



Contract # CN60744/3600000504  
Work Order #5



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## **VERTICAL CONTROL SURVEY REPORT**

**SOUTH FLORIDA WATER  
MANAGEMENT DISTRICT**

**FINAL**

February, 2008

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# VERTICAL CONTROL SURVEY REPORT

## Monitoring Well Reference Elevations

for:

**South Florida Water Management District**  
3301 Gun Club Road  
West Palm Beach, FL 33406

by:

**WOOLPERT, INC.**  
Florida Certificate of Authorization # 6777  
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Florida Professional Surveyor and Mapper # 5994

### Summary of Contents

Section 1: Vertical Control Survey Report	Pages 1-8
Summary of Contents .....	1
Overview of the Project .....	2
List of Project Deliverables.....	2
Date of Survey.....	2
Equipment Used .....	3
Project Location .....	3
Survey Methodology .....	3
Summary of Leveling Results .....	4
Well Site Notes and Changes .....	5
Monitoring Well Site Information Summary .....	7
Surveyor's Notes: .....	8
Section 2: Monitoring Well Site Information	Pages 9-37
Section 3: Monitoring Well Site Information in Table Format	Pages 38-39
Section 4: New Benchmark Data Sheets	Pages 40-45

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## Overview of the Project

This survey consisted of establishing or verifying elevations to third-order National Geodetic Survey (NGS) Standards at District Recorder Well Sites. This survey request is associated with the District's Vertical Datum Upgrade Project (VDUP).

There were two main tasks to this survey.

1. Set reference elevations and tags at each well using a local site benchmark (BM) referenced to the National Geodetic Vertical Datum of 1929 (NGVD29).
2. For those sites that did not have a local benchmark, set a concrete monument and establish elevations referencing the North American Vertical Datum of 1988 (NAVD88), and then compute a conversion NGVD29 elevation.

The following list of 25 well sites were included within this Work-Order #5.

BOGAFB	LCYP19	LKISSP	S65A-SCA	TIGER
KENAN	LHAT11	MARIC	S-65GW	TURLAK
KUB009	LHATCH3	ORF61	SEBRING	WR11
KUB012	LJACK	RATHAM	SKYLAK	WR15
LAKWEO	LKIS5B	S63A-SCA	SNIVLY	WR16

Also a part of this report, and the delivery of Work-Order #5 are the following sites: BFARM, KISSFS, WRLGTE. These sites could not be completed during Work-Order #4 for various reasons, so their information is being delivered along with Work-Order #5.

## List of Project Deliverables

In addition to four signed and sealed hard copies of this survey report, the following deliverables were also a part of this project.

1. The survey report in Adobe Acrobat format.
2. Digital photos named by sites.
3. Scanned copies of field notes.
4. Any other digital files associated with the survey.
5. Completed District benchmark description sheet for all set marks.

These digital deliverables will be delivered on CD along with the final signed and sealed copy of this report.

## Date of Survey

All site field operations took place between December 3, 2007 and January 22, 2008.

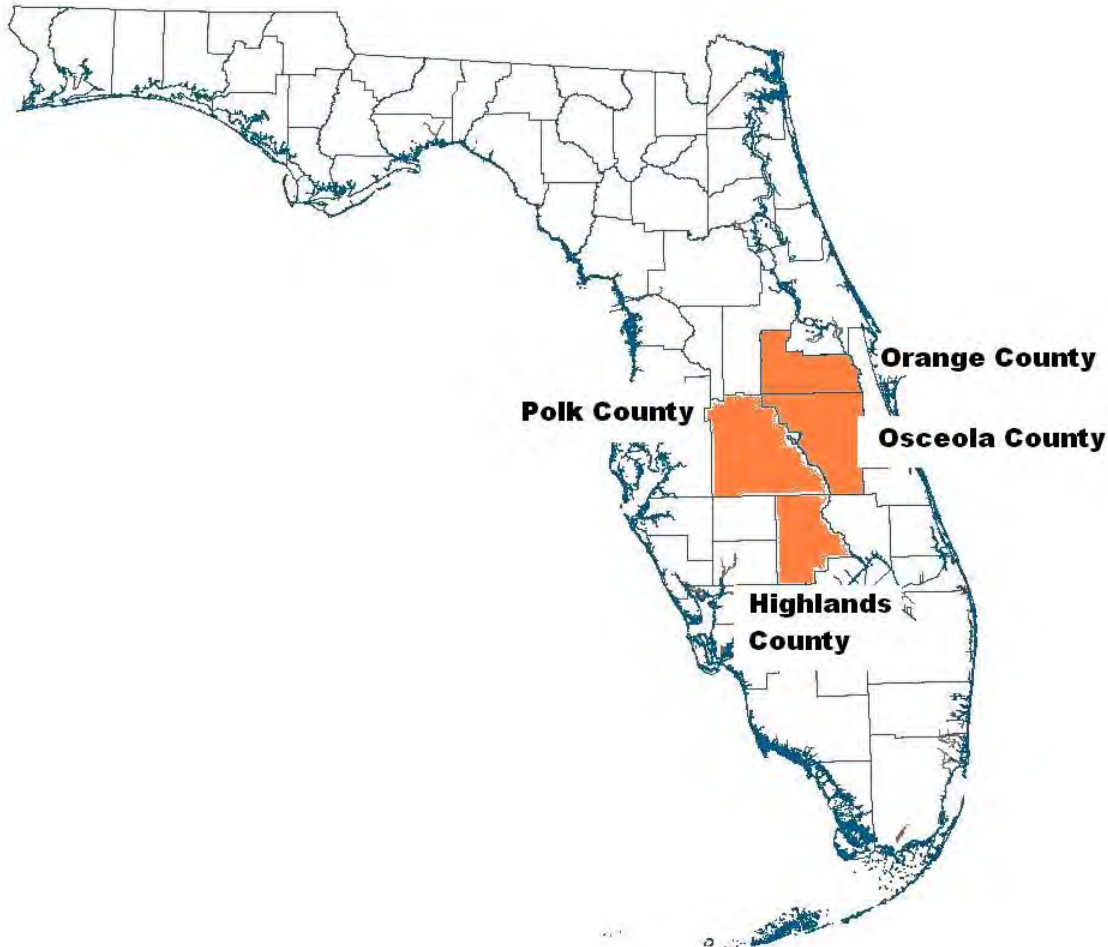
## Equipment Used

Wild NA2002 digital levels were used for all leveling. Latitude and Longitudes were determined for each site using Trimble Pro-XR sub-meter GPS equipment. These Latitudes and Longitudes were then converted to Florida State Plane Coordinates, East Zone, using the United States Army Corps of Engineers software CORPSCON version 6.0.1.

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## Project Location

All well site locations were in Orange, Osceola, Highlands and Polk Counties, Florida.



## Survey Methodology

Woolpert began by setting concrete monuments at each of the locations that did not have a benchmark on site. Monuments consisted of an 8 inch PVC pipe, 40 inches long, filled with poured concrete with an aluminum South Florida Water Management District survey cap.

Following building the concrete monuments, reconnaissance was done to find existing NGS control stations. Once found, elevation were established by using two NGS stations, performing closed level loops ensuring that NGS monument published elevations matched.

At each site, Woolpert used the local site benchmark to set reference elevations for each found well. Woolpert used the local benchmark to perform a closed loop level run from the benchmark to the reference mark to establish a NGVD29 elevation on the well reference point. If the local benchmark did not have a published NGVD29 elevation, Woolpert used the latitude, longitude, and NAVD88 elevation to find a NGVD29 elevation using the United States Army Corps of

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Engineers software CORPSCON version 6.0.1. To determine the sites benchmark latitude and longitude, Woolpert used a Trimble Pro-XR GPS receiver. This GPS receiver obtains differential GPS corrections from Coast Guard stations, resulting in horizontal accuracies of approximately 1 meter, at one sigma.

If a staff gauge existed at the site, Woolpert obtained the water level, the staff gauge reading, and recorded the time and date of those measurements.

Following all leveling and positioning, Woolpert then attached metal tags to each found well. Each tag was stamped with: Site name, well designation, elevation, date, firm name, and reference datum (NGVD29 in all cases).

## Summary of Leveling Results

BFARM was set using NGS station G354, a First-Order Class II benchmark with published elevation of 66.85 feet (NAVD88), and NGS station OSF WELLS BM1, a South Florida Water Management District benchmark with published elevation of 67.514 feet (NAVD88). Leveling began at station G354, passed through BFARM, and ended on OSF WELLS BM1 with a leveled elevation of 67.472. Total leveling distance was 6.63 miles resulting in a closure of 0.042 (0.077 allowable). Resulting elevation for BFARM was 64.09 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 65.02 feet.

WR11 was set using NGS station OS134, a Second-Order Class I benchmark with published elevation of 70.65 feet (NAVD88), and NGS station OS135, a Second-Order Class I benchmark with published elevation of 64.75 feet (NAVD88). Leveling began at station OS134, passed through WR11, and ended on OS135 with a leveled elevation of 64.65. Total leveling distance was 18.99 miles resulting in a closure of 0.10 (0.13 allowable). Resulting elevation for WR11 was 67.59 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 68.66 feet.

WR15 was set using NGS station OS134, a Second-Order Class I benchmark with published elevation of 70.65 feet (NAVD88), and NGS station OS135, a Second-Order Class I benchmark with published elevation of 64.75 feet (NAVD88). Leveling began at station OS134, passed through WR15, and ended on OS135 with a leveled elevation of 64.65. Total leveling distance was 18.99 miles resulting in a closure of 0.10 (0.13 allowable). Resulting elevation for WR15 was 62.01 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 63.09 feet.

For Well Site WR16, there existed a BM “WR11 1996” but it only had a published NGVD29 elevation of 66.19 feet. It did not have a published NAVD88 elevation. To establish an NAVD88 elevation, Woolpert used NGS station OS134, a Second-Order Class I benchmark with published elevation of 70.65 feet (NAVD88), and NGS station OS135, a Second-Order Class I benchmark with published elevation of 64.75 feet (NAVD88). Leveling began at station OS134, passed through “WR11 1996”, and ended on OS135 with a leveled elevation of 64.65. Total leveling distance was 18.99 miles resulting in a closure of 0.10 (0.13 allowable). Resulting elevation for “WR11 1996” was 65.14 feet NAVD88. As a check, the NAVD88 elevation was converted to NGVD29 using CORPSCON which yielded a value of 66.23 feet.

WRLGTE was set using NGS station L-715-003, a Second-Order Class I benchmark with published elevation of 91.44 feet (NAVD88), and NGS station L-659-024, a Second-Order Class I benchmark with published elevation of 102.44 feet (NAVD88). Leveling began at station L-715-003, passed through WRLGTE, and ended on L-659-024 with a leveled elevation of 102.43. Total leveling distance was 3.91 miles resulting in a closure of 0.01 (0.06 allowable). Resulting elevation for WRLGTE was 93.14 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 94.03 feet.

TURLAK was set using NGS station GOTHA RESET, a Second-Order Class I benchmark with published elevation of 136.56 feet (NAVD88), and NGS station ORA30, a Second-Order Class I benchmark with published elevation of 110.95 feet (NAVD88). Leveling began at station GOTHA RESET, passed through TURLAK, and ended on ORA30 with a leveled elevation of 111.030. Total leveling distance was 10.0 miles resulting in a closure of 0.08 (0.09 allowable). Resulting elevation for TURLAK was 123.39 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 124.28 feet.

## Well Site Notes and Changes

On January 9<sup>th</sup>, 2008 the District removed the following sites from the project. However, since four of the sites were already completed, Woolpert has included them within this report.

Well Designation	Notes
SKYLAK	
MARIC	~ had already been completed.
LHATCH3	~ had already been completed.
LHAT11	~ decommissioned.
SNIVLY	~ visited but not complete due to BM.
KUB009	~ visited but not complete. Tag existed, and BM was not at site.
KUB012	
LKISSP	~ visited to find BM, but not completed.
TIGER	~ had already been completed.
LKIS5B	
KENAN	~ had already been completed.

The following are project notes pertaining to specific well sites:

### BOGAFB:

This site was completed however the well box was empty at the time of measurements.

### LAKWEO:

The supplied BM from the District (P-13) did not have a published NAVD88 elevation, and could not be found in the field. According to a NGS BM search, the two nearest BM's with NAVD88 elevations would require approximately 20 miles of levels if they were found (BM's L64 and KR122 RESET). It would also require the construction of another concrete monument close to the LAKWEO site. These services could not be performed under this work-order since it would exceed the maximum fee allowed.

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ORF61:

The BM provided by the District for this site was R627, and was not on-site. It required approximately 1.2 miles of leveling.

SEBRING:

Two NGS BM's with NAVD88 elevations could not be found within 5 miles of the SEBRING well site. Woolpert used the on-site BM (SEBRING MW2004) to verify the existing tag in NGVD29.

KISSFS:

Woolpert used the on-site BM (KISSFS 1983) supplied by the District to set a reference tag in NGVD29. Using the two nearest NGS BM's with NAVD88, if found (Q512 and P512), would require approximately six miles of levels and could not be completed under this work-order since it would exceed the maximum fee allowed.

WR11:

Only GW1 was measured at this site, not GW2. GW2 was missed because both wells share the same box and the field crews did not notice the second well.

WR15:

Only GW1 was measured at this site, not GW2. GW2 was missed because both wells share the same box and the field crews did not notice the second well.

WR16:

Only GW1 was measured at this site, not GW2. GW2 was missed because both wells share the same box and the field crews did not notice the second well.

Therefore, a final list of the Well Sites included within this report are:

BOGAFB	MARIC	S-65GW	WR15
KENAN1	ORF61	SEBRING (no NAVD88)	WR16
LCYP19	RATHAM	TIGER	BFARM
LHATCH3	S63A-SCA	TURLAK	KISSFS (no NAVD88)
LJACK	S65A-SCA	WR11	WRLGTE

# Monitoring Well Site Information Summary

In Section 2, all well site information is presented in the same format.

**EXAMPLE:**

Site Name		Sensor		
Example		GW1		
<b>Latitude</b>	<b>Longitude</b>	<b>Northing</b>	<b>Easting</b>	
28° 23' 31.937"	81° 22' 31.937"	1472251	538267	
<b>Section</b>	<b>Township</b>	<b>Range</b>	<b>County</b>	<b>Quad</b>
13	24	29	Orange	Lake Jessamine
<b>Benchmark Information:</b>				
<b>Name</b>	<b>Existing / Set</b>	<b>NAVD88</b>	<b>NGVD29</b>	
BOG527	Set	80.851	81.876	
<b>Reference Point Information:</b>				
<b>Stamped Elevation (NGVD29)</b>		<b>Stamped Date</b>	<b>By Firm</b>	
87.50		9-21-07	Woolpert, Inc.	
Note: Reference mark at edge of wood as marked.				
<b>Staff Gauge Information:</b>				
<b>Water Elevation (NGVD29)</b>	<b>Gauge Reading</b>	<b>Time of Reading</b>	<b>Date of Reading</b>	
79.928	80.05	09:25	9-21-07	

**NOTES:**

1. Latitude and longitude were derived at the benchmark location, and is given to assist in locating the site. It is not meant to accurately locate each well.
2. The Northing and Easting were obtained by using CORPSCON to convert the latitude and longitude to Florida State Plane Coordinates, East Zone, Adjustment of 1990 (NAD83/90) HARN.
3. All measurements and elevations are in feet unless otherwise noted.
4. Reference point elevations were determined by using the stated NGVD29 elevation.
5. The site bench mark NGVD29 elevations were calculated using CORPSCON to convert the published NAVD88 elevation if a published NGVD29 elevation was not available.
6. In some cases the local benchmark only had a NGVD29 elevation, so it was used and no NAVD88 elevation is stated.
7. For some well sites an existing tag was found with a stamped elevation from another source. For these sites, Woolpert verified the tag elevation by leveling from the local site bench mark to the reference point. If the stamped tag elevation was accurate based on the leveling, the tag was left alone.



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Surveyor's Notes:

**THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.**

**THIS REPORT OF SURVEY CONSISTS OF FOUR SECTIONS AS OUTLINED WITHIN THE SUMMARY OF CONTENTS AND IS NOT VALID UNLESS ATTACHED TO THE OTHERS IN THEIR ENTIRETY.**

**ADDITIONS OR DELETIONS TO SURVEY MAPS AND REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.**

**Surveyor and Mapper in Responsible Charge:**

**John A. Cestnick**

Professional Surveyor and Mapper,

License Number: 5994

Signed: \_\_\_\_\_  
(For, and on behalf of the firm Woolpert, Inc.)

Seal:

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## **Section 2: Monitoring Well Site Information**

Site Name		Sensor		
S-65GW		GW1		

<b>Latitude</b> 27° 48' 12.7"	<b>Longitude</b> 81° 11' 51.2"	<b>Northing</b> 1261327	<b>Easting</b> 592302
<b>Section</b> 11	<b>Township</b> 31	<b>Range</b> 31	<b>County</b> Osceola
			<b>Quad</b> Lake Marian SW

**Benchmark Information:**

<b>Name</b> KR 1013	<b>Existing / Set</b> Existing	<b>NAVD88</b> 61.81	<b>NGVD29</b> 63.00
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**Reference Point Information:**

<b>Stamped Elevation (NGVD29)</b> 57.88	<b>Stamped Date</b> 1-17-08	<b>By Firm</b> Woolpert, Inc.
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Note: Reference mark at top of PVC pipe as marked.

**Staff Gauge Information:**

<b>Water Elevation (NGVD29)</b> NA	<b>Gauge Reading</b> NA	<b>Time of Reading</b> NA	<b>Date of Reading</b> NA
---------------------------------------	----------------------------	------------------------------	------------------------------

**To Reach Description:**  
From the intersection of SR 60 and US 441 travel northwest on SR 60 for 19.8 miles to the Kissimmee River, the structure is visible from the road and the wells are on a strip of land on the south side between the boat locks and the water control structure.

Sensor Well Area:



Sensor Well:



Tag Close-up:



Bench Mark:



Bench Mark:



Site Name		Sensor		
S-65GW		GW2		

<b>Latitude</b> 27° 48' 12.7"	<b>Longitude</b> 81° 11' 51.2"	<b>Northing</b> 1261327	<b>Easting</b> 592302
<b>Section</b> 11	<b>Township</b> 31	<b>Range</b> 31	<b>County</b> Osceola
			<b>Quad</b> Lake Marian SW

**Benchmark Information:**

<b>Name</b> KR 1013	<b>Existing / Set</b> Existing	<b>NAVD88</b> 61.81	<b>NGVD29</b> 63.00
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**Reference Point Information:**

<b>Stamped Elevation (NGVD29)</b> 57.98	<b>Stamped Date</b> 1-17-08	<b>By Firm</b> Woolpert, Inc.
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Note: Reference mark at top of PVC pipe as marked.

**Staff Gauge Information:**

<b>Water Elevation (NGVD29)</b> NA	<b>Gauge Reading</b> NA	<b>Time of Reading</b> NA	<b>Date of Reading</b> NA
---------------------------------------	----------------------------	------------------------------	------------------------------

**To Reach Description:**  
From the intersection of SR 60 and US 441 travel northwest on SR 60 for 19.8 miles to the Kissimmee River. Structure is visible from the road and wells are a strip of land on the south side between the boat locks and the water control structure.

Sensor Well Area:



Sensor Well:



Tag close Up:



Bench Mark:



Bench Mark:



Site Name		Sensor	
S-65GW		GW3	

<b>Latitude</b> 27° 48' 12.7"	<b>Longitude</b> 81° 11' 51.2"	<b>Northing</b> 1261327	<b>Easting</b> 592302
<b>Section</b> 11	<b>Township</b> 31	<b>Range</b> 31	<b>County</b> Osceola
			<b>Quad</b> Lake Marian SW

**Benchmark Information:**

<b>Name</b> KR 1013	<b>Existing / Set</b> Existing	<b>NAVD88</b> 61.81	<b>NGVD29</b> 63.00
------------------------	-----------------------------------	------------------------	------------------------

**Reference Point Information:**

<b>Stamped Elevation (NGVD29)</b> 57.87	<b>Stamped Date</b> 1-17-08	<b>By Firm</b> Woolpert, Inc.
--	--------------------------------	----------------------------------

Note: Reference mark at top of PVC pipe as marked.

**Staff Gauge Information:**

<b>Water Elevation (NGVD29)</b> NA	<b>Gauge Reading</b> NA	<b>Time of Reading</b> NA	<b>Date of Reading</b> NA
---------------------------------------	----------------------------	------------------------------	------------------------------

**To Reach Description:**  
From the intersection of SR 60 and US 441 travel northwest on SR 60 for 19.8 miles to the Kissimmee River. Structure is visible from the road and wells are a strip of land on the south side between the boat locks and the water control structure.

Sensor Well Area:



Sensor Well:



Tag Close Up:



Bench Mark:



Bench Mark:



# The NGS Data Sheet

See file [dsdata.txt](#) for more information about the datasheet.

```

DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 7.48
1 National Geodetic Survey, Retrieval Date = JULY 12, 2007
AH8844 *****
AH8844 DESIGNATION - KR 1013
AH8844 PID - AH8844
AH8844 STATE/COUNTY- FL/OSCEOLA
AH8844 USGS QUAD - LAKE MARIAN SW (1972)
AH8844
AH8844 *CURRENT SURVEY CONTROL
AH8844
AH8844 *-----*
AH8844 * NAD 83(1986)- 27 48 12. (N) 081 11 50. (W) SCALED
AH8844 * NAVD 88 - 18.839 (meters) 61.81 (feet) ADJUSTED
AH8844 *-----*
AH8844 GEOID HEIGHT- -26.86 (meters) GEOID03
AH8844 DYNAMIC HT - 18.811 (meters) 61.72 (feet) COMP
AH8844 MODELED GRAV- 979,152.5 (mgal) NAVD 88
AH8844
AH8844 VERT ORDER - SECOND CLASS I
AH8844
AH8844.The horizontal coordinates were scaled from a topographic map and have
AH8844.an estimated accuracy of +/- 6 seconds.
AH8844
AH8844.The orthometric height was determined by differential leveling
AH8844.and adjusted by the NATIONAL GEODETIC SURVEY in July 1999.
AH8844.No vertical observational check was made to the station.
AH8844
AH8844.The geoid height was determined by GEOID03.
AH8844
AH8844.The dynamic height is computed by dividing the NAVD 88
AH8844.geopotential number by the normal gravity value computed on the
AH8844.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AH8844.degrees latitude (g = 980.6199 gals.).
AH8844
AH8844.The modeled gravity was interpolated from observed gravity values.
AH8844
AH8844; North East Units Estimated Accuracy
AH8844;SPC FL E - 384,430. 180,570. MT (+/- 180 meters Scaled)
AH8844
AH8844 SUPERSEDED SURVEY CONTROL
AH8844
AH8844.No superseded survey control is available for this station.
AH8844
AH8844_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML805754(NAD 83)
AH8844_MARKER: DD = SURVEY DISK
AH8844_SETTING: 37 = SET IN A MASSIVE RETAINING WALL
AH8844_SP_SET: SPILLWAY RETAINING WALL
AH8844_STAMPING: KR 1013 0-1 1964 JACKSONVILLE
AH8844_MARK LOGO: USE
AH8844_MAGNETIC: N = NO MAGNETIC MATERIAL
AH8844_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AH8844_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR
AH8844+SATELLITE: SATELLITE OBSERVATIONS - September 19, 1997
AH8844
AH8844 HISTORY - Date Condition Report By
AH8844 HISTORY - 1964 MONUMENTED USE
AH8844 HISTORY - 19970919 GOOD FLDEP
AH8844
AH8844 STATION DESCRIPTION
AH8844
AH8844'DESCRIBED BY FL DEPT OF ENV PRO 1997 (MWM)
AH8844'THE MARK IS ABOUT 26.8 MI (43.1 KM) EAST-SOUTHEAST OF LAKE WALES,
AH8844'50.9 MI (81.9 KM) NORTH-NORTHWEST OF VERO BEACH IN ESTIMATED SECTION
AH8844'11, TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM THE
AH8844'INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE
AH8844'WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE
AH8844'JUNCTION ON RIVER RANCH BOULEVARD ON THE RIGHT, CONTINUE EAST ON STATE
AH8844'ROAD 60 FOR 1.45 MI (2.33 KM) TO THE JUNCTION OF A PAVED ROAD (ACCESS
AH8844'TO SPILLWAY DAM NUMBER S-65) ON THE RIGHT, TURN RIGHT ON THE PAVED
AH8844'ROAD AND GO SOUTH THEN WEST FOR 0.2 MI (0.3 KM) TO STRUCTURE NUMBER S

```

DATASHEETS

AH8844'65 AND THE MARK ON THE LEFT, SET IN THE TOP OF THE SOUTHEAST CONCRETE  
AH8844'RETAINING WALL. LOCATED 42.6 FT (13.0 M) WEST OF A METAL GUARDRAIL,  
AH8844'17.1 FT (5.2 M) SOUTH OF A STEEL LADDER GOING TO THE TOP OF THE  
AH8844'STRUCTURE, 1.0 FT (0.3 M) EAST OF A 3.0 FT (0.9 M) HIGH CHAINLINK  
AH8844'FENCE AND 1.0 FT (0.3 M) SOUTH OF THE SOUTH EDGE OF THE CONCRETE ROAD  
AH8844'CROSSING THE STRUCTURE.

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

# Monitoring Well Field Data Sheet

## SFWMD #067411

Site/Station Designation: 565GW

Date: JAN 17, 08

Crew: W. MILLER/A. ANTONIO

Bench Mark Used: KR1013

Name stamp	Date stamp	Published NAVD 88 Elev.	Published NGVD 29 Elev.	Sign Present (Y/N)
<u>KR1013 0-1</u>	<u>1972</u>	<u>61.808</u>	<u>63.00</u>	<u>Y</u>

964 JACKSONVILLE (if needed) Conversion factor = \_\_\_\_\_ Converted NGVD29 = \_\_\_\_\_

**Level Setup:**

STA	BS	HI	FS	NGVD29 EL	DIST & REM
<u>Bm</u>	<u>2.007</u>	<u>65.007</u>			
<u>6W1</u>	<u>2.188</u>	<u>60.073</u>	<u>7.122</u>	<u>57.885</u>	
<u>6W3</u>	<u>2.528</u>	<u>60.398</u>	<u>2.203</u>	<u>57.870</u>	
<u>6W2</u>	<u>6.835</u>	<u>64.816</u>	<u>2.417</u>	<u>57.981</u>	
<u>Bm</u>			<u>1.810</u>	<u>63.006</u>	
<u>GROUND</u>			<u>9.57</u>	<u>55.246</u>	

NGVD 29 Ground Elev. @ Well Site: 55.25

**Tag Check List:**

**Photo Check List:**

- |   |  |   |  |
|---|--|---|--|
| <ul style="list-style-type: none"> <li>• Stamp Site/Station Designation _____</li> <li>• Stamp Elevation in NGVD 29 _____</li> <li>• Stamp Date _____</li> <li>• Stamp By Woolpert _____</li> <li>• Stamp Datum (NGVD 29) _____</li> <li>• Scratch Elev / Remove Tag _____</li> </ul> |  | <ul style="list-style-type: none"> <li>_____ Bench Mark close Up</li> <li>_____ Bench Mark standing</li> <li>_____ M. Well tag close Up</li> <li>_____ M. Well standing</li> <li>_____ M. Well Area</li> <li>_____ Staff Gauge</li> </ul> | <ul style="list-style-type: none"> <li>Picture # _____</li> <li>Picture # _____</li> <li>Picture # _____</li> <li>Picture # _____</li> <li>Picture # _____</li> <li>Picture # _____</li> </ul> |
|---|--|---|--|

**Staff Gauge:**

Site Name	Water Elev.	Gauge Reading	Time Meas.	Date Meas.

**Latitude and Longitude Of Local Bench Mark:**

<u>27 48 12.7</u>	<u>81 11 51.2</u>
-------------------	-------------------

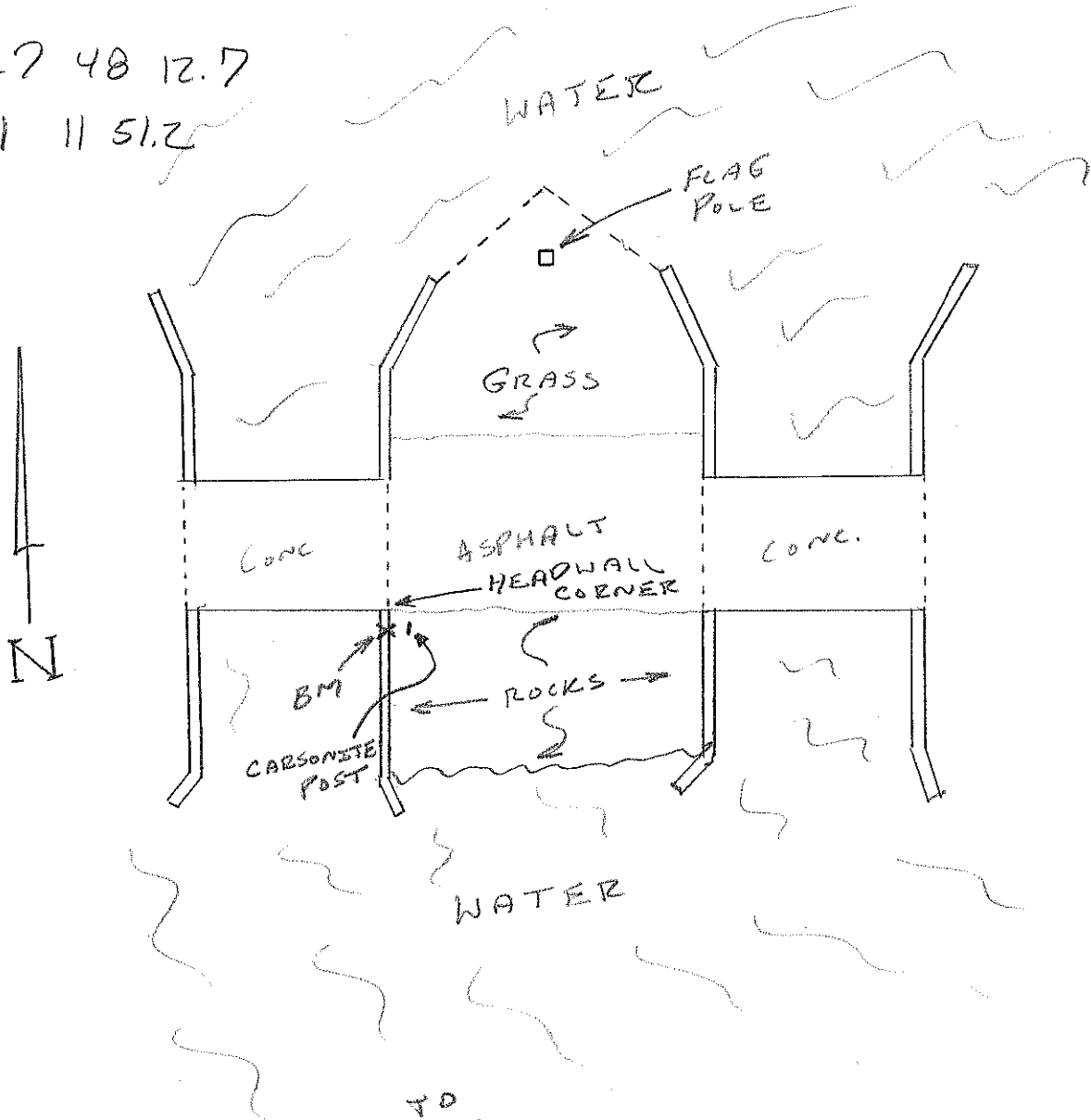
**Site Description, Comments, or Remarks:**



KR 1013

LAT 27 48 12.7

LONG 81 11 51.2



	TO BM	
	AZ.	DIST.
CARSONITE POST	270°	0.50'
FLAG POLE	230°	65'
HEADWALL CORNER	195°	1.20'

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# **Section 3: Monitoring Well Site Information in Table Format**

## Monitoring Well Site Information in Table Format

Well Designation	Well Type	County	Quadrangle	Section	Township	Range	Northing	Easting	Latitude of BM	Longitude of BM	Ref. Point Elev. (NGVD29)	Ref. Point Elev. (NAVD88)	Benchmark Name Used to Set Ref. Elev.	Benchmark Elev. (NGVD29)	Benchmark Elev. (NAVD88)
BOGAFB	NONE	ORANGE	PINE CASTLE	33	23	30	1497078	556344	28 27 05.30	81 18 36.09	92.14	91.17	GODWIN1	89.45	88.48
KENAN1	GW1	OSCEOLA	LAKE MARIN NE	10	30	33	1292324	650320	27 53 19.06	81 01 05.93	79.32	78.09	KEEN5	75.83	74.61
LCYPR19	GW1	OSCEOLA	CYPRESS LAKE	4	28	30	1360051	549721	28 04 28.30	81 19 49.10	57.51	56.39	LCYP19	54.53	53.41
LHATCH3	STG1	POLK	HESPERIDES	1	29	29	1327143	534579	27 59 02	81 22 37	59.27	58.06	LHATCH3	54.50	53.29
LJACK	STG1	OSCEOLA	LAKE MARIAN NW	31	29	32	1326984	607824	27 54 36	81 09 00	58.88	57.68	TLWMA3	60.80	59.60
MARIC	STG1	POLK	LAKE HATCHINEHA	18	28	29	1352657	507088	28 03 07.77	81 27 44.68	57.85	56.84	POT 28518	54.34	53.33
ORF 61	GW1	ORANGE	WINDERMERE	10	23	28	1503773	482382	28 28 09	81 32 28	108.40	107.45	R 627	108.71	107.77
ORF 61	GW2	ORANGE	WINDERMERE	10	23	28	1503773	482382	28 28 09	81 32 28	108.49	107.55	R 627	108.71	107.77
ORF 61	GW3	ORANGE	WINDERMERE	10	23	28	1503773	482382	28 28 09	81 32 28	108.49	107.55	R 627	108.71	107.77
RATHAM	GW1	POLK	FORT KISSIMMEE NW	6	32	32	1231938	602118	27 43 20.72	81 10 02.20	53.17	51.94	F 461	53.68	52.45
S63A-SCA	HW	OSCEOLA	CYPRESS LAKE	6	28	31	1361858	572373	28 04 47.8	81 15 35.5	67.95	67.05	KR 1068	63.86	62.96
S63A-SCA	TW	OSCEOLA	CYPRESS LAKE	6	28	31	1361858	572373	28 04 47.8	81 15 35.5	67.96	67.06	KR 1068	63.86	62.96
S-65GW	GW1	OSCEOLA	LAKE MARIAN SW	11	31	31	1261327	592302	27 48 12.7	81 11 51.2	57.88	56.69	KR 1013	63.00	61.81
S-65GW	GW2	OSCEOLA	LAKE MARIAN SW	11	31	31	1261327	592302	27 48 12.7	81 11 51.2	57.98	56.79	KR 1013	63.00	61.81
S-65GW	GW3	OSCEOLA	LAKE MARIAN SW	11	31	31	1261327	592302	27 48 12.7	81 11 51.2	57.87	56.68	KR 1013	63.00	61.81
S 65A SCA	STG1	OSCEOLA	FORT KISSIMMEE NW	28	32	32	1363587	525045	27 39 33.2	81 08 07.2	57.57	56.38	MACK 5-23-84	53.95	52.76
SEBRING	GW1	HIGHLANDS	LORIDA	5	35	30	1136116	541350	27 27 30.54	81 21 15.34	66.35	NA	SEBRING MW2004	63.04	NA
TIGER	STG1	POLK	LAKE WEOHYAKAPKA	17	30	30	1286486	545269	27 52 19.72	81 20 36.48	58.12	56.92	Z 504	56.24	55.04
TURLAK	GW1	ORANGE	LANDO WEST	11	23	28	1515086	503067	28 30 02.9	81 28 36.00	127.13	126.24	TURLAK 2008	124.28	123.39
WR 11	GW1	OSCEOLA	LAKE HATCHINEHA	3	28	29	1363587	525045	28 05 03.64	81 24 23.95	71.97	70.93	WR11 2007	68.66	67.59
WR 15	GW1	OSCEOLA	LAKE HATCHINEHA	2	28	29	1363442	530369	28 05 02.38	81 23 24.51	67.86	66.82	WR15 2007	63.09	62.01
WR 16	GW1	OSCEOLA	LAKE HATCHINEHA	2	28	29	1361365	529754	28 04 41.79	81 23 31.30	70.68	69.64	WR11 1996	66.19	65.14
BFARM	STG1	OSCEOLA	KISSIMMEE	35	25	28	1432592	503001	28 16 26.10	81 28 33.08	64.13	63.17	BFARM 2007	65.02	64.09
KISSFS	GW1	OSCEOLA	KISSIMMEE	19	25	29	1438580	511848	28 17 25.73	81 26 54.39	74.95	NA	KISSFS 1983	75.84	NA
KISSFS	GW2	OSCEOLA	KISSIMMEE	19	25	29	1438580	511848	28 17 25.73	81 26 54.39	74.36	NA	KISSFS 1983	75.84	NA
KISSFS	GW3	OSCEOLA	KISSIMMEE	19	25	29	1438580	511848	28 17 25.73	81 26 54.39	74.46	NA	KISSFS 1983	75.84	NA
WRLGTE	GW1	ORANGE	INTERCESSION CITY	34	24	28	1461558	494092	28 21 12.55	81 30 14.08	97.20	96.31	WRLGTE 2007	94.03	93.14
WRLGTE	GW2	ORANGE	INTERCESSION CITY	34	24	28	1461558	494092	28 21 12.55	81 30 14.08	97.18	96.29	WRLGTE 2007	94.03	93.14

**NOTES:**

1. Latitude and longitude were derived at the benchmark location, and is given to assist in locating the site. It is not meant to accurately locate each well.
2. Northing and Eastings were obtained by using CORPSCON to convert the latitude and longitude to Florida State Plane Coordinates, East Zone, Adjustment of 1990 (NAD83/90) HARN.
3. All measurements and elevations are in feet unless otherwise noted.
4. Some Benchmarks used did not have a published NAVD88 elevation, and therefore have been left blank.