



PROFESSIONAL SURVEYORS & MAPPERS
I N C O R P O R A T E D

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SURVEYOR'S REPORT

Specific Purpose Survey of the United States
Geological Survey Well **STL 185**
in
St Lucie County, Florida

Prepared for:

South Florida Water Management District

3301 Gun Club Road
West Palm Beach, Florida 33406

Prepared by:

Peter Andersen, PSM, Vice President
Florida Professional Surveyor and Mapper
License Number 5199
State of Florida

GCY, Inc. LB 4108
PO Box 1469/1505 SW Martin Highway
Palm City, Florida 33491/33490
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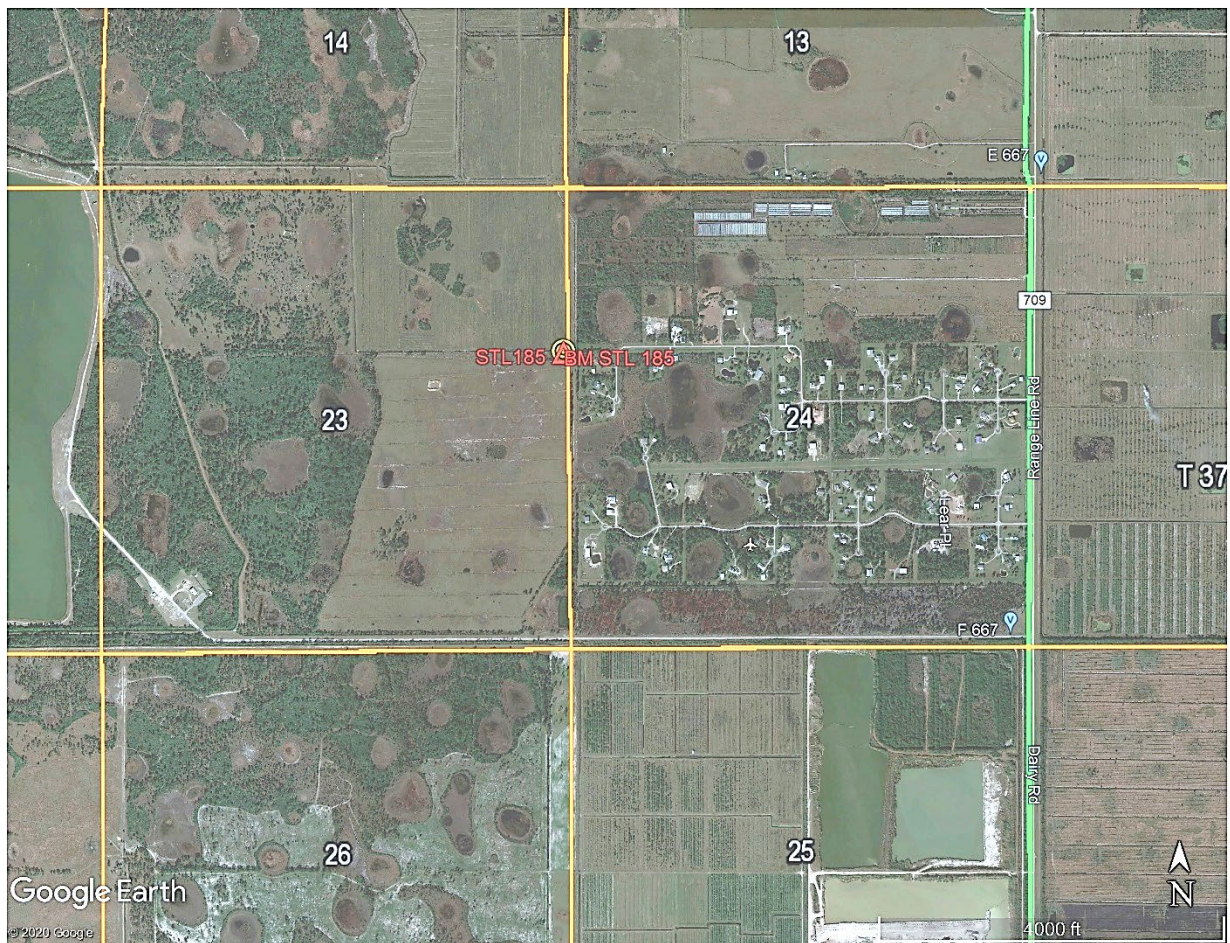
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PURPOSE

The Purpose of this survey is to set an Elevation Referenced Mark (Benchmark) using the guidelines for a National Geodetic Survey (NGS), Class "C" concrete monument and to establish a North American Vertical Datum of 1988 (NAVD 88) on said Benchmark and on an additional Reference Point with a Brass Plate, both at United States Geological Survey Well "STL 185".

LOCATION OF PROJECT

The United States Geological Survey Well "STL 185" is located in the Section 23, Township 37 South, Range 38 East, St Lucie County, Florida.



General Location (Not to Scale)

PROJECT VERTICAL DATUM

The project vertical datum is the North American Vertical Datum (NAVD) of 1988.

To convert the NAVD 88 elevation to the National Geodetic Vertical Datum (NGVD) of 1929 at **Station STL 185 add 1.453**. These values are based on Corpscon 6.0.1, a U.S. Army Corps of Engineers, Engineering Research and Development Center Windows based program to convert coordinates and elevations between datums using the updated vertcon05.txt and the vertcone.05 files supplied by the U.S Army Corps of Engineers. South Atlantic Division, Jacksonville, Florida.

PROJECT HORIZONTAL DATUM

The project horizontal datum is the State Plane Coordinate System, Florida East Zone, North American Datum 83, adjustment of 2011.

LEVELING METHODS

The leveling for this project was performed in accordance with standard survey practice using conventional third order methods, techniques and equipment.

The allowable error on this project meets or exceeds closures as required by SFWMD (.02 v miles) per executed SOW for 4600003703 W007. Leveling was run from National Geodetic Survey (NGS) monument "E 667" (NGS PID DL3198) through the site benchmark and closing on the National Geodetic Survey (NGS) monument "F 667" (NGS PID DL3199). Leveling was done using a Leica DNA 10 digital level S/N 331745

GPS METHODS

Latitude and longitude for the New Benchmark "**STL 185**" were established by observing a 4.5-hour Static Sessions on March 4, 2020 using a Trimble 5700 dual frequency receiver S/N 0220381397. The data from these sessions was sent to the NGS "OPUS" site for post processing on May 12, 2020 and the reports were received from the "OPUS" site the same day.

Surveyors' Notes:

1. All measurements herein are in United States Survey feet and decimal thereof, unless otherwise specified.
2. Underground utilities were not located as part of this survey.
3. This survey report or copies thereof are not valid without the original signature and seal of a Florida licensed Surveyor and Mapper.
4. Additions or deletions to this survey report by other than the signing party (or parties) is prohibited without written consent of the signing party (or parties).
5. To convert from NAVD 88 to NGVD 29 add 1.453 feet. This value is based on Corpscon 6.0.1 a U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville Fl.
6. Date of last field work: March 4, 2020, GCY job No. 18-1020-07.
7. SFWMD Data records (on file at the District's headquarters):
 - A. Electronic Data files:
Miscellaneous picture files
Digital level run
File names: XXXXXX.DAT
 - B. Conventional reporting
Field Book: 1862 pages 68-73

SURVEYOR'S CERTIFICATION

In my professional opinion this Specific Purpose Survey meets applicable portions of the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 5J-17, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

March 4, 2020

Last date of Survey



Peter Andersen, PSM, Vice President
Florida Professional Surveyor and Mapper
License Number 5199
State of Florida
GCY, Inc. LB No 4108

NOTE:

This is an electronically signed and sealed document pursuant to Chapter 5J-17.062, Florida Administrative Code. The printed survey map or report or copies thereof are not valid without the original signature and seal of a Florida licensed surveyor or mapper.





SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

U.S.G.S. Station Name: STL 185	U.S.G.S. Station Number: 271413080311201	Agency: GCY, INC.	Date of Field Work: 3/4/2020
Party Chief: LAPOLLA	Field Book: GCY 1862	Page(s): 68-73	Report Prepared by: ANDERSEN

SITE SPECIFIC DATA

Site Benchmark: STL 185	Benchmark Elevation(s) (NAVD88): 27.710	Corpscon 6.0.1 Conversion Factor (NAVD88 to NGVD29) + 1.453	
Well Reference Elevation (NAVD88): 28.974	DTW: 4.87 (03/ 3/ 2020 at 4:10 PM)	Ground Elevation (NAVD88): 27.4	Pad Elevation (NAVD88): N/A

GEOGRAPHIC DATA

Section 23	Township 37 S	Range 38 E
Well Latitude: 27° 14' 40.1929" N	Well Longitude: 80° 29' 53.1622" W	Location Source: RTK GPS
State Plane Coordinates:	Northing (Y) = 1058376.60	Easting (X) = 819241.23

Notes: NAVD88 – North American Vertical Datum of 1988; NGVD29- National Geodetic Vertical Datum of 1929; **Corpscon 6.0.1** - A U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville FL.

PICTURES

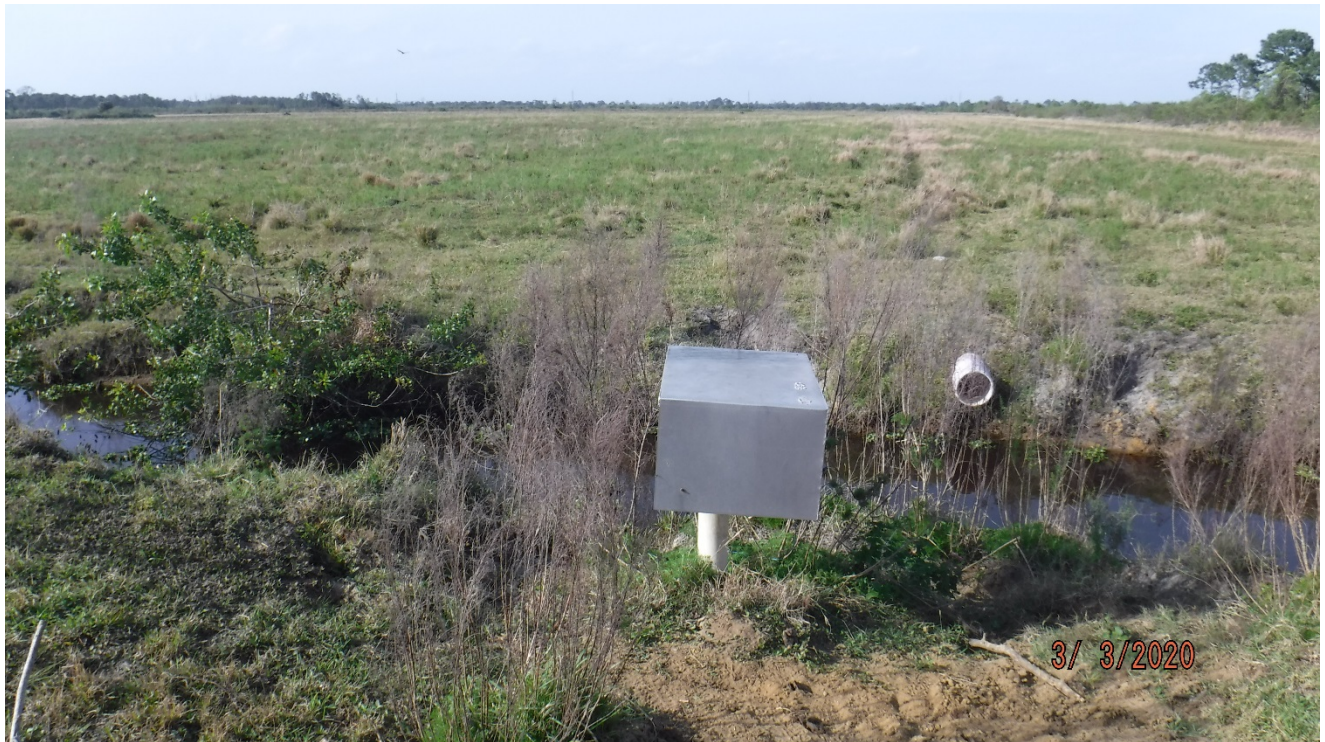
Aerial of Overall Well Site



Not to scale (GoogleEarth product)



Well Site and Well Head



Well: "STL 185"
Reference Point: MAGIC MARKER
BOX

Reference Point El. =**28.974**
feet NAVD88

Distance to Water =**4.87**
feet from reference point
(3/ 3/ 2020 at 4:10 PM)





SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

New Aluminum Tag





SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

USGS RMs -NONE



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Site Benchmark

Site Benchmark Overall Photo



Site BM:



Latitude: 27° 17' 55.63936" N
Longitude: 80° 15' 28.57158" W
NAVD88 EL = 27.710





SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Source Benchmarks



E 667, DL3198, 2, 20150113

Source BM – “E 667”



Latitude: **27° 15' 00.3" N**
Longitude: **80° 28' 51.7" W**
NAVD88 EL = 27.169



F 667, DL3199, 2, 20150113

Source BM – “F 667”



Latitude: **27° 14' 07.76" N**
Longitude: **80° 28' 55.74" W**
NAVD88 EL = 28.353



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

"E 667" Benchmark Datasheet (1 OF 2)

5/12/2020

DATASHEETS

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.12.5.7

Starting Datasheet Retrieval...

1 National Geodetic Survey, Retrieval Date = MAY 12, 2020

DL3198 *****

DL3198 DESIGNATION - E 667

DL3198 PID - DL3198

DL3198 STATE/COUNTY- FL/ST LUCIE

DL3198 COUNTRY - US

DL3198 USGS QUAD - FORT PIERCE SW (2018)

DL3198

DL3198 *CURRENT SURVEY CONTROL

DL3198

DL3198* NAD 83(1986) POSITION- 27 15 00.3 (N) 080 28 51.7 (W) HD_HELD2

DL3198* [NAVD 88](#) ORTHO HEIGHT - 8.281 (meters) 27.17 (feet) ADJUSTED

DL3198

DL3198 GEOID HEIGHT - -27.136 (meters) GEOID18

DL3198 DYNAMIC HEIGHT - 8.268 (meters) 27.13 (feet) COMP

DL3198 MODELED GRAVITY - 979,112.4 (mgal) NAVD 88

DL3198

DL3198 VERT ORDER - FIRST CLASS II

DL3198

DL3198.The horizontal coordinates were established by autonomous hand held GPS

DL3198.observations and have an estimated accuracy of +/- 10 meters.

DL3198.

DL3198.The orthometric height was determined by differential leveling and

DL3198.adjusted by the NATIONAL GEODETIC SURVEY

DL3198.in August 2009.

DL3198

DL3198.Significant digits in the geoid height do not necessarily reflect accuracy.

DL3198.GEOID18 height accuracy estimate available [here](#).

DL3198

DL3198.Click [photographs](#) - Photos may exist for this station.

DL3198

DL3198.The dynamic height is computed by dividing the NAVD 88

DL3198.geopotential number by the normal gravity value computed on the

DL3198.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

DL3198.degrees latitude (g = 980.6199 gals.).

DL3198

DL3198.The modeled gravity was interpolated from observed gravity values.

DL3198

DL3198; North East Units Estimated Accuracy

DL3198;SPC FL E - 323,220. 251,393. MT (+/- 10 meters HH2 GPS)

DL3198

DL3198_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNL5137514241(NAD 83)

DL3198

DL3198 SUPERSEDED SURVEY CONTROL

DL3198

DL3198.No superseded survey control is available for this station.

DL3198

DL3198_MARKER: DD = SURVEY DISK

DL3198_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

DL3198_STAMPING: E 667 2006

DL3198_MARK LOGO: FLDEP

DL3198_PROJECTION: RECESSED 8 CENTIMETERS

DL3198_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET

DL3198_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

https://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=DL3198

1/2



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

"E 667" Benchmark Datasheet (2 OF 2)

5/12/2020

DATASHEETS

DL3198+STABILITY: SURFACE MOTION
DL3198_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DL3198+SATELLITE: SATELLITE OBSERVATIONS - January 13, 2015

DL3198	HISTORY	- Date	Condition	Report By
DL3198	HISTORY	- 20060815	MONUMENTED	FLDEP
DL3198	HISTORY	- 20150113	GOOD	FLDEP

DL3198
DL3198 STATION DESCRIPTION

DL3198'DESCRIBED BY FL DEPT OF ENV PRO 2006 (BPJ)
DL3198'THE MARK IS ABOUT 8.2 MI SOUTHWEST OF PORT ST. LUCIE IN SECTION 18,
DL3198'TOWNSHIP 37 SOUTH, RANGE 39 EAST.
DL3198'
DL3198'TO REACH THE MARK FROM THE INTERSECTION OF COUNTY ROAD 709 (GLADES
DL3198'CUTOFF ROAD) AND COUNTY ROAD 609 (RANGELINE ROAD) ABOUT 7.8 MI WEST
DL3198'OF PORT ST. LUCIE, GO SOUTH ON COUNTY ROAD 609 (RANGE LINE ROAD) FOR
DL3198'3.1 MI TO THE MARK ON THE LEFT, SET IN THE TOP OF A ROUND CONCRETE
DL3198'MONUMENT FLUSH WITH THE GROUND AND LEVEL WITH COUNTY ROAD 609
DL3198'(RANGELINE ROAD).

DL3198'
DL3198'LOCATED 71.5 FT EAST OF THE APPROXIMATE CENTERLINE OF COUNTY ROAD 609
DL3198'(RANGE LINE ROAD), 19.1 FT NORTH OF THE APPROXIMATE EXTENDED
DL3198'CENTERLINE OF A DRIVEWAY AT 11191 RANGELINE ROAD, 9.0 FT SOUTH OF A
DL3198'WOODEN POWER POLE AND 1.0 FT WEST OF A CARSONITE WITNESS POST.

DL3198'
DL3198'NOTE A MAGNET WAS BURIED ON THE SOUTH SIDE OF THE MARK.

DL3198
DL3198 STATION RECOVERY (2015)

DL3198
DL3198'RECOVERY NOTE BY FL DEPT OF ENV PRO 2015 (BPJ)
DL3198'RECOVERED AS DESCRIBED.

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



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

"F 667" Benchmark Datasheet (1 OF 2)

5/12/2020

DATASHEETS

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.12.5.7

Starting Datasheet Retrieval...

1 National Geodetic Survey, Retrieval Date = MAY 12, 2020

DL3199 *****

DL3199 DESIGNATION - F 667

DL3199 PID - DL3199

DL3199 STATE/COUNTY- FL/ST LUCIE

DL3199 COUNTRY - US

DL3199 USGS QUAD - INDIANTOWN NW (2018)

DL3199

DL3199 *CURRENT SURVEY CONTROL

DL3199

DL3199* NAD 83(1986) POSITION- 27 14 07.76 (N) 080 28 55.74 (W) HD_HELD1

DL3199* [NAVD 88](#) ORTHO HEIGHT - 8.642 (meters) 28.35 (feet) ADJUSTED

DL3199

DL3199 GEOID HEIGHT - -27.120 (meters) GEOID18

DL3199 DYNAMIC HEIGHT - 8.629 (meters) 28.31 (feet) COMP

DL3199 MODELED GRAVITY - 979,110.2 (mgal) NAVD 88

DL3199

DL3199 VERT ORDER - FIRST CLASS II

DL3199

DL3199.The horizontal coordinates were determined by differentially corrected DL3199.hand held GPS observations or other comparable positioning techniques DL3199.and have an estimated accuracy of +/- 3 meters.

DL3199.

DL3199.The orthometric height was determined by differential leveling and DL3199.adjusted by the NATIONAL GEODETIC SURVEY

DL3199.in August 2009.

DL3199

DL3199.Significant digits in the geoid height do not necessarily reflect accuracy.

DL3199.GEOID18 height accuracy estimate available [here](#).

DL3199

DL3199.Click [photographs](#) - Photos may exist for this station.

DL3199

DL3199.The dynamic height is computed by dividing the NAVD 88

DL3199.geopotential number by the normal gravity value computed on the

DL3199.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

DL3199.degrees latitude (g = 980.6199 gals.).

DL3199

DL3199.The modeled gravity was interpolated from observed gravity values.

DL3199

DL3199; North East Units Estimated Accuracy

DL3199;SPC FL E - 321,602.0 251,289.0 MT (+/- 3 meters HH1 GPS)

DL3199

DL3199_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNL5127112624(NAD 83)

DL3199

DL3199 SUPERSEDED SURVEY CONTROL

DL3199

DL3199.No superseded survey control is available for this station.

DL3199

DL3199_MARKER: DD = SURVEY DISK

DL3199_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

DL3199_STAMPING: F 667 2006

DL3199_MARK LOGO: FLDEP

DL3199_PROJECTION: FLUSH

DL3199_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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"F 667" Benchmark Datasheet (2 OF 2)

5/12/2020

DATASHEETS

DL3199_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 DL3199+STABILITY: SURFACE MOTION
 DL3199_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 DL3199+SATELLITE: SATELLITE OBSERVATIONS - January 13, 2015

DL3199

DL3199 HISTORY	- Date	Condition	Report By
DL3199 HISTORY	- 20060815	MONUMENTED	FLDEP
DL3199 HISTORY	- 20150113	GOOD	FLDEP

DL3199

STATION DESCRIPTION

DL3199

DL3199'DESCRIBED BY FL DEPT OF ENV PRO 2006 (BPJ)
 DL3199'THE MARK IS ABOUT 8.7 MI SOUTHWEST OF PORT ST. LUCIE, IN SECTION 24,
 DL3199'TOWNSHIP 37 SOUTH, RANGE 38 EAST.

DL3199'

DL3199'TO REACH THE MARK FROM THE INTERSECTION OF COUNTY ROAD 709 (GLADES
 DL3199'CUTOFF ROAD) AND COUNTY ROAD 609 (RANGELINE ROAD) ABOUT 7.8 MI WEST
 DL3199'OF PORT ST. LUCIE, GO SOUTH ON COUNTY ROAD 609 (RANGELINE ROAD) FOR
 DL3199'4.1 MI TO THE JUNCTION OF A FLORIDA ROCK INDUSTRIES QUARRY ROAD ON
 DL3199'THE RIGHT AND THE MARK ON THE RIGHT, SET IN THE TOP OF A ROUND
 DL3199'CONCRETE MONUMENT FLUSH WITH THE GROUND AND LEVEL WITH COUNTY ROAD
 DL3199'609 (RANGE LINE ROAD).

DL3199'

DL3199'LOCATED 264.0 FT WEST OF THE APPROXIMATE CENTERLINE OF COUNTY ROAD 609
 DL3199'(RANGELINE ROAD), 19.0 FT NORTH OF A METAL GATE AND THE APPROXIMATE
 DL3199'CENTERLINE OF THE QUARRY ROAD, 1.5 FT EAST OF A 3-RAIL WOODEN FENCE
 DL3199'AND 1.4 FT EAST OF A CARSONITE WITNESS POST.

DL3199'

DL3199'NOTE A MAGNET WAS BURIED ON THE SOUTH SIDE OF THE MARK.

DL3199

STATION RECOVERY (2015)

DL3199

DL3199'RECOVERY NOTE BY FL DEPT OF ENV PRO 2015 (BPJ)
 DL3199'RECOVERED AS DESCRIBED.

*** retrieval complete.

Elapsed Time = 00:00:02



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Field Notes (1 of 6)

McCarty Ranch, St. Lucie

SFWMD - USGS / PWS WELLS

BENCH RUN FOR NEW BM "STL 185"
(NOV 88)

PEG TEST:

COLL. ERR. OLD:	1.0"	COLL. ERR. NEW:	4.9"
DIFF:	3.9"	RETICLE:	3.470'

STA	TOTAL DIST	ELEV	ADJ
E 667	0	27.168'	
5	2491.21'	27.168'	
11	5451.86'	29.234'	
18	8545.96'	28.293'	

(CONT. ON NEXT PG.)

18-1020-07-02 1862 68

77° M. CLOUDY 3.3.20TVES

LEICA DINA 10 M. LaBella PC

JOB: WELL STL 185 B. Goodman X

LINE: STL 185

NUS BM	E 667	PID: DL3198	DESC
			NOV 88 EL: 27.168'
			SET 1/2" I.R. + RED CAP " GUY TRAV. PT" (BM 1862-68A) UNDER POWER LINES, 105' NORTH OF THE E OF WALDO PEPPER DR. EXT.
			SET MAG. NAIL + BRASS WASHER " GUY TRAV. PT" (BM 1862-68B) 1' S. OF THE N. EOP OF THE ENTRANCE/EXIT RD FOR McCARTY RANCH PRESERVE, 3' WEST OF THE RED FIRE HYDRANT.
			SET MAG. NAIL + BRASS WASHER " GUY TRAV. PT" 1' S. OF THE N. EOP OF THE ENTRANCE/EXIT RD FOR McCARTY RANCH PRESERVE. (BM 1862-68C)

28.352 F667
DL3199



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Field Notes (2 of 6)

STA	TOTAL DIST	ELEV	ADT
24 RTK 10027	11258.74'	28.396'	
33 RTK 10026	14951.78'	27.203'	

DESC	1862 69
18-1020-07-02	3.3.20 TUES
79° CLOUDY	(OFF M. LOBBINS PC B. GOODMAN IN)
SET MAG. NAIL + BRASS WASHER "GUY TRAV. PT" (BM 1862-69A) 1' S. OF THE N. EOP OF THE ENTRANCE/EXIT RD OF MCCARTY RANCA PRESERVE. & EAT. OF THE SE GATE TO THE RANCA, JUST WEST OF THE SW CUR OF THE AIRPORT COMMUNITY.	
NEW BM "STL 185" (BM 1862-69B) SET 1 1/2" (I.P.) IRON PIPE + ALUMI. CAP "SFWMD STL 185 LB 4108 2020" I.P. IS 3' LONG W/1 CONC. COLLAR + GRADED CAP. 4.7" S. OF WELL STL 185.	
SET 1/2" I.R. + RED CAP "GUY INCL. TRAV. PT" (BM 1862-69C) 85' E. OF BM STL 185.	
(END RUN FOR TODAY) (CONT. ON NEXT PG.)	



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Field Notes (3 of 6)

SFWMD-USGS / PWS WELLS			
CONT. BENCH RD FROM PG'S 68-69 (NAV 88)			
Coll. Err. old:	Coll. Err. NEW:		
4.9"	0.0"		
STA	TOTAL DIST	ELEV	Δ
33	0	27.203'	
40	3981.48'	28.154'	
REV 10028	(18933.26')		
52	6995.95'	28.283'	
REV 10030	(21947.73')		
F 667	9078.20'	28.305'	
	(24029.98')		
(xxxxx.xx) COMBINED TOTAL OF BOTH LINES			

1862 70

18.10.20-07-02

LINE 1 STL 185 CONT.

3.4.20 WED
M. LaFolla PC
B. Gorman TX
T. McCabe G

DESC
BM 1862-69 C

SET MAG. NAIL + BRASS WASHER "GLY TRAV. PT"
(BM 1862-70A) 2' S. OF THE N. EOP OF THE
MCCARTY RANCH PRESERVE ENTRANCE/EXIT RD.
JUST WEST OF A RED FIRE HYDRANT.

SET MAG. NAIL + BRASS WASHER "GLY TRAV. PT"
(BM 1862-70B) 1' S. OF THE N. EOP OF THE
M.R. PRESERVE ENTRANCE/EXIT RD. 95' WEST
OF A 30 MPH SPEED LIMIT SIGN ON THE S. SIDE OF RD.

✓ TO NOS BM F 667 PFD: DL3199
LISTED NAVD 88 EL = 28.352'
FIELD = 28.305'
ERR = .047
DIST. IN METERS = 4.55 (24029.98')
MTS @ .02 PER MILE = .042

* END RUN *



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Field Notes (6 of 6)

SFWD - USGS / PH3 WELLS				
"M.P." - NG Bench Rod @				
WELL STA 185 (NAVD 88)				
STA	+	HI	-	EL
BM STA 185	5.376			27.71'
	5.15			
	5.126			
	(5.25)	32.96'		
s.s.1			5.61	27.35'
			4.14	
			3.986	
			3.858	
1			(3.986)	28.974'
	3.808			
	3.60			
	3.332			
	(3.60)	32.574'	5.642	
			5.372	
			5.103	
2			(5.372)	27.201'

1862 73

18-1020-07-02

3.4.20 WED

M. LaRilla PC

D. Gorman TX

P. McCabe ?

DESC

NEW BM STA 185 (BM 1892-69B)

NAVD 88 EL = 27.71'

NG @ WELL STA 185

MEASURING POINT @ WELL STA 185

USED OLD USGS BLACK MAGNET MARKER BOX w/ "X" ON THE WEST SIDE OF WELL OPENING, ON TOP OF PLYWOOD.

VTD BM 1892-69C LISTED = 27.203'

ERR = -.002

* END RUN *



South Florida Water Management District Benchmark Datasheet

Designation: STL 185 Project Name: USGS PHASE 3 WELLS Type: V State Plane Zone: FL East
Stamping: STL 185 LB4108 2020 Field Book Name: GCY 1862 Field Book Page: 68-73
Established By: GCY, INC. Recovered By: Recovery Date:
Surveyor: ANDERSEN Established Date: 03/04/20 Status: New

GEOGRAPHIC POSITION INFORMATION

Section: 23 Township: 37 SOUTH Range: 38 EAST
County: ST LUCIE Quadrangle: INDIANTOWN NW Quad Index: 1604 NGS Source BM(s): E 677
NAD83 Adj. Year: 2011 Vertical Datum: NAVD1988 Horizontal Datum: NAD1983 NGS PID(s): DL3198
NAVD88 Elevation (feet): 27.710 NGVD29 Elevation (feet): 29.163 2022 Elevation: NGS NAVD88 Elev (ft): 27.168
NAVD88 Class: NGVD29 Class: Other Elevation: NGS NAVD88 Elev (m): 8.281
NAVD88 Order: 3RD NGVD29 Order: 3RD Other Elevation Type: NGS 2022 Elev (ft):

CORPSCON 6.0.1 CONVERSION FACTOR (NAVD88 TO NGVD29): (A U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville FL)

Vertical Datum Offset: + 1.453 Actual NGS Elevation or ngvd29.txt file: OPUS Ortho Height: 27.644
Northing (Y) (feet): 1058362.007 Easting (X) (feet): 819243.322 Source of Latitude & Longitude: OPUS SOLUTION
Latitude: 27 14 40.04822 Longitude: 80 29 53.13966
Latitude (Decimal Degrees): 27.24445784 Longitude (Decimal Degrees): -80.49809435

RECOVERY DATA

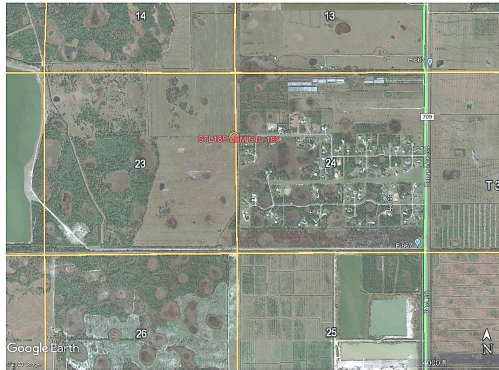
How to Reach: FROM THE INTERSECTION OF CR 714 AND CR 609 IN MARTIN COUNTY, GO NORTH ON CR 609, BECOMING CR 709 IN ST LUCIE COUNTY A DISTANCE OF 5.06 MILES TO AN UN-NAMED ROAD ON THE LEFT. GO WEST ON THE UN-NAMED ROAD A DISTANCE OF 1.13 MILES TO A GATE ON THE RIGHT. WHEN GOING THROUGH THE GATE YOU MUST CONTACT RODNEY HALL 772-216-5141 UPON ENTERING AND EXITING THE GATE. GO NORTH ALONG A FIELD ROAD FOR 0.65 MILES TO THE STATION ON THE LEFT. MARK IS 14.7 FEET SOUTH OF THE USGS WELL STL 185. MARK IS A STANDARD SFWMD DISK SET IN A 1 1/2" IRON PIPE WITH A CONCRETE COLLAR AND IS RECESSED ABOUT 0.5 FEET BELOW GRADE.

Description/Notes:

Notable Landmarks:
Other Source Benchmarks:

PICTURES

Aerial View of Overall Site



PICTURES

Site Sketch



From: opus
To: Pete Andersen
Subject: OPUS solution : 13970640.t01 OP1589293149883
Date: Tuesday, May 12, 2020 10:23:31 AM

FILE: 13970640.t01 OP1589293149883

NGS OPUS SOLUTION REPORT
=====

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: <https://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: petea@gcyinc.com DATE: May 12, 2020
RINEX FILE: 1397064n.20o TIME: 14:23:13 UTC

SOFTWARE: page5 1801.18 master74.pl 160321 START: 2020/03/04 13:03:00
EPHEMERIS: igs20953.eph [precise] STOP: 2020/03/04 17:45:00
NAV FILE: brdc0640.20n OBS USED: 12992 / 13454 : 97%
ANT NAME: TRM39105.00 NONE # FIXED AMB: 60 / 61 : 98%
ARP HEIGHT: 1.576 OVERALL RMS: 0.013(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) ITRF2014 (EPOCH:2020.1739)

X: 936752.232(m) 0.005(m) 936751.399(m) 0.005(m)
Y: -5596667.094(m) 0.003(m) -5596665.516(m) 0.003(m)
Z: 2902315.643(m) 0.002(m) 2902315.482(m) 0.002(m)

LAT: 27 14 40.04822 0.002(m) 27 14 40.06878 0.002(m)
E LON: 279 30 6.86034 0.005(m) 279 30 6.83996 0.005(m)
W LON: 80 29 53.13966 0.005(m) 80 29 53.16004 0.005(m)
EL HGT: -18.682(m) 0.002(m) -20.261(m) 0.002(m)
ORTHO HGT: 8.426(m) 0.047(m) [NAVD88 (Computed using GEOID18)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 17) SPC (0901 FL E)
Northing (Y) [meters] 3013611.300 322589.385
Easting (X) [meters] 549688.904 249705.864
Convergence [degrees] 0.22977222 0.22977222
Point Scale 0.99963048 0.99997166
Combined Factor 0.99963341 0.99997459

US NATIONAL GRID DESIGNATOR: 17RNL4968813611(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DH3757	WACH WAUCHULA CORS ARP	N273051.042	W0815256.615	140154.3
DR4402	LBL LBL LABELLE CORS ARP	N264451.324	W0812712.291	109644.9
DE9138	OKCB OKEECHOBEE CORS ARP	N271557.715	W0805119.181	35457.3

NEAREST NGS PUBLISHED CONTROL POINT

DL3198 E 667 N2715000000 W0802800051 1801.5

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

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390...+0000000000000005 391.21+0000000000000000
*110002+00000000000000B1 32...1+00000000000100467 332.21+0000000000005034
390...+0000000000000005 391.21+0000000000000000
*110003+00000000000000B2 32...1+00000000000050420 336.21+0000000000004439
390...+0000000000000005 391.21+0000000000000000
*110004+00000000000000A2 32...1+00000000000099707 335.21+0000000000003472
390...+0000000000000005 391.21+0000000000000000
*410005+00000000?.....1
*110006+000000000000E667 83..51+0000000000027168
*110007+000000000000E667 32...1+00000000000242679 331.21+0000000000004510
390...+0000000000000005 391.21+0000000000000002
*110008+0000000000000001 32...1+00000000000242655 332.21+0000000000003957
390...+0000000000000005 391.21+0000000000000001
*110009+0000000000000001 573..1+0000000000000024 574..1+0000000000485335
83..21+0000000000027721
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390...+0000000000000005 391.21+0000000000000001
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390...+0000000000000005 391.21+0000000000000000
*110185+0000000000000057 32...1+000000000028597 332.21+000000000004335
390...+0000000000000005 391.21+0000000000000000
*110186+0000000000000057 573..1-0000000000000127 574..1+0000000009047110
83..21+0000000000029381
*110187+0000000000000057 32...1+000000000016039 331.21+000000000004596
390...+0000000000000005 391.21+0000000000000000
*110188+000000000000F667 32...1+000000000015051 332.21+000000000005672
390...+0000000000000005 391.21+0000000000000000 71....+000000000DL3199
*110189+000000000000F667 573..1+0000000000000861 574..1+0000000009078200
83..21+0000000000028305

Palm City

13 May 2020

INPUT

State Plane, flhpgn - Florida HPGN
0901 - Florida East, U.S. Feet
Vertical - NAVD88, U.S. Feet

OUTPUT

Geographic, flhpgn - Florida HPGN
Vertical - NGVD29 (Custom), U.S. Feet

STL 185

1/1

Northing/Y: 1058362.007
Easting/X: 819243.322
Elevation/Z: 0
Convergence: 0 13 47.17583
Scale Factor: 0.999971664
Combined Factor: 0.999975914

Latitude: 27 14 40.04823
Longitude: 80 29 53.13965
Elevation/Z: 1.453

Remark: