# Surveyor's Report

# Reference Elevation Audit Project Lee, Monroe and Collier Counties, Florida

Cooner & Associates Project No. 070603.01

SFWMD Contract No. 4600000941 Work Order No. 1

Date of Last Field Work: May 12, 2008 in field book 228, pages 2-78; field book 230, pages 1-79;

field book 233, pages 3-43, field book 234, pages 1-23, 27

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Prepared for:

## South Florida Water Management District

## COONER & ASSOCIATES, INC.

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### **LEGEND:**

BM = benchmark

Elev. = elevation

Info = information

n/a = not applicable

**Ref.** = reference

HW = headwater

TW = tailwater

STG = stage

**SUB-CM** = sub-centimeter

SUB-M = sub-meter

#### **OVERVIEW OF THE PROJECT**

#### **PURPOSE**

The purpose of this survey is to establish or verify elevations to third order National Geodetic Survey (NGS) standards at sixty-three (63) South Florida Water Management District (SFWMD) Recorder Well Sites. This survey is associated with the District's Vertical Datum Upgrade Project (VDUP). Another objective of this Work Order is to establish NGS third order elevations referring to both the North American Vertical Datum of 1988 (NAVD 1988) and the National Geodetic Vertical Datum of 1929 (NGVD 1929) at each of the sites.

Elevations were established or verified using existing Recorder Well Site vertical control marks where possible. These vertical control marks are published in the South Florida Water Management District's ATLAS database as assigned by the District. Recorder Well reference elevations and staff gauges were also verified. Field measured NGVD 1929 reference elevations were posted on brass tags and left at each Recorder Well Site for mounting by the SFWMD.

Where existing monumentation was found to be disturbed or destroyed new vertical control points were established at Recorder Well Sites. All set monuments were constructed in accordance with the NGS, Class C, Pour-In-Place Concrete Monument standards and were referenced by a Carsonite witness post.

In some cases elevations of exiting vertical control points found to be in good condition were verified by ties to posted NGS benchmarks.

It was also the purpose of this project to establish GPS horizontal positions referring to North American Datum 1983 (NAD 1983), Florida East Zone, State Plane Coordinate System each site's vertical control point.

Also included in this report is summary methods used to establish NAVD 1988 and NGVD 1929 elevations established on vertical control point "CORK2A" at Recorder Well Site CORK2.

<u>Note</u>: Of the sixty-three (63) District Recorder Well sites identified by the SFWMD for this Work Order. Five (5) were found to have already been surveyed and did not require reference elevations. These sites were not resurveyed.

These sites are:

6MI82

CORK-SCA

**GRDN** 

GOLD-W1

HENDSG

Pictures of existing brass tags have been included in the results section of this report. Two sites (FMBMW & BCA7) were removed from the scope during the course of this project by the SFWMD.

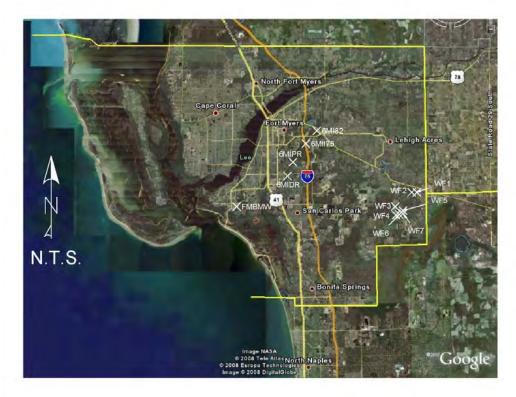
Site BCA14 was not resurveyed during this project due to access issues.

Pickett & Associates, Inc. was subcontracted by Cooner & Associates to complete this project. Please see report of survey by Pickett & Associates in Appendix "D". For a summary of tasks completed for each site, please refer to Appendix "C".

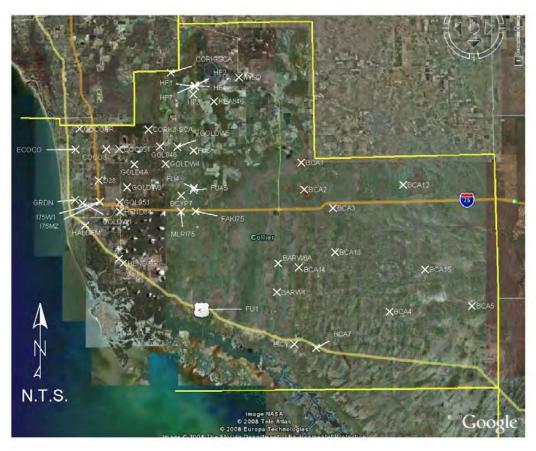
#### LOCATION OF PROJECT

The Recorder Well Sites surveyed for this project are located in Lee, Monroe and Collier counties in the

state of Florida. The following vicinity maps depict the project Recorder Well Sites:



LEE COUNTY VICINITY MAP



#### COLLIER COUNTY VICINITY MAP



MONROE COUNTY VICINITY MAP

#### ITEMS DELIVERED TO THE CLIENT

The following items are delivered to the client in the CD accompanying this report. Neither the report nor the items listed below and copies thereof are complete without the other.

- 1. This Surveyor's Report in Adobe Acrobat format
- 2. Digital photos named by site
- 3. Digital copy of scanned field notes and files associated with this survey
- 4. Completed District benchmark description sheet for all set benchmarks
- 5. Updated SFWMD Registration Worksheets in Microsoft Excel format

Carsonite Witness Posts were installed at each set benchmark.

#### **LEVELING METHODS**

#### CONFIGURATION OF LEVEL RUNS

A total of ten level lines were run for this project to newly set vertical control points or to verify existing site control. For each level line, two existing NGS vertical marks were used. Each run was started at one of the NGS marks and continued through recovered or established benchmarks and closed on the second NGS mark. All runs were configured to be closed level loops. Appendix A contains a summary of each level run, control points used, length of loop and misclosure information, based on field notes. Appendix B contains the results of level runs made to verify existing control points.

#### **EQUIPMENT USED**

All leveling to newly set or existing vertical marks during the project was performed with a Leica NA3003 or DNA03 digital level and Leica two-section, fiberglass bar-code level rods. Information and technical specifications for these digital levels are available at <a href="http://www.leica-geosystems.com">http://www.leica-geosystems.com</a>.

All leveling to establish reference elevations was performed using a Leica NA2 three-wire optical level.

#### VERTICAL DATUM FOR THE PROJECT

The vertical datum utilized for all level runs for the project is the North American Vertical Datum of 1988 (NAVD'88). For correlation with older data sets, the elevations of the benchmarks and reference tags are shown in NGVD'29. The NGVD'29 elevations were derived by one of the following methods. The methods are listed in order of priority:

- 1. Elevations posted in NGS or SFWMD benchmark recovery forms
- 2. Elevations posted in the file "NGVD29.txt" as provided by the SFWMD
- 3. Converted NAVD 1988 elevations using CORPSCON version 6.0.1

#### EXPECTED ACCURACY

The maximum allowable misclosure as specified in the project scope is 0.03 feet multiplied by the square root of the length of the level line in miles. Elevations derived from the methods outlined above meet Third-Order Accuracy Standards.

**Note:** See Appendix "D" for Pickett & Associates Leveling Methods.

#### **HORIZONTAL METHODS**

#### **EQUIPMENT USED**

Wherever possible, horizontal locations were performed with a Trimble 5800, dual-frequency Global Positioning Service (GPS) receiver. Control point positions were established by Real-Time Kinematic (RTK) GPS, or by Static GPS observations. Static GPS observations were post-processed using the Online Positional User Service (OPUS) provided by NGS. For areas where limited satellite accessibility was an issue, a Trimble mapping grade GPS receiver was used to establish GPS horizontal locations.

#### HORIZONTAL DATUM FOR THE PROJECT

The horizontal datum for the project is the Florida State Plane Coordinate System, East Zone, North American Datum of 1983 as verified by ties to the following National Geodetic Survey (NGS) high precision points:

"H 534"

"B 249"

"I75 U 32"

"M 250"

"X 534"

"F 533"

"E 533"

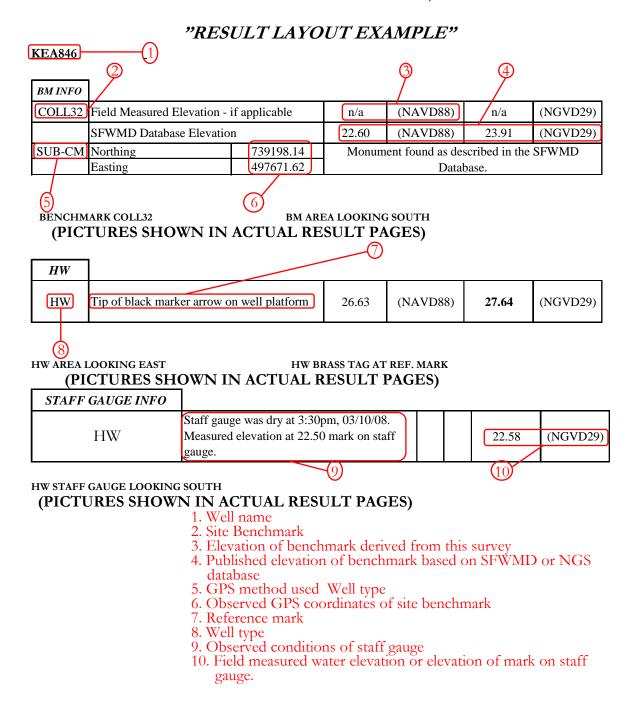
#### **EXPECTED ACCURACY**

Survey grade (RTK and Static) GPS methods outlined above have been tested and found by Cooner & Associates, Inc. to have a relative positional accuracy of less than 0.05 feet (SUB-CM). The expected accuracy for the mapping grade GPS method is at less than 3.28 feet (SUB-M).

**Note:** See Appendix "D" for Pickett & Associates Horizontal Methods.

#### PROJECT RESULTS

The following tables list the elevations established / verified at each Recorder Well Site in NAVD'88 and NGVD'29, the published elevations from the SFWMD or NGS Benchmark Databases, the Northing and Easting of the benchmarks (obtained from GPS observations), water elevations / staff gauge verification, observed staff gauge reading and photos of structures / reference marks/posted brass reference tags / benchmarks/staff gauges. Where applicable, we have also included benchmark recovery forms and site sketches for each set benchmark. Elevations and coordinates are in US Survey Feet and decimals thereof.



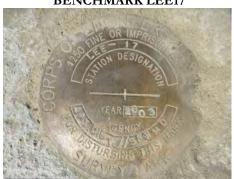
# SITES WITH EXISTING BENCHMARKS

#### WF1

BM INFO						
LEE17	Field Measured Elevation - if applicable		n/a	(NAVD88)	n/a	(NGVD29)
	SFWMD Database Elevation		29.17	(NAVD88)	30.38	(NGVD29)
SUB-CM	Northing	794555.9	Monument found as described in the SFWMD			SFWMD
	Easting	466355.96	Database.			

#### **BENCHMARK LEE17**







STG

STG Black marker "X" inside of a square on well platform. 32.91 (NAVD88) 34.12 (NGVD29)

#### STG AREA LOOKING WEST

#### STG BRASS TAG AT REF. MARK





STAFF GAUGE INFO

Staff gauge was dry at 3:26pm, 03/19/08.

STG

Measured elevation at 34.00 mark on staff gauge.

33.89 (NGVD29)

#### STG STAFF GAUGE LOOKING SOUTH



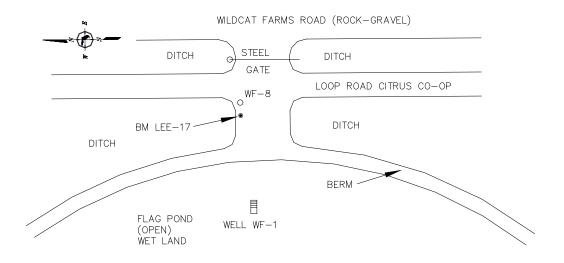


#### SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

	1				
COUNTY LEE	PROJECT WELLS		DESIGNATION LEE-17		
SECTION 35	TOWNSHIP 45 SOUTH RANG			RANGE 27 EAST	
GEOGRAPHIC INDEX OF QUAD Florida					
Established by Consul-Tech Surveying and Mapping, inc.		NAME OF QUADE	ANGLE /	ALVA SE	
SURVEYOR _Joseph S. Boggs _ DATE _ 3 / 21 / 2003         FIELD BOOK			PAGE _40		
HORIZONTAL DATUM: 83/90	ZONE WE	ST			
VERTICAL DATUM: NAVD 88 &	NGVD 29 (Based	l on NGS adjustme	nt of CERP	vertical network)	
CONTROL ACCURACY: HORIZON	NTAL SUB-METE	ER <b>VERT</b>	ICAL 3 <sup>rd</sup> O	rder	
STATE PLANE COORDINATES Feet	V 702254	V 70	4055	EL.=29.17' (NAVD 88)	
reet	X=793354	Y=79	4333	EL.=30.38' (NGVD 29)	
LATITUDE 26°31'06.42" N		LONGITUDE	081°34'49.	67" W	
	DESC	CRIPTION			
To Reach: To reach from the intersec	tion of SR-29 and	SR-82 (South of Lat	elle, Florida	a); Go west along SR-	
82, 8.6 miles, to the farm entrance (Citrus Co'op) on the south side of the road; Go south through the gate and east along a dirt road 0.9 mile, to a 90 degree bend to the south; Go south 0.3 mile, to LEE-17, set on the west					
side of the road.  "LEE-17" is a standard U.S. Army Corps of Engineers brass disc, bearing LEE-17 2003 JAX DIST SFWMD,					
set in a 10" round concrete monument				JAX DIST SEWIND,	
Set in a 10 Tourid Concrete Monument	(poured in place,	with a magnet place	u nearby).		

#### SKETCH





#### WF2

#### BM INFO LC10 Field Measured Elevation - if applicable (NAVD88) (NGVD29) n/a n/a SFWMD Database Elevation 30.69 (NAVD88) 31.90 (NGVD29) SUB-CM Northing 788644.3 Monument found as described in the SFWMD 463230.55 Easting Database.

#### BENCHMARK LC10





STG1					
STG1	Black marker "X" inside of a square on well platform.	34.25	(NAVD88)	35.46	(NGVD29)

#### STG1 BRASS TAG AT REF. MARK





STG2					
STG2	Orange mark at notch on north rim of 2 inch PVC pipe.	31.93	(NAVD88)	33.14	(NGVD29)

#### STG2 BRASS TAG AT REF. MARK



#### STG2 AREA LOOKING SOUTH



STAFF GAUGE INFO				
STG1 & STG2	Staff gauge was dry at 9:00am, 03/20/08.  Measured elevation at 35.00 mark on staff	34.90	O (NG	VD29)
	gauge.			

#### STG1 & STG2 STAFF GAUGE LOOKING SOUTH

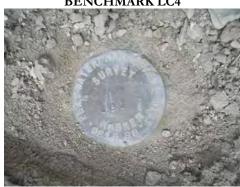


#### WF3

BM INFO						
LC4	Field Measured Elevation - if applicable		n/a	(NAVD88)	n/a	(NGVD29)
	SFWMD Database Elevation		31.64	(NAVD88)	32.85	(NGVD29)
SUB-CM	Northing	785414.08	Monument found as described in the SFWMD			SFWMD
	Easting	455507.41	Database.			

#### **BENCHMARK LC4**







STG1					
STG1	Black marker "X" inside of a square on well platform.	32.43	(NAVD88)	33.64	(NGVD29)

#### STG1 BRASS TAG AT REF. MARK

#### STG1 AREA LOOKING EAST





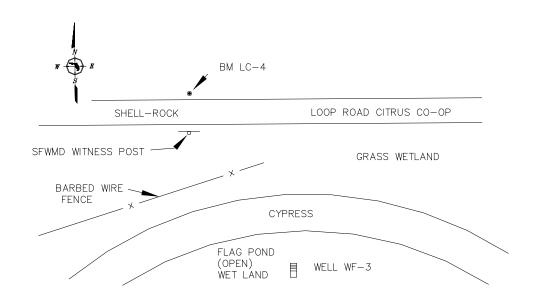


#### SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

COUNTY LEE	PROJECT WEL	1.0	DESIGNA	ATION I C 4	
				ATION LC-4	
SECTION 09	TOWNSHI	IP 46 SOUTH	i	RANGE 27 EAST	
GEOGRAPHIC INDEX OF QUAD Flor	rida				
Established by Consul-Tech Surveying and Mapping, inc.		NAME OF QUADRA	NGLE C	ORKSCREW	
SURVEYOR _Joseph S. Boggs _DATE_ 3 / 24 / 2003         FIELD BOOK			PAGE <u>21</u>		
HORIZONTAL DATUM: 83/90	ZONE WE	EST			
VERTICAL DATUM: NAVD 88 &	NGVD 29 (Based	l on NGS adjustment	of CERP	vertical network)	
CONTROL ACCURACY: HORIZON	NTAL SUB-METE	ER <b>VERTIC</b>	CAL 3 <sup>rd</sup> Or	der	
STATE PLANE COORDINATES Feet	X=782576	Y=7851	20	EL.=31.64' (NAVD 88)	
Teet	X=102310	1=7031	26	EL.=32.85' (NGVD 29)	
LATITUDE 26°29'35.37" N		LONGITUDE 081°3	36'48.63" V	V	
	DESC	CRIPTION			
To Reach: To reach from the intersect	tion of SR-29 and	SR-82 (South of Labe	lle, Florida)	); Go west along SR-	
82, 8.6 miles, to the farm entrance (Cit	82, 8.6 miles, to the farm entrance (Citrus Co'op) on the south side of the road; Go south through the gate for				
1.0 mile to a "T" intersection; Go right and meander along a dirt road 1.7 miles to the office on the left; Continue					
0.2 mile to a "T" intersection; Go right 0.4 mile to LC-4.					
"LC-4" is a 2" aluminum disc, in concre	ete, bearing So. Fl	a. Water Management	t Dist., LC-4	4, 1998, found on the	
north side of the gravel road, 19 feet no	orth of a metal wit	ness post.			

#### SKETCH





STG2					
STG2	Black mark on west rim of 2 inch PVC pipe.	31.92	(NAVD88)	33.13	(NGVD29)

#### STG2 BRASS TAG AT REF. MARK



#### STG2 AREA LOOKING EAST



STAFF GAUGE INFO			
STG1 & STG2	Staff gauge was dry at 12:43pm, 03/20/08. Measured elevation at 32.00 mark on staff	31.98	(NGVD29)
	gange.		

#### STG1 & STG2 STAFF GAUGE LOOKING EAST



#### <u>WF4</u>

#### BM INFO Field Measured Elevation - if applicable (NAVD88) (NGVD29) LC6 n/a n/a SFWMD Database Elevation 32.01 (NAVD88) 33.22 (NGVD29) SUB-CM Northing 779750.23 Monument found as described in the SFWMD 456007.12 Easting Database.







STG1					
STG1	Black marker "X" inside of a square on well	32.14	(NAVD88)	22.25	(NGVD29)
3101	platform.	32.14	(NAVDoo)	33.35	(NGVD29)

STG1 BRASS TAG AT REF. MARK







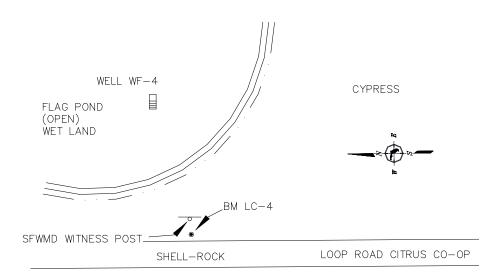


#### SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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	li .							
COUNTY LEE	PROJECT WEL	LS	<b>DESIGNATION LC-6</b>					
SECTION 15	TOWNSH	IP 46 SOUTH	RANGE 27 EAST					
GEOGRAPHIC INDEX OF QUAD Flor	rida							
Established by Consul-Tech Surveying and Mapping, inc.  NAME OF QUADRANGLE CORKSCREW								
SURVEYOR _Joseph S. Boggs _DATE_ 3 / 24 / 2003         FIELD BOOK								
HORIZONTAL DATUM: 83/90	HORIZONTAL DATUM: 83/90 ZONE WEST							
VERTICAL DATUM: NAVD 88 &	NGVD 29 (Based	l on NGS adjustment	of CERP vertical netw	ork)				
CONTROL ACCURACY: HORIZON	NTAL SUB-METE	ER VERTIO	AL 3 <sup>rd</sup> Order					
STATE PLANE COORDINATES Feet	V 702422	V 7704	EL.=32.01' (	NAVD 88)				
reet	X=783122	Y=7794	EL.=33.22' (	NGVD 29)				
LATITUDE 26°28'39.31" N		LONGITUDE	081°36'42.81" W					
	DESC	CRIPTION						
To Reach: To reach from the intersec	tion of SR-29 and	SR-82 (South of Labe	lle, Florida); Go west ald	ong SR-				
82, 8.6 miles, to the farm entrance (Cit	trus Co'op) on the	south side of the road	Go south through the o	gate for				
1.0 mile to a "T" intersection; Go right and meander along a dirt road 1.7 miles to the office on the left; Continue								
0.2 mile to a "T" intersection; Go right 1.6 mile to LC-6.								
"LC-6" is a 2" aluminum disc, in concre			Dist., LC-6, 1998, found	d on the				
east side of the gravel road, 3.9 feet w	est of a metal witr	ess post.						

#### SKETCH





STG2					
STG2	Black mark at notch on rim of 2 inch PVC pipe.	31.13	(NAVD88)	32.34	(NGVD29)

#### STG2 BRASS TAG AT REF. MARK



#### STG2 AREA LOOKING EAST



#### STAFF GAUGE INFO Staff gauge was dry at 4:45pm, 03/18/08. Measured elevation at 33.00 mark on staff STG1 & STG2 33.00 (NGVD29) gauge.

#### STG1 & STG2 STAFF GAUGE LOOKING EAST

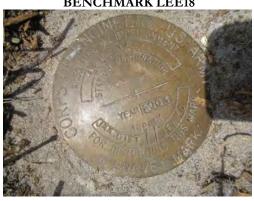


#### <u>WF5</u>

BM INFO						
LEE18	Field Measured Elevation - if applicable		n/a	(NAVD88)	n/a	(NGVD29)
	SFWMD Database Elevation		28.58	(NAVD88)	29.79	(NGVD29)
SUB-CM	Northing	782573.9	Monument found as described in the SFWMD			
	Easting	460637.74	Database.			

#### **BENCHMARK LEE18**







STG1					
STG1	Black marker "X" inside of a square on well platform.	33.38	(NAVD88)	34.59	(NGVD29)

#### STG1 BRASS TAG AT REF. MARK

#### STG1 AREA LOOKING NORTH







#### SOUTH FLORIDA WATER MANAGEMENT DISTRICT

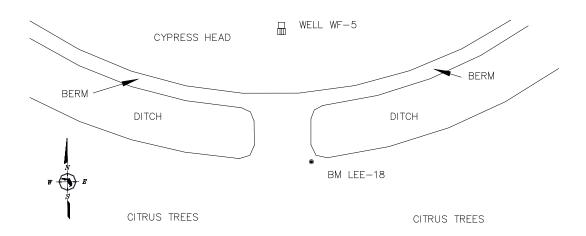
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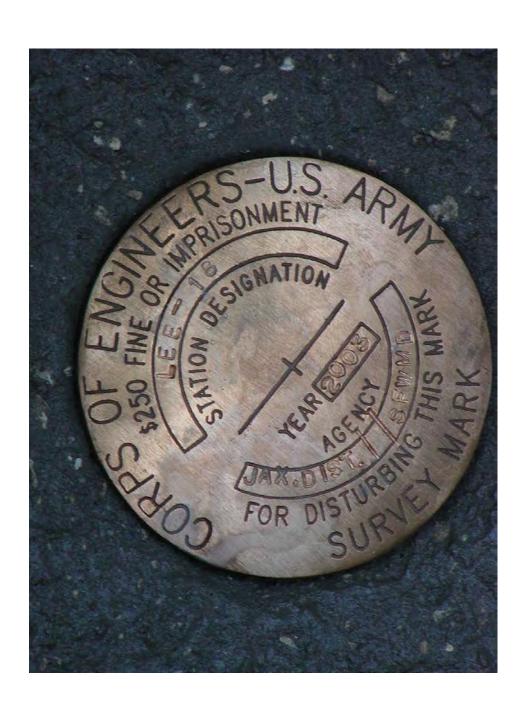
COUNTY LEE	PROJECT WEL	LS	DESIGN	ATION LEE-18				
SECTION 10	TOWNSH	P 46 SOUTH	RANGE 27 EAST					
GEOGRAPHIC INDEX OF QUAD Flo	GEOGRAPHIC INDEX OF QUAD Florida							
Established by Consul-Tech Surveying and Mapping, inc.  NAME OF QUADRANGLE CORKSCREW								
SURVEYOR _Joseph S. Boggs _DATE _3 / 24 / 2003								
HORIZONTAL DATUM: 83/90	ZONE WE	ST						
VERTICAL DATUM: NAVD 88 &	NGVD 29 (Based	l on NGS adjustment	of CERP	vertical network)				
CONTROL ACCURACY: HORIZOI	NTAL SUB-METE	R <b>VERTIC</b>	CAL 3 <sup>rd</sup> O	rder				
STATE PLANE COORDINATES Feet	X=787729	V_7922	20	EL.=28.58' (NAVD 88)				
reet	Feet X=787729 Y=782328 EL.=29.79' (NGVD 29)							
LATITUDE 26°29'07.48" N LONGITUDE 081°35'52.00" W								
DESCRIPTION								

To Reach: To reach from the intersection of SR-29 and SR-82 (South of Labelle, Florida); Go west along SR-82, 8.6 miles, to the farm entrance (Citrus Co'op) on the south side of the road; Go south through the gate and east along a dirt road 0.9 mile, to a 90 degree bend to the south; Go south 1.5 miles, to a 90 degree bend to the south; Go south 0.2 mile to a 90 degree bend to the west; Go west 0.6 mile to a "T" intersection; Go south (meandering) 1.0 mile to a double ditch with a berm in the middle running east-west; Go to the south side of the south ditch (BM LC-8 is at the southeast quadrant of the intersection); Go east along the south side of the ditch 0.25 mile to LEE-18, set at the top of bank of the ditch and at the southeast corner of an earthen bridge.

"LEE-18" is a standard U.S. Army Corps of Engineers brass disc, bearing LEE-18 2003 JAX DIST SFWMD, set in a 10" round concrete monument (poured in place, with a magnet placed nearby).

SKETCH





STG2	7				
STG2	Black mark at notch on east rim of 2 inch PVC pipe.	32.99	(NAVD88)	34.20	(NGVD29)

#### STG2 BRASS TAG AT REF. MARK



#### STG2 AREA LOOKING NORTH



STAFF GAUGE INFO				
	Staff gauge was dry at 12:53pm, 03/21/08.			
STG1 & STG2	Measured elevation at 33.00 mark on staff		33.01	(NGVD29)
	gauge.			

#### STG1 & STG2 STAFF GAUGE LOOKING NORTH



#### <u>WF6</u>

BM INFO						
LC7	Field Measured Elevation - if applicable		n/a	(NAVD88)	n/a	(NGVD29)
	SFWMD Database Elevation		28.81	(NAVD88)	30.02	(NGVD29)
SUB-CM	Northing	779932.32	Monument found as described in the SFWMD			
	Easting	758295.87	Database.			

#### BENCHMARK LC7

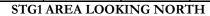






STG1					
STG1	Black mark on well platform.	31.79	(NAVD88)	33.00	(NGVD29)

#### STG1 BRASS TAG AT REF. MARK







STG2					
STG2	Black mark on south rim of 2 inch PVC pipe.	31.10	(NAVD88)	32.31	(NGVD29)

#### STG2 BRASS TAG AT REF. MARK



#### STG2 AREA LOOKING NORTH



STAFF GAUGE INFO				
	Staff gauge was dry at 1:32pm, 03/19/08.	·		
STG1 & STG2	Measured elevation at 33.00 mark on staff		33.00	(NGVD29)
	gauge.			

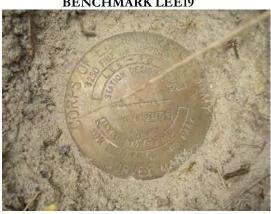
#### STG1 & STG2 STAFF GAUGE LOOKING NORTH



#### <u>WF7</u>

BM INFO							
LEE19	Field Measured Elevation -	n/a	(NAVD88)	n/a	(NGVD29)		
	SFWMD Database Elevation		28.23	(NAVD88)	29.44	(NGVD29)	
SUB-CM	Northing	780557.36	Monument found as described in the SFWMD				
	Easting	460636.64	Database.				

#### **BENCHMARK LEE19**





GW1					
I ( <del>ì</del> W1	Black mark at notch on west rim of 2 inch PVC pipe.	30.57	(NAVD88)	31.78	(NGVD29)

#### GW1 BRASS TAG AT REF. MARK





GW2					
GW2	Black mark on at notch on northwest rim of 2 inch PVC pipe.	30.97	(NAVD88)	32.18	(NGVD29)

#### GW2 BRASS TAG AT REF. MARK



#### **GW2 AREA LOOKING NORTH**



STG					
STG	Black marker "X" inside of a square on well platform.	33.24	(NAVD88)	34.45	(NGVD29)

#### STG BRASS TAG AT REF. MARK



#### STG AREA LOOKING NORTH



STAFF GAUGE INFO				
GW1, GW2 & STG	Staff gauge was dry at 1:50pm, 03/24/08. Measured elevation at 34.00 mark on staff gauge.		34.02	(NGVD29)

## GW1, GW2 & STG STAFF GAUGE LOOKING NORTH



#### SURVEYOR'S CERTIFICATION

In my professional opinion, this report of 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 not valid without the signature and original raised seal of a Florida Licensed Surveyor and Mapper. Additions or deletions to this report by anyone, other that the signing party, are prohibited without written consent of the signing party.

COENER & ASSOCIATES, INC.
DBPR Authorization Number 6773

5/29/08 By:

Darren Townsend, PSM

Professional Surveyor and Mapper

State of Florida

Certificate Number 6476

## APPENDIX "A"

### Level run information

Level run into	шаноп				
					ALLOWABLE
SITE NAME	SITE BM	NGS BM(S)	LINE LENGTH	MISCLOSURE	MISCLOSURE
BCA3	EC2	175 90 A74 175 90 A73	1.6 MILES	0.03'	0.04'
BCA4	MR "A"	CATHAM3 AZ MK CATHAM3 S 248	24.0 MILES	0.01'	0.15'
BCA5	RP12	N248 X527	11.4 MILES	0.03'	0.07'
BCA12	KB4	175 J 35 117 40 A 89	6.6 MILES	0.08'	0.08'
CORK2	CORK2A	Q 534	2.4 MILES	0.03'	0.05'
ECOCO	ECOCO	872 5222 A TIDAL 2604	5.5 MILES	0.03'	0.07'
FU4S	FU4S	A584 B584	5.1 MILES	0.02'	0.07'
BICY	DONA	OCHOBEE RMS B249	2.1 MILES	0.00'	0.04'
IWSD	IWSD	F533 E533	2.8 MILES	0.02'	0.05'
175MZ *	I75MZ	COLL36 D27	0.1 MILES	0.00'	0.01'

<sup>\*</sup> I75MZ was elevated using benchmarks provided by SFWMD.

## APPENDIX "B"

Adjusted level	run elevation	compared to	published elevations.

·	on the talk of the	NAVD88	NAVD88		NGVD29
SITE NAME	BENCHMARK	ADJUSTED ELEV.	PUBLISHED ELEV.	DIFFERENCE	ADJUSTED ELEV.
BCA3	EC2	13.05'	12.97'	+0.08'	14.42'
BCA4	MR "A"	7.55'	8.57'	-1.02'	8.98'
BCA12	RP12	9.62'	9.62'	0.00'	11.08'
BICY	KB4	13.02'	12.81'	+0.21'	14.42'

# APPENDIX "C" Task Breakdown by company

#### COONER & ASSOCIATES, TASKS COMPLETED

NO.	SITE NAME	SET MONUMENT	LEVEL RUNS	PROCESS RUNS	REF. & TAG	STAFF GAUGE	COORDINATES	REPORT
		per mon	per mile	per site	per site	per site	per site	per site
7	BCA1	0	0.0	0	1	1	1	1
8	BCA2	0	0.0	0	1	1	1	1
9	BCA3	0	1.6	1	1	1	1	1
10	BCA4	0	0.0	0	1	1	1	1
11	BCA5	0	11.4	1	1	1	1	1
13	BCA10	0	0.0	0	1	1	1	1
14	BCA11	0	0.0	0	1	1	1	1
15	BCA12	0	6.6	1	1	1	1	1
16	BCA13	0	0.0	0	1	1	1	1
18	BCA15	0	0.0	0	1	1	1	1
19	BCYP7	0	0.0	0	1	1	1	1
20	BICY	0	2.1	1	0	0	1	1
21	COC951	0	0.0	0	1	1	1	1
22	COCO3	0	0.0	0	1	1	1	1
23	COCOPR	0	0.0	0	1	1	1	1
27	D2-8	0	0.0	0	1	1	1	1
28	ECOCO	1	6.0	1	1	1	1	1
29	FAKI75	0	0.0	0	1	1	1	1
32	FU4	0	0.0	0	1	1	1	1
33	FU4S	1	5.1	1	1	1	1	1
34	FU5	0	0.0	0	1	1	1	1
36	GOL951	0	0.0	0	1	1	1	1
37	GOLD4A	0	0.0	0	1	1	1	1
39	GOLDW3	0	0.0	0	1	1	1	1
40	GOLDW4	0	0.0	0	1	1	1	1
43	HALDEM	0	0.0	0	1	1	1	1
44	HC1	0	0.0	0	1	1	1	1
45	HEND84	0	0.0	0	1	1	1	1
47	HF1	0	0.0	0	1	1	1	1
48	HF2	0	0.0	0	1	1	1	1
49	HF3	0	0.0	0	1	1	1	1
50	HF4	0	0.0	0	1	1	1	1
51	HF7	0	0.0	0	1	0	1	1
52	175MZ	1	0.1	1	0	0	1	1
53	175W1	0	0.0	0	1	1	1	1
54	IWSD	1	2.8	1	0	0	1	1
55	KEA846	0	0.0	0	1	1	1	1
56	MLRI75	0	0.0	0	1	1	1	1
57	WF1	0	0.0	0	1	1	1	1
58	WF2	0	0.0	0	1	1	1	1
59	WF3	0	0.0	0	1	1	1	1
60	WF4	0	0.0	0	1	1	1	1
61	WF5	0	0.0	0	1	1	1	1
62	WF6	0	0.0	0	1	1	1	1
63	WF7	0	0.0	0	1	1	1	1
-	NUMBER	4	35.7	8	42			45

#### PICKETT & ASSOCIATES - TASKS COMPLETED

NO.	SITE NAME	SET MONUMENT	LEVEL RUNS	PROCESS LEVELS	REF. & TAG	STAFF GAUGE	COORDINATES	PORT - BY COON
		per mon	per mile	per site	per site	per site	per site	per site
2	6MIDR	0	0.0	0	1	1	1	1
3	6MII75	0	0.0	0	1	1	1	1
4	6MIPR	0	0.0	0	1	1	1	1
5	BARW4	0	0.0	0	1	1	1	1
6	BARW6A	0	0.0	0	1	1	1	1
24	CORK3-SCA	0	0.0	0	1	1	1	1
31	FU1	0	0.0	0	1	1	1	1
35	GOL846	0	0.0	0	1	1	1	1
41	GOLDW5	0	0.0	0	1	1	1	1
25	CORK2	0	2.4	1	0	0	1	1
	BCA4	0	24.0	1	0	0	0	0
	NUMBER	0	26.43	2	9	9	10	10