topographic map and have
 AH8815.an estimated accuracy of +/- 6 seconds.
 AH8815.
 AH8815.The orthometric height was determined by differential leveling and
 AH8815.adjusted by the NATIONAL GEODETIC SURVEY
 AH8815.in July 1999.
 AH8815
 AH8815.Significant digits in the geoid height do not necessarily reflect accuracy.
 AH8815.GEOID12B height accuracy estimate available here.
 AH8815
 AH8815.The dynamic height is computed by dividing the NAVD 88
 AH8815.geopotential number by the normal gravity value computed on the
 AH8815.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AH8815.degrees latitude (g = 980.6199 gals.).
 AH8815
 AH8815.The modeled gravity was interpolated from observed gravity values.
 AH8815
 AH8815;                    North         East     Units  Estimated Accuracy
 AH8815;SPC FL E     -   347,440.      177,980.      MT  (+/- 180 meters Scaled)
 AH8815
 AH8815                          SUPERSEDED SURVEY CONTROL
 AH8815
 AH8815.No superseded survey control is available for this station.
 AH8815
 AH8815_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML779384(NAD 83)
 AH8815
 AH8815_MARKER: F = FLANGE-ENCASED ROD
 AH8815_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
 AH8815_STAMPING: W 462 1997
 AH8815_MARK LOGO: NGS
 AH8815_PROJECTION: FLUSH
```

AH8815_MAGNETIC: N = NO MAGNETIC MATERIAL
AH8815_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AH8815_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AH8815+SATELLITE: SATELLITE OBSERVATIONS - 1997
AH8815_ROD/PIPE-DEPTH: 18.2 meters
AH8815
AH8815 HISTORY - Date Condition Report By
AH8815 HISTORY - 1997 MONUMENTED FLDEP
AH8815
AH8815 STATION DESCRIPTION
AH8815
AH8815'DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
AH8815'THE MARK IS ABOUT 32.6 MI (52.5 KM) NORTHWEST OF OKEECHOBEE, 3.4 MI
AH8815'(5.5 KM) NORTHEAST OF LORIDA, 3.0 WEST OF KISSIMMEE RIVER IN SECTION
AH8815'3, TOWNSHIP 35 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM THE POST
AH8815'OFFICE IN LORIDA, GO SOUTHEAST ON U.S. HIGHWAY 98 FOR 1.05 MI (1.69
AH8815'KM) TO THE JUNCTION OF BLUFF HAMMOCK ROAD ON THE LEFT, TURN LEFT ON
AH8815'BLUFF HAMMOCK ROAD AND GO NORTHEAST FOR 2.5 MI (4.0 KM) TO THE MARK ON
AH8815'THE RIGHT, A STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF 59.6
AH8815'FT (18.2 M) WITH A LOGO CAP FLUSH WITH THE GROUND AND 0.5 FT (15.2 CM)
AH8815'BELOW THE LEVEL OF BLUFF HAMMOCK ROAD, THE DATUM POINT IS RECESSED 0.7
AH8815'FT (21.3 CM) BELOW THE LEVEL OF THE LOGO CAP. LOCATED 74.5 FT (22.7 M)
AH8815'SOUTH OF THE CENTER OF A METAL GATE, 73.5 FT (22.4 M) NORTH-NORTHEAST
AH8815'OF A TWIN OAK TREE, 31.0 FT (9.4 M) EAST OF THE CENTERLINE OF BLUFF
AH8815'HAMMOCK ROAD AND 0.8 FT (24.4 CM) WEST OF A CARSONITE WITNESS POST AND
AH8815'BARBWIRE FENCES. NOTE ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH
AH8815'LOGO CAP.

*** retrieval complete.
Elapsed Time = 00:00:02

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.8
1         National Geodetic Survey,   Retrieval Date = APRIL 12, 2016
 AH9331 ***********************************************************************
 AH9331  DESIGNATION -  KRR PC 25
 AH9331  PID         -  AH9331
 AH9331  STATE/COUNTY-  FL/OKEECHOBEE
 AH9331  COUNTRY     -  US
 AH9331  USGS QUAD   -  BASINGER NW (1972)
 AH9331
 AH9331                        *CURRENT SURVEY CONTROL
 AH9331  ______________________________________________________________________
 AH9331* NAD 83(2011) POSITION- 27 28 27.33617(N) 081 08 46.31393(W)   ADJUSTED
 AH9331* NAD 83(2011) ELLIP HT-   -11.189 (meters)        (06/27/12)   ADJUSTED
 AH9331* NAD 83(2011) EPOCH    -  2010.00
 AH9331* NAVD 88 ORTHO HEIGHT -    14.947 (meters)       49.04   (feet) ADJUSTED
 AH9331  ______________________________________________________________________
 AH9331  NAD 83(2011) X  -    871,586.526 (meters)                     COMP
 AH9331  NAD 83(2011) Y  - -5,595,348.414 (meters)                     COMP
 AH9331  NAD 83(2011) Z  -  2,924,934.832 (meters)                     COMP
 AH9331  LAPLACE CORR    -         -0.62  (seconds)                    DEFLEC12B
 AH9331  GEOID HEIGHT    -        -26.138 (meters)                     GEOID12B
 AH9331  DYNAMIC HEIGHT  -         14.924 (meters)       48.96   (feet) COMP
 AH9331  MODELED GRAVITY -    979,137.3   (mgal)                       NAVD 88
 AH9331
 AH9331  VERT ORDER      -  SECOND    CLASS I
 AH9331
 AH9331  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AH9331  Standards:
 AH9331         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AH9331            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
 AH9331  ------------------------------------------------------------------
 AH9331  NETWORK    1.06   1.55          0.45   0.42   0.79      0.04952250
 AH9331  ------------------------------------------------------------------
 AH9331  Click here for local accuracies and other accuracy information.
 AH9331
 AH9331
 AH9331.The horizontal coordinates were established by GPS observations
 AH9331.and adjusted by the National Geodetic Survey in June 2012.
 AH9331
 AH9331.NAD 83(2011) refers to NAD 83 coordinates where the reference
 AH9331.frame has been affixed to the stable North American tectonic plate. See
 AH9331.NA2011 for more information.
 AH9331
 AH9331.The horizontal coordinates are valid at the epoch date displayed above
 AH9331.which is a decimal equivalence of Year/Month/Day.
 AH9331
 AH9331.The orthometric height was determined by differential leveling and
 AH9331.adjusted by the NATIONAL GEODETIC SURVEY
 AH9331.in May 2004.
 AH9331
 AH9331.Significant digits in the geoid height do not necessarily reflect accuracy.
```

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AH9331.GEOID12B height accuracy estimate available here.
AH9331
AH9331.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AH9331
AH9331.The Laplace correction was computed from DEFLEC12B derived deflections.
AH9331
AH9331.The ellipsoidal height was determined by GPS observations
AH9331.and is referenced to NAD 83.
AH9331
AH9331.The dynamic height is computed by dividing the NAVD 88
AH9331.geopotential number by the normal gravity value computed on the
AH9331.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AH9331.degrees latitude (g = 980.6199 gals.).
AH9331
AH9331.The modeled gravity was interpolated from observed gravity values.
AH9331
AH9331. The following values were computed from the NAD 83(2011) position.
AH9331
AH9331;                    North         East     Units Scale Factor Converg.
AH9331;SPC FL E     -   347,960.924   185,551.314   MT  0.99994375   -0 04 02.8
AH9331;SPC FL E     - 1,141,601.80    608,762.94    sFT  0.99994375   -0 04 02.8
AH9331;UTM  17      - 3,038,974.183   485,556.244   MT  0.99960258   -0 04 02.8
AH9331
AH9331!             -  Elev Factor  x  Scale Factor =   Combined Factor
AH9331!SPC FL E     -   1.00000176  x   0.99994375  =   0.99994551
AH9331!UTM  17      -   1.00000176  x   0.99960258  =   0.99960434
AH9331
AH9331                          SUPERSEDED SURVEY CONTROL
AH9331
AH9331  NAD 83(2007)-  27 28 27.33644(N)    081 08 46.31506(W) AD(2002.00) 0
AH9331  NAD 83(1999)-  27 28 27.33629(N)    081 08 46.31502(W) AD(       ) 1
AH9331  ELLIP H (05/31/01)  -11.167  (m)                       GP(       ) 4 1
AH9331  NAD 83(1990)-  27 28 27.33527(N)    081 08 46.31469(W) AD(       ) 1
AH9331  ELLIP H (06/01/99)  -11.168  (m)                       GP(       ) 4 1
AH9331  NAVD 88 (06/01/99)   15.0    (m)  GEOID96 model used   GPS OBS
AH9331
AH9331.Superseded values are not recommended for survey control.
AH9331
AH9331.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AH9331.See file dsdata.txt to determine how the superseded data were derived.
AH9331
AH9331_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML8555638974(NAD 83)
AH9331
AH9331_MARKER: DD = SURVEY DISK
AH9331_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AH9331_STAMPING: KRR PC 25 1997 JAX DIST
AH9331_MARK LOGO: USE
AH9331_PROJECTION: RECESSED 8 CENTIMETERS
AH9331_MAGNETIC: O = OTHER; SEE DESCRIPTION
AH9331_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AH9331+STABILITY: SURFACE MOTION
AH9331_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AH9331+SATELLITE: SATELLITE OBSERVATIONS - January 15, 2011
AH9331
AH9331  HISTORY     - Date     Condition        Report By
AH9331  HISTORY     - 1997     MONUMENTED       USE
AH9331  HISTORY     - 20011005 GOOD             FLDEP
AH9331  HISTORY     - 20110115 GOOD             NOGUCO
AH9331
AH9331                          STATION DESCRIPTION
```

AH9331
AH9331'DESCRIBED BY US ENGINEERS 1997
AH9331'THE STATION IS ABOUT 24.7 MI (39.7 KM) NORTHWEST OF OKEECHOBEE, 7.2 MI
AH9331'(11.6 KM) EAST NORTHEAST OF LORIDA, 1.6 MI (2.6 KM) NORTHEAST OF
AH9331'KISSIMMEE RIVER CANAL C-38 IN SECTION 32, TOWNSHIP 34 SOUTH, RANGE 32
AH9331'EAST. TO REACH STATION FROM THE INTERSECTION OF U.S.HIGHWAY 98/441
AH9331'(PARROT AVE) AND U.S.HIGHWAY 98/STATE HIGHWAY 70 (N PARK ST) IN
AH9331'OKEECHOBEE, GO WEST ON U.S.HIGHWAY 98/STATE HIGHWAY 70 FOR 1.15 MI
AH9331'(1.85 KM) , THEN TURN RIGHT AND CONTINUE NORTHWEST ON U.S.HIGHWAY
AH9331'98/STATE HIGHWAY 700 FOR 15.9 MI (25.6 KM) TO A JUNCTION WITH MICCO
AH9331'BLUFF ROAD (NW 23OTH AVE) AT BASINGER, THEN TURN RIGHT ON MICCO BLUFF
AH9331'ROAD AND GO NORTH FOR 0.2 MI (0.3 KM) , THEN TURN LEFT AND CONTINUE
AH9331'NORTHWESTERLY ON MICCO BLUFF ROAD (NW 160TH DR) FOR 6.1 MI (9.8 KM) TO
AH9331'THE END OF THE PAVED ROAD AND BEGINNING OF A DIRT ROAD (NW 285TH DR)
AH9331'AND CONTINUE TO THE NORTH NORTHWEST FOR 3.4 MI (5.5 KM) TO THE STATION
AH9331'ON THE RIGHT, SET IN THE TOP OF A ROUND CONCRETE MONUMENT 0.3 FT (9.1
AH9331'CM) BELOW GROUND LEVEL. LOCATED 36 FT (11.0 M) NORTHEAST OF THE
AH9331'CENTERLINE OF ROAD (NW 285TH DR) , 50.5 FT (15.4 M) NORTH OF CENTER OF
AH9331'ROAD/CATTLE GUARD AT CENTER OF EAST-WEST FENCELINE OPENING, 31.5 FT
AH9331'(9.6 M) NORTH OF A 25 FT (7.6 M) HIGH CONCRETE POLE (NORTHMOST OF 2) ,
AH9331'1.0 FT (0.3 M) SOUTHWEST OF WOOD R/W FENCE POST WITH U.S.E.WITNESS
AH9331'SIGN ATTACHED. RECOVERABLE WITH MAGNETIC LOCATOR, MAGNETIC SOURCE
AH9331'UNKNOWN.
AH9331
AH9331 STATION RECOVERY (2001)
AH9331
AH9331'RECOVERY NOTE BY FL DEPT OF ENV PRO 2001 (JLM)
AH9331'THE MARK IS ABOUT 27.7 MI NORTHWEST OF OKEECHOBEE, 9.9 MI NORTHWEST OF
AH9331'BASINGER, IN
AH9331'SECTION 32, TOWNSHIP 34 SOUTH, RANGE 32 EAST.
AH9331'
AH9331'TO REACH THE MARK FROM THE INTERSECTION OF U.S. HIGHWAY 441 (PARROTT
AH9331'STREET) AND U.S.
AH9331'HIGHWAY 98 (STATE HIGHWAY 70, PARK STREET) IN OKEECHOBEE, GO WEST ON
AH9331'U.S. HIGHWAY 98
AH9331'(STATE HIGHWAY 70, PARK STREET) FOR 1.15 MI TO THE JUNCTION OF U.S.
AH9331'HIGHWAY 98 NORTH ON
AH9331'THE RIGHT, TURN RIGHT ON U.S. HIGHWAY 98 AND GO NORTHWESTERLY FOR 0.65
AH9331'MI TO THE
AH9331'RAILROAD TRACKS, CONTINUE NORTHWESTERLY ON U.S. HIGHWAY 98 FOR 11.9 MI
AH9331'TO THE JUNCTION
AH9331'OF COUNTY ROAD 68 EAST ON THE RIGHT, CONTINUE NORTHWESTERLY ON U.S.
AH9331'HIGHWAY 98 FOR
AH9331'1.85 MI TO THE JUNCTION OF NORTHWEST 176TH AVENUE (COUNTY ROAD 700-A)
AH9331'ON THE RIGHT,
AH9331'CONTINUE NORTHWESTERLY ON U.S. HIGHWAY 98 FOR 1.7 MI TO THE JUNCTION
AH9331'OF NORTHWEST
AH9331'203RD AVENUE (MICCO BLUFF ROAD) ON THE RIGHT, TURN RIGHT ON NORTHWEST
AH9331'203RD AVENUE
AH9331'(MICCO BLUFF ROAD) AND GO NORTH-NORTHWESTERLY FOR 0.2 MI TO THE
AH9331'JUNCTION OF NORTHWEST
AH9331'160TH DRIVE (MICCO BLUFF ROAD, COUNTY ROAD 68), TURN LEFT ON NORTHWEST
AH9331'160TH DRIVE
AH9331'(MICCO BLUFF ROAD, COUNTY ROAD 68) AND GO WEST-NORTHWESTERLY FOR 6.15
AH9331'MI TO THE END OF
AH9331'THE PAVED ROAD AND THE JUNCTION OF A DIRT ROAD LEADING NORTHWEST AND
AH9331'THE BEGINNING OF
AH9331'NORTHWEST 285TH DRIVE (A DIRT ROAD LEADING NORTHWESTERLY), BEAR RIGHT
AH9331'ON NORTHWEST
AH9331'285TH DRIVE AND GO NORTHWEST FOR 2.8 MI TO A EAST-WEST FENCELINE

AH9331'OPENING AND THE
AH9331'JUNCTION OF A DIRT ROAD ON THE LEFT LEADING WEST, PASSING THROUGH THE
AH9331'OPENING
AH9331'CONTINUE NORTHWEST ON THE DIRT ROAD (NORTHWEST 285TH DRIVE) FOR 0.7 MI
AH9331'TO AN
AH9331'EAST-WEST FENCELINE OPENING WITH ONE 25.0 FT CONCRETE POLE ON BOTH
AH9331'SIDES OF THE ROAD
AH9331'AND THE MARK ON THE RIGHT, SET IN THE TOP OF A ROUND CONCRETE MONUMENT
AH9331'RECESSED 0.3 FT
AH9331'BELOW THE LEVEL OF THE GROUND AND BELOW THE LEVEL OF NORTHWEST 285TH
AH9331'DRIVE.
AH9331'
AH9331'LOCATED 50.5 FT NORTH OF THE APPROXIMATE CENTERLINE OF THE ROAD AND
AH9331'CATTLE GUARD AT
AH9331'THE CENTER OF A EAST-WEST FENCELINE OPENING, 36.0 FT NORTHEAST OF THE
AH9331'APPROXIMATE
AH9331'CENTERLINE OF THE ROAD, 31.5 FT NORTH OF A 25.0 FT HIGH CONCRETE POLE
AH9331'(NORTHMOST OF 2)
AH9331'AND 1.0 FT SOUTHWEST OF A WOODEN FENCE POST WITH A U.S.E. WITNESS SIGN
AH9331'ATTACHED.
AH9331'
AH9331'NOTE AUTHORIZED PERSONNEL ONLY BEYOND THIS POINT.
AH9331'
AH9331'NOTE THE MARK WAS RECOVERED WITH A MAGNETIC LOCATOR.
AH9331
AH9331 STATION RECOVERY (2011)
AH9331
AH9331'RECOVERY NOTE BY NORTHROP GRUMMON CORPORATION 2011 (MR)
AH9331'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:02

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.8
1        National Geodetic Survey,   Retrieval Date = APRIL 12, 2016
 DF8361 ***********************************************************************
 DF8361  DESIGNATION -  E 555
 DF8361  PID         -  DF8361
 DF8361  STATE/COUNTY-  FL/OKEECHOBEE
 DF8361  COUNTRY     -  US
 DF8361  USGS QUAD   -  FORT KISSIMMEE (1972)
 DF8361
 DF8361                         *CURRENT SURVEY CONTROL
 DF8361  ______________________________________________________________________
 DF8361* NAD 83(1986) POSITION- 27 30 27.      (N) 081 10 36.      (W)    SCALED
 DF8361* NAVD 88 ORTHO HEIGHT -     14.687 (meters)        48.19   (feet) ADJUSTED
 DF8361  ______________________________________________________________________
 DF8361  GEOID HEIGHT    -        -26.153 (meters)                       GEOID12B
 DF8361  DYNAMIC HEIGHT  -         14.665 (meters)        48.11   (feet) COMP
 DF8361  MODELED GRAVITY -    979,136.5   (mgal)                         NAVD 88
 DF8361
 DF8361  VERT ORDER      -  SECOND    CLASS I
 DF8361
 DF8361.The horizontal coordinates were scaled from a topographic map and have
 DF8361.an estimated accuracy of +/- 6 seconds.
 DF8361.
 DF8361.The orthometric height was determined by differential leveling and
 DF8361.adjusted by the NATIONAL GEODETIC SURVEY
 DF8361.in May 2004.
 DF8361
 DF8361.Significant digits in the geoid height do not necessarily reflect accuracy.
 DF8361.GEOID12B height accuracy estimate available here.
 DF8361
 DF8361.The dynamic height is computed by dividing the NAVD 88
 DF8361.geopotential number by the normal gravity value computed on the
 DF8361.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DF8361.degrees latitude (g = 980.6199 gals.).
 DF8361
 DF8361.The modeled gravity was interpolated from observed gravity values.
 DF8361
 DF8361;                    North         East     Units  Estimated Accuracy
 DF8361;SPC FL E     -   351,650.      182,550.      MT  (+/- 180 meters Scaled)
 DF8361
 DF8361                           SUPERSEDED SURVEY CONTROL
 DF8361
 DF8361.No superseded survey control is available for this station.
 DF8361
 DF8361_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML825426(NAD 83)
 DF8361
 DF8361_MARKER: F = FLANGE-ENCASED ROD
 DF8361_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
 DF8361_STAMPING: E 555 2001
 DF8361_MARK LOGO: NGS
 DF8361_PROJECTION: FLUSH
```

DF8361_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
DF8361_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
DF8361_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DF8361+SATELLITE: SATELLITE OBSERVATIONS - October 06, 2001
DF8361_ROD/PIPE-DEPTH: 13.2 meters
DF8361
DF8361 HISTORY - Date Condition Report By
DF8361 HISTORY - 20011006 MONUMENTED FLDEP
DF8361
DF8361 STATION DESCRIPTION
DF8361
DF8361'DESCRIBED BY FL DEPT OF ENV PRO 2001 (JLM)
DF8361'THE MARK IS ABOUT 30.7 MI NORTHWEST OF OKEECHOBEE, 12.9 MI NORTHWEST
DF8361'OF BASINGER, IN
DF8361'ESTIMATED SECTION 24, TOWNSHIP 34 SOUTH, RANGE 31 EAST.
DF8361'
DF8361'TO REACH THE MARK FROM THE INTERSECTION OF U.S. HIGHWAY 441 (PARROTT
DF8361'STREET) AND U.S.
DF8361'HIGHWAY 98 (STATE HIGHWAY 70, PARK STREET) IN OKEECHOBEE, GO WEST ON
DF8361'U.S. HIGHWAY 98
DF8361'(STATE HIGHWAY 70, PARK STREET) FOR 1.15 MI TO THE JUNCTION OF U.S.
DF8361'HIGHWAY 98 NORTH ON
DF8361'THE RIGHT, TURN RIGHT ON U.S. HIGHWAY 98 AND GO NORTHWESTERLY FOR 0.65
DF8361'MI TO THE
DF8361'RAILROAD TRACKS, CONTINUE NORTHWESTERLY ON U.S. HIGHWAY 98 FOR 11.9 MI
DF8361'TO THE JUNCTION
DF8361'OF COUNTY ROAD 68 EAST ON THE RIGHT, CONTINUE NORTHWESTERLY ON U.S.
DF8361'HIGHWAY 98 FOR
DF8361'1.85 MI TO THE JUNCTION OF NORTHWEST 176TH AVENUE (COUNTY ROAD 700-A)
DF8361'ON THE RIGHT,
DF8361'CONTINUE NORTHWESTERLY ON U.S. HIGHWAY 98 FOR 1.7 MI TO THE JUNCTION
DF8361'OF NORTHWEST
DF8361'203RD AVENUE (MICCO BLUFF ROAD) ON THE RIGHT, TURN RIGHT ON NORTHWEST
DF8361'203RD AVENUE
DF8361'(MICCO BLUFF ROAD) AND GO NORTH-NORTHWESTERLY FOR 0.2 MI TO THE
DF8361'JUNCTION OF NORTHWEST
DF8361'160TH DRIVE (MICCO BLUFF ROAD, COUNTY ROAD 68), TURN LEFT ON NORTHWEST
DF8361'160TH DRIVE
DF8361'(MICCO BLUFF ROAD, COUNTY ROAD 68) AND GO WEST-NORTHWESTERLY FOR 6.15
DF8361'MI TO THE END OF
DF8361'THE PAVED ROAD AND THE JUNCTION OF A DIRT ROAD LEADING NORTHWEST AND
DF8361'THE BEGINNING OF
DF8361'NORTHWEST 285TH DRIVE (A DIRT ROAD LEADING NORTHWESTERLY), BEAR RIGHT
DF8361'ON NORTHWEST
DF8361'285TH DRIVE AND GO NORTHWESTERLY FOR 2.8 MI TO AN EAST-WEST FENCELINE
DF8361'OPENING AND THE
DF8361'JUNCTION OF A DIRT ROAD ON THE LEFT LEADING WEST, PASSING THROUGH THE
DF8361'OPENING
DF8361'CONTINUE NORTHWEST ON THE DIRT ROAD (NORTHWEST 285TH DRIVE) FOR 0.7 MI
DF8361'TO AN
DF8361'EAST-WEST FENCELINE OPENING WITH ONE 25.0 FT CONCRETE POLE ON BOTH
DF8361'SIDES OF THE ROAD,
DF8361'CONTINUE NORTHWEST ON THE DIRT ROAD FOR 0.7 MI TO THE INTERSECTION OF
DF8361'AN EAST-WEST
DF8361'DIRT ROAD, CONTINUE NORTHWEST ON THE DIRT ROAD FOR 2.3 MI TO A METAL
DF8361'GATE AND THE MARK
DF8361'ON THE RIGHT, A STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF
DF8361'43.4 FT WITH A NGS
DF8361'LOGO CAP FLUSH WITH THE GROUND AND LEVEL WITH THE ROAD, THE DATUM
DF8361'POINT IS RECESSED

DF8361'0.5 FT BELOW THE LEVEL OF THE NGS LOGO CAP.
DF8361'
DF8361'LOCATED 50.0 FT SOUTHEAST OF THE NORTHWEST CORNER OF A FENCE, 45.5 FT
DF8361'NORTHEAST OF THE
DF8361'APPROXIMATE CENTERLINE OF THE ROAD AND A STEEL GATE, 43.2 FT SOUTHEAST
DF8361'OF A BARBWIRE
DF8361'FENCE AND 1.0 FT SOUTHWEST OF A CARSONITE WITNESS POST.
DF8361'
DF8361'NOTE ACCESS TO THE DATUM POINT IS HAD THROUGH A 5-INCH NGS LOGO CAP.
DF8361'
DF8361'NOTE A MAGNET WAS IMBEDDED IN THE GROUND ON THE SOUTH SIDE OF THE
DF8361'MONUMENT.
DF8361'
DF8361'NOTE AUTHORIZED PERSONNEL ONLY BEYOND THIS POINT.
DF8361'
DF8361'NOTE FOR KEY CONTACT SOUTH FLORIDA WATER MANAGEMENT DISTRICT.

*** retrieval complete.
Elapsed Time = 00:00:02

H 555

E 555

PC-62

KRDR 02

KRR PC 25

W 462

Legend

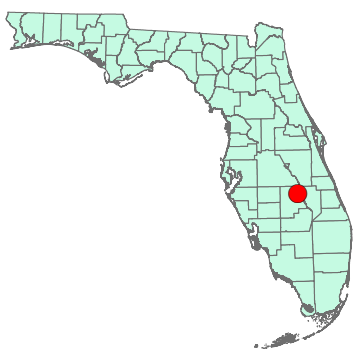
- 1st Order Control
- 2nd Order Control
- Monument Location

0 1,300 2,600 5,200 7,800 Feet

1 inch equals 2,640 feet

N

Location Sketch



KRDR 02 & PC-62

South Florida Water Management District
Kissimmee River Wells

NICK MILLER, INC.

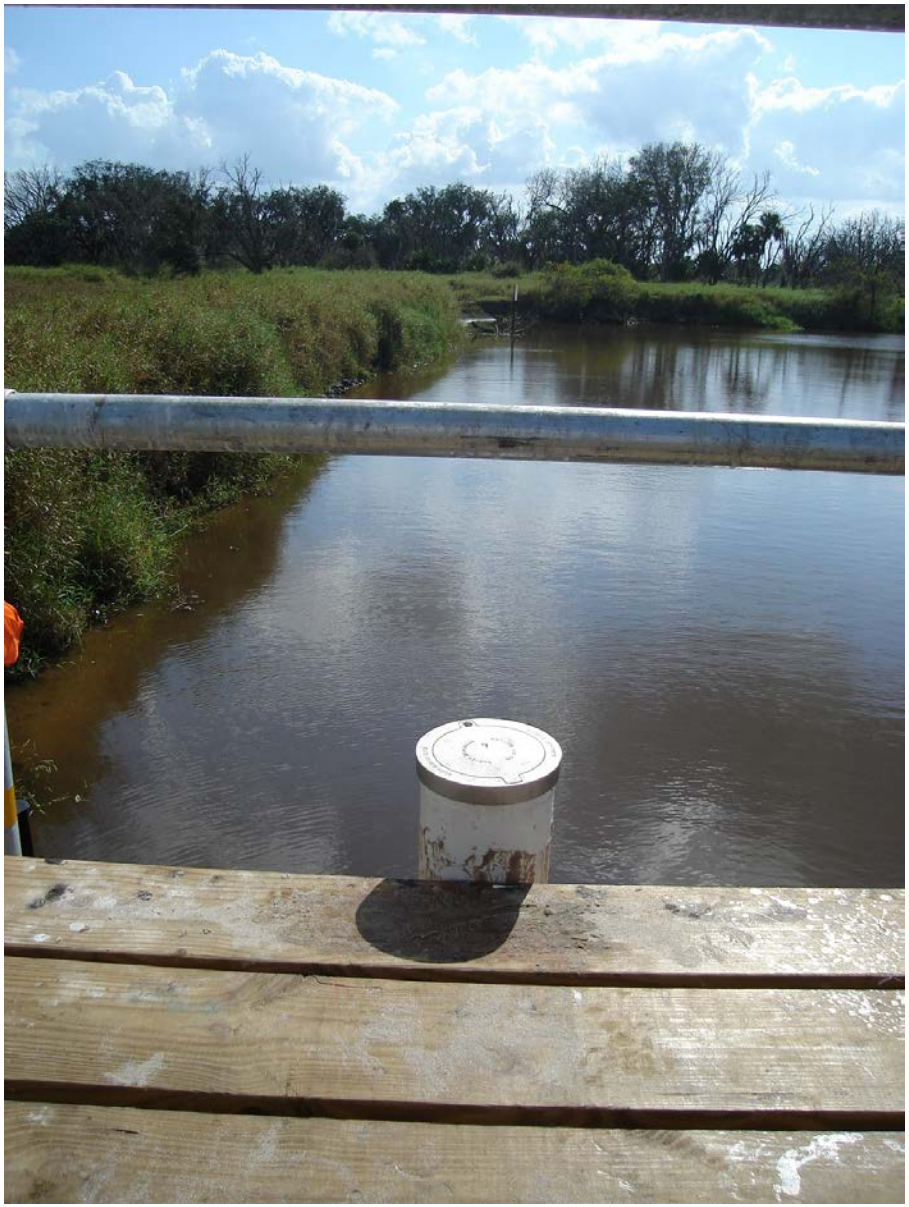
PC-62

Nick Miller, Inc.
Date of Photo: December 18, 2006
View: Looking at the well on structure facing west

PC-62

Nick Miller, Inc.
Date of Photo: December 18, 2006
View: Close-up of the well showing the contractor's markings

PC-62



Nick Miller, Inc.
Date of Photo: December 18, 2006
View: Looking at the benchmark facing south

PC-62

Nick Miller, Inc.
Date of Photo: December 18, 2006
View: A top view of the benchmark

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

COUNTY HIGHLANDS	**PROJECT Hydrology - Kissimmee River & Lake Marian Wells**	**DESIGNATION PC 62**
SECTION 23	**TOWNSHIP 34 SOUTH**	**RANGE 31 EAST**

GEOGRAPHIC INDEX OF QUAD

Established by Nick Miller Inc. **Recovered by**	**NAME OF QUADRANGLE** **FORT KISSIMMEE**
SURVEYOR Stephen M. Gordon **DATE** 12/28/2006	**FIELD BOOK** 19 **PAGE** 9

HORIZONTAL DATUM: **1927** (**1983**) **Other**_____ (circle one) ZONE (**E**) or **W**

STATE PLANE COORDINATES	**E 590,704 ft**	**N 1,151,489 ft**
LATITUDE: N 27.50139°	**LONGITUDE: W 81.20194°**	
VERTICAL DATUM: MSL **1929** (**1988**) **Other** _____ (circle one)		**EL. 44.65 ft**
VERTICAL DATUM: MSL (**1929**) **1988 Other** _____ (circle one)		**EL. 45.79 ft**

CONTROL ACCURACY: HORIZONTAL 1 2 3 (SUB-METER) (circle one) **VERTICAL 1 2 (3)**
GPS Derived Elevation

DESCRIPTION

To Reach:

FROM INTERSECTION OF US HIGHWAY 98 AND BLUFF HAMMOCK ROAD. HEAD NORTH ON BLUFF HAMMOCK ROAD FOR 4.9 MILES TO GRASS ROAD WITH A LOCKED SFWMD WOODEN GATE. HEAD EAST THROUGH LOCKED SFWMD GATE ON GRASS ROAD FOR 0.3 MILE TO A DIRT DOCKING AREA (ACCESS ROUTE TO KISSISSMEE RIVER). WITH AN AIRBOAT HEAD EAST THROUGH CREEK WATERWAY FOR 0.3 MILE TO KISSISSIMEE RIVER. HEAD NORTH ON KISSISSIMEE RIVER FOR 0.25 MILE TO MARK ON RIGHT. MARK IS LOCATED 2.4 FEET EAST OF SOLAR PANEL'S METAL POST, 5.10 FEET SOUTHEAST OF MONITORING WELL'S 1 FOOT DIAMETER CORRIGATED PIPE, 6.6 FEET SOUTHWEST OF RADIO ANTENNA'S METAL POST. MAGNET SET INSIDE PVC CASING.

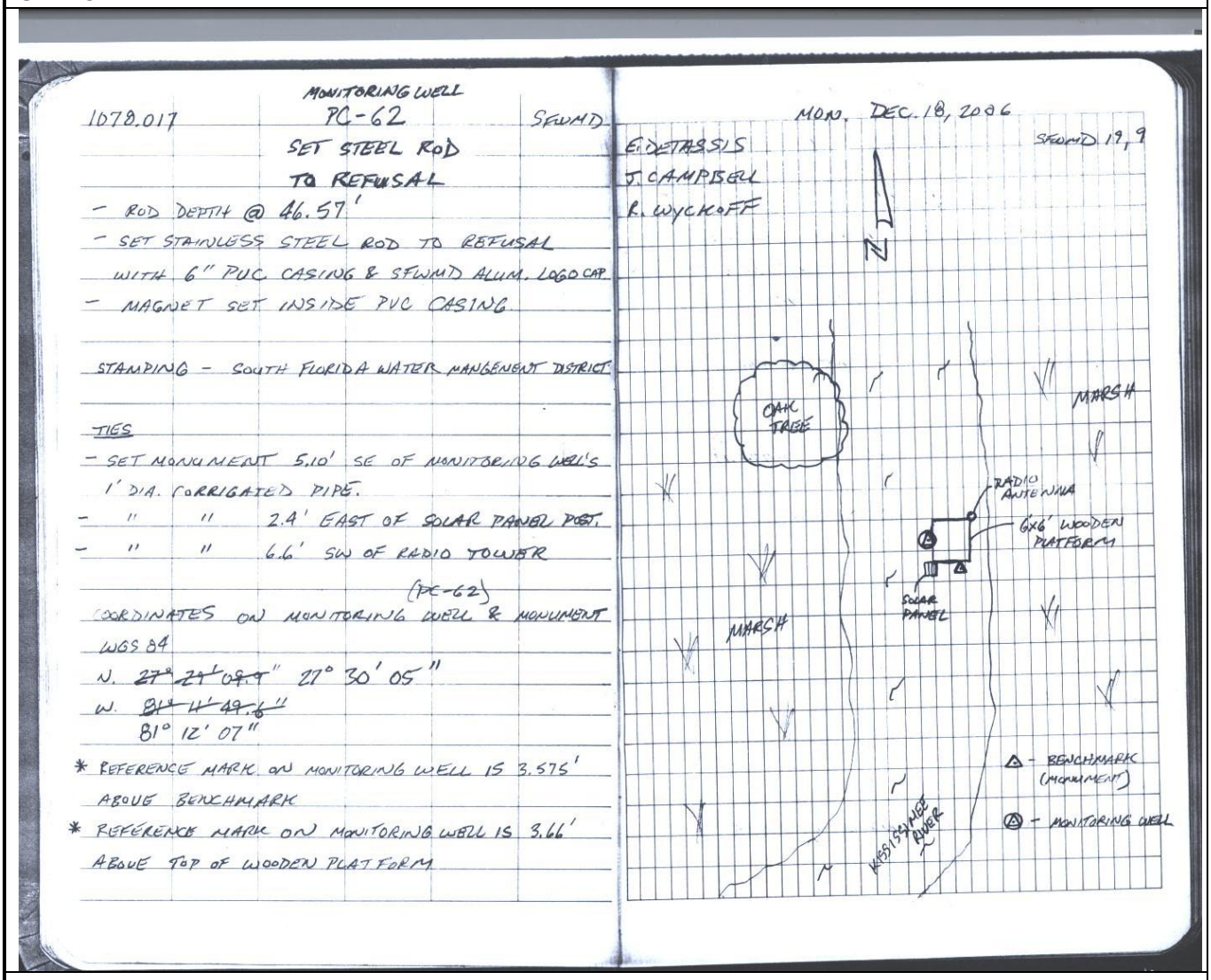
Benchmarks Used: E 555, H 555, W 462, KRR PC 25

Notable Land marks:

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

SKETCH



MONITORING WELL

1078.017 PC-62 SFWMD

SET STEEL ROD TO REFUSAL

- ROD DEPTH @ 46.57'
- SET STAINLESS STEEL ROD TO REFUSAL WITH 6" PVC CASING & SFWMD ALUM. LOGO CAP
- MAGNET SET INSIDE PVC CASING

STAMPING - SOUTH FLORIDA WATER MANGENENT DISTRICT

TIES

- SET MONUMENT 5.10' SE OF MONITORING WELL'S 1' DIA. CORRIGATED PIPE.
- " " 2.4' EAST OF SOLAR PANEL POST.
- " " 6.6' SW OF RADIO TOWER

(PC-62)

COORDINATES ON MONITORING WELL & MONUMENT

WGS 84

N. ~~27° 21' 04.9"~~ 27° 30' 05"

W. ~~81° 11' 49.6"~~ 81° 12' 07"

* REFERENCE MARK ON MONITORING WELL IS 3.575' ABOVE BENCHMARK
* REFERENCE MARK ON MONITORING WELL IS 3.66' ABOVE TOP OF WOODEN PLATFORM

MON. DEC. 18, 2006

SFWMD 19,9

E. DETASSIS

J. CAMPBELL

R. WYCKOFF

N

OAK TREE

MARSH

RADIO ANTENNA

6X6' WOODEN PLATFORM

SOLAR PANEL

MARSH

MISSISSINEWA RIVER

△ - BENCHMARK (MONUMENT)

Ⓐ - MONITORING WELL