SOUTH FLORIDA WATER MANAGEMENT DISTRICT

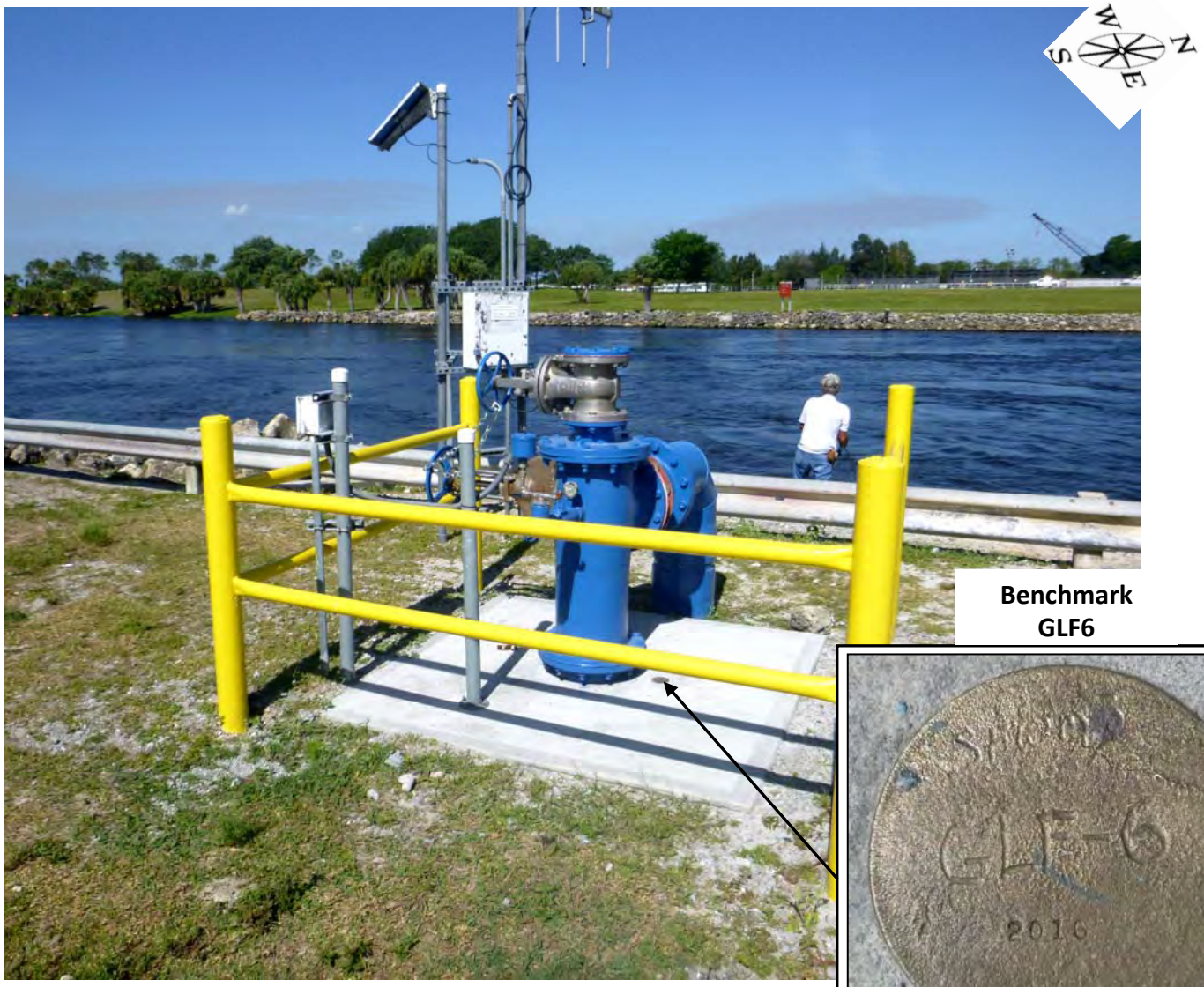
Rev. 1/16

Site Name: **GLF6**	Last Date of Field Work: **03-may-16**	
Party Chief: **Strickland**	Field Book: **Misc 6Y**	Page(s) **36,37 & 41**
Site Benchmark: **GLF6 2016**	Benchmark Elevation (NAVD88) **15.137**	Corpscon 6.0.1 Conversion Factor (NAVD88 to NGVD29) **+1.316**
Reference Elevation(s) (NAVD88): **18.13 – "X" at top of ¼" 90° elbow**	Existing Tag Elevation (Datum): **None**	Calibration Port Elevation(s) (NAVD88): **18.13 – "X" at top of ¼" 90° elbow**
Ground Elevation (NAVD88): **15.0 – NW Corner** **15.0 – NE Corner** **14.9 – SW Corner** **15.1 – SE Corner**		Pad Elevation (NAVD88): **15.09 – NW Corner** **15.13 – NE Corner** **15.05 – SW Corner** **15.09 – SE Corner**
Latitude: **26° 50' 18.76"**		Longitude: **80° 05' 07.33"**

Notes:
NAVD88 – North American Vertical Datum of 1988
NGVD29- National Geodetic Vertical Datum of 1929
Corpscon 6.0.1 – A MS-Windows-based program to convert coordinates and elevations between datum's

PICTURES

Overall Well Site



Benchmark GLF6

Looking Westerly

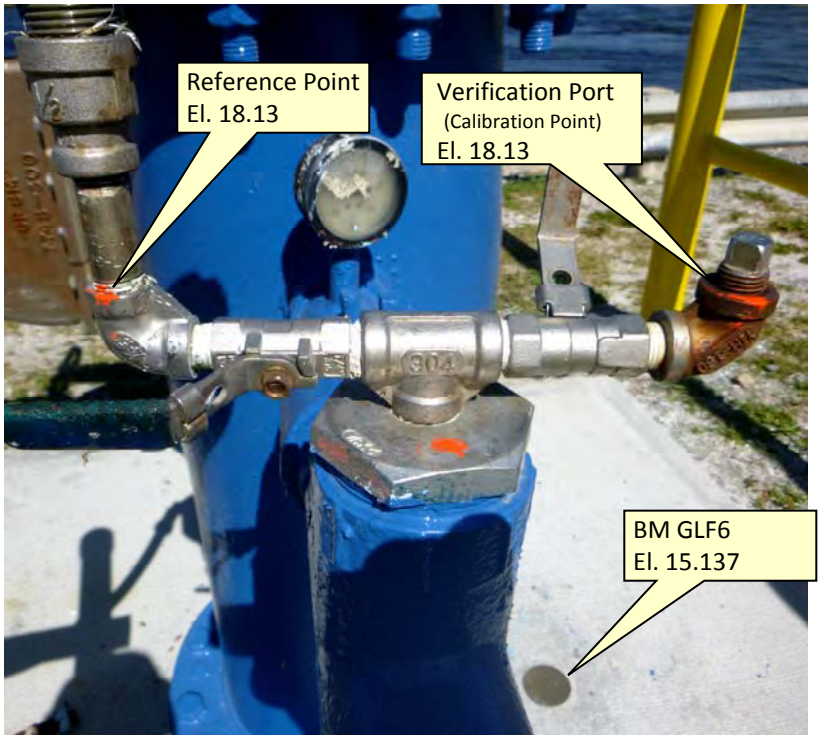
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/16

Brass Tag Close Up

Brass Tag to be added

Reference Marks



SEC 12 TWP 42 RGE 32

ESTABLISH NAVD 88 EL @ GLF6

STA	+	HI	−	ELEV	BM EL
BM		~~21.27~~ ~~21.66~~ 21.247		~~14.08~~ ~~14.47~~	~~14.079~~ ~~14.467~~ NAVD 88
	7.19				
BM			6.48	~~14.79~~ ~~15.18~~ 14.767	~~14.79~~ ~~15.18~~
	6.38	~~21.17~~ ~~21.56~~ 21.147			
BM			6.01	~~15.16~~ ~~15.55~~ 15.137	~~15.16~~ ~~15.55~~
	6.60	~~21.76~~ ~~22.15~~ 21.737			
BM			7.68	~~14.08~~ ~~14.47~~	~~14.08~~ ~~14.47~~ 14.057

WELL / PAD LOCATION

26 50 18.76 N
81 05 07.33 W

STRICKLAND & CLANTON

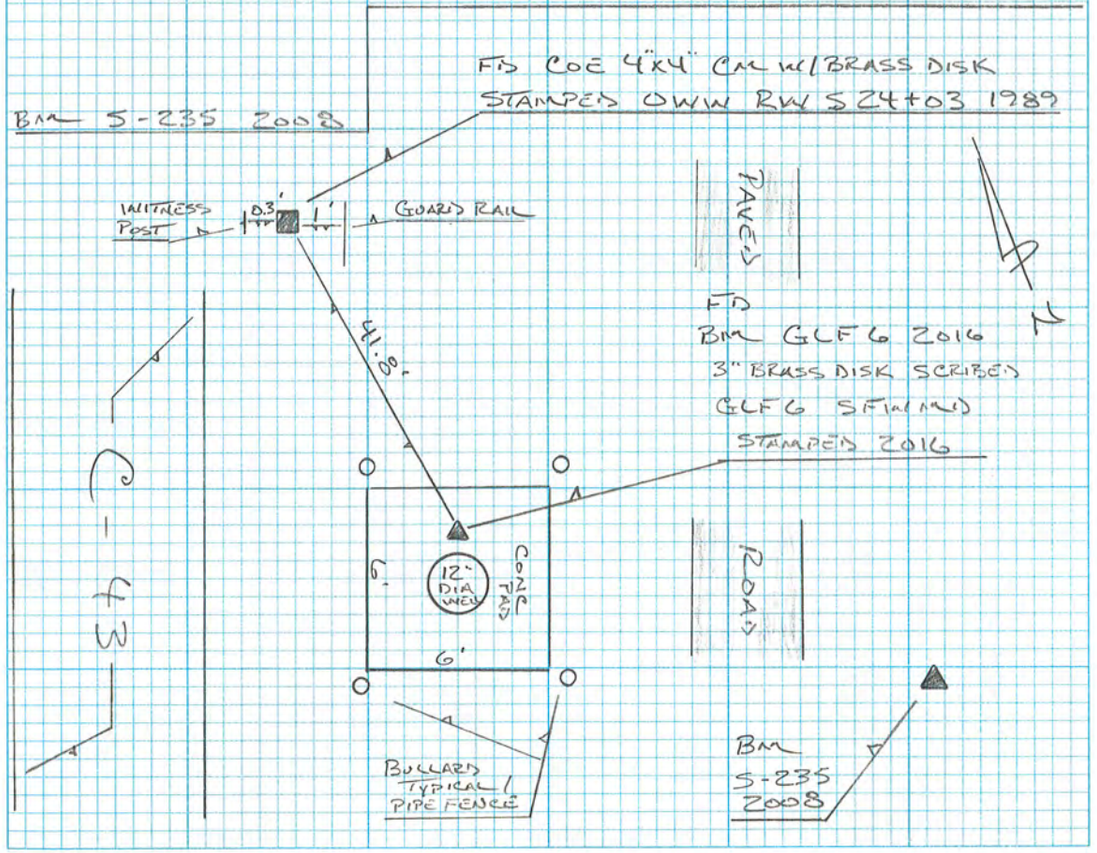
COMMENTS

BM S-235 2008 FD SFWMD BRASS DISK GOOD COND

14.057 (Adjusted Elevation - FCE117 Level line page 41)

BM OWW RW 524+03 1989 FD COE BRASS DISK IN 4"x4" CM GOOD COND

BM GLF6 2016 FD 3" BRASS DISK IN CONC PAD FOR WELL GLF6 (N. SIDE) STAMPED / SCRIBED SFWMD GLF6 2016



SEC 12 TWP 42 RGE 37

GLF 6 CONT'D

STA	+	HI	−	ELEV	BM EL	
BM	5.14	~~20.29~~ ~~20.69~~ 20.277			~~15.16~~ ~~15.55~~ NAVD88	15.137
"X" 2"x1/4" REDUCER			2.28	~~18.41~~	~~18.02~~	17.997
"X" 1/4" 90° N VERIFICATION PORT			2.15	~~18.54~~	~~18.15~~	18.127
"X" 1/4" 90° S REF PT			2.15	~~18.54~~	~~18.15~~	18.127
CONC PAD NW			5.19	~~15.50~~	~~15.11~~	15.087
GRND NW			5.3	~~15.39~~	~~15.00~~	14.977
CONC PAD NE			5.15	~~15.54~~	~~15.15~~	15.127
GRND NE			5.3	~~15.39~~	~~15.00~~	14.977
CONC PAD SE			5.19	~~15.50~~	~~15.11~~	15.087
GRND SE			5.2	~~15.49~~	~~15.10~~	15.077
CONC PAD SW			5.23	~~15.46~~	15.07	15.047
GRND SW			5.4	15.29	14.90	14.877
BM			5.14	15.55	~~15.55~~ ~~15.16~~	15.137

T ~~II~~ STRICKLAND
Ø CLAYTON

COMMENTS

BM GLF 6 2016 SFWMD 3" BRASS DISK SEE PG 36 THIS BOOK

"X" ATOP Ø 2" x 1/4" REDUCER

"X" ATOP Ø 1/4" 90° ELBOW (N. MOST) X ON E. SIDE

"X" ATOP Ø 1/4" 90° ELBOW (S. MOST) " " " "

CONC PAD NW CORNER

GRND @ " "

CONC PAD NE CORNER

GRND @ " "

CONC PAD SE CORNER

GRND @ " "

CONC PAD SW CORNER

GRND @ " "

BM GLF 6 2016 SFWMD 3" BRASS DISK

SEC 12 TWP 42 RGE 32
VERIFY EL @ BM 5235 2008 AS
PER HOWARD EHMKE

STA / PT#	EL	BM EL
BM / 1		35.28 NAVD 88
BM / 6	14.061	
BM / 11	35.283	35.28

DB 1158.04
DF 1155.77
TOTAL = 2313.81

EQ USED DINI LEVEL SN: 771295 ☐ STRICKLAND ☐ CLANTON
& BAR CODE ROD

FILE NAME = GLF6

NOTE: MADE SEARCH FOR E524 2001 DID NOT FIND
WE DID FIND MAGNET.

BM FCE 117 U.S ENGINEER DEPT AD 193 FD BRASS
DISK GOOD COND

BM 5235 2008 FD SFWMD BRASS DISK GOOD COND
SEE PG. 36 THIS BOOK

BM FCE 117 AS ABOVE

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/16

DESIGNATION: **GFL6**	PROJECT: **GFL6 Well**
ESTABLISHED BY: **SOUTH FLORIDA WATER MANAGEMENT DISTRICT** RECOVERED BY:	SURVEYOR: **Strickland** DATE: **03-may-16**

GEOGRAPHIC POSITION

SECTION **12**	TOWNSHIP **42** SOUTH	RANGE **32** EAST
COUNTY **Glades**	NAME OF QUADRANGLE **Moore Haven** GEOGRAPHIC INDEX OF QUAD **2309**	

HORIZONTAL DATUM: 1927 (1983) Other (circle one) ZONE (E) or W

VERTICAL DATUM: MSL 1929 (1988) Other (circle one)

VERTICAL ACCURACY: 1 2 (3)

STATE PLANE COORDINATE	X **628329**	Y **910491**	NAVD 88 EL. **15.137** NGVD 29 EL. **16.483**

CORPSCON 6.0.1 CONVERSION FACTOR (NAVD88 TO NGVD29):

LATITUDE: **26º50'18.76"N**	LONGITUDE: **81º05'07.33"W**

RECOVERY DATA

Stamping: **SFWM GFL6 2016**

To Reach: From the Glades County Court House in Moore Haven, go South on United States Highway 27 (U.S. 27) , 0.9 of a mile to the South foot of U.S. 27 bridge spanning the Caloosahatchee River (C-43) and an access road on the right; Follow the access road back toward river for 0.2 of a mile to the junction of Daniels Road; Turn right on Daniels road, passing underneath the bridge, and across a set of railroad tracks, for 0.1 of a mile to Alvin Ward Sr. Drive on left; Turn left and continue on Alvin Ward Sr. Drive, 0.3 of a mile to the intersection of the South Florida Water Management District Canal 20 (C-20) and Structure 235 (S-235); continue Northerly 130 feet more or less to station location on left at GFL-6 Well Site.
The station is a brass disk set on the concrete pad surrounding GFL-6 well and stamped "GFL 6 2016."

NOTABLE LAND MARKS: **S-235**

NGS SOURCE BENCHMARK: **FCE 117 (AJ6194)**

FIELD BOOK **Misc 6Y** PAGES **36,37 &41**

PICTURES

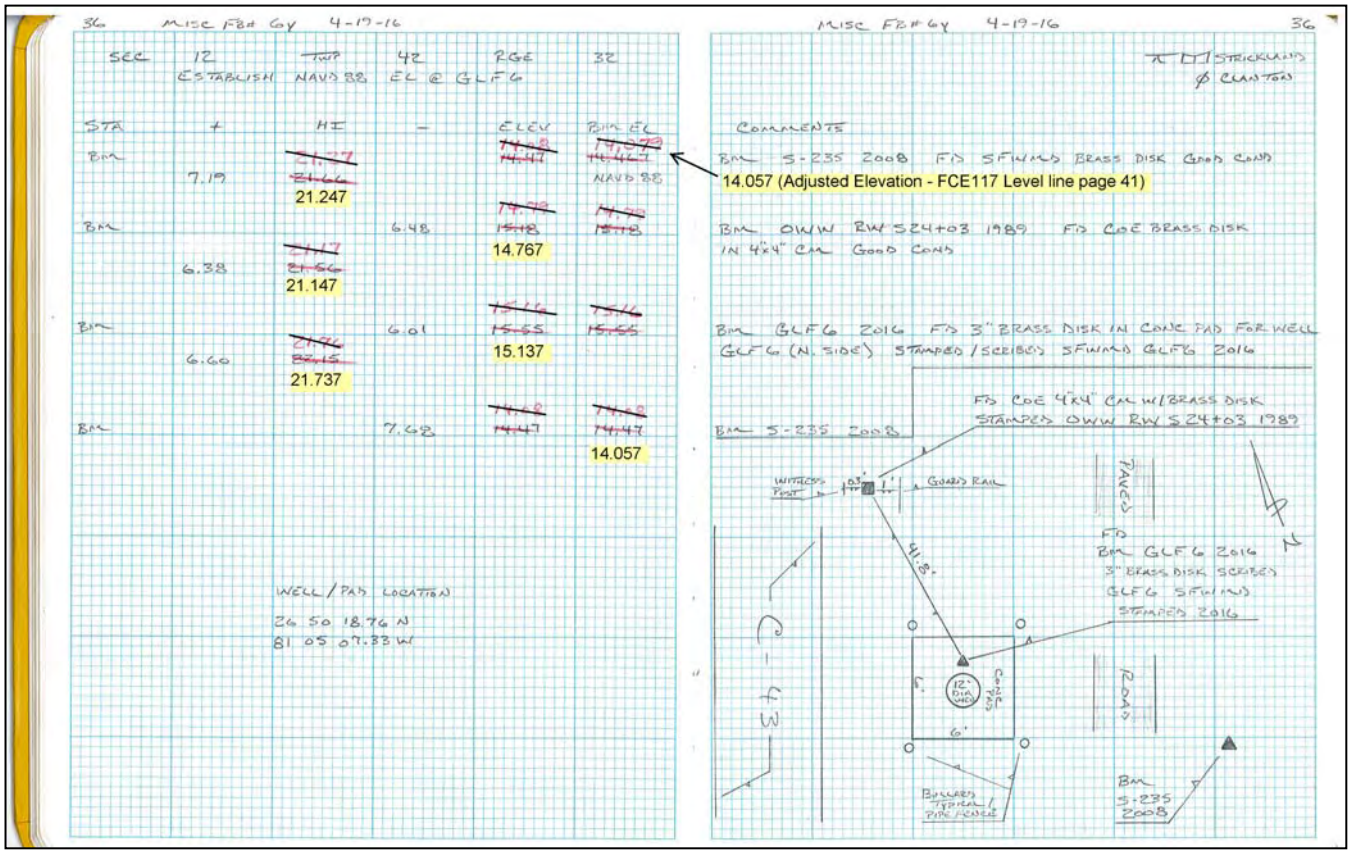
Overall Site

Looking Westerly

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/16

SKETCH



Source Benchmark
NGS FCE 117 (AJ6194)

From the "ngvd29.txt" file provided by NGS for the CERP Geodetic Vertical Control Project.
Line/Part: L26217/1 SSN+: mark floated, SSN*: mark constrained, SSN#: mark floated & constrained

Mark ID	SSN	PID	Designation	Geopotential	Elevation	Codes
1218	0047	AJ6194	FCE 117	10.9401	11.1633	

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.8
1         National Geodetic Survey,   Retrieval Date = MAY 10, 2016
 AJ6194 ***********************************************************************
 AJ6194  DESIGNATION -  FCE 117
 AJ6194  PID         -  AJ6194
 AJ6194  STATE/COUNTY-  FL/GLADES
 AJ6194  COUNTRY     -  US
 AJ6194  USGS QUAD   -  MOORE HAVEN (1970)
 AJ6194
 AJ6194                        *CURRENT SURVEY CONTROL
 AJ6194  ______________________________________________________________________
 AJ6194* NAD 83(2011) POSITION- 26 50 23.77019(N) 081 05 13.79801(W)   ADJUSTED
 AJ6194* NAD 83(2011) ELLIP HT-   -13.950 (meters)        (06/27/12)   ADJUSTED
 AJ6194* NAD 83(2011) EPOCH    -  2010.00
 AJ6194* NAVD 88 ORTHO HEIGHT -    10.753 (meters)       35.28   (feet) ADJUSTED
 AJ6194  ______________________________________________________________________
 AJ6194  NAD 83(2011) X  -    882,320.960 (meters)                     COMP
 AJ6194  NAD 83(2011) Y  - -5,626,138.598 (meters)                     COMP
 AJ6194  NAD 83(2011) Z  -  2,862,395.663 (meters)                     COMP
 AJ6194  LAPLACE CORR    -         -1.63  (seconds)                    DEFLEC12B
 AJ6194  GEOID HEIGHT    -        -24.702 (meters)                     GEOID12B
 AJ6194  DYNAMIC HEIGHT  -         10.736 (meters)       35.22   (feet) COMP
 AJ6194  MODELED GRAVITY -    979,120.3   (mgal)                       NAVD 88
 AJ6194
 AJ6194  VERT ORDER      -  FIRST     CLASS II
 AJ6194
 AJ6194  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AJ6194  Standards:
 AJ6194         FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
 AJ6194            Horiz  Ellip           SD_N   SD_E   SD_h       (unitless)
 AJ6194  ------------------------------------------------------------------
 AJ6194  NETWORK    2.04   2.90           0.82   0.84   1.48     -0.21372955
 AJ6194  ------------------------------------------------------------------
 AJ6194  Click here for local accuracies and other accuracy information.
 AJ6194
 AJ6194
 AJ6194.The horizontal coordinates were established by GPS observations
 AJ6194.and adjusted by the National Geodetic Survey in June 2012.
 AJ6194
 AJ6194.NAD 83(2011) refers to NAD 83 coordinates where the reference
 AJ6194.frame has been affixed to the stable North American tectonic plate. See
 AJ6194.NA2011 for more information.
 AJ6194
 AJ6194.The horizontal coordinates are valid at the epoch date displayed above
 AJ6194.which is a decimal equivalence of Year/Month/Day.
 AJ6194
 AJ6194.The orthometric height was determined by differential leveling and
 AJ6194.adjusted by the NATIONAL GEODETIC SURVEY
 AJ6194.in January 2002.
 AJ6194
 AJ6194.Significant digits in the geoid height do not necessarily reflect accuracy.
```

AJ6194.GEOID12B height accuracy estimate available here.
AJ6194
AJ6194.Photographs are available for this station.
AJ6194
AJ6194.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AJ6194
AJ6194.The Laplace correction was computed from DEFLEC12B derived deflections.
AJ6194
AJ6194.The ellipsoidal height was determined by GPS observations
AJ6194.and is referenced to NAD 83.
AJ6194
AJ6194.The dynamic height is computed by dividing the NAVD 88
AJ6194.geopotential number by the normal gravity value computed on the
AJ6194.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ6194.degrees latitude (g = 980.6199 gals.).
AJ6194
AJ6194.The modeled gravity was interpolated from observed gravity values.
AJ6194
AJ6194. The following values were computed from the NAD 83(2011) position.
AJ6194

AJ6194;		North	East	Units	Scale Factor	Converg.
AJ6194;SPC FL E	-	277,672.635	191,336.629	MT	0.99994210	-0 02 21.7
AJ6194;SPC FL E	-	910,997.64	627,743.59	sFT	0.99994210	-0 02 21.7
AJ6194;UTM 17	-	2,968,709.876	491,339.585	MT	0.99960093	-0 02 21.7

AJ6194

AJ6194!		Elev Factor	x	Scale Factor	=	Combined Factor
AJ6194!SPC FL E	-	1.00000219	x	0.99994210	=	0.99994429
AJ6194!UTM 17	-	1.00000219	x	0.99960093	=	0.99960312

AJ6194
AJ6194 SUPERSEDED SURVEY CONTROL
AJ6194

AJ6194	NAD 83(2007)-	26 50 23.77035(N)		081 05 13.79875(W)		AD(2002.00)	0
AJ6194	ELLIP H (02/10/07)	-13.929	(m)			GP(2002.00)	
AJ6194	NAD 83(1999)-	26 50 23.77035(N)		081 05 13.79908(W)		AD( )	1
AJ6194	ELLIP H (12/12/02)	-13.904	(m)			GP( )	4 1
AJ6194	NAVD 88 (12/12/02)	10.75	(m)	35.3	(f)	LEVELING	3

AJ6194
AJ6194.Superseded values are not recommended for survey control.
AJ6194
AJ6194.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AJ6194.See file dsdata.txt to determine how the superseded data were derived.
AJ6194
AJ6194_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMK9133968709(NAD 83)
AJ6194
AJ6194_MARKER: DD = SURVEY DISK
AJ6194_SETTING: 36 = SET IN A MASSIVE STRUCTURE
AJ6194_SP_SET: FLOOD LOCK WALL
AJ6194_STAMPING: FCE 117
AJ6194_MARK LOGO: USE
AJ6194_MAGNETIC: O = OTHER; SEE DESCRIPTION
AJ6194_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AJ6194_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ6194+SATELLITE: SATELLITE OBSERVATIONS - January 06, 2015
AJ6194

AJ6194	HISTORY	- Date	Condition	Report By
AJ6194	HISTORY	- 1962	MONUMENTED	USE
AJ6194	HISTORY	- 20010616	GOOD	EMCINC
AJ6194	HISTORY	- 2002	GOOD	MAPTEC
AJ6194	HISTORY	- 20040929	GOOD	MCKIM
AJ6194	HISTORY	- 20110330	GOOD	MCKIM

```
AJ6194  HISTORY     - 20130605 GOOD             BAKER
AJ6194  HISTORY     - 20150106 GOOD             USGS
AJ6194
AJ6194                          STATION DESCRIPTION
AJ6194
AJ6194'DESCRIBED BY EMC INCORPORATED 2001 (WJB)
AJ6194'THE STATION IS LOCATED IN MOORE HAVEN, FLORIDA ON THE MOORE
AJ6194'HAVEN LOCK AT LAKE OKEECHOBEE.  LOCATED ON THE MOORE HAVEN QUAD
AJ6194'SECTION 12, TOWNSHIP 42 SOUTH, RANGE 32 EAST.
AJ6194'
AJ6194'OWNERSHIP   U.S. ARMY CORPS OF ENGINEERS
AJ6194'
AJ6194'TO REACH THE STATION FROM THE INTERSECTION OF FIFTH STREET AND
AJ6194'U.S. HIGHWAY 27 AT THE GLADES COUNTY COURTHOUSE IN MOORE HAVEN,
AJ6194'FLORIDA GO EAST 0.16 KILOMETERS (0.1 MILES) TO AN EXIT TO THIRD
AJ6194'STREET, THENCE SOUTH 0.16 KILOMETERS (0.1 MILES) TO INTERSECTION
AJ6194'WITH AVENUE J, THENCE LEFT (EAST) ON AVENUE J 0.24 KILOMETERS (0.15
AJ6194'MILES) TO INTERSECTION WITH FIRST STREET, THENCE LEFT (NORTH) 0.96
AJ6194'KILOMETERS (0.6 MILES) ON FIRST STREET TO THE INTERSECTION WITH
AJ6194'COUNTY ROAD 720 NORTHWEST, THENCE RIGHT (EAST) ON COUNTY ROAD
AJ6194'720 NORTHWEST 0.16 KILOMETERS (0.1 MILES) TO PAVED ROAD TO MOORE
AJ6194'HAVEN LOCK, THENCE RIGHT (SOUTHEAST) ON PAVED ROAD 0.32
AJ6194'KILOMETERS (0.2 MILES) THROUGH THE COMPOUND TO THE TOP OF
AJ6194'HERBERT HOOVER LEVEE AT THE WEST SIDE OF MOORE HAVEN LOCK AND
AJ6194'THE MARK AHEAD APPROXIMATELY 10 METERS ON THE LOCK.
AJ6194'
AJ6194'THE STATION IS 7.5 METERS (24.6 FEET) WEST OF THE NORTHWEST CORNER
AJ6194'OF LOCK CONTROL HOUSE, 1.45 METERS (4.8 FEET) NORTHEAST OF A METAL
AJ6194'LIGHT POLE, 0.15 METERS (0.5 FEET) SOUTH OF THE TOP OF CONCRETE
AJ6194'STEPS AND APPROXIMATELY 0.6 METERS (2.0 FEET) ABOVE THE TOP OF HERBERT
AJ6194'HOOVER LEVEE.  THE MARK IS A UNITED STATES ENGINEER DEPARTMENT BRONZE
AJ6194'DISK WITH A RAISED TRIANGULAR CENTER POINT, SET FLUSH WITH THE TOP OF
AJ6194'CONCRETE ON THE WEST LOCK WALL.
AJ6194'
AJ6194
AJ6194                          STATION RECOVERY (2002)
AJ6194
AJ6194'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (WJB)
AJ6194'RECOVERED AS DESCRIBED.
AJ6194
AJ6194                          STATION RECOVERY (2004)
AJ6194
AJ6194'RECOVERY NOTE BY MCKIM AND CREED 2004 (BRH)
AJ6194'RECOVERED IN GOOD CONDITION.
AJ6194
AJ6194                          STATION RECOVERY (2011)
AJ6194
AJ6194'RECOVERY NOTE BY MCKIM AND CREED 2011 (CJB)
AJ6194'RECOVERED IN GOOD CONDITION.
AJ6194
AJ6194                          STATION RECOVERY (2013)
AJ6194
AJ6194'RECOVERY NOTE BY M BAKER JR INCORPORATED 2013 (SJC)
AJ6194'RECOVERED IN GOOD CONDITION.
AJ6194
AJ6194                          STATION RECOVERY (2015)
AJ6194
AJ6194'RECOVERY NOTE BY US GEOLOGICAL SURVEY 2015 (RDH)
AJ6194'RECOVERED IN GOOD CONDITION.
```

```
*** retrieval complete.
Elapsed Time = 00:00:03
```

Project Information		Coordinate System	
Name:		Name:	Default
Size:		Datum:	WGS 1984
Modified:	2/15/2012 8:48:57 AM (UTC:-7)	Zone:	Default
Time zone:	Mountain Standard Time	Geoid:	
Reference number:		Vertical datum:	
Description:			

Level Report

Imported file: GLF6.DAT
Instrument: DiNi
Standard error per kilometer of double leveling: 0.00230 ft
Standard error per turn/station setup: 0.00000 ft
Creation option: Delta elevations
Description usage: Feature codes

Run - 1 Raw Observations

Raw Misclosure: 0.00400 ft
Σ BS Distances: 1158.030 ft
Σ FS Distances: 1155.770 ft
Run Length: 2313.800 ft
Reduction: Adjusted Values

Create	Point ID	BS	IS	FS	Δ Elevation	Raw Elevation	Correction	Adj. Elevation	Type	Distance	Description
☑	1	☑ 5.56300 ft			0.00000 ft	35.279 ft	0.00000 ft	35.279 ft	Benchmark	94.910 ft	FC117 3
☐	2			☑ 7.03600 ft	-1.47300 ft	33.806 ft	-0.00021 ft	33.806 ft	Computed	100.200 ft	3
	2	☑ 5.92100 ft								247.440 ft	3
☐	3			☑ 5.40800 ft	0.51300 ft	34.319 ft	-0.00156 ft	34.317 ft	Computed	248.980 ft	3
	3	☑ 5.02900 ft								100.030 ft	3
☐	4			☑ 9.58700 ft	-4.55800 ft	29.761 ft	-0.00179 ft	29.759 ft	Computed	101.510 ft	3
	4	☑ 0.31700 ft								37.040 ft	3
☐	5			☑ 8.31300 ft	-7.99600 ft	21.765 ft	-0.00182 ft	21.763 ft	Computed	38.580 ft	3
	5	☑ 0.30000 ft								92.750 ft	3
☐	6					14.059 ft	-0.00200 ft	14.057 ft	Computed	91.270 ft	S235 3

				8.00600 ft	-7.70600 ft						
	6	8.03100 ft								91.110 ft	S235 3
	7			0.32500 ft	7.70600 ft	21.765 ft	-0.00219 ft	21.763 ft	Computed	93.040 ft	3
	7	8.98600 ft								47.110 ft	3
	8			1.14400 ft	7.84200 ft	29.607 ft	-0.00224 ft	29.605 ft	Computed	47.150 ft	3
	8	9.55900 ft								96.690 ft	3
	9			4.84900 ft	4.71000 ft	34.317 ft	-0.00244 ft	34.315 ft	Computed	95.180 ft	3
	9	5.62400 ft								250.620 ft	3
	10			6.19400 ft	-0.57000 ft	33.747 ft	-0.00379 ft	33.743 ft	Computed	244.980 ft	3
	10	7.13200 ft								100.330 ft	3
	11			5.59600 ft	1.53600 ft	35.283 ft	-0.00400 ft	35.279 ft	Benchmark	94.880 ft	FC117 3

Run - 1 (N1) Reduced Observations

Observation	Status	Raw Δ Elevation	Correction	Final Δ Elevation	Setups	Length	Σ BS Readings	Σ FS Readings	Std. Error
1-11 (E1)	Enabled	0.00400 ft	-0.00400 ft	0.00000 ft	10	2313.800 ft	56.46200 ft	56.45800 ft	0.02226 ft

Run - 1 (N1) Reduced Coordinates

Point ID	Status	Elevation
1	Enabled	35.27900 ft
11	Enabled	35.27900 ft