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SURVEYOR'S REPORT

Specific Purpose Survey of the United States
Geological Survey Well **PB 1642**
in
Palm Beach 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

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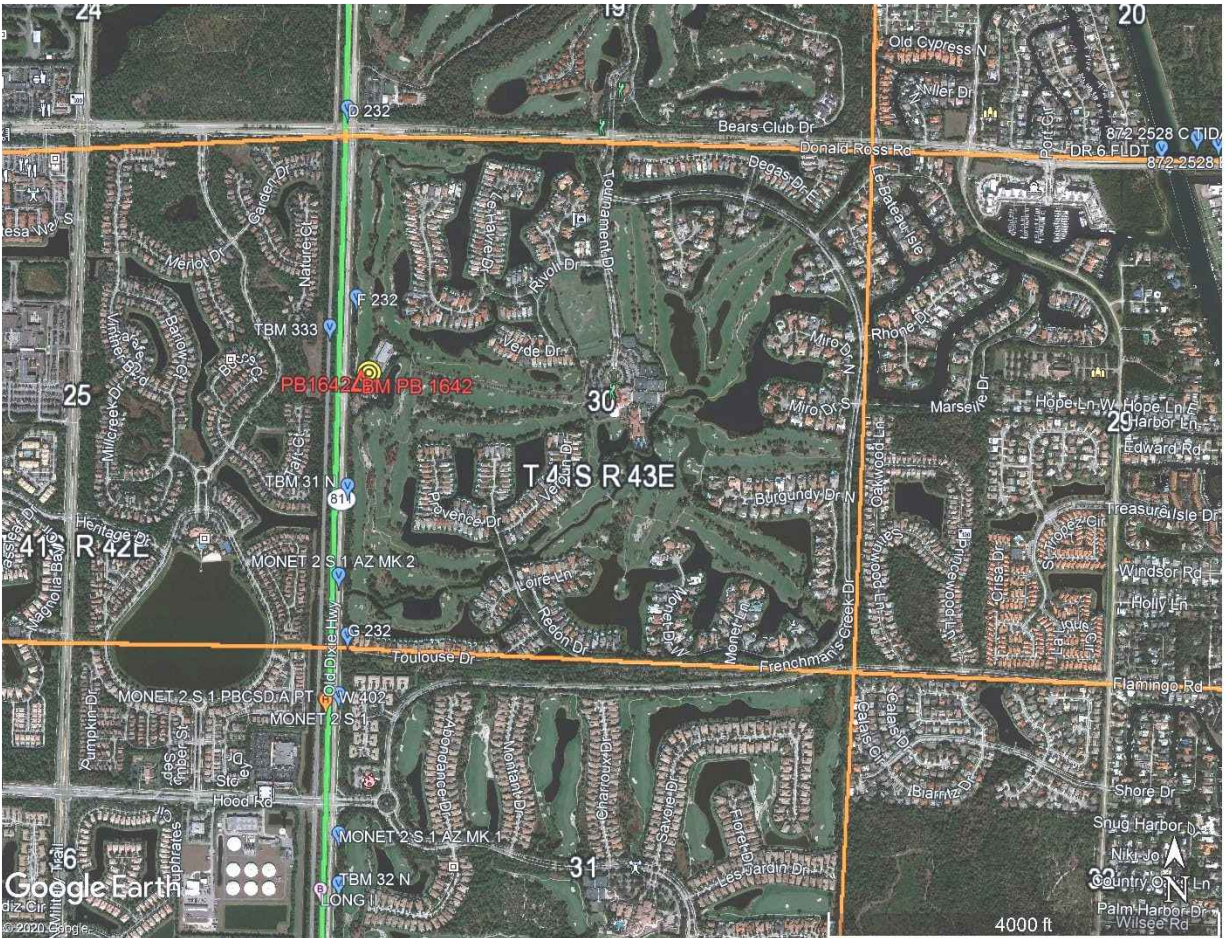
PURPOSE



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 "PB 1642".

LOCATION OF PROJECT

The United States Geological Survey Well "PB 1642" is located in the Section 30, Township 41 South, Range 43 East, Palm Beach 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 PB 1642 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 v miles) per executed SOW for 4600003703 WO07. National Geodetic Survey (NGS) monument "MONET 3" (NGSPID AD7817) through the site benchmark and closing on the Palm Beach County Benchmark "GUNTER". Leveling was done using a Leica DNA 10 digital level S/N 331745

GPS METHODS

Latitude and longitude for the New Benchmark "PB 1642" were established by observing a 4.5 hour Static Sessions on March 13, 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 4, 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 1.503 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: March 13, 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: 1863 pages 1-6

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 13, 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.





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U.S.G.S. Station Name: PB 1642	U.S.G.S. Station Number: 265233080054001	Agency: GCY, INC.	Date of Field Work: 3/13/2020
Party Chief: LAPOLLA	Field Book: GCY 1863	Page(s): 1-6	Report Prepared by: ANDERSEN

SITE SPECIFIC DATA

Site Benchmark: PB 1642	Benchmark Elevation(s) (NAVD88): 11.466	Corpscon 6.0.1 Conversion Factor (NAVD88 to NGVD29) + 1.503	
Well Reference Elevation (NAVD88): 14.417	DTW: 9.35 (3/ 12/ 2020 at 3:42 PM)	Ground Elevation (NAVD88): 12.2	Pad Elevation (NAVD88): N/A

GEOGRAPHIC DATA

Section 30	Township 41 S	Range 43 E
Well Latitude: 26° 52' 33.8598" N	Well Longitude: 80° 05' 40.5799" W	Location Source: RTK GPS
State Plane Coordinates:	Northing (Y) = 925177.527	Easting (X) = 951310.653

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: "PB 1642"
Reference Point: MAGIC MARKER
BOX

Reference Point El. = 14.417
feet NAVD88

Distance to Water = 9.35
feet from reference point
(03/ 13/ 2020 at 3:42 PM)





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New Aluminum Tag





SOUTH FLORIDA WATER MANAGEMENT DISTRICT

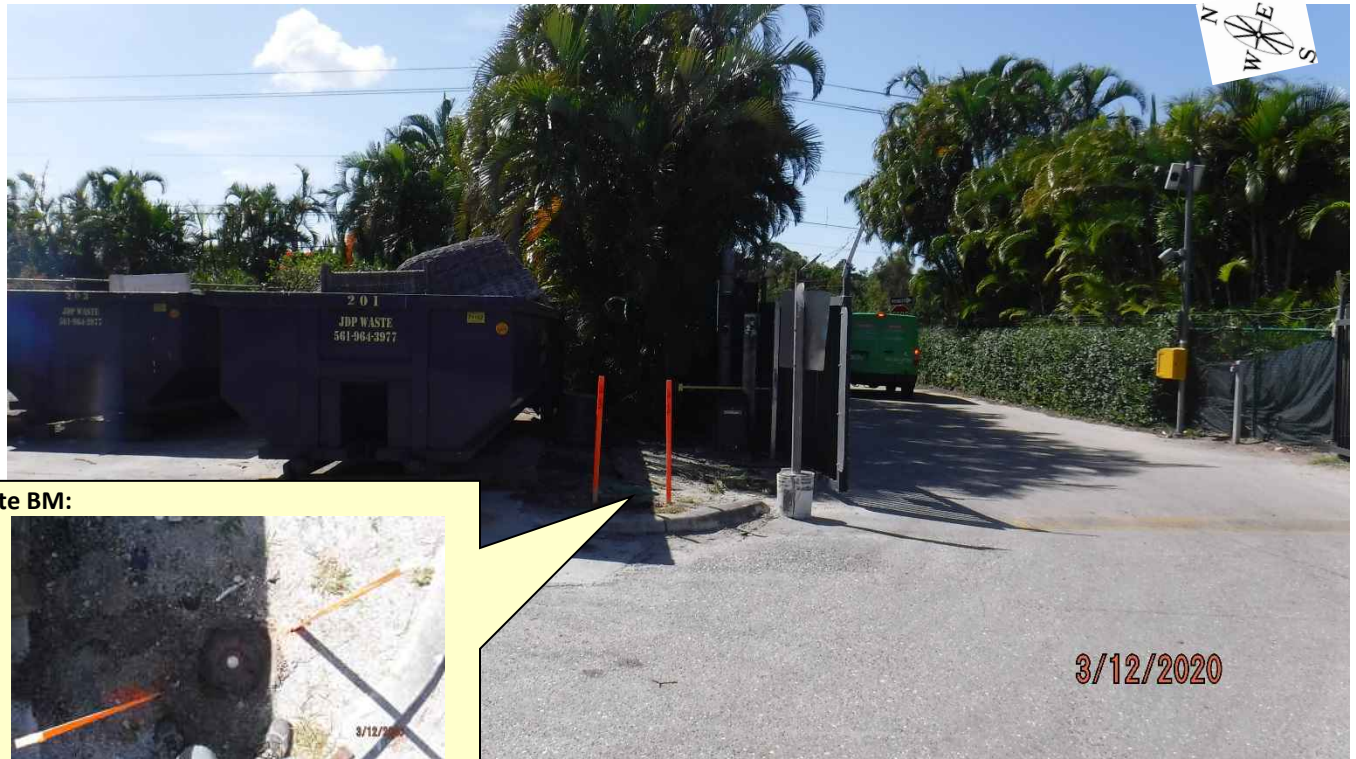
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USGS RMs - NONE



Site Benchmark

Site Benchmark Overall Photo



Site BM:



Latitude: $26^{\circ} 52' 33.10799''$ N
Longitude: $80^{\circ} 05' 41.47562''$ W
NAVD88 EL = 11.466



3/12/2020



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Source Benchmarks

NO PHOTOS AVAILABLE



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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"MONET 3" Benchmark Datasheet (1 OF 4)

5/4/2020

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 4, 2020

AD7817 *****

AD7817 DESIGNATION - MONET 3
AD7817 PID - AD7817
AD7817 STATE/COUNTY- FL/PALM BEACH
AD7817 COUNTRY - US
AD7817 USGS QUAD - RIVIERA BEACH (2018)

AD7817 *CURRENT SURVEY CONTROL

AD7817 * NAD 83(2011) POSITION- 26 51 10.08455(N) 080 05 45.75596(W) ADJUSTED
AD7817* NAD 83(2011) ELLIP HT- -23.105 (meters) (06/27/12) ADJUSTED
AD7817* NAD 83(2011) EPOCH - 2010.00
AD7817* [NAVD 88](#) ORTHO HEIGHT - 3.845 (meters) 12.61 (feet) ADJUSTED

AD7817 GEOID HEIGHT - -26.951 (meters) GEOID18
AD7817 NAD 83(2011) X - 979,394.923 (meters) COMP
AD7817 NAD 83(2011) Y - -5,609,392.723 (meters) COMP
AD7817 NAD 83(2011) Z - 2,863,663.357 (meters) COMP
AD7817 LAPLACE CORR - -4.16 (seconds) DEFLEC18
AD7817 DYNAMIC HEIGHT - 3.839 (meters) 12.60 (feet) COMP
AD7817 MODELED GRAVITY - 979,105.2 (mgal) NAVD 88

AD7817 VERT ORDER - FIRST CLASS II

AD7817 Network accuracy estimates per FGDC Geospatial Positioning Accuracy Standards:

	FGDC (95% conf, cm)		Standard deviation (cm)			CorrNE (unitless)
	Horiz	Ellip	SD_N	SD_E	SD_h	
AD7817 NETWORK	1.73	2.86	0.70	0.71	1.46	-0.02427802

AD7817 Click [here](#) for local accuracies and other accuracy information.

AD7817.The horizontal coordinates were established by GPS observations and adjusted by the National Geodetic Survey in June 2012.

AD7817.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has been affixed to the stable North American tectonic plate. See [NA2011](#) for more information.

AD7817.The horizontal coordinates are valid at the epoch date displayed above which is a decimal equivalence of Year/Month/Day.

AD7817.The orthometric height was determined by differential leveling and adjusted by the NATIONAL GEODETIC SURVEY in May 1994.

AD7817.Significant digits in the geoid height do not necessarily reflect accuracy. GEOID18 height accuracy estimate available [here](#).

AD7817.Click [photographs](#) - Photos may exist for this station.

https://www.ngs.noaa.gov/cgi-bin/ds_mark.pri?PidBox=AD7817

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"MONET 3" Benchmark Datasheet (2 OF 4)

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DATASHEETS

AD7817.The X, Y, and Z were computed from the position and the ellipsoidal ht.

AD7817

AD7817.The Laplace correction was computed from DEFLEC18 derived deflections.

AD7817

AD7817.The ellipsoidal height was determined by GPS observations

AD7817.and is referenced to NAD 83.

AD7817

AD7817.The dynamic height is computed by dividing the NAVD 88

AD7817.geopotential number by the normal gravity value computed on the

AD7817.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

AD7817.degrees latitude (g = 980.6199 gals.).

AD7817

AD7817.The modeled gravity was interpolated from observed gravity values.

AD7817

AD7817. The following values were computed from the NAD 83(2011) position.

AD7817

AD7817;	North	East	Units	Scale Factor	Converg.
AD7817;SPC FL E	- 279,415.166	289,835.586	MT	1.00004077	+0 24 30.0
AD7817;SPC FL E	- 916,714.59	950,902.25	sFT	1.00004077	+0 24 30.0
AD7817;UTM 17	- 2,970,451.812	589,804.934	MT	0.99969956	+0 24 30.0

AD7817

AD7817! Elev Factor x Scale Factor = Combined Factor

AD7817!SPC FL E - 1.00000363 x 1.00004077 = 1.00004440

AD7817!UTM 17 - 1.00000363 x 0.99969956 = 0.99970319

AD7817

AD7817_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNK8980470451(NAD 83)

AD7817

AD7817	PID	Reference Object	Distance	Geod. Az
AD7817				dddmmss.s
AD7817	AD7824	MONET 3 RM 5	14.753 METERS	00103
AD7817	AD6491	JUNO BEACH FIRST BAP CH SPIRE	34.870 METERS	01340
AD7817	AD7825	MONET 3 RM 6	14.184 METERS	16147
AD7817	AD6490	MONET 2	42.186 METERS	19756

AD7817

AD7817

SUPERSEDED SURVEY CONTROL

AD7817

AD7817	NAD 83(2007)-	26 51 10.08437(N)	080 05 45.75689(W)	AD(2002.00)	0
AD7817	ELLIP H (02/10/07)	-23.080 (m)		GP(2002.00)	
AD7817	NAD 83(1999)-	26 51 10.08421(N)	080 05 45.75740(W)	AD()	1
AD7817	ELLIP H (07/06/01)	-23.065 (m)		GP()	4 2
AD7817	NAD 83(1990)-	26 51 10.08281(N)	080 05 45.75645(W)	AD()	1
AD7817	ELLIP H (03/31/93)	-23.028 (m)		GP()	4 1
AD7817	NAD 83(1990)-	26 51 10.08561(N)	080 05 45.75515(W)	AD()	3
AD7817	NAD 83(1986)-	26 51 10.09026(N)	080 05 45.76383(W)	AD()	3
AD7817	NAVD 88	3.85 (m)	12.6 (f)	LEVELING	3
AD7817	NGVD 29 (01/31/13)	4.30 (m)	14.1 (f)	RESET	3
AD7817	NGVD 29	4.30 (m)	14.1 (f)	LEVELING	3
AD7817	NGVD 29 (09/01/92)	4.303 (m)	14.12 (f)	ADJUSTED	1 2
AD7817	NGVD 29 (10/23/89)	4. (m)	13. (f)	VERT ANG	

AD7817

AD7817.Superseded values are not recommended for survey control.

AD7817

AD7817.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

AD7817.See file [dsdata.pdf](#) to determine how the superseded data were derived.

AD7817

AD7817_MARKER: DH = HORIZONTAL CONTROL DISK

AD7817_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

AD7817_STAMPING: MONET 3 1983

AD7817_MARK LOGO: NGS

AD7817_PROJECTION: FLUSH

AD7817_MAGNETIC: N = NO MAGNETIC MATERIAL

AD7817_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

AD7817+STABILITY: SURFACE MOTION

https://www.ngs.noaa.gov/cgi-bin/ds_mark.pl?PidBox=AD7817

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"MONET 3" Benchmark Datasheet (3 OF 4)

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DATASHEETS

AD7817_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AD7817+SATELLITE: SATELLITE OBSERVATIONS - April 10, 2004

AD7817

AD7817	HISTORY	- Date	Condition	Report By
AD7817	HISTORY	- 1983	MONUMENTED	NGS
AD7817	HISTORY	- 1985	GOOD	FLDT
AD7817	HISTORY	- 19910118	GOOD	NGS
AD7817	HISTORY	- 19910810	GOOD	ADRGs
AD7817	HISTORY	- 20020302	GOOD	USPSQD
AD7817	HISTORY	- 20020514	GOOD	MAPTEC
AD7817	HISTORY	- 20040410	GOOD	USPSQD
AD7817	HISTORY	- 20100708	GOOD	SUTESO

AD7817

STATION DESCRIPTION

AD7817

AD7817

AD7817'DESCRIBED BY NATIONAL GEODETIC SURVEY 1983 (CLN)
AD7817'THE STATION IS LOCATED ABOUT 8.80 KM (5.45 MI) SOUTH OF JUPITER, 5.20
AD7817'KM (3.25 MI) SOUTHWEST OF JUNO BEACH, 5.20 KM (3.25 MI) NORTHEAST OF
AD7817'NORTH PALM BEACH AND ON PROPERTY OWNED BY GARDENS BAPTIST CHURCH,
AD7817'11980 ALTERNATE A1A AT PALM BEACH GARDENS. PHONE 626-9398. TO REACH
AD7817'STATION FROM THE POST OFFICE IN JUPITER, GO SOUTH ON ALTERNATE A1A FOR
AD7817'0.64 KM (0.40 MI) TO THE JUNCTION OF STATE HIGHWAY 706. CONTINUE SOUTH
AD7817'ON HIGHWAY A1A FOR 5.76 KM (3.55 MI) TO A CROSSROAD (DONALD ROSS ROAD)
AD7817'. CONTINUE SOUTH ON HIGHWAY A1A FOR 3.36 KM (2.10 MI) TO GARDENS
AD7817'BAPTIST CHURCH ON LEFT AND STATION. THE STATION IS A STANDARD CGS DISK
AD7817'STAMPED--MONET 3 1983--, SET INTO THE TOP OF A ROUND CONCRETE
AD7817'MONUMENT, 30 CM (12 IN) IN DIAMETER, FLUSH WITH THE GROUND, LOCATED
AD7817'66.14 METERS (216.99 FT) SOUTH OF THE CENTER OF ATLANTIC ROAD, 30.48
AD7817'METERS (100.00 FT) SOUTH-SOUTHWEST OF THE SOUTHWEST CORNER OF THE
AD7817'GARDENS BAPTIST CHURCH, 20.42 METERS (66.99 FT) EAST OF THE CENTER OF
AD7817'MEDIAN OF STATE HIGHWAY ALTERNATE A1A, 3.05 METERS (10.01 FT) EAST OF
AD7817'THE EAST EDGE OF CONCRETE SIDEWALK, .30 NORTH OF A METAL WITNESS POST.
AD7817'THE UNDERGROUND MARK IS A STANDARD NGS DISK STAMPED --MONET 3 1983--,
AD7817'SET INTO AN IRREGULAR MASS OF CONCRETE 3 FT BELOW GROUND LEVEL.
AD7817'REFERENCE MARK NO 5 IS A STANDARD NGS DISK STAMPED,--MONET 3 NO 5
AD7817'1983--, SET INTO THE TOP OF A ROUND CONCRETE MONUMENT, 30 CM (12 IN)
AD7817'IN DIAMETER, FLUSH WITH THE GROUND. THE STATION IS LOCATED 50.90
AD7817'METERS (166.99 FT) SOUTH OF THE CENTER OF ATLANTIC ROAD, 20.42 METERS
AD7817'(66.99 FT) EAST OF THE CENTER OF MEDIAN OF STATE HIGHWAY ALTERNATE
AD7817'A1A, 16.15 METERS (52.99 FT) SOUTH OF THE SOUTHWEST CORNER OF CHURCH,
AD7817'.30 METERS (0.98 FT) NORTH OF A WITNESS POST. REFERENCE MARK NO 6 IS A
AD7817'STANDARD NGS DISK STAMPED,--MONET 3 NO 6 1983--, SET INTO THE TOP OF A
AD7817'ROUND CONCRETE MONUMENT, 30 CM (12 IN) IN DIAMETER, FLUSH WITH THE
AD7817'GROUND. THE STATION IS LOCATED 43.28 METERS (141.99 FT) SOUTH OF THE
AD7817'SOUTHWEST CORNER OF THE CHURCH, THE STATION IS A REFERENCE MARK. SET
AD7817'IN A SQUARE CONCRETE MONUMENT, 24.08 METERS (79.00 FT) EAST OF THE
AD7817'CENTER OF MEDIAN OF STATE HIGHWAY ALT A1A, 2.74 METERS (8.99 FT)
AD7817'EAST OF THE EAST EDGE OF CONCRETE SIDEWALK, .30 METERS (0.98 FT) NORTH
AD7817'OF A WITNESS POST.

AD7817

STATION RECOVERY (1985)

AD7817

AD7817

AD7817'RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 1985
AD7817'9.3 KM (5.80 MI) SOUTH FROM JUPITER.
AD7817'THE MARK IS ABOVE LEVEL WITH SIDEWALK.
AD7817'0.4 MILE SOUTH ALONG ALTERNATE A1A FROM THE POST OFFICE IN JUPITER,
AD7817'THENCE CONTINUE SOUTH ALONG ALTERNATE A1A FROM STATE HIGHWAY 706 FOR
AD7817'3.6 MILES TO (DONALD ROSS ROAD), THENCE CONTINUE SOUTH ALONG
AD7817'ALTERNATE A1A FOR 2.1 MILES TO THE GARDENS BAPTIST CHURCH ON LEFT,
AD7817'217.0 FEET SOUTH OF THE CENTER OF ATLANTIC ROAD, 100.0 FEET
AD7817'SOUTH-SOUTHWEST OF THE SOUTHWEST CORNER OF THE BAPTIST CHURCH, 67.0
AD7817'FEET EAST OF THE CENTER OF MEDIAN OF STATE HIGHWAY ALTERNATE A1A AND
AD7817'10.0 FEET EAST OF THE EAST EDGE OF A CONCRETE SIDEWALK.
AD7817'THE MARK IS 1.0 METERS N FROM A WITNESS POST

AD7817



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"MONET 3" Benchmark Datasheet (4 OF 4)

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DATASHEETS

AD7817 STATION RECOVERY (1991)
 AD7817
 AD7817'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1991
 AD7817'8.8 KM (5.5 MI) SOUTHERLY ALONG STATE HIGHWAY 811 FROM THE JUNCTION
 AD7817'OF STATE HIGHWAY 706 (INDIANTOWN ROAD) IN JUPITER, 65.8 M (215.9 FT)
 AD7817'SOUTH OF THE CENTERLINE OF ATLANTIC ROAD, 30.8 M (101.0 FT) SOUTH OF
 AD7817'THE SOUTHWEST CORNER OF THE WEST WING OF THE FIRST BAPTIST CHURCH,
 AD7817'9.0 M (29.5 FT) EAST OF THE CENTERLINE OF THE NORTHBOUND LANES OF THE
 AD7817'HIGHWAY, 2.2 M (7.2 FT) EAST OF THE EAST EDGE OF A SIDEWALK, 2.1 M
 AD7817'(6.9 FT) WEST OF THE FOUNDATION OF A SIGN (FIRST BAPTIST CHURCH), 1.9
 AD7817'M (6.2 FT) SOUTH OF A 5-INCH PALM TREE (1991), 0.3 M (1.0 FT) NORTH
 AD7817'OF A WITNESS POST, AND THE MONUMENT IS RECESSED 0.1 M (0.3 FT) BELOW
 AD7817'THE GROUND SURFACE.

AD7817 STATION RECOVERY (1991)
 AD7817
 AD7817'RECOVERY NOTE BY ADR GEODETIC SERVICES 1991
 AD7817'TO REACH THE STATION FROM THE INTERSECTION OF OLD DIXIE HIGHWAY (STATE
 AD7817'ROUTE 811) AND DONALD ROSS ROAD, GO SOUTH ON OLD DIXIE HIGHWAY FOR
 AD7817'2.2 MI (3.54 KM) TO THE STATION ON THE LEFT. IT IS 215 FEET SOUTH OF
 AD7817'THE CENTERLINE OF ATLANTIC ROAD WHICH LEADS TO THE EAST AND 3 FEET
 AD7817'WEST OF A CONCRETE FIRST BAPTIST CHURCH SIGN.
 AD7817'THE STATION IS SOUTHWEST 92.74 FT (28.27 M) FROM A NAIL AND TIN TAB IN
 AD7817'THE SOUTHEAST SIDE OF A CABBAGE PALM, SOUTHEAST 21.04 FT (6.41 M)
 AD7817'FROM A CROSS CUT IN THE TOP OF A CURB ON THE EASTERLY SIDE OF OLD
 AD7817'DIXIE HIGHWAY, AND NORTH 19.92 FT (6.07 M) FROM A NAIL AND TIN TAB IN
 AD7817'AN ASPHALT WHITE PATH. THE STATION IS 1 FEET NORTH OF A PALM BEACH
 AD7817'COUNTY SURVEY WITNESS SIGN AND POST.

AD7817 STATION RECOVERY (2002)
 AD7817
 AD7817'RECOVERY NOTE BY US POWER SQUADRON 2002 (AEP)
 AD7817'RECOVERED IN GOOD CONDITION.

AD7817 STATION RECOVERY (2002)
 AD7817
 AD7817'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (CDP)
 AD7817'RECOVERED AS DESCRIBED.

AD7817 STATION RECOVERY (2004)
 AD7817
 AD7817'RECOVERY NOTE BY US POWER SQUADRON 2004 (AEP)
 AD7817'RECOVERED IN GOOD CONDITION.

AD7817 STATION RECOVERY (2010)
 AD7817
 AD7817'RECOVERY NOTE BY SURVTECH SOLUTIONS 2010 (BS)
 AD7817'RECOVERED IN GOOD CONDITION.

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



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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"GUNTHER" Benchmark Datasheet (1 OF 1)

CONTROL STATIONS REPORT

NAME: GUNTER
 SEARCH DATE: 11/06/2012
 STAMPED: GUNTER PBC BM
 STATUS: RECOVERED
 TOWNSHIP: 41 RANGE: 43 SECTION: 30 STABILITY: D
 FIELD BOOK: 1211EE FIELD BOOK PAGE: 38 NAVD 88 ACCURACY:
 NGVD 29 FEET: NGVD 29 AGENCY NGVD 29 LEVELING: VERTICAL 29 By:
 NAVD 88 FEET: 9.635 NAVD 88 AGENCY PBCO NAVD 88 LEVELING: 07/01/2003 VERTICAL 88 By: Gary L Beaty
 VERTICAL CONTROL SURVEY DRAWING NO.: S-3-03-1924 VERTICAL DISK: Y
 HORIZONTAL ACCURACY: HORIZONTAL AGENCY: HORIZONTAL CONSTRAIN:
 Y72: X72: N90: E90:
 FIELD BOOK HORIZONTAL: FIELD BOOK PAGE HORIZONTAL: HORIZONTAL DISK: N
 CONVERGENCE 90: SCALE FACTOR 90: POINT NO:
 HORIZONTAL CONTROL SURVEY DRAWING NO: HORIZONTAL 90 BY:
 APPROXIMATE LATITUDE: 26 52 30.1 APPROXIMATE LONGITUDE: 80 05 47.9
 MONUMENT TYPE: P.B.C. BRASS DISK
 GPS ACCURACY: GPS NO: GPS HORIZONTAL AGENCY:
 DATE CREATED 98: N98: SCALE FACTOR 98:
 CONVERGENCE 98: E98: DATUM: ADJUSTMENT:
 STATION PAIR: GPS HORIZONTAL 98 BY:

N=No Y=Yes 10=First Order 20=Second Order 21=Second Order Class I 22=Second Order Class II 30=Third Order
 2=0.02m Local Accuracy 3=0.03m Local Accuracy

It is the responsibility of the user to verify the data by referring to the Certified Survey on file in the Office of the County Engineer.

MEMO

TO REACH THE STATION PROCEED TO ITS LOCATION 0.5 MILE SOUTH OF DONALD ROSS ROAD ON THE EAST SIDE OF ALTERNATE A-1-A.
 THE STATION IS A BRASS DISK SET IN THE SOUTHWEST CORNER OF A DRAINAGE INLET AND STAMPED GUNTER PBC BM.
 THE STATION IS LOCATED 87.5 FEET SOUTH OF A RAILROAD SPIKE IN THE CENTER OF AN ASPHALT BIKE PATH, 10 FEET WEST OF THE WEST EDGE OF PAVEMENT OF SAID BIKEPATH, 23 FEET WEST OF AN 8 FOOT CHAIN LINK FENCE, 144 FEET SOUTH OF THE CENTER OF A U-TURN BREAK IN THE MEDIAN AND 336 FEET SOUTH OF THE CENTERLINE OF A MAINTENANCE ROAD TO THE EAST.
 RECOVERED 11/06/2012



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Field Notes (1 of 6)

SFWMD - USGS P143 WELLS			
BENCH RUN FOR NEW BM PB 1042 (NAVD 88)			
PEG TEST:			
COLL. ERR. OLD = 3.7"		COLL. ERR. NEW = 5.9"	
DIFF = 2.2"		RETICLE = 3.972'	
STA	TOTAL DIST	ELEV.	ADJ
MONET3	Ø	12.614'	
8	2655.03'	11.774'	
15	6063.87'	11.489'	
(CONT. ON PG. 02)			

18-1020-07-02		1863 01
79° N. SUNNY		3.12.20 TWURS
LEELA PNA 10		M. LaPolla PC
JOB: WELL PB 1042		D. Gorman A
LINE: PB 1042		
DESC		
NGS BM MONET3 PID: AD7817		
NAVD 88 EL: 12.614'		
SET MAG. NAIL - BRASS WASHER "GLY TRAV. PT."		
1' W. OF THE EAST END OF THE NORTH BOUND LINES		
OF ALT. A1A. IN FRONT OF A CURB INLET WITH MANHOLE		
55' N. OF THE E. OF SERVICE RD FOR		
FRENCHMAN'S RESERVE (BM 1863-01A)		
S. OF HOOD RD.		
SET MAG. NAIL - BRASS WASHER "GLY TRAV. PT."		
1' W. OF THE EAST END OF THE N. BOUND LINES		
OF ALT. A1A. N. OF HOOD RD. WEST OF A CONC.		
POWER POLE W/ # 8421 (BM 1863-01B)		
10.79'		
P.O. 0/1		



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (2 of 6)

SFWMD-USGS / PWS WELLS
 CONT. BENCH RUN FROM PG. 01
 (NOV 28)

STA	TOTAL DIST	ELEV	AW
NEW BM PB1642	8795.54'	11.466'	

18-1020-07-02

1863 02

8:50 Sunday
 J. L. TO THURS
 M. LARILLO PK
 B. GORDON T

DESC
 NEW BM PB1642 (BM 1803-02A)
 SET 1 1/2" (I.D.) IRON PIPE + ALUM. CAP
 " SFWMD PB 1642 LOCATED 1810" IRON PIPE
 IS 3' LONG W/ CONC. COLLAR + GRAVEL CAP.
 1.5' W. OF THE "D" CURB DOWN NOSE NEAR
 THE NE COR OF DUMPSTER AREA. JUST INSIDE
 ENTRANCE / EXIT GATE TO FREEMAN'S CREEK
 MOUNTAIN AREA.

(END RUN FOR TODAY)
 (CONT. ON PG. 03)



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (3 of 6)

SF WMD-USGS / PLUS WELLS
CONT BENCH RUN FROM PG 01-02
(NAVD88)

PEG TEST:

Coll ERR OLD = 5.9"	Coll ERR NEW = -0.2"
DEP = 6.1"	RETICLE = 3.957'

STA	TOTAL DIST	ELEV	ADJ
NEW BM PB11642	0 (8795.54')	11.406'	
P.B.C. BM GUNTER	518.39' (9313.93')	9.609'	

(xxx.xx') = TOTAL DIST. OF COMBINED
RUNS FROM PG'S 01-03.

26

18-1020-07-02	1863 03
60° Sunny	3.13.20 FRT
LEICA DINA 10	M. Lapina PC
JOB: WELL PD 11642	D. Guzman A
LINE: PB 11642	

DESC	
Bm 1863-01A	NAVD 88 = 11.406'
NEW BM PB11642	
P.B.C. BM GUNTER (Bm 1863-03A)	
LISTED NAVD 88 = 9.635'	
ERR = .026	
DIST IN MILES = 1.76'	
MIS E .02 PER MILE = .0265	

* END RUN *

9.635



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Field Notes (4 of 6)

SFWMD - USGS PWS WELLS	18-1070-07-02	1863'04
4.5 hr OPUS SESSION @	81° Sunny	3.17.10 FRI
Bm PB 1642		M. LARINA PL
		B. GORMAN TA
BASE: TREMBLE 5100		
START: 9:28 AM		
END: 14:00		
HZ = 5.62'		
ANTENNA: ZEPHYR		



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (5 of 6)

SFWMD-USGS / PWS WELLS

WELL DATA @ PB 11042 (NOV 2022)

WELL DIAMETER = 4" PVC

PICTURE: 101-1110

D.T.W. = 9.35'

TIME: 15:42

DATE: 03/12/2020

MEASURING POINT = 14.417'

TOP OF WATER = 5.047'

WELL HEAD CASING:

ALUMI. BOX W/ HINGED LID

(L) 2.08' x (W) 1.80' x (H) 1.30'

GPS: FILE: SFWMD USGS PWS WELLS 2

10035 WELL PB 11042

N- 925177.527

E- 951310.653

+1.503'

PB-1020-07-02

1863 05

8:40 M. SUNNY

3/12/20 THURS

M. LoPellio PC

B. Gorman TA

PICTURES:

WELLS:

101-1109 LOOKING WEST

101-1111 BRASS TAG

101-1112

101-1113

101-1114

NEW BM PB 11042

101-1106

101-1107

101-1108 LOOKING WEST



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (6 of 6)

SFWMD-USGS PWB WELLS					
"M.P." + NO BENCH ROD FOR					
WELL PB 11642 (NOV 88)					
STA	+	HI	-	EL	ADJ
Bm PB 11642	6.507			11.466'	
	5.89				
	5.276				
	(5.891)	17.357'			
S.S. 1			5.18	12.177'	
			3.182		
			2.94		
			2.096		
1			(2.939)	14.417'	
	3.013				
	2.769				
	2.524				
	(2.768)	17.186'	6.338		
			5.72		
			5.103		
2			(5.72)	11.466'	

18-1020-07.02 1863 06

3.13.70 FRI
M. Lapina PC
B. Gorman R

DESC

Bm PB 11642 (Bm 1863-02A)
NOV 88 = 11.466'

NO @ WELL PB 11642

MEDDURING POINT @ WELL PB 11642
USED OLD USGS BLACK MARKER BOX W/ "X" @
THE NW SIDE OF WELL OPENING TOP OF PLYWOOD
(Bm 1863-06A)

✓ TO Bm PB 11642 (Bm 1863-02A)
NOV 88 = 11.466'
ERR = FLAT

* END RUN *



South Florida Water Management District Benchmark Datasheet

Designation: PB 1642	Project Name: USGS PHASE 3 WELLS	Type: V	State Plane Zone: FL East
Stamping: PB 1642 LB4108 2020	Field Book Name: GCY 1863	Field Book Page: 1-6	
Established By: GCY, INC.	Recovered By: _____	Recovery Date: _____	
Surveyor: ANDERSEN	Established Date: 03/13/20	Status: New	

GEOGRAPHIC POSITION INFORMATION

Section: 30	Township: 41 SOUTH	Range: 43 EAST
County: PALM BEACH	Quadrangle: JUPITER	Quad Index: 1473
NAD83 Adj. Year: 2011	Vertical Datum: NAVD1988	Horizontal Datum: NAD1983
NAVD88 Elevation (feet): 11.466	NGVD29 Elevation (feet): 12.969	2022 Elevation: _____
NAVD88 Class: _____	NGVD29 Class: _____	Other Elevation: _____
NAVD88 Order: 3RD	NGVD29 Order: 3RD	Other Elevation Type: _____

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: 11.404
Northing (Y) (feet): 925101.03	Easting (X) (feet): 951230.086	Source of Latitude & Longitude: OPUS SOLUTION
Latitude: 26	52	33.10799
DD°	MM'	SS"
Longitude (Decimal Degrees): 26.87586333		Longitude (Decimal Degrees): -80.09485434
		DD° MM' SS"

RECOVERY DATA

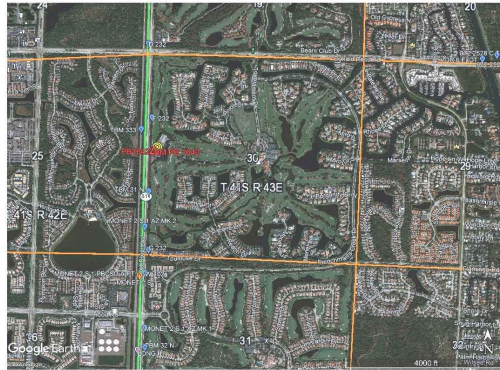
How to Reach: FROM THE INTERSECTION OF OLD DIXIE HIGHWAY AND DONALD ROSS ROAD GO SOUTH ON OLD DIXIE HIGHWAY ABOUT 0.46 MILES TO THE MAINTENANCE ENTRANCE TO FRENCHMAN'S CREEK; ENTER THE MAINTENANCE AREA GOING ABOUT 116 FEET FROM THE EAST RIGHT OF WAY OF OLD DIXIE HIGHWAY AND THE POINT ON THE RIGHT. MARK IS SET 1.5 FEET WEST OF THE CURB BULLNOSE NEAR THE NORTHEAST CORNER OF THE DUMPSTER AREA. 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 : 13970730.t01 OP1588594256932
Date: Monday, May 04, 2020 8:15:40 AM

FILE: 13970730.t01 OP1588594256932

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 04, 2020
RINEX FILE: 1397073n.20o TIME: 12:15:25 UTC

SOFTWARE: page5 1801.18 master94.pl 160321 START: 2020/03/13 13:28:00
EPHEMERIS: igs20965.eph [precise] STOP: 2020/03/13 18:00:00
NAV FILE: brdc0730.20n OBS USED: 11302 / 11922 : 95%
ANT NAME: TRM39105.00 NONE # FIXED AMB: 66 / 69 : 96%
ARP HEIGHT: 1.713 OVERALL RMS: 0.017(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) ITRF2014 (EPOCH:2020.1985)

X: 979312.625(m) 0.002(m) 979311.795(m) 0.002(m)
Y: -5608234.490(m) 0.016(m) -5608232.905(m) 0.016(m)
Z: 2865942.664(m) 0.010(m) 2865942.503(m) 0.010(m)

LAT: 26 52 33.10799 0.005(m) 26 52 33.12836 0.005(m)
E LON: 279 54 18.52438 0.004(m) 279 54 18.50465 0.004(m)
W LON: 80 5 41.47562 0.004(m) 80 5 41.49535 0.004(m)
EL HGT: -23.597(m) 0.018(m) -25.189(m) 0.018(m)
ORTHO HGT: 3.476(m) 0.054(m) [NAVD88 (Computed using GEOID18)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 17) SPC (0901 FL E)
Northing (Y) [meters] 2973007.132 281971.358
Easting (X) [meters] 589904.824 289935.510
Convergence [degrees] 0.40920556 0.40920556
Point Scale 0.99969978 1.00004099
Combined Factor 0.99970349 1.00004470

US NATIONAL GRID DESIGNATOR: 17RNK8990473007(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DF9225	ZMA1 MIAMI WAAS 1 CORS ARP	N254928.585	W0801909.066	118603.2
DE9138	OKCB OKEECHOBEE CORS ARP	N271557.715	W0805119.181	86942.6
DG9798	PBCH WEST PALM CORS ARP	N265046.638	W0801309.300	12788.9

NEAREST NGS PUBLISHED CONTROL POINT

AD2963 F 232 N265240.000 W0800542.000 212.6

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.

Palm City

28 April 2020

INPUT

Geographic, flhpgn - Florida HPGN
Vertical - NAVD88, U.S. Feet

OUTPUT

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

PB 1642

1/1

Latitude: 26 52 33.9
Longitude: 080 05 40.6
Elevation/Z: 0

Northing/Y: 925181.572
Easting/X: 951308.806
Elevation/Z: 1.503
Convergence: 0 24 33.55139
Scale Factor: 1.000041047
Combined Factor: 1.000045218

Remark: