

SPECIFIC PURPOSE SURVEY C-951 WELL CLUSTER REFERENCE ELEVATION

November 2016



**SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SURVEY SECTION**

3301 Gun Club Road West Palm Beach, Florida 33406

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Surveyor's Report

Report Date: 11/08/16

Submittal: Final

Prepared for: Hydrogeology

South Florida Water Management District



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SURVEY SECTION**

3301 Gun Club Road West Palm Beach, Florida 33406
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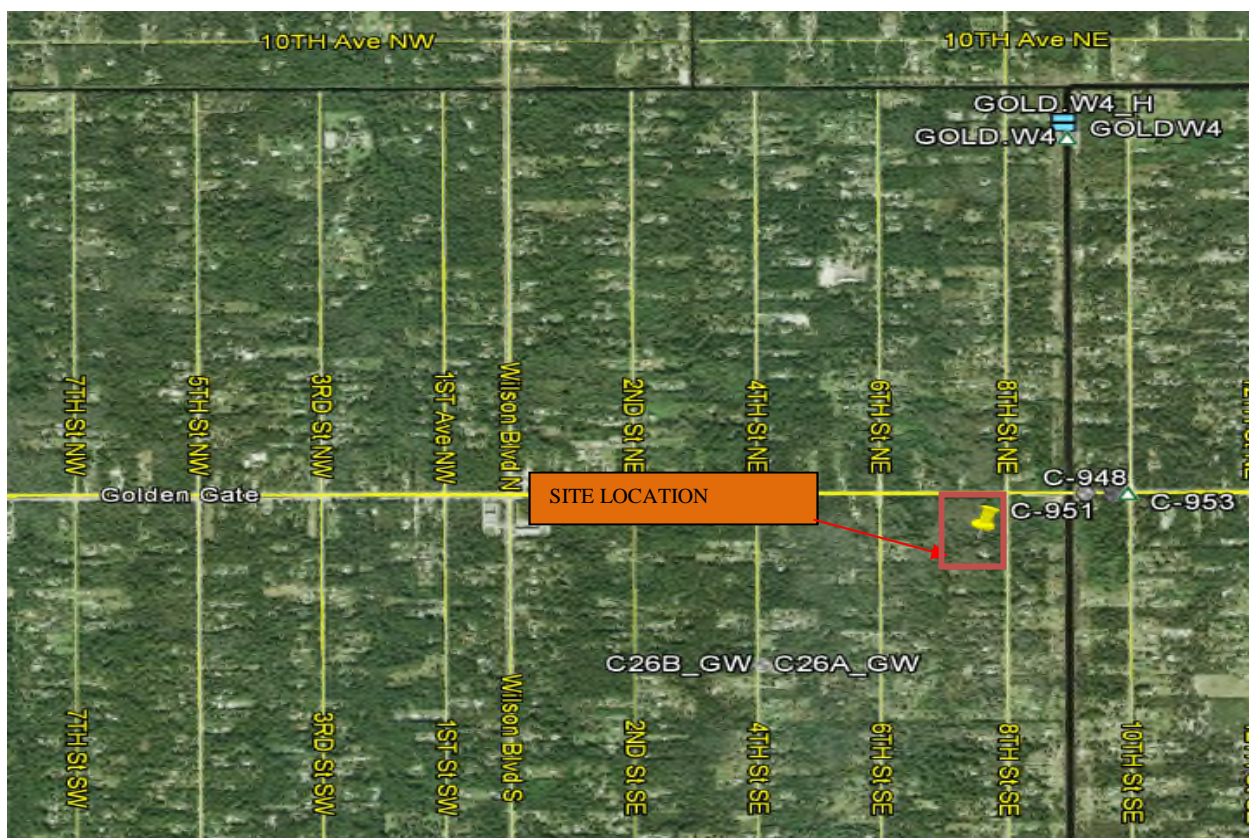
OVERVIEW OF THE PROJECT

PURPOSE

The purpose of this Survey is to establish Reference Elevation for Groundwater wells monitored by the USGS and South Florida Water Management District (SFWMD). Third order elevations referring to both the North American Vertical Datum of 1988 (NAVD88) and the National Geodetic Vertical Datum of 1929 (NGVD29). NGVD 29 elevation shall be based on offset from NAVD 88 using USACE Corpscon 6.0.1.

Location of Project

The project is located in Collier County, Florida. Following is a map of Location.



General Location (Not to Scale)

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 The NGVD 29 elevations were derived using data from published NGS superseded values when applicable, otherwise values provided by the South Florida Water Management District in a file named "NGVD29.txt" were used. The linear unit for all elevations is the U.S. survey feet unless otherwise stated.

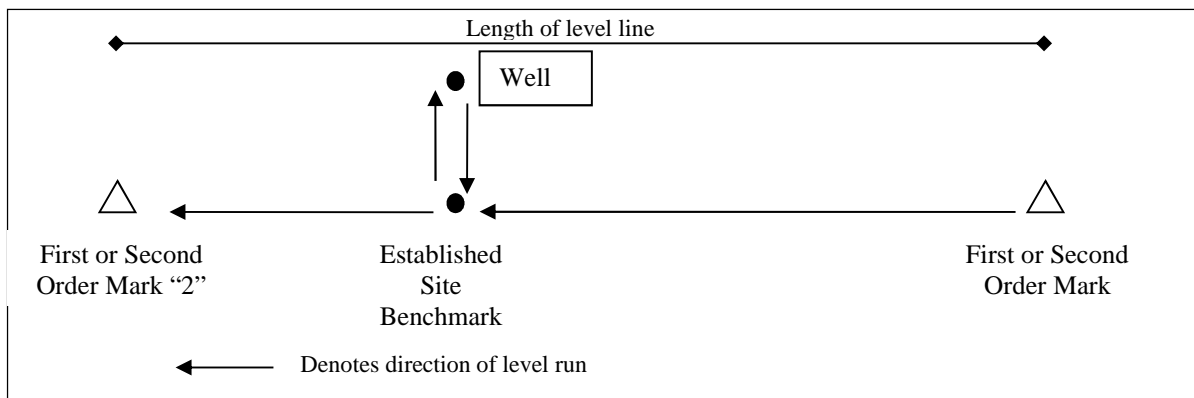
LEVELING METHODS

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 is as follows. The run was started at one of the First or Second Order marks and continued through the Site Benchmark (Found or Established) at the well and closed on the original or additional First or Second Order NGS vertical mark. (See Figure 1. below).

For each well site, a closed loop was run from an established Third Order vertical mark (Site Benchmark).

Figure 1 Typical Level Run Pattern



The FGCS maximum allowable misclosure for this type of run is 0.03' multiplied by the square root of the length of the line in miles.

EQUIPMENT USED

All leveling was performed with a Topcon Digital Level.

BENCHMARKS USED

INTRODUCTION

The following instrument was used for GPS observations:

- (1) Garmin GPS Map 78.

Description	X, (Easting) 83/86 Coordinates	Y, (Northing) 83/86 Coordinates	Latitude	Longitude
BM V583	457293.734	689651.039	26 13 47	81 36 24
BM W583	467949.208	689905.413	26 13 50	81 34 27
BM L583	477875.172	689963.575	26 13 51	81 32 38

CONTROL BENCHMARKS

The NGS Data Sheet

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

```
PROGRAM = datasheet95, VERSION = 8.10
1 National Geodetic Survey, Retrieval Date = NOVEMBER 7, 2016
DG7294 *****
DG7294 DESIGNATION - V 583
DG7294 PID - DG7294
DG7294 STATE/COUNTY- FL/COLLIER
DG7294 COUNTRY - US
DG7294 USGS QUAD - BELLE MEADE NE (1973)
DG7294
DG7294 *CURRENT SURVEY CONTROL
DG7294
DG7294* NAD 83(1986) POSITION- 26 13 47. (N) 081 36 24. (W) SCALED
DG7294* NAVD 88 ORTHO HEIGHT - 3.376 (meters) 11.08 (feet) ADJUSTED
DG7294
DG7294 GEOID HEIGHT - -23.931 (meters) GEOID12B
DG7294 DYNAMIC HEIGHT - 3.370 (meters) 11.06 (feet) COMP
DG7294 MODELED GRAVITY - 979,044.6 (mgal) NAVD 88
DG7294
DG7294 VERT ORDER - SECOND CLASS I
DG7294
DG7294.The horizontal coordinates were scaled from a topographic map and have
DG7294.an estimated accuracy of +/- 6 seconds.
DG7294.
DG7294.The orthometric height was determined by differential leveling and
DG7294.adjusted by the NATIONAL GEODETIC SURVEY
DG7294.in March 2005.
DG7294
DG7294.Significant digits in the geoid height do not necessarily reflect accuracy.
DG7294.GEOID12B height accuracy estimate available here.
DG7294
DG7294.The dynamic height is computed by dividing the NAVD 88
DG7294.geopotential number by the normal gravity value computed on the
DG7294.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DG7294.degrees latitude (g = 980.6199 gals.).
DG7294
DG7294.The modeled gravity was interpolated from observed gravity values.
DG7294
DG7294; North East Units Estimated Accuracy
DG7294;SPC FL E - 210,210. 139,380. MT (+/- 180 meters Scaled)
DG7294
DG7294_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMK394012(NAD 83)
DG7294
DG7294 SUPERSEDED SURVEY CONTROL
DG7294
DG7294.No superseded survey control is available for this station.
DG7294
DG7294_MARKER: F = FLANGE-ENCASED ROD
DG7294_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
DG7294_STAMPING: V 583 2003
DG7294_MARK LOGO: NGS
```

DG7294_PROJECTION: RECESSED 5 CENTIMETERS
 DG7294_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
 DG7294_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 DG7294_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 DG7294+SATELLITE: SATELLITE OBSERVATIONS - June 27, 2013
 DG7294_ROD/PIPE-DEPTH: 10.9 meters
 DG7294
 DG7294 HISTORY - Date Condition Report By
 DG7294 HISTORY - 20030611 MONUMENTED FLDEP
 DG7294 HISTORY - 20130627 GOOD FL-021
 DG7294
 DG7294 STATION DESCRIPTION
 DG7294
 DG7294'DESCRIBED BY FL DEPT OF ENV PRO 2003 (BPJ)
 DG7294'THE MARK IS ABOUT 12.5 MI NORTHEAST OF NAPLES, ESTIMATED SECTION 10,
 DG7294'TOWNSHIP 49 SOUTH, RANGE 27 EAST.
 DG7294'
 DG7294'TO REACH THE MARK FROM THE JUNCTION OF COUNTY ROAD 951 (COLLIER
 DG7294'BOULEVARD) AND COUNTY ROAD 876 (GOLDEN GATE BOULEVARD) ABOUT 8.0 MI
 DG7294'NORTHEAST OF NAPLES, GO EAST ON GOLDEN GATE BOULEVARD FOR 5.0 MI TO
 DG7294'THE INTERSECTION OF WILSON BOULEVARD AND THE MARK ON THE RIGHT, A
 DG7294'STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF 35.9 FT WITH AN
 DG7294'NGS LOGO CAP RECESSED 0.2 FT BELOW THE LEVEL OF THE GROUND AND ABOUT
 DG7294'2.5 FT BELOW THE LEVEL OF GOLDEN GATE BOULEVARD, THE DATUM POINT IS
 DG7294'RECESSED 0.2 FT BELOW THE LEVEL OF THE NGS LOGO CAP.
 DG7294'
 DG7294'LOCATED 86.6 FT WEST OF THE APPROXIMATE CENTERLINE OF WILSON
 DG7294'BOULEVARD, 72.0 FT NORTHWEST OF A CONCRETE CATCH BASIN, 61.5 FT SOUTH
 DG7294'OF THE APPROXIMATE CENTERLINE OF GOLDEN GATE BOULEVARD, 28.5 FT
 DG7294'SOUTHWEST OF POWER POLE NUMBER 7-7587-7686 AND 1.3 FT NORTHEAST OF A
 DG7294'CARSONITE WITNESS POST.
 DG7294'
 DG7294'NOTE A BAR MAGNET WAS BURIED ON THE SOUTH SIDE OF THE MARK.
 DG7294'
 DG7294'NOTE ACCESS TO THE DATUM POINT IS HAD THROUGH A 5-INCH NGS LOGO CAP.
 DG7294
 DG7294 STATION RECOVERY (2013)
 DG7294
 DG7294'RECOVERY NOTE BY COLLIER COUNTY FLORIDA 2013 (MLB)
 DG7294'RECOVERED IN GOOD CONDITION.

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.10
 1 National Geodetic Survey, Retrieval Date = NOVEMBER 7, 2016
 DG7296 *****
 DG7296 DESIGNATION - W 583
 DG7296 PID - DG7296
 DG7296 STATE/COUNTY- FL/COLLIER
 DG7296 COUNTRY - US
 DG7296 USGS QUAD - BELLE MEADE NE (1973)
 DG7296
 DG7296 *CURRENT SURVEY CONTROL

DG7296
 DG7296* NAD 83(1986) POSITION- 26 13 50. (N) 081 34 27. (W) SCALED
 DG7296* [NAVD 88](#) ORTHO HEIGHT - 3.650 (meters) 11.98 (feet) ADJUSTED
 DG7296
 DG7296 GEOID HEIGHT - -23.975 (meters) GEOID12B
 DG7296 DYNAMIC HEIGHT - 3.644 (meters) 11.96 (feet) COMP
 DG7296 MODELED GRAVITY - 979,044.5 (mgal) NAVD 88

DG7296
 DG7296 VERT ORDER - SECOND CLASS I
 DG7296

DG7296.The horizontal coordinates were scaled from a topographic map and have
 DG7296.an estimated accuracy of +/- 6 seconds.

DG7296.
 DG7296.The orthometric height was determined by differential leveling and
 DG7296.adjusted by the NATIONAL GEODETIC SURVEY
 DG7296.in March 2005.

DG7296
 DG7296.Significant digits in the geoid height do not necessarily reflect accuracy.
 DG7296.GEOID12B height accuracy estimate available [here](#).

DG7296
 DG7296.The dynamic height is computed by dividing the NAVD 88
 DG7296.geopotential number by the normal gravity value computed on the
 DG7296.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DG7296.degrees latitude (g = 980.6199 gals.).

DG7296
 DG7296.The modeled gravity was interpolated from observed gravity values.

DG7296
 DG7296;

	North	East	Units	Estimated Accuracy
DG7296;SPC FL E -	210,280.	142,630.	MT	(+/- 180 meters Scaled)

DG7296
 DG7296_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMK426013(NAD 83)

DG7296
 DG7296 SUPERSEDED SURVEY CONTROL

DG7296
 DG7296.No superseded survey control is available for this station.

DG7296
 DG7296_MARKER: DD = SURVEY DISK
 DG7296_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 DG7296_STAMPING: W 583 2003
 DG7296_MARK LOGO: FLDEP
 DG7296_PROJECTION: RECESSED 5 CENTIMETERS
 DG7296_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
 DG7296_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 DG7296+STABILITY: SURFACE MOTION
 DG7296_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 DG7296+SATELLITE: SATELLITE OBSERVATIONS - February 20, 2014

DG7296

HISTORY	- Date	Condition	Report By
DG7296 HISTORY	- 20030613	MONUMENTED	FLDEP
DG7296 HISTORY	- 20140220	GOOD	FL-021

DG7296
 DG7296 STATION DESCRIPTION

DG7296
 DG7296'DESCRIBED BY FL DEPT OF ENV PRO 2003 (BPJ)
 DG7296'THE MARK IS ABOUT 14.2 MI NORTHEAST OF NAPLES, ESTIMATED SECTION 12,
 DG7296'TOWNSHIP 49 SOUTH, RANGE 27 EAST.

DG7296'
 DG7296'TO REACH THE MARK FROM THE JUNCTION OF COUNTY ROAD 951 (COLLIER
 DG7296'BOULEVARD) AND COUNTY ROAD 876 (GOLDEN GATE BOULEVARD) ABOUT 8.0 MI

DG7296 'NORTHEAST OF NAPLES, GO EAST ON GOLDEN GATE BOULEVARD FOR 5.0 MI TO
 DG7296 'THE INTERSECTION OF WILSON BOULEVARD, CONTINUE EAST ON GOLDEN GATE
 DG7296 'BOULEVARD FOR 2.0 MI TO THE INTERSECTION OF 16TH STREET NORTHEAST AND
 DG7296 'THE MARK ON THE LEFT, SET IN THE TOP OF A ROUND CONCRETE MONUMENT
 DG7296 'RECESSED 0.2 FT BELOW THE LEVEL OF THE GROUND AND ABOUT 0.5 FT ABOVE
 DG7296 'THE LEVEL OF GOLDEN GATE BOULEVARD. LOCATED 63.3 FT NORTH OF THE
 DG7296 'APPROXIMATE CENTERLINE OF GOLDEN GATE BOULEVARD, 44.5 FT NORTHEAST OF
 DG7296 'A WOODEN POWER POLE AND PHONE CABLE PEDESTAL NUMBER 1561, 37.0 FT
 DG7296 'WEST OF THE APPROXIMATE CENTERLINE OF 16TH STREET NORTHEAST, 16.3 FT
 DG7296 'NORTH OF A HOG WIRE FENCE CORNER POST, 1.4 FT EAST OF A HOG WIRE
 DG7296 'FENCE AND 1.2 FT EAST OF A CARSONITE WITNESS POST.
 DG7296 '
 DG7296 'NOTE A BAR MAGNET WAS BURIED ON THE SOUTH SIDE OF THE MARK.
 DG7296
 DG7296 STATION RECOVERY (2014)
 DG7296
 DG7296 'RECOVERY NOTE BY COLLIER COUNTY FLORIDA 2014 (MLB)
 DG7296 'RECOVERED IN GOOD CONDITION.

The NGS Data Sheet

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

```
PROGRAM = datasheet95, VERSION = 8.10
1      National Geodetic Survey, Retrieval Date = NOVEMBER 7, 2016
DG7330 *****
DG7330 DESIGNATION - L 583
DG7330 PID - DG7330
DG7330 STATE/COUNTY- FL/COLLIER
DG7330 COUNTRY - US
DG7330 USGS QUAD - BELLE MEADE NE (1973)
DG7330
DG7330 *CURRENT SURVEY CONTROL
DG7330
DG7330 *-----*
DG7330* NAD 83(1986) POSITION- 26 13 51. (N) 081 32 38. (W) SCALED
DG7330* NAVD 88 ORTHO HEIGHT - 3.716 (meters) 12.19 (feet) ADJUSTED
DG7330 *-----*
DG7330 GEOID HEIGHT - -24.013 (meters) GEOID12B
DG7330 DYNAMIC HEIGHT - 3.710 (meters) 12.17 (feet) COMP
DG7330 MODELED GRAVITY - 979,044.5 (mgal) NAVD 88
DG7330
DG7330 VERT ORDER - SECOND CLASS I
DG7330
DG7330.The horizontal coordinates were scaled from a topographic map and have
DG7330.an estimated accuracy of +/- 6 seconds.
DG7330.
DG7330.The orthometric height was determined by differential leveling and
DG7330.adjusted by the NATIONAL GEODETIC SURVEY
DG7330.in March 2005.
DG7330
DG7330.Significant digits in the geoid height do not necessarily reflect accuracy.
DG7330.GEOID12B height accuracy estimate available here.
DG7330
DG7330.The dynamic height is computed by dividing the NAVD 88
DG7330.geopotential number by the normal gravity value computed on the
```

DG7330.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DG7330.degrees latitude (g = 980.6199 gals.).
 DG7330
 DG7330.The modeled gravity was interpolated from observed gravity values.
 DG7330
 DG7330;

	North	East	Units	Estimated Accuracy
DG7330;SPC FL E	- 210,300.	145,660.	MT	(+/- 180 meters Scaled)

 DG7330
 DG7330_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMK456013(NAD 83)
 DG7330
 DG7330

SUPERSEDED SURVEY CONTROL

 DG7330
 DG7330.No superseded survey control is available for this station.
 DG7330
 DG7330_MARKER: DD = SURVEY DISK
 DG7330_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 DG7330_STAMPING: L 583 2003
 DG7330_MARK LOGO: FLDEP
 DG7330_PROJECTION: FLUSH
 DG7330_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
 DG7330_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 DG7330+STABILITY: SURFACE MOTION
 DG7330_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 DG7330+SATELLITE: SATELLITE OBSERVATIONS - February 20, 2014
 DG7330

DG7330	HISTORY	- Date	Condition	Report By
DG7330	HISTORY	- 20030610	MONUMENTED	FLDEP
DG7330	HISTORY	- 20110507	GOOD	INDIV
DG7330	HISTORY	- 20140220	GOOD	FL-021

 DG7330

STATION DESCRIPTION

 DG7330
 DG7330'DESCRIBED BY FL DEPT OF ENV PRO 2003 (BPJ)
 DG7330'THE MARK IS ABOUT 16.0 MI EAST-NORTHEAST OF NAPLES, ESTIMATED SECTION
 DG7330'6, TOWNSHIP 49 SOUTH, RANGE 28 EAST.
 DG7330'
 DG7330'TO REACH THE MARK FROM THE JUNCTION OF COUNTY ROAD 846 (IMMOKALEE
 DG7330'ROAD) AND COUNTY ROAD 858 (OIL WELL ROAD) ABOUT 14.5 MI NORTHEAST OF
 DG7330'NAPLES, GO EAST ON COUNTY ROAD 858 FOR 3.15 MI TO THE INTERSECTION OF
 DG7330'EVERGLADES BOULEVARD, TURN RIGHT ON EVERGLADES BOULEVARD AND GO SOUTH
 DG7330'FOR 4.25 MI TO THE INTERSECTION OF GOLDEN GATE BOULEVARD (COUNTY ROAD
 DG7330'876) AND THE MARK ON THE LEFT. THE MARK CAN ALSO BE REACHED FROM THE
 DG7330'JUNCTION OF COUNTY ROAD 951 AND COUNTY ROAD 876 (GOLDEN GATE
 DG7330'BOULEVARD) ABOUT 8.0 MI NORTHEAST OF NAPLES, GO EAST ON GOLDEN GATE
 DG7330'BOULEVARD FOR 5.0 MI TO THE INTERSECTION OF WILSON BOULEVARD,
 DG7330'CONTINUE EAST ON GOLDEN GATE BOULEVARD FOR 3.85 MI TO THE
 DG7330'INTERSECTION OF EVERGLADES BOULEVARD AND THE MARK ON THE LEFT, SET IN
 DG7330'THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND AND ABOUT
 DG7330'1.0 FT BELOW THE LEVEL OF GOLDEN GATE BOULEVARD.
 DG7330'
 DG7330'LOCATED 175.5 FT WEST OF THE APPROXIMATE CENTERLINE OF A DRIVEWAY AT
 DG7330'3161 GOLDEN GATE BOULEVARD, 169.0 FT EAST OF THE APPROXIMATE
 DG7330'CENTERLINE OF EVERGLADES BOULEVARD, 43.7 FT NORTH OF THE APPROXIMATE
 DG7330'CENTERLINE OF GOLDEN GATE BOULEVARD AND 1.3 FT SOUTH OF A CARSONITE
 DG7330'WITNESS POST.
 DG7330'
 DG7330'NOTE A BAR MAGNET WAS BURIED ON THE SOUTH SIDE OF THE MARK.
 DG7330
 DG7330

STATION RECOVERY (2011)

DG7330
DG7330'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2011 (JH)
DG7330'RECOVERED IN GOOD CONDITION.
DG7330
DG7330 STATION RECOVERY (2014)
DG7330
DG7330'RECOVERY NOTE BY COLLIER COUNTY FLORIDA 2014 (MLB)
DG7330'RECOVERED IN GOOD CONDITION.









C-951 WELL SITE



PROJECT RESULTS

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

SURVEYOR’S REPORT
VERTICAL CONTROL
WELL C-953

BM V583 (DG7294)	Elevation:	11.08ft	(NAVD 88)	12.40 ft	(NGVD 29)
BM W583 (DG7296)	Elevation:	11.98ft	(NAVD 88)	13.30ft	(NGVD 29)
Site BM	C-951 2016	11.25 ft	(NAVD 88)	12.57ft	(NGVD 29)
Reference Elevation		15.20ft	(NAVD 88)	16.52ft	(NGVD 29)
Top of Well Pad Elevation		11.84ft	(NAVD 88)	13.16ft	(NGVD 29)
Ground Elevation		11.5ft	(NAVD 88)	12.8ft	(NGVD 29)
Length of Run:	.01 mi	To Reach WELL C-953:			
Max Allowable Misclosure:	0.00 ft	TO REACH the Mark and Site from CR951 (Collier Blvd) and I-75N in Naples. Go north on CR 951 for 4.5mils +/- to Golden Gate. Go East on Golden Gate for 6.0mils +/- to 8 th St SE. Go south on 8 th St. SE for 0.12mils to an opening on west side of Road. Enter and go .06mils to Site.			
Actual Misclosure:	0.00 ft				



Benchmark set at wellsite for wells C-953, C-951 and C-948

SURVEYOR'S REPORT
VERTICAL CONTROL
WELL C-951

BM V583 (DG7294)	Elevation:	11.08ft	(NAVD 88)	12.40 ft	(NGVD 29)
BM W583 (DG7296)	Elevation:	11.98ft	(NAVD 88)	13.30ft	(NGVD 29)
Site BM	C-951 2016	11.25 ft	(NAVD 88)	12.57ft	(NGVD 29)
Reference Elevation		15.63ft	(NAVD 88)	16.95ft	(NGVD 29)
Top of Well Pad Elevation		12.06ft	(NAVD 88)	13.38ft	(NGVD 29)
Ground Elevation		11.8ft	(NAVD 88)	13.1ft	(NGVD 29)
Length of Run:	.01 mi		To Reach WELL C-951: TO REACH the Mark and Site from CR951 (Collier Blvd) and I-75N in Naples. Go north on CR 951 for 4.5mils +/- to Golden Gate. Go East on Golden Gate for 6.0mils +/- to 8 th St SE. Go south on 8 th St. SE for 0.12mils to an opening on west side of Road. Enter and go .06mils to Site.		
Max Allowable Misclosure:	0.00 ft				
Actual Misclosure:	0.00 ft				



Benchmark set at wellsite for wells C-953, C-951 and C-948

SURVEYOR'S REPORT
VERTICAL CONTROL
WELL C-948

BM W583 (DG7296)	Elevation:	11.98ft	(NAVD 88)	13.30ft	(NGVD 29)
Site BM	C-951 2016	11.25 ft	(NAVD 88)	12.57ft	(NGVD 29)
Reference Elevation		14.63ft	(NAVD 88)	15.95ft	(NGVD 29)
Top of Well Pad Elevation		12.05ft	(NAVD 88)	13.37ft	(NGVD 29)
Ground Elevation		11.7ft	(NAVD 88)	13.0ft	(NGVD 29)
Length of Run:	.01 mi				
Max Allowable Misclosure:	0.00 ft				
Actual Misclosure:	0.00 ft				

To Reach WELL C-948:
TO REACH the Mark and Site from CR951 (Collier Blvd) and I-75N in Naples. Go north on CR 951 for 4.5mils +/- to Golden Gate. Go East on Golden Gate for 6.0mils +/- to 8th St SE. Go south on 8th St. SE for 0.12mils to an opening on west side of Road. Enter and go .06mils to Site.






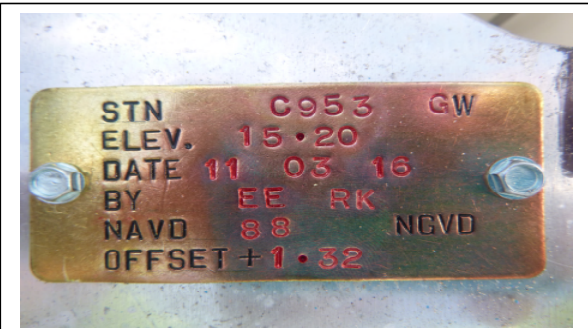

Benchmark set at wellsite for wells C-953, C-951 and C-948

SURVEYOR'S REPORT
PROJECT RESULTS
WELL C-953




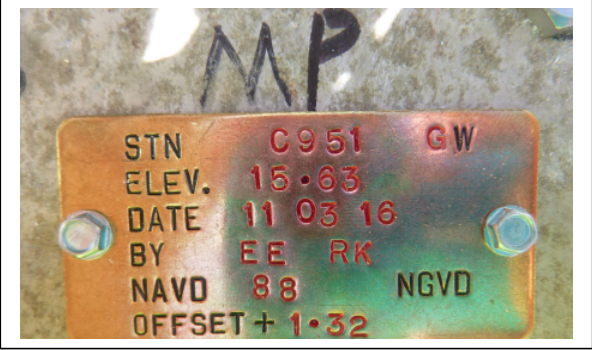
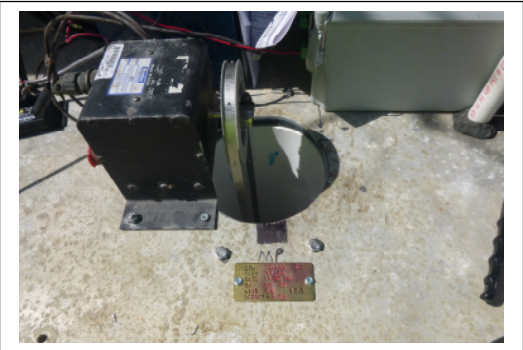
Site C-953 GW		Date of Field Work 9/22 - 10/20/16
Party Chief Hudson/Giammarco	Field Book Name/Number Misc FB #6V	Page Number(s) Pg. 71-75
Site Benchmark Name C-951 2016	Benchmark Elevation (NAVD88) 11.25ft	Datum Offset to NGVD29 +1.32
Reference Elevation (NAVD 88) 15.20ft		Existing Tag Elevation (Datum) NA
Latitude 26° 13' 41.6"		Longitude 81° 35' 29"

Notes: Re-located Wells due to construction in area of old wells.

Photographs

Overall Site	Benchmark Location	Benchmark Close Up
		
Brass Tag Close Up	Brass Tag + Reference Mark	
		

SURVEYOR'S REPORT
PROJECT RESULTS
WELL C-951




Site C-951 GW		Date of Field Work 9/22 - 10/20/16
Party Chief Hudson/Giammarco	Field Book Name/Number Misc FB #6V	Page Number(s) Pg. 71-75
Site Benchmark Name C-951 2016	Benchmark Elevation (NAVD88) 11.25ft	Datum Offset to NGVD29 +1.32
Reference Elevation (NAVD 88) 15.63ft		Existing Tag Elevation (Datum) NA
Latitude 26° 13' 41.7"		Longitude 81° 35' 29.4"
Notes: Re-located Wells due to construction in area of old wells.		
Photographs		
Overall Site	Benchmark Location	Benchmark Close Up
		
Brass Tag Close Up	Brass Tag + Reference Mark	
		


SURVEYOR'S REPORT
PROJECT RESULTS
WELL C-948


Site C-948 GW		Date of Field Work 9/22 - 10/20/16
Party Chief Hudson/Giammarco	Field Book Name/Number Misc FB #6V	Page Number(s) Pg. 71-75
Site Benchmark Name C-951 2016	Benchmark Elevation (NAVD88) 11.25ft	Datum Offset to NGVD29 +1.32
Reference Elevation (NAVD 88) 14.63ft		Existing Tag Elevation (Datum) NA
Latitude 26° 13' 41.5"		Longitude 81° 35' 29.2"

Notes: Re-located Wells due to construction in area of old wells.

Photographs

Overall Site	Benchmark Location	Benchmark Close Up
		

Brass Tag Close Up


Brass Tag + Reference Mark


SURVEYOR'S REPORT PROJECT RESULTS Field Notes

Misc Field - J 9/22/16 (71)

Begin Field For using Wells C948, C951, C953

Road Control

Notes

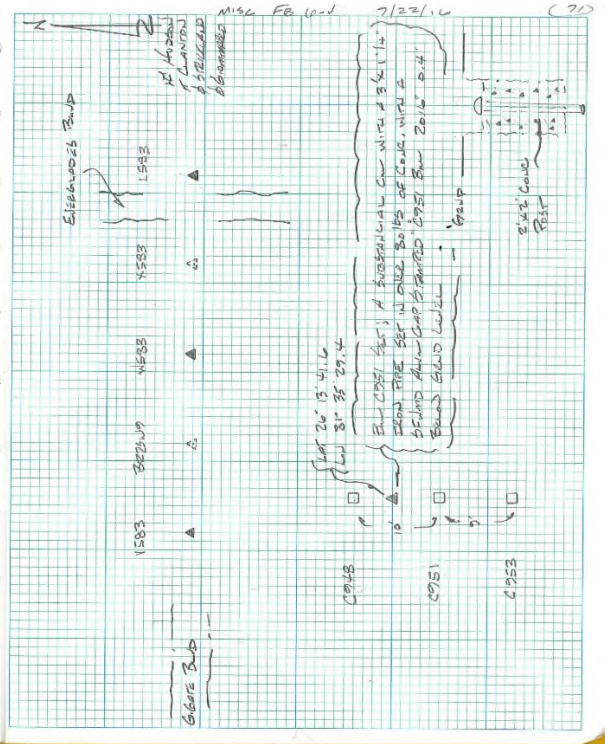
1. V583 Recovered in Good Cond.
2. BERTWY 16 RECOVERED DUE TO NEW BEAR CONTROL.
3. W583 RECOVERED in Good Cond.
4. X583 WAS NOT TO BE RECOVERED WAS MADE USING THE STREET & DIST TIES AND METAL DIST. 2 ± 10' DA AREA WAS SUMMERED OFF W/ SHOVEL TO NO AVAL.
5. L583 RECOVERED in Good Cond.

Wells & Site Bm

6. C953: Lot 26' 13' 41.6" Lot 31' 35' 29.0"
7. C951 Lot 26' 13' 41.7" Lot 31' 35' 29.4"
8. C948 Lot 26' 13' 41.5" Lot 31' 35' 29.2"
9. BM C951 Lot 26' 13' 41.6" Lot 31' 35' 29.6"

Misc

10. A NEW SECOND ALUM CAP (NO STAMPING) WAS FOUND IN TOP OF THE N. RETAINING WALL AND 20' E. OF THE W. END OF SAID WALL. UNKNOWN WHO SET CAP.
11. THERE IS CONCRETE FOUND IN GORE BUILD W/ LOTS OF IRON BY BRIDGES. ANY WAY TO GET INFO?



Misc Field - J 10/13/16 (73)

COND TO BE 71

LEVELS TO VERIFY NEW Bm & ESTAB Bm FOR LEVEL ROAD TO USE WELLS

FILE LINE	C951		Bm
77	1	END	
1			11.08
12		12.483	[88]
15		22.027	
25		11.95	11.95
END LEVEL LINE			
10/20/16	LEVELS COND TO Bm C951 & WELL SITE		
12			12.483
27		11.249	
29		12.482	12.483
		END LOOP	
	COND TO 75		

Misc Field - J 10/13/16 (74)

LEVELS: WBS Dini & BAE CODE PDS

fwd Hudson & CLARKE & BRANDEGE

LEVELS FOR V583, NEXT SHOULD BE Bm TO W583

Comments

"NGS V583" RECOVERED in Good Cond. PER DESC. MAG NAIL SET in W. EDGE OF PAVE 83' SE 2' TOE SOUTH OF GORE BUILD - FROM FIELD WELLS.

SECOND ALUM CAP (NO STAMPING) FOUND IN THE NORTH RETAINING WALL OF THE GORE BUILD BRIDGE SPANNING THE G.O. MAIN CANAL. MARK IS ABOUT 20' E. OF THE WEST END OF SAID N. RETAINING WALL TO 3' ABOVE BEAR CONTROL.

"NGS W583"; BEAR ROAD in DIST 2 MINUTE.

MAG NAIL FROM BEAR

Bm C951 (B 71)

FROM ROAD

MISC F.O.B. 10/20/16

COND F2 Pg 74

SEWER WELL REF ELEV

STA	+	4E	-	ELEV	Sum
					11.25
C-948	5.50	10.75			
REF			2.12	14.63	
PAD			4.70	12.05	
GRND			5.1	11.65	
C-951					
REF			1.12	15.63	
PAD			4.69	12.06	
GRND			5.0	11.75	
C-953					
REF			1.55	15.20	
PAD			4.91	11.84	
GRND			5.3	11.45	
Sum			5.50	11.25	11.25
		END	SURVEY		

MISC F.O.B. 10/20/16 (75)

EQUIP: ZIESS WILSON / 25 ROD

XAVI HUBSON
of GARRARCO

Comments

Run C-951 Pg 74

TOP OF MARKED BOLT HEAD
COND. PAD
GRND ELEV

0" MARK REF ELEV
COND. PAD
GRND ELEV

0" MARK REF ELEV
COND. PAD
GRND ELEV

• Run Abole

Abbreviation:

- NAVD 88 - North American Vertical Datum of 1988
- NGVD 29 - National Geodetic Vertical Datum of 1929
- NAD 83/99- (Horizontal Datum) North American Datum
- NGS - National Geodetic Survey.
- SFWMD - South Florida Water Management District
- PSM - Professional Surveyor & Mapper

SURVEYOR'S CERTIFICATION

I hereby certify that this Specific Purpose Survey was made under my responsible charge and meets applicable portions of the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 5J, Florida Administrative Code, pursuant to Section 472.027, Florida State Statutes.

This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

Date of Survey
October 20, 2016

Elvie D. Ebanks PSM
Professional Surveyor and Mapper
State of Florida
Certificate No. 5765