PROFESSIONAL SURVEYORS & MAPPERS
INCORPORATED

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Statewide: 800.386.1066 www.gcyinc.com

SURVEYOR'S REPORT

Specific Purpose Survey of the United States
Geological Survey Well **M 1024**
in
Martin 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
772-286-8083

TABLE OF CONTENTS

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 **"M 1024"**.

LOCATION OF PROJECT

The United States Geological Survey Well **"M 1024"** is located in the Section 19, Township 40 South, Range 43 East, Martin 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 M-1024 add 1.503.** 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 √ miles) per executed SOW for 4600003703 WO07.
Leveling was run from National Geodetic Survey (NGS) monument "MAR 10" (NGSPID AD6243) to the site benchmarks and closing on SFWMD Benchmark "M 1039". Leveling was done using a Leica DNA 10 digital level S/N 331745

GPS METHODS

Latitude and longitude for the New Benchmark "M 1024" were established by observing a 4.5 hour Static Session on January 30, 2020 using a Trimble 5700 dual frequency receiver S/N 0220381397. The data from this session was sent to the NGS "OPUS" site for post processing on April 21, 2020 and a report was 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 1.503 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: February 5, 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 8-10, 24-25

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.

February 5, 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.

PROFESSIONAL SURVEYORS & MAPPERS
INCORPORATED

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

U.S.G.S. Station Name: **M 1024**	U.S.G.S. Station Number: 265822080052701	Agency: **GCY, INC.**	Date of Field Work: **2/5/2020**
Party Chief: LAPOLLA	Field Book: **GCY 1862**	Page(s): **8-10, 24-25**	Report Prepared by: ANDERSEN

SITE SPECIFIC DATA

Site Benchmark: **M 1024**	Benchmark Elevation(s) *(NAVD88)*: **23.234**	Corpscon 6.0.1 Conversion Factor (*NAVD88 to NGVD29*) **+ 1.503**	
Well Reference Elevation (*NAVD88*): 24.509	DTW: **23.05** (02/ 05/ 2020 at 14:00 PM)	Ground Elevation *(NAVD88)*: **23.5**	Pad Elevation (*NAVD88*): **N/A**

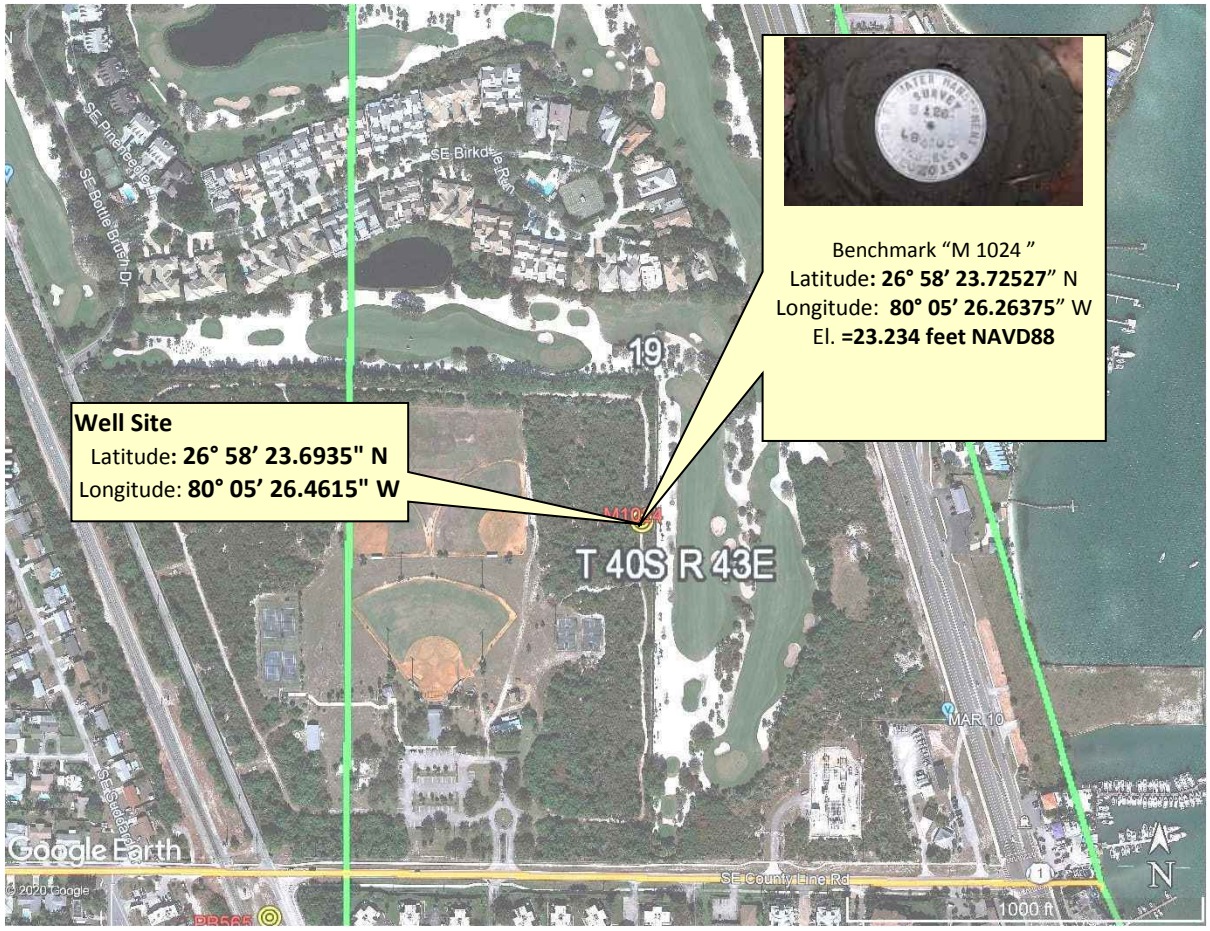
GEOGRAPHIC DATA

Section **19**	Township **40 S**	Range **43 E**
Well Latitude: **26° 58’ 23.6935" N**	Well Longitude: **80° 05’ 26.4615" W**	Location Source: **RTK GPS**
State Plane Coordinates:	Northing (Y) = 960513.06	Easting (X) = 952335.26

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: "M 1024"
Reference Point: MAGIC MARKER BOX

Reference Point El. = **24.509 feet NAVD88**

Distance to Water = 23.05 **feet** from reference point (02/ 05/ 2020 at 14:00 PM)

New Aluminum Tag

USGS RMs NONE

Site Benchmark

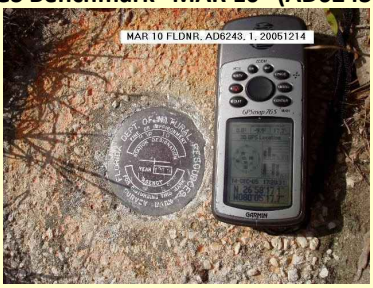
Site Benchmark Overall Photo

Site BM:

Latitude**: 26° 58’ 23.72527**” N
Longitude: **80° 05’ 26.26375**” W
NAVD88 EL = 23.234

Source Benchmarks

NGS Benchmark "MAR 10" (AD6243)



Latitude**: 26° 58' 18.19**" N
Longitude: **80° 05' 16.97**" W
NAVD88 EL = 15.033

"MAR 10" Benchmark Datasheet (1 o 3)

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 = APRIL 28, 2020
 AD6243 ***********************************************************************
 AD6243  TIDAL BM     -  This is a Tidal Bench Mark.
 AD6243  DESIGNATION -  MAR 10
 AD6243  PID          -  AD6243
 AD6243  STATE/COUNTY-  FL/MARTIN
 AD6243  COUNTRY      -  US
 AD6243  USGS QUAD    -  JUPITER (2018)
 AD6243
 AD6243                         *CURRENT SURVEY CONTROL
 AD6243  ______________________________________________________________________
 AD6243* NAD 83(1986) POSITION- 26 58 18.19   (N) 080 05 16.97   (W)   HD_HELD1
 AD6243* NAVD 88 ORTHO HEIGHT -     4.582 (meters)       15.03  (feet) ADJUSTED
 AD6243  ______________________________________________________________________
 AD6243  GEOID HEIGHT     -        -27.537 (meters)                     GEOID18
 AD6243  DYNAMIC HEIGHT   -          4.575 (meters)       15.01  (feet) COMP
 AD6243  MODELED GRAVITY -    979,092.1   (mgal)                         NAVD 88
 AD6243
 AD6243  VERT ORDER       -  SECOND    CLASS I
 AD6243
 AD6243.The horizontal coordinates were determined by differentially corrected
 AD6243.hand held GPS observations or other comparable positioning techniques
 AD6243.and have an estimated accuracy of +/- 3 meters.
 AD6243.
 AD6243.The orthometric height was determined by differential leveling and
 AD6243.adjusted by the NATIONAL GEODETIC SURVEY
 AD6243.in June 1991.
 AD6243
 AD6243.Significant digits in the geoid height do not necessarily reflect accuracy.
 AD6243.GEOID18 height accuracy estimate available here.
 AD6243
 AD6243.This Tidal Bench Mark is designated as VM 18716
 AD6243.by the CENTER FOR OPERATIONAL OCEANOGRAPHIC PRODUCTS AND SERVICES.
 AD6243
 AD6243.This Tidal Bench Mark is designated as VM 18937
 AD6243.by the CENTER FOR OPERATIONAL OCEANOGRAPHIC PRODUCTS AND SERVICES.
 AD6243
 AD6243.Click photographs - Photos may exist for this station.
 AD6243
 AD6243.The dynamic height is computed by dividing the NAVD 88
 AD6243.geopotential number by the normal gravity value computed on the
 AD6243.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AD6243.degrees latitude (g = 980.6199 gals.).
 AD6243
 AD6243.The modeled gravity was interpolated from observed gravity values.
 AD6243
 AD6243;                   North         East     Units  Estimated Accuracy
 AD6243;SPC FL E     -   292,597.5     290,535.3     MT  (+/- 3 meters HH1 GPS)
 AD6243
 AD6243_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNK9050483629(NAD 83)
 AD6243
 AD6243                             SUPERSEDED SURVEY CONTROL
 AD6243
 AD6243  NGVD 29 (09/01/92)    5.036  (m)           16.52   (f) ADJUSTED    2 1
```

"MAR 10" Benchmark Datasheet (2 of 3)


```
AD6243
AD6243.Superseded values are not recommended for survey control.
AD6243
AD6243.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AD6243.See file dsdata.pdf to determine how the superseded data were derived.
AD6243
AD6243_MARKER: DD = SURVEY DISK
AD6243_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AD6243_STAMPING: MAR 10 1980 BSM
AD6243_MARK LOGO: FLDNR
AD6243_PROJECTION: FLUSH
AD6243_MAGNETIC: N = NO MAGNETIC MATERIAL
AD6243_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AD6243+STABILITY: SURFACE MOTION
AD6243_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AD6243+SATELLITE: SATELLITE OBSERVATIONS - February 22, 2017
AD6243
AD6243  HISTORY     - Date     Condition        Report By
AD6243  HISTORY     - 1980     MONUMENTED       FLDNR
AD6243  HISTORY     - 20031002 GOOD             USPSQD
AD6243  HISTORY     - 20051214 GOOD             FLDEP
AD6243  HISTORY     - 20060119 GOOD             FLDEP
AD6243  HISTORY     - 20070411 GOOD             LBFH
AD6243  HISTORY     - 20170222 GOOD             NGS
AD6243  HISTORY     - 20170222 GOOD             NGS
AD6243
AD6243                          STATION DESCRIPTION
AD6243
AD6243'DESCRIBED BY FL DEPT OF NAT RES 1980
AD6243'2.4 MI NORTH FROM JUPITER.
AD6243'BEGIN AT THE NORTH END OF THE U.S. HIGHWAY 1 BRIDGE OVER THE
AD6243'LOXAHATCHEE RIVER, PROCEED NORTH 1.65 MILES ALONG U.S. HIGHWAY 1 TO
AD6243'THE MARK.  THE MARK BEARS 78.2 FEET WEST OF THE U.S. 1 SOUTHBOUND LANE
AD6243'CENTERLINE, 2.2 FEET EAST OF THE SOUTHEAST CORNER OF A 6-FOOT HIGH
AD6243'CHAIN-LINK FENCE, ABOUT 450 FEET NORTH OF THE MARTIN/PALM BEACH COUNTY
AD6243'LINE, AND 2.2 FEET EAST OF A WITNESS POST.
AD6243
AD6243                          STATION RECOVERY (2003)
AD6243
AD6243'RECOVERY NOTE BY US POWER SQUADRON 2003 (AEP)
AD6243'RECOVERED IN GOOD CONDITION.
AD6243
AD6243                          STATION RECOVERY (2005)
AD6243
AD6243'RECOVERY NOTE BY FL DEPT OF ENV PRO 2005 (JRH)
AD6243'RECOVERED AS DESCRIBED.
AD6243
AD6243                          STATION RECOVERY (2006)
AD6243
AD6243'RECOVERY NOTE BY FL DEPT OF ENV PRO 2006 (JRH)
AD6243'RECOVERED AS DESCRIBED.
AD6243
AD6243                          STATION RECOVERY (2007)
AD6243
AD6243'RECOVERY NOTE BY LINDAHL BROWNING FERRARI HELLSTROM 2007 (GM)
AD6243'RECOVERED IN GOOD CONDITION.
AD6243
AD6243                          STATION RECOVERY (2017)
AD6243
AD6243'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2017 (SWA)
AD6243'RECOVERED IN GOOD CONDITION.
AD6243
AD6243                          STATION RECOVERY (2017)
AD6243
AD6243'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2017 (SWA)
```

"MAR 10" Benchmark Datasheet (3 of 3)

AD6243'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:01

"M 1039" Benchmark Datasheet (1 of 1)

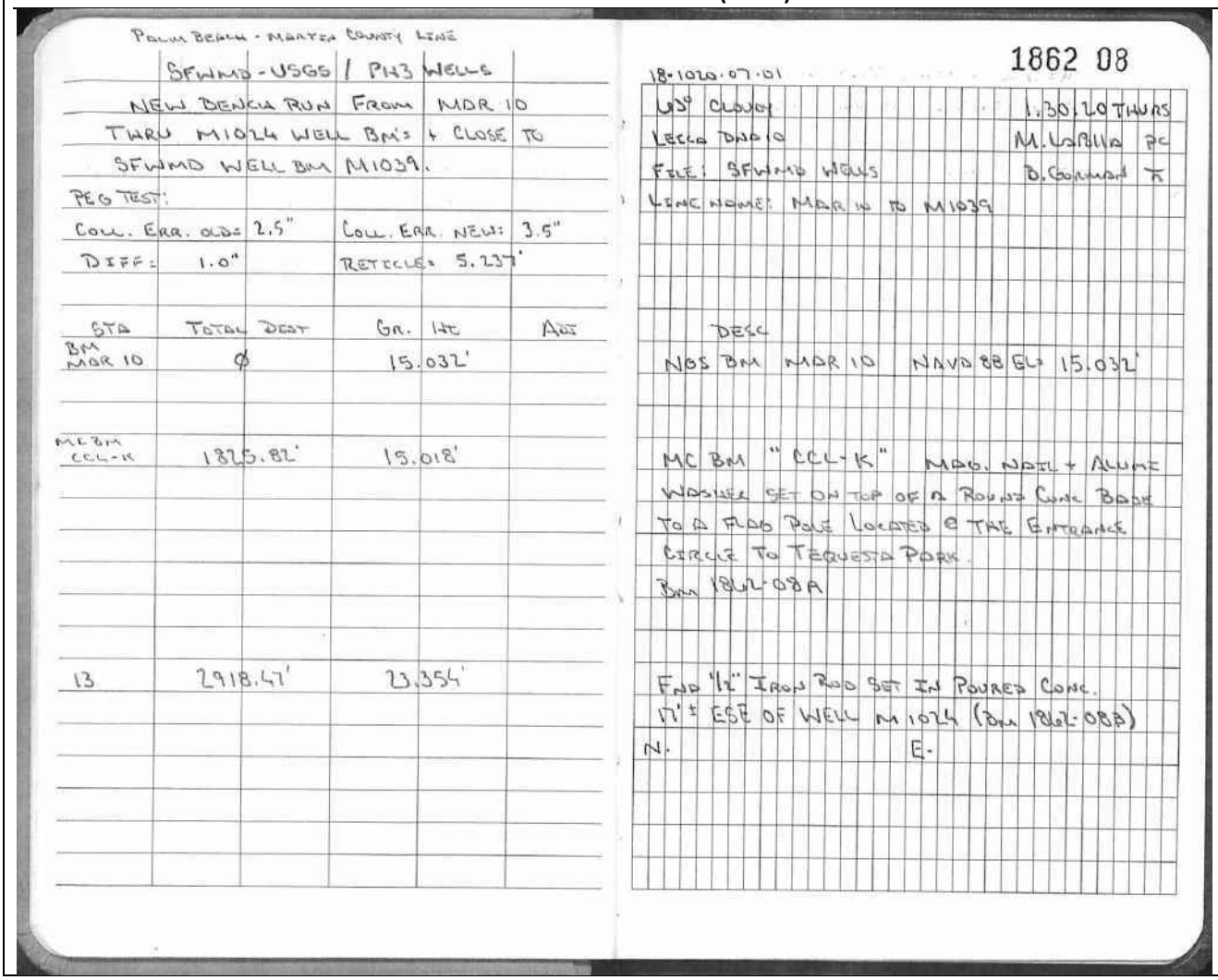
GDSRV_SFWMD_CONTROL: Vertical

DESIGNATION	M1039
TYPE	Vertical
ESTABLISHED_DATE	12/31/2004, 7:00 PM
NAD83_ADJUSTMENT_YEAR	
NAVD_CLASS	
NAVD_ORDER	3rd Order
NGVD_CLASS	
NGVD_ORDER	3rd Order
NAVD_ELEV	22.37
NGVD_ELEV	23.86
VERTICAL_DATUM_OFFSET	
NAD83_XCOORD	952,324.89
NAD83_YCOORD	960,410.86
NAD83_ORDER	
LONG_DEG_83	-80
LAT_DEG_83	26
BENCHMARK_STAMP	M 1039 2005
BENCHMARK_STATUS	
NGS_SOURCE_PIDS	
HOW_TO_REACH	
DESCRIPTION	BENCHMARK IS SITUATED WEST OF U.S. 1 AND NORTH OF COUNTY LINE ROAD IN SECTION 19-T40S-R42E, MARTIN COUNTY, FLORIDA TO REACH THE BENCHMARK FROM THE INTERSECTION OF US-1 AND COUNTY LINE ROAD IN TEQUESTA, FLORIDA, TRAVEL WEST ON COUNTY LINE ROAD FOR 0.2 MILES TO THE ENTRANCE OF TEQUESTA PARK ON THE RIGHT (NORTH). TURN RIGHT AND ENTER THE PARK. IMMEDIATELY AFTER ENTERING THE PARK, THERE IS A SANDY TRAIL TO THE RIGHT (EAST) WHICH CIRCLES THE PARK. TURN RIGHT AND FOLLOW THE SANDY TRAIL FOR 0.2 MILES TO THE BENCHMARK ON THE LEFT SIDE OF THE TRAIL. BENCHMARK IS A STANDARD ALUMINUM SFWMD DISC SET IN THE SOUTH SIDE OF THE CONCRETE ENCASEMENT FOR TAPE DOWN WELL M1039, LYING 10 FEET (MORE OR LESS) WEST OF THE CENTERLINE OF SAID TRAIL.
FLAG	

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (1 of 5)



PALM BEACH - MARTIN COUNTY LINE

SFWMD - USGS / PH3 WELLS

NEW RIVER RUN FROM MDR 10

THRU M1024 WELL BM'S & CLOSE TO

SFWMD WELL BM M1039.

PEG TEST:

COLL. ERR. OLD: 2.5" COLL. ERR. NEW: 3.5"

DIFF: 1.0" RETICLE: 5.237'

STA	TOTAL DIST	GR. HT	ADJ
BM MDR 10	0	15.032'	
MC BM CCL-K	1875.82'	15.018'	
13	2918.47'	23.354'	

1862 08

18-1020-07-01

USC CLOUD 1.30.20 THURS

LEICA DNA 10 M. LABIVA PC

FILE: SFWMD WELLS B. GORMAN X

LINE NAME: MDR 10 TO M1039

DESC

NOS BM MDR 10 NAVD 88 EL: 15.032'

MC BM "CCL-K" MAG. NAIL + ALUM WASHER SET ON TOP OF A ROUND CONC. BASE TO A FLAG POLE LOCATED @ THE ENTRANCE CIRCLE TO TEQUESTA PARK.

BM 1862-08A

FND ½" IRON ROD SET IN POURED CONC. 17' ± ESE OF WELL M1024 (BM 1862-08A)

N. E.

Field Notes (2 of 5)

SFWMD - USGS | PHB WELLS

CONT. BENCH RUN FROM PG. 08

STA	TOTAL DIST	GR. HT.	ADJ
BM M1024	2933.94'	23.234'	
14	2953.48'	23.725'	
BM M1039	3074.94'	22.362'	

18-1020-07-01

1862 09

64° CLOUDY

1.30.20 THURS

M. LaPella PC

B. Gorman ⊼

DESC

NEW BM "M1024" SET 1½" (I.D.) IRON PIPE W/ ALUMN. CAP. 3' LONG. W/ CONC COLLAR + GROOVED IN CAP. BM 1862-09A

"SFWMD M1024 LB4108 2020"

22' ± EAST OF WELL M1024.

N- E-

FND ½" I.R. SET IN POURED CONC. 2' ± NORTH OF WELL M1024. BM 1862-09B

N- , E-

SFWMD BM M1039 LISTED NAVD 88- 22.37'

"SFWMD M-1039 2005" ALUMN DISK SET ON TOP OF CONC. COLLAR @ WELL M1039.

FIELD = 22.362'

ERR- -.008

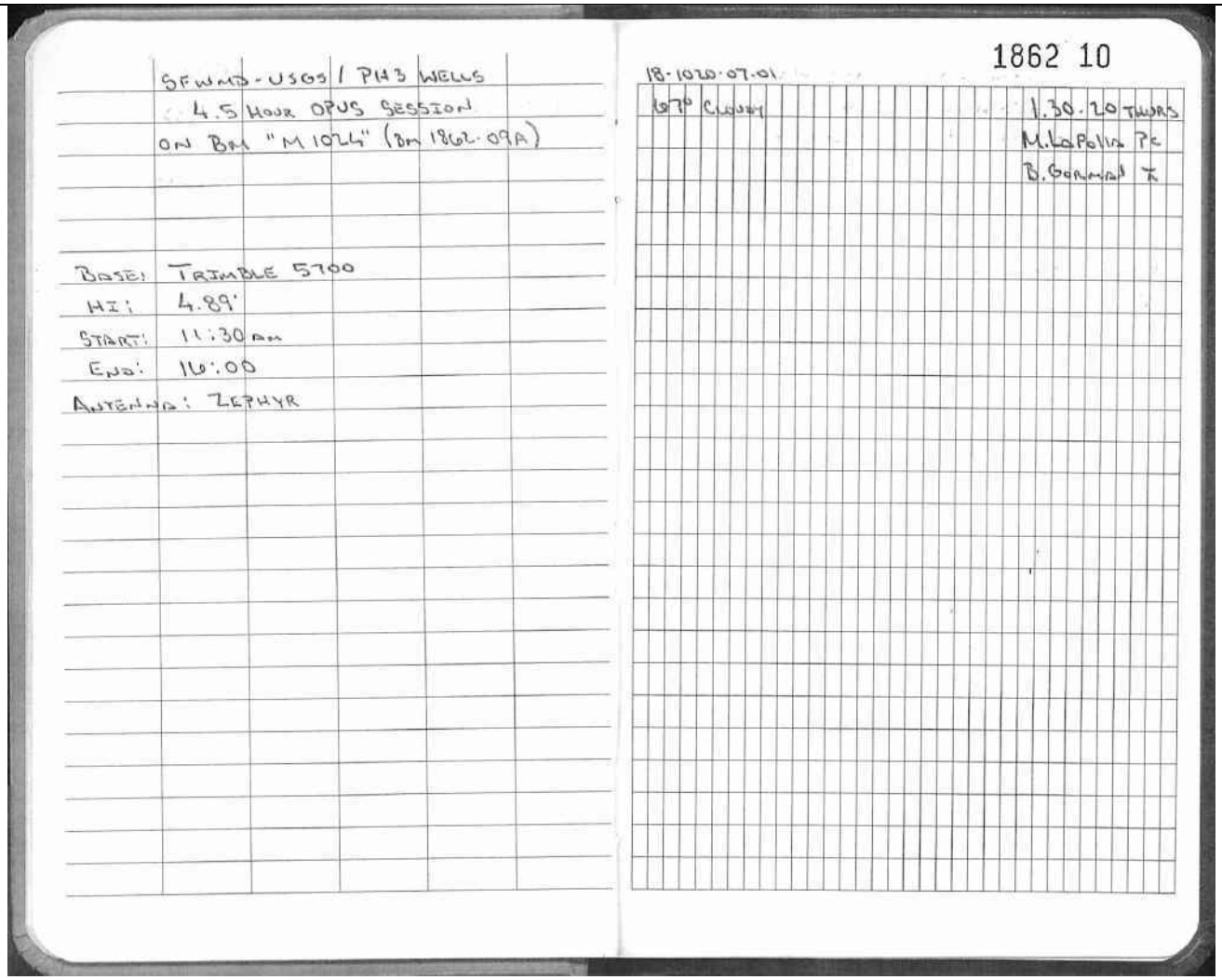
DIST. IN MILES: 0.58

MTS = .015

MTS: .02 PER MILE *

* END RUN *

Field Notes (3 of 5)



SFWMD - USGS / PH3 WELLS
4.5 HOUR OPUS SESSION
ON BM "M 1024" (DM 1862.09A)

BASE: TRIMBLE 5700
HI: 4.89'
START: 11:30 AM
END: 16:00
ANTENNA: ZEPHYR

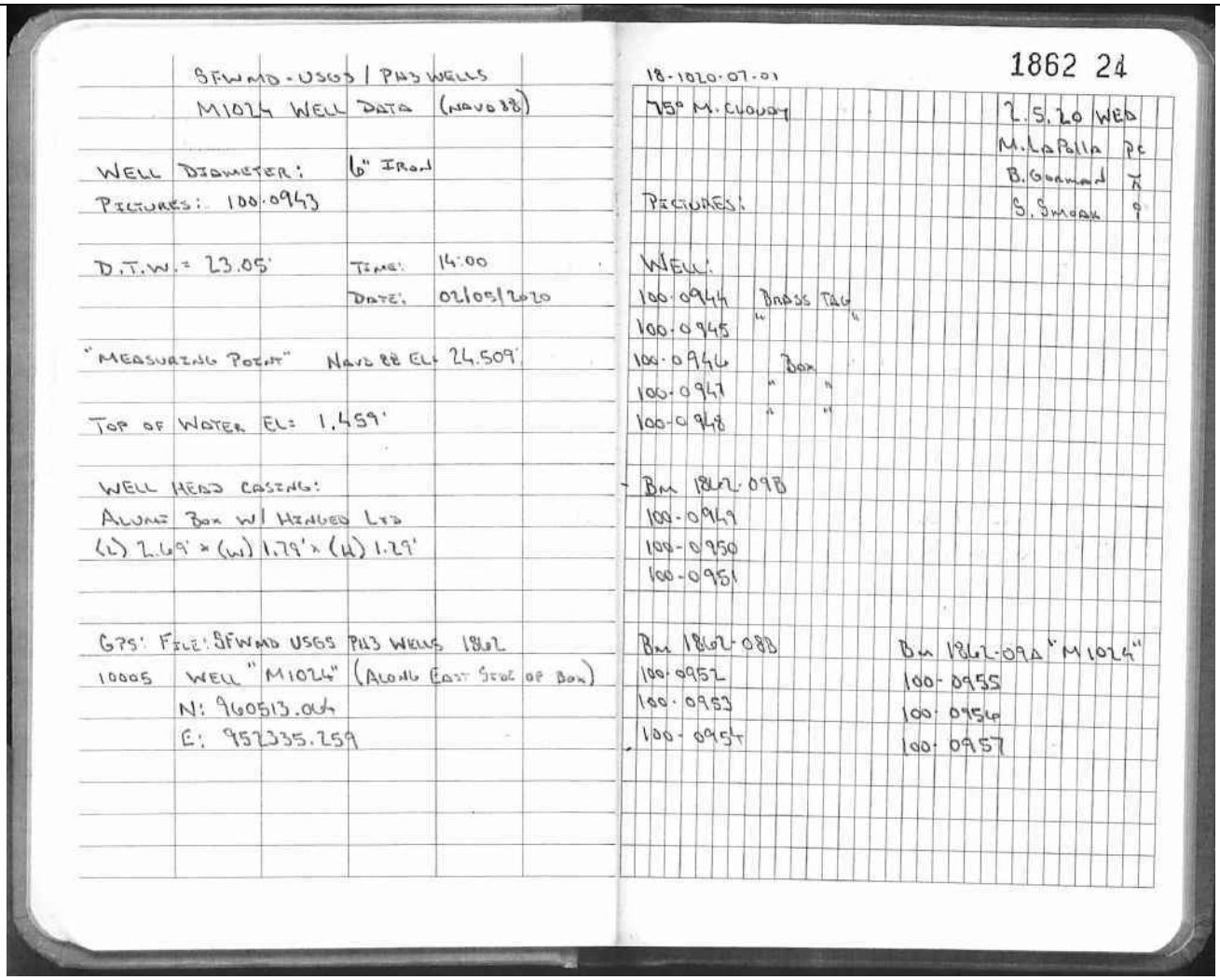
1862 10

18-1020-07-01

67° CLOUDY

1.30.20 THURS
M. LaPolla PE
B. Gorman X

Field Notes (4 of 5)



SFWMD - USGS / PW3 WELLS
M1024 WELL DATA (NAVD88)

WELL DIAMETER: 6" IRON
PICTURES: 100.0943

D.T.W.: 23.05' TIME: 14:00
DATE: 02/05/2020

"MEASURING POINT" NAVD 88 EL: 24.509'

TOP OF WATER EL: 1.459'

WELL HEAD CASING:
ALUM. BOX W/ HINGED LID
(L) 2.69' x (W) 1.79' x (H) 1.29'

GPS: FILE: SFWMD USGS PW3 WELLS 1862
10005 WELL "M1024" (ALONG EAST SIDE OF BOX)
N: 960513.064
E: 952335.259

18-1020-07-01

1862 24

75° M. CLOUDY

PICTURES:

2.5.20 WED
M. LaPolla PL
B. Gunnard "
S. Smoak "

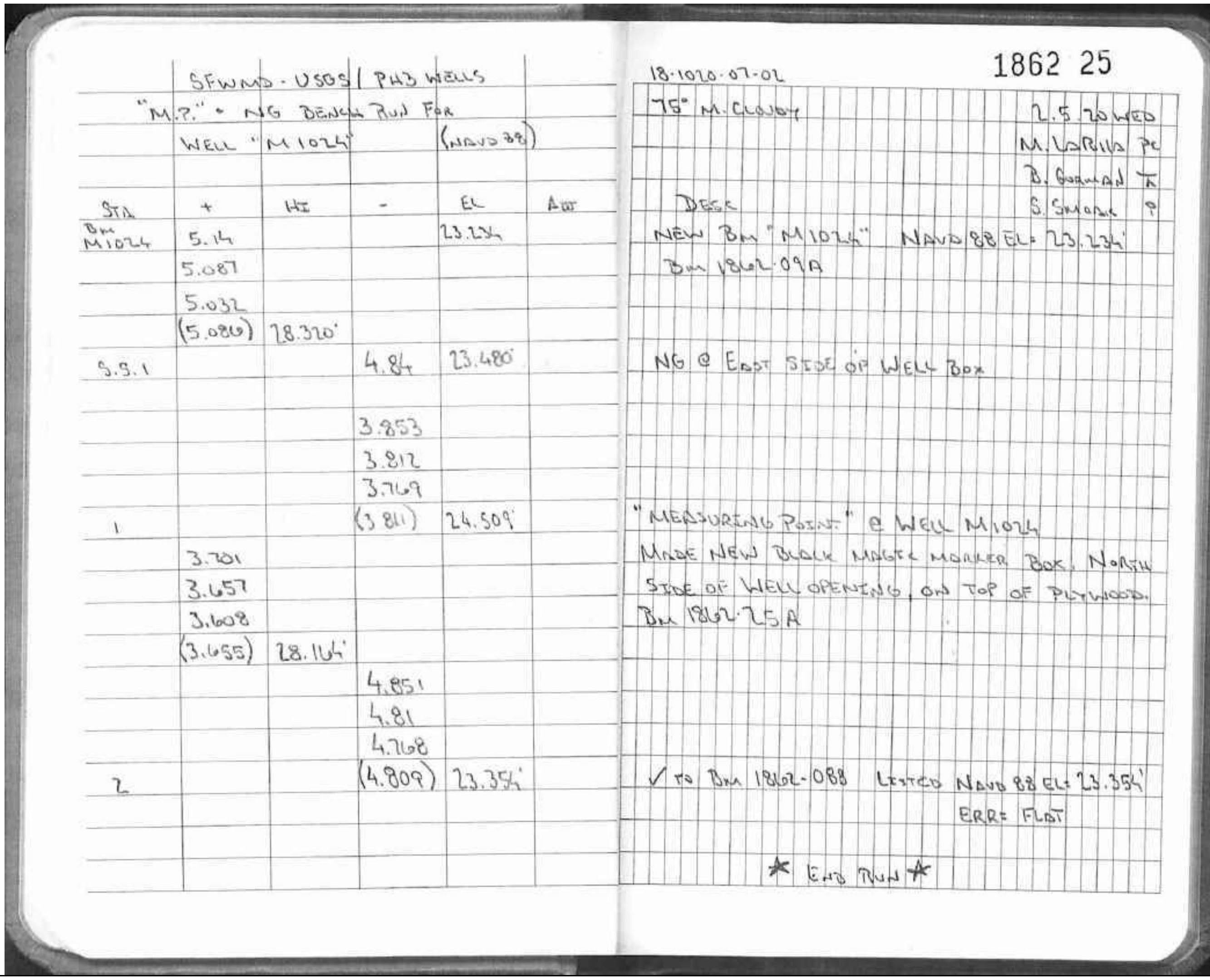
WELL:
100.0944 BRASS TAG
100.0945 "
100.0946 BOX
100.0947 " "
100.0948 " "

BM 1862-098
100.0949
100.0950
100.0951

BM 1862-088
100.0952
100.0953
100.0954

BM 1862-094 "M1024"
100.0955
100.0956
100.0957

Field Notes (5 of 5)



SFWMD - USGS / PH3 WELLS
"M.P." + NG BENCH RUN FOR
WELL "M1024" (NAVD 88)

STA	+	HI	-	EL	ADJ
BM M1024	5.14			23.234	
	5.087				
	5.032				
	(5.086)	28.320'			
S.S.1			4.84	23.480'	
			3.853		
			3.812		
			3.769		
1			(3.811)	24.509'	
	3.701				
	3.657				
	3.608				
	(3.655)	28.164'			
			4.851		
			4.81		
			4.768		
2			(4.809)	23.354'	

18-1020-07-02 — 1862 25

75° M. CLOUDY — 2.5.20 WED

M. LaRillo PC
B. Gorman TT
S. Smyrak ?

DESC

NEW BM "M1024" NAVD 88 EL= 23.234'
BM 1862-09A

NG @ EAST SIDE OF WELL BOX

"MEASURING POINT" @ WELL M1024
MADE NEW BLACK MAGIC MARKER BOX, NORTH SIDE OF WELL OPENING, ON TOP OF PLYWOOD.
BM 1862-25A

✓ TO BM 1862-088 LISTED NAVD 88 EL= 23.354'
ERR= FLAT

* END RUN *

South Florida Water Management District Benchmark Datasheet

Designation:	M 1024	Project Name:	USGS PHASE 3 WELLS	Type:	V	State Plane Zone:	FL East
Stamping:	M 1024 LB4108 2020	Field Book Name:	GCY-1862	Field Book Page:	8-10, 24-25		
Established By:	GCY, INC	Recovered By:		Recovery Date:			
Surveyor:	ANDERSEN	Established Date:	01/29/20	Status:			

GEOGRAPHIC POSITION INFORMATION

Section:	19	Township:	40 SOUTH	Range:	43 EAST		
County:	MARTIN	Quadrangle:	JUPITER	Quad Index:	1473	NGS Source BM(s):	10-Mar
NAD83 Adj. Year:	2011	Vertical Datum:	NAVD1988	Horizontal Datum:	NAD1983	NGS PID(s):	AD6243
NAVD88 Elevation (feet):	23.234	NGVD29 Elevation (feet):	24.737	2022 Elevation:		NGS NAVD88 Elev (ft):	15.033
NAVD88 Class:	3RD	NGVD29 Class:	3RD	Other Elevation:		NGS NAVD88 Elev (m):	4.582
NAVD88 Order:		NGVD29 Order:		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: +	1.503	Actual NGS Elevation or ngvd29.txt file:		OPUS Ortho Height:	23.219		
Northing (Y) (feet):	960516.399	Easting (X) (feet):	952353.128	Source of Latitude & Longitude:	OPUS SOLUTION		
Latitude:	26	58	23.72527	Longitude:	80	5	26.26375
	DD°	MM'	SS"		DD°	MM'	SS"
Latitude (Decimal Degrees):	26.97325702			Longitude (Decimal Degrees):	-80.09062882		

RECOVERY DATA

How to Reach:	BENCHMARK IS SITUATED WEST OF U.S. 1 AND NORTH OF COUNTY LINE ROAD IN SECTION 19-T40S-R42E, MARTIN COUNTY, FLORIDA TO REACH THE BENCHMARK FROM THE INTERSECTION OF US-1 AND COUNTY LINE ROAD IN TEQUESTA, FLORIDA, TRAVEL WEST ON COUNTY LINE ROAD FOR 0.2 MILES TO THE ENTRANCE OF TEQUESTA PARK ON THE RIGHT (NORTH). TURN RIGHT AND ENTER THE PARK. IMMEDIATELY AFTER ENTERING THE PARK, THERE IS A SANDY TRAIL TO THE RIGHT (EAST) WHICH CIRCLES THE PARK. TURN RIGHT AND FOLLOW THE SANDY TRAIL FOR 0.2 MILES TO THE BENCHMARK ON THE RIGHT SIDE OF THE TRAIL. 15' +/- SOUTHEAST OF WELL M 1024 AND 12' +/- EAST OF DIRT TRAIL
Description/Notes:	
Notable Landmarks:	
Other Source Benchmarks:	

PICTURES

Aerial View of Overall Site

PICTURES

Site Sketch

Page 1 of 1

From: opus
To: Pete Andersen
Subject: OPUS solution : 13970300.T01 OP1587469846671
Date: Tuesday, April 21, 2020 7:54:33 AM

FILE: 13970300.T01 OP1587469846671

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: April 21, 2020
RINEX FILE: 1397030q.20o TIME: 11:54:15 UTC

SOFTWARE: page5 1801.18 master76.pl 160321 START: 2020/01/30 16:30:00
EPHEMERIS: igs20904.eph [precise] STOP: 2020/01/30 21:01:00
NAV FILE: brdc0300.20n OBS USED: 12395 / 12819 : 97%
ANT NAME: TRM39105.00 NONE # FIXED AMB: 49 / 52 : 94%
ARP HEIGHT: 1.491 OVERALL RMS: 0.016(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) ITRF2014 (EPOCH:2020.0814)

X:	978885.783(m)	0.008(m)	978884.954(m)	0.008(m)
Y:	-5603351.380(m)	0.016(m)	-5603349.796(m)	0.016(m)
Z:	2875565.745(m)	0.009(m)	2875565.584(m)	0.009(m)

LAT:	26 58 23.72527	0.002(m)	26 58 23.74568	0.002(m)
E LON:	279 54 33.73625	0.011(m)	279 54 33.71652	0.011(m)
W LON:	80 5 26.26375	0.011(m)	80 5 26.28348	0.011(m)
EL HGT:	-20.454(m)	0.016(m)	-22.045(m)	0.016(m)
ORTHO HGT:	7.077(m)	0.030(m)	[NAVD88 (Computed using GEOID18)]	

	UTM COORDINATES UTM (Zone 17)	STATE PLANE COORDINATES SPC (0901 FL E)
Northing (Y) [meters]	2983798.075	292765.984
Easting (X) [meters]	590247.012	290277.814
Convergence [degrees]	0.41249444	0.41249444
Point Scale	0.99970054	1.00004175
Combined Factor	0.99970375	1.00004496

US NATIONAL GRID DESIGNATOR: 17RNK9024783798(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG9798	PBCH WEST PALM CORS ARP	N265046.638	W0801309.300	19004.1
DF7050	MTNT MIAMI TNT CORS ARP	N255156.760	W0805425.186	147266.0
DE9138	OKCB OKEECHOBEE CORS ARP	N271557.715	W0805119.181	82467.4

NEAREST NGS PUBLISHED CONTROL POINT

AD6243	MAR 10	N265800018.	W0800500016.	307.8

*410100+00000000?.....1
*110101+0000000000MAR 10 83..51+0000000000015032
*110102+0000000000MAR 10 32...1+0000000000182286 331.21+0000000000005753
390...+0000000000000005 391.21+0000000000000000
*110103+0000000000000001 32...1+0000000000182087 332.21+0000000000005382
390...+0000000000000005 391.21+0000000000000000
*110104+0000000000000001 573..1+0000000000000199 574..1+0000000000364373
83..21+0000000000015403
*110105+0000000000000001 32...1+0000000000074899 331.21+0000000000007416
390...+0000000000000005 391.21+0000000000000000
*110106+0000000000000002 32...1+0000000000075136 332.21+0000000000002039
390...+0000000000000005 391.21+0000000000000000
*110107+0000000000000002 573..1-0000000000000039 574..1+0000000000514408
83..21+0000000000020780
*110108+0000000000000002 32...1+0000000000165107 331.21+0000000000007972
390...+0000000000000005 391.21+0000000000000000
*110109+0000000000000003 32...1+0000000000165155 332.21+0000000000005145
390...+0000000000000005 391.21+0000000000000000
*110110+0000000000000003 573..1-0000000000000086 574..1+0000000000844670
83..21+0000000000023608
*110111+0000000000000003 32...1+0000000000156156 331.21+0000000000001534
390...+0000000000000005 391.21+0000000000000000
*110112+0000000000000004 32...1+0000000000155939 332.21+0000000000005933
390...+0000000000000005 391.21+0000000000000000
*110113+0000000000000004 573..1+0000000000000131 574..1+0000000001156765
83..21+0000000000019209
*110114+0000000000000004 32...1+0000000000192730 331.21+0000000000003196
390...+0000000000000005 391.21+0000000000000000
*110115+0000000000000005 32...1+0000000000192849 332.21+0000000000006852
390...+0000000000000005 391.21+0000000000000000
*110116+0000000000000005 573..1+0000000000000011 574..1+0000000001542344
83..21+0000000000015553
*110117+0000000000000005 32...1+0000000000053340 331.21+0000000000004110
390...+0000000000000005 391.21+0000000000000000
*110118+0000000000000006 32...1+0000000000053615 332.21+0000000000004989
390...+0000000000000005 391.21+0000000000000000
*110119+0000000000000006 573..1-0000000000000264 574..1+0000000001649299
83..21+0000000000014674
*110120+0000000000000006 32...1+0000000000040732 331.21+0000000000003723
390...+0000000000000005 391.21+0000000000000000
*110121+0000000000000007 32...1+0000000000040387 332.21+0000000000004235
390...+0000000000000005 391.21+0000000000000000
*110122+0000000000000007 573..1+0000000000000081 574..1+0000000001730418
83..21+0000000000014162
*110123+0000000000000007 32...1+0000000000045189 331.21+0000000000004583
390...+0000000000000005 391.21+0000000000000000
*110124+00000MC BM CCL K 32...1+0000000000050214 332.21+0000000000003727
390...+0000000000000005 391.21+0000000000000000
*110125+00000MC BM CCL K 573..1-0000000000004943 574..1+0000000001825821
83..21+0000000000015018
*110126+00000MC BM CCL K 32...1+0000000000164846 331.21+0000000000004997
390...+0000000000000005 391.21+0000000000000000
*110127+0000000000000008 32...1+0000000000159462 332.21+0000000000005519
390...+0000000000000005 391.21+0000000000000001
*110128+0000000000000008 573..1+0000000000000441 574..1+0000000002150128
83..21+0000000000014496

*110129+0000000000000008 32...1+0000000000194827 331.21+0000000000002781
390...+0000000000000005 391.21+0000000000000000
*110130+0000000000000009 32...1+0000000000191823 332.21+0000000000001200
390...+0000000000000005 391.21+0000000000000001
*110131+0000000000000009 573..1+0000000000003444 574..1+0000000002536778
83..21+0000000000016077
*110132+0000000000000009 32...1+0000000000024857 331.21+0000000000005013
390...+0000000000000005 391.21+0000000000000000
*110133+0000000000000010 32...1+0000000000028445 332.21+0000000000003714
390...+0000000000000005 391.21+0000000000000000
*110134+0000000000000010 573..1-0000000000000143 574..1+0000000002590080
83..21+0000000000017376
*110135+0000000000000010 32...1+0000000000084146 331.21+0000000000006351
390...+0000000000000005 391.21+0000000000000000
*110136+0000000000000011 32...1+0000000000084010 332.21+0000000000003193
390...+0000000000000005 391.21+0000000000000000
*110137+0000000000000011 573..1-0000000000000008 574..1+0000000002758236
83..21+0000000000020533
*110138+0000000000000011 32...1+0000000000071386 331.21+0000000000006095
390...+0000000000000005 391.21+0000000000000000
*110139+0000000000000012 32...1+0000000000071361 332.21+0000000000003229
390...+0000000000000005 391.21+0000000000000000
*110140+0000000000000012 573..1+0000000000000017 574..1+0000000002900984
83..21+0000000000023400
*110141+0000000000000012 32...1+0000000000008516 331.21+0000000000004544
390...+0000000000000005 391.21+0000000000000000
*110142+0000000000000013 32...1+0000000000008975 332.21+0000000000004589
390...+0000000000000005 391.21+0000000000000000 71....+00000BM 1862 08B
*110143+0000000000000013 573..1-0000000000000443 574..1+0000000002918475
83..21+0000000000023354
*110144+0000000000000013 32...1+0000000000008351 331.21+0000000000004856
390...+0000000000000005 391.21+0000000000000000
*110145+00000000BM M1024 32...1+0000000000007116 332.21+0000000000004976
390...+0000000000000005 391.21+0000000000000000 71....+00000BM 1862 09A
*110146+00000000BM M1024 573..1+0000000000000792 574..1+0000000002933943
83..21+0000000000023234
*110147+00000000BM M1024 32...1+0000000000010544 331.21+0000000000005073
390...+0000000000000005 391.21+0000000000000000
*110148+0000000000000014 32...1+0000000000008990 332.21+0000000000004582
390...+0000000000000005 391.21+0000000000000000 71....+00000BM 1862 09B
*110149+0000000000000014 573..1+0000000000002347 574..1+0000000002953477
83..21+0000000000023725
*110150+0000000000000014 32...1+0000000000023113 331.21+0000000000004278
390...+0000000000000005 391.21+0000000000000000
*110151+0000000000000015 32...1+0000000000025568 332.21+0000000000004933
390...+0000000000000005 391.21+0000000000000000
*110152+0000000000000015 573..1-0000000000000108 574..1+0000000003002158
83..21+0000000000023071
*110153+0000000000000015 32...1+0000000000028422 331.21+0000000000004226
390...+0000000000000005 391.21+0000000000000000
*110154+0000000000000016 32...1+0000000000028181 332.21+0000000000005204
390...+0000000000000005 391.21+0000000000000000
*110155+0000000000000016 573..1+0000000000000133 574..1+0000000003058760
83..21+0000000000022092
*110156+0000000000000016 32...1+0000000000008351 331.21+0000000000004484
390...+0000000000000005 391.21+0000000000000000
*110157+00000000BM M1039 32...1+0000000000007827 332.21+0000000000004214

390...+0000000000000005 391.21+0000000000000000 71....+000000WELL M1039
*110158+00000000BM M1039 573..1+0000000000000657 574..1+0000000003074938
83..21+0000000000022362

Palm City

23 April 2020

INPUT	OUTPUT
Geographic, flhpgn - Florida HPGN Vertical - NAVD88, U.S. Feet	State Plane, flhpgn - Florida HPGN 0901 - Florida East, U.S. Feet Vertical - NGVD29 (Custom), U.S. Feet

m 1024

1/1

Latitude: 26 58 23.72527	**Northing/Y:** 960516.400
Longitude: 080 5 26.26375	**Easting/X:** 952353.130
Elevation/Z: 0	**Elevation/Z:** 1.503
	Convergence: 0 24 44.98415
	Scale Factor: 1.000041753
	Combined Factor: 1.000045994

Remark: