

# **SURVEYOR'S REPORT**

**Specific Purpose Survey of  
Monitoring Wells HIF 40, HIH 1 and HIS 1  
Highlands County, Florida**

**Prepared for:**

**South Florida Water Management District**

**Prepared by:**



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**Licensed Business (L.B.) 6860**

**South Florida Water Management District's**

**Purchase Order number 4500015866**

**Keith and Associates project number 07050.06,**

**Task 001**

**Report Date: April 9, 2008**

**Submittal: Final**

**SURVEYOR'S REPORT**

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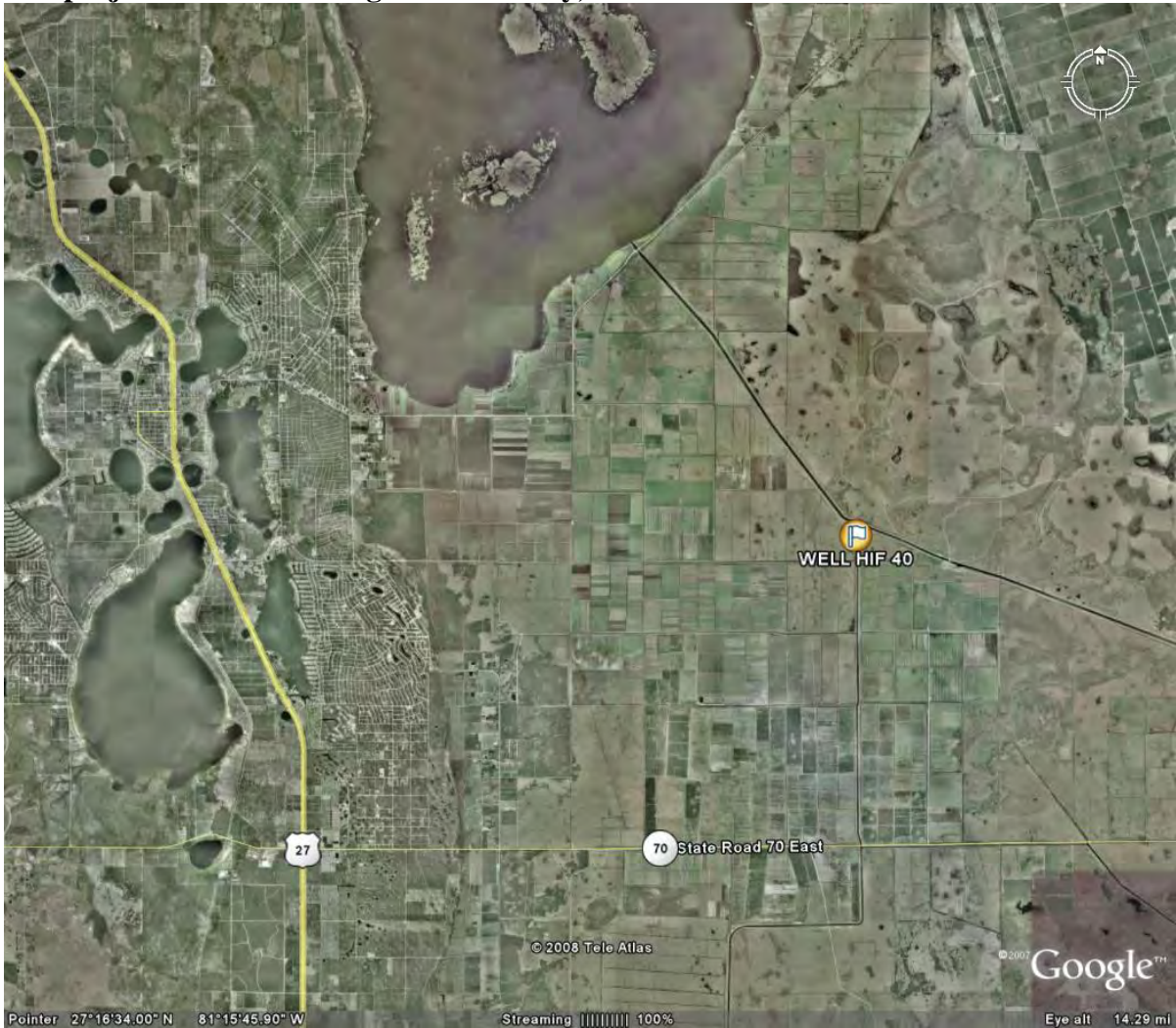
# SURVEYOR'S REPORT

## PURPOSE

To establish (NAVD 1988 and NGVD 1929) vertical data on the existing Wells and set a site benchmark.

## LOCATION OF PROJECT

The project is located in Highlands County, Florida.



## **SURVEYOR'S REPORT**

### **ITEMS DELIVERED TO THE DISTRICT**

1. Electronic copy of field notes
2. Electronic copy of all computation sheets
3. CORPSMET 95 file
4. Site photographs
5. Surveyor's Report
6. District Benchmark Sheets
7. District Well Excel Sheet
8. Well Activation Excel Sheet

### **DATUM FOR THE PROJECT**


The vertical datum for the project is National Geodetic Vertical Datum (NGVD) of 1929 and North American Vertical Datum (NAVD) of 1988. The NGVD 1929 elevation and offset were obtained using Benchmark Q-438 as found in the South Florida Water Management District's benchmark data base. The horizontal datum is NAD (North American Datum) 1983/90.

### **LEVELING METHODS**

Site Benchmark "HIF 40 2008" is a 3-1/2" South Florida Water Management District brass disk set in poured concrete, 5.4' north of well HIF 40. A level loop was run starting at NGS benchmark Q-438, through site benchmark HIF 40 2008 and back to Q-438. A Leica NA2 conventional level was used for the level run and the site As-Builts. The level runs meet or exceed the closure requirement of "the square root of the level run in miles x 0.03'

## SURVEYOR'S REPORT

### VERTICAL CONTROL

<b>Q-438</b>		Elevation:	<b>NAVD 1988</b>	<b>38.822'</b>	<b>NGVD 1929</b>	<b>40.02'</b>
PID AE6429	Latitude		27° 16' 21" (Scaled)	From NGS Data Sheet		From the South Florida Water Management District's Benchmark Data Base
State/County FL/Highlands	Longitude		-81° 12' 08" (Scaled)			
USGS QUAD Basinger SW (1972)						
Vertical Order Class	Second I	<p>The mark is about 10.1 mi (16.3 km) east-southeast of Lake Placid in Section 11, Township 37 South, Range 31 East. To reach the mark from the intersection of U.S. Highway 27 and State Road 70 south of Lake Placid, go east on State Road 70 for 7.7 mi (12.4 km) to the west end of the bridge over Canal C 41 (Harney Pond Canal), continue east on State Road 70 for 0.1 mi (0.2 km) to the east end of the bridge over Canal C 41 and a locked gate on the left, turn left passing through the gate on east levee road and go north for 4.4 mi (7.1 km) to flood control gate Structure S 82 on the left and the mark set flush in the southeast corner of structure. Located 51.3 ft (15.6 m) east of the southwest corner of the structure, 15.1 ft (4.6 m) south of a gate control column and 7.5 ft (2.3 m) south of the approximate centerline of the bridge.</p>				
						

# 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 = JANUARY  8, 2016
AE6429 *****
AE6429 DESIGNATION -  Q 438
AE6429 PID          -  AE6429
AE6429 STATE/COUNTY-  FL/HIGHLANDS
AE6429 COUNTRY      -  US
AE6429 USGS QUAD    -  BASINGER SW (1972)
AE6429
AE6429                      *CURRENT SURVEY CONTROL
AE6429
AE6429* NAD 83(1986) POSITION- 27 16 21.      (N) 081 12 08.      (W) SCALED
AE6429* NAVD 88 ORTHO HEIGHT -  11.833 (meters)      38.82 (feet) ADJUSTED
AE6429
AE6429 GEOID HEIGHT   -      -25.641 (meters)                GEOID12B
AE6429 DYNAMIC HEIGHT -      11.815 (meters)      38.76 (feet) COMP
AE6429 MODELED GRAVITY -  979,124.0 (mgal)                NAVD 88
AE6429
AE6429 VERT ORDER    -  SECOND      CLASS I
AE6429
AE6429.The horizontal coordinates were scaled from a topographic map and have
AE6429.an estimated accuracy of +/- 6 seconds.
AE6429.
AE6429.The orthometric height was determined by differential leveling and
AE6429.adjusted by the NATIONAL GEODETIC SURVEY
AE6429.in March 1998.
AE6429
AE6429.Significant digits in the geoid height do not necessarily reflect accuracy.
AE6429.GEOID12B height accuracy estimate available here.
AE6429
AE6429.The dynamic height is computed by dividing the NAVD 88
AE6429.geopotential number by the normal gravity value computed on the
AE6429.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AE6429.degrees latitude (g = 980.6199 gals.).
AE6429
AE6429.The modeled gravity was interpolated from observed gravity values.
AE6429
AE6429;
AE6429;          North      East      Units  Estimated Accuracy
AE6429;SPC FL E    -  325,610.    179,980.    MT    (+/- 180 meters Scaled)
AE6429
AE6429                      SUPERSEDED SURVEY CONTROL
AE6429
AE6429.No superseded survey control is available for this station.
AE6429
AE6429_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML799166(NAD 83)
AE6429
AE6429_MARKER: DV = VERTICAL CONTROL DISK
AE6429_SETTING: 38 = SET IN THE ABUTMENT OR PIER OF A LARGE BRIDGE
AE6429_SP_SET: FLOOD CONTROL GATE
AE6429_STAMPING: Q 438 1995
AE6429_MARK LOGO: NGS

```

AE6429\_MAGNETIC: N = NO MAGNETIC MATERIAL  
 AE6429\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
 AE6429\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 AE6429+SATELLITE: SATELLITE OBSERVATIONS - August 20, 2013

AE6429

AE6429	HISTORY	- Date	Condition	Report By
AE6429	HISTORY	- 1995	MONUMENTED	FLDEP
AE6429	HISTORY	- 20091221	GOOD	MOREKL
AE6429	HISTORY	- 20130820	GOOD	SFLWMD

AE6429

AE6429 STATION DESCRIPTION

AE6429

AE6429'DESCRIBED BY FL DEPT OF ENV PRO 1995 (LGB)  
 AE6429'THE MARK IS ABOUT 10.1 MI (16.3 KM) EAST-SOUTHEAST OF LAKE PLACID IN  
 AE6429'SECTION 11, TOWNSHIP 37 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM  
 AE6429'THE INTERSECTION OF U.S. HIGHWAY 27 AND STATE ROAD 70 SOUTH OF LAKE  
 AE6429'PLACID, GO EAST ON STATE ROAD 70 FOR 7.7 MI (12.4 KM) TO THE WEST END  
 AE6429'OF THE BRIDGE OVER CANAL C 41 (HARNEY POND CANAL), CONTINUE EAST ON  
 AE6429'STATE ROAD 70 FOR 0.1 MI (0.2 KM) TO THE EAST END OF THE BRIDGE OVER  
 AE6429'CANAL C 41 AND A LOCKED ON THE LEFT, TURN LEFT PASSING THROUGH THE  
 AE6429'GATE ON EAST LEVEE ROAD AND GO NORTH FOR 4.4 MI (7.1 KM) TO FLOOD  
 AE6429'CONTROL GATE STRUCTURE S 82 ON THE LEFT AND THE MARK SET FLUSH IN THE  
 AE6429'SOUTHEAST CORNER OF STRUCTURE. LOCATED 51.3 FT (15.6 M) EAST OF THE  
 AE6429'SOUTHWEST CORNER OF THE STRUCTURE, 15.1 FT (4.6 M) SOUTH OF A GATE  
 AE6429'CONTROL COLUMN AND 7.5 FT (2.3 M) SOUTH OF THE APPROXIMATE CENTERLINE  
 AE6429'OF THE BRIDGE. NOTE ALL GATES ON LEVEE ARE LOCKED, FOR KEY CONTACT  
 AE6429'CARL ZEISS, SOUTH FLORIDA WATER MANAGEMENT DISTRICT, WEST PALM BEACH,  
 AE6429'FL. PHONE NUMBER (407) 686-8800.

AE6429

AE6429 STATION RECOVERY (2009)

AE6429

AE6429'RECOVERY NOTE BY MORGAN AND EKLUND INC 2009

AE6429'RECOVERED AS DESCRIBED

AE6429

AE6429 STATION RECOVERY (2013)

AE6429

AE6429'RECOVERY NOTE BY S FL WATER MGMT DIST 2013



AE6429'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:01

## SURVEYOR'S REPORT

### VERTICAL CONTROL (CONTINUED)

<b>SITE BENCHMARK "HIF 40 2008"</b>	Elevation:	NAVD 1988	30.946'	NGVD 1929	32.144'
	Latitude	27° 16' 17.8"	Derived from the level loop as described in the Leveling Methods section of this report.		Derived from the level loop as described in the Leveling Methods section of this report.
State/County FL/Highlands	Longitude	-81° 12' 08.0"			
USGS QUAD Basinger SW (1972)					
Vertical Order      Third Horizontal Order    Third		<p>The mark is about 10.1 mi (16.3 km) east-southeast of Lake Placid in Section 11, Township 37 South, Range 31 East. To reach the mark from the intersection of U.S. Highway 27 and State Road 70 south of Lake Placid, go east on State Road 70 for 7.7 mi (12.4 km) to the west end of the bridge over Canal C 41 (Harney Pond Canal), continue east on State Road 70 for 0.1 mi (0.2 km) to the east end of the bridge over Canal C 41 and a locked gate on the left, turn left passing through the gate on east levee road and go north for 4.4 mi (7.1 km) to flood control gate Structure S 82 on the left, turn left passing over Structure S 82 to the west side of Canal C-41, turn left and proceed approx. 80' south to three wells and the mark on the left. The mark is a SFWMD 3 1/2" brass disk set in poured concrete, in line and 5.4' north of the northerly well (HIF 40).</p>			
					
					



**SURVEYOR'S REPORT**

**PROJECT RESULTS**

Well HIF 40	Well HIS 1	Well HIH 1
<p>Reference mark: <b><u>Found marker mark on pipe just above PVC portion.</u></b></p> <p><b>New Information at the site:</b>  <b>Wrote the following information on the side of the well pipe.</b>            Mark El. <b><u>36.05' NGVD 29</u></b>            Mark El. <b><u>34.85' NAVD 88</u></b>            Initials: <b><u>KEITH &amp; ASSOC.</u></b>            Date: <b><u>1/30/08</u></b></p> <p><b>Previous Information at the site:</b>            Reference Mark Elevation(s)            El. <b><u>None</u></b>            Date: <b><u>None</u></b>            Initials: <b><u>None</u></b>            Reference Mark location:  <b><u>Same mark as noted above.</u></b></p>	<p>Reference mark: <b><u>Found marker mark on PVC pipe under housing.</u></b></p> <p><b>New Information at the site:</b>  <b>Wrote the following information on the side of the well pipe.</b>            Mark El. <b><u>35.38' NGVD 29</u></b>            Mark El. <b><u>34.18' NAVD 88</u></b>            Initials: <b><u>KEITH &amp; ASSOC.</u></b>            Date: <b><u>1/30/08</u></b></p> <p><b>Previous Information at the site:</b>            Reference Mark Elevation(s)            El. <b><u>None</u></b>            Date: <b><u>None</u></b>            Initials: <b><u>None</u></b>            Reference Mark location: <b><u>Same mark as noted above.</u></b></p>	<p>Reference mark: <b><u>Found marker mark on pipe just above PVC portion.</u></b></p> <p><b>New Information at the site:</b>  <b>Wrote the following information on the side of the well pipe.</b>            Mark El. <b><u>35.86' NGVD 29</u></b>            Mark El. <b><u>34.66' NAVD 88</u></b>            Initials: <b><u>KEITH &amp; ASSOC.</u></b>            Date: <b><u>1/30/08</u></b></p> <p><b>Previous Information at the site:</b>            Reference Mark Elevation(s)            El. <b><u>None</u></b>            Date: <b><u>None</u></b>            Initials: <b><u>None</u></b>            Reference Mark location:  <b><u>Same mark as noted above.</u></b></p>
<p><b><u>DTW</u></b> (Distance to water inside well)  <b><u>Unable to obtain, well sealed.</u></b>            Reference mark: <b><u>N/A</u></b>            El. <b><u>N/A</u></b> (NGVD 29)            Measurement to water: <b><u>N/A</u></b>            Date: <b><u>N/A</u></b>            Time: <b><u>N/A</u></b>            Ground Elevation next to Well:  <b><u>32.64' (NGVD 1929) (on concrete pad).</u></b></p>	<p><b><u>DTW</u></b> (Distance to water inside well)            Reference mark: <b><u>Same mark as noted above.</u></b>            El. <b><u>26.7'</u></b> (NGVD 29)            Measurement to water: <b><u>8.7'</u></b>            Date: <b><u>01/28/08</u></b>            Time: <b><u>11:18 a.m.</u></b>            Ground Elevation next to Well:  <b><u>32.54' (NGVD 1929) (on concrete pad).</u></b></p>	<p><b><u>DTW</u></b> (Distance to water inside well)  <b><u>Unable to obtain, well sealed.</u></b>            Reference mark: <b><u>N/A</u></b>            El. <b><u>N/A</u></b> (NGVD 29)            Measurement to water: <b><u>N/A</u></b>            Date: <b><u>N/A</u></b>            Time: <b><u>N/A</u></b>            Ground Elevation next to Well:  <b><u>32.64' (NGVD 1929) (on concrete pad).</u></b></p>

**SURVEYOR'S REPORT**

**SITE PHOTOS**

**Well HIF 40 Measuring Point & Brass Tag**



**1/30/08**

**Keith and Associates**

**SURVEYOR'S REPORT**

**SITE PHOTOS**

**Well HIS 1 Measuring Point & Brass Tag**



**1/30/07**

**Keith and Associates**

**SURVEYOR'S REPORT**

**SITE PHOTOS**

**Well HIH 1 Measuring Point & Brass Tag**



**1/30/08**

**Keith and Associates**

## SURVEYOR'S REPORT

### Comments

Elevations shown hereon are NGVD 1929 datum unless noted otherwise.

Party Chief: D. Ferels Field Book: 287 Page Pages 39-40

Field Book: 289 Page Page 80

Bench Mark: "HIF 40 2008" El. 30.946', Vertical Datum: NAVD1988

El. 32.144', Vertical Datum: NGVD1929

Offset: 1.20' SFWMD VALUE (subtract this value from NGVD 1929 to convert to NAVD 1988)

Offset: 1.20' NGS VALUE (subtract this value from NGVD 1929 to convert to NAVD 1988)

The offset value referred to as "SFWMD VALUE" was derived by subtracting the NAVD 1988 value from the NGVD 1929 value at NGS benchmark Q-438.

NAVD 88 - North American Vertical Datum of 1988

NGVD29 -National Geodetic Vertical Datum of 1929

NAD 83 -99 (Horizontal Datum) North American Datum

NGS - National Geodetic Survey

SFWMD - South Florida Water Management District

PVC - Polyvinyl Chloride

L.B. - Licensed Business

RTK – Real Time Kinematic

K&A – Keith and Associates

PSM – Professional Surveyor & Mapper

USGS – United States Geological Survey

QUAD – Quadrangle Map

PID - Permanent Identifier

### SURVEYOR'S CERTIFICATION

I hereby certify that this Specific Purpose Survey meets applicable portions of the Minimum Technical Standards set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 61-G17, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

Keith and Associates, Inc.

L.B. number 6860

By:

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Date of Survey  
January 30, 2008

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Michael M. Mossey, PSM  
Professional Surveyor and Mapper  
State of Florida  
Certificate No. 5660

Well Sites HIF 40 HIS 1 HIH 1.gen

Identification\_Information:

Citation:

Citation\_Information:

Originator: Michael M. Mossey, P. S. M. (ed.)

Publication\_Date: 20081219

Publication\_Time: Unknown

Title: HIF 40

Edition: 1

Series\_Information:

Publication\_Information:

Publication\_Place: Not Published

Publisher: None

Online\_Linkage: mmossey@keith-associates.com

Larger\_Work\_Citation:

Citation\_Information:

Series\_Information:

Publication\_Information:

Description:

Abstract: Wells HIF 40, HIS 1 and HIH 1.

Purpose:

To establish reference elevations in NAVD 1988 and NGVD 1929 datum at the site on the existing well and set a site benchmark.

Time\_Period\_of\_Content:

Time\_Period\_Information:

Single\_Date/Time:

Range\_of\_Dates/Times:

Beginning\_Date: 20080128

Ending\_Date: 20080130

Multiple\_Dates/Times:

Currentness\_Reference: Publication Date

Status:

Progress: Complete

Maintenance\_and\_Update\_Frequency: Unknown

Spatial\_Domain:

Bounding\_Coordinates:

West\_Bounding\_Coordinate: 81°12' 08.0"

East\_Bounding\_Coordinate: 81°12' 08.0"

North\_Bounding\_Coordinate: 27°16' 17.8"

South\_Bounding\_Coordinate: 27°16' 17.8"

Keywords:

Theme:

Theme\_Keyword\_Thesaurus: Specific Purpose Survey

Theme\_Keyword: Well Site

Place:

Place\_Keyword\_Thesaurus: Highlands County, Florida

Place\_Keyword: Well Sites HIF 40, HIS 1 and HIH 1

Place\_Keyword: Sections 11 Township 37 S - Range 31 E

Stratum:

Temporal:

Access\_Constraints: Need SFWMD key to access gates.

Use\_Constraints: None

Point\_of\_Contact:

Contact\_Information:

Contact\_Person\_Primary:

Contact\_Person: Steve Krupa

Contact\_Organization: South Florida Water Management

District

Contact\_Organization\_Primary:

Contact\_Position: Senior Supervisor

Contact\_Address:

Address\_Type: mailing and physical address

Address:

Well Sites HIF 40 HIS 1 HIH 1.gen  
3301 Gun Club Road  
MS 4330

City: West Palm Beach  
State\_or\_Province: Florida  
Postal\_Code: 33406  
Country: USA

Contact\_Voice\_Telephone: Office (561) 682-6923  
Contact\_Electronic\_Mail\_Address: skrupa@sfwmd.gov  
Hours\_of\_Service: 8:00 am to 5:00 pm EST

Security\_Information:  
Cross\_Reference:

Citation\_Information:  
Series\_Information:  
Publication\_Information:

Data\_Quality\_Information:

Attribute\_Accuracy:

Attribute\_Accuracy\_Report:

Horizontal locations were obtained using a Trimble 5700 receiver and RTK cellular link. The vertical data was collected using a Leica NA2 Level. Coordinates are based on the Florida State Plane Coordinate System, East Zone, NAD 1983/90. Elevations are based on NGVD 1929 with an offset supplied to convert to NAVD 1988.

Logical\_Consistency\_Report:

Vertical data at the sites was established using site Benchmark "HIF 40 2008", a South Florida Water Management 3-1/2" brass disk in poured concrete 5.4' north of well HIF 40.

Completeness\_Report:

Well HIF 40 (NGVD1929) Elev. 36.05'

Well HIS 1 (NGVD1929) Elev. 35.38'

Well HIH 1 (NGVD1929) Elev. 35.86'

Offset written at wells (-) 1.20' to NAVD 1988.

Site Benchmark HIF 40 2008, The mark is about 10.1 mi (16.3 km) east-southeast of Lake Placid in Section 11, Township 37 South, Range 31 East. To reach the mark from the intersection of U. S. Highway 27 and State Road 70 south of Lake Placid, go east on State Road 70 for 7.7 mi (12.4 km) to the west end of the bridge over Canal C 41 (Harney Pond Canal), continue east on State Road 70 for 0.1 mi (0.2 km) to the east end of the bridge over Canal C 41 and a locked gate on the left, turn left passing through the gate on east levee road and go north for 4.4 mi (7.1 km) to flood control gate Structure S 82 on the left, turn left passing over Structure S 82 to the west side of Canal C-41, turn left and proceed approx. 80' south to three wells and the mark on the left. The mark is a SFWMD 3 1/2" brass disk set in poured concrete, in line and 5.4' north of the northerly well (HIF 40).

NAVD 1988 elevation 30.946' (field derived)

NGVD 1929 elevation 32.144' (field derived)

Benchmark Q-438, The mark is about 10.1 mi (16.3 km) east-southeast of Lake Placid in Section 11, Township 37 South, Range 31 East. To reach the mark from the intersection of U. S. Highway 27 and State Road 70 south of Lake Placid, go east on State Road 70 for 7.7 mi (12.4 km) to the west end of the bridge over Canal C 41 (Harney Pond Canal), continue east on State Road 70 for 0.1 mi (0.2 km) to the east end of the bridge over Canal C 41 and a locked gate on the left, turn left passing through the gate on east levee road and go north for 4.4 mi (7.1 km) to flood control gate Structure S 82 on the left and the mark set flush in the southeast corner of structure. Located 51.3

Well Sites HIF 40 HIS 1 HIH 1.gen  
ft (15.6 m) east of the southwest corner of the structure,  
15.1 ft (4.6 m) south of a gate control column and 7.5 ft  
(2.3 m) south of the approximate centerline of the bridge.  
NAVD 1988 elevation 38.822' (Data sheet)  
NGVD 1929 elevation 40.02' (From SFWMD benchmark  
data base)

Positional\_Accuracy:

Horizontal\_Positional\_Accuracy:

Horizontal\_Positional\_Accuracy\_Report:

obtained  
and  
static

The horizontal location of the benchmark was  
using sub-meter GPS methods, Trimble 5700 receiver  
a twenty minute static session. The results of the  
session were processed through the NGS website OPUS  
program.

Quantitative\_Horizontal\_Positional\_Accuracy\_Assessment:

Horizontal\_Positional\_Accuracy\_Value: +/- 3'

Horizontal\_Positional\_Accuracy\_Explanation: Value

derived using Trimble 5700 receiver/cellular RTK link.

Vertical\_Positional\_Accuracy:

Vertical\_Positional\_Accuracy\_Report:

NGS benchmark Q-438 was used to establish the  
elevations on the site benchmark.

Quantitative\_Vertical\_Positional\_Accuracy\_Assessment:

Vertical\_Positional\_Accuracy\_Value: 0.001'

Vertical\_Positional\_Accuracy\_Explanation: Better

than 0.03ft. x sq. root of miles of the Level Loop.

Quantitative\_Vertical\_Positional\_Accuracy\_Assessment:

Vertical\_Positional\_Accuracy\_Value: 0.001'

Vertical\_Positional\_Accuracy\_Explanation: Better

than 0.03ft. x the sq. root of miles of the Level Loop.

Lineage:

Source\_Information:

Source\_Citation:

Citation\_Information:

Series\_Information:

Publication\_Information:

Larger\_Work\_Citation:

Citation\_Information:

Series\_Information:

Publication\_Information:

Source\_Time\_Period\_of\_Content:

Time\_Period\_Information:

Single\_Date/Time:

Range\_of\_Dates/Times:

Multiple\_Dates/Times:

Process\_Step:

Process\_Description:

Florida

Site Benchmark "HIF 40 2008" is a 3-1/2" South

benchmark

Water Management District brass disk set in poured  
concrete at the Well sites. A level loop was run  
starting at NGS benchmark Q-438, through site

HIF

HIF 40 2008 and back to Q-438. The well and site  
elevations were established using the site benchmark

40 2008.

Process\_Date: 20080130

Process\_Contact:

Contact\_Information:

Page 3



Well Sites HIF 40 HIS 1 HIH 1.gen  
 Contact\_Person\_Primary:  
 Contact\_Organization\_Primary:  
 Contact\_Address:

Spatial\_Data\_Organization\_Information:  
 Spatial\_Reference\_Information:  
 Horizontal\_Coordinate\_System\_Definition:  
 Geographic:  
 Latitude\_Resolution: 27°16' 17.8"  
 Longitude\_Resolution: -81°12' 08.0"  
 Geographic\_Coordinate\_Units: Degrees, minutes, and  
 decimal seconds

Geodetic\_Model:  
 Vertical\_Coordinate\_System\_Definition:  
 Altitude\_System\_Definition:  
 Depth\_System\_Definition:

Entity\_and\_Attribute\_Information:  
 Detailed\_Description:  
 Entity\_Type:  
 Attribute:  
 Attribute\_Domain\_Values:  
 Attribute\_Value\_Accuracy\_Information:  
 Overview\_Description:

Distribution\_Information:  
 Distributor:  
 Contact\_Information:  
 Contact\_Person\_Primary:  
 Contact\_Organization\_Primary:  
 Contact\_Organization: Keith and Associates  
 Contact\_Person: Michael Mossey  
 Contact\_Position: Project Surveyor  
 Contact\_Address:  
 Address\_Type: mailing and physical address  
 Address: 301 East Atlantic Boulevard  
 City: Pompano Beach  
 State\_or\_Province: Florida  
 Postal\_Code: 33060-6643  
 Country: Broward  
 Contact\_Voice\_Telephone: 954 788-3400  
 Contact\_Facsimile\_Telephone: 954 788-3500  
 Contact\_Electronic\_Mail\_Address:  
 mmossey@keith-associates.com  
 Hours\_of\_Service: 8:00-5:00 est.

Distribution\_Liability: None  
 Standard\_Order\_Process:  
 Digital\_Form:  
 Digital\_Transfer\_Information:  
 Digital\_Transfer\_Option:  
 Online\_Option:  
 Computer\_Contact\_Information:  
 Network\_Address:  
 Dialup\_Instructions:  
 Offline\_Option:  
 Recording\_Capacity:

Available\_Time\_Period:  
 Time\_Period\_Information:  
 Single\_Date/Time:  
 Range\_of\_Dates/Times:  
 Multiple\_Dates/Times:

Metadata\_Reference\_Information:  
 Metadata\_Date: 20070828  
 Metadata\_Revision\_Date: 20050721  
 Metadata\_Contact:  
 Contact\_Information:

Well Sites HIF 40 HIS 1 HIH 1.gen

Contact\_Person\_Primary:

Contact\_Person: Michael M. Mossey, P. S. M.

Contact\_Organization: Keith and Associates

Contact\_Organization\_Primary:

Contact\_Position: Project Surveyor

Contact\_Address:

Address\_Type: mailing and physical address

Address: 301 East Atlantic Boulevard

City: Pompano Beach

State\_or\_Province: FL

Postal\_Code: 33060-6643

Country: USA

Contact\_Voice\_Telephone: 954 788-3400

Contact\_Facsimile\_Telephone: 954 788-3500

Contact\_Electronic\_Mail\_Address:

mmossey@keith-associates.com

Hours\_of\_Service: 8:00 am to 5:00 pm EST

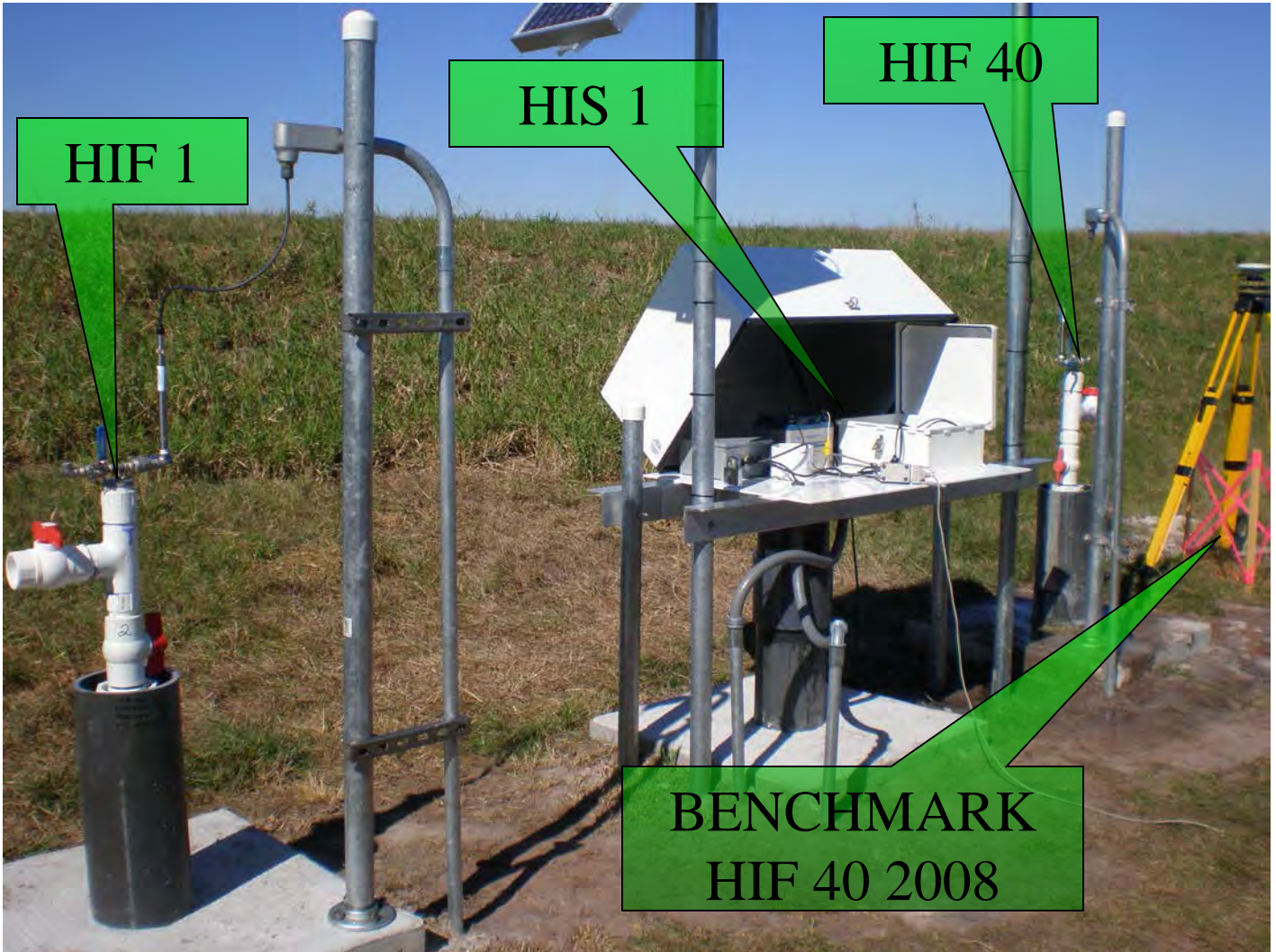
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Metadata\_Standard\_Version: 19940608

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# WELL SITE HIF 40, HIH 1 & HIS 1



1/28/08

Keith and Associates, Inc.

Well locations

# WELL SITE HIF 40, HIH 1 & HIS 1



**1/28/08**

**Keith and Associates, Inc.**

**Site Benchmark HIF 40 2008**

# WELL SITE HIF 40, HIH 1 & HIS 1



**1/28/08**

**Keith and Associates, Inc.**

**Site Benchmark HIF 40 2008 Location**

# WELL SITE HIF 40, HIH 1 & HIS 1



**1/28/08**

**Keith and Associates, Inc.**

**Well HIF 40**

# WELL SITE HIF 40, HIH 1 & HIS 1

UPPER  
MEASURING POINT



1/30/08

Keith and Associates, Inc.

Well HIF 40 Upper Measuring Point

# WELL SITE HIF 40, HIH 1 & HIS 1



**1/308/08**

**Keith and Associates, Inc.**

**Well HIF 40 Lower Measuring Point**



# WELL SITE HIF 40, HIH 1 & HIS 1



**1/30/08**

**Keith and Associates, Inc.**

**Well HIF 40 Tag, Upper Measuring Point Elevation**

# WELL SITE HIF 40, HIH 1 & HIS 1



**1/30/08**

**Keith and Associates, Inc.**

**Well HIS 1**

# WELL SITE HIF 40, HIH 1 & HIS 1



1/30/08

Keith and Associates, Inc.

Well HIS 1 Measuring Point

# WELL SITE HIF 40, HIH 1 & HIS 1

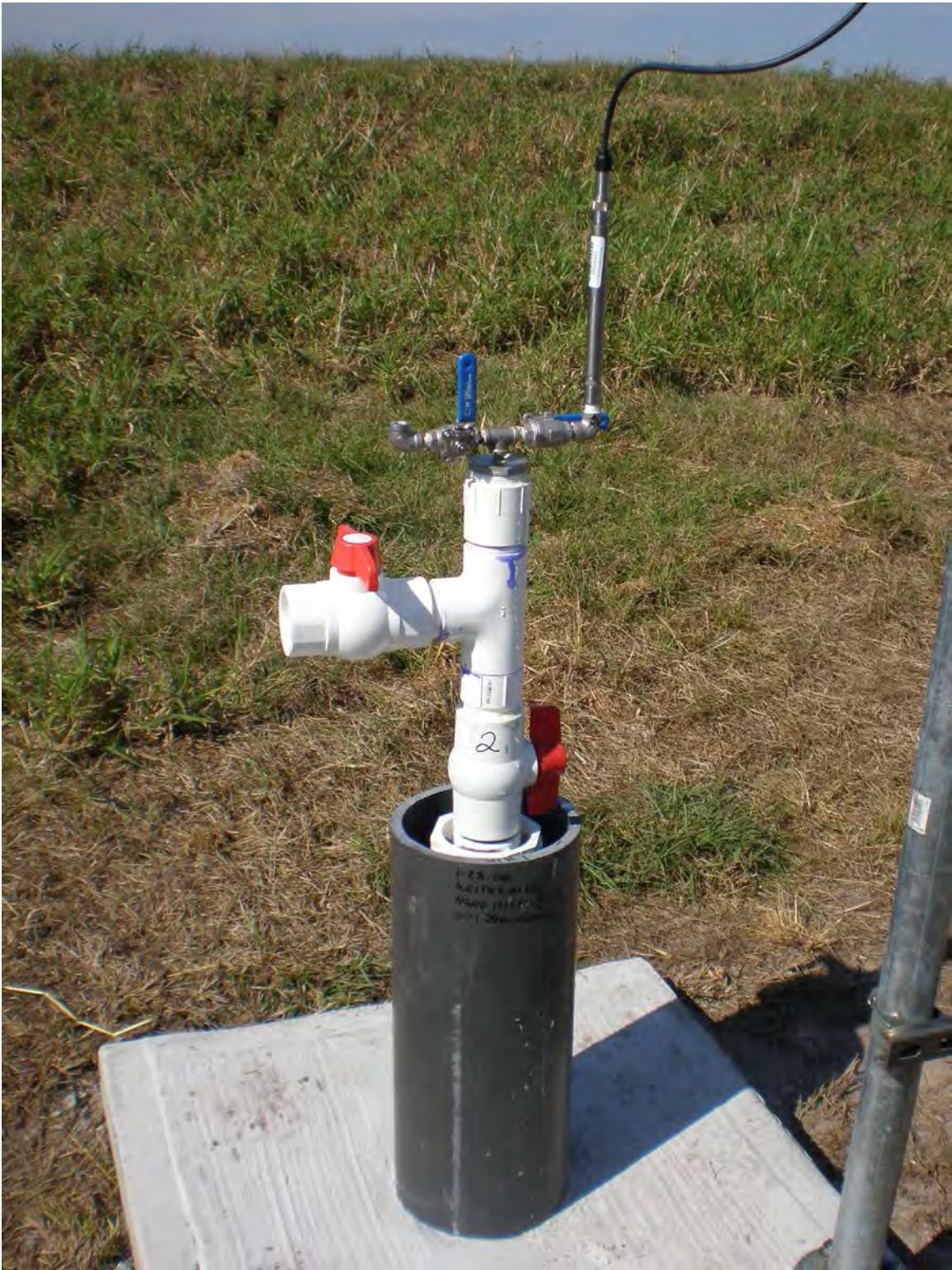


**1/30/08**

**Keith and Associates, Inc.**

**Well HIS 1 Tag**

# WELL SITE HIF 40, HIH 1 & HIS 1

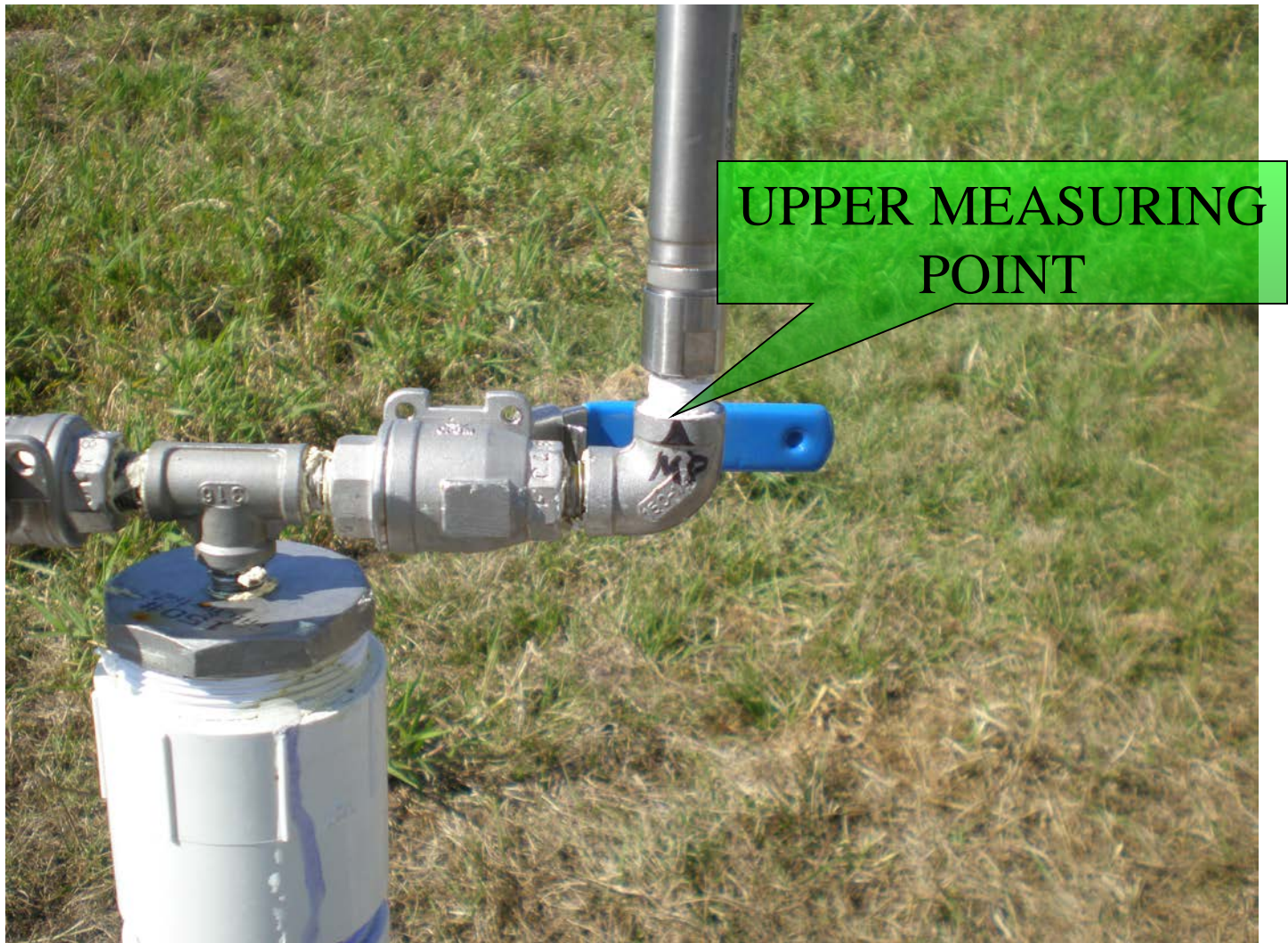


1/30/08

Keith and Associates, Inc.

Well HIH 1 Location

# WELL SITE HIF 40, HIH 1 & HIS 1



**1/30/08**

**Keith and Associates, Inc.**

**Well HIH 1 Upper Measuring Point**

# WELL SITE HIF 40, HIH 1 & HIS 1



**1/30/08**

**Keith and Associates, Inc.**

**Well HIH 1 Tag, Upper Measuring Point Elevation**

# WELL SITE HIF 40, HIH 1 & HIS 1



**1/30/08**

**Keith and Associates, Inc.**

**Well HIH 1 Tag, Lower Measuring Point Location**



1-28-08

LEVELS

GREEN

S.F.W.M.D.

HIF = 40

NAVD 1988

ELEV.

ADS. ELEV

BM

F  
3.613  
2.510

HI

-

38.822 ✓

(220) 1.407

2.510 ✓

41.332 ✓

TPI

10.998

11.537

9.876

10.385

(22A) 8.754

9.876 ✓

40.823 ✓

(23) 9.233

10.385 ✓

30.947 ✓

30.946 ✓

BM

Q438

3.110

2.001

(22) 0.889

2.000 ✓

38.823 ✓

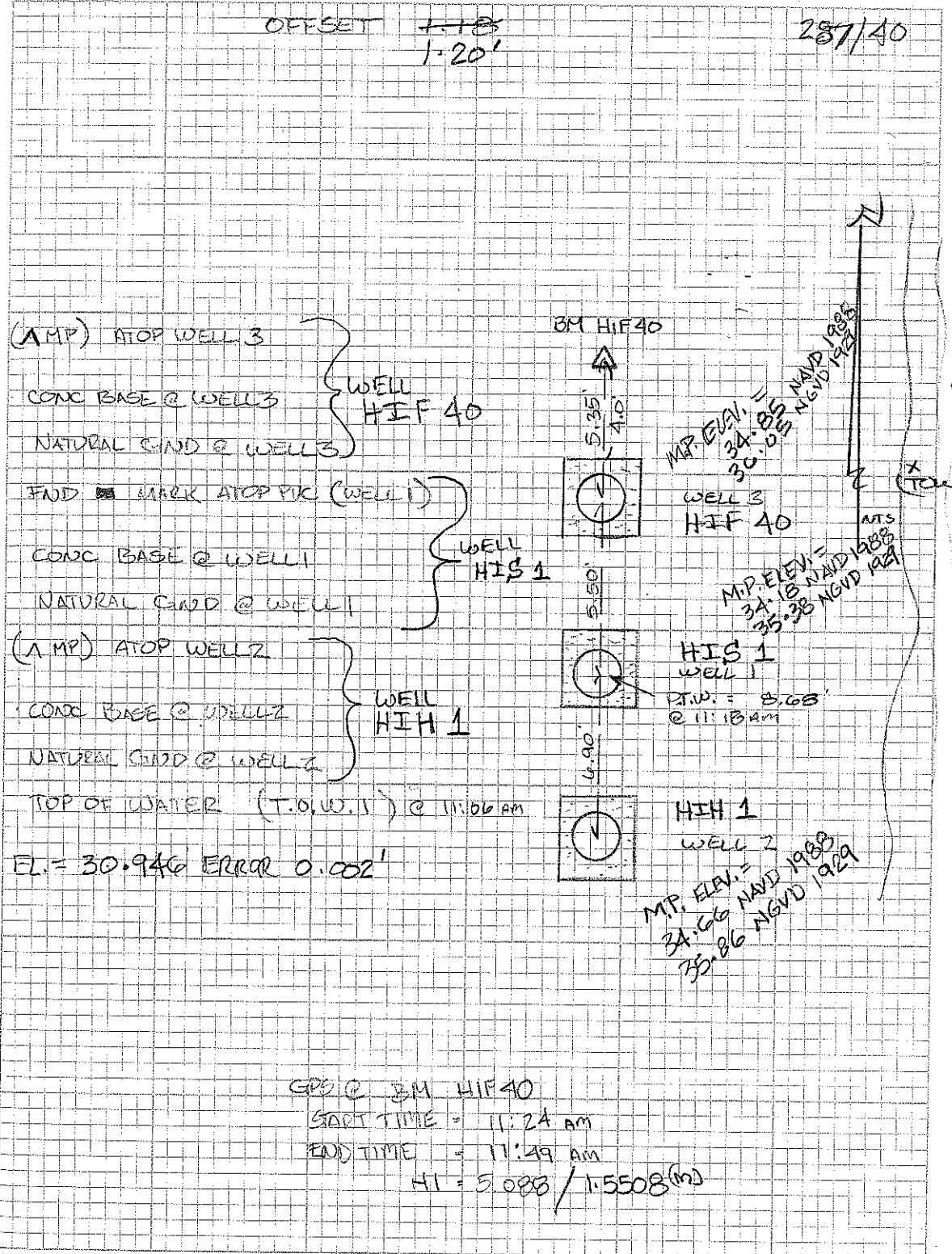
287/39

FIND BRASS DISK IN THE S.E. COR. OF CONC STRUCTURE  
682. STAMPED Q 438 1995

SET S.F.W.M.D. BRASS DISC IN POURED CONC MON.  
STAMPED HIF 40 2008

FROM THE INTERSECTION OF OS RT & SR TO TRAVEL EAST ON S.R. TO  
FOR 7.7 MILES TO A BRIDGE OVER CANAL, THEN TRAVEL NORTH  
ALONG CANAL FOR 4.2 MILES MARK IS ON THE WEST SIDE  
OF CANAL

1-28-08 FERRELS GREENS		S.F.W.M.D. HIF-40		NAVD 1988 ELEV	NAVD 1929 ELEV
	+	HI	-		
BM "HIF40"	4.613	35.107 35.559		30.496 30.946'	
TP1	0.550	34.929 35.399	0.710 3.966 4.460	34.849 <del>31.379</del> 31.439 30.939 <del>30.489</del>	36.049' <del>35.579</del> 32.639' 32.139'
TP2	1.120	34.848 35.298	1.221 3.955 4.33	<del>33.728</del> 34.178 <del>30.578</del> 31.343 <del>30.578</del> 30.968	34.908 35.378' 32.543' 32.168'
TP3	0.862	35.074 35.524	0.1636 4.080 4.420 10.610	<del>34.212</del> 34.662 <del>30.994</del> 31.444' <del>30.654</del> 31.104' <del>24.464</del> 24.914'	35.342 35.862' 32.644' 32.304' 26.114'
BM "HIF40"			4.579	<del>30.475</del> 30.945'	32.145'



1-30-08

FELDS

MAIS

S.F.W.M.D.

HIF 40

NAVD 1988  
ELEV

BM  
HIF 40

+  
5.029

HI  
35.975 ✓

30.946

TP 1

2.87

36.106 ✓

2.739

33.236 ✓

TP 2

3.120

36.204 ✓

3.022

33.084 ✓

BM

5.258

30.946 ✓

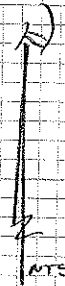
PICT #

- 1-2
- 3-4
- 5-6
- 7
- 8-9
- 10-11
- 12-13
- 14-15
- 16-17
- 18-19
- 20-21
- 22
- 23-24
- 25-26

CLOSE UP TAGS

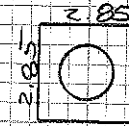
- MP (HIF 40)
- HIF 40 INFO
- HIF 40
- HIF 40 TAG
- HIS 1 TAG
- HIS 1 MARK (MP)
- HIS 1 TAG
- HIS 1 MP
- HIS 1 INFO
- HIS 1
- HIF 40 INFO
- HIF 40 SECONDARY MP MARK
- HIS 1

289/80



△ BM HIF 40

■ MARK ATOP PVC  
(HIF 40)

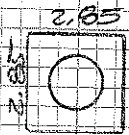


HIF 40  
36.05

■ MARK ATOP PVC  
(HIS 1)



HIS 1  
35.38



HIS 1  
35.86



**SOUTH FLORIDA WATER MANAGEMENT DISTRICT**

Rev. 4/01

<b>COUNTY</b> HIGHLANDS	<b>PROJECT WELL SITES</b> HIF 40, HIS 1 & HIH 1	<b>DESIGNATION</b> HIF 40 2008
<b>SECTION</b> 11	<b>TOWNSHIP</b> 37 SOUTH	<b>RANGE</b> 31 EAST
<b>GEOGRAPHIC INDEX OF QUAD</b>		
Established by <u>KEITH AND ASSOCIATES</u>		NAME OF QUADRANGLE <u>BASINGER S.W. (1972)</u>
SURVEYOR <u>D. FERELS</u> DATE <u>1/28/ 2008</u>		FIELD BOOK <u>287</u> PAGE <u>39</u>
HORIZONTAL DATUM: 1983/90      ZONE EAST		
VERTICAL DATUM: NGVD 1929    AND    NAVD 1988		
CONTROL ACCURACY: HORIZONTAL 3rd      VERTICAL 3rd		
STATE PLANE COORDINATES	X 590478.6	Y 1067960.2
		NAVD 1988 EL. 30.946'
		NGVD 1929 EL. 32.144'
LATITUDE	27°16'17.8"	LONGITUDE -81°12'08.0"
<b>DESCRIPTION</b>		
To Reach:		
The mark is about 10.1 mi (16.3 km) east-southeast of Lake Placid in Section 11, Township 37 South, Range 31 East. To reach the mark from the intersection of U.S. Highway 27 and State Road 70 south of Lake Placid, go east on State Road 70 for 7.7 mi (12.4 km) to the west end of the bridge over Canal C 41 (Harney Pond Canal), continue east on State Road 70 for 0.1 mi (0.2 km) to the east end of the bridge over Canal C 41 and a locked gate on the left, turn left passing through the gate on east levee road and go north for 4.4 mi (7.1 km) to flood control gate Structure S 82 on the left, turn left passing over Structure S 82 to the west side of Canal C-41, turn left and proceed approx. 80' south to three wells and the mark on the left. The mark is a SFWMD 3 1/2" brass disk set in poured concrete, in line and 5.4' north of the northerly well (HIF 40).		
Notable Land marks:		
See photos below.		

SKETCH



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01



JOB# 7050.06 Florida

PARTY CHIEF D. FERELS

DATE: January 28, 2008

Datum: NAVD88

FIELD BOOK 287

PAGE 39

STATION	3 WIRE	AVG.(ENG)	HI	3 WIRE	AVG.(ENG)	ELEV.	BM EL.	DIST.	ERROR	ACCUM.	ADJ. ELEV.	METRIC	DESCRIPTION
	3.613												
BM	2.510	2.510	41.332			38.822	38.822						NGS BENCHMARK Q-438
	1.407	0.000											
STADIA		220.600											
	10.998			11.537									
TP1	9.876	9.876	40.823	10.385	10.385	30.947		230.40	0.000256713	0.000502507	30.946	9.433	SET 3 1/2" BRASS DISK IN POURED
	8.754	0.000		9.233	0.000			-230.40					CONCRETE, 5.4' N. OF WELL
	29.628			31.155				-9.80					HIF 40. BM IS STAMPED HIF 40
STADIA		224.400			230.400								2008
				3.110									
BM				2.001	2.000	38.823	38.822	446.50	0.000497493	0.001000000	38.822	11.833	BM CHECK Q-438
				0.889	0.001			2.30					
				6.000				-7.50					
					222.100								
							LOR=	897.50	CHECK VALUES TO VERIFY SAME				
									OR TO SEE THEY ARE WITHIN				
	TOTAL +=	445.000		TOTAL -=	452.500			897.50	THIRD ORDER SPECS( MAX DIFF. 33 FT.)				
					-7.50								
					RAW CLOSURE=		0.001						
					ERROR PER FOOT=		0.000						
					MTS ALLOWABLE ERROR FOR THIRD ORDER=		0.012						
					ACTUAL ERROR=		0.001	RED IF BAD-----GREEN IF GOOD					

JOB#	7050.06		PARTY CHIEF	D. FERELS	DATE:	January 28, 2008		Datum:	NGVD29	FIELD BOOK	287	PAGE	39	
STATION	3 WIRE	AVG.(ENG)	HI	3 WIRE	AVG.(ENG)	ELEV.	BM EL.	DIST.	ERROR	ACCUM.	ADJ. ELEV.	METRIC	DESCRIPTION	
	3.613													
BM	2.510	2.510	42.530			40.020	40.020						NGS BENCHMARK Q-438	
	1.407	0.000												
STADIA		220.600												
	10.998			11.537										
TP1	9.876	9.876	42.021	10.385	10.385	32.145		230.40	0.000256713	0.000502507	32.144	9.798	SET 3 1/2" BRASS DISK IN POURED	
	8.754	0.000		9.233	0.000			-230.40					CONCRETE, 5.4' N. OF WELL	
	29.628			31.155				-9.80					HIF 40. BM IS STAMPED HIF 40	
STADIA		224.400			230.400								2008	
				3.110										
BM				2.001	2.000	40.021	40.020	446.50	0.000497493	0.001000000	40.020	12.198	BM CHECK Q-438	
				0.889	0.001			2.30						
				6.000				-7.50						
					222.100									
								LOR=	897.50	CHECK VALUES TO VERIFY SAME				
										OR TO SEE THEY ARE WITHIN				
	TOTAL +=	445.000		TOTAL -=	452.500			897.50	THIRD ORDER SPECS( MAX DIFF. 33 FT.)					
					-7.50									
					RAW CLOSURE=		0.001							
					ERROR PER FOOT=		0.000							
					MTS ALLOWABLE ERROR FOR THIRD ORDER=		0.012							
					ACTUAL ERROR=		0.001	RED IF BAD-----GREEN IF GOOD						