SURVEYOR'S REPORT

CENTRAL FLORIDA WATER INITIATIVE (CFWI) SURVEYS

GARDNER COBB (GARDNER)
WELL, TRANSECTS & SEASONAL HIGH-WATER MARK SURVEY

County: OSCEOLA
Location Name: GARDNER

Prepared for:

South Florida Water Management District
WORK ORDER NO. 4600003702-WO2

Prepared by:

PICKETT
SURVEYING • ENGINEERING

P&A PROJECT NO.:	18995
FIELD DATES:	05/1-05/16/2019
DATE OF THIS REPORT:	06/18/2019

Pickett & Associates, Inc. • 475 South First Avenue • Bartow, FL 33830 • (863) 533-9095

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PROJECT DESCRIPTION

This survey was prepared to document the horizontal and vertical location of a new monitoring well (OSS-3) and benchmark established by District's Data, Monitoring, and Investigations Team (DMIT), establish an additional benchmark near the associated wetlands to be monitored, and locate transects and seasonal high water markers at the wetland site.

The benchmark at the well is a standard SFWMD 2" survey marker disk stamped "OSS-3" imbedded in the corner of the concrete well pad. The additional benchmark is a standard SFWMD 2" survey marker disk set in the top of a 1 ¼" iron pipe in concrete stamped "OSS-3 A"

LOCATION:
The GARDNER OSS-3 well is located on South Florida Water Management District lands in an area known as Gardner Cobb Marsh in Osceola County. From St. Cloud, travel south on Canoe Creek Road approximately 10 miles to Lake Cypress Road, go west on Lake Cypress Road approximately 0.8 miles to entrance road leading south. Go south and westerly along main road 5.1 miles to well on the right.

HORIZONTAL DATUM:
The horizontal position of the OSS-3 mark was established by base-rover RTK-GPS using published NGS mark R 513 (PID DF6726) as the base. Prior to using R 513, it was confirmed with a Trimble R-10 receiver using a subscription-based Network Real Time Kinematic GPS solution (NRTK-GPS). The horizontal position checked within 0.06 feet. The published values for R 513 were used for the GPS base to establish the horizontal values for OSS-3. Using the resulting position, OSS-3 was used as a base for all subsequent field location work at this well and wetland site. All horizontal positions were determined by Base-Rover RTK-GPS from OSS-3. As a final redundant check, R 513 was re-measured using OSS-3 as a base and checked within 0.05' of published values.

Horizontal coordinate values are referenced to the East Zone of the Florida State Plane Coordinate System, North American Datum of 1983, Adjustment of 2011 (Epoch 2010.0000), US Survey Feet. (sFT)

VERTICAL DATUM:
Elevations were determined by differential leveling using third order methods with a digital level and a bar code rod. The allowable error for the level run is 0.02' √miles per SFWMD specifications for this work order. The run originated on Z 506 (PID – AJ6685) and closed on A 507 (PID – AJ6686) with a closure of 0.028' (low) which exceeded the closure tolerance by 0.008'. After consulting with the District Survey Project Manager, the published elevation for A 507 was held for a level loop to OSS-3 that closed back to A507 within .001'. No further adjustment was made. The elevation of OSS-3A was determined by double run differential leveling from OSS-3.

Vertical elevations were established in the North American Vertical Datum of 1988 (NAVD 88). Units are in feet.

OSS-3 Benchmark and Well Summary
Elevations are NAVD 88 (feet)

Latitude: 28° 02′ 40.66877″ (N) Longitude: 81° 19′ 47.05347″ (W)

Northing: 1,349,073.632 sFT Easting: 549, 807.38 sFT

BM Elevation: 55.54′ Well Measure point elevation: 58.87

Pad Elevation: 55.51′ Ground Elevation: 55.2

Measure down to water from well measure point on May 16, 2019. 8.40′

OSS-3A Benchmark Summary

Latitude: 28° 02′ 43.62607″(N) Longitude: 81° 19′ 44.39261″ (W)

Northing: 1,349,371.646sFT Easting: 550,046.599 sFT

BM Elevation: 54.73

EQUIPMENT USED

- Trimble DiNi 22 Level Serial Number 772842 (digital level)
- Trimble GPS unit R-10, Serial Number 0079 (RTK)
- Trimble GPS unit R-10, Serial Number 2948 (RTK)
- Trimble Total Station, Serial Number 36820056 (optical)

See attached following documents:

- Well and Benchmark Photos
- SFWMD Benchmark forms
- SFWMD Site Form
- Survey Maps

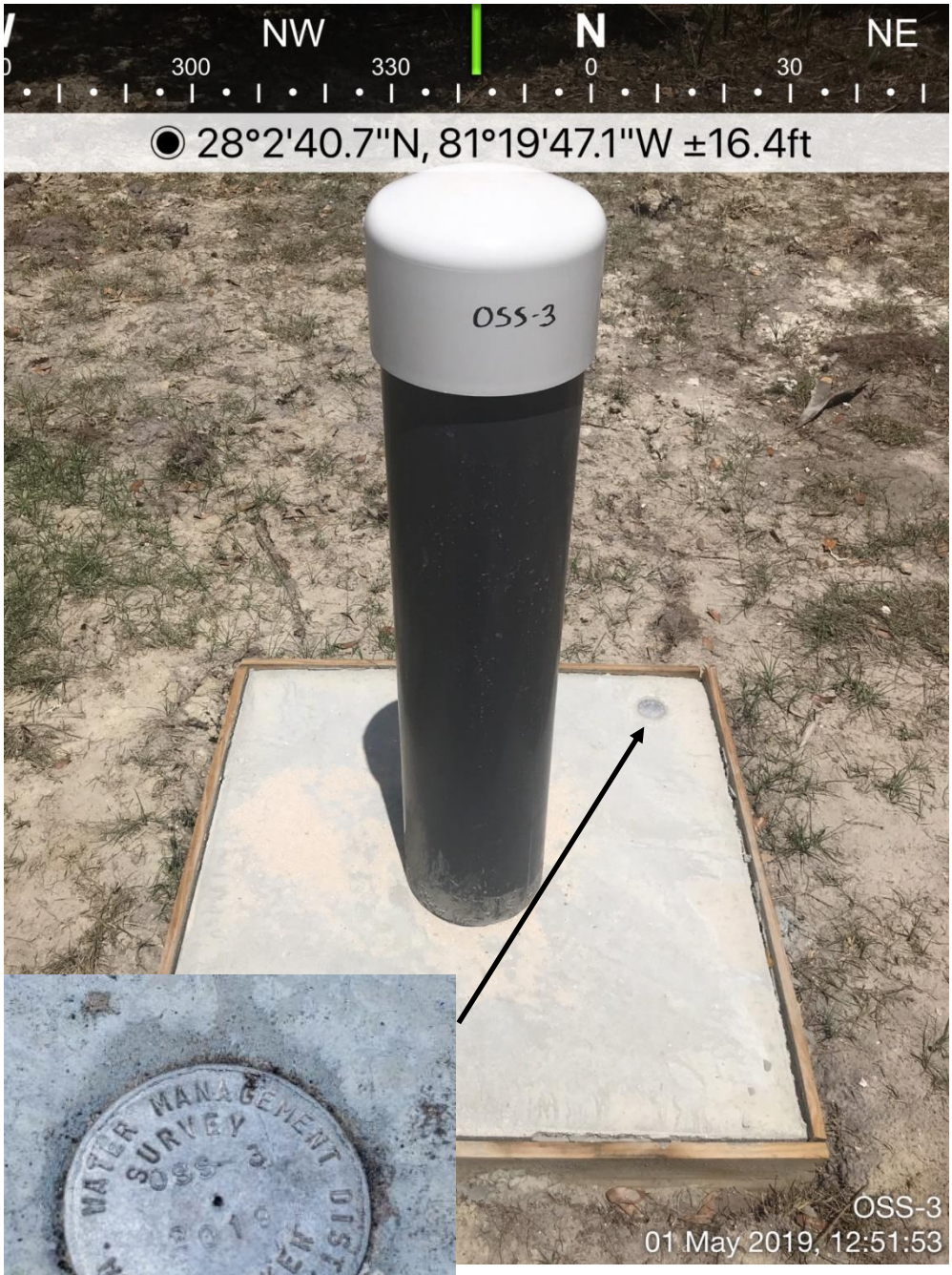
Digitally signed by John M. Clyatt

John M. Clyatt P.S.M.
Florida Registration No. 4092
Pickett & Associates, Inc.
Florida Registration No. LB 364

JOHN M. CLYATT License Number 4092 STATE OF FLORIDA Professional Surveyor and Mapper

June 14, 2019
Survey Date

OSS-3 WELL PHOTOS



BENCHMARK OSS-3
ELEVATION 55.54' (NAVD88)

OSS-3 WELL PHOTOS

OSS-3 WELL PHOTOS

OSS-3 WELL PHOTOS

OSS-3 WELL PHOTOS

OSS-3 WELL PHOTOS

OSS-3 WELL ENCLOSURE STAND-PIPE

BENCHMARK OSS-3A

Benchmark OSS-3A
EL 54.73' (NAVD 88)

TRANSECT POINTS AND SEASONAL HIGH-WATER MARKS SUMMARY TABLE

Transect	Point ID	Attribute	Elevation	LAT - LONG	SPC Coord
1	GC 1.1	Wetland boundary	55.1'	28° 02' 42.12153" 81° 19' 45.79148"	N 1349220.04 E 549920.850
	GC 1.2	Hydric at surface	54.6'	28° 02' 43.09048" 81° 19' 46.24546"	N 1349318.005 E 549880.439
	GC 1.3	Muck at surface	53.7'	28° 02' 43.74400" 81° 19' 46.12814"	N 1349383.976 E 549891.129
2	GC 2.1	Wetland boundary	54.8'	28° 02' 44.15246" 81° 19' 51.01274"	N 1349426.412 E 549453.585
	GC 2.2	Hydric at surface	54.5'	28° 02' 44.52311" 81° 19' 50.20894"	N 1349463.648 E 549525.706
	GC 2.3	Muck at surface	54.1'	28° 02' 44.67761" 81° 19' 50.05347"	N 1349479.214 E 549539.678
3	GC 3.1	Wetland boundary	55.1'	28° 02' 48.25826" 81° 19' 49.96906"	N 1349840.804 E 549548.222
	GC 3.2	Hydric at surface	54.6'	28° 02' 48.22698" 81° 19' 49.67058"	N 1349837.572 E 549574.957
	GC 3.3	Muck at surface	54.4'	28° 02' 48.14581" 81° 19' 49.48345"	N 1349829.329 E 549591.701
High Water Marks	GC SH 1	Seasonal HW elevation	56.37'	28° 02' 44.24911" 81° 19' 45.68752"	N 1349434.880 E 549930.746
	ONLY ONE SEASONAL HIGH WATER MARK				

NOTE:
The horizontal locations of all the above points were determined by base-rover RTK-GPS with an estimated horizontal accuracy of +/- 0.10 feet.

The estimated vertical accuracy of all transect points is +/- 0.10 '. Seasonal High-Water marks were determined by differential leveling and have an estimated vertical accuracy of +/- .01'.

See General Location Map and Transects & Seasonal High-Water Marks Map included herein.

TRANSECT 1 PHOTOS

TRANSECT 2 PHOTOS

TRANSECT 3 PHOTOS

SEASONAL HIGH-WATER MARK

ONLY ONE SEASONAL HIGH AT THIS SITE

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/16

DESIGNATION: **OSS-3**		PROJECT: **CFWI GARDNER COBB**	
ESTABLISHED BY: **PICKETT AND ASSOCIATES, INC.** RECOVERED BY:		SURVEYOR: **John M. Clyatt** DATE: **May 16, 2019**	
GEOGRAPHIC POSITION			
SECTION **16**	TOWNSHIP **28** SOUTH	RANGE **30** EAST	
COUNTY: **Osceola**	NAME OF QUADRANGLE: **CYPRESS LAKE** GEOGRAPHIC INDEX OF QUAD: **3311**		
HORIZONTAL DATUM: 1927 **(1983)** 2022 Other___ *(circle one)* ZONE (E) or W			
VERTICAL DATUM: MSL 1929 **(1988)** 2022 Other ____ *(circle one)*			
VERTICAL ACCURACY: 1 2 (3)			
STATE PLANE COORDINATE	(N) Y= **1,349,073.632**	(E) X= **549,807.38**	NAVD 88 EL. **55.54′** NGVD 29 EL. **56.69′**

CORPSCON 6.0.1 CONVERSION FACTOR (NAVD88 TO NGVD29): + **1.148'**

(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.)

ACTUAL NGS or (ngvd29.txt file) OPUS Ortho Height

LATITUDE: **28° 02′ 40.66877″ (N)**	LONGITUDE: **81° 19′ 47.05347″ (W)**	(NAD_83 (2011) EPOCH:2010.0000)

RECOVERY DATA

Stamping: **OSS-3 2019**

To Reach: From St. Cloud, travel south on Canoe Creek Road approximately 10 miles to Lake Cypress Road, go west on Lake Cypress Road approximately 0.8 miles to entrance road leading south into Gardner Cobb Marsh Management Area. Go south and westerly along dirt road 5.1 miles to well on right. Requires SFWMD key for gate into property.

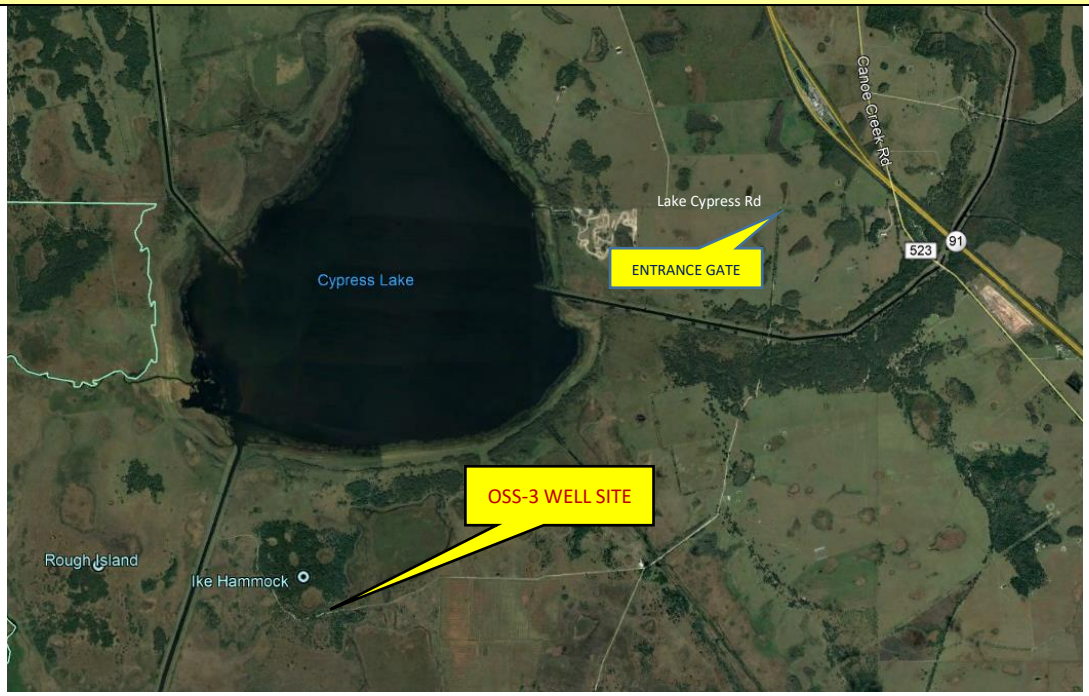
NOTABLE LAND MARKS: Cypress Lake

NGS-SOURCE BENCHMARK: A 507 (PID AJ6686)

FIELD BOOK **972** PAGE **24-35**

PICTURES

Aerial Overall Site
From: Google Earth
Imagery Date:12/17/18



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/16

View Looking From Road

Top View

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/16

DESIGNATION: **OSS-3A**		PROJECT: **CFWI GARDNER COBB**	
ESTABLISHED BY: **PICKETT AND ASSOCIATES, INC.** RECOVERED BY:		SURVEYOR: **John M. Clyatt** DATE: **May 16, 2019**	
GEOGRAPHIC POSITION			
SECTION **16**	TOWNSHIP **28** SOUTH	RANGE **30** EAST	
COUNTY: **Osceola**	NAME OF QUADRANGLE: **CYPRESS LAKE** GEOGRAPHIC INDEX OF QUAD: **3311**		
HORIZONTAL DATUM: 1927 **(1983)** 2022 Other___ *(circle one)* ZONE (E) or W			
VERTICAL DATUM: MSL 1929 **(1988)** 2022 Other ____ *(circle one)*			
VERTICAL ACCURACY: 1 2 (3)			
STATE PLANE COORDINATE	(N) Y= **1,349,371.646**	(E) X= **550,046.599**	NAVD 88 EL. **54.73′** NGVD 29 EL. **55.88′**

CORPSCON 6.0.1 CONVERSION FACTOR (NAVD88 TO NGVD29): + **1.148'**

(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.)

ACTUAL NGS or (ngvd29.txt file) OPUS Ortho Height

LATITUDE: **28° 02′ 43.62607″ (N)**	LONGITUDE: **81° 19′ 44.39261″ (W)**	(NAD_83 (2011) EPOCH:2010.0000)

RECOVERY DATA

Stamping: **OSS-3A 2019**

To Reach: From St. Cloud, travel south on Canoe Creek Road approximately 10 miles to Lake Cypress Road, go west on Lake Cypress Road approximately 0.8 miles to entrance road leading south into Gardner Cobb Marsh Management Area. Go south and westerly along dirt road 5.1 miles to OSS-3 well on right. From well, go north 200 feet to margin of wetland and then east 250' to mark on southerly margin of wetland. Requires SFWMD key for gate into property.

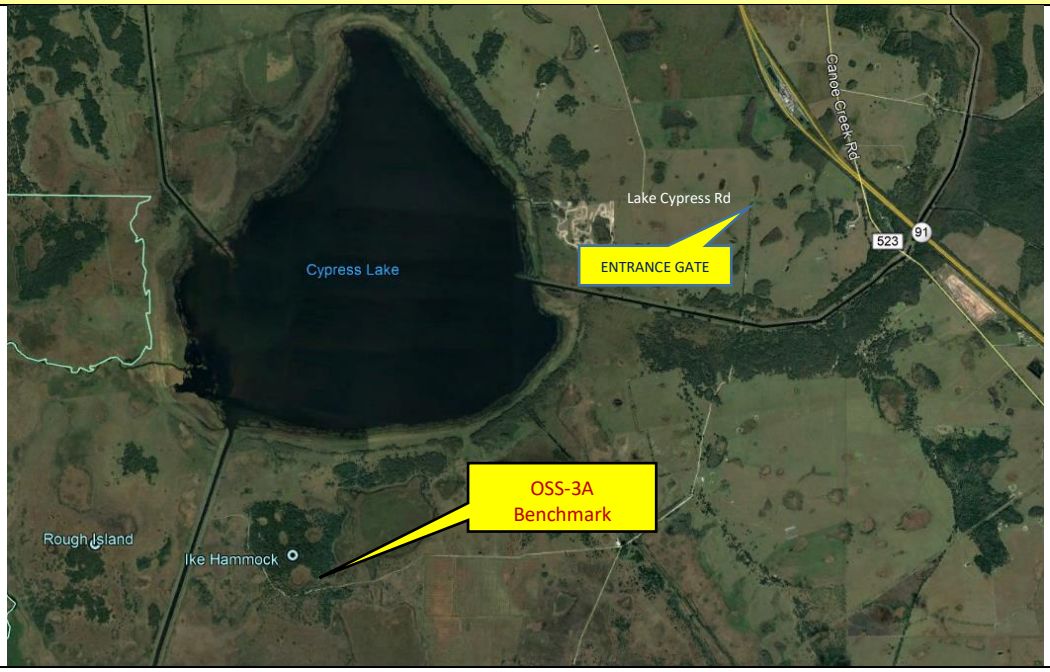
NOTABLE LAND MARKS: Cypress Lake

NGS-SOURCE BENCHMARK: A 507 (PID AJ6686)

FIELD BOOK **972** PAGE **24-35**

PICTURES

Aerial Overall Site
From: Google Earth
Imagery Date:12/17/18



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SCADA RTU Station Name: **OSS-3**	DB Hydro Site Name: **GARDNER**	Agency: **WMD**	Date of Field Work: **06/14/19**
Party Chief: **Dustin Lanier**	Field Book: **972**	Page(s): **1-14**	Prepared by: **John Clyatt**

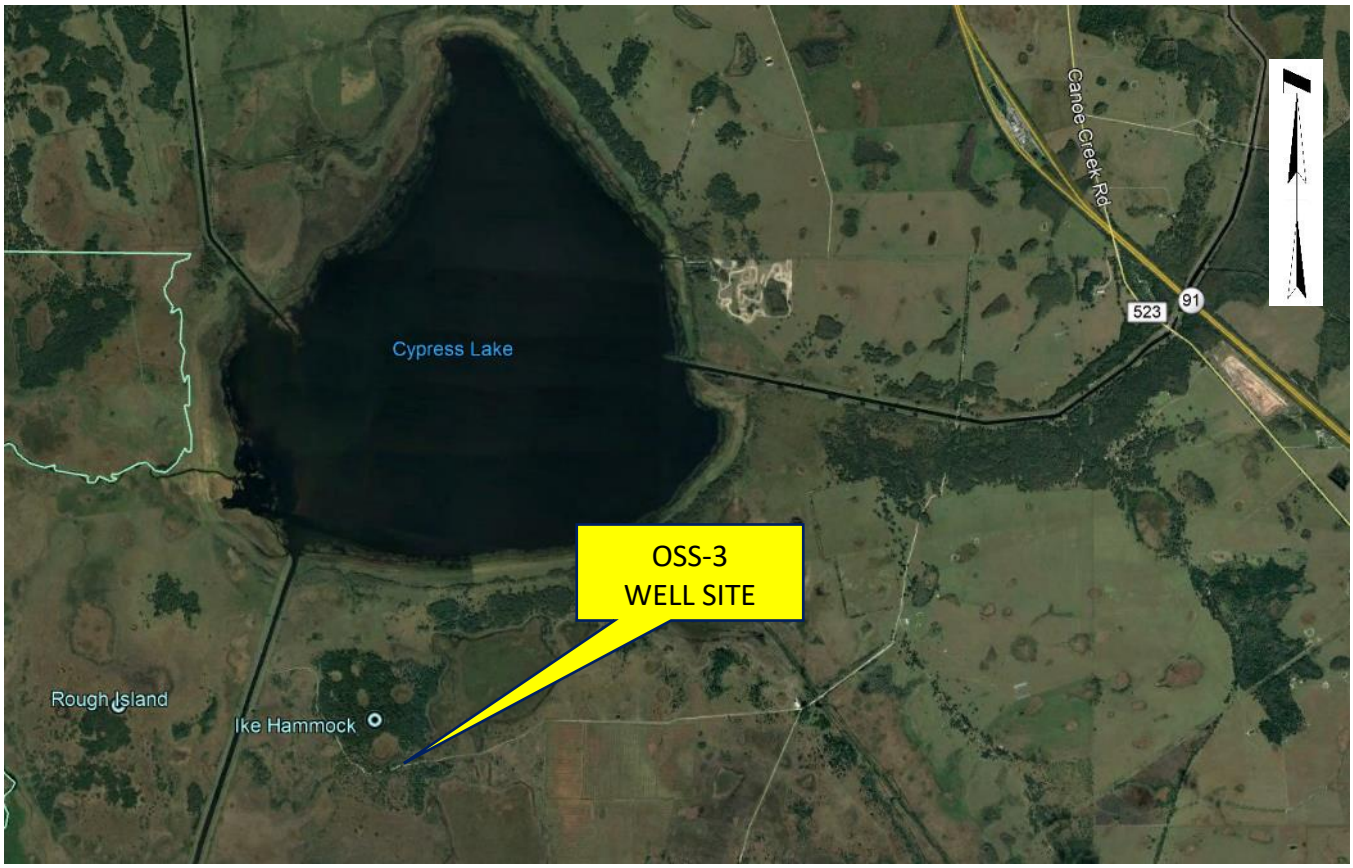
SITE SPECIFIC DATA			
Site Benchmark: **OSS-3**	Benchmark Elevation (NAVD88) **55.54**	Corpscon 6.0.1 Conversion Factor (*NAVD88 to NGVD29*) **+ 1.148'**	
Reference Elevation(s) (*NAVD88*): **58.87'**	Existing Brass Tag Elevation (Datum): **Not Applicable**	Calibration Port Elevation(s) (*NAVD88*): **Not Applicable**	
Ground Elevation (NAVD88): **55.2**	Pad Elevation (NAVD88): **67.41**		

GEOOGRAPHIC DATA			
Section **24**	Township **30** South	Range **29** East	
Well	Latitude: **28° 02' 40.6877" (N)**	Longitude: **81°19' 47.05347" (W)**	Source: RTK GPS – NAD 83(2011)
	State Plane Coordinates	Northing (Y) = **1,349,073.632 ft**	Easting (X) = **549,807.380 ft**

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 Overall Site **Not to scale (Google Earth product)**




NW
N
NE
300
330
0
30
60
28°2'40.7"N, 81°19'47.1"W ±16.4ft
OSS-3
Benchmark OSS-3
EL 55.54' (NAVD 88)
Well
PICKETT
OSS-3
01 May 2019, 12:51:42


SW
W
NW
210
240
270
300
28°2'40.7"N, 81°19'47.1"W ±16.4ft
Reference Point
EL =58.87
Well
PICKETT
OSS-3
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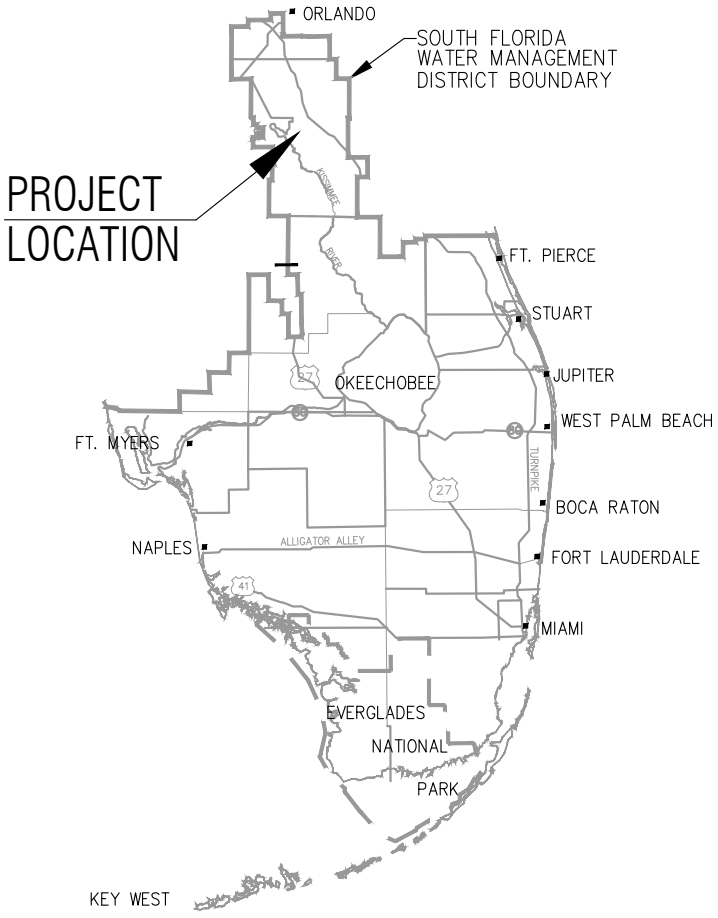


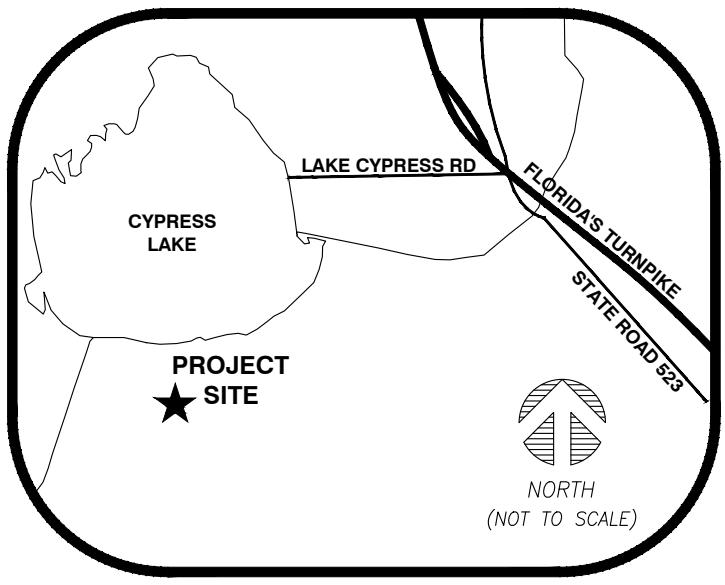
NOT TO SCALE

LOCATION MAP

CENTRAL FLORIDA WATER INITIATIVE (CFWI) SURVEYS

GARDNER COBB

SECTION 16, TOWNSHIP 28 S, RANGE 30 E,
OSCEOLA COUNTY, FL



VICINITY MAP IN OSCEOLA COUNTY

LEGEND:

NGS — NATIONAL GEODETIC SURVEY
BENCHMARK

SHEET 1 OF 2

DRAWN	CHECKED	DATE	REVISIONS

CENTRAL FLORIDA WATER INITIATIVE (CFWI)
GARDNER COBB
WELL, TRANSECTS & SEASONAL
HIGH-WATER MARKS SURVEY

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
INFRASTRUCTURE MANAGEMENT BUREAU-SURVEY & MAPPING SECTION
P.O. BOX 24680, 3301 GUN CLUB ROAD
WEST PALM BEACH, FLORIDA 33416-4680

NORTH

0 40 80

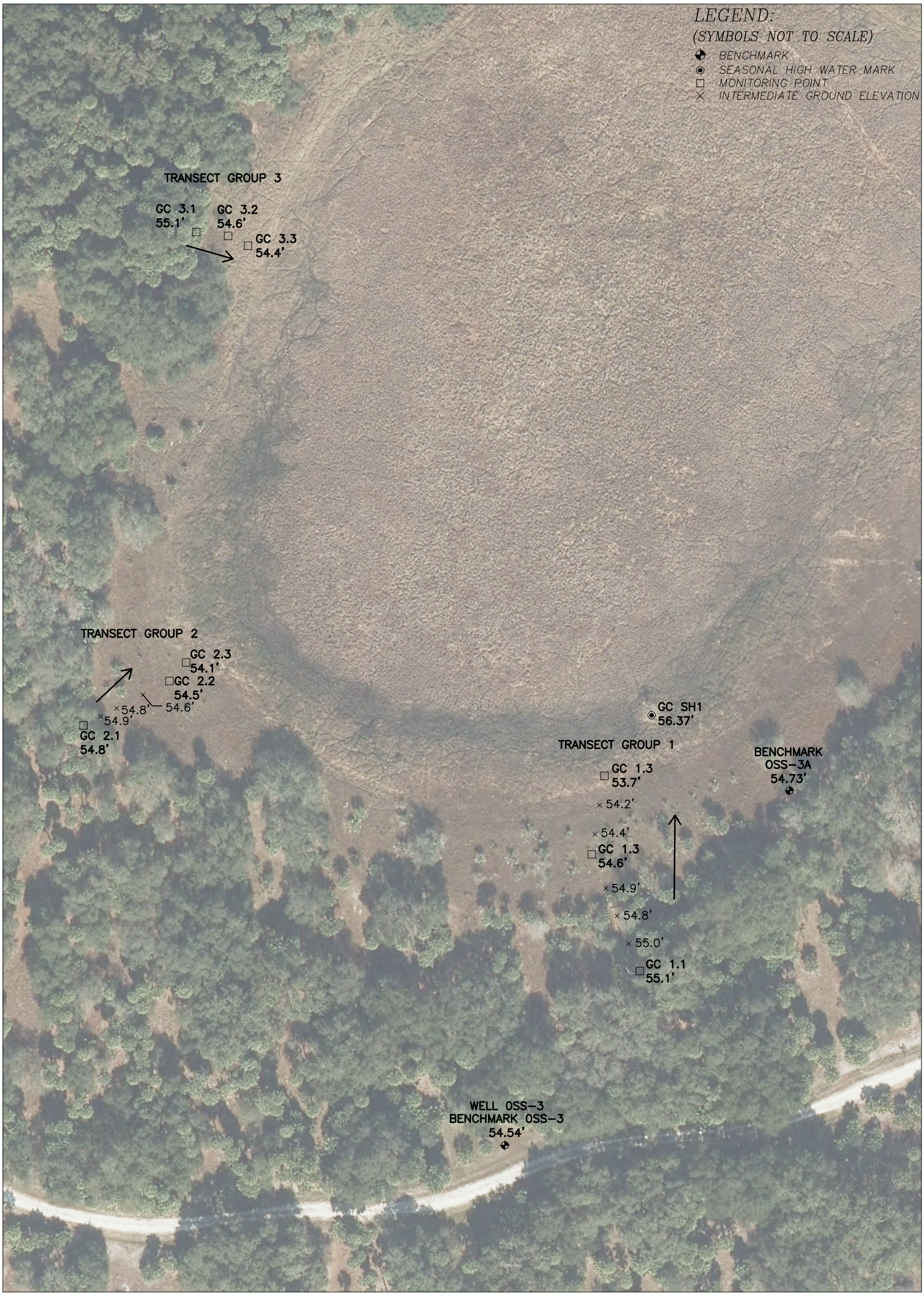
(IN FEET)
1 inch = 80 ft.

GRAPHIC & INTENDED DISPLAY SCALE

CENTRAL FLORIDA WATER INITIATIVE (CFWI) SURVEYS

GARDNER COBB

TRANSECTS & SEASONAL HIGH WATER MARKS



SHEET 2 OF 2

DRAWN	CHECKED	DATE	REVISIONS

CENTRAL FLORIDA WATER INITIATIVE (CFWI)
GARDNER COBB
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SOUTH FLORIDA WATER MANAGEMENT DISTRICT
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WEST PALM BEACH, FLORIDA 33416-4680