# *APPENDIX C*

# *REFERENCE MATERIALS*

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Excerpts from Canals in South Florida: A Technical Support Document

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### Other Basins that Discharge to C-38

Three other basins discharge water into the section of the C-38 canal downstream of S-6E, before the canal reaches Lake Okeechobee. The L-59E basin has an area of 22.5 square miles. The land use in the basin is agricultural, although most of the area is improved pasture for beef cattle production. Runoff from the L-59E basin collects in the L-59 borrow canal and flows east to C-38 through the L-59E basin culvert located through the C-38 levee. The S-154 basin has an area of 49.41 square miles and is located on the west side of the town of Okeechobee. The land use in the basin is urban and agricultural. Urban lands are within the northwest section of the town of Okeechobee. Agriculture includes citrus, beef cattle production, and dairy operations. The S-154 culvert is located on the L-D4 canal and discharges to C-38. The S-154C basin has an area of 3.4 square miles and is located along the southwest corner of the S-154 basin. The land use in the basin is agricultural including improved pasture, cattle production, citrus groves, and dairy operations. The major water control structure in this basin is the S-154C culvert, which discharges through L-D4, about 5 miles west of the town of Okeechobee.

## Major Canals Downstream of Lake Istokpoga

### C-41A Canal (Discharges to C-38)

C-41A (Stub Canal or Brighton Canal) is the main outlet for Lake Istokpoga. The canal is about 20.1 miles long and the width varies between 30 and 130 feet. The bottom elevation ranges between -8.0 to 24.0 feet NGVD. The design water surface elevation ranges from 19.3 to 40.0 feet NGVD. There are four major water control structures in the basin: S-68, S-83, S-84, and G-85. Land use in this basin is primarily agricultural (citrus groves and vegetable production), as well as improved pastures and beef cattle production. During wet periods, drainage water is released to C-41A; during dry periods, irrigation water is drawn from the C-41A. S-68, which is located at the outlet of Lake Istokpoga, is used to maintain optimum upstream stage in Lake Istokpoga, regulate releases during floods, maintain downstream stages, and provide irrigation water during dry periods. G-85, on the Istokpoga Canal, is used as an auxiliary outlet for Lake Istokpoga whenever the lake stage is above regulation and when S-68 or the lower canals are not able to remove the high flows.

### C-40 Canal (Discharges to Lake Okeechobee)

The Indian Prairie Canal (C-40) is about 18.1 miles long with a bottom width of 20 to 50 feet. The bottom elevation ranges between -4.7 and 10.1 feet NGVD. The design water surface elevation is in the range of 18.6 to 25.9 feet NGVD. Land use in this basin is agricultural, including citrus groves, vegetable production, improved pasture, and cattle production. There are three major structures in the C-40 basin: S-72, S-75, and G-208. S-72 is located on the C-40 canal, about 4 miles upstream from Lake Okeechobee. S-75 is located on C-40 about 10 miles upstream from S-72. Both S-72 and S-75 maintain upstream water control stages in C-40, pass the design flood flow during high water periods, and provide flow to maintain downstream stage and meet irrigation demands during dry periods. G-208 is a pumping station thatsupplies water from Lake Okeechobee to C-40 when the stage is lower than 20.2 feet NGVD.

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### C-41 and C-39A Canals (Discharges to Lake Okeechobee)

C-41 (Harney Pond Canal) is about 28.1 miles long and has a bottom width of 20 to 70 feet. The bottom elevation ranges from -13.0 to 16.7 feet NGVD. The design water surface elevation ranges between 18.6 to 32.5 feet NGVD. The land use in the C-41 basin is primarily agricultural, with citrus production in the higher elevations and mainly improved pasture for beef cattle production in the lower-lying lands. Truck crop and caladium production is also practiced. Four major water control structures are in the C-41 basin: S-70, S-71, S-82, and G-207. S-71 and S-70 maintain optimum upstream stages in C-41, pass flood waters during wet period, and maintain downstream stages and supply irrigation water during dry periods. S-82 is located on the C-41, 5 miles downstream from Lake Istokpoga and 500 feet downstream from the junction of C-41 and C-41A. This structure regulates discharges from C-41A into C-41. The G-207 pump station supplies water from Lake Okeechobee to the C-41 canal when Lake Istokpoga is below its regulatory schedule. The C-39A canal connects the C-40 and C-41A canals, is 3.2 miles long, and has a bottom width of 20 feet. The C-39A bottom elevation ranges from 19 to 20.2 feet NGVD and its design water surface elevation is 25.9 to 25.2 feet NGVD.

### Other Basins that Discharge to C-40 and C-41 (L59W, L-60E, L-60W, L-61E)

The L-59W basin has an area of 9.96 square miles. Land use in the basin is agriculture, with most of the area improved pasture for beef cattle production. Runoff from the L-59W basin collects into the L-59W borrow canal, and flows west to C-40 through the L-59W basin culvert. Interceptor levee 60 runs parallel to the northwest shore of Lake Okeechobee, immediately southwest of L-59, between the C-40 and C-41 canals. The land use in the L-60E and L-60W basins is agricultural; mostly improved pasture for beef cattle production. The L-60E basin has an area of 7.9 square miles and drains to C-40 through the L-60E basin culvert. The L-60W basin has an area of 5.1 square miles and drains to C-41 through the L-60W basin culvert. Interceptor levee 61 runs parallel to the northwest shore of Lake Okeechobee, immediately southwest of L-60, between the C-41 canal and the L-50 levee. The L-61E basin has an area of 23.4 square miles and land use in the basin is agricultural. There are some citrus groves, but most of the area is improved pasture for beef cattle production. The Seminole Tribe operates a bypass from S-71 to supply water to the L-61E basin. The tribe also operates a 90 cfs pump to supply water to this basin.

## Basins that Flow Directly to Lake Okeechobee

Basins associated with five District Structures S-131, S-133, S-127 and S-129 and S-193 discharge through District water control structures directly to Lake Okeechobee.

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USGS Stream Gage Data for Site No. 02273230

C-41 Canal Near Brighton, FL

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# ---------------------------------- WARNING ----------------------------------------
# Some of the data that you have obtained from this U.S. Geological Survey database
# may not have received Director's approval. Any such data values are qualified
# as provisional and are subject to revision. Provisional data are released on the
# condition that neither the USGS nor the United States Government may be held liable
# for any damages resulting from its use.
#
# Additional info: https://help.waterdata.usgs.gov/policies/provisional-data-statement
#
# File-format description:  https://help.waterdata.usgs.gov/faq/about-tab-delimited-output
# Automated-retrieval info: https://help.waterdata.usgs.gov/faq/automated-retrievals
#
# Contact:   gs-w_support_nwisweb@usgs.gov
# retrieved: 2021-01-04 13:33:14 EST       (nadww02)
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# Data for the following 1 site(s) are contained in this file
#    USGS 02273230 C-41 CANAL NEAR BRIGHTON, FL
# -----------------------------------------------------------------------------------
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# Data provided for site 02273230
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#         31118       00060     Discharge, cubic feet per second
#
# Data-value qualification codes included in this output:
#     A  Approved for publication -- Processing and review completed.
#
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| USGS | 02273230 | 2017-09-11 18:45 | EDT | 25.89 | A | 1110 | A |
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| USGS | 02273230 | 2017-09-13 06:45 | EDT | 25.44 | A | 1380 | A |
| USGS | 02273230 | 2017-09-13 07:00 | EDT | 25.44 | A | 1390 | A |
| USGS | 02273230 | 2017-09-13 07:15 | EDT | 25.43 | A | 1380 | A |
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| USGS | 02273230 | 2017-09-13 08:00 | EDT | 25.42 | A | 1380 | A |
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| USGS | 02273230 | 2017-09-13 17:45 | EDT | 25.35 | A | 1490 | A |
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DRAFT

Excerpt from SFWMD Permit 28-00097-S

DRAFT

SITE TEMPORARY BENCH MARK
SET 5/8" IRON ROD & CAP
"FRS TRAV LB 4241"
N. 1045069.01
E. 582618.71
EL = 33.20

A
SD-1

N

50 0 100

STATE ROAD 70

PROPERTY BOUNDARY

BMP-1

VERIFY EXISTING CRUSHED CULVERT IS BLOCKED OR REMOVE

33.7 LF 36" CMP (DESTROYED)
IE = 23.40 (N)
IE = 27.25 (S)

BASIN 2
82.97 ac

BASIN 3
136.73 ac

MATCHLINE SHEET C-2

DRAFT

SCANNED 04/24/2013 MS

ORIGINAL SUBMITTAL
APR 2 3 2013
OKS

APPLICATION NUMBER
130423-13
OKS

JOB NO. 0187-01-ES
SCALE: AS SHOWN
DATE 4-12-2013
DESIGN R.A.J.
DRAWN J.J.D.
CHECKED
APPROVED

| NO. | DATE | REVISION |
|---|---|---|
| | | |

TWO BAR G, LLC
BMP DESIGNS
AND IMPLEMENTATION
HIGHLANDS COUNTY FLORIDA

SITE PLAN

Royal Consulting Services, Inc.
241 West Wilson Avenue
Longwood, FL 32750
(407) 331-5095 office
(407) 331-5095 fax
www.rcsinfo.com
FL COA No. 7790

RICHARD A. JONES
LICENSED
No. 31118
STATE OF FLORIDA

4/24/13
Richard A. Jones
No. 31118

SHEET
C-1

MATCHLINE SHEET C-1

39.0 LF 36" CMP
IE = 21.10 (N)
IE = 21.30 (S)

BASIN 3
136.73 ac

BASIN 2
82.97 ac

BASIN 1
75.64 ac

SITE TEMPORARY BENCH MARK
NE CORNER CONCRETE SLAB
N. 1582293.146'
E. 582278.37'
EL. = 27.50

BMP-2

PROPERTY BOUNDARY

MATCHLINE SHEET C-3

N

50 0 100

| JOB NO. 0187-01-ES |
|---|
| SCALE: AS SHOWN |
| DATE 4-12-2013 |
| DESIGN R.A.J. |
| DRAWN J.J.D. |
| CHECKED |
| APPROVED |

| NO. | DATE | REVISION |
|---|---|---|
| | | |

TWO BAR G, LLC
BMP DESIGNS
AND IMPLEMENTATION
HIGHLANDS COUNTY FLORIDA

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211 Wild Warren Avenue
Longwood, FL 32750
(407) 331-5065 fax
www.royalconsulting.com
FL COA No. 7390

SHEET C-2

RICHARD A. JONES LICENSE

4/12/13
Richard A. Jones
No. 31118

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SCANNED 04/24/2013 MS

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APR 23 2013

OKS

APPLICATION NUMBER

130423-13

OKS

MATCHLINE SHEET C-2

BASIN 3
136.73 ac

BASIN 1
75.64 ac

PROPERTY BOUNDARY

MATCHLINE SHEET C-4

DRAFT

N

50 0 100

| JOB NO. 0187-01-ES |
|---|
| SCALE: AS SHOWN |
| DATE 4-12-2013 |
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| DRAWN J.J.D. |
| CHECKED |
| APPROVED |

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|---|---|---|

TWO BAR G, LLC
BMP DESIGNS
AND IMPLEMENTATION

HIGHLANDS COUNTY FLORIDA

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(407) 831-5065 fax
www.royalconsulting.com
FL COA No: 7290

SHEET C-3

4/12/13
Richard A. Jones
No. 31118

SCANNED 04/24/2013 MS

ORIGINAL SUBMITTAL

APR 23 2013

OKS

APPLICATION NUMBER

130423-13

OKS

MATCHLINE SHEET C-3

BASIN 3
136.73 ac

BASIN 1
75.64 ac

SITE TEMPORARY BENCH MARK
SET 5/8" IRON ROD & CAP
"ERS TRAV LB 4241"
N. 1039556.86
E. 581221.46
EL = 30.55

BMP-3

A
SD-2

REMOVE
31.2 LF 48" CMP
IE = 21.85 (N)
IE = 22.17 (S)

PROPERTY BOUNDARY

38.9 LF 66" CMP
IE = 21.92 (W)
IE = 21.79 (E)
TOP OF 'T' RISER EL = 30.20 (E)

REMOVE
29.0 LF 24" CMP
IE = 25.59 (E)
IE = 25.55 (W)

PROPOSED
PUMP STATION

REMOVE
29.4 LF 24" CMP
IE = 25.56 (E)
IE = 25.64 (W)

REMOVE AND RELOCATE
EXISTING PUMP
STATION

PROPOSED
CULVERT

REMOVE
39.9 LF 18" STEEL PIPE
IE = 27.52 (W)
TOP OF 45° BEND EL = 28.98

CANAL C-41

64.8 LF 72" CMP
IE = 28.15 (S)
IE = 26.09 (N)
TOP OF 7.7' RISER
EL = 32.05 (N)

64.4 LF 72" CMP
IE = 19.84 (S)
IE = 20.10 (N)
TOP OF T.P. RISER EL = 31.97 (N)

N

50 0 100

DRAFT

SCANNED 04/24/2013 MS

ORIGINAL SUBMITTAL
APR 23 2013
OKS

APPLICATION NUMBER
130423-13
OKS

| | |
|---|---|
| JOB NO. | 0187-01-ES |
| SCALE: | AS SHOWN |
| DATE | 4-12-2013 |
| DESIGN | R.A.J. |
| DRAWN | J.J.D. |
| CHECKED | |
| APPROVED | |

REVISION | DATE | NO.

TWO BAR G, LLC
BMP DESIGNS
AND IMPLEMENTATION
HIGHLANDS COUNTY FLORIDA

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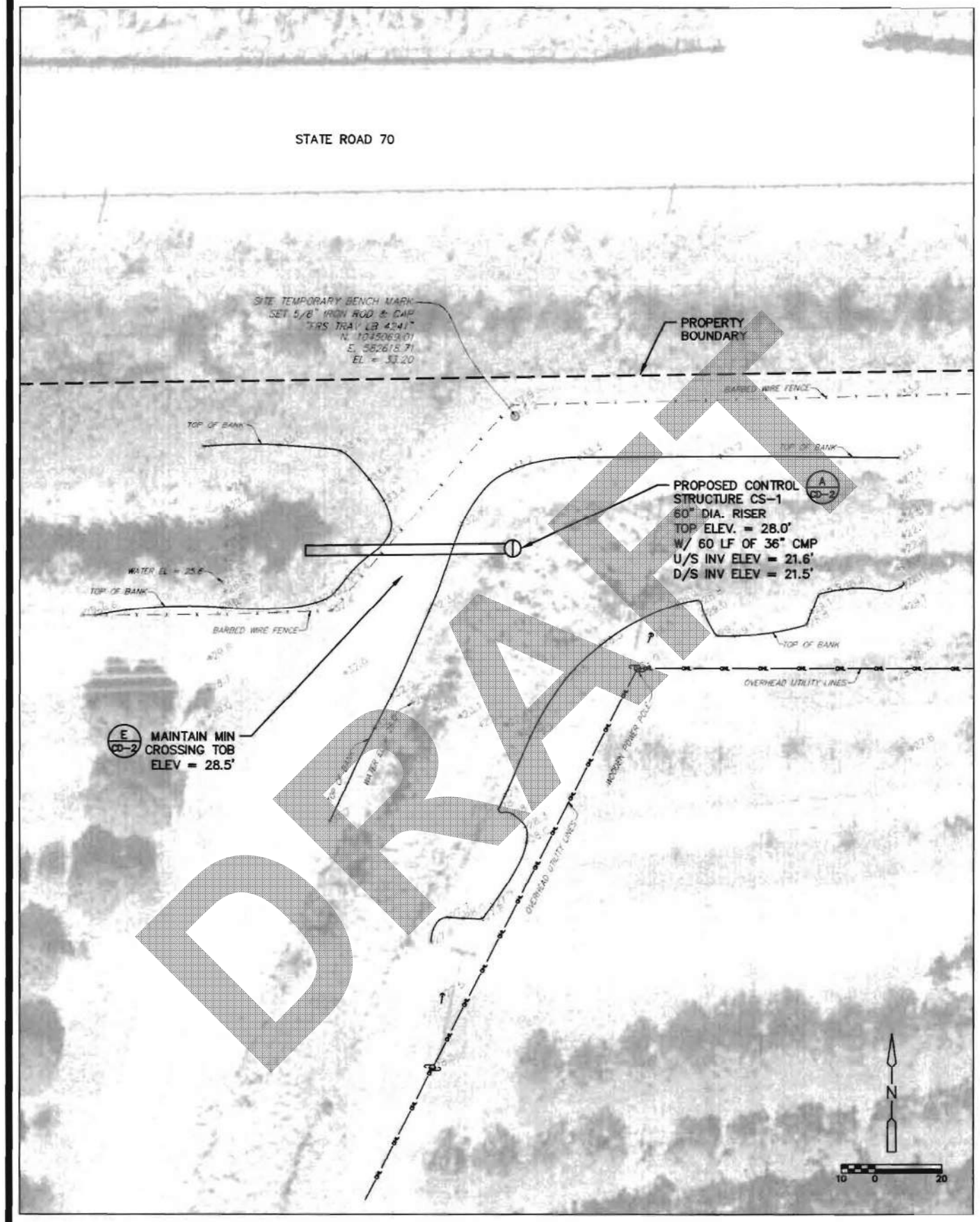
(407) 831-5085 fax
www.royalconsulting.com
FL COA No. 7290

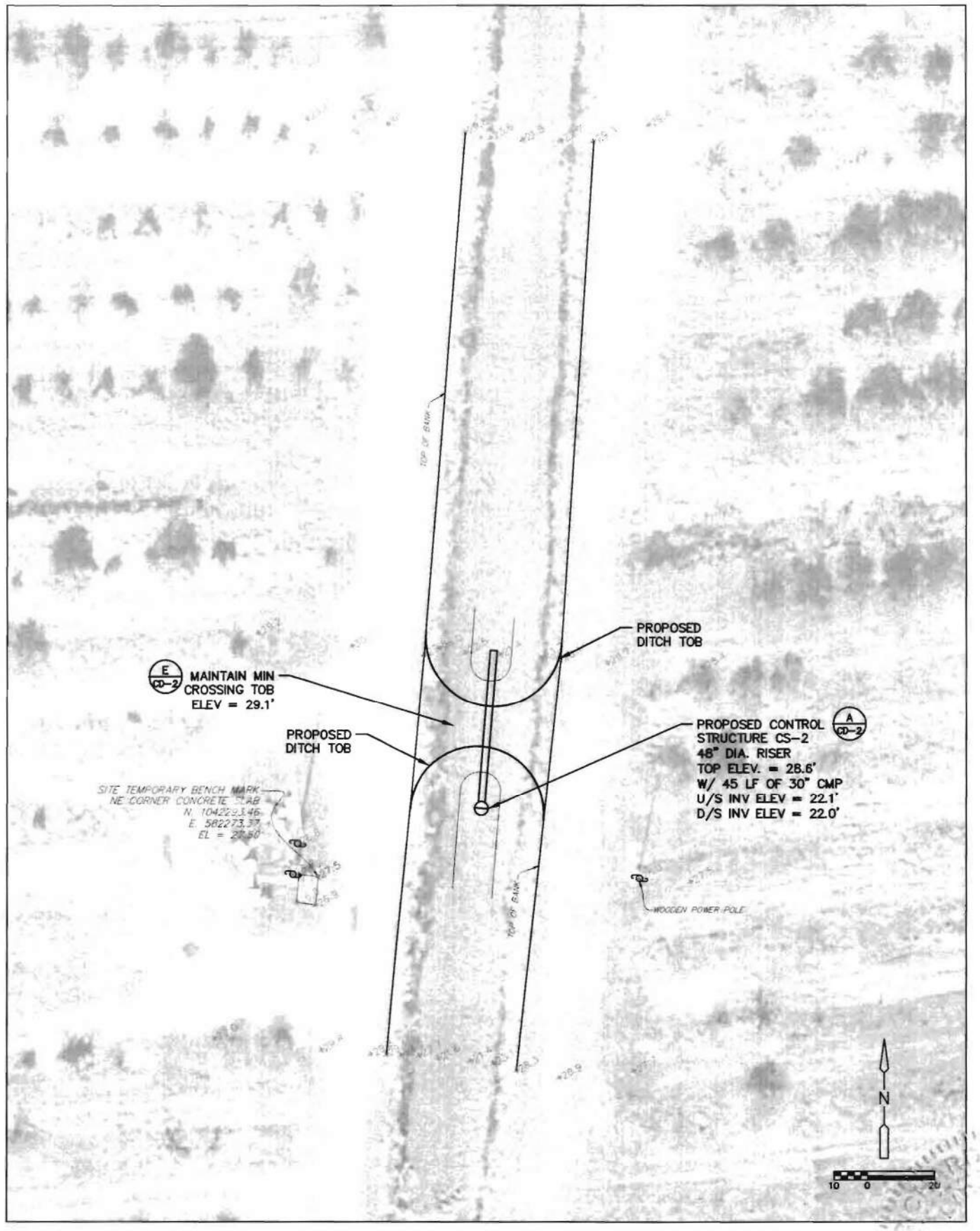
RICHARD A. JONES
LICENSED
No. 31118

4/12/13
Richard A. Jones
No. 31118

SHEET
C-4




BMP-1 SITE DETAIL A




BMP-2 SITE DETAIL B

DRAFT

SCANNED 04/24/2013 MS

ORIGINAL SUBMITTAL

APR 23 2013

OKS

APPLICATION NUMBER

130423-13

JOB NO. 0187-01-ES
SCALE: AS SHOWN
DATE 4-12-2013
DESIGN R.A.J.
DRAWN J.J.D.
CHECKED
APPROVED

| NO. | DATE | REVISION |
|---|---|---|

TWO BAR G, LLC
BMP DESIGNS
AND IMPLEMENTATION
HIGHLANDS COUNTY FLORIDA

SITE DETAILS

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211 West Warren Avenue
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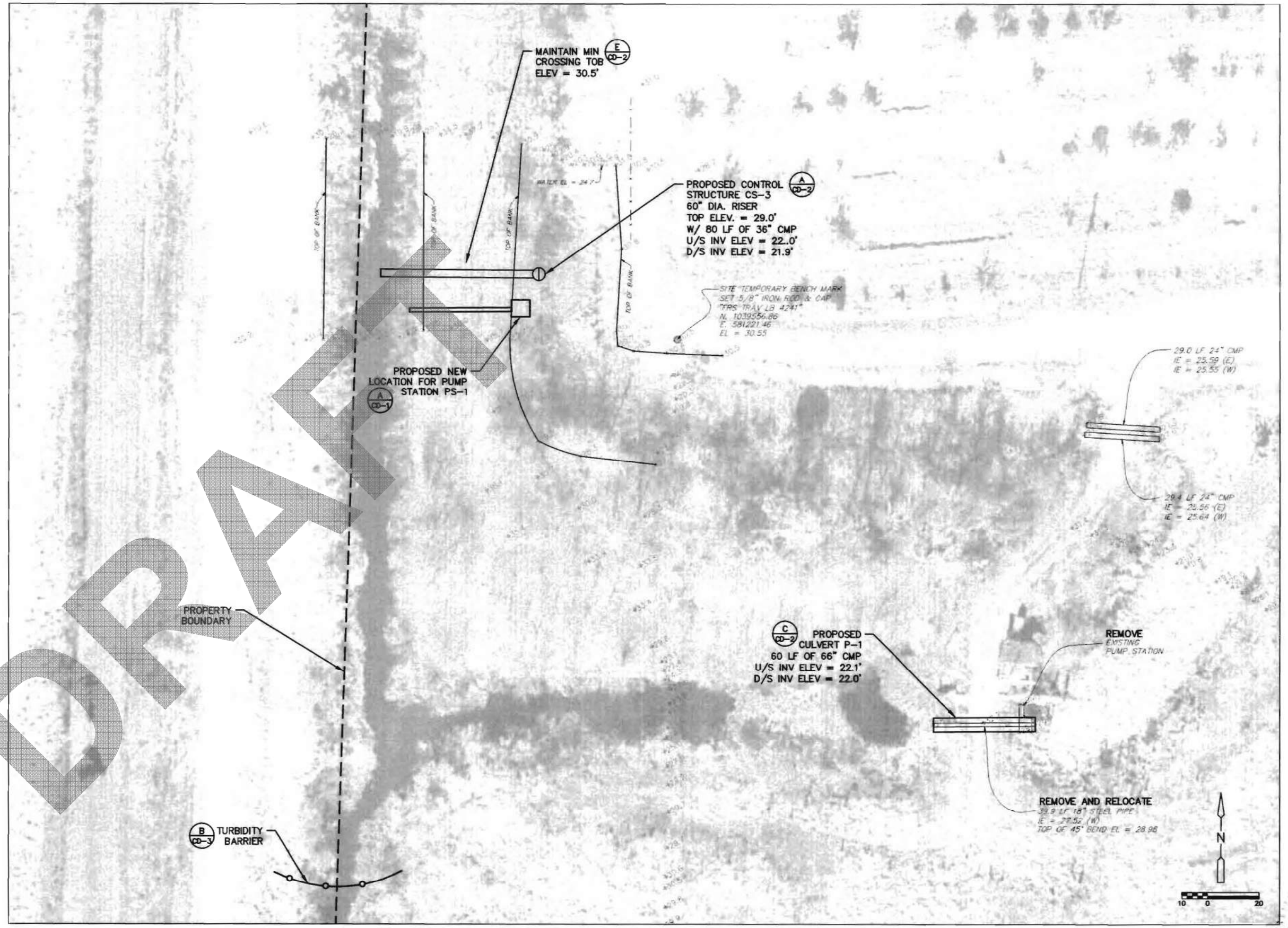
(407) 831-5085 fax
www.royalconsulting.com
FL COA No. 7990

4/12/13
Richard A. Jones
No. 31118

SHEET
SD-1



OKS

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SCANNED 04/24/2013 MS

BMP-3 SITE DETAIL A

ORIGINAL SUBMITTAL

APR 23 2013

OKS

APPLICATION NUMBER

130423-13

OKS

D-1477

JOB NO. 0187-01-ES
SCALE: AS SHOWN
DATE 4-12-2013
DESIGN R.A.J.
DRAWN J.J.D.
CHECKED
APPROVED

| NO. | DATE | REVISION |
|---|---|---|

TWO BAR G, LLC
BMP DESIGNS
AND IMPLEMENTATION
HIGHLANDS COUNTY FLORIDA

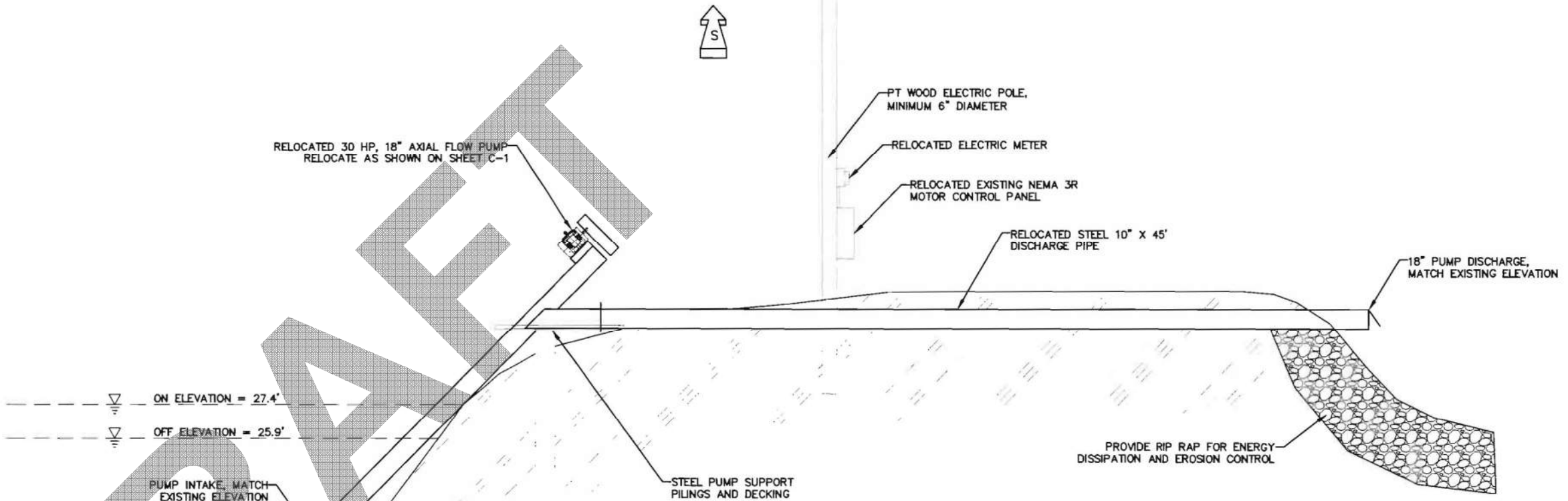
SITE DETAILS

Royal Consulting Services, Inc.
211 Hwy 27 North, Ste 105
Lake Wales, FL 33853
(863) 676-1477
www.royalconsulting.com
FL COA No 7290

4/12/13

Richard A. Jones
No. 31118

SHEET
SD-2




PS-1 DRAINAGE PUMP STATION (A)
N.T.S

DRAFT

ORIGINAL SUBMITTAL

APR 2 3 2013

OKS

APPLICATION NUMBER

130423-13

OKS

SCANNED 04/24/2013 MS

4/17/13

Richard A. Jones
No. 31118

| JOB NO. 0187-01-ES |
|---|
| SCALE: AS SHOWN |
| DATE 4-12-2013 |
| DESIGN R.A.J. |
| DRAWN J.J.D. |
| CHECKED |
| APPROVED |

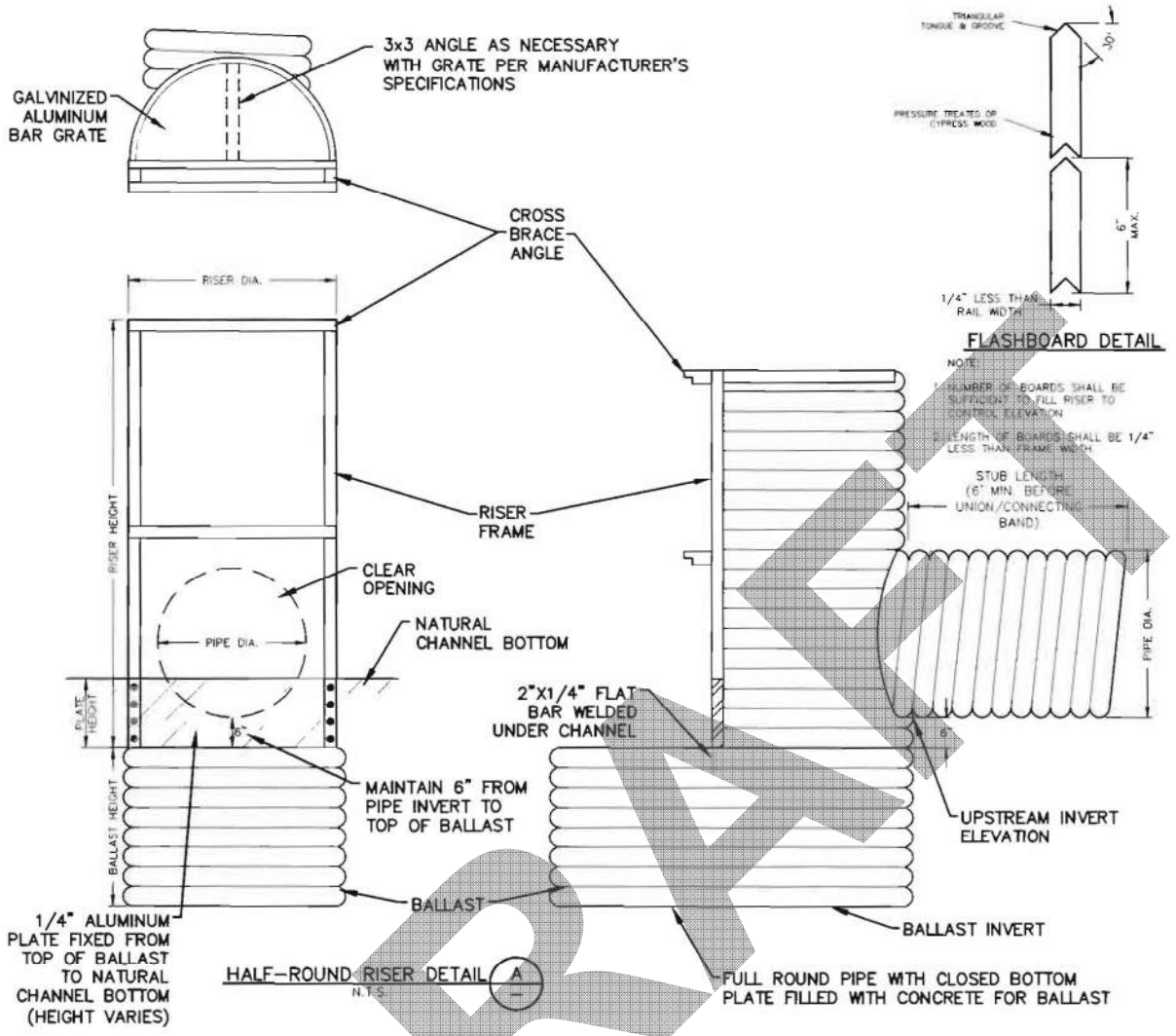
| NO. | DATE | REVISION |
|---|---|---|

**TWO BAR G, LLC**
**BMP DESIGNS**
**AND IMPLEMENTATION**
HIGHLANDS COUNTY FLORIDA

**PUMP STATION DETAILS**

Royal Consulting Services, Inc.
211 West Warren Avenue
Longwood, FL 32750
(407) 831-3955 phone
(407) 831-5095 fax
www.royalconsultingservices.com
FL COA No. 7990

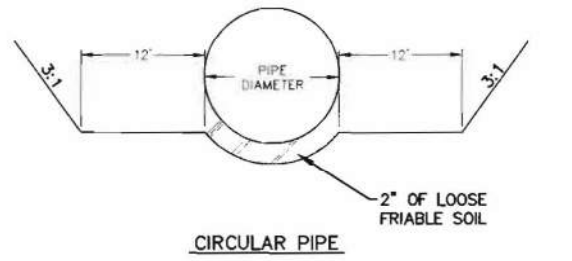
**SHEET CD-1**



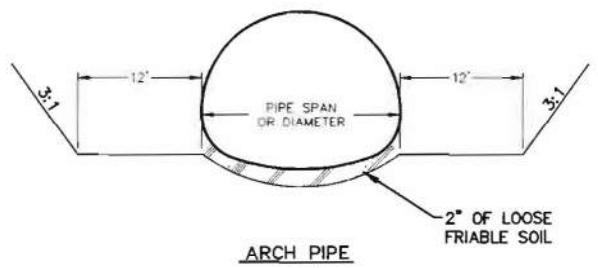

HALF-ROUND RISER DETAIL (A) N.T.S.




FLASHBOARD DETAIL

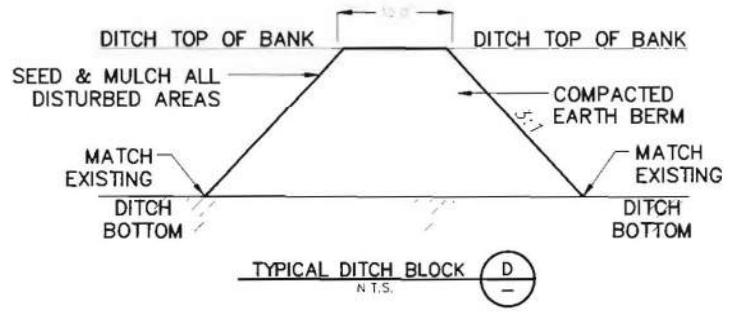



CIRCULAR PIPE

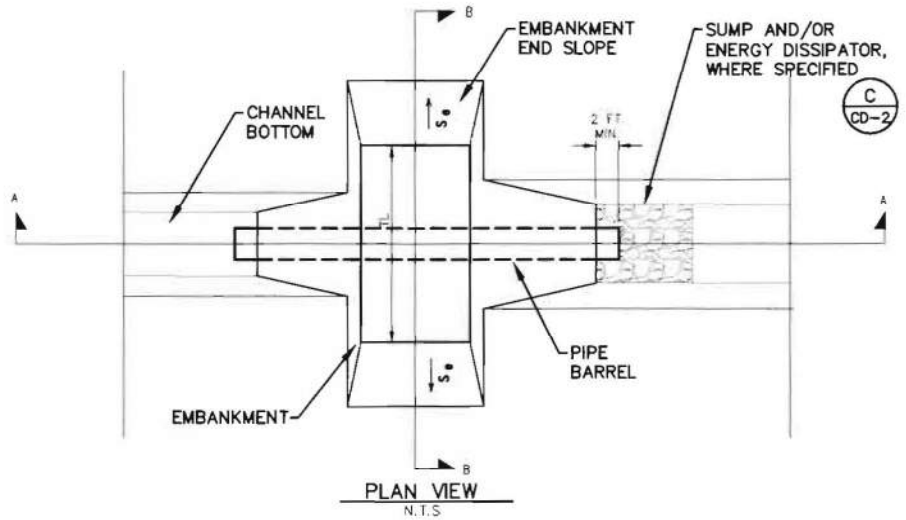



ARCH PIPE

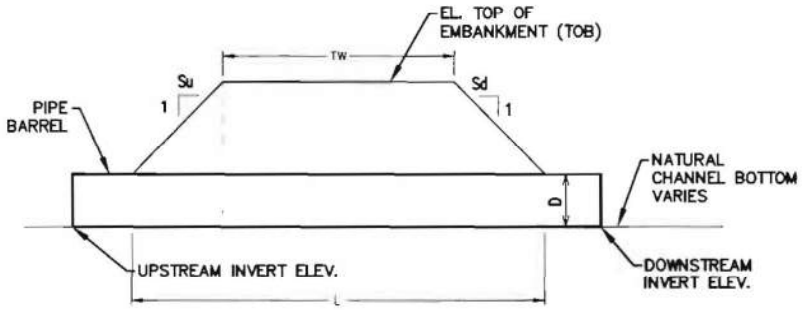
PIPE BEDDING DETAIL (C) N.T.S.



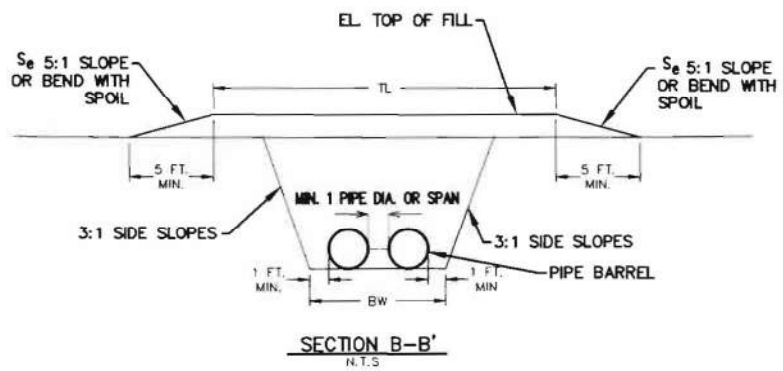

TYPICAL DITCH BLOCK (D) N.T.S.



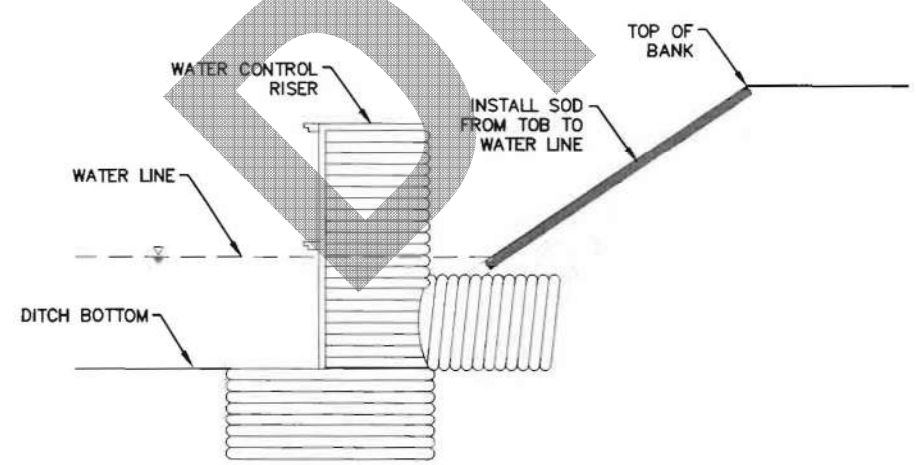

PLAN VIEW N.T.S.




SECTION A-A' N.T.S.

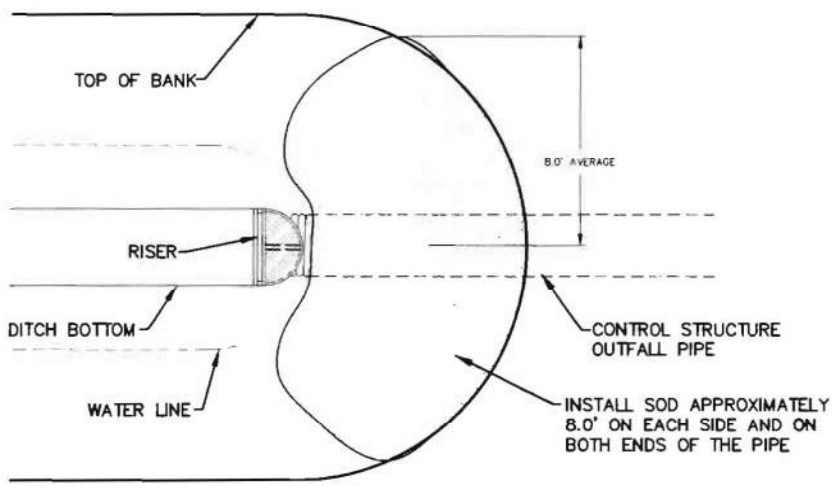



SECTION B-B' N.T.S.




PROFILE VIEW

SOD STABILIZATION AT RISERS (B) N.T.S.




PLAN VIEW

CULVERT CROSSING DETAIL (E) N.T.S.

ORIGINAL SUBMITTAL

APR 23 2013

OKS

APPLICATION NUMBER

130423-13

OKS

4/12/13

Richard A. Jones No. 31118

DRAFT
SCANNED 04/24/2013 MS

JOB NO. 0187-01-ES
SCALE: AS SHOWN
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DRAWN J.J.D.
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| NO. | DATE | REVISION |
|---|---|---|

TWO BAR G, LLC
BMP DESIGNS
AND IMPLEMENTATION
HIGHLANDS COUNTY FLORIDA

CIVIL DETAILS

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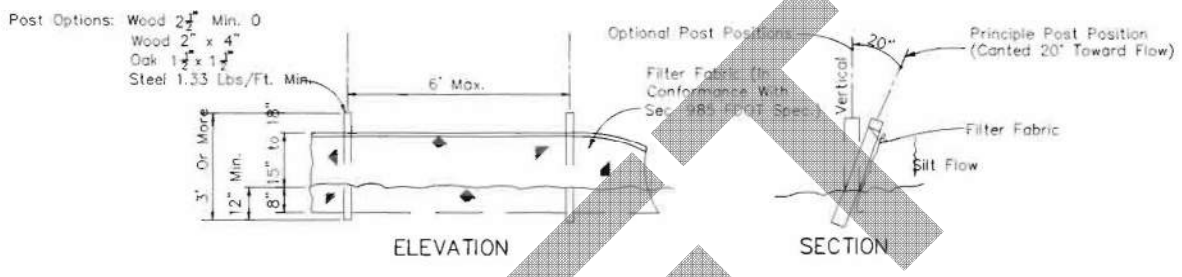
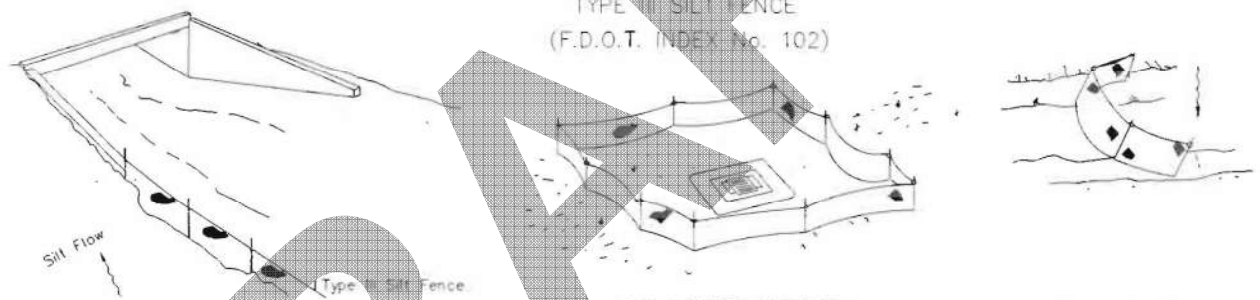
211 West Wilson Avenue
Longwood, FL 32750
(407) 831-3068
(407) 831-3068 fax
www.royalconsulting.com
FL COA No. 7290

SHEET CD-2




TYPE III SILT FENCE
(F.D.O.T. INDEX No. 102)



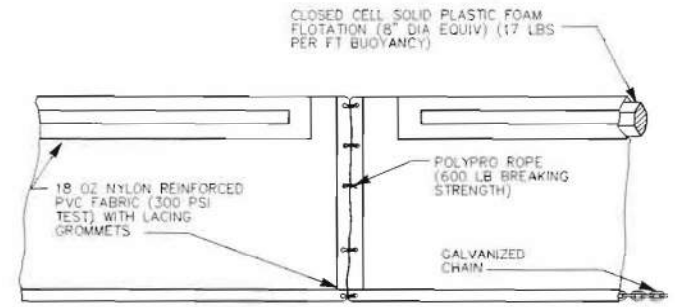

Type III Silt Fence Protection Around Ditch Bottom Inlets.

Type III Silt Fence

Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers are to be used at permanent bodies of water.

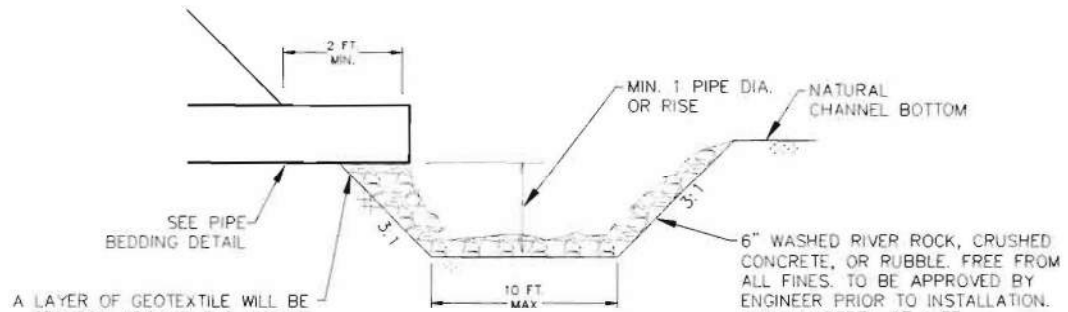
SILT FENCE APPLICATIONS

SILT FENCE DETAIL (A)
N.T.S.




FDOT INDEX 103 TYPE I
FLOATING TURBIDITY BARRIER

FLOATING TURBIDITY BARRIER DETAIL (B)
N.T.S.




RIP-RAP/ENERGY DISSIPATOR (C)
N.T.S.

DRAFT

SCANNED 04/24/2013 MS

ORIGINAL SUBMITTAL
APR 23 2013
OKS

APPLICATION NUMBER
130423-13
OKS

JOB NO. 0187-01-ES
SCALE: AS SHOWN
DATE 4-12-2013
DESIGN R.A.J.
DRAWN J.J.D.
CHECKED
APPROVED

| NO. | DATE | REVISION |
|---|---|---|

TWO BAR G, LLC
BMP DESIGNS
AND IMPLEMENTATION
HIGHLANDS COUNTY FLORIDA

EROSION CONTROL DETAILS

Royal Consulting Services, Inc.
211 Weld Street, Suite 2250
Longwood, FL 32750
(407) 831-3095 phone
(407) 831-3095 fax
www.royalconsulting.com
FL COA No. 7290

4/12/13
Richard A. Jones
No. 31118

SHEET CD-3

## CONTROL STRUCTURE & PIPE INFORMATION TABLE

| STRUCTURE ID | CONDITION | TOP OF RISER (ft) | RISER DIAMETER (in) | RISER HEIGHT (ft) | US INVERT ELEVATION (ft) | DS INVERT ELEVATION (ft) | BOARD ELEVATION (ft) | PIPE DIA (in) | PIPE LENGTH (ft) | BERM WIDTH (ft) | BERM ELEV (ft) | U/S WATER (ft) | D/S WATER (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CS-1 | PROPOSED | 28.0 | 60.0 | 6.4 | 21.60 | 21.50 | 26.20 | 36.0 | 60.0 | 24.0 | 28.50 | 27.80 | 26.90 |
| CS-2 | PROPOSED | 28.6 | 48.0 | 6.5 | 22.10 | 22.00 | 27.50 | 30.0 | 45.0 | 12.0 | 29.10 | 28.60 | 27.80 |
| CS-3 | PROPOSED | 29.0 | 60.0 | 7.0 | 22.00 | 21.90 | 25.33 | 36.0 | 80.0 | 35.0 | 30.50 | 26.90 | 24.61 |
| P-1 | PROPOSED | - | - | - | 22.10 | 22.00 | - | 66.0 | 60.0 | 12.0 | 32.70 | VARIES | 24.61 |
| PS-1 | RELOCATED | - | - | - | 27.50 | 27.50 | - | 18.0 | 39.9 | 35.0 | 30.50 | 26.90 | 24.61 |

Note: All elevations in NAVD 88.

| EXISTING PUMP STATION | | |
|---|---|---|
| DIAMETER | (in) | (in) |
| POWER | (hp) | 30 |
| FLOW | (gpm) | 9,920 |
| ON ELEV | (ft) | 27.4 |
| OFF ELEV | (ft) | 25.9 |

Note: All elevations in NAVD 88.

## DRAINAGE BASINS

| BASIN ID | AREA (ac) | PORTION (%) | DESIGN FLOW (cfs) | DESIGN FLOW (gpm) |
|---|---|---|---|---|
| 1 | 75.64 | 25.61% | 13.19 | 5920 |
| 2 | 82.97 | 28.09% | 14.47 | 6494 |
| 3 | 136.73 | 46.30% | 23.84 | 10701 |
| TOTAL | 295.34 | 100.00% | 51.50 | 23115 |

Note: Permitted discharge rate is 51.50 CFS

## ALUMINUM PIPE MINIMUM GAGE

| PIPE SIZE | CORRUGATION | GAGE |
|---|---|---|
| 16" to 24" | 2-2/3 X 1/2 | 16 |
| 30" to 36" | 2-2/3 X 1/2 | 14 |
| 42" to 54" | 2-2/3 X 1/2 | 12 |
| 60" | 2-2/3 X 1/2 | 10 |
| 66" to 120" | 2-2/3 X 1/2 | 8 |
| 66" to 120" | 3 X 1 | 12 |

## CONSTRUCTION TOLERANCE

| ITEM | UNITS | GENERAL GUIDELINES |
|---|---|---|
| **OUTFALL CULVERT** | | |
| upstream invert | ft | +/- 0.2 |
| downstream invert | ft | less than upstream |
| height | ft | no tolerance |
| diameter | ft | =/> size indicated |
| length | ft | no tolerance |
| **DROP INLET** | | |
| crest elevation | ft | +/- 0.2 |
| width, diameter, length | ft | within 10% |
| **DITCHES** | | |
| invert | ft | +/- 0.2 |
| side slope | ft/ft | within 10% |
| bottom width | ft | -0.2, +4.0 |
| top width | ft | as needed |
| **SWALES** | | |
| bottom, side slopes | ft | see swale cross section |
| depth | ft | field adjusted |
| slope, length | ft | see swale info table |
| wetland buffer separation | ft | 2.0 minimum |
| **ROADS** | | |
| width | ft | -0.2, +4.0 |
| location | ft | field adjusted |
| ditch separation | ft | field adjusted |
| radius | ft | field adjusted |

## ELEVATIONS & DEPTH OF EXISTING DITCH AT PROPOSED STRUCTURES

| STRUCTURE ID | UPSTREAM BOTTOM | UPSTREAM TOB | UPSTREAM DEPTH | DOWNSTREAM BOTTOM | DOWNSTREAM TOB | DOWNSTREAM DEPTH |
|---|---|---|---|---|---|---|
| CS-1 | 20.2 | 28.5 | 8.3 | 21.0 | 29.7 | 8.7 |
| CS-2 | 21.6 | 29.1 | 7.5 | 21.6 | 29.1 | 7.5 |
| CS-3 | 20.4 | 30.9 | 10.5 | 19.7 | 29.1 | 9.4 |
| P-1 | 19.1 | 29.4 | 10.3 | 22.0 | 29.8 | 7.8 |
| PS-1 | 20.4 | 30.9 | 10.5 | 19.7 | 29.1 | 9.4 |

## STRUCTURE DESIGN FLOW RATES

| STRUCTURE ID | STRUCTURE TYPE | BASIN ID | DESIGN FLOW (cfs) | DESIGN FLOW (gpm) |
|---|---|---|---|---|
| CS-1 | FBR | 1,2 | 27.66 | 12414 |
| CS-2 | FBR | 1 | 13.19 | 5920 |
| CS-3 | FBR | 1,2,3 | 29.40 | 13195 |
| P-1 | CULVERT | OFFSITE | MATCH UPSTREAM | |
| PS-1 | PUMP | 1,2,3 | 22.10 | 9920 |

ORIGINAL SUBMITTAL

APR 2 3 2013

OKS

APPLICATION NUMBER

130423-13

OKS

DRAFT

SCANNED 04/24/2013 MS

JOB NO. 0187-01-ES
SCALE: AS SHOWN
DATE 4-12-2013
DESIGN R.A.J.
DRAWN J.J.D.
CHECKED
APPROVED
REVISION
NO. DATE

TWO BAR G, LLC
BMP DESIGNS
AND IMPLEMENTATION
HIGHLANDS COUNTY FLORIDA

INFORMATION TABLES

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Longwood, FL 32750
(407) 831-3260 phone
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www.royalconsulting.com
FL COA No. 7260

4/12/13
Richard A. Jones
No. 31118

SHEET CD-4

Excerpt from SFWMD Permit 28-00140-S

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## HYDROLOGIC AND HYDRAULIC MODELING

The hydrologic – hydraulic model for the Highlands Ranch wetland reserve easement (WRE) includes the Recommended Alternative. This alternative is equal to the design Alternative 2 previously modeled and was developed in cooperation with the NRCS. See **Appendix E – Draft Hydrologic and Hydraulic Modeling Report** for the hydrologic – hydraulic model of the design Alternatives 1 and 2. The Recommended Alternative was analyzed following the same methodology applied to the two design alternatives and is provided in this **Appendix C**. This study was completed in NAVD 88 datum and at this approximate location the NAVD 88 is 1.19 feet below NGVD 29. The project is located approximately 1.5 miles west of Canal C-41.

## RECOMMENDED ALTERNATIVE

The Recommended Alternative consists of dike construction and modifications along the property's boundary, construction of one reinforced concrete weir, two reinforced concrete emergency spillways, ditch filling, land smoothing areas, installation of equalizer culverts, pump removal, and existing culverts removal. The dike will be constructed or modified to an elevation of 31.0 feet-NAVD with 3:1 side slope and a top width of 12.0 feet to provide access for vehicles. These modifications will create two basins: FN to the north and FS to the south. The weir will be constructed in the FN basin. This weir will discharge into Canal 8. The proposed weir is trapezoidal with 15.0 feet wide broad crest at 28.0 feet (NAVD) with 10:1 side slope and top elevation at 31 feet-NAVD. The proposed spillways are trapezoidal with 15.0 feet wide broad crest at 29.0 feet-NAVD with 10:1 side slopes and top elevation at 31.0 feet-NAVD. Five 36 inch diameter reinforced concrete pipes are proposed to connect the north and south fields. The culvert invert elevation is proposed at 24.0 feet-NAVD. In addition, on-site borrow areas will be used as fill material to construct the dike. The borrow areas were not included in the hydrologic-hydraulic model. The initial conditions for the long term simulations and storm simulations were the same as Pre - Restoration conditions. The duration of the long term simulation was 20 years (January 1996 to December 2015). See **Section 2.1**, Recommended Alternative Basin Map for the location of the proposed structural improvements and drainage areas.

## RESULTS

The results of the long term simulations are evaluated with the stage percent exceedance probability. **Table 1** shows the water surface elevation (WSEL) associated with average conditions (50 percentile) and seasonal high (33 percentile). **Figure 1** shows the study area inundated days and elevation for the Pre – Restoration condition and Recommended Alternative. The Pre – Restoration condition and Recommended Alternative results show that 50% of the days inundated sustain a water elevation of 25.71 and 25.84 feet-NAVD, respectively. Seasonal high water elevations (33 percentile) in the Pre – Restoration condition and Recommended Alternative are 26.07 and 26.21 feet-NAVD, respectively. The peak discharges and stages for the 3-year/24-hour, 5-year/24-hour, 10-year/72-hour, 25-year/24-hour, 25-year/72-hour, and 100-year/24-hour storm events are presented in **Tables 2 and 3.** These tables summarizes the off-site peak discharges and the on-site stages for all storm events. **Table 4** shows the total storage and the change in storage based on the Pre – Restoration condition for each storm event.

DRAFT

**Sections 28, 29 & 33**
**Township 37 South**
**Range 31 East**

Source: USDA FSA ArcGIS Image Service. Service Name: NAIP/Florida_2015_1m.

Proposed Reinforced Concrete Weir with RipRap Apron

Canal 1 to Canal C41

Proposed Reinforced Concrete Spillway with RipRap Apron

Pump to be removed

Pump to be removed

Canal 2

Canal 3

Proposed 3 - 36" RCP Equalizers

Proposed 2 - 36" RCP Equalizers

Proposed Reinforced Concrete Spillway with RipRap Apron

36" CMP

18" CMP

Canal 4

Canal 5 to Canal C41

FN

FS

26 27 28 28 28 28 27 29 27 27

N

800 400 0 800 Feet

1 inch = 800 feet

**Legend**

- Recommended Alternative Basin
- Flow Direction
- Land Smoothing
- Dike Construction
- Dike Modification
- Culvert to be removed

DRAFT

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

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www.kleinfelder.com

| | |
|---|---|
| PROJECT NO. | 20162768.004A |
| DRAWN: | 3/22/2017 |
| DRAWN BY: | NL |
| CHECKED BY: | CTC |
| FILE NAME: | 17-0222--NRCS Highlands-PostAlt2Basin.mxd |

**Post-Restoration Recommended Alternative Basin Map**

**Highlands Ranch**
**Wetland Reserve Easement (WRE) Project**
**Highlands County, Florida**

FIGURE
**1**

Excerpt from SFWMD Permit 28-0211-S-03

DRAFT

N

200 0 200 400
SCALE IN FEET


NOTES:

1. WRE INTERIOR LAND SMOOTHING TO BE PERFORMED TO THE LINES AND GRADES SHOWN ON THESE DRAWINGS WITHIN THE TOLERANCES PROVIDED IN THE CONTRACT DOCUMENTS. DITCHES, FORMER GROVE BEDS, BERMS, LOCAL HIGH POINTS, AND OTHER GRADING FEATURES WITHIN THE INTERIOR OF THE PROJECT SITE SHALL BE EXCAVATED, FILLED, AND/OR SMOOTHED AS NECESSARY TO MEET THE ELEVATIONS SHOWN ON THESE DRAWINGS.

2. CLEARING AND GRUBBING LIMITS ARE BOUNDED BY THE DOWNSTREAM (OUTER) TOE OF THE PERIMETER BERM (℄ 'A') AND INCLUDE THE ENTIRE WRE INTERIOR AND CENTRAL BERM (℄ 'B'), WITH THE EXCEPTION OF THE GRADING EXCLUSION ZONE.

3. SEE SHEET 01C003 FOR POINT TABLE AND DESIGN WRE ELEVATIONS ALONG THE PERIMETER AND CENTRAL BERM.

4. INSTALL SILT FENCING BETWEEN DOWNSTREAM TOE OF DIKE/BERM AND CONSERVATION EASEMENT BOUNDARY OR TOP OF BANK OF CLOSEST ADJACENT CANAL, WHICHEVER IS CLOSER.

PRELIMINARY

C:\pwworking\rpk\d0941727\01C002.dwg Thu, 01 Dec 2016 - 12:51pm RLEBLANC

| ISSUE | DATE | DESCRIPTION |
|---|---|---|
| 4 | 11/23/2016 | PHASE VI CORRECTED FINAL DESIGN |
| 3 | 8/18/2016 | PHASE VI CORRECTED FINAL DESIGN |
| 2 | 7/14/2016 | PHASE V FINAL DESIGN |
| 1 | 6/9/2016 | PHASE IV INTERMEDIATE DESIGN |
| 0 | 6/2/2016 | PHASE IV PRELIMINARY DESIGN |

| | |
|---|---|
| PROJECT MANAGER | SUSAN RAY, P.E. |
| DESIGNED BY | M. OURAL |
| DRAWN BY | Z. ARTH |
| CHECKED BY | R. LEBLANC |
| PROJECT NUMBER | T.O. AG-4209-D-15-0010 |

**NATURAL RESOURCE CONSERVATION SERVICE**
**SEVENTY GROVE WRE**
**HIGHLANDS COUNTY, FLORIDA**

CIVIL

OVERALL SITE PLAN
(1 OF 2)

FILENAME 01C002.dwg
SCALE 1"=200'

SHEET
01C002


NOTES:

1. WRE INTERIOR LAND SMOOTHING TO BE PERFORMED TO THE LINES AND GRADES SHOWN ON THESE DRAWINGS WITHIN THE TOLERANCES PROVIDED IN THE CONTRACT DOCUMENTS. DITCHES, FORMER GROVE BEDS, BERMS, LOCAL HIGH POINTS, AND OTHER GRADING FEATURES WITHIN THE INTERIOR OF THE PROJECT SITE SHALL BE EXCAVATED, FILLED, AND/OR SMOOTHED AS NECESSARY TO MEET THE ELEVATIONS SHOWN ON THESE DRAWINGS.

2. CLEARING AND GRUBBING LIMITS ARE BOUNDED BY THE DOWNSTREAM (OUTER) TOE OF THE PERIMETER BERM (℄ 'A') AND INCLUDE THE ENTIRE WRE INTERIOR AND CENTRAL BERM (℄ 'B'), WITH THE EXCEPTION OF THE GRADING EXCLUSION ZONE.

3. NO WORK WILL BE ALLOWED WITHIN 50 FT OF THE DRIP LINE OF THE OAK TREE INSIDE THE GRADING EXCLUSION AREA SHOWN ON THESE DRAWINGS. ADDITIONALLY, NO CLEARING, GRUBBING OR GRADING IS ALLOWED WITHIN THE LIMITS OF THE GRADING EXCLUSION AREA EXCEPT AS OTHERWISE NOTED. THE PUMP AND PUMP APPURTENANCES WITHIN THIS AREA MUST BE REMOVED TO THE EXTENT THAT NO EARTHWORK IS REQUIRED FOR REMOVAL.

4. INSTALL SILT FENCING BETWEEN DOWNSTREAM TOE OF DIKE/BERM AND CONSERVATION EASEMENT BOUNDARY OR TOP OF BANK OF CLOSEST ADJACENT CANAL, WHICHEVER IS CLOSER.

WRE INTERIOR ELEVATION GRADE BREAKS ALONG PERIMETER BERM (BL 'A')

| STATION | ELEVATION | GRADE IN | GRADE OUT |
|---|---|---|---|
| 52+65 | 32 | 0% | 10% |
| 52+75 | 31 | 10% | 10% |
| 52+85 | 30 | 10% | 0% |
| 78+85 | 30 | 0% | 10% |
| 78+95 | 29 | 10% | 0% |
| 116+95 | 29 | 0% | 10% |
| 117+05 | 30 | 10% | 0% |
| 122+85 | 30 | 0% | 10% |
| 122+90 | 31 | 10% | 10% |
| 122+95 | 32 | 10% | 0% |
| 133+85 | 32 | 0% | 10% |
| 133+90 | 31 | 10% | 10% |
| 133+95 | 30 | 10% | 0% |
| 147+00 | 30 | 0% | 10% |
| 147+05 | 31 | 10% | 0% |
| 162+00 | 31 | 0% | 10% |
| 162+05 | 30 | 10% | 0% |

WRE INTERIOR ELEVATION GRADE BREAKS ALONG PERIMETER BERM (BL 'A')

| STATION | ELEVATION | GRADE IN | GRADE OUT |
|---|---|---|---|
| 170+90 | 30 | 0% | 10% |
| 170+95 | 31 | 10% | 0% |
| 183+45 | 31 | 0% | 10% |
| 183+50 | 30 | 10% | 0% |
| 193+00 | 30 | 0% | 10% |
| 193+05 | 31 | 10% | 0% |
| 211+60 | 31 | 0% | 10% |
| 211+65 | 30 | 10% | 0% |
| 241+20 | 30 | 0% | 10% |
| 241+30 | 31 | 10% | 0% |
| 267+95 | 31 | 0% | 10% |
| 268+05 | 30 | 10% | 0% |
| 270+40 | 30 | 0% | 10% |
| 270+50 | 31 | 10% | 10% |
| 270+60 | 32 | 10% | 0% |

WRE INTERIOR ELEVATION GRADE BREAKS ALONG CENTRAL BERM (BL 'B')

| STATION | ELEVATION | GRADE IN | GRADE OUT |
|---|---|---|---|
| 23+20 | 32 | 0% | 10% |
| 23+25 | 31 | 10% | 10% |
| 23+30 | 30 | 10% | 0% |

GRADING POINT DATA

| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---|---|---|---|---|
| 1 | 1048538.08 | 575511.83 | 32.0 | GRADING EXCLUSION ZONE CORNER |
| 2 | 1048338.08 | 575179.51 | 32.0 | GRADING EXCLUSION ZONE CORNER |
| 3 | 1048438.46 | 575126.12 | 32.0 | GRADING EXCLUSION ZONE CORNER |
| 4 | 1048776.50 | 575203.78 | 32.0 | GRADING EXCLUSION ZONE CORNER |
| 5 | 1048776.50 | 575511.67 | 32.0 | GRADING EXCLUSION ZONE CORNER |
| 6 | 1054909.11 | 575770.80 | 31.0 | WRE INTERIOR GRADE BREAK |
| 7 | 1054852.45 | 575496.01 | 31.0 | WRE INTERIOR GRADE BREAK |
| 8 | 1054453.14 | 575487.69 | 31.0 | WRE INTERIOR GRADE BREAK |
| 9 | 1053460.50 | 576130.05 | 30.0 | WRE INTERIOR GRADE BREAK |
| 10 | 1053750.49 | 575757.72 | 30.0 | WRE INTERIOR GRADE BREAK |
| 11 | 1053759.66 | 575610.81 | 30.0 | WRE INTERIOR GRADE BREAK |
| 12 | 1053545.40 | 575522.85 | 30.0 | WRE INTERIOR GRADE BREAK |
| 13 | 1052201.72 | 575984.79 | 30.0 | WRE INTERIOR GRADE BREAK |
| 14 | 1051835.66 | 575601.94 | 30.0 | WRE INTERIOR GRADE BREAK |
| 15 | 1051745.86 | 575032.81 | 30.0 | WRE INTERIOR GRADE BREAK |

GRADING POINT DATA

| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---|---|---|---|---|
| 16 | 1051654.81 | 575032.81 | 30.0 | WRE INTERIOR GRADE BREAK |
| 17 | 1051649.41 | 575411.03 | 30.0 | WRE INTERIOR GRADE BREAK |
| 18 | 1051329.43 | 575709.16 | 30.0 | WRE INTERIOR GRADE BREAK |
| 19 | 1050873.54 | 575684.53 | 30.0 | WRE INTERIOR GRADE BREAK |
| 20 | 1050624.82 | 575000.03 | 32.0 | WRE INTERIOR GRADE BREAK |
| 21 | 1050125.85 | 574997.26 | 32.0 | WRE INTERIOR GRADE BREAK |
| 22 | 1048970.65 | 575033.04 | 32.0 | WRE INTERIOR GRADE BREAK |
| 23 | 1048319.53 | 575041.96 | 32.0 | WRE INTERIOR GRADE BREAK |
| 24 | 1048047.49 | 575305.28 | 32.0 | WRE INTERIOR GRADE BREAK |

| ISSUE | DATE | DESCRIPTION |
|---|---|---|
| 4 | 11/23/2016 | PHASE VI CORRECTED FINAL DESIGN |
| 3 | 8/18/2016 | PHASE VI CORRECTED FINAL DESIGN |
| 2 | 7/14/2016 | PHASE V FINAL DESIGN |
| 1 | 6/9/2016 | PHASE IV INTERMEDIATE DESIGN |
| 0 | 6/2/2016 | PHASE IV PRELIMINARY DESIGN |

| | |
|---|---|
| PROJECT MANAGER | SUSAN RAY, P.E. |
| DESIGNED BY | M. OURAL |
| DRAWN BY | Z. ARTH |
| CHECKED BY | R. LEBLANC |
| PROJECT NUMBER | T.O. AG-4209-D-15-0010 |

**NATURAL RESOURCE CONSERVATION SERVICE**
**SEVENTY GROVE WRE**
**HIGHLANDS COUNTY, FLORIDA**

CIVIL

OVERALL SITE PLAN
(2 OF 2)

FILENAME 01C003.dwg
SCALE 1"=200'
SHEET 01C003

DRAFT

C:\pwworking\tpa\d0941727\01C003.dwg Mon, 28 Nov 2016 - 12:09pm TBURTON

Excerpt from SFWMD Permit 28-00286-S

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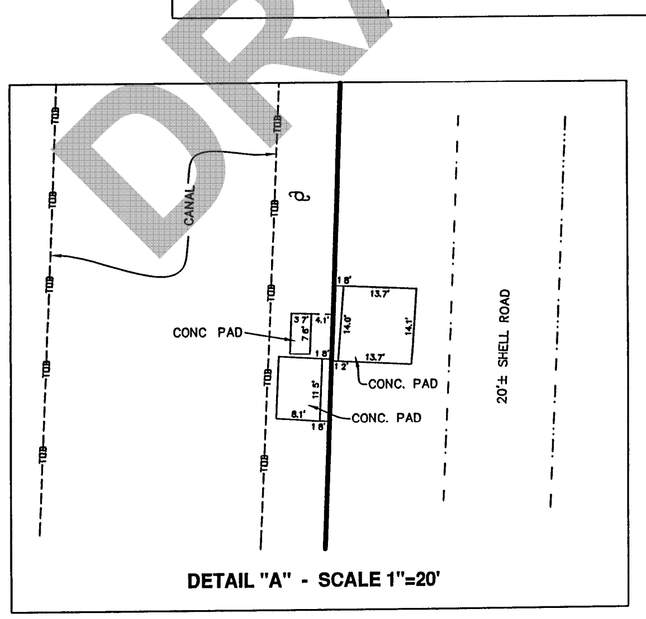
DRAFT




DETAIL "A" - SCALE 1"=20'

## BOUNDARY SURVEY

***LEGAL DESCRIPTION:***

*A PORTION OF UNSURVEYED SECTION 29, TOWNSHIP 37 SOUTH, RANGE 31 EAST, HIGHLANDS COUNTY, FLORIDA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS: COMMENCE AT THE S.W. CORNER OF SECTION 20, TOWNSHIP 37 SOUTH, RANGE 31 EAST, AS SHOWN ON THE MAP OF BOUNDARY AGREEMENT AS RECORDED IN PLAT BOOK 8, PAGE 79 OF THE PUBLIC RECORDS OF HIGHLANDS COUNTY, FLORIDA; THENCE NORTH 89°10'00" EAST ALONG THE NORTH LINE OF SECTION 29, TOWNSHIP 37 SOUTH, RANGE 31 EAST A DISTANCE OF 1840.51 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 2°04'23" WEST A DISTANCE OF 5279.87 FEET; THENCE NORTH 89°57'28" EAST A DISTANCE OF 25.03 FEET TO THE CENTERLINE OF A SHELL ROAD; THENCE SOUTH 2°24'20" WEST ALONG THE CENTERLINE OF SHELL ROAD A DISTANCE OF 14.47 FEET; THENCE NORTH 88°27'13" EAST ALONG SAID CENTERLINE OF SHELL ROAD A DISTANCE OF 630.06 FEET; THENCE SOUTH 78°30'59" EAST AND CENTERLINE OF SHELL ROAD A DISTANCE OF 818.55 FEET; THENCE NORTH 1°50'59" EAST A DISTANCE OF 15.00 FEET; THENCE SOUTH 81°29'02" EAST A DISTANCE OF 157.75 FEET; THENCE NORTH 2°16'29" EAST A DISTANCE OF 5472.09 FEET TO THE NORTH LIEN OF SECTION 29; THENCE SOUTH 89°10'00" WEST A DISTANCE OF 1641.78 FEET TO THE POINT OF BEGINNING.*

*CONTAINING 200 ACRES MORE OR LESS.*

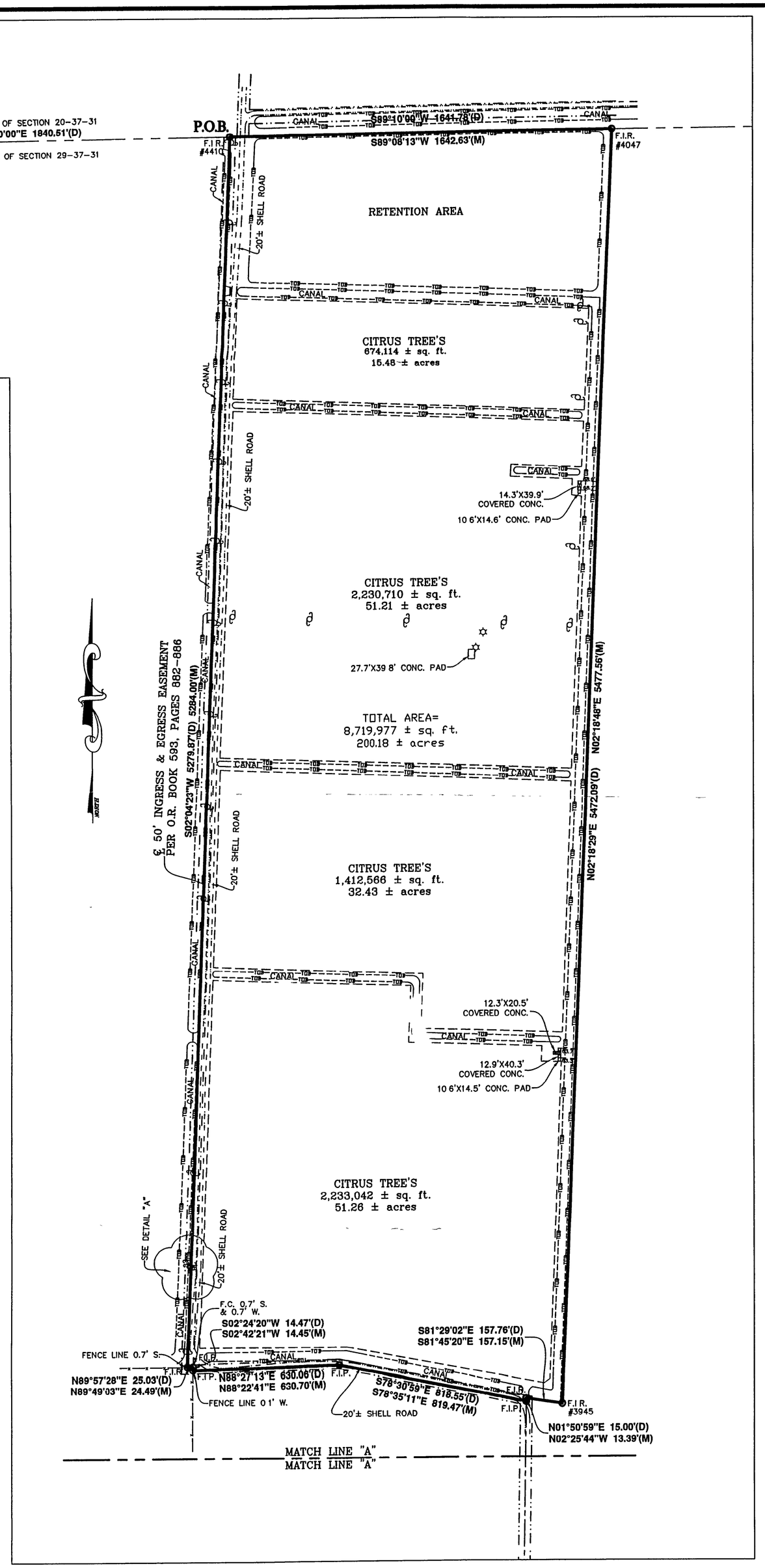
*TOGETHER WITH A PERPETUAL EASEMENT FOR INGRESS AND EGRESS ACROSS AFOREDESCRIBED LANDS TO STATE ROAD 70, GENERALLY FOLLOWING OF EXISTING DIRT ROAD AND MORE FULLY DESCRIBED IN DEED RECORDED IN O.R. BOOK 593, PAGE 882 THROUGH 886 INCLUSIVE, PUBLIC RECORDS OF HIGHLANDS COUNTY, FLORIDA.*

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

| LEGEND OF SYMBOLS | | | |
|---|---|---|---|
| Sign | | Mitered End | |
| Clean-out | | Telephone Box | |
| Gas Valve | | Water Valve | |
| Storm Inlet | | Monitoring Well | |
| Water Meter | | Fire Hydrant | |
| Electric Box | | Traffic Signal Box | |
| Utility Pole | | Drainage Manhole | |
| Light Pole | | Sanitary Manhole | |




# GERMAINE SURVEYING INC.

PROFESSIONAL LAND SURVEYORS

3803 KENILWORTH BLVD. BUS. (863) 385-6856
SEBRING, FLORIDA 33870 FAX. (863) 382-4531
CORPORATE LICENSE #6017

CLIENT:
*BENDER GROVES, LLC*

| | | | |
|---|---|---|---|
| *JOB#* | 53-10 | *SCALE:* | 1"=300' |
| *DATE:* | 3/23/10 | *DRAWN BY:* | BAM |
| *TASK:* | 001 | *CHECKED BY:* | |

## SURVEYOR'S CERTIFICATION:

I HEREBY CERTIFY THAT THIS DRAWING IS A TRUE AND CORRECT REPRESENTATION OF A SURVEY PERFORMED UNDER MY SUPERVISION, IN ACCORDANCE WITH THE MINIMUM TECHNICAL STANDARDS SET FORTH IN CHAPTER 61 G-17, PURSUANT TO SECTION 472.027 FLORIDA STATUTES, AS ADOPTED BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYOR'S. SUBJECT TO ALL EASEMENTS, RIGHTS-OF-WAYS, SETBACK LINES, UNDERGROUND UTILITIES, RESERVATIONS AND RESTRICTIONS.

PROFESSIONAL LAND SURVEYOR AND MAPPER

*GARY L. GERMAINE*
*FLORIDA CERTIFICATE #3945*

UNLESS IT BEARS THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF THIS FLORIDA LICENSED SURVEYOR AND MAPPER, THIS DRAWING, SKETCH, PLAT OR MAP IS FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE CONSIDERED VALID.

## GENERAL NOTES:

| | | | |
|---|---|---|---|
| 1) N. | NORTH. | 2) S. | SOUTH. |
| 3) E. | EAST. | 4) W. | WEST. |
| 5) P.G. | PAGE. | | |
| 6) ° | DEGREE. | | |
| 7) ' | FEET OR MINUTES. | | |
| 8) " | INCHES OR SECONDS. | | |
| 9) CONC. | CONCRETE. | | |
| 10) B.W.F. | BARBED WIRE FENCE. | | |
| 11) C.L.F. | CHAIN LINK FENCE. | | |
| 12) O.R. | OFFICIAL RECORD. | | |
| 13) F.I.R. | FOUND IRON ROD. | | |
| 14) F.I.P. | FOUND IRON PIPE. | | |
| 15) F.N.D. | FOUND NAIL & DISC. | | |
| 16) P.O.B. | POINT OF BEGINNING. | | |
| 17) P.O.C. | POINT OF COMMENCEMENT. | | |
| 18) P.C.P. | PERMANENT CONTROL POINT. | | |
| 19) F.C.M. | FOUND CONCRETE MONUMENT. | | |
| 20) S.C.M. | SET 4" X 4" CONCRETE MONUMENT. | | |
| 21) S.I.R. | SET IRON ROD WITH CAP #PLS 3945. | | |
| 22) S.N.D. | SET NAIL & BRASS DISK STAMPED "PLS #3945". | | |
| 23) C.B.S. | CONCRETE BLOCK STRUCTURE. | | |
| 24) ( P ) | AS RECORDED ON PLAT. | | |
| 25) ( D ) | AS RECORDED ON DEED. | | |
| 26) ( M ) | AS MEASURED IN FIELD. | | |
| 27) ( PRO ) | PRORATED MEASUREMENT. | | |
| 28) H.D.P.E. | HIGH DENSITY POLYETHYLENE PIPE. | | |

29) THIS SURVEY PREPARED FROM LEGAL DESCRIPTION PROVIDED AND IS NOT A CERTIFICATE OF TITLE.

30) BEARING SYSTEM BASED ON THE WEST PROPERTY LINE AS BEING S02°04'23"W.

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## REVISIONS

| | |
|---|---|
| 1 | 100625-11 |
| 2 | |
| 3 | RECEIVED |
| 4 | JUN 25 2010 |
| 5 | OKEECHOBEE SERVICE CENTER |
| 6 | |

RECEIVED
JUN 25 2010
ENV RES REGULATION

SHEET 1 OF 1

Excerpt from SFWMD Permit 28-00408-S

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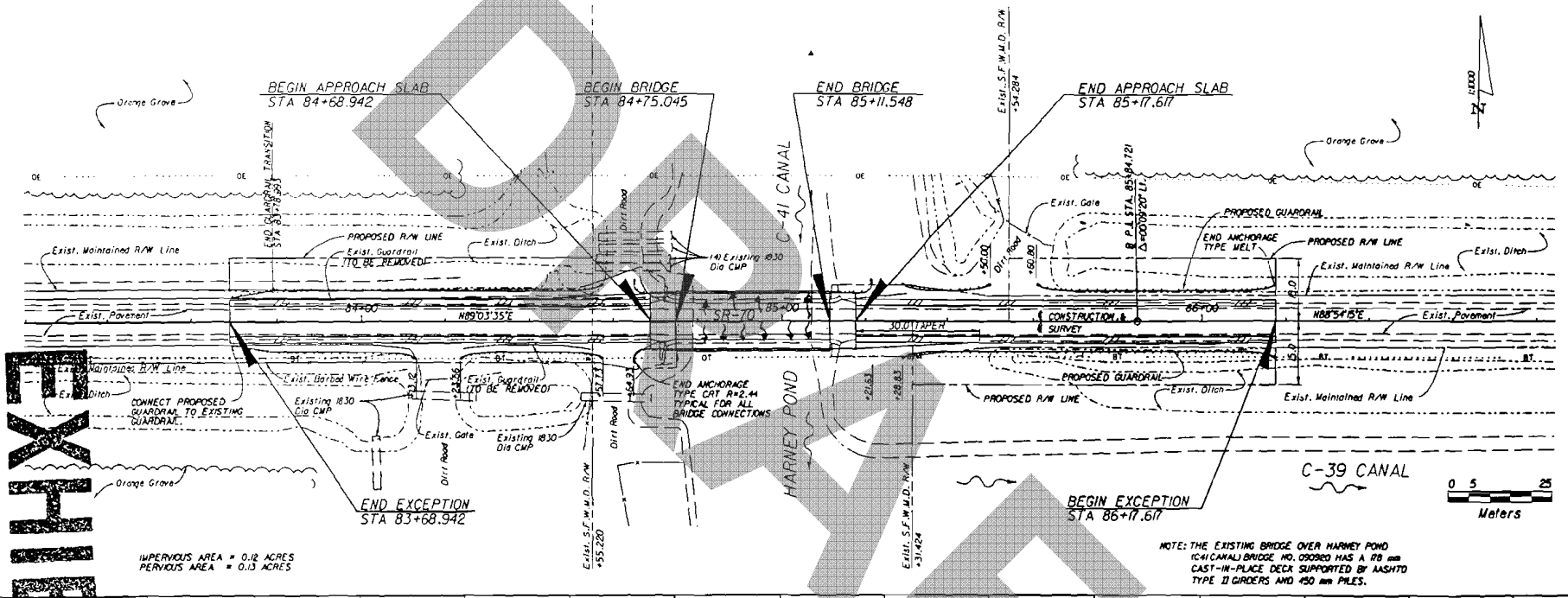


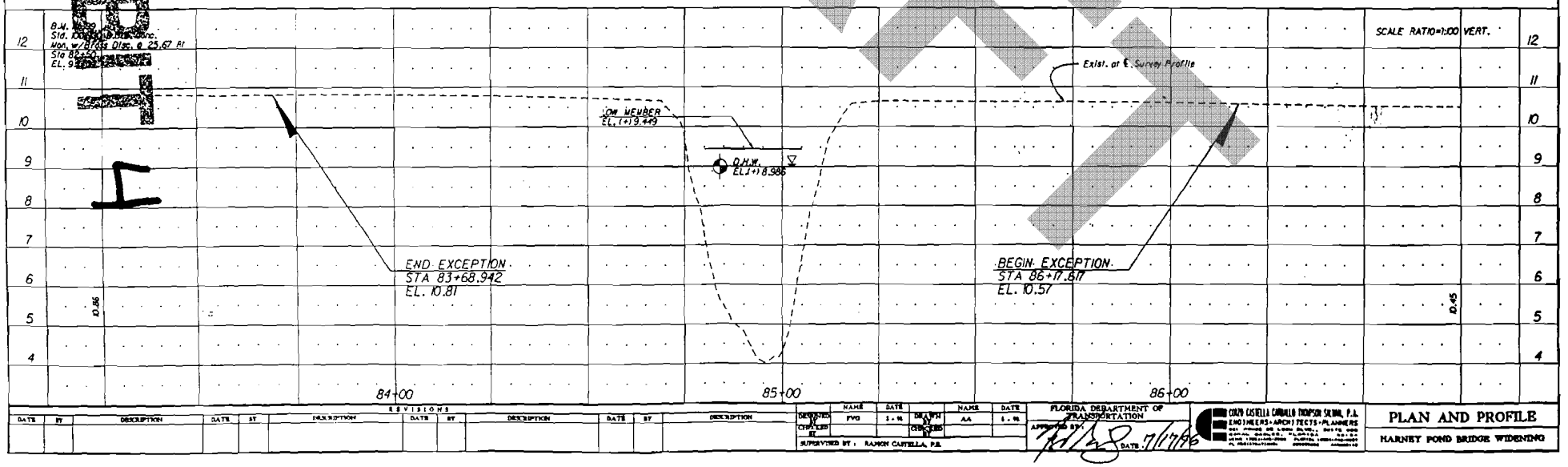


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| DESIGNED | NAME | DATE | DRAWN | NAME | DATE |
|---|---|---|---|---|---|
| | FVG | 3-96 | | AA | 3-96 |
| CHECKED | | | CHECKED | | |

SUPERVISED BY : RAMON CASTELLA, P.E.

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY: DATE: 7/17/96

COTO CASTELLA CARBALLO THOMPSON SALMAN, P.A.
ENGINEERS • ARCHITECTS • PLANNERS

# PLAN AND PROFILE

HARNEY POND BRIDGE WIDENING

D-1491

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EXHIBIT

Excerpt from SFWMD Permit 28-00670-P

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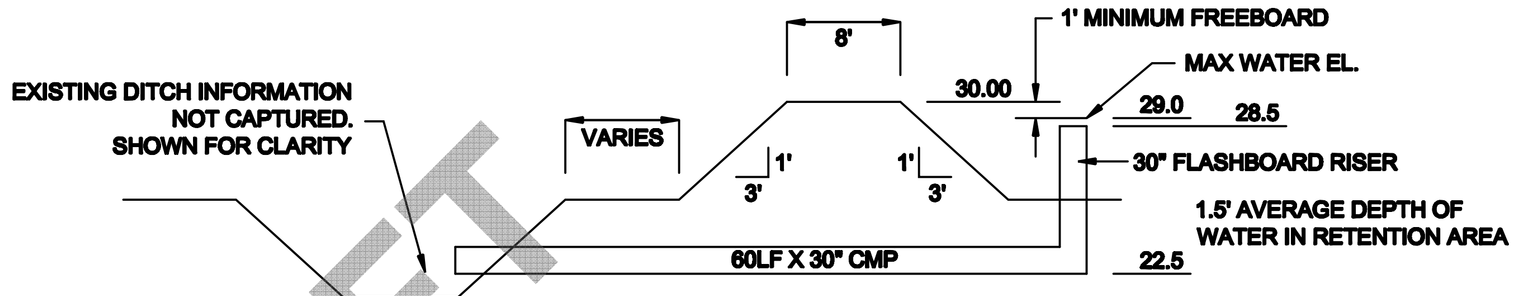


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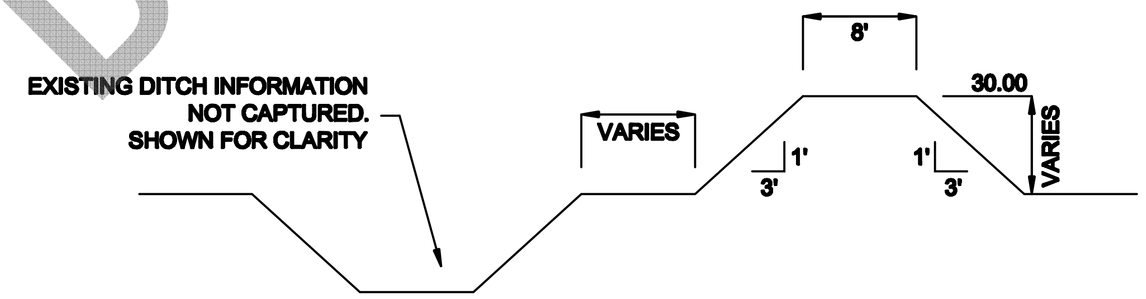


## SECTION A - A

NOT TO SCALE


SCALE: 1"=100'
0 50 100 200

DRAFT

Steven L. Dobbs
Engineering, LLC
1062 JAKES WAY
Okeechobee, Fl 34974
Phone: (863) 824-7644
FLORIDA CERTIFICATE OF AUTHORIZATION No. 00029206

SLD ENGINEERING

DATE: 03-23-2012
DRAWN BY: SLD
DESIGNED BY: SLD
CHECKED BY: SLD
PROJECT No.: 2010-006
HORIZ. SCALE: 1" = 100'
VERT. SCALE: N/A
CADD FILE: 2010-006 base

| NO. | DATE | BY | REVISIONS |
|---|---|---|---|

SCALE VERIFICATION
SOLID BAR IS EQUAL TO ONE INCH ON ORIGINAL DRAWING, ADJUST ALL SCALED DIMENSIONS ACCORDINGLY

Printed Date:

RB FARMS
SFWMD ERP
HIGHLANDS COUNTY, FL

SFWMD
IRRIGATION & WATER QUALITY PLAN

JOB No.: 2010-006
SHEET 2 OF 3

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY STEVEN L. DOBBS, P.E., SHALL BE WITHOUT LIABILITY TO STEVEN L. DOBBS ENGINEERING, LLC.

Excerpt from SFWMD Permit 28-00211-S

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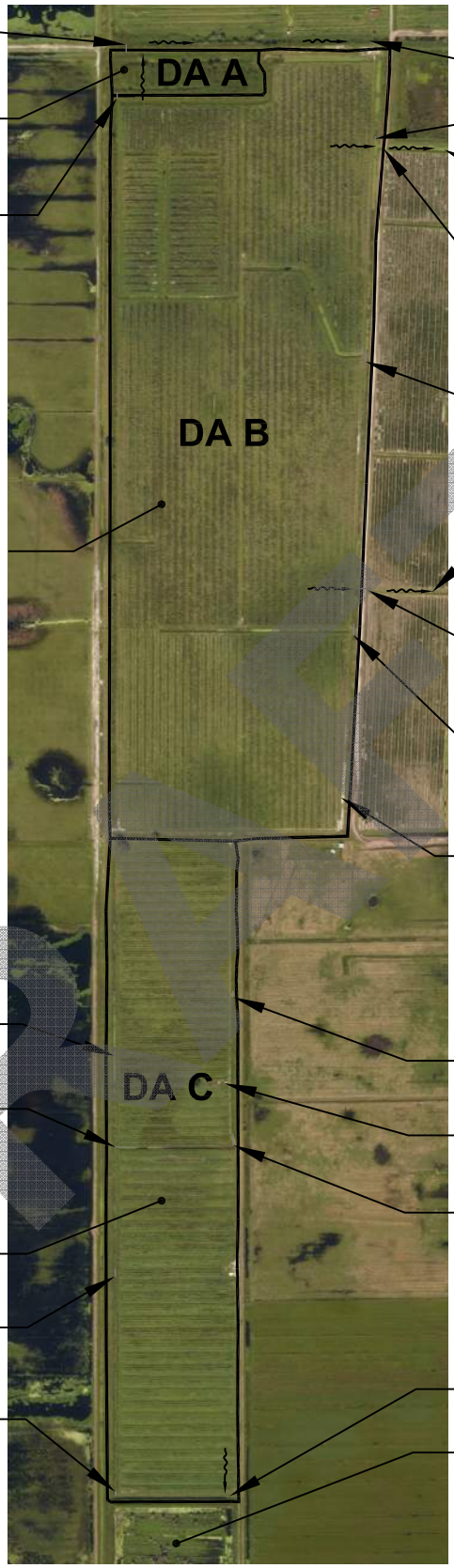


36" CPP
Discharges
Off-Site

Pre-Restoration
Drainage Area A = 6.90Ac

18" CMP

Off-Site Discharge
Flow Direction

Un-Named Canal to
Canal C-41 (North Canal)

24" CMP

Un-Named Canal to
Canal C-41 (East Canal)

24" Flashboard Riser
Existing Control Structure 1
Discharges Off-Site

24" CMP

Pre-Restoration
Drainage Area B = 199.86 Ac

Un-Named Canal to
Canal C-41 (East Canal)

24" Flashboard Riser
Existing Control Structure 2
Discharges Off-Site

24" CMP

North/South Access Road

24" CMP

24" CMP

24" CMP

Pump

24" CMP

Pre-Restoration
Drainage Area C = 88.06 Ac

42" CMP

3-12" HDPE

Pump
Discharges Off-Site

Existing Pond to
Canal C-41

N

N.T.S.

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| | |
|---|---|
| PROJECT NO. | 20162768.002A |
| DRAWN: | 3/18/16 |
| DRAWN BY: | JJT |
| CHECKED BY: | CTC |
| FILE NAME: | 17863SG - basin delineation revision 7_21_2016.dwg |

**PRE-RESTORATION**

**BASIN_MAP**

NRCS Seventy Grove
Wetland Reserve Easement
Highlands County
FLORIDA

Figure

1

PLOTTED: 19 Oct 2016, 10:51am, ccolon
CAD FILE: G:\00_2015 Projects\20162768.002A_HDR Engineering Inc-NRCS 70 Grove\Incm\Files\Topo\ LAYOUT: Predev
ATTACHED IMAGES: Images: 17863.tif
ATTACHED XREFS:
OFFICE_NAME

SFWMD Pre-Application Meeting Notes (1/10/2019)

DRAFT

*Florida Department of Transportation*

RON DESANTIS
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

KEVIN J. THIBAULT
SECRETARY

**FDOT 414506-6 SR70 From CR29 to Lonesome Island Rd Meeting (Highlands County)**
Go-To Meeting
January 10, 2019
1:00 pm – 1:30 pm

**Meeting Minutes**

**Attendees:**

Carolyn McCreedy, SFWMD
Nicole Monies, FDOT
Randy Lachler, FDOT
Patrick Bateman, FDOT
Brent Setchell, FDOT
Sergio Figueroa, FDOT
Manny Monreal, FDOT

---

**44506-6 SR70 Realignment**

Nicole opened the meeting with introductions and then she described the project. Brent added the history of the project and Sergio mentioned that this project is a FDOT SWAT job.

FDOT is evaluating options for realigning SR 70 within the project limits by reconstructing the two existing travel lanes on a new alignment south of the existing SR 70, with the option to expand to a 4-lane ultimate typical in the future. The total length of the proposed project is approximately 4.3 miles.

Discussion:

1. SFWMD stated north side of SR70 is a wetland restoration site
2. SFWMD stated south side of SR70 are permitted grove facilities
   a) Verify permitted conditions and maintain control elevations
   b) Verify locations of agricultural wells
3. SFWMD emphasized the importance of establishing an accurate SHW elevation
4. SFWMD emphasized the need for a reciprocal outfall if discharging to agricultural canal
   a) Agricultural canal located adjacent to SR 70 on the south side will be relocated south
   b) Agricultural canal will be owned and maintained by others
   c) Agricultural canal may serve as an outfall for FDOT

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Discussion Cont.:

5. SFWMD offered that it might be best to apply for a 20-year conceptual permit if FDOT only plans to construct the interim 2-lanes, but permit the ultimate 4-lanes.
6. FDOT indicated it will maintain/replace the 3 existing cross drains. Currently, these cross drains act as equalizers rather than moving water from one side to the other. FDOT will ensure they are sized appropriately.
7. Proposed Treatment Method Criteria:
   a) Wet Detention: greater of 1" over basin or 2.5" over net new impervious
   b) Dry Retention: 50% reduction (for dry retention, ensure facilities recover)
   c) Nutrient Loading Calcs for discharges to impaired WBID (Harney Pond Canal, C-41)
   d) SFWMD to verify the 50% more treatment criteria due to discharges to impaired WBID
8. Proposed Attenuation Criteria:
   a) Design Storm Events: 25 year 72 hour, 100 year 72 hour
   b) C-41 Basin Requirement: 35.4 CSM (cfs per Sq. Mile), 10 year 72 hour
9. Proposed Floodplain Compensation:
   a) SFWMD emphasized no offsite impacts
   b) SFWMD will allow Cup for Cup Method or Modeling Methodology
   c) Hydrologic/Hydraulic Modeling (ICPR4): SFWMD emphasized no pre/post stage increases, and requested that model information represent construction documents and that a schematic be provided

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# APPENDIX E

# CULTURAL RESOURCE ASSESSMENT

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# CULTURAL RESOURCE ASSESSMENT SURVEY
# PROJECT DEVELOPMENT AND ENVIRONMENT (PD&E) STUDY

# STATE ROAD (SR) 70 FROM COUNTY ROAD (CR) 29 TO LONESOME ISLAND ROAD
# HIGHLANDS COUNTY, FLORIDA

**Financial Project Identification No.: 414506-5-22-01**
**ETDM No.: 14364**

Florida Department of Transportation
District One
801 North Broadway Avenue
Bartow, Florida 33830

DRAFT

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding May 26, 2022 and executed by FHWA and FDOT.

**January 2023**

# CULTURAL RESOURCE ASSESSMENT SURVEY
# PROJECT DEVELOPMENT AND ENVIRONMENT (PD&E) STUDY

# STATE ROAD (SR) 70 FROM COUNTY ROAD (CR) 29 TO LONESOME ISLAND ROAD
# HIGHLANDS COUNTY, FLORIDA

**Financial Project Identification No.: 414506-5-22-01**
**ETDM No.: 14364**

**Prepared for:**

The Florida Department of Transportation
District One
801 N. Broadway Avenue
Bartow, Florida 33830-3809

**Prepared by:**

Archaeological Consultants, Inc.
8110 Blaikie Court, Suite A
Sarasota, Florida 34240

Marion Almy – Project Manager
Lee Hutchinson – Project Archaeologist
Justin Winkler – Archaeologist
Kimberly M. Irby – Project Architectural Historian
Savannah Young – Architectural Historian

**In Association with:**

Kisinger Campo & Associates
201 North Franklin Street, Suite 400
Tampa, Florida 33602

**January 2023**

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# EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District One is conducting a Project Development and Environment (PD&E) Study along State Road (SR) 70 from County Road (CR) 29 to Lonesome Island Road in Highlands County, Florida. The purpose of this project is to improve roadway deficiencies of the SR 70 corridor from CR 29 to Lonesome Island Road. In addition, the project intends to enhance operational capacity of the corridor, thereby improving emergency evacuation/response times as well as access for standard roadway maintenance (FDOT 2022). The study is approximately 4.3-miles long and proposed improvements include realigning the two-lane undivided segment of SR 70 by reconstructing the two existing travel lanes on new alignment; the widening of this segment up to four lanes is also being considered. The realignment will occur on the south side of SR 70 where new right-of-way (ROW) is proposed and the existing canal that runs parallel to SR 70 will be rerouted; no additional ROW is required on the north side of the roadway. In addition, linear ponds will be constructed within the new ROW and two Floodplain Compensation (FPC) sites will be developed at the eastern and western limits of the project. The project was evaluated through FDOT's Efficient Transportation Decision Making (ETDM) process as project No. 14364. This is a federally funded project.

The purpose of this Cultural Resource Assessment Survey (CRAS) was to locate and identify any archaeological sites and historic resources within the project area of potential effect (APE) and to assess their significance in terms of eligibility for listing in the National Register of Historic Places (NRHP). As defined in *36 Code of Federal Regulations [CFR] Part § 800.16(d)*, the APE is the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." The archaeological APE is limited to the footprint of proposed activities within the existing boundaries of the project. The historical/architectural APE includes immediately adjacent parcels where resources within 200-feet (ft) of the existing ROW were surveyed along the north side of SR 70 and resources within 500-ft from edge of proposed ROW were surveyed on the south where new ROW will be acquired. In addition, the historical/architectural APE for the two FPC sites includes the footprint of construction and immediately adjacent parcels as contained within 100-ft. The fieldwork was conducted in November 2022.

All work was conducted to comply with Section 106 of the *National Historic Preservation Act* of 1966, as amended by Public Law 89-665; the *Archaeological and Historic Preservation Act*, as amended by Public Law 93-291; Executive Order 11593; and Chapter 267, *Florida Statutes (FS)*. All work was carried out in conformity with Part 2, Chapter 8 ("Archaeological and Historical Resources") of the FDOT's *Project Development and Environment (PD&E) Manual* (FDOT 2020), and the Florida Division of Historical Resources' (FDHR) standards contained in the *Cultural Resource Management Standards and Operational Manual* (FDHR 2003), as well as with the provisions contained in the Chapter 1A-46, *Florida Administrative Code* (*FAC*). Principal Investigators meet the *Secretary of the Interior's Historic Preservation Professional Qualification Standards* (48 FR 44716) for archaeology, history, architecture, architectural history, or historic architecture.

Archaeological background research including a review of the Florida Master Site File (FMSF) and the NRHP indicated that four sites have been recorded within one mile of the APE, and all are dated to the Belle Glades period (BCE 700–700 CE) (**Figure 4.1; Table 4.1**). 8HG00627 was considered ineligible for listing in the National Register for Historic Places (NRHP) by the State Historic Preservation Officer (SHPO). Two precontact sand mounds were recorded and include 8HG00629, a prehistoric burial mound with human remains that was deemed eligible for listing in the NRHP by the SHPO, while 8HG00630, another precontact sand mound, was not evaluated by the

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SHPO. A precontact campsite (8HG00632), was determined to have insufficient information for an eligibility determination by the SHPO. The corridor has environmental features which indicate additional sites may be found, thus requiring archaeological testing. A review of relevant site locational information for environmentally similar areas within Highlands County and the surrounding region indicated a low to moderate probability for prehistoric archaeological sites within the APE. Background research also indicated that sites, if present, would most likely be small lithic/artifact scatters. As a result of the field survey, no archaeological sites were discovered.

Historic background research, including a review of the FMSF and the NRHP, indicated that no historic resources were previously recorded within the APE. A review of relevant historic United States Geological Survey (USGS) quadrangle maps, historic aerial photographs, and the Highlands County property appraiser's website data revealed the potential for four new historic resources 45 years of age or older (constructed in 1977 or earlier) within the APE (McIntyre 2022).

Historic/architectural field survey resulted in the identification and evaluation of four historic resources (8HG01577, 8HG01578, 8HG01579, and 8HG01580) within the APE. These include one building (8HG01577), one bridge culvert (8HG01578), and two linear resources (8HG01579 and 8HG01580). The Frame Vernacular style building (8HG01577) is located at 2121 SR 70 E and was constructed in circa (ca.) 1977. Overall, the building lacks sufficient architectural features and is not a significant embodiment of a type, period, or method of construction. The SR 70 Cross Drain Culvert (8HG01578) is a pre-cast concrete culvert constructed in ca. 1970 in order to carry SR 70 over an unnamed cross drain which provides a connection between the drainage canals running parallel to SR 70. The resource is a typical example of a common post-1945 concrete bridge culvert found throughout Florida and does not possess any notable engineering features or design elements. As such, this type of bridge culvert is excluded from Section 106 consideration by the Program Comment for Common Post-1945 Concrete and Steel Bridges (Federal Register 2012:68793). The 4.3-mile segment of SR 70 (8HG01579) within the APE is a two-lane undivided roadway was historically known as Florida State Road 8 and was constructed by ca. 1926. Overall, the segment of SR 70 within the APE is a common two-lane roadway that lacks specific design or engineering features or characteristics that would differentiate it from other similar roads. The 3.8-mile-long and 4.3-mile-long segments of the SR 70 Drainage Canals (8HG01580) within the APE were constructed in ca. 1943. The drainage canals are not associated with surrounding major drainage projects. Overall, the SR 70 Drainage Canals are a common example of early twentieth century drainage canals found throughout Highlands County and lack unique design or engineering features. The newly identified historic resources have been altered, lack sufficient architectural or engineering features, and background research did not reveal any historical associations with significant persons and/or events. Thus, the resources do not appear eligible for listing in the NRHP, either individually or as a part of a historic district.

Given the results of background research and field survey, including the excavation of 114 shovel tests, no archaeological sites that are listed, determined eligible for listing, or that appear potentially eligible for listing in the NRHP were located within the APE. Historic/architectural field survey resulted in the identification and evaluation of four historic resources (8HG01577, 8HG01578, 8HG01579, and 8HG01580) within the APE. These include one building (8HG01577), one bridge culvert (8HG01578), and two linear resources (8HG01579 and 8HG01580). Overall, the newly identified historic resources have been altered, lack sufficient architectural or engineering features, and background research did not reveal any historical associations with significant persons and/or events. Thus, the resources do not appear eligible for listing in the NRHP, either individually or as a part of a historic district. As such, there are no cultural resources that are listed, eligible for listing, or that appear potentially eligible for listing in the NRHP within the APE. Therefore, it is the professional opinion of ACI that the proposed undertaking will result in no historic properties affected.

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# TABLE OF CONTENTS



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# FIGURES, TABLES, AND PHOTOGRAPHS

**Figures** **Page**



**Tables**



**Photographs**



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# 1.0 INTRODUCTION

The Florida Department of Transportation (FDOT) District One is conducting a Project Development and Environment (PD&E) Study along State Road (SR) 70 from County Road (CR) 29 to Lonesome Island Road in Highlands County, Florida (**Figure 1.1**). The purpose of this project is to improve roadway deficiencies of the SR 70 corridor from CR 29 to Lonesome Island Road. In addition, the project intends to enhance operational capacity of the corridor, thereby improving emergency evacuation/response times as well as access for standard roadway maintenance (FDOT 2022). The project was evaluated through FDOT's Efficient Transportation Decision Making (ETDM) process as project No. 14364. This is a federally funded project.

## 1.1 Project Description

The study is approximately 4.3-miles long and proposed improvements include realigning the two-lane undivided segment of SR 70 by reconstructing the two existing travel lanes on new alignment; the widening of this segment up to four lanes is also being considered. The realignment will occur on the south side of SR 70 where new right-of-way (ROW) is proposed and the existing canal that runs parallel to SR 70 will be rerouted; no additional ROW is required on the north side of the roadway. In addition, linear ponds will be constructed within the new ROW and two Floodplain Compensation (FPC) sites will be developed at the eastern and western limits of the project.

SR 70 serves as an east-west corridor across Central Florida from Bradenton to Fort Pierce. Within the study limits, the SR 70 corridor is classified as a rural principal arterial and is a part of the Strategic Intermodal System (SIS). The existing roadway is a two-lane undivided facility with 10-foot travel lanes and 6-foot (4-foot paved) shoulders. SR 70 is exhibiting severe pavement distress. FDOT conducted a geotechnical investigation and determined unsuitable material beneath the roadbed is likely the cause of the pavement distresses. Segments of SR 70 will need to be reconstructed to remove the unsuitable material to maintain an acceptable pavement condition. The narrow shoulders and border area along with the deep canals make reconstructing the roadway infeasible within the existing ROW. As a result, additional ROW must be acquired to reconstruct and rehabilitate the existing roadway. In addition, there is the need for a four-lane divided roadway.

## 1.2 Report Purpose

The purpose of the Cultural Resource Assessment Survey (CRAS) was to locate and identify any archaeological sites and historic resources within the project area of potential effects (APE) and to assess their significance in terms of eligibility for listing in the National Register of Historic Places (NRHP). All work was conducted to comply with Section 106 of the *National Historic Preservation Act* of 1966, as amended by Public Law 89-665; the *Archaeological and Historic Preservation Act*, as amended by Public Law 93-291; Executive Order 11593; and Chapter 267, *Florida Statutes (FS)*. All work was carried out in conformity with Part 2, Chapter 8 ("Archaeological and Historical Resources") of the FDOT's *Project Development and Environment (PD&E) Manual* (FDOT 2020), and the Florida Division of Historical Resources' (FDHR) standards contained in the *Cultural Resource Management Standards and Operational Manual* (FDHR 2003), as well as with the provisions contained in the Chapter 1A-46, *Florida Administrative Code* (*FAC*). Principal Investigators meet the *Secretary of the Interior's Historic Preservation Professional Qualification Standards* (48 FR 44716) for archaeology, history, architecture, architectural history, or historic architecture.

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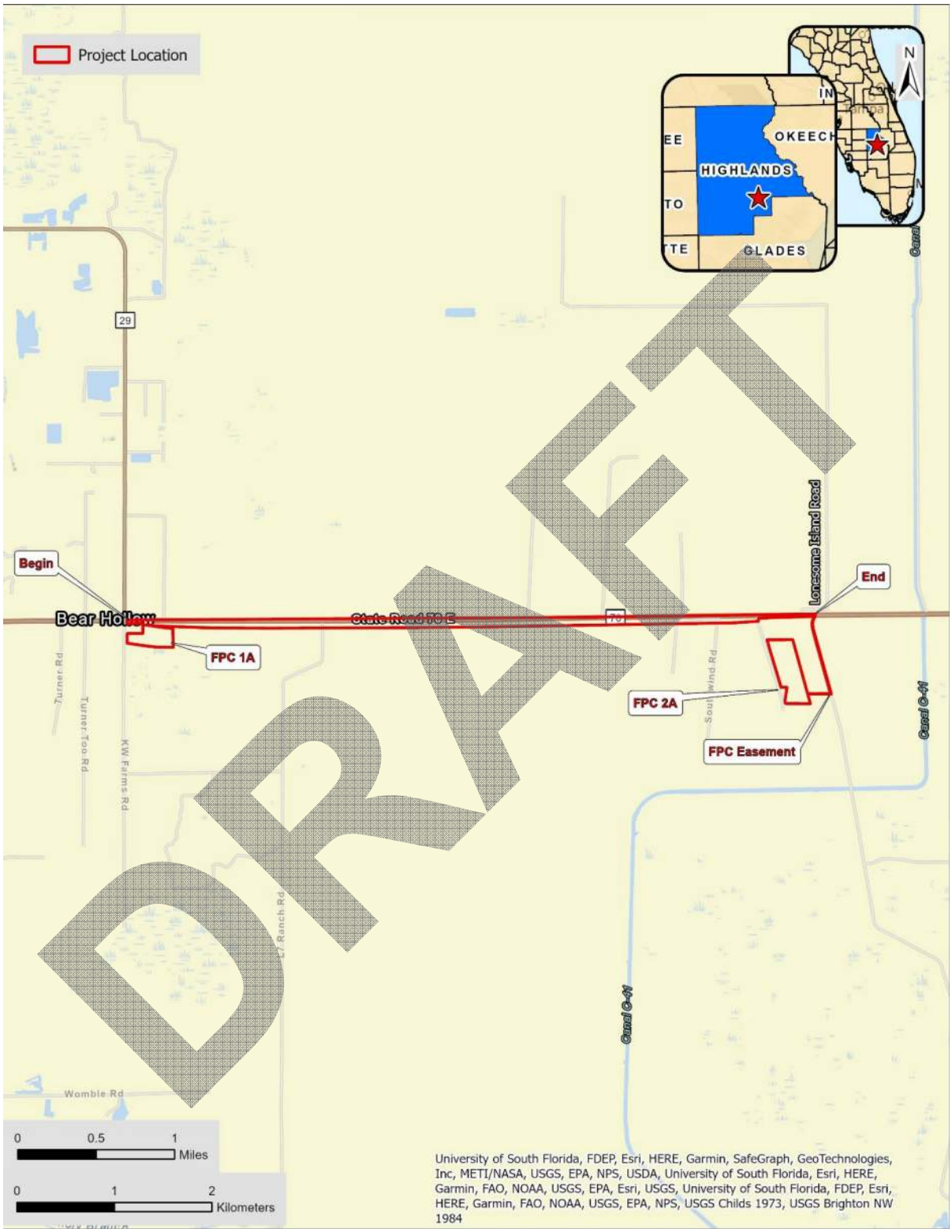


**Figure 1.1.** Project location.

## 1.3 Area of Potential Effects

As defined in *36 Code of Federal Regulations [CFR] Part § 800.16(d)*, the APE is the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." The archaeological APE is limited to the footprint of proposed activities within the existing boundaries of the project. The historical/architectural APE includes immediately adjacent parcels where resources within 200-feet (ft) of the existing ROW were surveyed along the north side of SR 70 and resources within 500-ft from edge of proposed ROW were surveyed on the south where new ROW will be acquired. In addition, the historical/architectural APE for the two FPC sites includes the footprint of construction and immediately adjacent parcels as contained within 100-ft.

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# 2.0 ENVIRONMENTAL SETTING

Environmental factors such as geology, topography, relative elevation, soils, vegetation, and water are important in determining where archaeological sites were likely located. These variables influenced what types of resources were available in each area, which in turn influenced decisions regarding settlement location and land-use patterns. Because of the influence of these environmental factors upon the inhabitants, a discussion of the effective environment is included.

## 2.1 Location and Setting

The SR 70 APE consists of the ROW extending from CR 29 to Lonesome Island Road and is in Section 36, Township 37 South, Range 30 East; Sections 31-34, Township 37 South, Range 31 East; Section 1, Township 38 South, Range 30 East; Section 3-6, Township 38 South, Range 31 East (United States Geological Survey [USGS] Brighton NW and Childs 2013a, b) (**Figure 2.1**). The project area contains two defined FPCs: FPC 1A occupies the western terminus of the project corridor adjacent to south SR 70 and includes a 19-acre plot of lowland hay fields (**Photo 2.1**). FPC 2A currently overlaps a 31.5-acre portion of the Premier Citrus grove operation, including a proposed easement following Joe Durrance Road terminating at SR 70 (**Photo 2.2**). The proposed ROW expansion and canal reroute south of SR 70 initially proceeds through woodland pasture intersected by a minor bay swamp (**Photos 2.3, 2.4**). Conditions at L-7 Ranch Road transform into lowland pasture until reaching RB Farms which has intensive sod farming that shifts to abandoned citrus grove until Dosia Smith Road (**Photos 2.5-2.7**). At this point, ROW improvements adjust to the existing SR 70 boundaries terminating at Lonesome Island Road (**Photo 2.8**). Extensive disturbance within the project area largely consists of rural agricultural improvement particularly from citrus cultivation and sod farming. There are also parallel east and westbound canals that signal long-term destruction of the survey corridor (**Photos 2.9, 2.10**).

**Photo 2.1.** Lowland hay field conditions from north pond limits (FPC 1A).

**Photo 2.2.** Gravel road conditions overlapping proposed easement location in citrus grove (FPC 2A).

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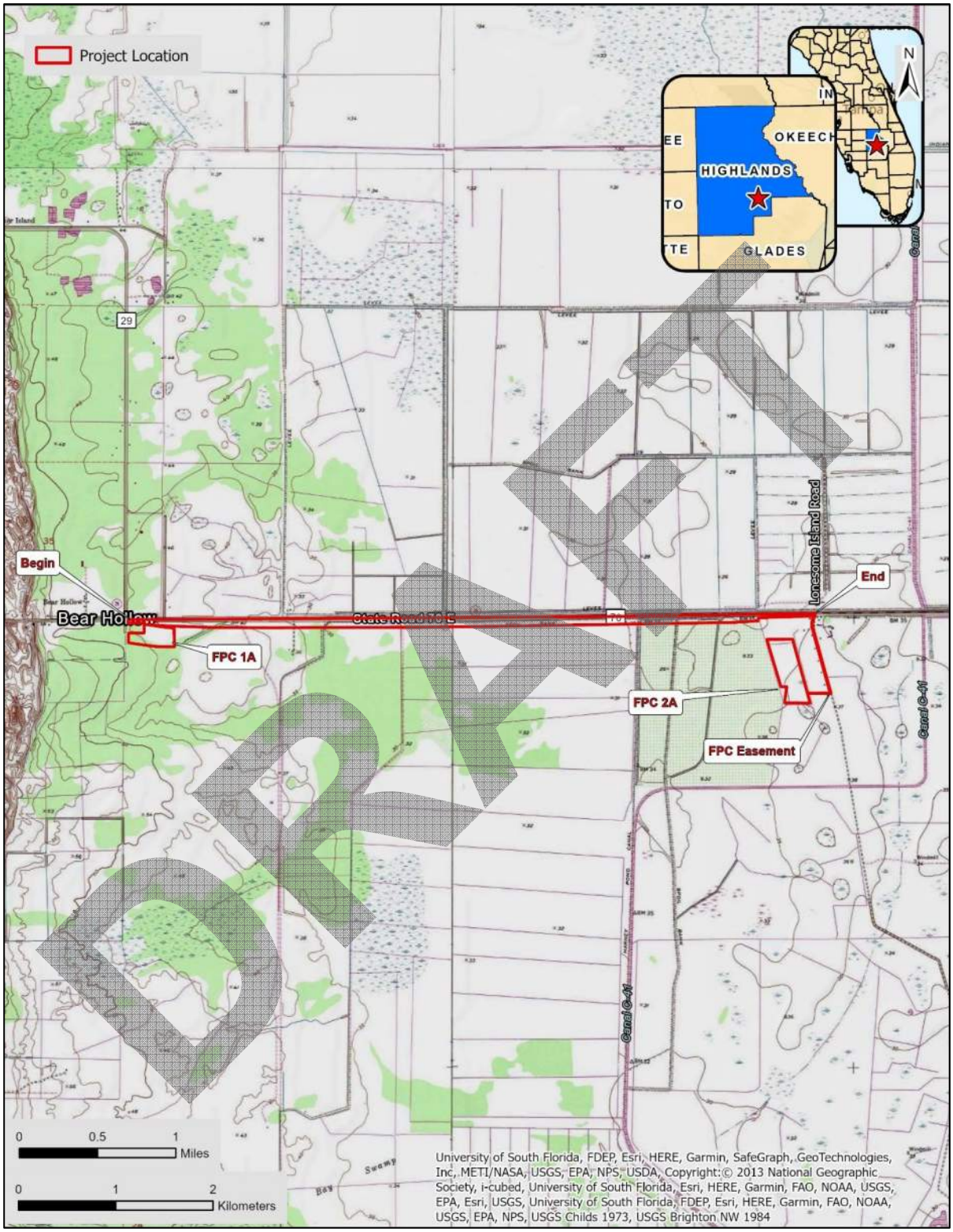


**Figure 2.1.** Environmental setting of the SR 70 corridor and two FPC sites.

**Photo 2.3.** Woodland pasture in southern ROW between CR 29 and L-7 Ranch Road.

**Photo 2.4.** Southern ROW expansion and canal reroute intersecting wetland between FPC 1A and linear pond 1.

**Photo 2.5.** Lowland pasture conditions in south ROW between L-7 Ranch Rd and RB sod farm.

**Photo 2.6.** Southern ROW expansion and canal reroute conditions within RB sod farm.

**Photo 2.7.** Abandoned citrus grove between RB sod farm and Dosia Smith Rd in south ROW.

**Photo 2.8.** SR 70 corridor conditions from Lonesome Island Rd.

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**Photo 2.9.** North canal conditions parallel within west half of SR 70 corridor.

**Photo 2.10.** South canal conditions within east half of SR 70 corridor.

## 2.2 Physiography and Geology

The APE is contained within the Central Highlands physiographic zone, and more specifically at the junctions of the Lake Wales Ridge, Okeechobee Plain and the Caloosahatchee Incline (White 1970). The APE is geologically underlain by undifferentiated, lighter yellow sediment of the Pleistocene and Holocene (Scott 1978, 2001; Scott et al. 2001). These are surficially evidenced by medium fine sand and silt, shelly sand and clay, and peat. The APE ranges in elevation from 30-45 ft about mean sea level (amsl).

## 2.3 Soils and Vegetation

General vegetation tends to consist of the Grasslands Prairie type, with additional environments of freshwater marshes and forests of longleaf pine and xerophytic oaks. According to the U.S. Department of Agriculture (USDA), the length of the APE consists of three soil associations: the Myakka-Immokalee-Smyrna, Felda-Hicoria-Malabar, and Kaliga-Tequesta-Gator associations. The Myakka-Immokalee-Smyrna association is characterized by nearly level, poorly drained, sandy soils that have an organic stained subsoil. Native vegetation includes longleaf and slash pine with an undergrowth of saw palmetto, running oak, inkberry, wax myrtle, huckleberry, chalky bluestem, pineland threeawn, scattered fetterbush and gallberry. In depressions, water tolerant plants such as cypress, loblolly bay, gorodonia, red maple, sweetbay, maidencane, blue maidencane, chalky bluestem, sand cordgrass and bluejoint panicum are more common. The Felda-Hicoria-Malabar association is characterized by nearly level, poorly drained or very poorly drained sandy soils that are underlain by loamy material at a depth of 20 to more than 40 inches (in). Natural vegetation consists of cypress, willow, sweetbay, red bay, pickerel weed, arrowhead, maidencane, sawgrass, chalky bluestem, bushybeard bluestem, sand cordgrass, wax myrtle, and other water tolerant plants. Some areas have scattered cabbage palms, cypress, wax myrtle, pond pine, slash pine, pineland threeawn, and various grasses, vines, and shrubs. In depressions, the vegetation is dominantly St. Johnswort or maidencane. The Kaliga-Tequesta-Gator association is characterized by nearly level, very poorly drained soils that have an organic layer underlain by loamy material. A large part of this soil is in natural vegetation of sawgrass, pickerel weed, maidencane, cattails, flags, and scattered thickets of woody button bush. A few areas are covered with cypress, red maple, loblolly bay, black tupelo, sweetgum, needlegrass pickerel weed, ferns, wax myrtle, cordgrass or Jamaica sawgrass, Coastal Plain willow, redosier

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dogwood, and American hornbeam (Carter et al. 1989). The specific soil types within the APE are listed in **Table 2.1** and their locations are depicted on **Figures 2.2-2.4**.

**Table 2.1.** Soil types within the APE.

| Soil type, % slopes | Drainage | Setting |
|---|---|---|
| Felda fine sand, 0-2% | Poor | Slough. Sandy over loamy soils on flats of hydric or mesic lowlands. |
| Immokalee sand, 0-2% | Poor | Slough. Sandy soils on flats of mesic or hydric lowlands |
| Kaliga Muck, frequently ponded, 0-1% | Very poor | Freshwater marshes and ponds. Organic soils in depressions and on floodplains |
| Sanibel Muck, frequently ponded, 0-1% | Very poor | Freshwater marshes and ponds. Organic soils in depressions and on flood plains. |
| Tequesta Muck, frequently flooded, 0-1% | Very poor | Sandy soils on flats of mesic or hydric lowlands |

The APE falls at the junction of pine flatwoods and sand pine and scrub forests; the latter is on the ridge top, with the pine flatwoods in the lower lying area (Davis 1980). The soils support different vegetative regimes, which in turn provide habitats for the local animal population, and thus providing essential food resources. They have variable suitability for openland, woodland, and wetland habitats. The habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses, and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, dove, meadowlark, field sparrow, cottontail, and sparrow hawk. Both Felda fine sand and Tequesta muck are well-suited for openland areas. Woodland wildlife habitat includes area of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include turkey, thrushes, woodpeckers, squirrels, gray fox, racoon, wild hog, white-tailed deer, and owl. The habitat for wetland wildlife includes areas of open, marshy, or swampy, shallow water areas. Wildlife in these areas include ducks, egrets, herons, ibis, kingfishers, alligators, mink, and otters. Basinger and Felda fine sands, and Kaliga, Sanibel, and Tequesta mucks are all well-suited to wetlands (Carter et al. 1989: Table 8). Those soils not mentioned above are rated poor or very poor for that habitat.

## 2.4 Paleoenvironmental Considerations

The early environment of the region was different from that seen today. Sea levels were lower, the climate was arid, and fresh water was scarce. An understanding of human ecology during the earliest periods of human occupation in Florida cannot be based on observations of the modern environment because of changes in water availability, botanical communities, and faunal resources. Aboriginal inhabitants would have developed cultural adaptations in response to the environmental changes taking place, which were then reflected in settlement patterns, site types, artifact forms, and subsistence economies.

Due to the arid conditions between 16,500 and 12,500 years ago, the perched water aquifer and potable water supplies were absent. Palynological studies conducted in Florida and Georgia suggest that between 13,000 and 5000 years ago, this area was covered with an upland vegetation community of scrub oak and prairie (Watts 1969, 1971, 1975). However, the environment was not static. Evidence recovered from the inundated Page-Ladson Site in north Florida has clearly demonstrated that there were two periods of low water tables and dry climatic conditions and two episodes of elevated water tables and wet conditions (Dunbar 2006). The rise of sea level reduced xeric habitats over the next several millennia.

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By 5000 years ago, a climatic event marking a brief return to Pleistocene climatic conditions induced a change toward more open vegetation. Southern pine forests replaced the oak savannahs. Extensive marshes and swamps developed along the coasts and subtropical hardwood forests became established along the southern tip of Florida (Delcourt and Delcourt 1981). Northern Florida saw an increase in oak species, grasses, and sedges (Carbone 1983). At Lake Annie, in south central Florida, wax myrtle and pine dominated pollen cores. The assemblage suggests that by this time, a forest dominated by longleaf pine along with cypress swamps and bayheads existed in the area (Watts 1971, 1975). About 5000 years ago, surface water was plentiful in karst terrains and the level of the Floridan aquifer rose to 5 ft above present levels. With the establishment of warmer winters and cooler summers than in the preceding early Holocene, the fire-adapted pine communities prevailed. These depend on the high summer precipitation caused by the thunderstorms and the accompanying lightning strikes to spark the fires (Watts et al. 1996; Watts and Hansen 1994). The increased precipitation resulted in the formation of the large swamp systems such as the Okefenokee and Everglades (Gleason and Stone 1994). At this time, modern floral, climatic, and environmental conditions were established.

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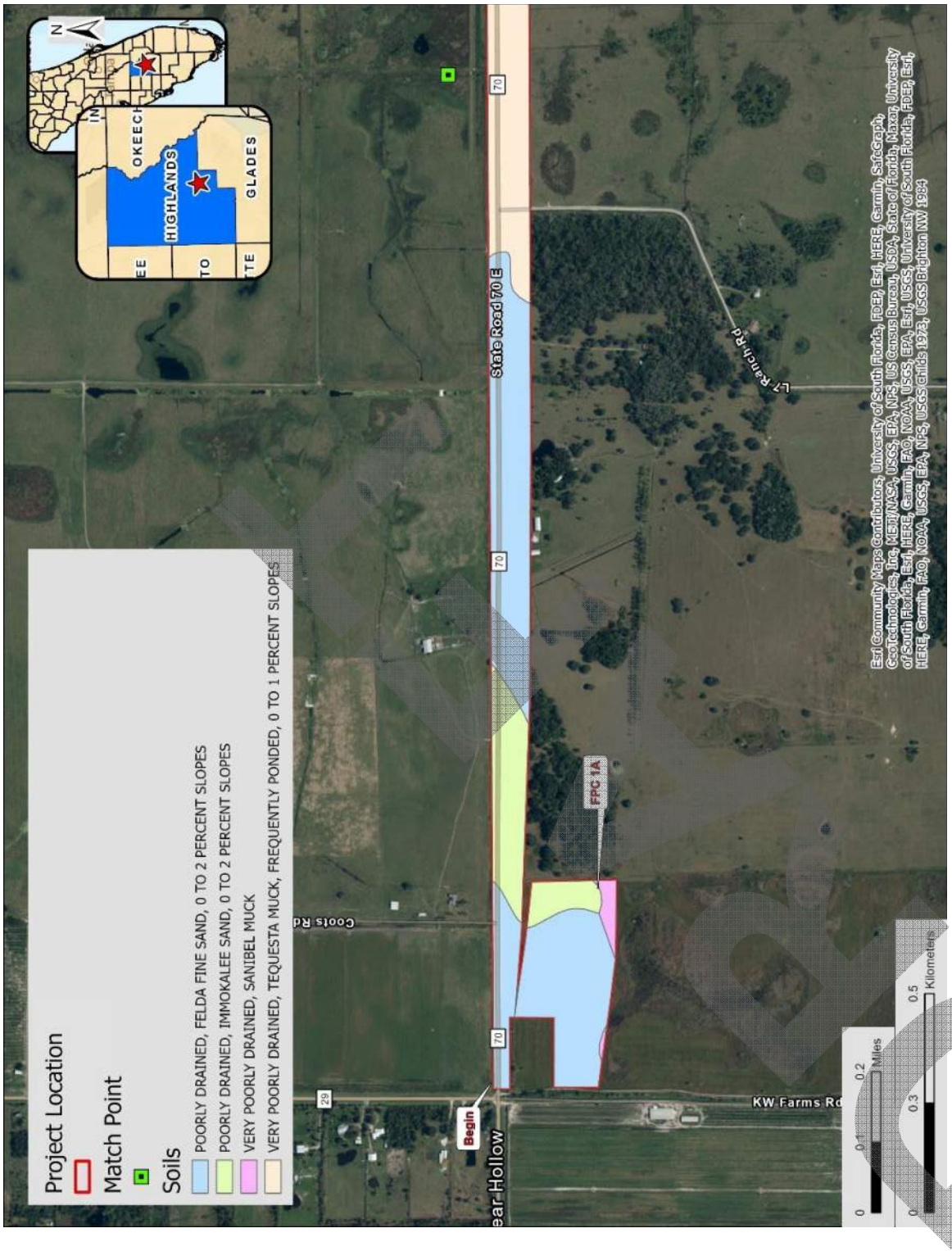


**Figure 2.2.** Soil type distribution within the project.

**Figure 2.3.** Soil type distribution within the project.

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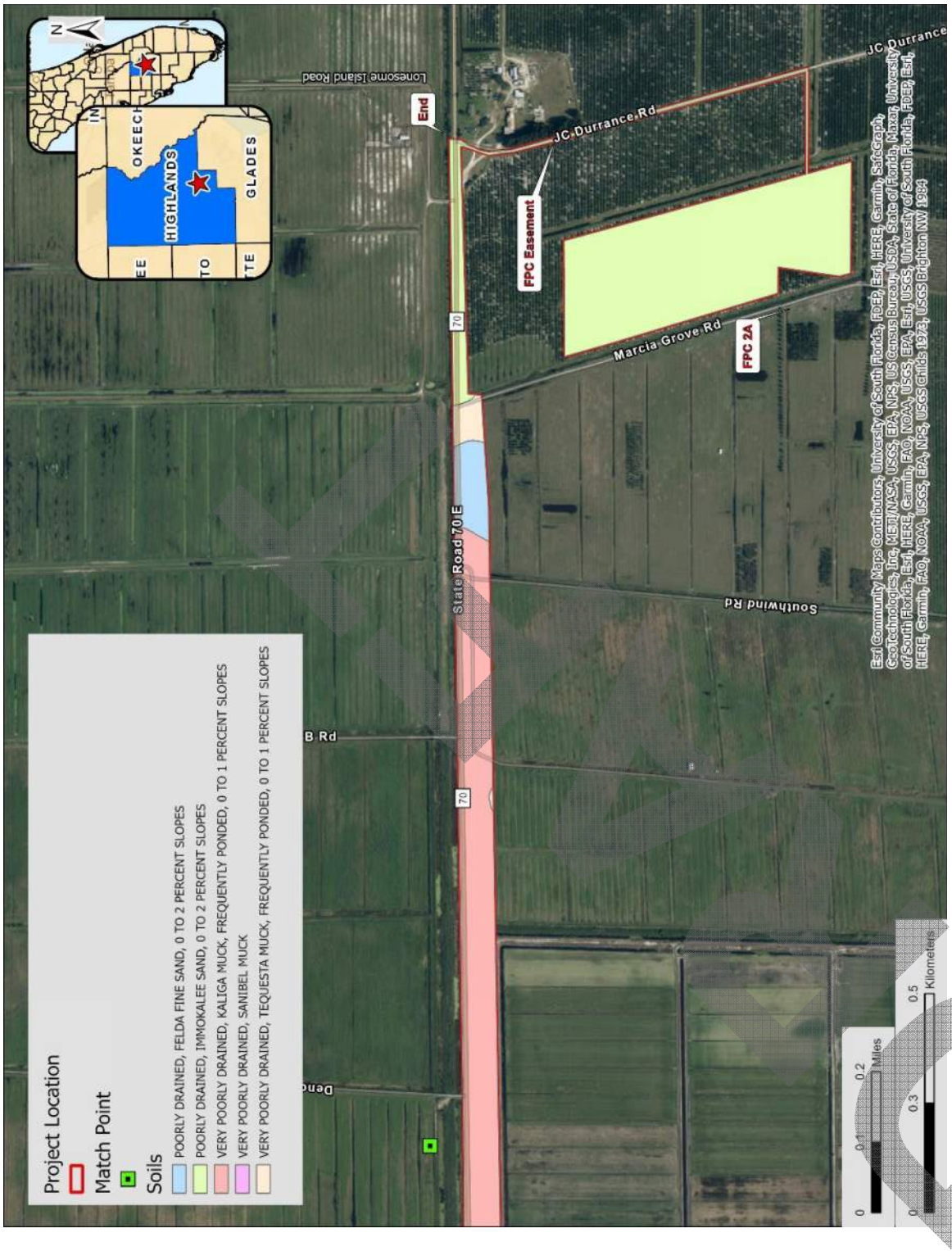


**Figure 2.4.** Soil type distribution within the project.

## 3.0 CULTURAL HISTORY

In general, archaeologists summarize the culture history of a given area (i.e., an archaeological region) by outlining the sequence of archaeological cultures through time. These cultures are defined largely in geographical terms but also reflect shared environmental and cultural factors. The project area lies within the area once known archaeologically as the Kissimmee Region, as first described by John Goggin (1947). Based on the most recent revisions of South Florida archaeological areas, the project area is situated within the Okeechobee Basin archaeological region (Milanich 1994:227; Milanich and Fairbanks 1980), alternatively referred to as the Belle Glade Area of the South Florida Region (Griffin 1988) (**Figure 3.1**). Despite the systematic excavations at the Belle Glade (Willey 1949) and Fort Center (Sears 1982) sites, situated on opposite sides of Lake Okeechobee, the Okeechobee Basin/Belle Glade area (hereinafter referred to as the Belle Glade Area) is perhaps the least known of all the South Florida regions.

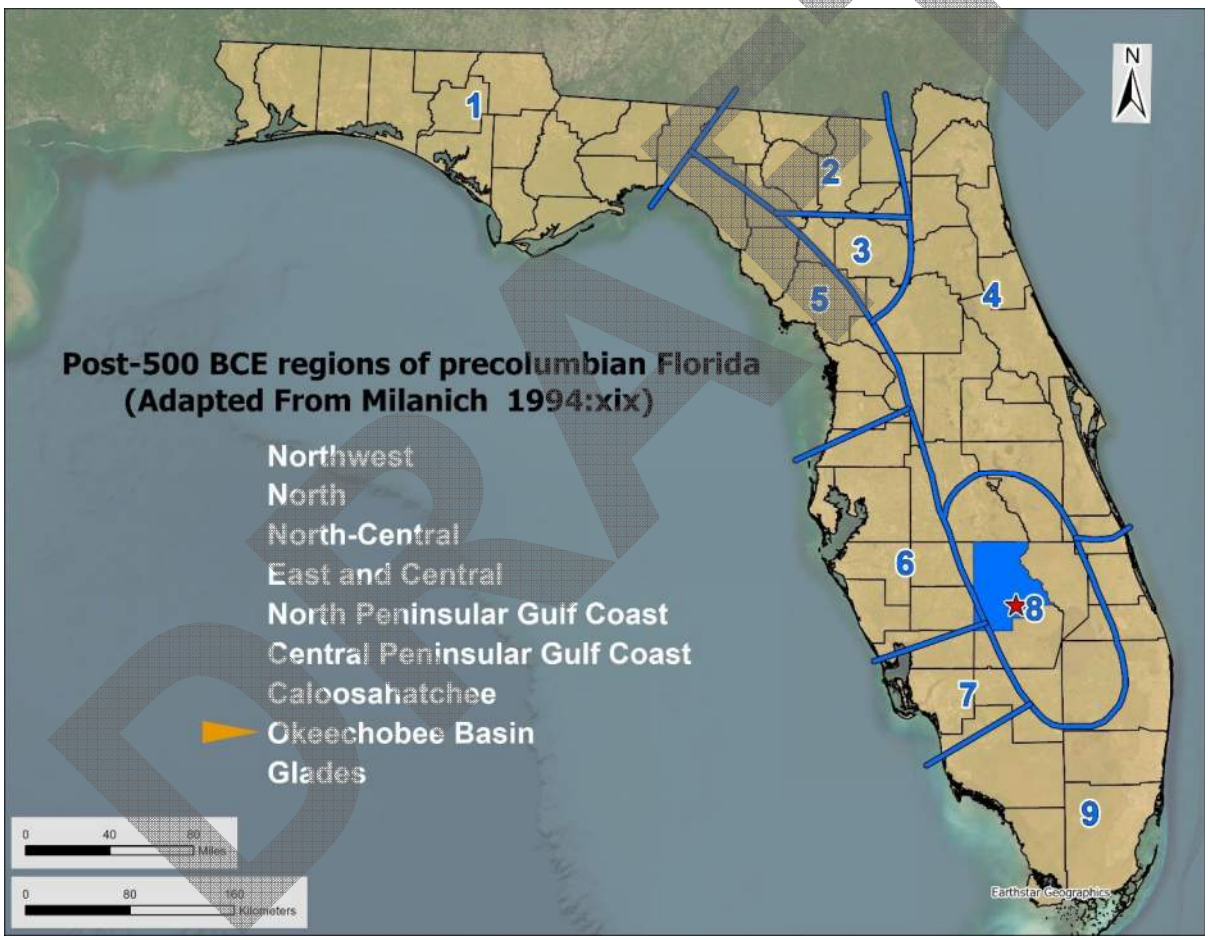


**Figure 3.1**. Florida Archaeological Regions.

The sequence of cultural development for the South Florida Region is pan-regional during the earliest periods of human occupation: the Paleoindian and the Archaic. By approximately 500 BCE (Before Common Era), distinctive regional cultures were present, and the Belle Glade culture had developed in adaptation to the surrounding savannahs and hammocks. A notable feature of this area is the large and sometimes complex earthworks, including linear ridges, circular-linear earthworks, and circular earthworks. These are found in the area surrounding Lake Okeechobee and extending northward into the Kissimmee River Valley.

The local history of the region is divided into four broad periods based initially upon the major governmental powers. The first period, Colonialism, occurred during the exploration and control of Florida by the Spanish and British from around 1513 until 1821. At that time, Florida became a territory of the United States and 21 years later became a State (Territorial and Statehood). The Civil War and Aftermath (1861-1899) period deals with the Civil War, the period of Reconstruction following the war, and the late 1800s, when the transportation systems were dramatically increased and development throughout the state expanded. The Twentieth Century includes sub-periods defined by important historic events such as the World Wars, the Boom of the 1920s, and the Depression. Each of these periods evidenced differential development and utilization of the region, thus effecting the historic site distribution across the land.

## 3.1 Paleoindian

There is little evidence of the earliest of Florida's known occupational periods within the Belle Glade area. For general information, Griffin (1989) and others (i.e.Widmer 1988) point to Paleoindian sites outside the area, including Little Salt Spring (Clausen et al. 1975b; 1979) and Warm Mineral Springs (Clausen et al. 1975a) in Sarasota County, as well as the Cutler Fossil Site (Carr 1986) in Dade County. One possible Paleoindian site, Sharktooth Mountain (8GL130), is located north of Fisheating Creek. The site is represented by two possible chert flakes found in association with marine fossils recovered from dredged pond spoil (Carr 1990). A Simpson type projectile point, discovered by an avocational archaeologist at the Avon Park Air Force Range (Austin and Piper 1986), suggests that aboriginal groups may have entered the Belle Glade Area at a relatively early date. Based upon current environmental data, the scarcity of Paleoindian sites in this region is not surprising. Pollen profiles suggest that the Belle Glade Area was extremely arid (Watts 1975:346).

## 3.2 Archaic

The extremely arid conditions of the Paleoindian and Early Archaic (6500-5000 BCE) gradually gave way to more mesic conditions in much of peninsular Florida during the Middle Archaic, ca. 5000 to 2000 BCE. However, the continued relative scarcity of sites in the Belle Glade Area may be indicative of the persistence of inhospitable xeric conditions (Watts 1975; Watts and Hansen 1988). Among the rare sites dated to the Archaic is a preceramic Archaic midden discovered by Gleason and Stone on a ridge east of Lake Okeechobee (Hale 1984:173). In addition, the Chandler Slough Site in Okeechobee County, originally found during a roadway survey (Ballo and Wiedenfeld 1989), yielded both a Florida Archaic Stemmed (subtype Marion) and a Lafayette-like projectile point, datable to the Middle to Late Archaic and Late Archaic to Transitional periods, respectively (Ballo and Browning 1991). Further, survey of the Avon Park Air Force Range resulted in the discovery of several lithic scatter type sites, that might date to the Archaic (Austin 1987:290).

By the Middle Archaic period, water-associated mortuary sites are known at Little Salt Spring in Sarasota County and at the Bay West Site in Collier County (Beriault et al. 1981), west of the Belle Glade Area. Similarly, the Gauthier (Carr and Jones 1981) and Windover sites in Brevard County (Doran 2002) have yielded muck burials, and the Cheetum Site in Dade County (Newman 1986) has provided evidence of mostly secondary burials in a compact concretion zone at the base of the site. The Cheetum Site burials have been radiocarbon dated to about 4000 years ago.

According to Austin (1987:296) "population movement or expansion into the Kissimmee River and Okeechobee regions, if it occurred at all, probably took place sometime around 2000-1000 BCE, since intensive occupation of the interior prior to this would have been difficult because of the shortage of fresh water." This time, referred to as the Late or Ceramic Archaic (Orange phase), is evidenced by

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the first appearance of fiber-tempered pottery. While no fiber-tempered pottery is recorded in the Belle Glade area, near Lake Okeechobee, semi-fiber-tempered wares were found at the Fort Center Site (Sears 1982) and at the Ortona complex (Carr et al. 1995). Similarly, two sites, located within the Avon Park Air Force Range, yielded a small number of semi-fiber-tempered sherds (Austin 1987:291). Archaeological survey of a portion of the Brighton Seminole Reservation by the Archaeological and Historical Conservancy in 1992 resulted in the recording of several small campsites, tentatively dated to the Late Archaic, located in small hammocks along a freshwater prairie (FMSF).

Griffin suggests that during the latter part of the fiber-tempered period, much of the rim around the Everglades and down into the Upper Keys was sparsely settled, and the Everglades proper was not yet being used (1988:132). In addition, Hale (1984), citing work by Kelly Brooks (1974:256) suggests that it was not until nearly the third century that the rising water level in the Lake Okeechobee Basin caused the formation of sand beach ridges around the shoreline of the lake and much of present-day South Florida came into being.

The termination of the Late Archaic corresponds to a time of environmental change. The maturing of productive estuarine systems was accompanied by cultural changes leading to the establishment of what John Goggin originally defined as the "Glades Tradition" (Griffin 1988:133). Dominated by the presence of sand-tempered ceramics in the archaeological record, the Glades Tradition was also characterized by the exploitation of the food resources of the tropical coastal waters with secondary dependence on game and some use of wild plant foods (Goggin 1949).

## 3.3 Glades

The Glades Tradition was defined by Goggin based on the work he conducted in South Florida in the 1930s and 1940s (Goggin 1947). Goggin noticed that the archaeological assemblage, beginning about 500 BCE, began to take on a distinct appearance. This appearance reflected an adaptation to the tropical coastal environment of South Florida because the estuary systems, along with their high biological productivity, were now well established. The archaeological record disclosed widespread population increases and an apparent florescence in tool assemblages related to the exploitation of the marine environment.

Most information concerning the post-500 BCE aboriginal populations is derived from coastal sites where the subsistence patterns are typified by the extensive exploitation of fish and shellfish, wild plants, and inland game, such as deer. Inland sites, such as those in the Big Cypress Swamp, show a greater, if not exclusive, reliance on interior resources. Known inland sites often consist of sand burial mounds, shell, dirt middens along major watercourses, and small dirt middens containing animal bone and ceramic sherds in oak/palm hammocks or palm tree islands associated with freshwater marshes. However, the most conspicuous site types are earthworks. These complexes include such forms as circular ditches, liner ridges, and various combinations of these features (Carr 1975). Many of these are situated in the broad flat savannahs. Sears (1982) hypothesized that Belle Glade peoples constructed these to provide artificial, dry fields for the growing of maize. However, Johnson's research, and others, have proven that these earthworks were not suitable for maize cultivation (Johnson 1991; Thompson et al. 2013).

**Belle Glade I (500 BCE-200 CE [Common Era]):** Small house mounds in the savannahs along the creek banks characterize the settlement pattern of this period. Sears has hypothesized that small fields encircled and drained by ditches may date as early as 1000 to 800 BCE (Sears 1982). By 450 BCE, the large circular field at Fort Center was built. Ceramics gradually change from semi-fiber-tempered to sand-tempered during this long period, and little evidence has been found to link the

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peoples of the Okeechobee Basin with other Florida aboriginal cultures, except the St. Johns area. In the project vicinity, evidence of this early period is found at the Ortona complex where recent research indicates that "…initial occupation might have occurred during the Belle Glade I period, if not earlier" (Carr et al. 1995).

**Belle Glade II (200-800 CE):** Belle Glade Plain pottery became the dominant ceramic ware at the Fort Center Site and within the region by the beginning of this period, ca. 200 CE. Raised fields were used for planting to avoid the high-water table (Sears 1982:185-189). At the Fort Center Site, a distinct mortuary ceremonialism is found to mark Period II. In addition to house mounds, there is evidence that ceremonial mounds, a charnel platform amid a mortuary pond, and other earthworks were built during this period. The preparation of the dead apparently became a complex cultural trait, and certain artifacts such as trade ceramics, wooden carvings, and some shells were utilized. Connections between Fort Center and the Hopewell sites in Florida and throughout the eastern United States have been suggested (Sears 1982:198-199). Based on percentages of Belle Glade Plain ceramics and a platform pipe fragment, Mound B at Ortona probably dates to this period which terminated about 600/800 CE.

**Belle Glade III: (800-1400 CE):** Period III was a hiatus between Period II and the later Calusa Empire. Long linear ridges were used for horticulture during this period. Belle Glade Plain ceramics increased in frequency, and St. Johns Check-Stamped begins to appear in small quantities sometime after 1000 CE. Sears suggests that during this period, there was little change in artifacts, and faunal evidence indicates a continued use of the total environment for food resources. The North Fisheating Creek Site has been dated at 500 to 1200 (Carr 1975:14). The Lakeport Earthworks may also date to this time. In addition, two black dirt midden sites, recorded within the Brighton Seminole Reservation, have been assigned to the Belle Glade III period (FMSF).

**Belle Glade IV: (1400-1700 CE):** This time is dominated by Belle Glade Plain ceramics. A series of new rim forms became common, particularly the expanded flat and comma shaped varieties. Aboriginal artifacts manufactured from European-derived metals, and historic materials such as glass beads and San Luis polychrome majolica, appear in sites throughout South Florida. Among the distinctive artifacts are small metal ceremonial tablets, whose focus of distribution is the area around Lake Okeechobee, including its tributaries and drainages (Allerton et al. 1984). Indeed, Sears concludes that ". . . Fort Center was a part of the sixteenth and seventeenth century Calusa empire . . .," and he adds that three of the "metal badges" found at Fort Center are the largest and heaviest known, suggesting the importance of the inland region" (1982:201).

Regional sites dating to this period, at least in part, include the Daugherty Site, an earthworks complex located on the Kissimmee River where a ceremonial tablet was unearthed from a sand burial mound (Allerton et al. 1984:28). Further to the south, the Belle Glade Site in Palm Beach County yielded elaborate European grave goods, including gold, silver, and copper items as well as glass beads (Willey 1949:60-61). One or more mounds at the Ortona complex, west of Lake Okeechobee, may be dated to Belle Glade IV due to a high ratio of Belle Glade Plain and a high frequency of well-made late rim forms. Similar late-style Belle Glade Plain pottery and a complete absence of sand-tempered pottery characterize the vicinity of Mound H, the mound attached to the Large Mound. Thus, archaeological research suggests that some portions of the Ortona complex date from ca. 1000 to 1200. "Like Fort Center, it appears that at least some parts of the Ortona Site were used until the period of Spanish contact. This is evidenced by European artifacts, including Nueva Cadiz beads which were recovered by Goggin at the Ortona burial mound" (Carr et al. 1995).

Throughout the Belle Glade area, the diversity of food resources aided the development of the powerful Calusa domain. In addition to the readily available fish, deer, alligator, snakes, opossums, and

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turtles, Fontenada, a Spanish captive of the Calusa, described bread made from roots that grew in the lake area. The Okeechobee Basin continued to be occupied during the contact period. Spanish materials, including precious metals probably salvaged from wrecked ships, were brought into the area, and often were used as grave goods in burial mounds. A large population continued to live at Fort Center in the 16th and 17th centuries as Europeans began the conquest of La Florida.

The cultural traditions of the natives ended with the advent of European expeditions to Florida. The initial events, authorized by the Spanish Crown in the 1500s, ushered in devastating effects. Such notable figures as Pánfilo de Narvaéz, Hernando de Soto, and Pedro Menéndez de Avilés visited Florida. De Soto sought the allegedly rich Indian town of Cale and Menéndez sailed the St. Johns River in search of a cross-peninsular waterway. By 1763, the native populations were largely wiped out -- ravaged by conquest and disease, the typical effects of European contact.

The area that now constitutes the State of Florida was ceded to England in 1763 after two centuries of Spanish possession. England governed Florida until 1783 when the Treaty of Paris returned Florida to Spain; however, Spanish influence was nominal during this second period of ownership. Prior to the Anglo-American settlement of Florida, portions of the Muskogean Creek, Yamassee, and Oconee Native American groups moved into Florida and repopulated the demographic vacuum created by the decimation of the aboriginal inhabitants. These migrating groups of Native Americans became known to English speakers as Seminoles. Many Indians who escaped death or capture fled to the swamps and uncharted lands in South Florida. The Seminoles formed, at various times, loose confederacies for mutual protection against the new American Nation to the north (Tebeau 1980:72). Escaped slaves from South Carolina and Georgia joined the Seminoles who provided protection to this fugitive population (Porter 1996). The loss of slave labor, particularly in light of the abolitionist movement in the northeast, coupled with the anxiety of having a free and hostile slave population immediately to the south, caused great concern among plantation owners. This historically underestimated nuance of the Seminole Wars prompted General Thomas S. Jessup to say, “This you may be assured it is a Negro and not an Indian War” (Knetsch 2003:104).

## 3.4 Territorial and Statehood

Because of the First Seminole War and the Adams-Onis Treaty of 1819, Florida became a U.S. territory in 1821. Andrew Jackson, named provisional governor, divided the territory into St. Johns and Escambia Counties. At that time, St. Johns County encompassed all of Florida lying east of the Suwannee River, and Escambia County included the land lying to the west. Settlement was slow and scattered during the early years. In the first territorial census in 1825, some 317 persons reportedly lived in South Florida; by 1830 that number was up to 517 (Tebeau 1980:134).

Although the First Seminole War was fought in north Florida, the Treaty of Moultrie Creek in 1823, at the end of the war, was to affect the settlement of south Florida. In exchange for occupancy of an approximately four-million-acre reservation south of Ocala and north of Charlotte Harbor, the Seminoles relinquished their claim to the remainder of the peninsula (Covington 1958; Mahon 1985). The treaty satisfied neither the Native Americans nor the settlers. The inadequacy of the reservation, the desperate situation of the Seminoles, and the mounting demand of the whites for their removal, spawned the Indian Removal Act of 1830, and soon produced another conflict. By 1835, the Second Seminole War was underway.

During the war, the U.S. Army dispatched troops to explore and establish forts throughout the Peace and Kissimmee River valleys. Colonel Zachary Taylor led an expedition down the Kissimmee River during the winter of 1837-38 that led to the creation of Forts Gardiner and Basinger. Taylor laid

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out the stockade on the west side of the Kissimmee River in a small hammock. Captain Monroe and his company were left to finish construction of the fort. A military road extended from Fort Fraser, near present-day Winter Haven, skirted around the Sebring area, and continued on to Fort Center on the western shore of Lake Okeechobee (Sprague 1848). The war lasted until 1842 when the federal government decided to end the conflict by withdrawing troops from Florida. By that time, Fort Basinger had been abandoned, partially fallen, and burned. Some of the battle-weary Seminoles were persuaded to migrate west where the federal government had set aside land for Native American habitation. However, those who were adamant about remaining were allowed to do so with the Peace River serving as the new western boundary of a Seminole reservation (Olausen 1993; Tebeau 1980).

Encouraged by the passage of the Armed Occupation Act in 1842, designed to promote settlement and to protect the Florida frontier, families moved south through the state. The Act made available 200,000 acres outside the already developed regions south of Gainesville to the Peace River, barring coastal lands and those within a two-mile radius of a fort. It stipulated that any family or single man over 18, able to bear arms, could earn title to 160 acres by erecting a habitable dwelling, cultivating at least five acres of land, and living on it for five years (Covington 1961:48). During the nine-month period the law was in effect, 1184 permits were issued totaling some 189,440 acres (Covington 1961:48).

In 1845, the Union admitted Florida, with Tallahassee as the state capital. Ten years later, Brevard County, which included Okeechobee County, was carved from Mosquito County and the State initiated surveys in the area.

Settlement of this part of the state was hindered by the presence of the Seminole Indians and the settlers asked for additional forts to be built as a means of protection from the Indian. By 1849, there were 12 new or proposed outposts established across the state from Manatee to Fort Capron (Ft. Pierce). These included Fort Arbuckle, on the east side of Lake Arbuckle, Fort Kissimmee, and Fort Drum (Covington 1982; Van Landingham 1978). The latter two forts were constructed under General David E. Twiggs, and the simple road that linked the entire chain of forts was known as Twiggs Trail (Newman et al. 2002).

In December of 1855, the Third Seminole War, or the Billy Bowlegs War erupted as a result of pressure placed on Native Americans remaining in Florida to migrate west (Covington 1982). The war started when Seminole Chief Billy Bowlegs and 30 warriors attacked an army camp killing four soldiers and wounding four others. The attack was in retaliation for damage done by several artillerymen to property belonging to Bowlegs. This hostile action renewed state and federal interest in the final elimination of the Seminoles from Florida. The Third Seminole War degenerated into a series of skirmishes, raids, and ambushes in 1857 and 1858. Military action was not decisive during the war. Therefore, in 1858, the U.S. government resorted to monetary persuasion to induce the remaining Seminoles to emigrate west. A total of 165 Seminoles migrated west, and, on May 8, 1858, the Third Seminole War was officially declared at an end.

The exterior boundaries of Township 37 and 38 South, Range 30 East was initially surveyed in 1859 by John Jackson; and J.W. Childs surveyed Townships 37 and 38 South, Range 31 East (State of Florida 1870a, b, c, d). There were no historic features denoted within or adjacent to the APE, (**Figure 3.2**). The area around sections 1 and 12 were described as 3rd rate pine, some with scrub oak and palmetto, or wet boggy/springy 2nd and 3rd rate lands (State of Florida 1859a, b; 1870e).

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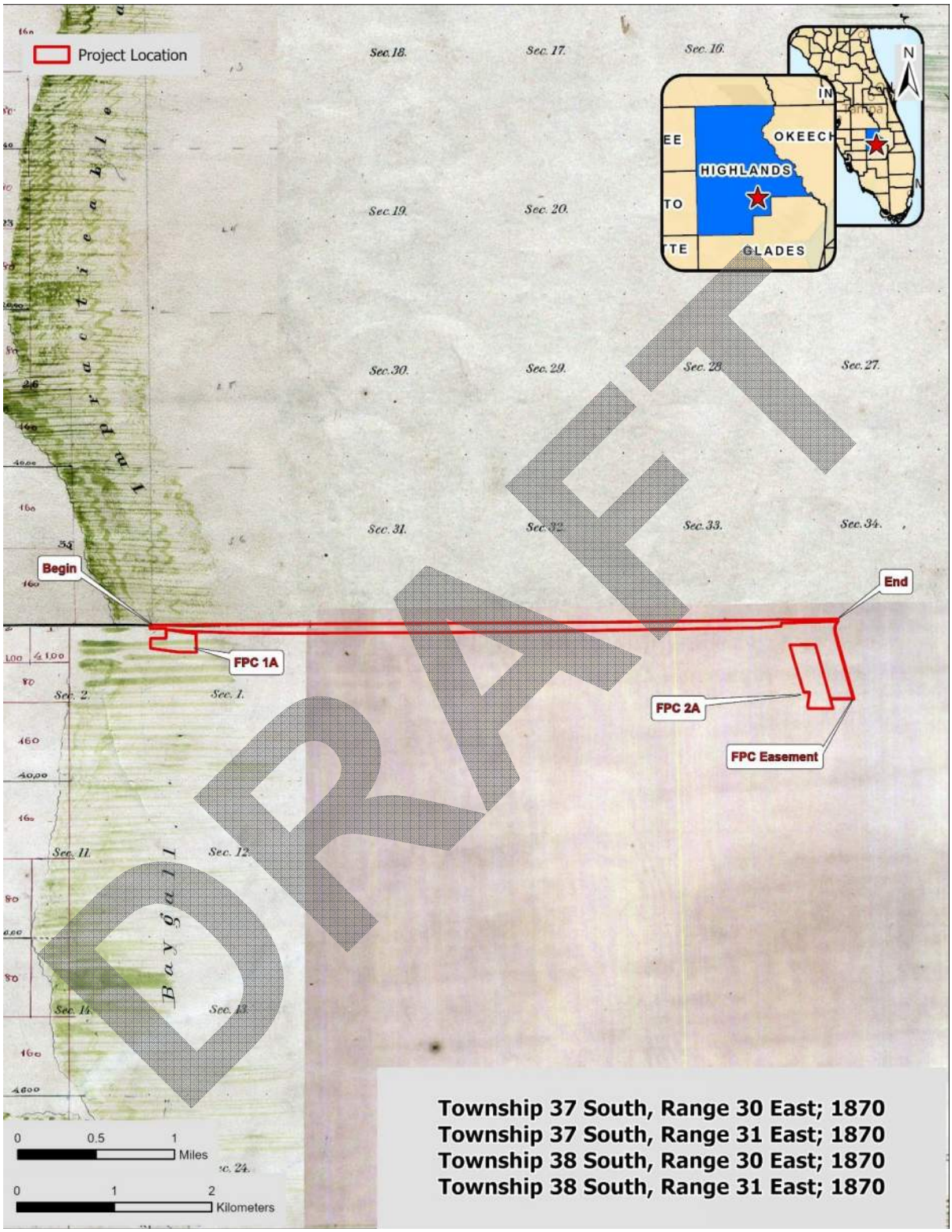


**Figure 3.2.** 1870 plat showing the SR 70 corridor and two FPC sites.

Cattle ranching served as one of the first important economic activities reported in the region. Mavericks left by early Spanish explorers such as DeSoto and Narvaez provided the source for the herds raised by the mid-eighteenth century "Cowkeeper" Seminoles. As the Seminoles were pushed

further south during the Seminole Wars and their cattle were either sold or left to roam, settlers captured or bought the cattle and branded them for their own. By the late 1850s, the cattle industry of southwestern Florida was developing on a significant scale. By 1860, Fort Brooke (Tampa) and Punta Rassa (south of Ft. Myers) were the major cattle shipping points for southwest Florida (Covington 1957). The expansive prairies of the Peace and Kissimmee River Valleys served as the seat of this developing cattle industry (Akerman 1976; Dacy 1940).

## 3.5 Civil War and Aftermath

In 1861, Florida followed South Carolina's lead and seceded from the Union as a prelude to the Civil War. One of the major contributions of the state to the war effort was in the supplying of beef to the Confederacy. The Confederate Government estimated that three-fourths of the cattle that Florida supplied originated from Brevard and Manatee Counties (Shofner 1995:72). The lack of railway transport to other states, the federal embargo, the Union supporters, and the Union troops holding key areas such as Jacksonville and Ft. Myers prevented an influx of finished materials preventing widespread settlement of Florida. The Civil War ended in 1865.

The historic settlements developed along the rivers and creeks, where transportation was easiest. In general, these pioneers were cattlemen who, attracted by the vast grazing lands, settled their families at Basinger and Fort Drum. Among the first cowboys on the prairies in the 1860s were those employed by Jacob Summerlin. Cattle drives, begun in St. Augustine, went around the northwest side of Lake Okeechobee to Fort Thompson, in route to Punta Rassa (Tebeau 1980). Settlement, however, was impeded by the lack of inland transportation.

In 1850, the federal government had turned over to the states for drainage and reclamation all "swamp and overflow land." In 1855, the legislature had established a trust fund, the Florida Internal Improvement Fund, in which state lands were to be held. The Fund had become mired in debt after the Civil War and, under state law, no land could be sold until the debt was cleared. The Trustees of the fund searched for someone to buy enough state land to pay off the Fund's debt to permit sale of the remaining acreage that it held. In 1881, Hamilton Disston, a prominent Pennsylvania entrepreneur and friend of then Governor William Bloxham, entered into an agreement with the State to purchase four million acres of swamp and overflowed land for one million dollars. In exchange for this, he promised to drain and improve the land. This transaction, which became known as the Disston Purchase, enabled the distribution of large land subsidies to railroad companies, which induced them to begin extensive construction programs for new lines throughout the state. Disston and the railroad companies in turn sold smaller parcels of land to developers and private investors.

In the 1880s, the first railroad lines extended south through central Florida because of the sale of state lands and the Disston Purchase. One of Disston's proposed undertakings was the dredging of a canal that would connect the Caloosahatchee with Lake Okeechobee. He also proposed to lower the level of the lake in an attempt to drain the surrounding land. By 1885, the Atlantic and Gulf Coast Canal and Okeechobee Land Company was permitted to buy the drained land at 25 cents per acre, and in 1894 owned all the land around Lake Okeechobee. Disston died in 1896 and the Disston Land Company was liquidated by court order in order to pay taxes and other debts (Covington 1957:172).

The Florida Southern Railroad extended south from Bartow to Arcadia in early 1886. The railroad bypassed the county seat, Pine Level, opting instead to travel through Arcadia. This led to the relocation of the county seat to Arcadia in November of 1888. With the railroad as a catalyst, the 1880s through the 1910s witnessed a sudden surge of land buying. As the forests were felled, the opened landscape provided rich agricultural land for the cattle and citrus industries. The latter was encouraged

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by a series of freezes in north Florida in the winter of 1884/1895 that destroyed groves. During this time, areas were opened for homesteading, and tracts were deeded to early settlers (Olausen 1993).

## 3.6 Twentieth Century

The propaganda initiated in the 1880s which expounded the benefits of Florida, led to an influx of winter residents and year-round retirees enjoying Florida for its health benefits. One of these retirees, George Sebring, arrived in central Florida with the intention of establishing a retirement community. Sebring, along with several brothers, had founded the community of Sebring, Ohio in 1898 as a company town for their family pottery business. In 1903, the brothers divided their holdings, and when his health started to fail, George passed many of his responsibilities on to his son. He traveled throughout Europe, the Middle East, and the United States, including Florida, where he established a permanent winter residence. Although he built a residence in Daytona Beach in 1909, he started searching for an area in which to build a community based on citrus cultivation. In 1911, Sebring visited an acquaintance that showed Sebring some acreage that he owned around Lake Jackson. Sebring purchased approximately nine thousand acres on the east side of Lake Jackson, and established the second Sebring community (Olausen 1993; Sebring Chamber of Commerce 1962).

George Sebring knew that the success of the new community depended upon the creation of a transportation network to link the inhabitants with other cities and towns. In the fall of 1911, the Atlantic Coast Line (ACL) Railroad started laying track from Haines City south to Avon Park. The ACL had served as the backbone trunk line of the southeast since 1902 when it merged with the lines owned by Henry B. Plant. With the merger, the ACL extended from Virginia throughout north and west Florida. George Sebring convinced ACL officials to extend their track south from Avon Park to Sebring, and the first train arrived in Sebring on June 14, 1912 (Olausen 1993). In 1916, it reached Lake Stearns (now known as Lake June in Winter) and built a station they called Weco. In 1918, the Lake Grove Development Company purchased a large tract of land on the east side of the lake and changed the name of the settlement to Lake Stearns. The Consolidated Naval Stores Company moved in to the area to harvest the local timber and develop groves (HPA 1995). It was around this time that the lands within the APE were purchased: Daniel D. Cline (1917), Jere A. Melendy (1917), Fannie L. Hallam (1914), and Steven L. Ferrell (1918) (State of Florida n.d.:236, 238).

The great Florida Land Boom of the 1920s saw widespread development of towns and highways. Several reasons prompted the boom, including the mild winters, the growing number of tourists, the larger use of the automobile, the completion of roads, the promise by the Florida Legislature never to pass state income or inheritance taxes, and the aggressive advertising campaigns of real estate companies. The growth spurred the division of Desoto County into Highlands, Glades, Charlotte, Hardee, and Desoto Counties in April 1921. Florida State Road 8 – now known as SR 70 – had been constructed through the APE by ca. 1926 and spanned from Haines City through Sebring to Ft. Pierce (FDOT 1926).

In August 1925, the Florida East Coast railway placed an embargo on all freight shipments to south Florida as rail lines and ports in Miami and West Palm Beach became inundated with incoming shipments. Throughout the fall, national newspapers suggested fraud in land sales, and business people throughout the nation complained about the amount of money being transferred to Florida. As 1926 dawned and spring arrived, economic concerns continued to be expressed, and advertisements to sell properties declined in the local newspapers (HPA 1987; Olausen 1993).

By 1927, the economic growth of the early 1920s was halted. To make the situation even worse, two hurricanes hit south Florida in 1926 and 1928. In September 1926, a devastating hurricane swept

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through South Florida killing hundreds in the Moore Haven area. The Sebring firefighters loaded a boxcar of supplies and rode a Seaboard train as far south as possible. The firefighters were the first rescue workers on the scene and sent many evacuees back to Sebring. Refugees again fled north when another hurricane swept through south Florida in September 1928. The 1928 hurricane winds created a tidal wave of water over Lake Okeechobee's shores, killing hundreds. The hurricane not only created a flood of refugees, but also cut utility lines and destroyed citrus crops (Sebring Historical Society 1987). The following year, the Mediterranean fruit fly invaded and paralyzed the citrus industry creating quarantines and inspections that further slowed an already sluggish industry. The stock market crash in October furthered the economic distress.

The Consolidated Naval Stores Company continued to promote the region and convinced Dr. Melville Dewey (creator of the Dewey Decimal System and developer of Lake Placid, NY) to finance development in the area. In 1931, town of Lake Stearns was renamed to Lake Placid and a hotel was built on the west shore of Lake Placid (then known as Lake Childs), as well as a golf course, tennis courts, rifle range and boathouse. In 1941, the facilities were purchased by the Presbyterian Synod as a conference center (HPA 1995).

The generosity of private citizens and federal relief projects helped the residents of central Florida survive the Depression. Financier John Roebling and his wife Margaret Shippen Roebling, concerned over plans to turn a pristine wilderness area into farmland, purchased 3,800 acres, and donated the land for use as a state park. In 1931, the Highlands Hammock State Park opened, under the direction of Franklin D. Roosevelt's Civilian Conservation Corps (CCC). The CCC camp, which employed 200 men, provided a steady source of income for local merchants who supplied food, clothing, building materials, and tools to the contingent (Adams et al. 1989; Olausen 1993; Sebring Historical Society 1987). The Federal Writers' Project (FWP) of the Work Projects Administration, did not directly support local businesses, but encouraged tourism by publishing a guide to Florida during the late 1930s. They noted that almost every section of the park is accessible, and improvements have been made carefully to preserve Highlands Hammock as part of primeval Florida (FWP 1939:100).

The economy of Highlands County recovered during World War II. By the time that the Highlands Hammock CCC camp closed, a new post office had been built, and plans were underway for the construction of a new highway (US 27), and an army air base. During the late 1930s, factories in the U.S. started procuring military materials to supply the Allied forces in their fight against Hitler and the Axis powers. After the draft was reinstituted by the Selective Service Act of 1940, new military training bases were established throughout the country. Recognizing the financial benefits that a military base would have on the local economy, Sebring city officials started lobbying the U.S. Army to establish an air base near the city as early as July 1940. The Army agreed to establish an army air base in Sebring on June 12, 1941. Completed in January 1942, Hendricks Field was used to train B-17 flight crews. At the height of the war, approximately 9000 military personnel were stationed at Hendricks Field. The influx of military personnel with the accompanying demand for housing, goods, and services returned prosperity to the area.

With the decreased need for military personnel at the end of the war, Hendricks Field, like many bases across Florida, was deactivated on December 31, 1945. It was declared surplus, conveyed to Sebring's City Council in 1947, and renamed Sebring Air Terminal (HPA 1987; Kendrick 1964; Olausen 1993; Sebring Historical Society 1987). Significant flooding during the post-war years led to the creation of the Central and Southern Florida (C&SF) Project by the U.S. Congress in 1948 (SFWMD n.d. [a]). This project was considered "the largest civil works project in the country" and was comprised of a flood control system of canals constructed by the U.S. Army Corps of Engineers which spanned from south of Orlando to Florida Bay (SFWMD n.d. [a]). The Central and Southern Florida

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Flood Control District was established by the Florida Legislature in 1949 and is considered the predecessor to the South Florida Water Management District (SFWMD) (SFWMD n.d. [a]).

Tourism, which had dwindled during the Great Depression and World War II, returned as a major contributor to central Florida's economy during the post-war years. One event that continues to draw visitors is an annual automobile race that started in the 1950s. In 1950, the Sports Car Club of America sponsored the first automobile race held at the Sebring Air Terminal. With the involvement of the International de l'Automobile and the Automobile Club of America, the race expanded in 1952 to a 5.2-mile course raced over 12 hours. In the late 1950s, this annual event was renamed "The 12 Hours of Sebring" and continues to attract an international audience (Olausen 1993:27).

Like tourism, agriculture continued to be a basis for the local economy in the post-World War II years. During the early 1960s, approximately 30,500 acres were devoted to citrus production in Highlands County. Since that time, the acreage has doubled with Highlands County now ranking as the fourth largest citrus producer in the state. Other industries in the county include raising beef and dairy cattle, and growing vegetables, ornamental plants, and exotic flowers. In 1930, there were only 2,824 beef cattle in Highlands County; by 1955, the number had risen to 51,773. During the same period, the number of improved pastures had risen from 54 to 33,778. By 1962, land in Highlands County devoted to pasture totaled 540,000 acres with 52,000 head of cattle which accounted for a gross income of $3.5 million (Olausen 1993; Sebring Historical Society 1987).

Largely, the post-World War II development of Highlands County is similar to that of the rest of America with increasing numbers of automobiles and asphalt, sprawl away from the historic commercial center, and strip development along major highways. The growing use of the automobile led to the demise of the train system in the U.S. Around 1950, the Atlantic Coast Line discontinued daily passenger train service to Sebring and eliminated all passenger service around 1954. However, the Seaboard Air Line continued to service passengers, and the Atlantic Coast Line continued to transport freight. In 1967, the two rail lines merged to form the Seaboard Coast Line.

Since the 1950s, tourists and retirees have fed the regional economy. Supporting services include the hospitality, travel, construction, and healthcare industries. As the number of single-family residential areas has grown in Highlands County, there has been greater demand for conveniently located shopping and greater transportation infrastructure. Practically translated, this demographic phenomenon has resulted in an explosion of retail businesses and road construction. Within the APE, however, the 1953 quad maps show no development in the surrounding area at that time (USGS 1953a, b) (**Figures 3.3-3.5**). In keeping with this business trend, the amount of nonagricultural employment in Highlands County rose by 63% from 1990 to 1999. The county is home to two hospitals, three citrus corporations, and the Georgia Pacific paper and LINPAC plastics plants. The Lykes Ranch, located in Glades and Highlands Counties, maintains one of the largest cow-calf operations in the United States (Lykesranch.com n.d.). The county remains sparsely settled and agriculturally based. However, as development continues, the population has gradually increased. Highlands County's population increased from 98,786 in 2010 to 101,235 in 2020 (USCB 2022).

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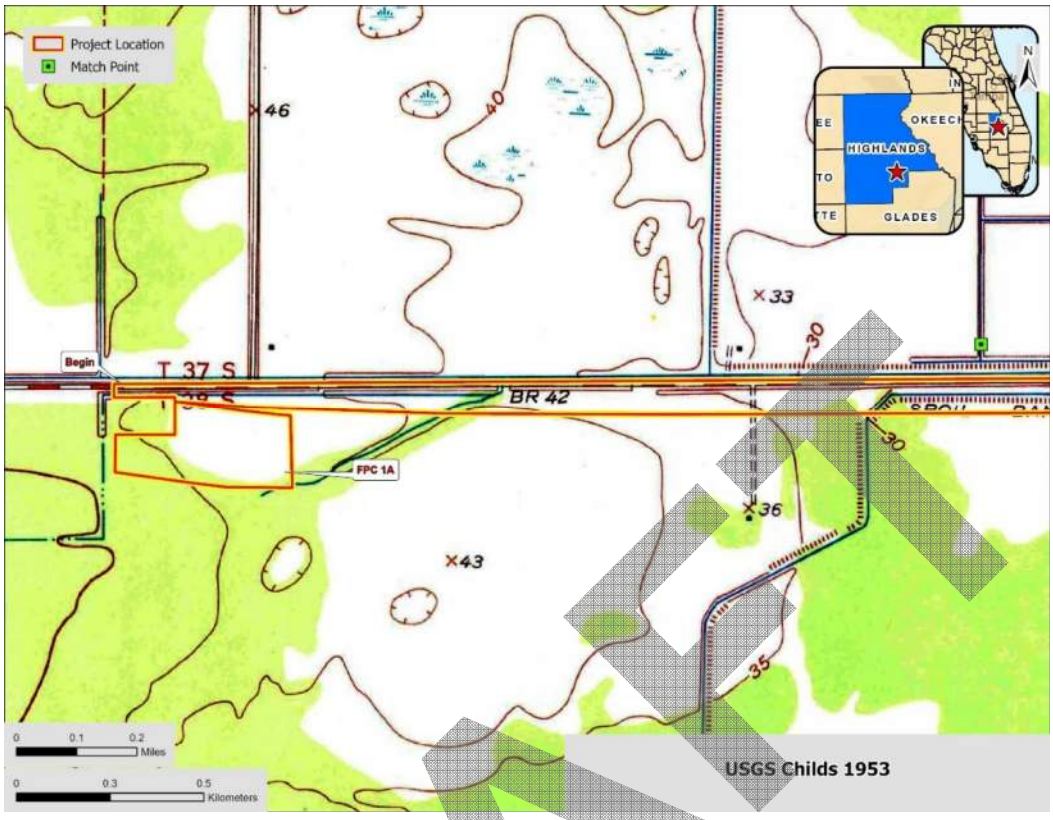


**Figure 3.3.** 1953 Childs quad map showing the western project limits.

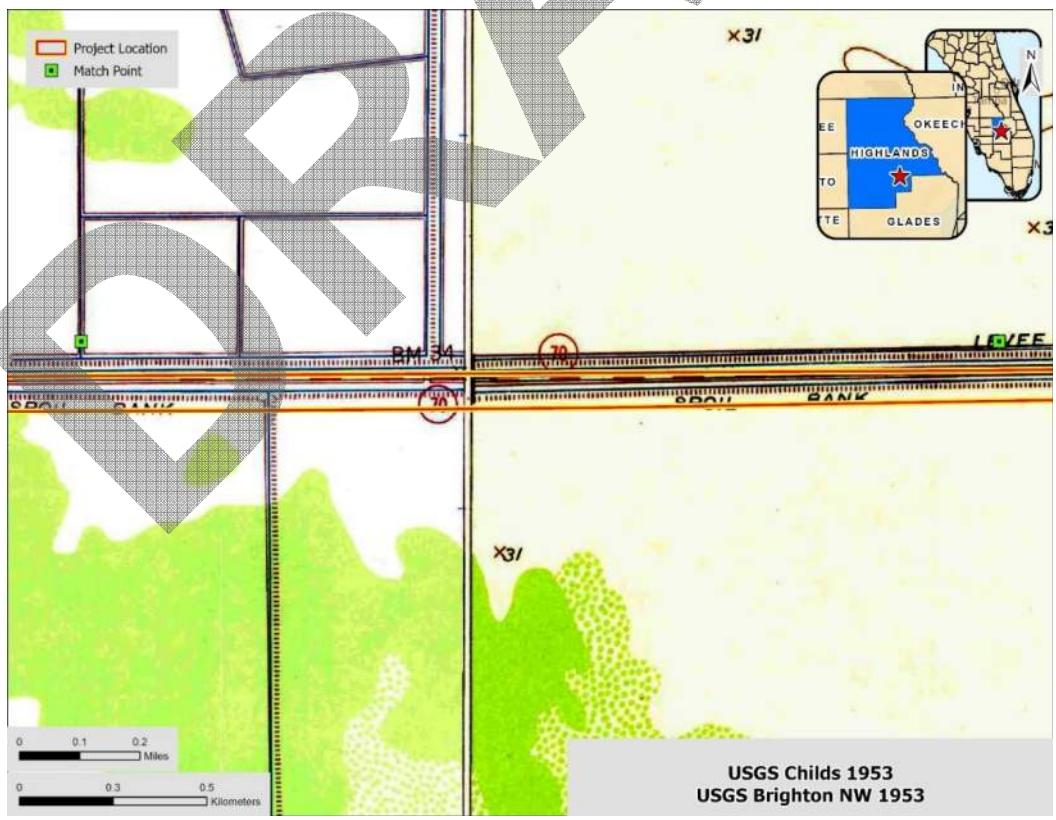


**Figure 3.4.** 1953 Childs and Brighton NW quad maps showing the central area of the SR 70 corridor.

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**Figure 3.5.** 1953 Brighton NW quad map showing the eastern project limits.

## 3.7 Project Area Specifics

The aerial photos available from the Publication of Archival Library and Museum Materials (PALMM) show little historic development of the land within the APE (USDA 1958a, b, c, 1974a, b, c) (**Figures 3.6-3.8**). SR 70 – formerly known as Florida State Road 8 – was constructed by ca. 1926 and was well established by the time of the first available historic aerial photograph of the APE taken in ca. 1943 (FDOT 1926; USDA 1943). The canals running parallel to the north and south sides of SR 70 were constructed by ca. 1943 and development was predominantly agricultural in the area at this time (USDA 1943). Alterations within the APE have largely been limited to the continuous agricultural working of the surrounding land and changing irrigation patterns, including minor canals running into those parallel to SR 70. These changes can be seen over time between ca. 1958 and 1974 (USDA 1958a, b, c, 1974a, b, c) (**Figures 3.6 – 3.8**). A residence was constructed to the south of SR 70 to the east of CR 29 and west of L7 Ranch Road between ca. 1974 and 1981 (USDA 1974; FDOT 1981). The area remains predominantly agricultural today.

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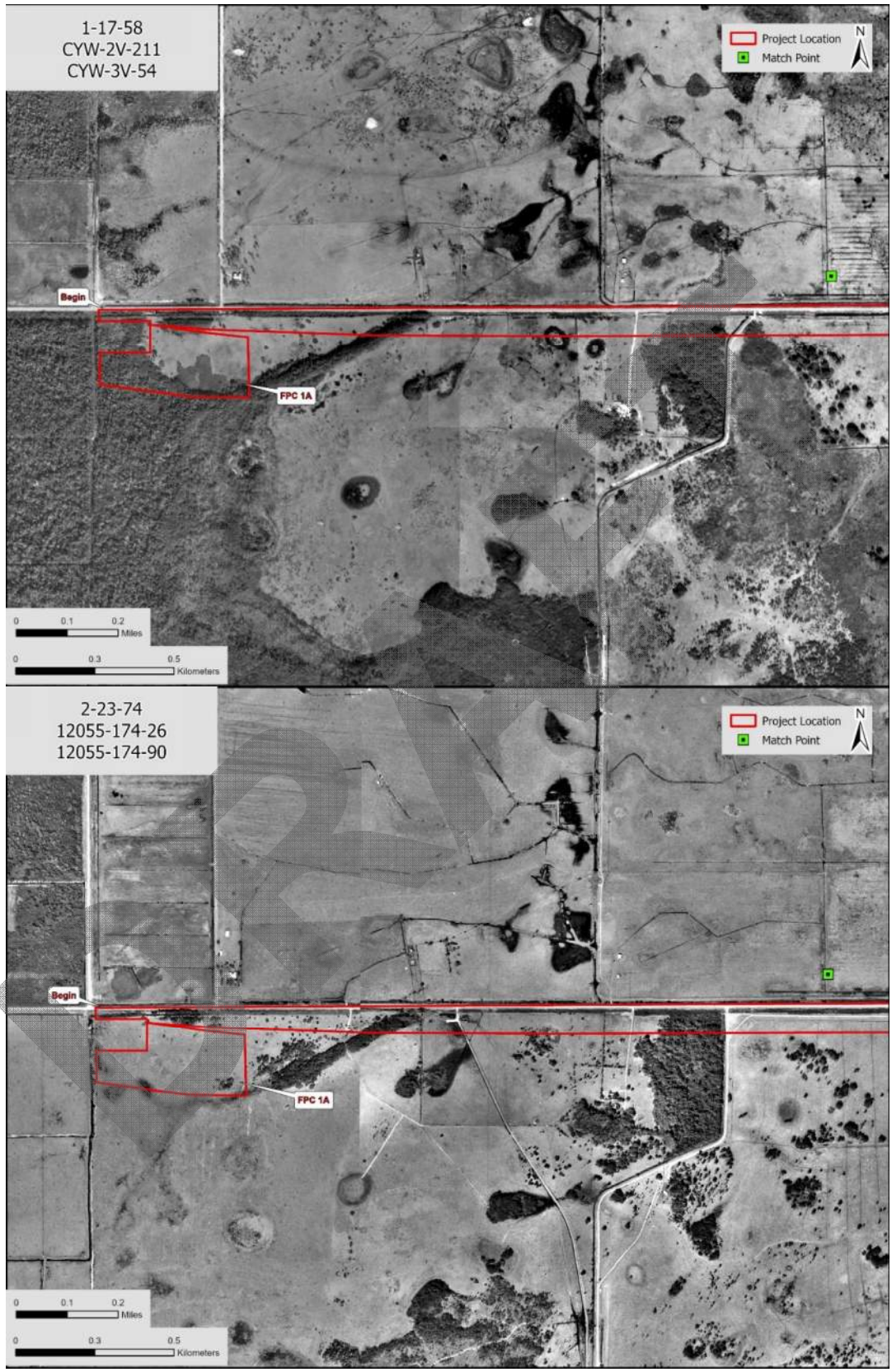


**Figure 3.6.** 1958 and 1974 aerial photographs of the western project limits (USDA 1958a,b; 1974a,b).


**Figure 3.7.** 1958 and 1974 aerial photographs of the central area of the SR 70 corridor (USDA 1958b,c; 1974b,c).

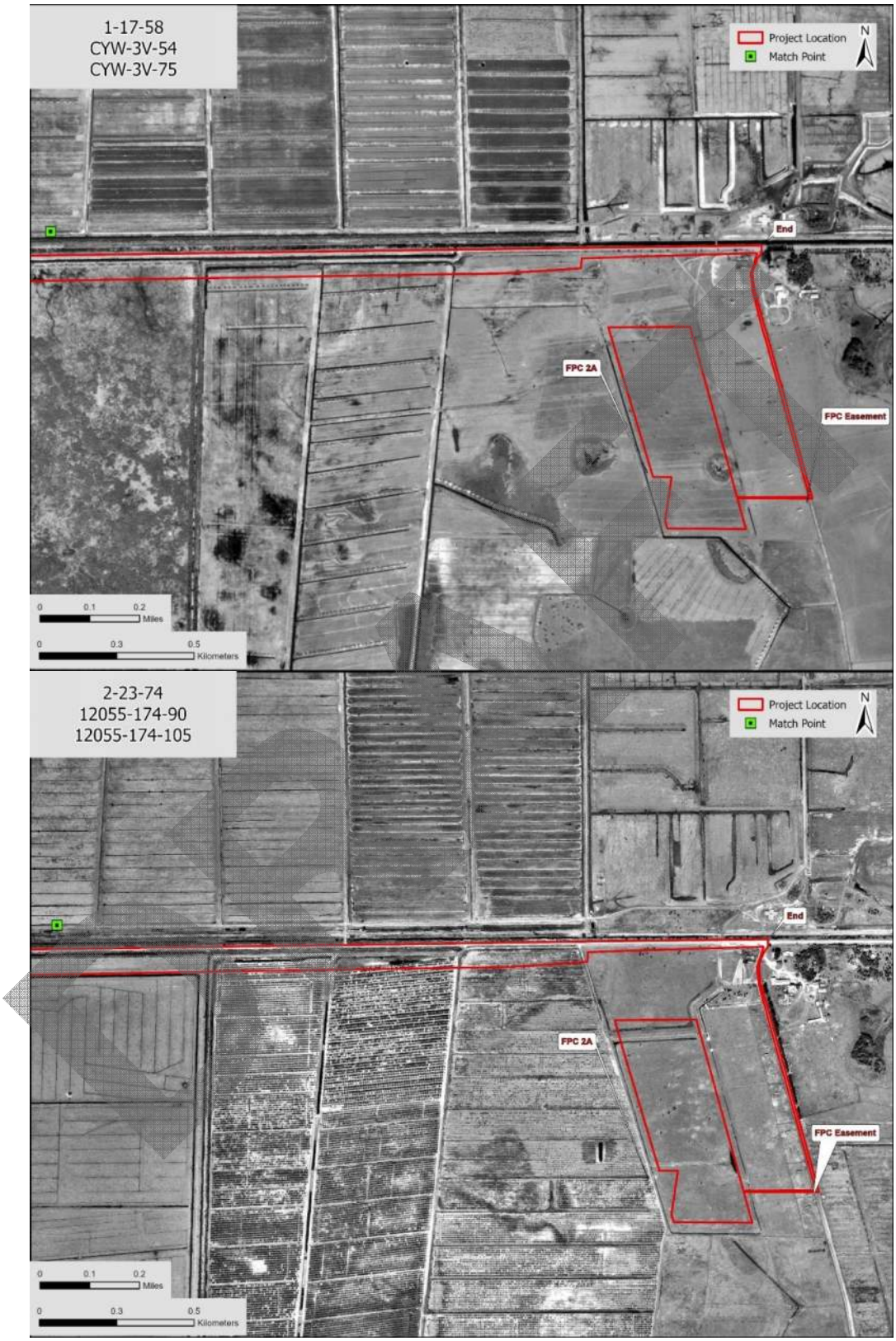


**Figure 3.8.** 1958 and 1974 aerial photographs of the eastern project limits (USDA 1958b,c; 1974b,c).

# 4.0 RESEARCH CONSIDERATIONS AND METHODOLOGY

## 4.1 Background Research and Literature Review

A review of archaeological and historical literature, records and other documents and data pertaining to the project area was conducted. The focus of this research was to ascertain the types of cultural resources known in the project area and vicinity, their temporal/cultural affiliations, site location information, and other relevant data. This included a review of cultural resources listed in the NRHP, the Florida Master Site File (FMSF), CRAS reports, published books and articles, unpublished manuscripts, and maps as well as the Preliminary Pond Analysis (ACI 2021). It should be noted that the FMSF digital data used in this report were updated in September 2022. According to FMSF staff, input may be a month or more behind receipt of reports and site files and the GIS data are updated quarterly. Thus, the findings of the background research phase of investigation may not be current with actual work performed in the area.

## 4.2 Archaeological Considerations

Background research indicated that four sites have been recorded within one mile of the APE, and all are dated to be from the Belle Glades period (BCE 700–700 CE) (**Figure 4.1; Table 4.1**). 8HG00627 was considered ineligible for listing in the NRHP by the State Historic Preservation Officer (SHPO). Two precontact sand mounds were recorded and include 8HG00629, a prehistoric burial mound with human remains that was deemed eligible for listing in the NRHP by the SHPO, while 8HG00630, another precontact mound, was not evaluated by the SHPO. A precontact campsite (8HG00632), had insufficient information for an eligibility determination to be made by the SHPO. These sites were recorded during an archaeological survey of the West Okeechobee Basin (Johnson 1990) and subjected to additional study (Dunn 2012, 2015; Wayne 2010). In addition to these surveys, several other have been conducted proximate to the APE and are listed in **Table 4.2**.

In general, site location data for the general area indicate a pattern of site distribution favoring the relatively higher and better-drained terrain near a permanent or semi-permanent source of potable water including rivers, lakes, and freshwater marshes (ACI 1998). As such, the APE was considered to have a low to moderate prehistoric archaeological potential. The potential for historic archaeological sites was considered low given the absence of structures or buildings on the property until the early 1970s.

**Table 4.1.** Previously recorded sites within one mile of the APE.

| Site # | Site Name | Site Type | Associated Cultures | SHPO Eval |
|---|---|---|---|---|
| 8HG00627 | Mineral Lick | Land-terrestrial | Belle Glades, BCE 700 – 1700 CE | Ineligible for NRHP listing |
| 8HG00629 | Scarborough Mound | Precontact burial mound | Belle Glades, BCE 700 – 1700 CE | Eligible for NRHP listing |
| 8HG00630 | Scarborough Home | Precontact mound/s | Belle Glades, BCE 700 – 1700 CE | Not evaluated by SHPO |
| 8HG00632 | Smoak | Campsite (precontact) | Belle Glades, BCE 700 – 1700 CE | Insufficient information |

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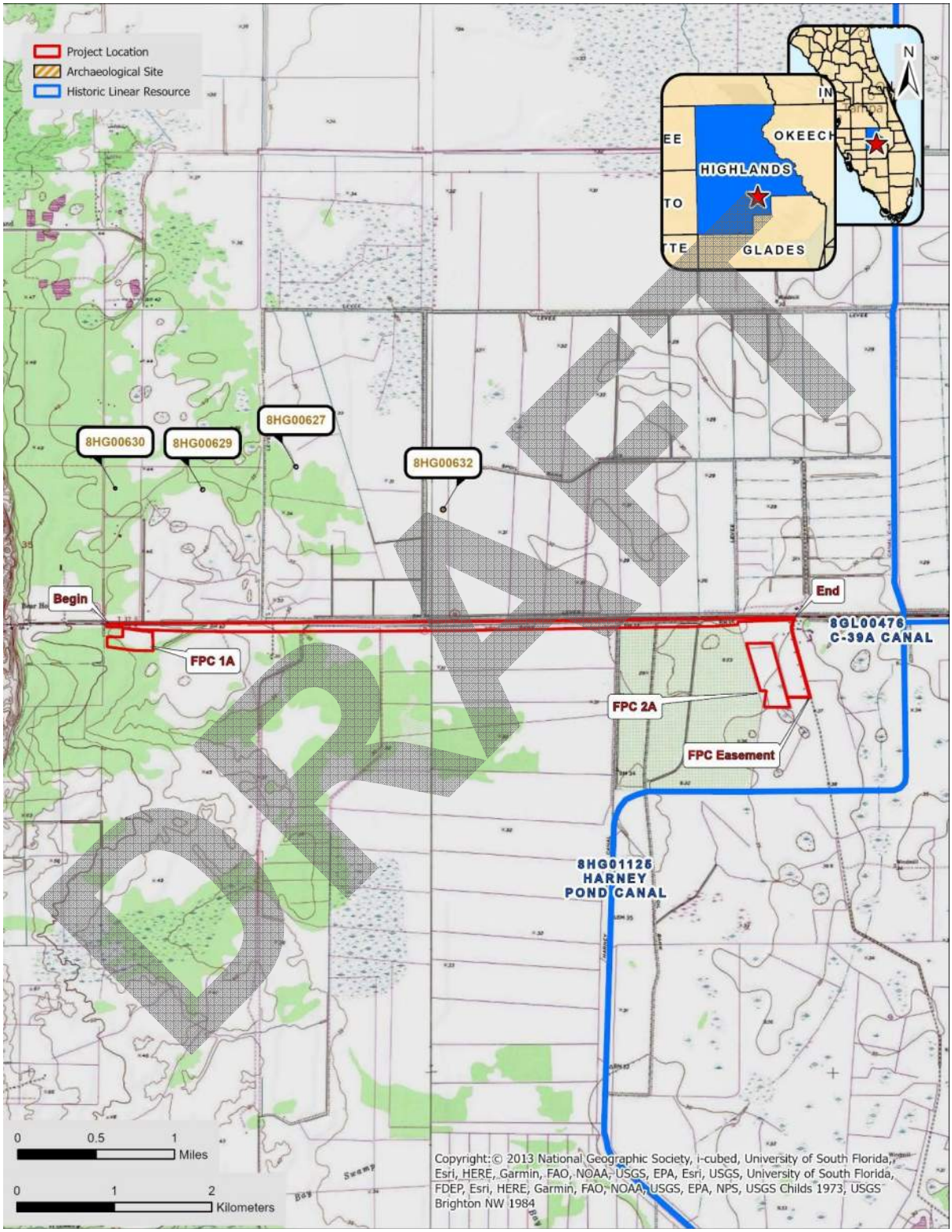


**Figure 4.1.** Previously recorded cultural resources within one mile of the project limits.

**Table 4.2.** CRAS surveys proximate to the project limits.

| Survey No. | Title | Reference |
|---|---|---|
| 2366 | A Report of Investigations on the West Okeechobee Basin Archaeological Survey | Johnson 1990 |
| 4543 | Cultural Resource Assessment Survey for Bridge Numbers 090024, 090920, and 090013 along State Road 70 Highway & Bridge Design Project, Highlands County, Florida | Janus Research 1996 |
| 16476 | Cultural Resource Assessment Survey of the Florida Gas Transmission Company Phase VIII Expansion Loop 10 and Extension: Station 27 to Arcadia Greenfield 3: Arcadia to Station 29 | Janus Research 2008 |
| 16532 | Florida Gas Transmission Phase VIII First Addendum Report Related to Report Nos. 2008-07035 and 2008-07036 | Coughlin et al. 2009 |
| 16938 | Florida Gas Transmission Phase VIII Second Addendum Report Related to Report Nos. 2008-07035 and 2008-07036 | Coughlin et al. 2010 |
| 17536 | Cultural Resource Investigations Conducted for the Darroh Mud Disposal Site Addition located in Highlands County, Florida with the Planned Florida Gas Transmission Company (FGT) Phase VIII Expansion | Janus Research 2010 |
| 19506 | Trip Report: NRCS Scarborough WRP Highlands County Cultural Resources Reconnaissance Survey | Dunn 2012 |
| 19507 | Cultural Resources Reconnaissance Survey, Scarborough and Sons Ranch, Inc., Highlands County, Florida | Wayne 2010 |
| 20284 | FCC Wireless Telecommunications Bureau New Tower Submission Packet, Form 620: F703A, John, Highlands County, Florida | Wayne 2013 |
| 22234 | NRCS 70 Grove WE Compatible Use Agreement Wetland Restoration Highlands County Cultural Resources Letter Report | Dunn 2015 |
| 24485 | 70 Grove Wetland Reserve Easement (WRE) Cultural Resources Survey | Bertine 2017 |
| 24890 | Lonesome Island Wetland Reserve Easement (WRE) Cultural Resources Survey | Bertine 2018b |
| 24969 | Cultural Resources Survey Sun Ray and Lonesome Tracts, Highlands County, Florida | Smith 2013 |
| 25440 | Highlands Ranch Wetland Reserve Easement (WRE) Cultural Resources Survey | Bertine 2018a |
| 26797 | Scarborough 2020 Wetlands Reserve Program (WRP) Project – FY – 20 | Hussey 2019 |
| 27291 | Cultural Resource Assessment Survey Project Development and Environment (PD&E) Study SR 70 from Jefferson Avenue to CR 29, Highlands County, Florida. | ACI 2019a |
| 27292 | Cultural Resource Assessment Survey Technical Memorandum, Proposed Pond Sites, State Road (SR) 70 from Jefferson Avenue to County Road (CR) 29, Highlands County, Florida. | ACI 2019b |

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## 4.3 Historical/Architectural Considerations

A review of the FMSF and NRHP revealed that no historic resources have been previously recorded within the APE; however, two linear resources (8HG01125 and 8GL00476) have been recorded in close proximity to, but outside of, the APE (**Figure 4.1**). A segment of the Harney Pond Canal (C-41) (8HG01125) was recorded to the east of the APE during the *Cultural Resource Assessment Survey of the Florida Gas Transmission Company (FGT) Phase VIII Expansion, Loop 10 and Extension: Station 27 to Arcadia, Greenfield 3: Arcadia to Station 29* conducted by Janus Research in 2008 (Survey No. 16476). In 2009, the SHPO found there was insufficient information to determine

NRHP eligibility. The Harney Pond Canal (C-41) was authorized by the 1954 Flood Control Act and is a part of the Central and Southern Florida Flood Control District (CSFFCD) which was established to control flooding throughout the region, including the Kissimmee River Basin. In addition, a segment of the C-39A Canal (8HG00476) was recorded to the east of the APE during the *Cultural Resource Assessment Survey 4-D Citrus & Sod, Inc., Glades County, Florida* conducted by SouthArc, Inc. in 2012 (Survey No. 23368). The ca. 1948 canal runs east-west from Highlands County along the northern Glades County line and is typical of large canals in South Florida. In 2016, the SHPO found there was insufficient information to determine NRHP eligibility.

A review of relevant historic USGS quadrangle maps, historic aerial photographs, and the Highlands County property appraiser's website data revealed the potential for four new historic resources 45 years of age or older (constructed in 1977 or earlier) within the APE (McIntyre 2022).

## 4.4 Field Methodology

The FDHR's Module Three, *Guidelines for Use by Historic Professionals*, indicates that the first stage of archaeological field survey is a reconnaissance of the project area to "ground truth," or ascertain the validity of the predictive model (FDHR 2003). During this part of the survey, the researcher assesses whether the initial predictive model needs adjustment based on disturbance or conditions such as constructed features (i.e., parking lots, buildings, etc.), underground utilities, landscape alterations (i.e., ditches and swales, mined land, dredged and filled land, agricultural fields), or other constraints that may affect the archaeological potential. Additionally, these Guidelines indicate that non-systematic "judgmental" testing may be appropriate in urbanized environments where pavement, utilities, and constructed features make systematic testing unfeasible; in geographically restricted areas such as proposed pond sites; or within project areas that have limited high and moderate probability zones, but where a larger subsurface testing sample may be desired. While predictive models are useful in determining preliminary testing strategies in a broad context, it is understood that testing intervals may be altered due to conditions encountered by the field crew at the time of survey. A reasonable and good faith effort was made to locate any historic properties within the APE (Advisory Council on Historic Preservation n.d.).

Archaeological field methodology included ground surface inspection, as well as subsurface shovel testing, in order to locate sites not exposed on the ground. Testing was conducted at both 50 m (164 ft) around the isolated areas of higher terrain and proximate to wetlands and at 100 m (328 ft) in areas of anomalous elevation and demonstrable disturbance as well as judgmentally. Shovel tests were circular and measured approximately 50 centimeters (cm) in diameter and one meter deep unless precluded by groundwater intrusion. All soil removed from the tests was screened through 0.62 cm mesh hardware cloth to maximize the recovery of artifacts. The locations of all shovel test were recorded with a Trimble Juno 5d Series device and Terrasync mobile mapping application, and, following the recording of relevant data such as environmental setting and stratigraphic profile, all shovel tests were refilled.

Historic/architectural field methodology consisted of a field survey of the APE to determine and verify the location of all buildings and other historic resources (i.e., bridges, roads, cemeteries) that are 45 years of age or older (constructed in or prior to 1977), and to establish if any such resources could be determined eligible for listing in the NRHP. The field survey focused on the assessment of existing conditions for all previously recorded historic resources located within the project APE, and the presence of unrecorded historic resources within the project area. For each property, photographs were taken, and information needed for the completion of FMSF forms was gathered. In addition to

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architectural descriptions, each historic resource was reviewed to assess style, historic context, condition, and potential NRHP eligibility. Also, informant interviews would have been conducted, if possible, with knowledgeable persons to obtain site-specific building construction dates and/or possible associations with individuals or events significant to local or regional history.

## 4.5 Inadvertent/Unexpected Discovery of Cultural Remains

Occasionally, archaeological deposits, subsurface features or unmarked human remains are encountered during the course of development, even though the project area may have previously received a thorough and professionally adequate cultural resources assessment. Such events are rare, but they do occur. In the event that human remains are encountered during the course of development, the procedures outlined in Chapter 872, FS must be followed. However, it was not anticipated that such sites would be found during this survey.

In the event such discoveries are made during the development process, all activities in the immediate vicinity of the discovery will be suspended, and a professional archaeologist will be contacted to evaluate the importance of the discovery. The area will be examined by the archaeologist, who, in consultation with staff of the Florida SHPO, will determine if the discovery is significant or potentially significant. In the event the discovery is found to be not significant, the work may immediately resume. If, on the other hand, the discovery is found to be significant or potentially significant, then development activities in the immediate vicinity of the discovery will continue to be suspended until such time as a mitigation plan, acceptable to SHPO, is developed and implemented. Development activities may then resume within the discovery area, but only when conducted in accordance with the guidelines and conditions of the approved mitigation plan.

## 4.6 Laboratory Methods and Curation

No cultural resources were discovered; thus, no laboratory methods were utilized.

All project related material (field notes, maps, digital data, photographs, etc.) will be maintained at ACI (P19015) in Sarasota, unless the client requests otherwise.

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# 5.0 RESULTS AND CONCLUSIONS

## 5.1 Archaeological

Archaeological field survey included both surface reconnaissance and the excavation of 114 shovel tests (**Figures 5.1 – 5.3**) north and south of SR 70. Testing throughout the APE was conducted at both 50 m intervals around the isolated areas of higher terrain and proximate to wetlands and at 100 m intervals in areas of anomalous elevation and demonstrable disturbance, as well as judgmentally. All shovel tests were excavated to 100 cm unless precluded by ground water intrusion. A reasonable and good faith effort was made per the regulations laid out in *36 CFR § 800.4(b)(1)* to identify and cultural resources within the APE (Advisory Council on Historic Preservation n.d.). All shovel tests were negative, and no archaeological materials were discovered on the surface; thus, no archaeological sites were discovered. The stratigraphic profile across the APE was variable and sample profiles are listed below.

- FPC 1A (**Photo 5.1**): 0-20 centimeters below surface (cmbs) dark gray sand; 20-40 cmbs light gray sand; 40-100 cmbs grayish-brown sand; water at 70 cmbs
- FPC 2A (**Photo 5.2**): 0-50 cmbs gray sand; 50-60 cmbs dark brown sand; 60-100 cmbs light brown sand
- FPC 2A Easement (**Photo 5.3**): 0-30 cmbs light gray sand; 30-50 cmbs gray sand; 50-100 cmbs light gray sand
- CR 29 to L-7 Ranch Road (**Photo 5.4**): 0-30 cmbs gray sand; 30-80 cmbs light gray sand; 80-100 cmbs dark brown sand
- L-7 Ranch Road to RB Sod Farm (**Photo 5.5**): 0-20 cmbs dark gray sand; 20-40 cmbs light gray sand; 40-60 cmbs dark brown sand; 60-100 cmbs gray clay
- RB Sod Farm to Southwind Road (**Photo 5.6**): 0-60 cmbs dark grayish-brown sandy clay; 60-100 cmbs gray clay
- Southwind Road to Lonesome Island Road (**Photo 5.7**): 0-100 cmbs mixed alternating layers of dark gray, gray, light gray and brown sand to sandy clay

**Photo 5.1.** Standard soil profile within retention pond location of FPC 1A.

**Photo 5.2.** Standard soil profile within retention pond location of FPC 2A.

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**Photo 5.3.** Standard soil profile within retention pond easement of FPC 2A.

**Photo 5.4.** Standard soil profile between CR 29 and L-7 Ranch Road.

**Photo 5.5.** Standard profile between L-7 Ranch Road and RB Sod Farm.

**Photo 5.6.** Standard soil profile within RB Sod Farm.

**Photo 5.7.** Standard soil profile between RB Sod Farm and Dosia Smith Road.

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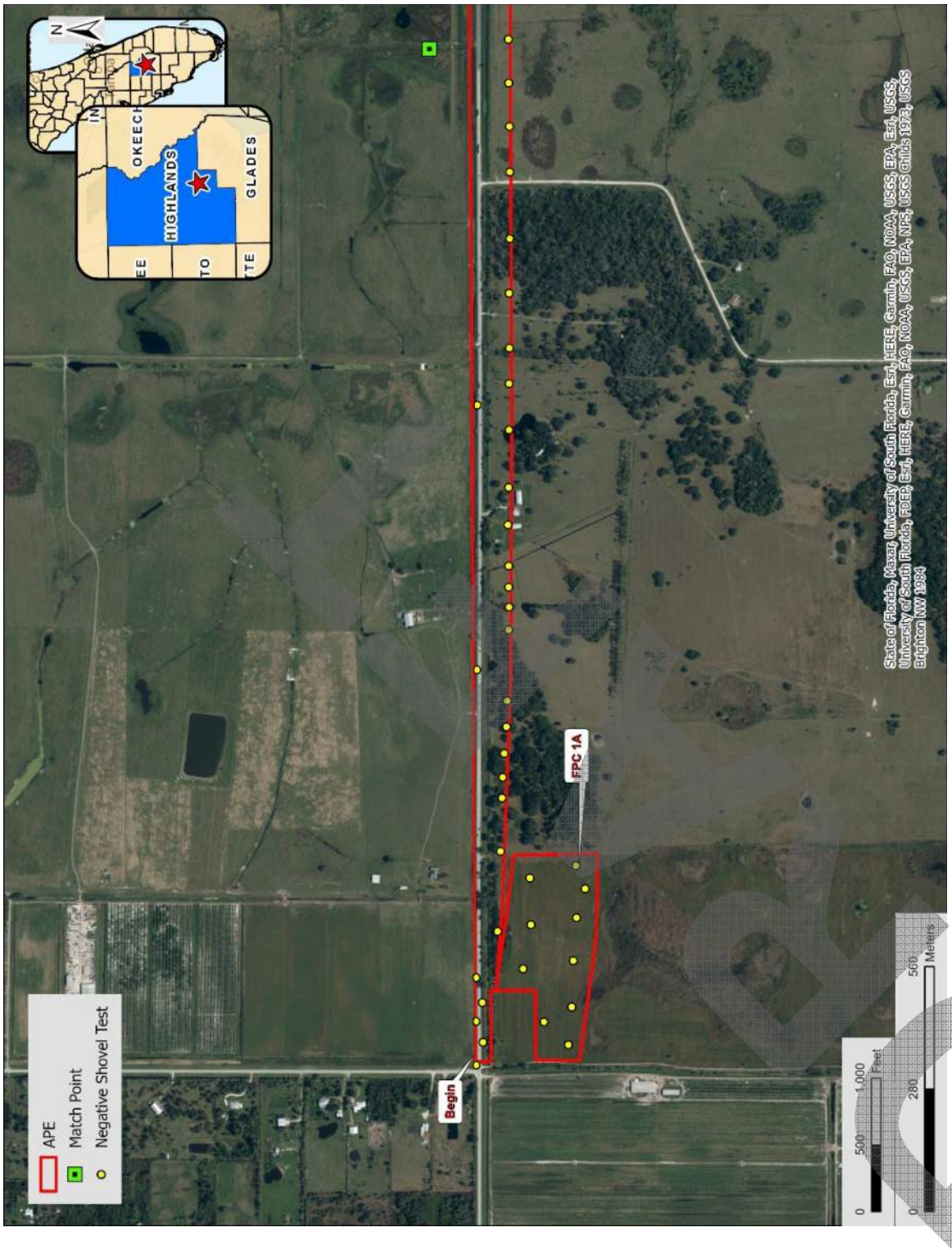


**Figure 5.1.** Approximate location of the shovel tests within the APE.

**Figure 5.2.** Approximate location of the shovel tests within the APE.

E-44

**Figure 5.3.** Approximate location of the shovel tests within the APE.

E-45

## 5.2 Historical/Architectural

Background research revealed that no historic resources were previously recorded within the APE. As a result of the historic/architectural field survey, four historic resources (8HG01577, 8HG01578, 8HG01579, and 8HG01580) were newly identified, recorded, and evaluated within the APE (**Figures 5.4 - 5.6**). These include one Frame Vernacular style building (8HG01577), the SR 70 Cross Drain Culvert (8HG01578), a segment of SR 70 (8HG01579), and segments of the SR 70 Drainage Canals (8HG01580). Overall, the Frame Vernacular style building (8HG01577) lacks sufficient architectural features and is not a significant embodiment of a type, period, or method of construction. The SR 70 Cross Drain Culvert (8HG01578) is a pre-cast concrete culvert constructed in ca. 1970 in order to carry SR 70 over an unnamed cross drain which provides a connection between the drainage canals running parallel to SR 70. The resource is a typical example of a common post-1945 concrete bridge culvert found throughout Florida and does not possess any notable engineering features or design elements. As such, this type of bridge culvert is excluded from Section 106 consideration by the Program Comment for Common Post-1945 Concrete and Steel Bridges (Federal Register 2012:68793). The 4.3-mile segment of SR 70 (8HG01579) within the APE is a common two-lane roadway that lacks specific design or engineering features or characteristics that would differentiate it from other similar roads. The 3.8-mile-long and 4.3-mile-long segments of SR 70 Drainage Canals (8HG01580) are not associated with surrounding major drainage projects. The SR 70 Drainage Canals are a common example of early twentieth century drainage canals found throughout Highlands County and lack unique design or engineering features. Overall, the newly identified historic resources have been altered, lack sufficient architectural or engineering features, and background research did not reveal any historical associations with significant persons and/or events. Thus, the resources do not appear eligible for listing in the NRHP, either individually or as a part of a historic district.

Descriptions and photographs of the newly identified resources follow, and copies of the FMSF forms are included in **Appendix A**. No informant interviews for historic resources were conducted during the field survey. A reasonable and good faith effort was made per the regulations laid out in 36 CFR § 800.4(b)(1) (Advisory Council on Historic Preservation n.d.) to survey all areas of the APE. The Survey Log is contained in **Appendix B**.

**8HG01577:** The Frame Vernacular style building at 2121 SR 70 E was constructed in ca. 1977 (**Photos 5.8 and 5.9**). The two-story, irregular plan building rests on a concrete slab and continuous concrete foundation and has a wood frame structural system clad in natural, unfinished wood siding. The side gable roofs and shed roof are covered with standing seam sheet metal. A brick chimney is located on the eave end of the northeast elevation. The main entryway is on the northeast elevation through a single door recessed beneath the principal roof with a wooden porch support and wooden platform. Visible windows include a mixture of individual three-light metal picture units and individual two-light metal sliding units. Distinguishing architectural features include overhanging eaves with boxed rafter tails, natural wood exterior, wood window and door trim, and corner boards. Alterations include replacement roofing. It is unclear whether additions have been made to the building as the historic aerial photographs are obscured by heavy tree coverage. A gable roof segment comprised of two one-car garages is located on the north elevation. Overall, the building lacks sufficient architectural features and is not a significant embodiment of a type, period, or method of construction. In addition, background research did not reveal any historic associations with significant persons and/or events. As a result, 8HG01577 does not appear eligible for listing in the NRHP, either individually or as part of a historic district.

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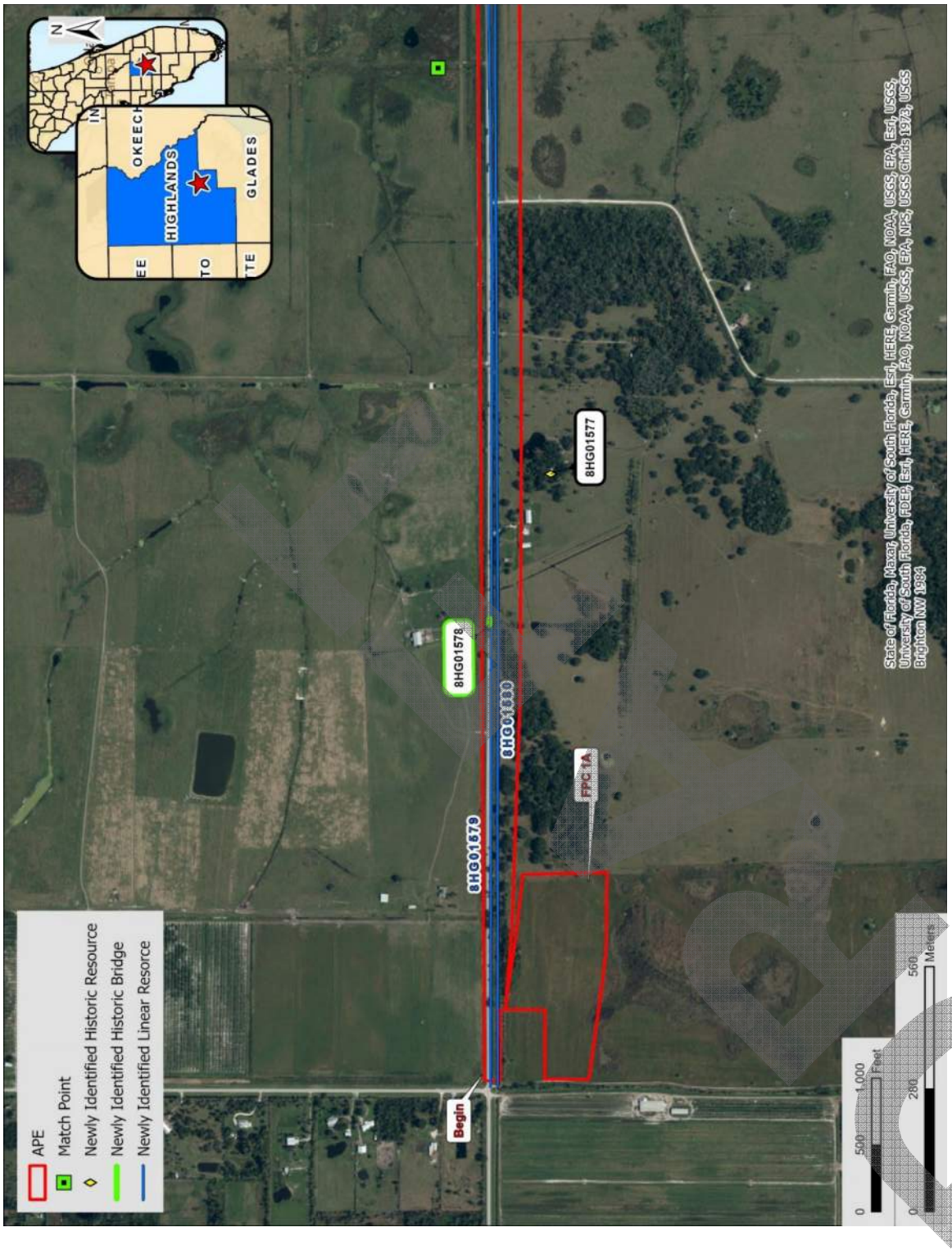


**Figure 5.4.** Location of recorded historic resources within the APE.

**Figure 5.5.** Location of recorded historic resources within the APE.

**Figure 5.6.** Location of historic resources within the eastern APE.

**Photo 5.8.** 2121 SR 70 E (8HG01577), looking south.

**Photo 5.9.** 2121 SR 70 E (8HG01577), looking east.

**8HG01578:** The SR 70 Cross Drain Culvert is a single span, pre-cast concrete culvert constructed in ca. 1970 or earlier (**Photo 5.10**). The culvert is located in Section 1 of Township 37 South, Range 30 East and Section 36 of Township 38 South, Range 30 East (USGS 1953a). The culvert was constructed in order to carry SR 70 over an unnamed cross drain which provides a connection between the drainage canals running parallel to SR 70. The overall dimension of the bridge measures approximately 40-ft long and is comprised of one concrete pipe with concrete wing walls. Metal

guardrails are located along the north and south sides of the roadway. The culvert is approximately 50-ft wide with a paved roadway that is approximately 20-ft wide.

**Photo 5.10.** SR 70 Cross Drain Culvert (8HG01578), looking northeast.

The bridge is a typical example of a common post-1945 concrete pipe culvert found throughout Florida. These types of bridges were constructed as part of the massive expansion of the State's road system in the decades following the end of World War II (Parsons Brinckerhoff 2005). This bridge does not possess any notable engineering features or design elements that would differentiate it from dozens of similar examples built throughout Florida during the same time period. This bridge was not recorded during the update to the Historic Highway Bridges of Florida; however, similar examples were evaluated as ineligible for listing in the NRHP during that survey update (FDOT 2012; Survey No. 20057). As such, this type of bridge is excluded from Section 106 consideration by the Program Comment for Common Post-1945 Concrete and Steel Bridges (Federal Register 2012:68793). In addition, background research did not reveal any historic associations with significant persons and/or events. Thus, due to its commonality of design and lack of significant attributes or association, 8HG01578 does not appear eligible for listing in the NRHP either individually or as part of a historic district.

**8HG01579:** The segment of SR 70 (also known as Fritz Street within the APE) is situated along the 37 South/38 South Township line and passes through Section 36 of Township 37 South, Range 30 East; Section 1 of Township 38 South, Range 30 East; Sections 31 – 34 of Township 37 South, Range 31 East; Sections 3, 4, 6, and 7 of Township 38 South, Range 31 East (USGS 1953a, 1953b). The segment within the APE is a two-lane undivided roadway that is 27-ft wide and spans approximately 4.3 miles from CR 29 to Lonesome Island Road (**Photo 5.11**). The road is lined with metal guardrails and drainage canals run parallel to the north and south of the roadway. The surrounding viewshed consists predominantly of irrigated agricultural land and wetlands. The segment of SR 70 within the APE was historically known as Florida State Road 8 and was constructed by ca. 1926 (FDOT 1926). The route spanned from Haines City through Sebring to Ft. Pierce. The alignment within the APE does not appear to have been significantly altered since ca. 1926; however, the road has been improved to modern standards.

**Photo 5.11.** SR 70 (8HG01579), looking east.

The overwhelming majority of the road's total length is located outside the project APE. Surveying and recording the entire roadway are beyond the scope of this project, as such only the segment within the APE was recorded. Overall, the segment of SR 70 within the APE is a common two-lane roadway that lacks specific design or engineering features or characteristics that would differentiate it from other similar roads. Background research did not reveal any historic associations with significant persons and/or events. As a result, 8HG01579 does not appear eligible for listing in the NRHP, either individually or as part of a historic district.

**8HG01580:** The SR 70 Drainage Canals flow through Section 1 of Township 38 South, Range 30 East and Sections 3, 4, 6, and 7 of Township 38 South, Range 31 E (USGS 1953a, 1953b). The segments located within the APE are approximately 3.8 miles long (south of SR 70) and 4.3 miles long (north of SR 70) and range from 20 – 40-ft wide, with steep earthen banking that is moderately overgrown with vegetation (**Photo 5.12**). Within the APE, the non-navigable canals flow parallel along the south side of SR 70 from south of CR 29 in the west to just east of Southwind Road and parallel to the north side of SR 70 from CR 29 in the west to Lonesome Island Road in the east. The canals were constructed in ca. 1943 or earlier and several minor unnamed irrigation ditches flowing perpendicularly into the canals have been constructed over the years (USDA 1943). In addition, several driveways/minor roads have been constructed over the segments. A South Florida Water Management District (SFWMD) map of the area was reviewed, as well as a ca. 1973 map of the Central and Southern Florida Flood Control District (CSFFCD), and the canal was not represented on these maps further indicating the common nature of the canals (SFWMD n.d.(b); U.S. Army Corps of Engineers 1973). They are not associated with surrounding major drainage projects. Surveying and recording the entire linear resource are beyond the scope of this project, as such only the segments within the APE were surveyed and recorded. The canals continue briefly outside of the APE, including a segment approximately 0.34 miles long to the west of CR 29 and 0.74 miles to the east of Lonesome Island Road. Overall, the SR 70 Drainage Canals are a common example of early twentieth century drainage canals found throughout Highlands County and lack unique design or engineering features. Background research did not reveal any historic associations with significant persons and/or events. As a result,

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8HG01580 does not appear eligible for listing in the NRHP, either individually or as part of a historic district.

**Photo 5.12.** SR 70 Drainage Canals (8HG01580), looking west. The photo is of the southern canal and is representative of the segments throughout the APE.

## 5.3 Conclusions

Given the results of background research and field survey, including the excavation of 114 shovel tests, no archaeological sites that are listed, eligible for listing, or that appear potentially eligible for listing in the NRHP were located within the APE. Historic/architectural field survey resulted in the identification and evaluation of four historic resources (8HG01577, 8HG01578, 8HG01579, and 8HG01580) within the APE. These include one building (8HG01577), one bridge culvert (8HG01578), and two linear resources (8HG01579 and 8HG01580). Overall, the newly identified historic resources have been altered, lack sufficient architectural or engineering features, and background research did not reveal any historical associations with significant persons and/or events. Thus, the resources do not appear eligible for listing in the NRHP, either individually or as a part of a historic district. As such, there are no cultural resources that are listed, eligible for listing, or that appear potentially eligible for listing in the NRHP within the APE. Therefore, it is the professional opinion of ACI that the proposed undertaking will result in no historic properties affected.

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**APPENDIX A**

**Florida Master Site File Forms**

☒ Original
☐ Update

# HISTORICAL STRUCTURE FORM
## FLORIDA MASTER SITE FILE
**Version 5.0 3/19**

Site#8 HG01577
Field Date 11-11-2022
Form Date 11-23-2022
Recorder # _____

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) 2121 SR 70 E — Multiple Listing (DHR only) _____
Survey Project Name CRAS SR 70 from CR 29 to Lonesome Island Road — Survey # (DHR only) _____
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☐private-individual ☒private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

## LOCATION & MAPPING

| Street Number | Direction | Street Name | Street Type | Suffix Direction |
|---|---|---|---|---|
| 2121 | | SR 70 | | E |

Address:
Cross Streets (nearest / between) _____
USGS 7.5 Map Name CHILDS — USGS Date 1953 — Plat or Other Map _____
City / Town (within 3 miles) Lake Placid — In City Limits? ☐yes ☒no ☐unknown — County Highlands
Township 38S — Range 30E — Section 1 — ¼ section: ☐NW ☐SW ☐SE ☐NE — Irregular-name: _____
Tax Parcel # C-01-38-30-A00-0010-0000 — Landgrant _____
Subdivision Name _____ — Block _____ — Lot _____
UTM Coordinates: Zone ☐16 ☒17 — Easting 473310 — Northing 3009403
Other Coordinates: X: _____ Y: _____ — Coordinate System & Datum _____
Name of Public Tract (e.g., park) _____

## HISTORY

Construction Year: 1977 ☒approximately ☐year listed or earlier ☐year listed or later
Original Use Residence, private — From (year): 1977 — To (year): CURR
Current Use _____ — From (year): _____ — To (year): _____
Other Use _____ — From (year): _____ — To (year): _____
Moves: ☐yes ☒no ☐unknown Date: _____ Original address _____
Alterations: ☒yes ☐no ☐unknown Date: _____ Nature Roofing
Additions: ☐yes ☐no ☒unknown Date: _____ Nature _____
Architect (last name first): _____ Builder (last name first): _____
Ownership History (especially original owner, dates, profession, etc.)

Linda Dee Ranch & Cattle Company (2010); Simone Properties, Inc. (2004); Okeechobee Sod, Inc. (1990); Jack & Louise Devane

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☐unknown Describe _____

## DESCRIPTION

Style Frame Vernacular — Exterior Plan Irregular — Number of Stories 2
Exterior Fabric(s) 1. Wood/Plywood 2. _____ 3. _____
Roof Type(s) 1. Gable 2. Shed 3. _____
Roof Material(s) 1. Sheet metal:standing seam 2. _____ 3. _____
Roof secondary strucs. (dormers etc.) 1. _____ 2. _____
Windows (types, materials, etc.)

Picture, metal, single, 3-light; Sliding, metal, single, 2-light

Distinguishing Architectural Features (exterior or interior ornaments)

Overhanging eaves w/ boxed rafter tails, natural wood exterior, wood window/door trim, corner boards

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)

| DHR USE ONLY | OFFICIAL EVALUATION | DHR USE ONLY |
|---|---|---|
| NR List Date _____ ☐Owner Objection | SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date _____ Init._____<br>KEEPER – Determined eligible: ☐yes ☐no Date _____<br>NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2) | |

DRAFT

# HISTORICAL STRUCTURE FORM

Site #8 HG01577

## DESCRIPTION (continued)

Chimney: No. 1 Chimney Material(s): 1. Brick 2. _____

Structural System(s): 1. Wood frame 2. _____ 3. _____

Foundation Type(s): 1. Slab 2. Continuous

Foundation Material(s): 1. Concrete, Generic 2. _____

Main Entrance (stylistic details)

NE ELEV: single door recessed beneath the principal roof w/ wooden porch support

Porch Descriptions (types, locations, roof types, etc.)

SW ELEV: open, partial width, beneath a shed roof w/ wooden half wall and screening

Condition (overall resource condition): ☐excellent ☒good ☐fair ☐deteriorated ☐ruinous

Narrative Description of Resource

A two-story Frame Vernacular style building w/ two one-car garages on the N ELEV. A small wooden deck/platform is located at the main entrance on the NE ELEV.

Archaeological Remains _____ ☐Check if Archaeological Form Completed

## RESEARCH METHODS (select all that apply)

| | | | |
|---|---|---|---|
| ☒FMSF record search (sites/surveys) | ☐library research | ☐building permits | ☐Sanborn maps |
| ☐FL State Archives/photo collection | ☐city directory | ☐occupant/owner interview | ☐plat maps |
| ☒property appraiser / tax records | ☐newspaper files | ☐neighbor interview | ☐Public Lands Survey (DEP) |
| ☐cultural resource survey (CRAS) | ☐historic photos | ☐interior inspection | ☐HABS/HAER record search |

☒other methods (describe) USDA historic aerial photographs (PALMM)

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

Publication of Archival Library and Museum Materials (PALMM), accessible online at: http://palmm.fcla.edu/

## OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐yes ☒no ☐insufficient information

Appears to meet the criteria for National Register listing as part of a district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

The building is not a significant embodiment of a type, period, or method of construction; and has no known significant historic associations.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. _____ 3. _____ 5. _____

2. _____ 4. _____ 6. _____

## DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc

Document description Files, photos, research, document File or accession #'s P19015

2) Document type _____ Maintaining organization _____

Document description _____ File or accession #'s _____

## RECORDER INFORMATION

Recorder Name Savannah Y. Finch Affiliation Archaeological Consultants Inc

Recorder Contact Information 8110 Blaikie Court, Ste. A / Sarasota, FL/ 34240 /aciflorida@comcast.net

(address / phone / fax / e-mail)

**Required Attachments**

❶ **USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED**

❷ **LARGE SCALE STREET, PLAT OR PARCEL MAP** (available from most property appraiser web sites)

❸ **PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE**

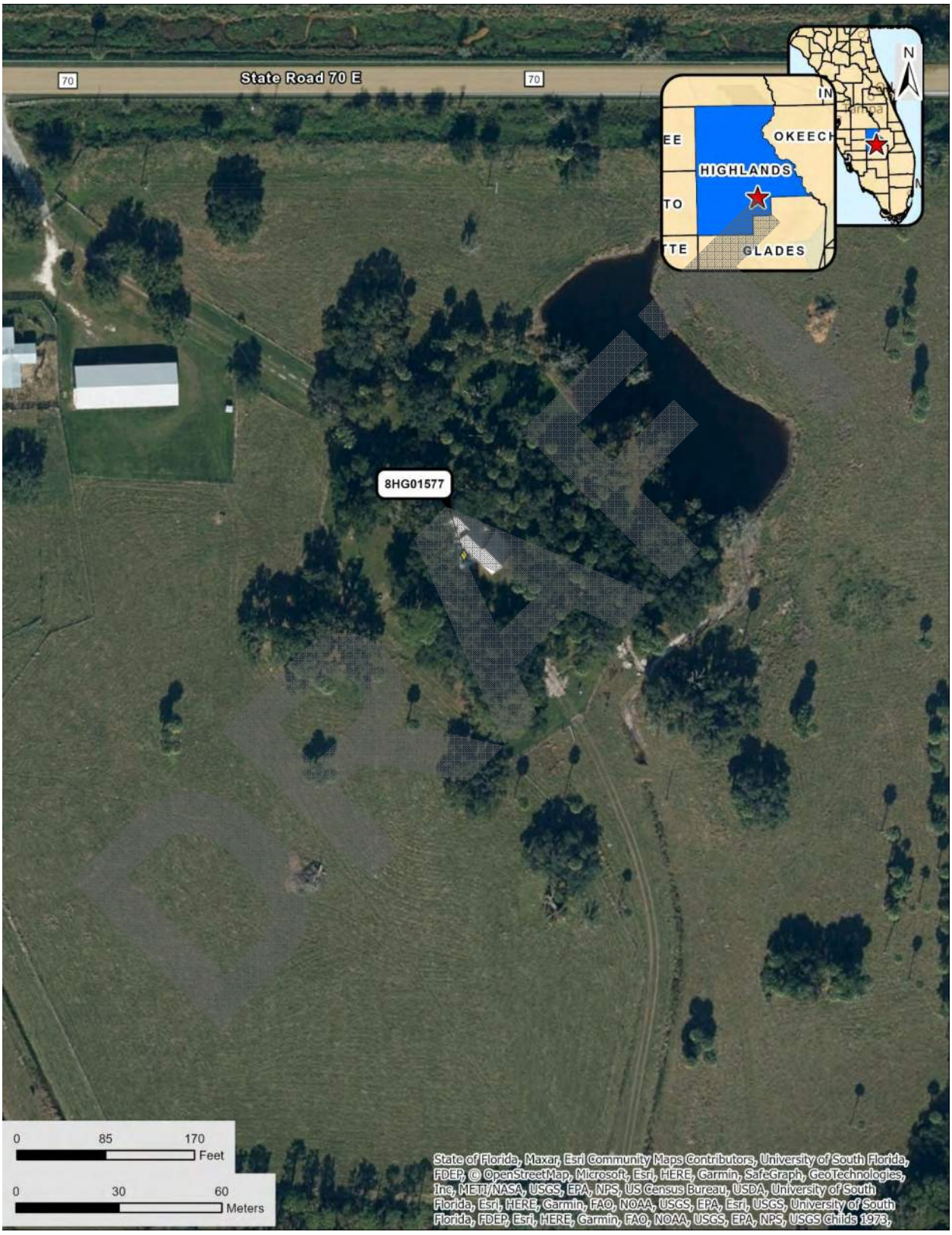
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable). Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

DRAFT

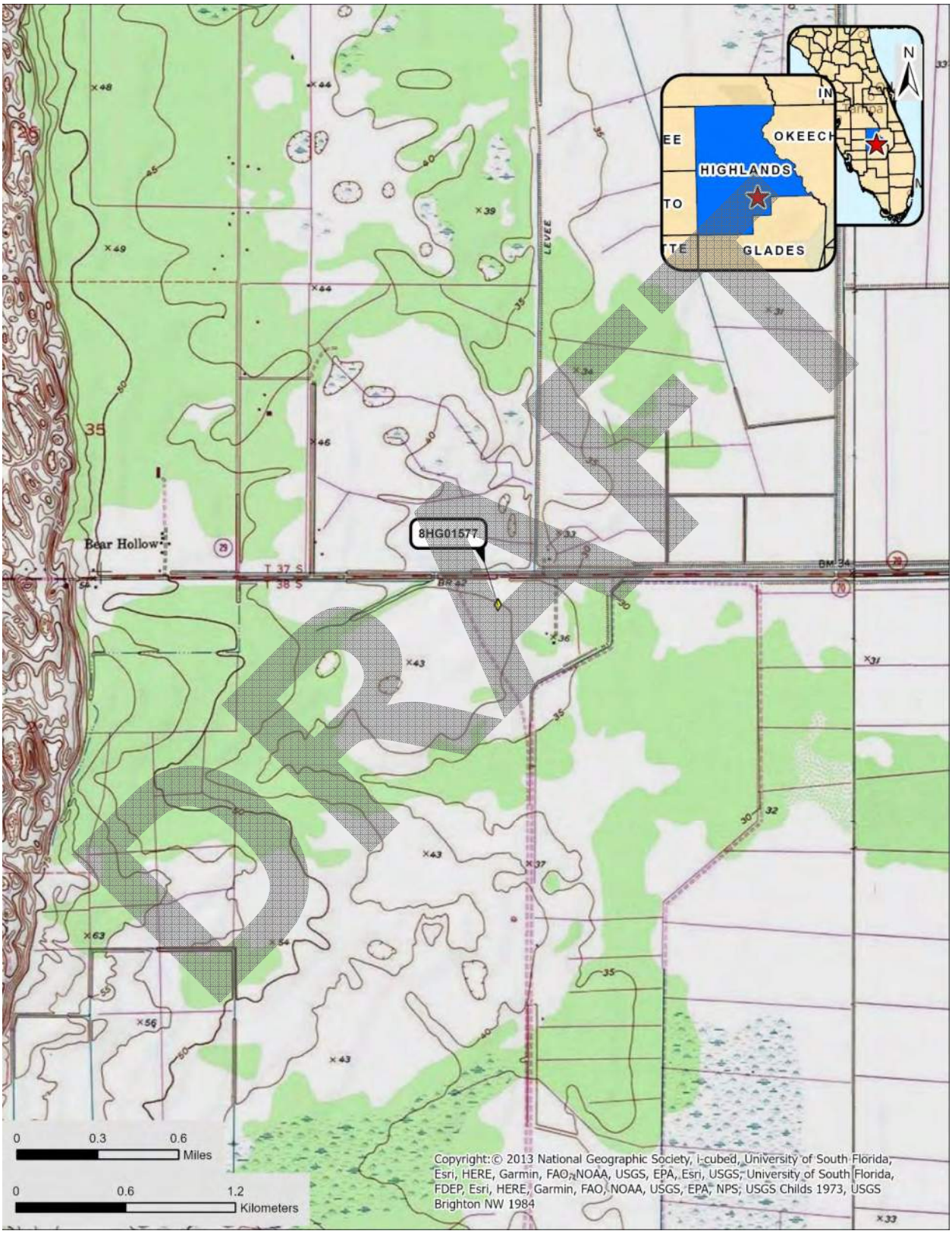
**PHOTOGRAPHS**

DRA

## AERIAL MAP


State Road 70 E
70
70
8HG01577
HIGHLANDS
OKEECH
GLADES
N
0 85 170
Feet
0 30 60
Meters
State of Florida, Maxar, Esri Community Maps Contributors, University of South Florida, FDEP, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, University of South Florida, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Esri, USGS, University of South Florida, FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, USGS Childs 1973,

**USGS Childs**
**Township 38 South, Range 30 East, Section 1**




DRAFT

☒Original
☐Update

# HISTORICAL BRIDGE FORM
## FLORIDA MASTER SITE FILE
**Version 5.0 3/19**

Consult *Guide to the Historical Bridge Form* for detailed instructions

Site #8 HG01578
Field Date 11-11-2022
Form Date 11-28-2022
Recorder #
FDOT Bridge #

Bridge Name(s) SR 70 Cross Drain Culvert
Project Name CRAS SR 70 from CR 29 to Lonesome Island Road
Multiple Listing (DHR only)
Survey # (DHR only)
Ownership: ☐private-profit ☐private-nonprofit ☐private-individual ☐private-nonspecific ☐city ☐county ☒state ☐federal ☐Native American ☐foreign ☐unknown

## LOCATION & MAPPING

Route(s) Carried/Feature(s) Crossed SR 70 (Fritz Street) / Cross Drain
USGS 7.5 Map Name CHILDS USGS Date 1953 Plat or Other Map
City/Town (within 3 miles) Lake Placid In City Limits? ☐yes ☒no ☐unknown County Highlands
Township 37S Range 30E Section 1 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name:
Township 38S Range 30E Section 36 ¼ section: ☐NW ☐SW ☐SE ☐NE
Landgrant Tax Parcel #
UTM Coordinates: Zone ☐16 ☒17 Easting 472973 Northing 3009541
Other Coordinates: X: Y: Coordinate System & Datum
Name of Public Tract (e.g., park)

## HISTORY

Year Built 1970 ☐approximately ☒year listed or earlier ☐year listed or later
Still in use? ☒yes ☐no ☐restricted use (describe)
Prior Fords, Ferries, or Bridges at this Location

Bridge Use: original and current with dates (standard descriptions: auto, railway, pedestrian, fishing pier, abandoned)
Original & Current: carries SR 70 over unnamed cross drain (Auto)

Ownership history
State Highway Agency

Designers/Engineers
Builders/Contractors
Text of Plaque or Inscription
N/A

Narrative History (How did bridge come to be built? How was it financed?, etc.)
The SR 70 Cross Drain Culvert was constructed to carry SR 70 over the unnamed drainage ditch which provides a connection between the drainage canals running parallel (north and south) to SR 70.

## DESCRIPTION

**GENERAL**

Overall Bridge Design 1. Culvert 2.
Overall Condition ☐excellent ☐good ☒fair ☐deteriorated ☐ruinous
Style and Decorative Details
Concrete round culvert w/ concrete wing walls

Tender Station Description
N/A

Alterations: Dates and Descriptions
Unknown

DRAFT

| DHR USE ONLY | OFFICIAL EVALUATION | DHR USE ONLY |
|---|---|---|
| NR List Date<br>☐Owner Objection | SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date Init.<br>KEEPER – Determined eligible: ☐yes ☐no Date<br>NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2) | |


**Florida Master Site File / Div. of Historical Resources / R. A. Gray Bldg / 500 S Bronough St., Tallahassee, FL 32399-0250**
Phone **850.245.6440** / Fax **850.245.6439** / E-mail **SiteFile@dos.myflorida.com**

# HISTORICAL BRIDGE FORM

Site #8 HG01578

## DESCRIPTION (continued)

**SUPERSTRUCTURE**

Spans: Total Number 1 Total Length(ft) 40

Main Spans: Number 1 Length(ft) 40 Width(ft) 50 Roadway width(ft) 20
Main Span Design Culvert
Main Span Materials 1. Concrete 2. _____

Approach Spans: Number_____ Length(ft)_____ Width(ft)_____ Roadway width(ft)_____
Approach Span Design _____
Approach Span Materials 1._____ 2. _____

Deck Materials 1. _____ 2. _____

**SUBSTRUCTURE**

Abutment Materials 1. _____ 2. _____
Abutment Description _____

Pier Materials 1. _____ 2. _____
Pier Description _____

## RESEARCH METHODS (check all that apply)

| | | | |
|---|---|---|---|
| ☐FDOT database search | ☐Fla. Archives / photo collection | ☐newspaper files | ☐informal archaeological inspection |
| ☐HABS/HAER record search | ☐property appraiser / tax records | ☐city directory | ☐formal archaeological survey |
| ☒FMSF record search (sites/surveys) | ☐library research | ☐Public Lands Survey (DEP) | ☐cultural resource survey |

☒Other methods (specify) USDA historic aerial photographs (PALMM)

Bibliographic References (give FMSF manuscript # if relevant, use separate sheet if needed)

Publication of Archival Library and Museum Materials (PALMM), accessible online at: http://palmm.fcla.edu/

## OPINION OF RESOURCE SIGNIFICANCE

Potentially eligible individually for National Register of Historic Places? ☐yes ☒no ☐insufficient information
Potentially eligible as contributor to a National Register district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (**required,** use separate sheet if needed)

This is a common post-1945 concrete culvert and is not a rare example of its type. Background research did not reveal significant historical associations. The SR 70 Cross Drain Culvert does not appear to be eligible for listing in the NRHP.

Area(s) of historical significance (See *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1._____ 3._____ 5._____
2._____ 4._____ 6._____

## DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field & analysis notes, photos, plans, other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description Files, photos, research, document File or accession #'s P19015

2) Document type _____ Maintaining organization _____
Document description _____ File or accession #'s _____

## RECORDER INFORMATION

Recorder Name Savannah Y. Finch Affiliation Archaeological Consultants Inc
Recorder Contact Information 8110 Blaikie Court, Ste. A / Sarasota, FL/ 34240 /aciflorida@comcast.net
(address / phone / fax / e-mail)

**Required Attachments**

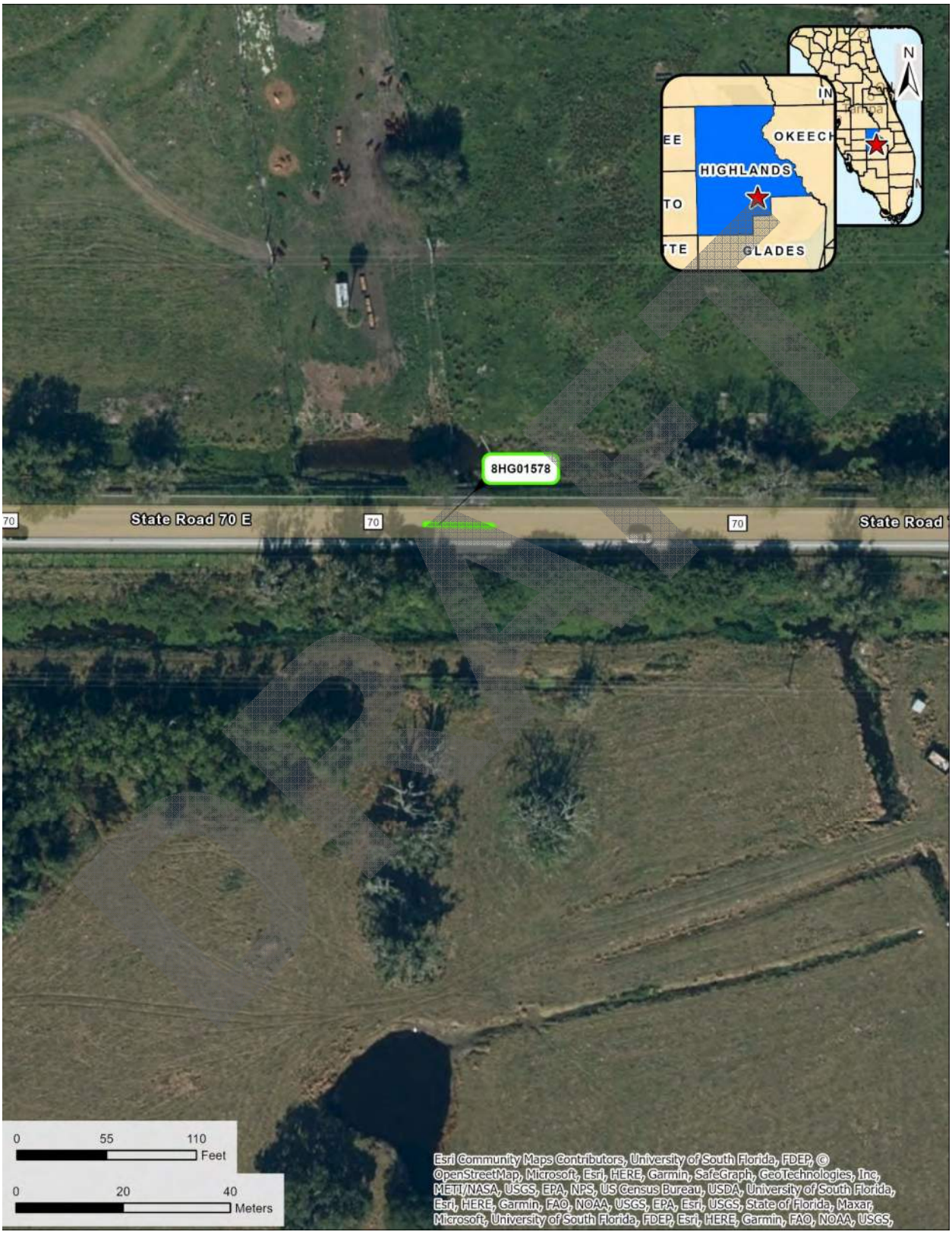
❶ **USGS 7.5' TOPO MAP WITH BRIDGE LOCATION CLEARLY MARKED**

❷ **PHOTO OF BRIDGE**
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable). Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

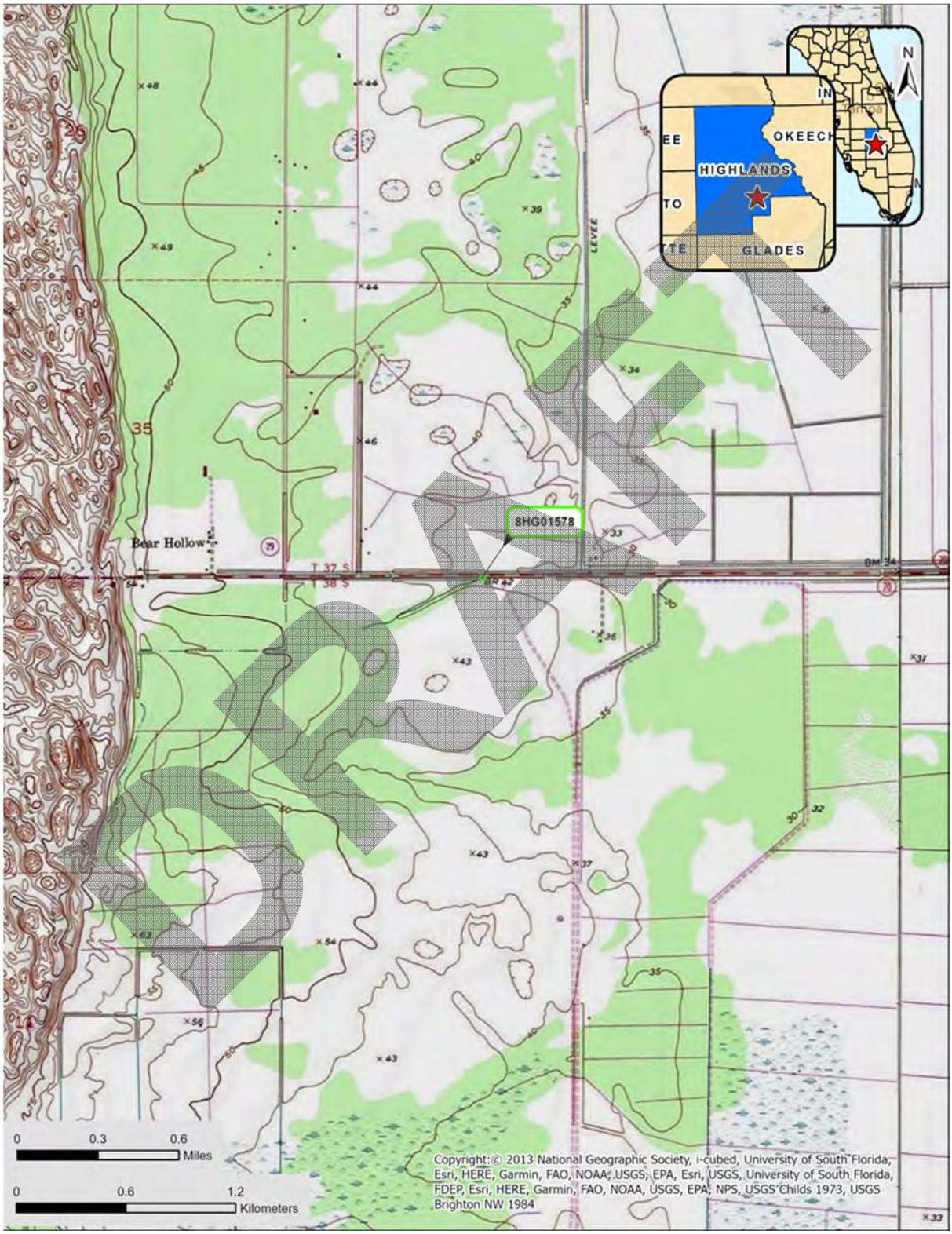
DRAFT

**PHOTOGRAPHS**

## AERIAL MAP


N
OKEECH
HIGHLANDS
GLADES
8HG01578
State Road 70 E
70
State Road
0 55 110
Feet
0 20 40
Meters
Esri Community Maps Contributors, University of South Florida, FDEP, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, University of South Florida, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Esri, USGS, State of Florida, Maxar, Microsoft, University of South Florida, FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS,

**USGS Childs**
**Township 37 South, Range 30 East, Section 1**
**Township 38 South, Range 30 East, Section 36**




DRAFT

☒Original
☐Update

# RESOURCE GROUP FORM
## FLORIDA MASTER SITE FILE
**Version 5.0 3/19**

Consult the *Guide to the Resource Group Form* for additional instructions

Site # HG01579
Field Date 11-11-2022
Form Date 11-28-2022
Recorder# _____

**NOTE: Use this form to document districts, landscapes, building complexes and linear resources** as described in the box below. Cultural resources contributing to the Resource Group should also be documented individually at the Site File. **Do not use this form for National Register multiple property submissions** (MPSs). National Register MPSs are treated as Site File manuscripts and are associated with the individual resources included under the MPS cover using the Site File manuscript number.

**Check ONE box that best describes the Resource Group:**

- ☐ **Historic district** (NR category "district"): buildings and NR structures only: NO archaeological sites
- ☐ **Archaeological district** (NR category "district"): archaeological sites only: NO buildings or NR structures
- ☐ **Mixed district** (NR category "district"): includes more than one type of cultural resource (example: archaeological sites and buildings)
- ☐ **Building complex** (NR category usually "building(s)"): multiple buildings in close spatial and functional association
- ☐ **Designed historic landscape** (NR category usually "district" or "site"): can include multiple resources (see *National Register Bulletin #18*, page 2 for more detailed definition and examples: e.g. parks, golf courses, campuses, resorts, etc.)
- ☐ **Rural historic landscape** (NR category usually "district" or "site"): can include multiple resources and resources not formally designed (see *National Register Bulletin #30, Guidelines for Evaluating and Documenting Rural Historic Landscapes* for more detailed definition and examples: e.g. farmsteads, fish camps, lumber camps, traditional ceremonial sites, etc.)
- ☒ **Linear resource** (NR category usually "structure"): Linear resources are a special type of structure or historic landscape and can include canals, railways, roads, etc.

Resource Group Name SR 70 (Fritz Street) Multiple Listing [DHR only] _____
Project Name CRAS SR 70 from CR 29 to Lonesome Island Road FMSF Survey # _____
National Register Category (please check one): ☐building(s) ☒structure ☐district ☐site ☐object
Linear Resource Type (if applicable): ☐canal ☐railway ☒road ☐other (describe): _____
Ownership: ☐private-profit ☐private-nonprofit ☐private-individual ☐private-nonspecific ☐city ☐county ☒state ☐federal ☐Native American ☐foreign ☐unknown

## LOCATION & MAPPING

Address: (Street Number / Direction / Street Name / Street Type / Suffix Direction)
City/Town (within 3 miles) Lake Placid In Current City Limits? ☐yes ☒no ☐unknown
County or Counties (do not abbreviate) Highlands
Name of Public Tract (e.g., park) _____
1) Township 38S Range 30E Section 1 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: _____
2) Township 37S Range 30E Section 36 ¼ section: ☐NW ☐SW ☐SE ☐NE
3) Township 37S Range 31E Section 31-34 ¼ section: ☐NW ☐SW ☐SE ☐NE
4) Township 38S Range 31E Section 3,4,6,7 ¼ section: ☐NW ☐SW ☐SE ☐NE
USGS 7.5' Map(s) 1) Name CHILDS USGS Date 1953
2) Name BRIGHTON NW USGS Date 1953
Plat, Aerial, or Other Map (map's name, originating office with location) _____
Landgrant _____
Verbal Description of Boundaries (description does not replace required map)

A segment of SR 70 that is approximately 4.3 miles long, spanning from CR 29 in the west to Lonesome Island Road in the east.

| DHR USE ONLY | OFFICIAL EVALUATION | DHR USE ONLY |
|---|---|---|
| NR List Date _____ ☐Owner Objection | SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date _____ Init._____<br>KEEPER – Determined eligible: ☐yes ☐no Date _____<br>NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2) | |

DRAFT

# RESOURCE GROUP FORM

Site #8 HG01579

## HISTORY & DESCRIPTION

Construction Year: 1926 ☐approximately ☒year listed or earlier ☐year listed or later
Architect/Designer: _____ Builder: _____
Total number of individual resources included in this Resource Group: # of contributing 1 # of non-contributing 0
Time period(s) of significance (choose a period from the list or type in date range(s), e.g. *1895-1925*)
1. Twentieth C American 3. _____
2. _____ 4. _____
Narrative Description (*National Register Bulletin 16A* pp. 33-34; attach supplementary sheets if needed)

The segment of SR 70 (historically known as Florida State Road 8) within the APE was constructed by ca. 1926 and provided a route spanning from Haines City through Sebring to Ft. Pierce (FDOT 2022).

## RESEARCH METHODS (check all that apply)

| | | | |
|---|---|---|---|
| ☒FMSF record search (sites/surveys) | ☐library research | ☐building permits | ☐Sanborn maps |
| ☐FL State Archives/photo collection | ☐city directory | ☐occupant/owner interview | ☐plat maps |
| ☒property appraiser / tax records | ☐newspaper files | ☐neighbor interview | ☐Public Lands Survey (DEP) |
| ☐cultural resource survey | ☐historic photos | ☐interior inspection | ☐HABS/HAER record search |

☒other methods (specify) USDA historic aerial photographs (PALMM)

Bibliographic References (give FMSF Manuscript # if relevant)

PALMM, http://palmm.fcla.edu/; FDOT 2022, "Florida Official Transportation Map Archive - 1926." Accessed November 28, 2022. https://www.fdot.gov/gis/floridatransportationmaparchive.shtm.

## OPINION OF RESOURCE SIGNIFICANCE

Potentially eligible individually for National Register of Historic Places? ☐yes ☒no ☐insufficient information
Potentially eligible as contributor to a National Register district? ☐yes ☒no ☐insufficient information
Explanation of Evaluation (required, see *National Register Bulletin 16A* p. 48-49. Attach longer statement, if needed, on separate sheet.)

The linear resource is a common roadway that has been altered by maintenance over the years and is not a significant embodiment of a type, period, or method of construction; and has no known significant historic associations.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)
1. _____ 3. _____ 5. _____
2. _____ 4. _____ 6. _____

## DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description Files, photos, research, document File or accession #'s P19015

2) Document type _____ Maintaining organization _____
Document description _____ File or accession #'s _____

## RECORDER INFORMATION

Recorder Name Savannah Y. Finch Affiliation Archaeological Consultants Inc
Recorder Contact Information 8110 Blaikie Court, Ste. A / Sarasota, FL/ 34240 /aciflorida@comcast.net
(address / phone / fax / e-mail)

**Required Attachments**

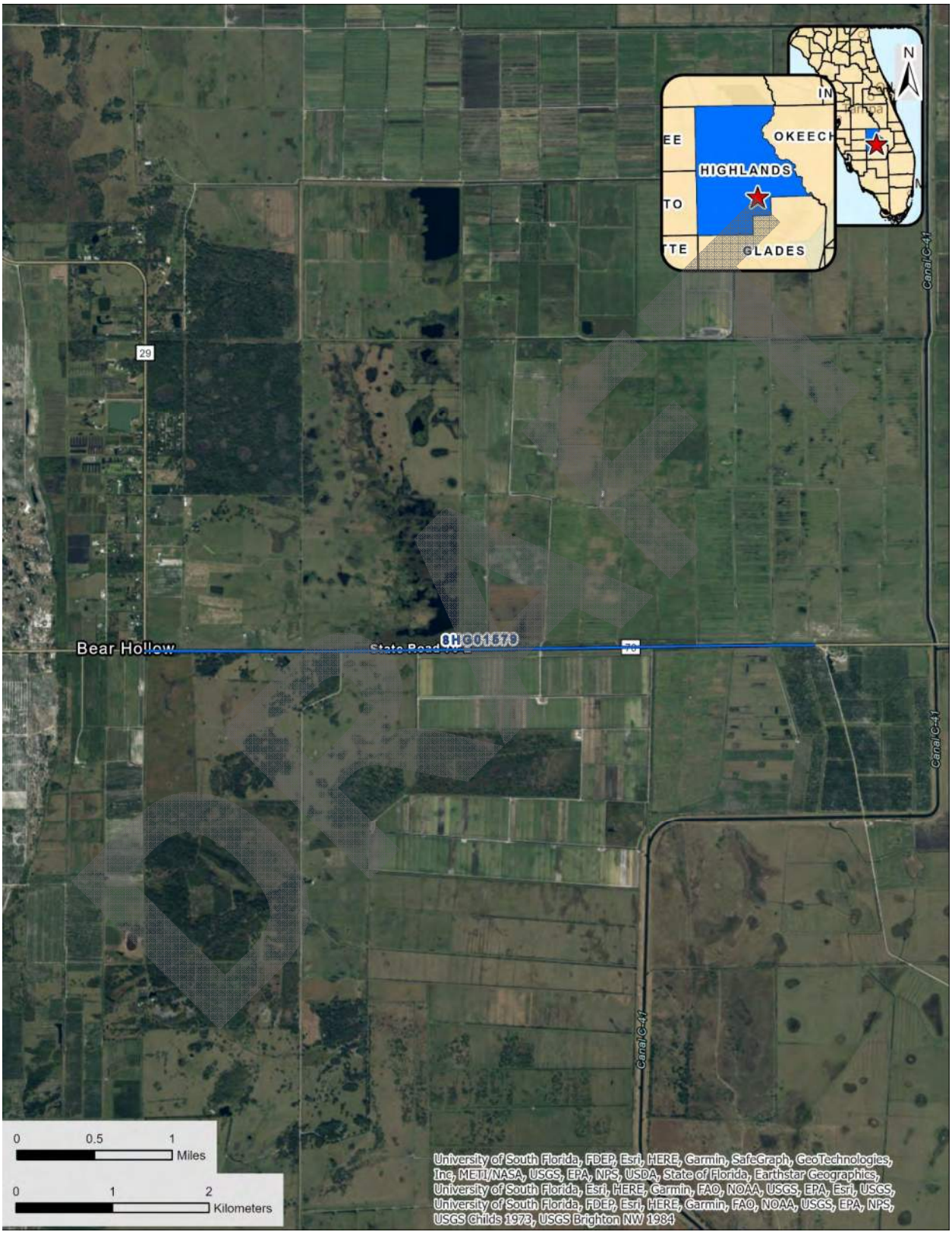
❶ **PHOTOCOPY OF USGS 7.5' MAP WITH DISTRICT BOUNDARY CLEARLY MARKED**
❷ **LARGE SCALE STREET, PLAT OR PARCEL MAP WITH RESOURCES MAPPED & LABELED**
❸ **TABULATION OF ALL INCLUDED RESOURCES -** Include name, FMSF #, contributing? Y/N, resource category, street address or other location information if no address.
❹ **PHOTOS OF GENERAL STREETSCAPE OR VIEWS (Optional: aerial photos, views of typical resources)** When submitting images, they must be included in digital AND hard copy format (plain paper grayscale acceptable). Digital images must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

DRAFT

**PHOTOGRAPHS**

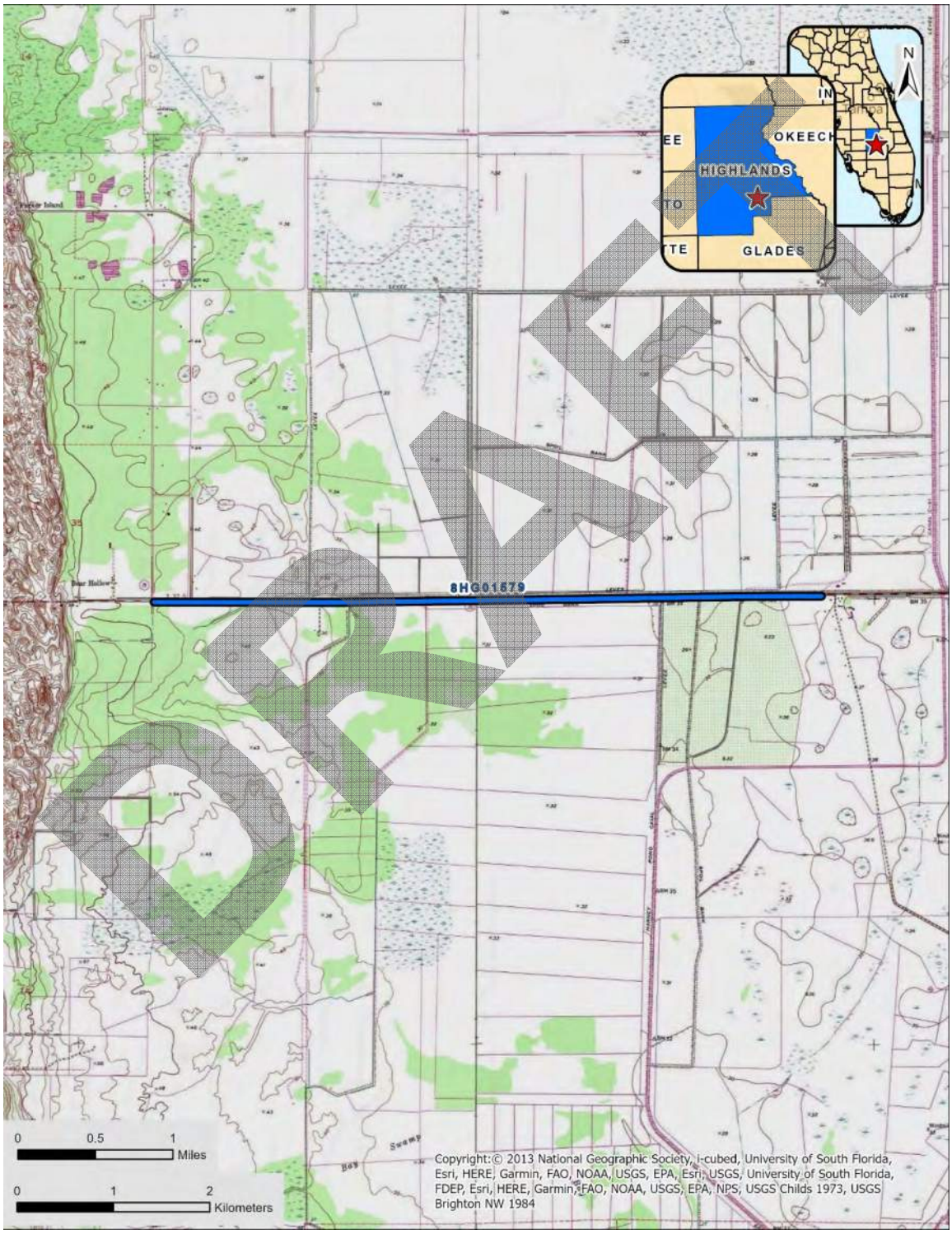
DRAFT

## AERIAL MAP


N
OKEECH
HIGHLANDS
GLADES
Canal C-41
29
Bear Hollow
8HG01579
70
0 0.5 1 Miles
0 1 2 Kilometers
University of South Florida, FDEP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, State of Florida, Earthstar Geographics, University of South Florida, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Esri, USGS, University of South Florida, FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, USGS Childs 1973, USGS Brighton NW 1984

**USGS Childs**
**Township 37 South, Range 30 East, Section 36; Township 38 South, Range 30 East, Section 1**

**USGS Brighton NW**
**Township 37 South, Range 31 East, Sections 31 – 34; Township 38 South, Range 31 East, Sections 3, 4, 6, 7**




DRAFT

☒Original
☐Update

# RESOURCE GROUP FORM
## FLORIDA MASTER SITE FILE
**Version 5.0 3/19**

Consult the *Guide to the Resource Group Form* for additional instructions

Site #8 HG01580
Field Date 11-11-2022
Form Date 11-28-2022
Recorder# _____

**NOTE: Use this form to document districts, landscapes, building complexes and linear resources** as described in the box below. Cultural resources contributing to the Resource Group should also be documented individually at the Site File. **Do not use this form for National Register multiple property submissions** (MPSs). National Register MPSs are treated as Site File manuscripts and are associated with the individual resources included under the MPS cover using the Site File manuscript number.

**Check ONE box that best describes the Resource Group:**

- ☐ **Historic district** (NR category "district"): buildings and NR structures only: NO archaeological sites
- ☐ **Archaeological district** (NR category "district"): archaeological sites only: NO buildings or NR structures
- ☐ **Mixed district** (NR category "district"): includes more than one type of cultural resource (example: archaeological sites and buildings)
- ☐ **Building complex** (NR category usually "building(s)"): multiple buildings in close spatial and functional association
- ☐ **Designed historic landscape** (NR category usually "district" or "site"): can include multiple resources (see *National Register Bulletin #18*, page 2 for more detailed definition and examples: e.g. parks, golf courses, campuses, resorts, etc.)
- ☐ **Rural historic landscape** (NR category usually "district" or "site"): can include multiple resources and resources not formally designed (see *National Register Bulletin #30, Guidelines for Evaluating and Documenting Rural Historic Landscapes* for more detailed definition and examples: e.g. farmsteads, fish camps, lumber camps, traditional ceremonial sites, etc.)
- ☒ **Linear resource** (NR category usually "structure"): Linear resources are a special type of structure or historic landscape and can include canals, railways, roads, etc.

Resource Group Name SR 70 Drainage Canals Multiple Listing [DHR only] _____
Project Name CRAS SR 70 from CR 29 to Lonesome Island Road FMSF Survey #_____
National Register Category (please check one): ☐building(s) ☒structure ☐district ☐site ☐object
Linear Resource Type (if applicable): ☒canal ☐railway ☐road ☐other (describe): _____
Ownership: ☐private-profit ☐private-nonprofit ☐private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☒unknown

## LOCATION & MAPPING

Address: Street Number | Direction | Street Name | Street Type | Suffix Direction
City/Town (within 3 miles) Lake Placid In Current City Limits? ☐yes ☒no ☐unknown
County or Counties (do not abbreviate) Highlands
Name of Public Tract (e.g., park) _____
1) Township 38S Range 30E Section 1 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: _____
2) Township 38S Range 31E Section 3,4 ¼ section: ☐NW ☐SW ☐SE ☐NE
3) Township 38S Range 31E Section 6,7 ¼ section: ☐NW ☐SW ☐SE ☐NE
4) Township _____ Range _____ Section _____ ¼ section: ☐NW ☐SW ☐SE ☐NE
USGS 7.5' Map(s) 1) Name CHILDS USGS Date 1953
2) Name BRIGHTON NW USGS Date 1953
Plat, Aerial, or Other Map (map's name, originating office with location) _____
Landgrant _____
Verbal Description of Boundaries (description does not replace required map)

Segments running parallel to SR 70 that are approximately 3.8 miles long (south; from CR 29 in the west to just east of Southwind Rd) & 4.3 miles long (north; from CR 29 in the west to Lonesome Island Road), ranging between 20 - 40 feet wide.

| DHR USE ONLY | OFFICIAL EVALUATION | DHR USE ONLY |
|---|---|---|
| NR List Date _____ ☐Owner Objection | SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date _____ Init._____<br>KEEPER – Determined eligible: ☐yes ☐no Date _____<br>NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2) | |

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# RESOURCE GROUP FORM

Site #8 HG01580

## HISTORY & DESCRIPTION

Construction Year: 1943 ☐approximately ☒year listed or earlier ☐year listed or later
Architect/Designer: _____ Builder: _____
Total number of individual resources included in this Resource Group: # of contributing 1 # of non-contributing 0
Time period(s) of significance (choose a period from the list or type in date range(s), e.g. *1895-1925*)
1. Twentieth C American 3. _____
2. _____ 4. _____
Narrative Description (*National Register Bulletin 16A* pp. 33-34; attach supplementary sheets if needed)

The SR 70 Drainage Canals have steep earthen banking that is moderately overgrown w/ vegetation & have been altered over the years by several unnamed irrigation ditches flowing perpendicularly into the canal, as well as driveways & minor dirt roads.

## RESEARCH METHODS (check all that apply)

| | | | |
|---|---|---|---|
| ☒FMSF record search (sites/surveys) | ☐library research | ☐building permits | ☐Sanborn maps |
| ☐FL State Archives/photo collection | ☐city directory | ☐occupant/owner interview | ☐plat maps |
| ☒property appraiser / tax records | ☐newspaper files | ☐neighbor interview | ☐Public Lands Survey (DEP) |
| ☐cultural resource survey | ☐historic photos | ☐interior inspection | ☐HABS/HAER record search |

☒other methods (specify) USDA historic aerial photographs (PALMM)
Bibliographic References (give FMSF Manuscript # if relevant)

Publication of Archival Library and Museum Materials (PALMM), accessible online at: http://palmm.fcla.edu/

## OPINION OF RESOURCE SIGNIFICANCE

Potentially eligible individually for National Register of Historic Places? ☐yes ☒no ☐insufficient information
Potentially eligible as contributor to a National Register district? ☐yes ☒no ☐insufficient information
Explanation of Evaluation (required, see *National Register Bulletin 16A* p. 48-49. Attach longer statement, if needed, on separate sheet.)

The linear resource is a common drainage ditch that has been altered over the years and is not a significant embodiment of a type, period, or method of construction; and has no known significant historic associations.

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)
1. _____ 3. _____ 5. _____
2. _____ 4. _____ 6. _____

## DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type All materials at one location Maintaining organization Archaeological Consultants Inc
Document description Files, photos, research, document File or accession #'s P19015

2) Document type _____ Maintaining organization _____
Document description _____ File or accession #'s _____

## RECORDER INFORMATION

Recorder Name Savannah Y. Finch Affiliation Archaeological Consultants Inc
Recorder Contact Information 8110 Blaikie Court, Ste. A / Sarasota, FL/ 34240 /aciflorida@comcast.net
(address / phone / fax / e-mail)

**Required Attachments**

❶ **PHOTOCOPY OF USGS 7.5' MAP WITH DISTRICT BOUNDARY CLEARLY MARKED**
❷ **LARGE SCALE STREET, PLAT OR PARCEL MAP WITH RESOURCES MAPPED & LABELED**
❸ **TABULATION OF ALL INCLUDED RESOURCES -** Include name, FMSF #, contributing? Y/N, resource category, street address or other location information if no address.
❹ **PHOTOS OF GENERAL STREETSCAPE OR VIEWS (Optional: aerial photos, views of typical resources)** When submitting images, they must be included in digital AND hard copy format (plain paper grayscale acceptable). Digital images must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

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**PHOTOGRAPHS**

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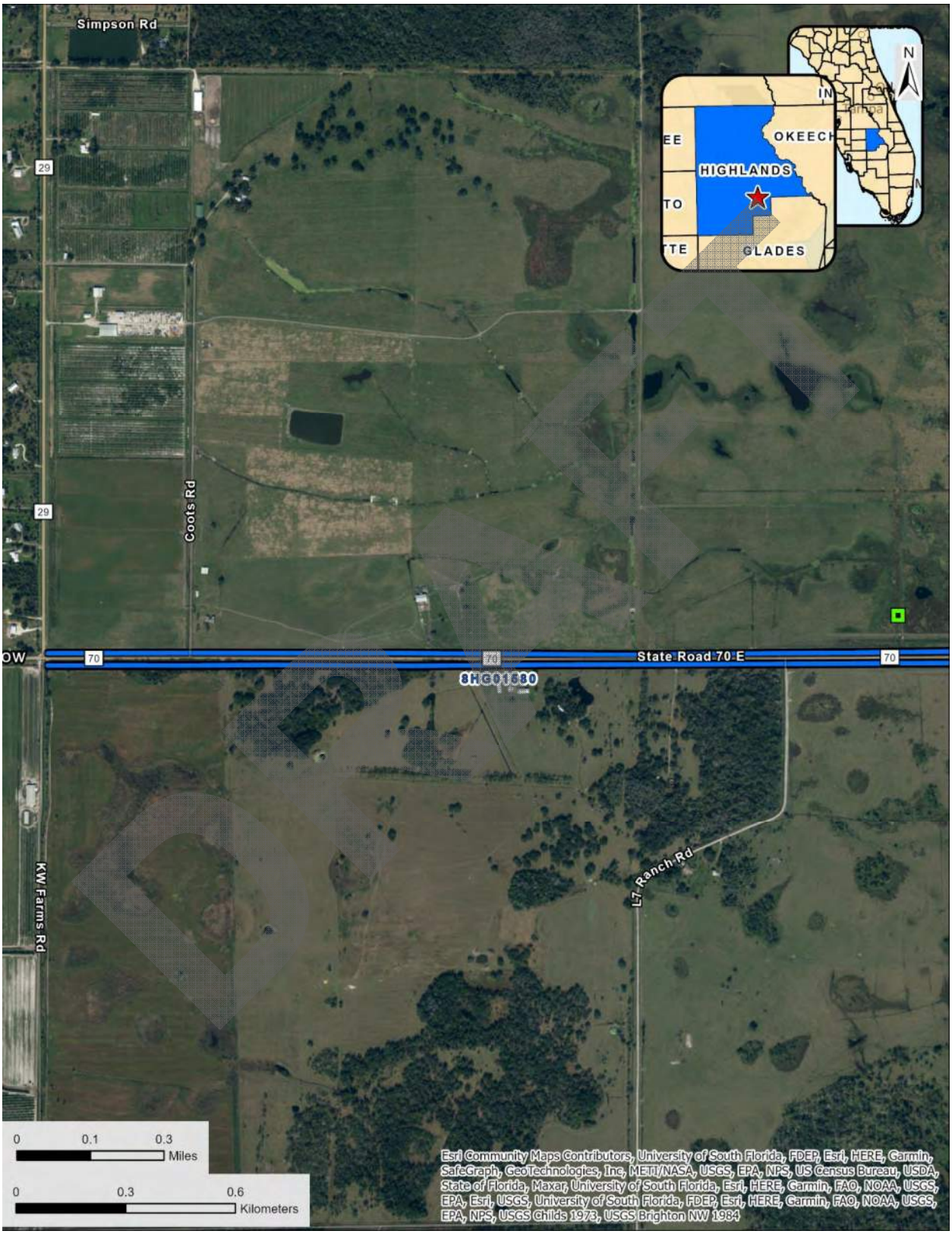
## AERIAL MAP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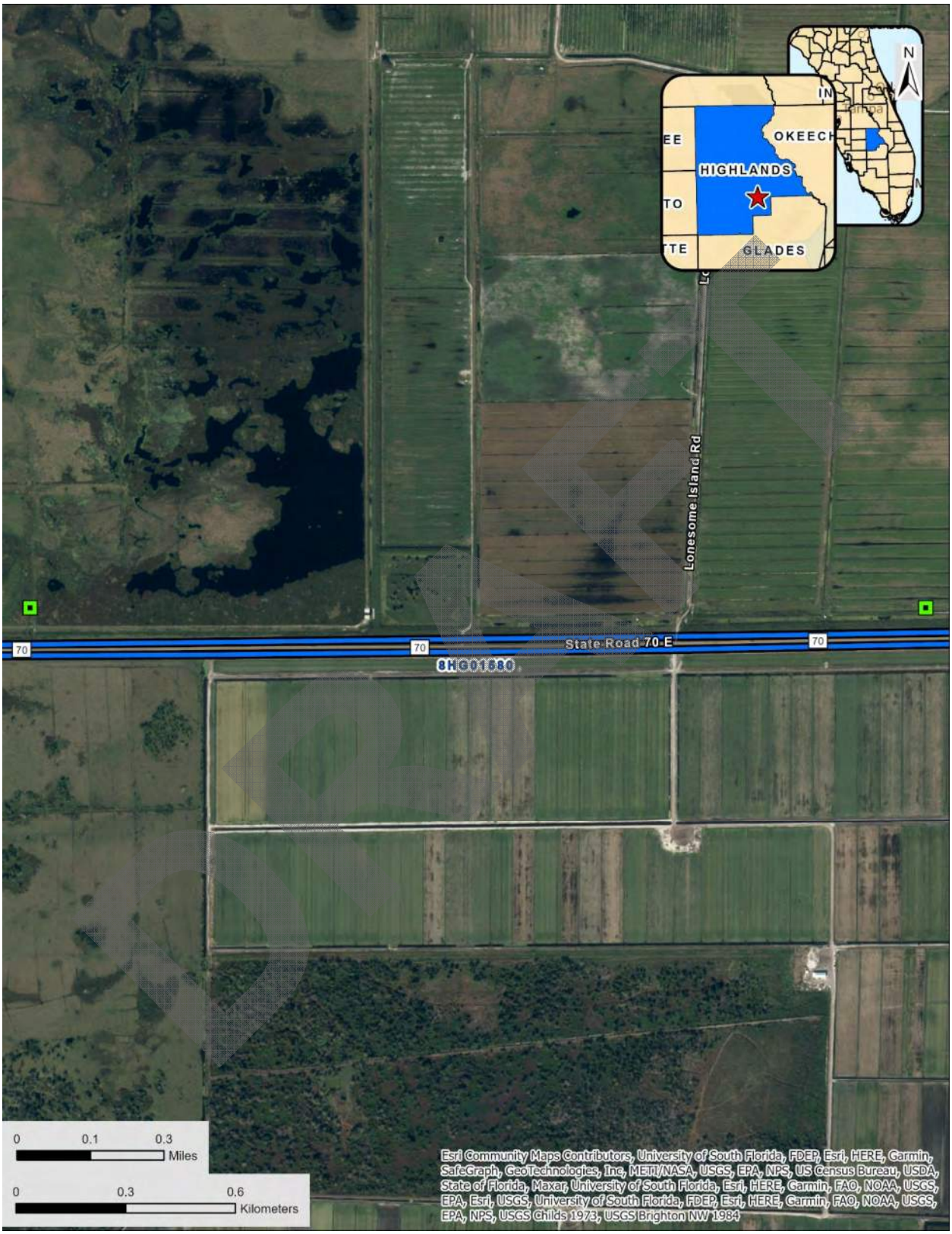
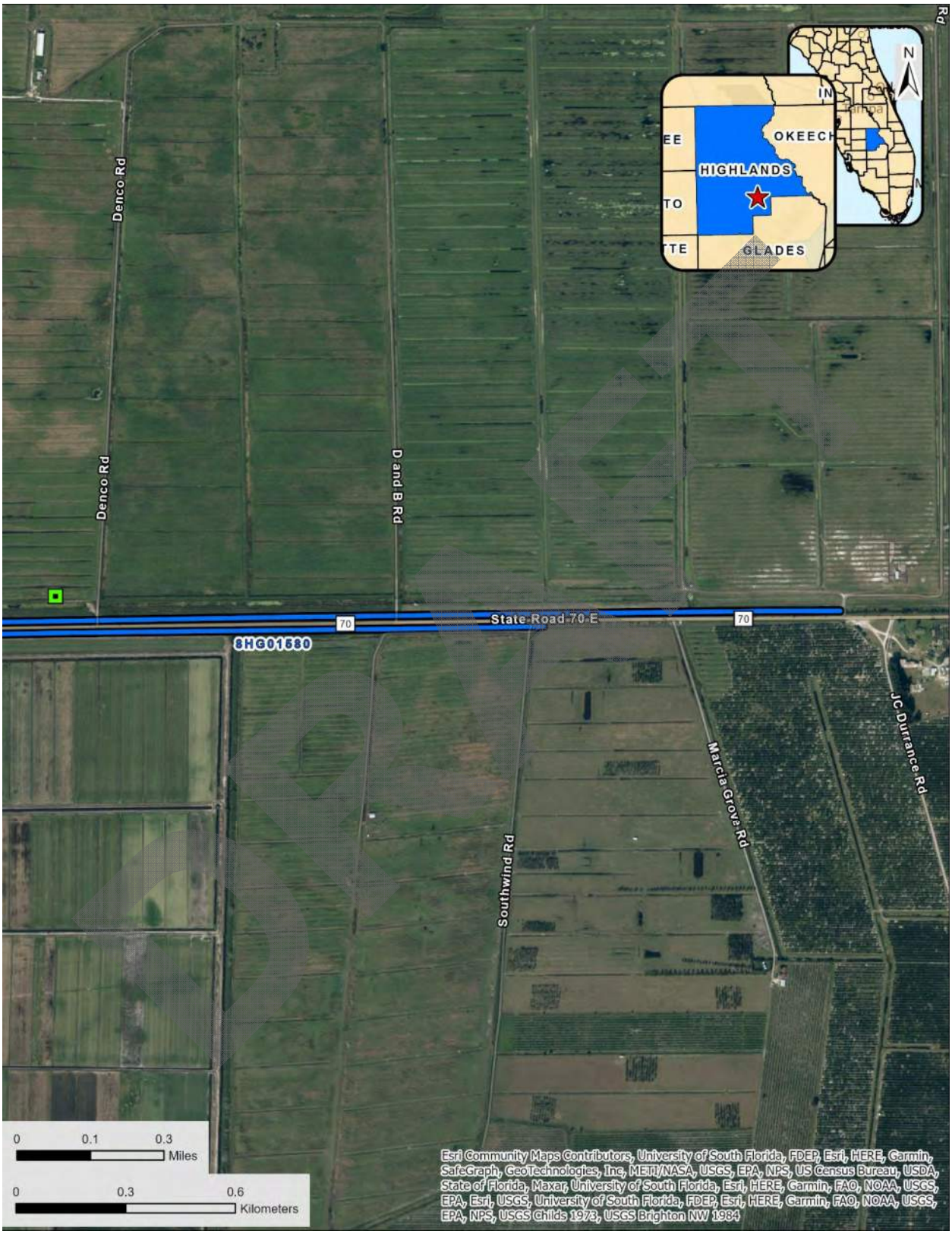
29
Coots Rd
70
State Road 70 E
70
70
8HG01580
KW Farms Rd
L7 Ranch Rd
N
HIGHLANDS
OKEECH
GLADES
0 0.1 0.3
Miles
0 0.3 0.6
Kilometers
Esri Community Maps Contributors, University of South Florida, FDEP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, State of Florida, Maxar, University of South Florida, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Esri, USGS, University of South Florida, FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, USGS Childs 1973, USGS Brighton NW 1984


N
OKEECH
HIGHLANDS
GLADES
Lonesome Island Rd
70
State Road 70 E
8HG01580
0 0.1 0.3
Miles
0 0.3 0.6
Kilometers
Esri Community Maps Contributors, University of South Florida, FDEP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, State of Florida, Maxar, University of South Florida, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Esri, USGS, University of South Florida, FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, USGS Childs 1973, USGS Brighton NW 1984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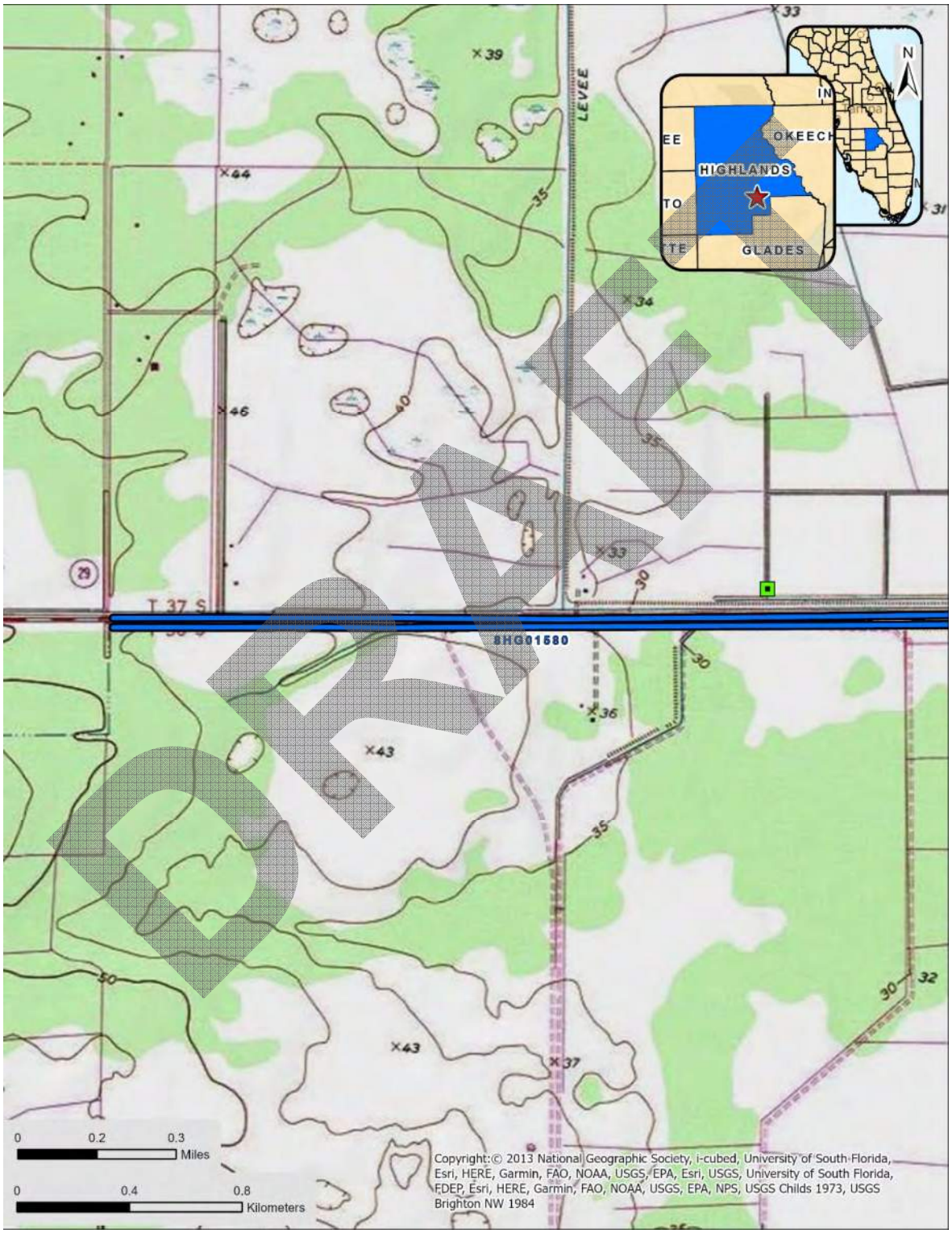
Denco Rd
D and B Rd
State Road 70 E
70
70
8HG01580
Southwind Rd
Marcia Grove Rd
JC Durrance Rd
HIGHLANDS
OKEECH
GLADES
N
0 0.1 0.3
Miles
0 0.3 0.6
Kilometers
Esri Community Maps Contributors, University of South Florida, FDEP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, State of Florida, Maxar, University of South Florida, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Esri, USGS, University of South Florida, FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, USGS Childs 1973, USGS Brighton NW 1984

**USGS Childs**
**Township 38 South, Range 30 East, Section 1**

**USGS Brighton NW**
**Township 38 South, Range 31 East, Sections 3, 4, 6, 7**

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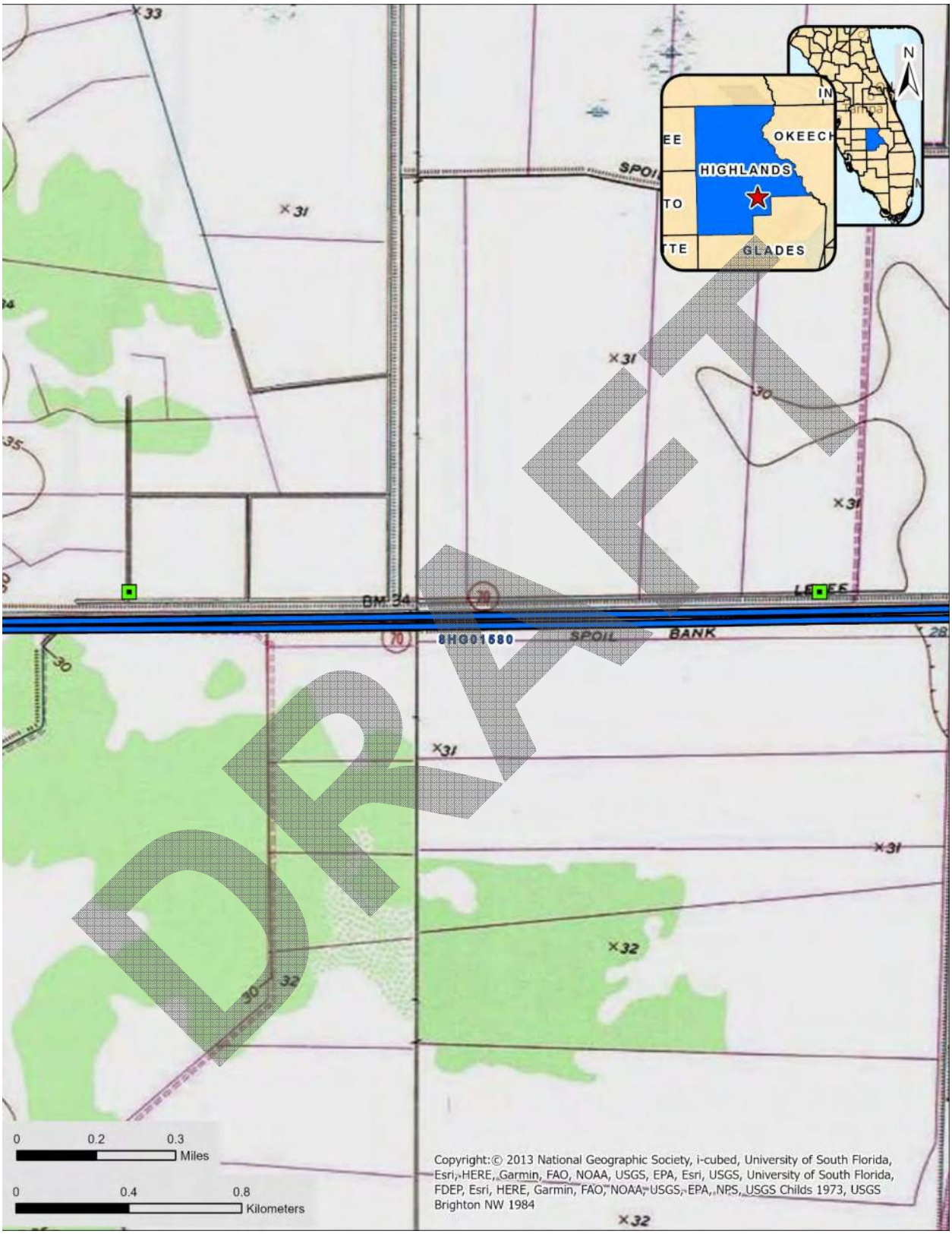
HIGHLANDS
OKEECH
GLADES
N
8HG01580
SPOIL BANK
BM 34
0 0.2 0.3 Miles
0 0.4 0.8 Kilometers
Copyright:© 2013 National Geographic Society, i-cubed, University of South Florida, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Esri, USGS, University of South Florida, FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, USGS Childs 1973, USGS Brighton NW 1984

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BANK
LEVEE
LEVEE
8HG01580
BM 34
BM35
BM 34
HIGHLANDS
OKEECH
GLADES
N
0 0.2 0.3 Miles
0 0.4 0.8 Kilometers
Copyright:© 2013 National Geographic Society, i-cubed, University of South Florida, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Esri, USGS, University of South Florida, FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, USGS Childs 1973, USGS Brighton NW 1984

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**APPENDIX B**
**Survey Log**

Ent D (FMSF only) _____

# Survey Log Sheet

**Florida Master Site File**
**Version 5.0 3/19**

Survey # (FMSF only) _____

**Consult *Guide to the Survey Log Sheet* for detailed instructions.**

## Manuscript Information

**Survey Project** (name and project phase)
CRAS SR 70 From CR 29 to Lonesome Island Road, HG Co. - Phase I

**Report Title** (exactly as on title page)
Cultural Resource Assessment Survey SR 70 from CR 29 to Lonesome Island Road, Highlands County, Florida FPID No.: 414506-5-22-01

**Report Authors** (as on title page) 1. ACI 3. _____
2. _____ 4. _____

**Publication Year** 2022 **Number of Pages in Report** (do not include site forms) 52

**Publication Information** (Give series, number in series, publisher and city. For article or chapter, cite page numbers. Use the style of *American Antiquity*.)
P19015; ACI, Sarasota.

**Supervisors of Fieldwork** (even if same as author) Names _____

**Affiliation of Fieldworkers:** Organization Archaeological Consultants Inc City Sarasota

**Key Words/Phrases** (Don't use county name, or common words like *archaeology, structure, survey, architecture, etc.*)
1. SR 70 3. Lonesome Island Road 5. _____ 7. _____
2. CR 29 4. _____ 6. _____ 8. _____

**Survey Sponsors** (corporation, government unit, organization, or person funding fieldwork)
Name Kisinger Campo and Associates, Inc. Organization _____
Address/Phone/E-mail 201 North Franklin Street, Suite 400, Tampa, Florida 33602

**Recorder of Log Sheet** Crystal Wright **Date Log Sheet Completed** 11-28-2022

**Is this survey or project a continuation of a previous project?** ☒No ☐Yes: **Previous survey #s (FMSF only)** _____

## Project Area Mapping

**Counties** (select every county in which field survey was done; attach additional sheet if necessary)
1. Highlands 3. _____ 5. _____
2. _____ 4. _____ 6. _____

**USGS 1:24,000 Map Names/Year of Latest Revision** (attach additional sheet if necessary)
1. Name CHILDS Year 1973 4. Name _____ Year _____
2. Name BRIGHTON NW Year 1984 5. Name _____ Year _____
3. Name _____ Year _____ 6. Name _____ Year _____

## Field Dates and Project Area Description

**Fieldwork Dates:** Start 11-7-2022 End 11-11-2022 **Total Area Surveyed** (fill in one) _____ hectares 200.00 acres
**Number of Distinct Tracts or Areas Surveyed** 1
**If Corridor** (fill in one for each) **Width:** _____ meters 75 feet **Length:** _____ kilometers 4.30 miles

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# Survey Log Sheet

Survey #_____

## Research and Field Methods

**Types of Survey** (select all that apply): ☒archaeological ☒architectural ☒historical/archival ☐underwater ☐damage assessment ☐monitoring report ☐other(describe): _____

**Scope/Intensity/Procedures**

background research, surface reconnaissance; systematic and judgmental subsurface testing (50 & 100 m) N=108, all negative; 50 cm diameter, 1 m deep, 1/4" screen; historic survey; photos taken; report prepared

**Preliminary Methods** (select as many as apply to the project as a whole)

| | | | | |
|---|---|---|---|---|
| ☐Florida Archives (Gray Building) | ☐library research- *local public* | ☒local property or tax records | ☒other historic maps | ☐LIDAR |
| ☐Florida Photo Archives (Gray Building) | ☐library-special collection | ☐newspaper files | ☒soils maps or data | ☐other remote sensing |
| ☒Site File property search | ☒Public Lands Survey (maps at DEP) | ☒literature search | ☒windshield survey | |
| ☒Site File survey search | ☐local informant(s) | ☐Sanborn Insurance maps | ☒aerial photography | |

☐other (describe): _____

**Archaeological Methods** (select as many as apply to the project as a whole)

☐Check here if **NO** archaeological methods were used.

| | | | |
|---|---|---|---|
| ☐surface collection, controlled | ☐shovel test-other screen size | ☐block excavation (at least 2x2 m) | ☐metal detector |
| ☒surface collection, uncontrolled | ☐water screen | ☐soil resistivity | ☐other remote sensing |
| ☒shovel test-1/4"screen | ☐posthole tests | ☐magnetometer | ☒pedestrian survey |
| ☐shovel test-1/8" screen | ☐auger tests | ☐side scan sonar | ☐unknown |
| ☐shovel test 1/16"screen | ☐coring | ☐ground penetrating radar (GPR) | |
| ☐shovel test-unscreened | ☐test excavation (at least 1x2 m) | ☐LIDAR | |

☐other (describe): _____

**Historical/Architectural Methods** (select as many as apply to the project as a whole)

☐Check here if **NO** historical/architectural methods were used.

| | | | |
|---|---|---|---|
| ☐building permits | ☐demolition permits | ☐neighbor interview | ☐subdivision maps |
| ☐commercial permits | ☒windshield survey | ☐occupant interview | ☐tax records |
| ☐interior documentation | ☒local property records | ☐occupation permits | ☐unknown |

☐other (describe): _____

## Survey Results

**Resource Significance Evaluated?** ☒Yes ☐No

**Count of Previously Recorded Resources** 0 **Count of Newly Recorded Resources** 4

**List Previously Recorded Site ID#s with Site File Forms Completed** (attach additional pages if necessary)

NA

**List Newly Recorded Site ID#s** (attach additional pages if necessary)

HG01577, HG01578, HG01579, HG01580

**Site Forms Used:** ☐Site File Paper Forms ☒Site File PDF Forms

**REQUIRED: Attach Map of Survey or Project Area Boundary**

| SHPO USE ONLY | SHPO USE ONLY | SHPO USE ONLY |
|---|---|---|

**Origin of Report:** ☐872 ☐Public Lands ☐UW ☐1A32 # _____ ☐Academic ☐Contract ☐Avocational ☐Grant Project # _____ ☐Compliance Review: CRAT # _____

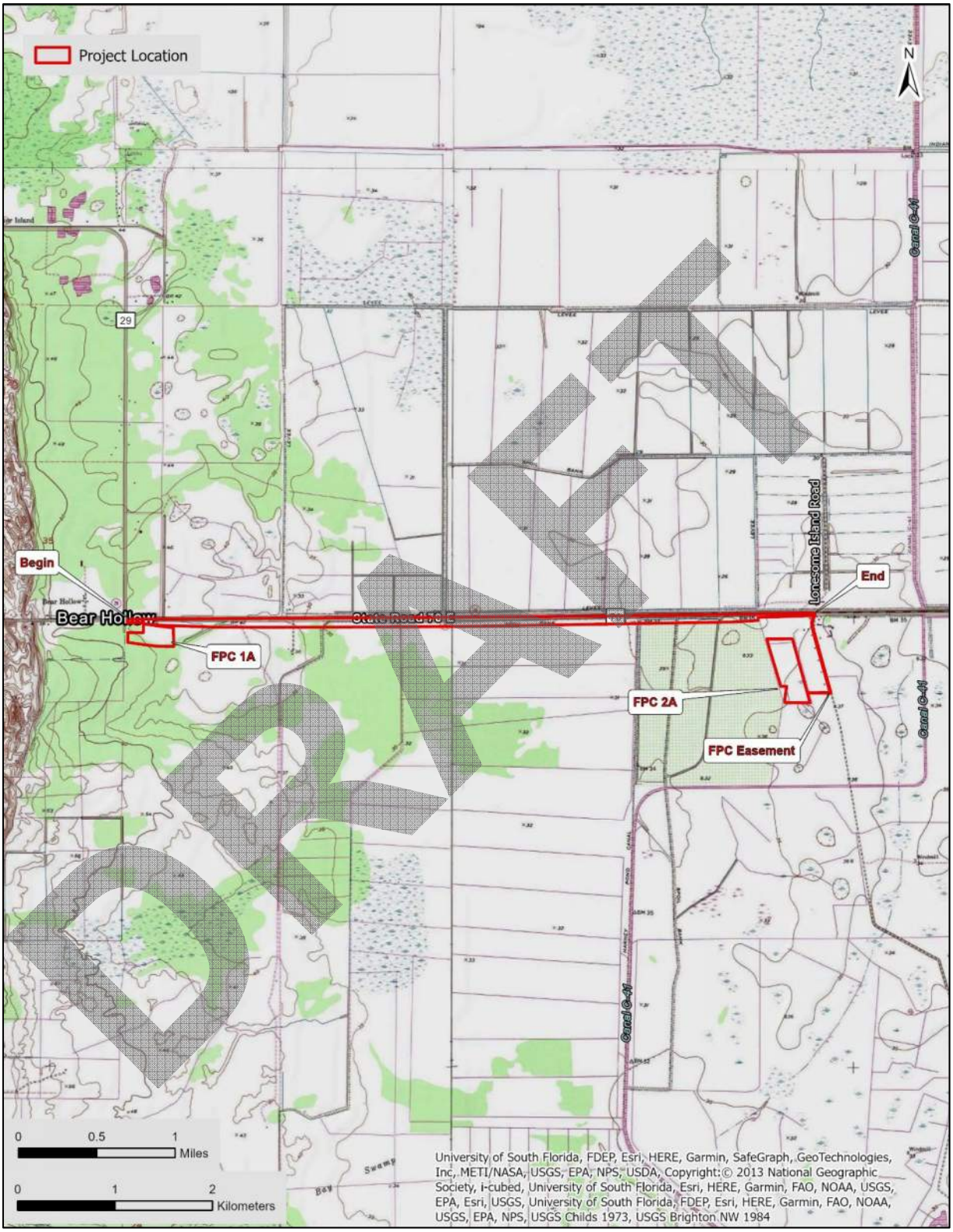
**Type of Document:** ☐Archaeological Survey ☐Historical/Architectural Survey ☐Marine Survey ☐Cell Tower CRAS ☐Monitoring Report ☐Overview ☐Excavation Report ☐Multi-Site Excavation Report ☐Structure Detailed Report ☐Library, Hist. or Archival Doc ☐Desktop Analysis ☐MPS ☐MRA ☐TG ☐Other: _____

**Document Destination:** Plottable Projects **Plotability:** _____

DRAFT



Florida Master Site File / Div. of Historical Resources / R.A. Gray Bldg / 500 S Bronough St., Tallahassee, Florida 32399-0250
Phone 850.245.6440, Fax 850.245.6439, Email: SiteFile@dos.myflorida.com



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| | |
|---|---|
| USGS Childs 1973 and Brighton NW 1984<br>Township 37 South, Range 30 East, Section 36<br>Township 37 South, Range 31 East, Sections 31 to 34<br>Township 38 South, Range 30 East, Section 1<br>Township 38 South, Range 31 East, Sections 3, 4, 6, 7 | **Cultural Resource Assessment Survey**<br>SR 70 from CR 29 to Lonesome Island Road<br>Highlands County, Florida<br>FPID No: 414506-5-22-01 |

# APPENDIX F

# WETLANDS & PROTECTED SPECIES

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# POND SITING REPORT
# WETLANDS AND PROTECTED SPECIES EVALUATION

## SR 70 FROM CR 29 TO LONESOME ISLAND ROAD
## PD&E STUDY
## FINANCIAL PROJECT ID: 414506-5-22-01

**Highlands County, Florida**

DRAFT

***Prepared for:***
**Florida's Department of Transportation**
**District One**
**801 N. Broadway Avenue**
**Bartow, Florida 33830-3809**

**March 2021**

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# *List of Attachments*



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# 1.0 Introduction

The Florida Department of Transportation (FDOT), District One, is conducting a Project Development and Environment (PD&E) Study for the widening of State Road (SR) 70 from County Road (CR) 29 to Lonesome Island Road in Highlands County. The study includes a build alternative for a four lane roadway. The purpose of this report is to evaluate proposed pond sites and provide a rating to determine, preliminarily, if any wetlands or protected species will be impacted by the selection of a proposed pond site. To support the project's proposed improvements, preliminary pond sites were identified and consist of three (3) stormwater management facilities (SMF), four (4) floodplain compensation (FPC) sites, and one (1) regional pond is proposed (**Figure 1-1**). Each of these proposed pond sites was assessed for potential impacts to wetlands and protected species to assign a rating of potential involvement of None, Low, Moderate, or High.

For the purpose of this document, wetlands are defined per Chapter 62-340, Florida Administrative Code (F.A.C), Section 373.019 (27), Florida Statutes, Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-01), and the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region (ERD/EL TR-10-20).

The proposed ponds (assessment areas) were also evaluated for potential occurrences of federal and state listed protected animal species as defined by the Endangered Species Act of 1973, as amended, and 68A-27, F.A.C.

# 2.0 Methodology

To determine the approximate locations and boundaries of existing upland and wetland communities within each of the proposed pond sites and potential utilization of these sites by protected species, available site-specific data was collected and reviewed.

The literature and databases reviewed as part of this evaluation are included in the References section of this report.

Environmental scientists familiar with Florida natural communities conducted on-site field reviews of the proposed pond sites in May 2020. The purpose of these field reviews was to assess existing ecological conditions at each site. The vegetative communities within each of the proposed pond sites were mapped and their species composition determined. Each site was also evaluated to determine its potential to support protected wildlife species.

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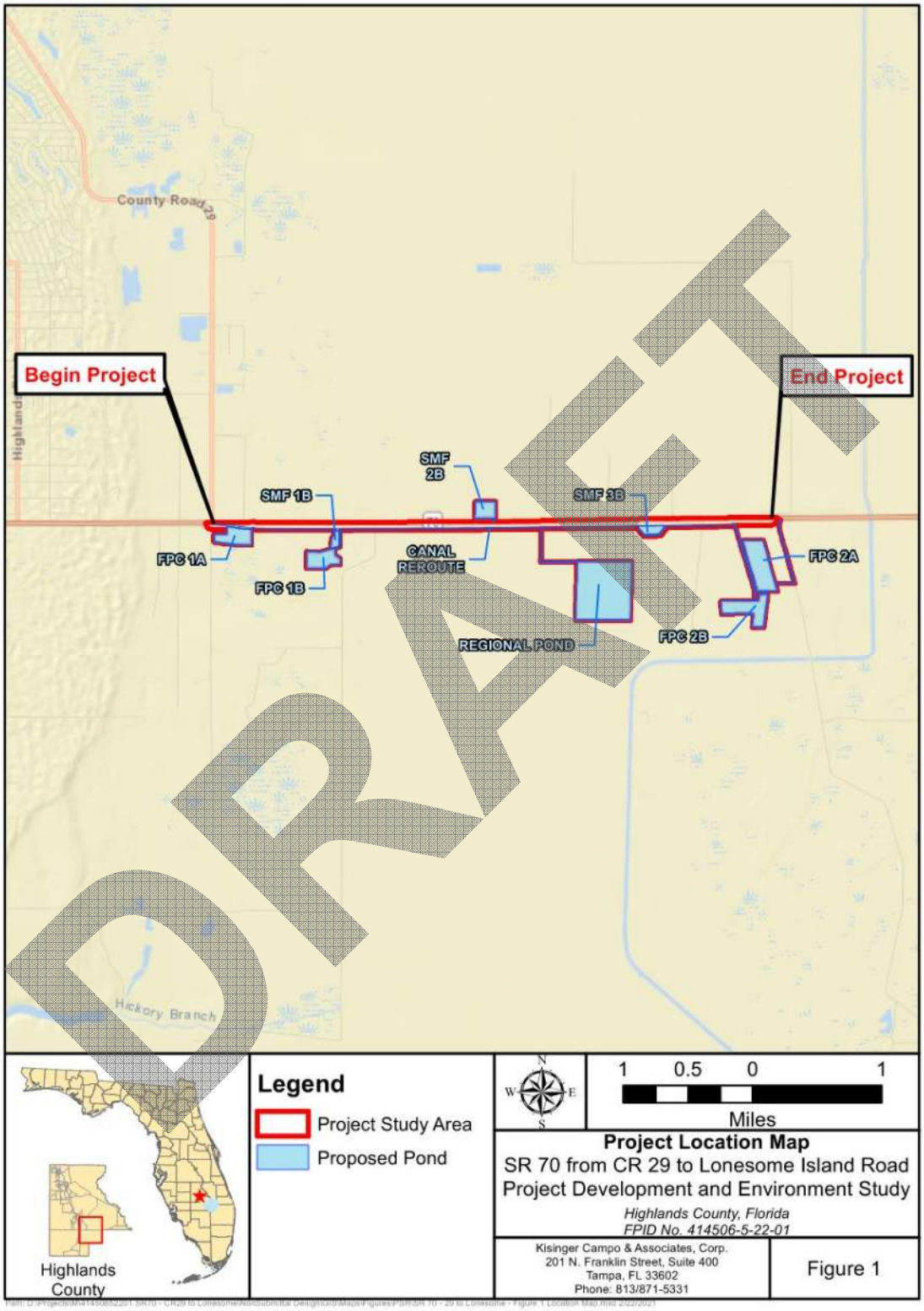
**Figure 1-1 Project Location Map**

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# 3.0 Results

## 3.1 Existing Land Use

The pond site assessment areas consist of three (3) SMF sites, four (4) FPC sites, and one (1) regional pond site. Existing land use and habitats within the assessment areas were classified using the FLUCFCS (FDOT 1999). Wetlands were also classified using USFWS Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al. 1979). Existing land uses found within each pond site are shown in **Table 3-1**. A map of existing land uses found within the assessment areas is provided in **Attachment A**. Land uses within all assessment areas consists primarily of agricultural land uses including improved pastures (FLUFCS 211), citrus groves (FLUCFCS 221), and sod farms (FLUCFCS 242).

Stormwater Management Facility Sites

SMF 1B is located south of SR 70 approximately 1.0 mile east of CR 29 (**Figure 1-1; Attachment A**). SMF 1B is comprised of improved pastures (FLUCFCS 211) and temperate hardwoods (FLUCFCS 425) (**Table 3-1**).

SMF 2B is located north of SR 70 approximately 1.0 miles east of CR 29 (**Figure 1-1; Attachment A**). SMF 2B is comprised of freshwater marshes (FLUCFCS 641), citrus groves (FLUCFCS 221), and streams and waterways (FLUCFCS 510) which consists of a man-made canal that runs parallel to SR 70 (**Table 3-1**).

SMF 3B is located south of SR 70 approximately 1.0 mile west of Lonesome Island Road (**Figure 1-1; Attachment A**). SMF 3B is comprised of unimproved pastures (FLUCFCS 212) and streams and waterways (FLUCFCS 510) which consists of man-made agricultural ditches (**Table 3-1**).

Floodplain Compensation Sites

FPC 1A is located south of SR 70, directly east of CR 29 (**Figure 1-1**; **Attachment A**). FPC 1A is comprised of improved pastures (FLUCFCS 211), streams and waterways (FLUFCS 510) consisting of man-made agricultural ditches, mixed wetland hardwoods (FLUCFCS 617), and freshwater marshes (FLUCFCS 641) (**Table 3-1**).

FPC 1B is located south of SR 70 approximately 1.0 mile east of CR 29. This proposed pond site abuts SMF 1B directly to the south. FPC 1B is comprised of improved pastures (FLUCFCS 211), temperate hardwoods (FLUCFCS 425), and streams and waterways (FLUCFCS 510) which consists of man-made agricultural ditches (**Table 3-1**).

FPC 2A is located south of SR 70 approximately 0.2 miles west of Lonesome Island Road. FPC 2A is comprised of citrus groves (FLUCFCS 221) and streams and waterways (FLUCFCS 510) which consists of man-made agricultural canals (**Table 3-1**).

FPC 2B is located south of SR 70 approximately 0.2 miles west of Lonesome Island Road, directly south of FPC 2A. FPC 2B is comprised of unimproved pastures (FLUCFCS 212), and streams and waterways (FLUCFCS 510) which consists of man-made agricultural ditches and canals (**Table 3-1**).

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Regional Pond

The proposed regional pond is located south of SR 70 approximately 1.3 miles west of Lonesome Island Road. The regional pond is comprised of sod farms (FLUCFCS 242) and streams and waterways (FLUCFCS 510) which consists of man-made agricultural ditches (**Table 3-1**).

**Table 3-1 Existing Land Uses within the Assessment Areas**

| Pond Site ID | FLUCFCS Code[1] | FLUCFCS Description | USFWS Classification[2] | Acreage |
|---|---|---|---|---|
| SMF 1B | 211 | Improved Pastures | N/A | 5.01 |
| | 425 | Temperate Hardwoods | N/A | 0.02 |
| | | | ***SMF 1B Total Area*** | **5.03** |
| SMF 2B | 221 | Citrus Groves | N/A | 0.32 |
| | 510 | Streams and Waterways | R2UBHx | 0.37 |
| | 641 | Freshwater Marshes | PEM1Ad | 13.15 |
| | | | ***SMF 2B Total Area*** | **13.84** |
| SMF 3B | 212 | Unimproved Pastures | N/A | 6.96 |
| | 510 | Streams and Waterways | PEM1Cx | 0.17 |
| | | | ***SMF 3B Total Area*** | **7.13** |
| FPC 1A | 211 | Improved Pastures | N/A | 19.04 |
| | 510 | Streams and Waterways | PEM1Cx | 0.39 |
| | 617 | Mixed Wetland Hardwoods | PFOCd | 0.16 |
| | 641 | Freshwater Marshes | PEM1Ad | 0.60 |
| | | | ***FPC 1A Total Area*** | **20.19** |
| FPC 1B | 211 | Improved Pastures | N/A | 19.16 |
| | 425 | Temperate Hardwoods | N/A | 1.29 |
| | 510 | Streams and Waterways | PEM1Cx | 0.43 |
| | | | ***FPC 1B Total Area*** | **20.88** |
| FPC 2A | 221 | Citrus Groves | N/A | 41.96 |
| | 510 | Streams and Waterways | PEM1Cx, R2AB4Hx | 0.08 |
| | | | ***FPC 2A Total Area*** | **42.04** |
| FPC 2B | 212 | Unimproved Pastures | N/A | 31.95 |
| | 510 | Streams and Waterways | PEM1Cx, R2AB4Hx | 1.01 |
| | | | ***FPC 2B Total Area*** | **32.96** |
| Regional Pond | 211 | Improved Pastures | N/A | 0.33 |
| | 242 | Sod Farms | N/A | 122.18 |
| | 510 | Streams and Waterways | PEM1Cx | 3.14 |
| | | | ***Regional Pond Total Area*** | **125.65** |

[1]FDOT 1999
[2]Cowardin, *et al*. 1979
PEM1Ad: Palustrine, Emergent, Persistent, Temporarily Flooded, Partially Drained/Ditched
PEM1Cx: Palustrine, Emergent, Persistent, Seasonally Flooded, Excavated
PFO1Cd: Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded, Partially Drained/Ditched
R2AB4Hx: Riverine, Lower Perennial, Aquatic Bed, Floating Vascular, Permanently Flooded, Excavated
R2UBHx: Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded, Excavated

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## 3.2 Threatened and Endangered Species

Based upon in house assessments, site reviews, and species specific surveys, several federal and state listed protected species were identified as occurring or having the potential to occur within the assessment areas. Theses species are listed in **Table 3-2**, along with their ranking of potential for occurrence. The potential for occurrence for each species is designated as None, Low, Moderate, or High based on the habitat requirements for each species, the presence of the habitat within the assessment areas, and documented occurrences of the species within one (1) mile of the assessment areas. A ***None*** rating indicates that suitable habitat does not exist within the assessment areas. A ***Low*** rating indicates that low suitability habitat for that species is present within the assessment areas and the species has not been documented within the vicinity of the assessment areas. A ***Moderate*** rating indicates that suitable habitat exists and it is reasonable to assume the species is present. A ***High*** rating indicates that suitable habitat exists and the species was observed during field reviews. A protected species map showing documented occurrences within one (1) mile of the assessment areas is provided in **Attachment B**.

**Table 3-1 Protected Species Potential for Occurrence**

| Species | Designated Status | | | Habitat Preference | Potential for Occurrence |
|---|---|---|---|---|---|
| | Federal | State | FDACS | | |
| **Reptiles** | | | | | |
| ***Federal Species*** | | | | | |
| American Alligator *Alligator mississippiensis* | SAT | - | - | Freshwater and brackish marshes, ponds, lakes, rivers, swamps, bayous, canals, and large spring runs | High |
| Eastern Indigo Snake *Drymarchon couperi* | T | - | - | Mesic flatwoods, upland pine forests, swamps, wet prairies, xeric pinelands and scrub habitats, agricultural lands | High (Observed By Others) |
| Blue-tailed Mole Skink *Plestiodon egregius lividus* | T | - | - | Central Florida in habitat with loose sandy areas, such as rosemary scrub, sand pine scrub, oak scrub, scrubby flatwoods and turkey oak barrens | Low |
| Sand Skink *Plestiodon reynoldsi* | T | - | - | Central Florida in habitat with loose sandy areas, such as rosemary scrub, sand pine scrub, oak scrub, scrubby flatwoods and turkey oak barrens | Low |
| ***State Species*** | | | | | |
| Gopher Tortoise *Gopherus polyphemus* | C | T | - | Dry upland habitats including sandhills, scrub, xeric oak hammock and dry pine flatwoods; also commonly uses disturbed habitats such as pastures, old fields and road shoulders | High |
| Short-tailed Snake *Lampropeltis extenuata* | - | T | - | Dry upland habitats with open canopies and dry sandy soils including sandhill, rosemary-sand pine scrub and adjacent xeric oak hammocks | Moderate |

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| Species | Designated Status | | | Habitat Preference | Potential for Occurrence |
|---|---|---|---|---|---|
| | Federal | State | FDACS | | |
| Florida Pine Snake *Pituophis melanoleucus mugitus* | - | T | - | Dry sandy soils with open canopies. Sandhill, sand pine scrub and scrubby flatwoods | Moderate |
| **Birds** | | | | | |
| ***Federal Species*** | | | | | |
| Florida Grasshopper Sparrow *Ammodramus savannarum floridanus* | E | - | - | Large areas of frequently burned dry prairie habitat with patchy open areas sufficient for foraging | Low |
| Florida Scrub-jay *Aphelocoma coerulescens* | T | - | - | Early successional stages of fire-dominated xeric oak communities located on well-drained, sandy soils; preferred habitat consists of scrub oaks between 3 and 10 feet tall, with open sand and scattered clumps of herbaceous vegetation. | Low |
| Audubon's Crested Caracara *Caracara cheriway* | T | - | - | Open country such as dry prairie and pasture lands with scattered cabbage palm, cabbage palm/live oak hammocks, and shallow ponds and sloughs. Cabbage palms or live oaks with low-growing surrounding vegetation are required for nesting. | High (Observed 2020) |
| Bald Eagle *Haliaeetus leucocephalus* | NL[1] | NL[2] | - | Large open water bodies, saltwater marshes, dry prairies, mixed pine, hardwood forests, wet prairies, marshes, pine flatwoods and sandhills | High |
| Wood Stork *Mycteria americana* | T | - | - | Fresh and saltwater habitats such as fresh and saltwater marshes, tidal flats, wet prairies, cypress swamps and agricultural environments | High |
| Everglade Snail Kite *Rostrhamus sociabilis* | E | - | - | Large open freshwater marshes and lakes with shallow water and a low density of emergent vegetation | High |
| ***State Species*** | | | | | |
| Florida Sandhill Crane *Antigone canadensis pratensis* | - | T | - | Wet and dry prairies, marshes and marshy lake edges | High (Observed 2020) |
| Florida Burrowing Owl *Athene cunicularia floridana* | - | T | - | Areas of short, herbaceous groundcover; including prairies, sandhills and farmland | Low |
| Little Blue Heron *Egretta caerulea* | - | T | - | Freshwater marshes, coastal beaches, mangrove swamps, cypress swamps, hardwood swamps, wet prairies and bay swamps | High (Observed 2020) |

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| Species | Designated Status | | | Habitat Preference | Potential for Occurrence |
|---|---|---|---|---|---|
| | Federal | State | FDACS | | |
| Tricolored Heron *Egretta tricolor* | - | T | - | Freshwater marshes, coastal beaches, mangrove swamps, cypress swamps, hardwood swamps, wet prairies and bay swamps | High (Observed 2019) |
| Southeastern American Kestrel *Falco sparverius paulus* | - | T | - | Pine scrub, dry prairies, mixed pine hardwood forests and pine flatwoods | Moderate |
| Roseate Spoonbill *Platalea ajaja* | - | T | - | Freshwater marshes, coastal beaches, mangrove swamps, cypress swamps, hardwood swamps, wet prairies and bay swamps | High |
| **Mammals** | | | | | |
| ***Federal Species*** | | | | | |
| Florida Bonneted Bat *Eumops floridanus* | E | - | - | Precise habitat requirements unknown; roosts in forested communities or artificial structures and forages in open areas | High (Observed 2020 via acoustics) |
| Florida Panther *Puma concolor couguar* | E | - | - | A variety of habitats including upland forests, prairies, wetlands, stands of saw palmetto and swamps | Low |
| ***State Species*** | | | | | |
| Southern Fox Squirrel *Sciurus niger niger* | - | NL[3] | - | Sandhills (high pine), pine flatwoods, and pastures and other open, ruderal habitats with scattered pines and oaks | Low |
| Florida Black Bear *Ursus americanus floridanus* | - | NL[4] | - | Mixed hardwood pine, cabbage palm hammock, upland oak scrub and forested wetlands, such as cypress and riverine | Low |

Notes:
None = No habitat for potentially occurring protected species
Low = Minimal/suboptimal habitat for potentially occurring protected species
Moderate = Conditions favorable for protected species
High = Protected species confirmed or highly likely
E = endangered, T = threatened, SSC = species of special concern, NL = not listed, C = candidate species for listing
[1] While not listed under the ESA, the Bald Eagle is federally protected under the Bald and Golden Eagle Protection Act.
[2] While not listed under Chapter 68A-27 FAC, the Bald Eagle is state protected under the FWC Bald Eagle Management Plan (2008).
[3] The Southern Fox Squirrel, their nests, and young are afforded protection under 68A-29.002(1)(c) F.A.C.
[4] The Florida black bear is no longer state-listed; however, this species is managed in Florida by the FWC's Florida Black Bear Conservation rule (68A-4.009, F.A.C.).

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The project limits are within the consultation areas for the crested caracara, Everglade snail kite, Florida bonneted bat, Florida grasshopper sparrow, Florida scrub-jay, sand skink, and blue-tailed mole skink. Habitat for the Florida grasshopper sparrow does not exist within the assessment areas; therefore, it is anticipated that the proposed pond sites will have no involvement with this species.

The potential for protected species involvement in each individual SMF, FPC, and Regional Pond site was rated based on existing land use, habitat quality, and documented occurrences of protected species. These rankings are summarized and presented in **Table 3-3**.

**Table 3-3 Level of Potential Protected Species Involvement**

| Pond Site ID | None | Low | Moderate | High | Potential Suitable Habitat | Observed |
|---|---|---|---|---|---|---|
| SMF 1B | | | X | | EIS, GT, STS, FPS, BS, SS, SHC, SFS, FBO, CC, LBH, TCH, RS, WS, ESK, FP, BB | |
| SMF 2B | | | | X | AA, EIS, SHC, SFS, CC, LBH, TCH, RS, WS, ESK, FBB, FP, BB | SHC |
| SMF 3B | | X | | | EIS, LBH, TCH, SHC, RS, WS | |
| FPC 1A | | | X | | EIS, GT, STS, FPS, BS, SS, SHC, FBO, CC, LBH, TCH, RS, WS, ESK, FP | |
| FPC 1B | | | | X | EIS, GT, STS, FPS, BS, SS, SHC, SFS, FBO, CC, LBH, TCH, RS, WS, ESK, FP, BB | TCH |
| FPC 2A | | | | X | EIS, GT, STS, FPS, BS, SS, SHC, FSJ, FBO, SFS, CC, FBB, FP, BB | CC, FBB |
| FPC 2B | | | X | | EIS, GT, STS, FPS, BS, SS, SHC, FSJ, FBO, SFS, CC, LBH, TCH, FBB, RS, WS, FP, BB | |
| Regional Pond | | | | X | EIS, SHC, CC, LBH, TCH, RS, WS, ESK, FP | SHC |

**Legend**:
None = No habitat for potentially occurring protected species
Low = Minimal/suboptimal habitat for potentially occurring protected species
Moderate = Conditions favorable for protected species
High = Protected species confirmed or highly likely

Species

AA = American alligator
EIS = Eastern indigo snake
GT = gopher tortoise
STS = short-tailed snake
FPS = Florida pine snake
BS = blue-tailed mole skink
SS = sand skink
SHC = Florida sandhill crane
FSJ = Florida scrub-jay
FBO = Florida burrowing owl
SFS = southern fox squirrel
CC = crested caracara
LBH = little blue heron
TCH = tricolored heron
SAK = Southeastern American kestrel
BE = bald eagle
FBB = Florida bonneted bat
RS = roseate spoonbill
WS = wood stork
ESK = Everglade snail kite
FP = Florida panther
BB = Florida black bear

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## 3.3 Wetlands and Surface Waters

Of the eight (8) pond sites proposed, a total of seven (7) sites include wetlands or surface waters (SMF 2B, SMF 3B, FPC 1A, FPC 1B, FPC 2A, FPC 2B, and the Regional Pond) (**Table 3-1**). The wetland and surface water systems found within these proposed pond sites are streams and waterways (FLUCFCS 510), mixed wetland hardwoods (FLUCFCS 617), and freshwater marshes (FLUCFCS 641). All surface waters within proposed pond sites consist of man-made agricultural ditches and/or canals.

**Table 3-4** provides the level of potential wetland involvement for each proposed pond site. Ranking of wetland involvement was based on acreage of wetlands and surface waters found on-site. A ***None*** potential for involvement indicates that there are no wetlands/surface waters found on-site. A ***Low*** potential for involvement indicates that there is less than 0.5 acres of wetlands/surface waters on-site. A ***Moderate*** potential for involvement indicates that there is 0.5 to 1.0 acre of wetlands/surface waters on-site. A ***High*** potential for involvement indicates that there is over 1.0 acre of wetlands/surface waters on-site.

**Table 3-4 Level of Potential Wetland Involvement**

| Pond Site ID | Pond Site Area (Acres) | None | Low | Moderate | High | Comments |
|---|---|---|---|---|---|---|
| SMF 1B | | X | | | | No wetlands or surface waters |
| SMF 2B | | | | | X | 13.15 acres of freshwater marshes, 0.37 acres of streams and waterways |
| SMF 3B | | | X | | | 0.17 acres of streams and waterways |
| FPC 1A | | | | | X | 0.16 acres of mixed wetland hardwoods, 0.60 acres of freshwater marshes, 0.39 acres of streams and waterways |
| FPC 1B | | | X | | | 0.43 acres of streams and waterways |
| FPC 2A | | | X | | | 0.26 acres of streams and waterways |
| FPC 2B | | | | | X | 1.01 acres of streams and waterways |
| Regional Pond | | | | | X | 3.14 acres of streams and waterways |

**Legend:**
None = No wetland involvement
Low = Minimal wetland involvement (<0.5 ac)
Moderate = Some wetland involvement (0.5-1.0 ac)
High = Substantial wetland involvement (> 1.0 ac)

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## 3.4 Summary

For comparison purposes, a None, Low, Medium or High rating scale was used to evaluate the potential for wetlands and protected species involvement at each proposed pond site.

**Table 3-2** identifies the potential of each pond site to provide habitat for each protected animal species. Rankings of protected species involvement was based on the types of habitat found in each proposed pond site and the relative condition of the habitat to support protected species, and if protected species were observed in the project vicinity. A ***None*** rating indicates that suitable habitat does not exist within the assessment areas. A ***Low*** rating indicates that low suitability habitat for protected species is present within the assessment areas and the species has not been documented within the vicinity of the assessment areas. A ***Moderate*** rating indicates that suitable habitat exists and it is reasonable to assume protected species are present. A ***High*** rating indicates that suitable habitat exists and protected species were observed during field reviews within the assessment areas. Overall potential protected species involvement rankings for each assessment area are provided in **Table 3-3**.

**Table 3-4** provides the level of potential wetland involvement for each proposed pond site. Ranking of wetland involvement was based on acreage of wetlands found on-site. A ***None*** potential for involvement indicates that there are no wetlands/surface waters found on-site. A ***Low*** potential for involvement indicates that there is less than 0.5 acres of wetlands/surface waters on-site. A ***Moderate*** potential for involvement indicates that there is 0.5 to 1.0 acre of wetlands/surface waters on-site. A ***High*** potential for involvement indicates that there is over 1.0 acre of wetlands/surface waters on-site.

A summary of potential protected species involvement and potential wetland involvement for each of the assessment areas is provided in **Table 3-5**.

**Table 3-5 Summary of Findings**

| Pond Site ID | Size (acres) | Potential Wetland Involvement | Potential Protected Species Involvement |
|---|---|---|---|
| SMF 1B | 5.02 | None | Moderate |
| SMF 2B | 13.80 | High | High |
| SMF 3B | 6.05 | Low | Low |
| FPC 1A | 20.15 | High | Moderate |
| FPC 1B | 19.41 | Low | High |
| FPC 2A | 41.94 | Low | High |
| FPC 2B | 32.90 | High | Moderate |
| Regional Pond | 125.39 | High | High |

**Legend:**
Potential Wetland Involvement
None = No wetland involvement
Low = Minimal wetland involvement (<0.5 ac)
Moderate = Some wetland involvement (0.5-1.0 ac)
High = Substantial wetland involvement (> 1.0 ac)
Potential Protected Species Involvement
None = No habitat for potentially occurring protected species
Low = Minimal/suboptimal habitat for potentially occurring protected species
Moderate = Conditions favorable for protected species
High = Protected species confirmed or highly likely

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# 4.0 Conclusions

As part of the stormwater treatment design for the proposed roadway improvement project, eight (8) proposed ponds (assessment areas) were evaluated for potential protected species and wetland involvement. The land use and habitat types found within the pond sites are dominated by the following land uses: improved pastures, sod farms, citrus groves, and freshwater marshes, with improved pastures and streams and waterways being the most prevalent.

Protected Species

Based upon in house assessments and field reviews, a total of 23 federal or state protected animal species were evaluated for potential occurrence within the assessment areas. Four sites, SMF 2B, FPC 1B, FPC 2A, and the Regional Pond were given a high ranking of protected species involvement due to confirmed observations of protected species within proposed pond site limits. Three sites, SMF 1B, FPC 1A, and FPC 2B were given a moderate ranking of protected species involvement due to the presence of suitable habitat in the sites and the close proximity of documented protected species occurrences. One site, SMF 3B, was given a low ranking for protected species involvement due to minimal habitat present for protected species (**Table 3-3**).

Wetlands

Of the eight (8) proposed pond sites, seven (7) contain wetlands or surface waters. Five sites, SMF 3B, FPC 1B, FPC 2A, FPC 2B, and the Regional Pond, contain only surface waters. Two sites, SMF 2B and FPC 1A, contain both wetlands and surface waters.

Four ponds, SMF 2B, FPC 1A, FPC 2B, and the Regional Pond, were given a high ranking for wetland involvement due to on-site wetlands or surface waters occupying more than 1.0 acre. Three ponds, SMF 3B, FPC 1B, and FPC 2A, were given a low ranking for wetland involvement due to on-site wetlands or surface waters occupying less than 0.5 acres. One pond, SMF 1B, has no potential for wetland involvement due to the absence of wetlands and surface waters.

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# 5.0 References


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# Attachment A

## Land Use Map

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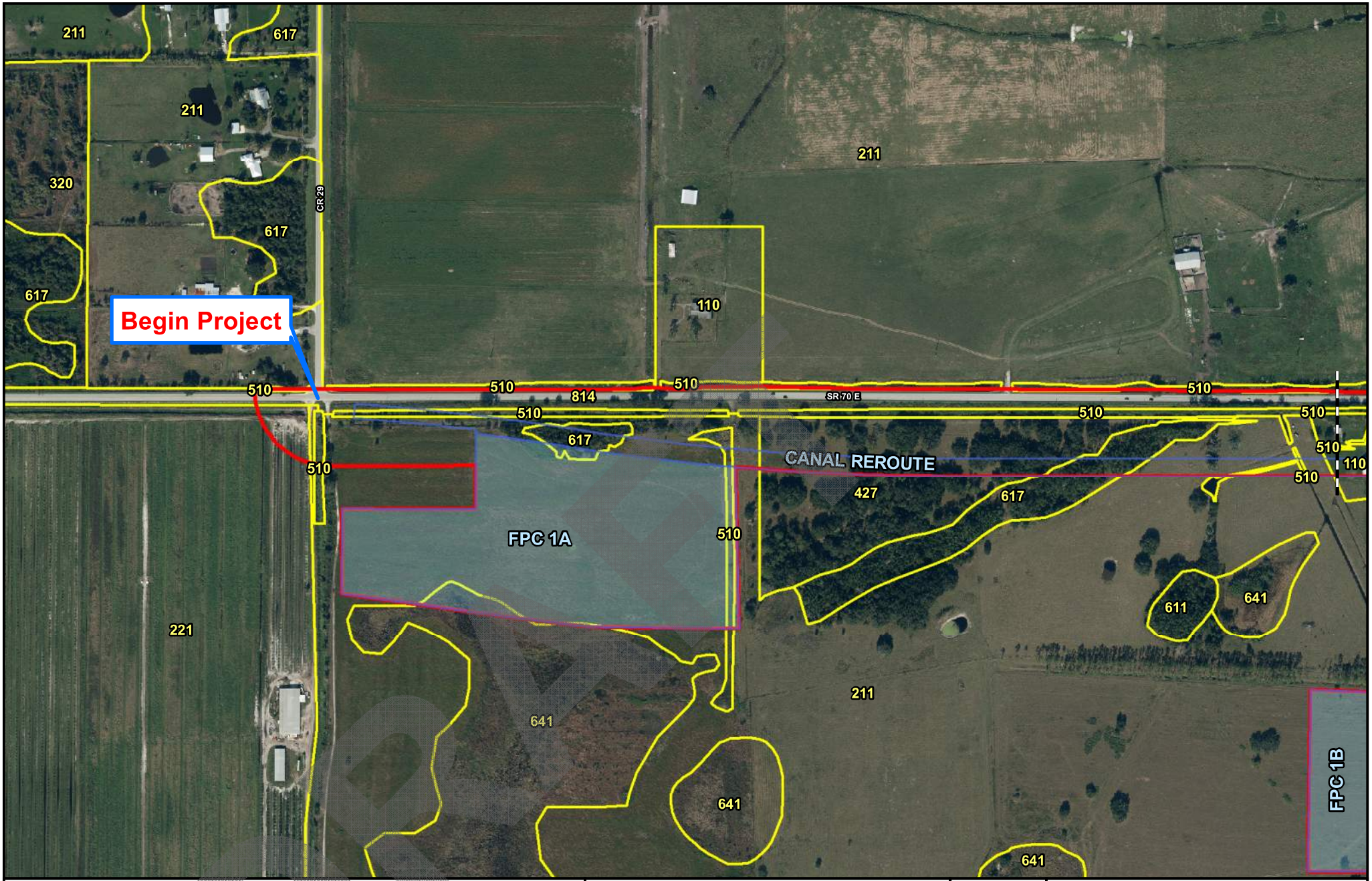


Project Study Area

Proposed Pond

110: Residential, Low Density

211: Improved Pastures

221: Citrus Groves

320: Upland Shrub and Brushland

427: Live Oak

510: Streams and Waterways

611: Bay Swamps

617: Mixed Wetland Hardwoods

641: Freshwater Marshes / Graminoid Prairie - Marsh

814: Roads and Highways

# Land Use Map

SR 70 from CR 29 to Lonesome Island Road
Project Development & Environment Study

*FPID No. 414506-5-22-01*
*Highlands County, FL*

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**Attachment A** Page 1 of 7

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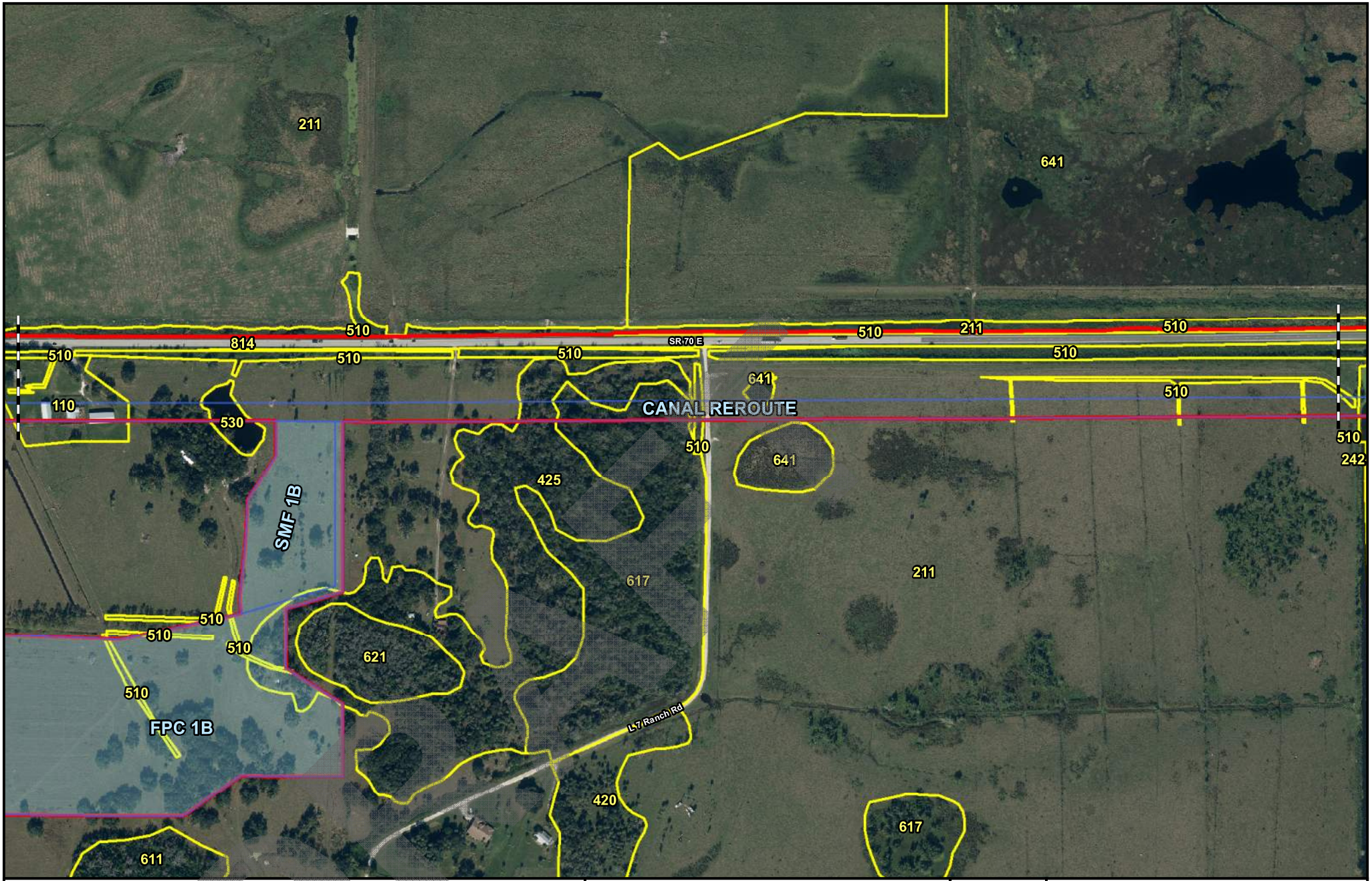


Project Study Area

Proposed Pond

110: Residential, Low Density

211: Improved Pastures

242: Sod Farms

420: Upland Hardwood Forests

425: Temperate Hardwood

510: Streams and Waterways

530: Reservoirs

611: Bay Swamps

617: Mixed Wetland Hardwoods

621: Cypress - Mixed Hardwoods

641: Freshwater Marshes / Graminoid Prairie - Marsh

814: Roads and Highways

# Land Use Map

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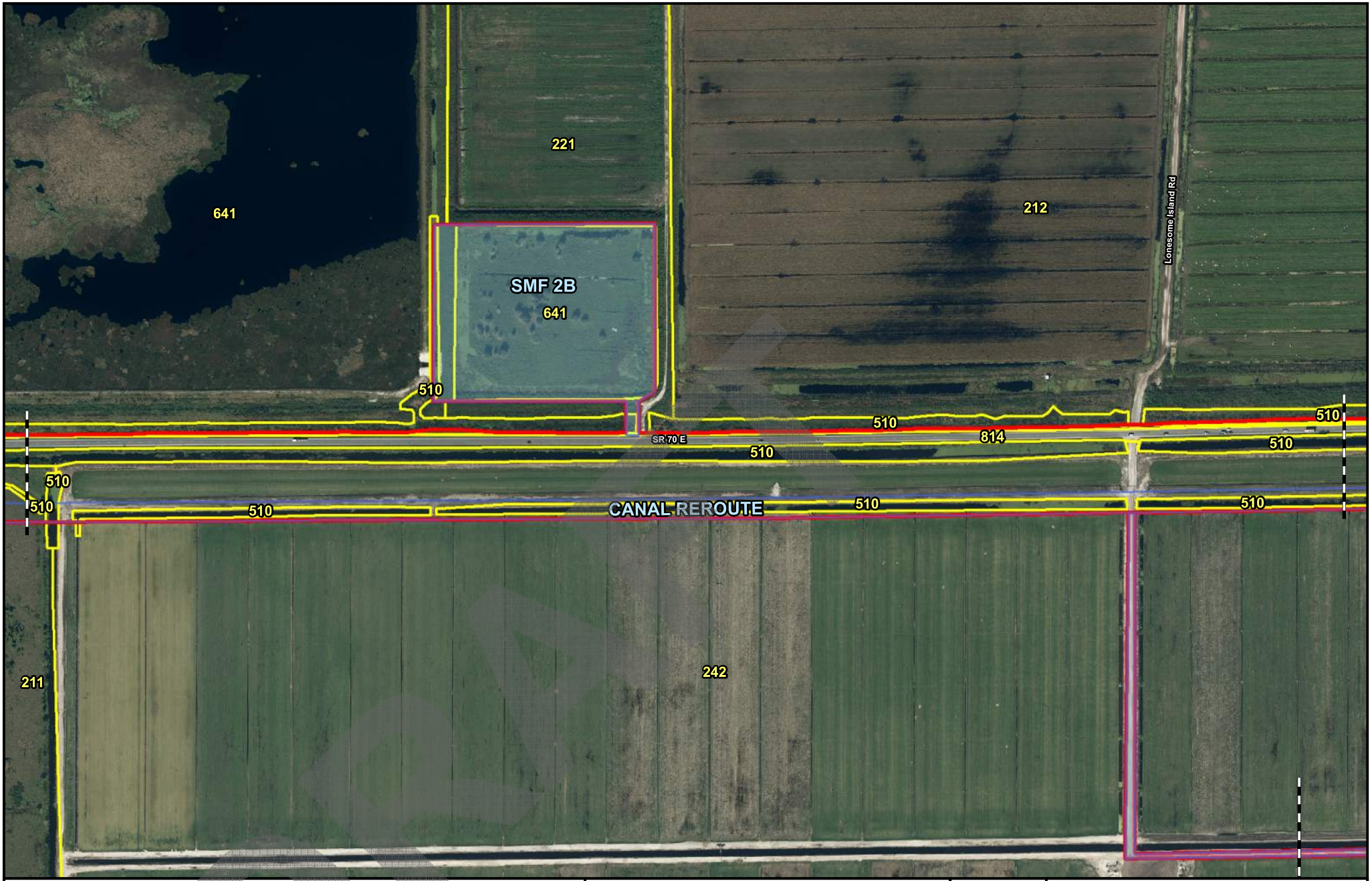


Project Study Area

Proposed Pond

211: Improved Pastures

212: Unimproved Pastures

221: Citrus Groves

242: Sod Farms

510: Streams and Waterways

641: Freshwater Marshes / Graminoid Prairie - Marsh

814: Roads and Highways

# Land Use Map

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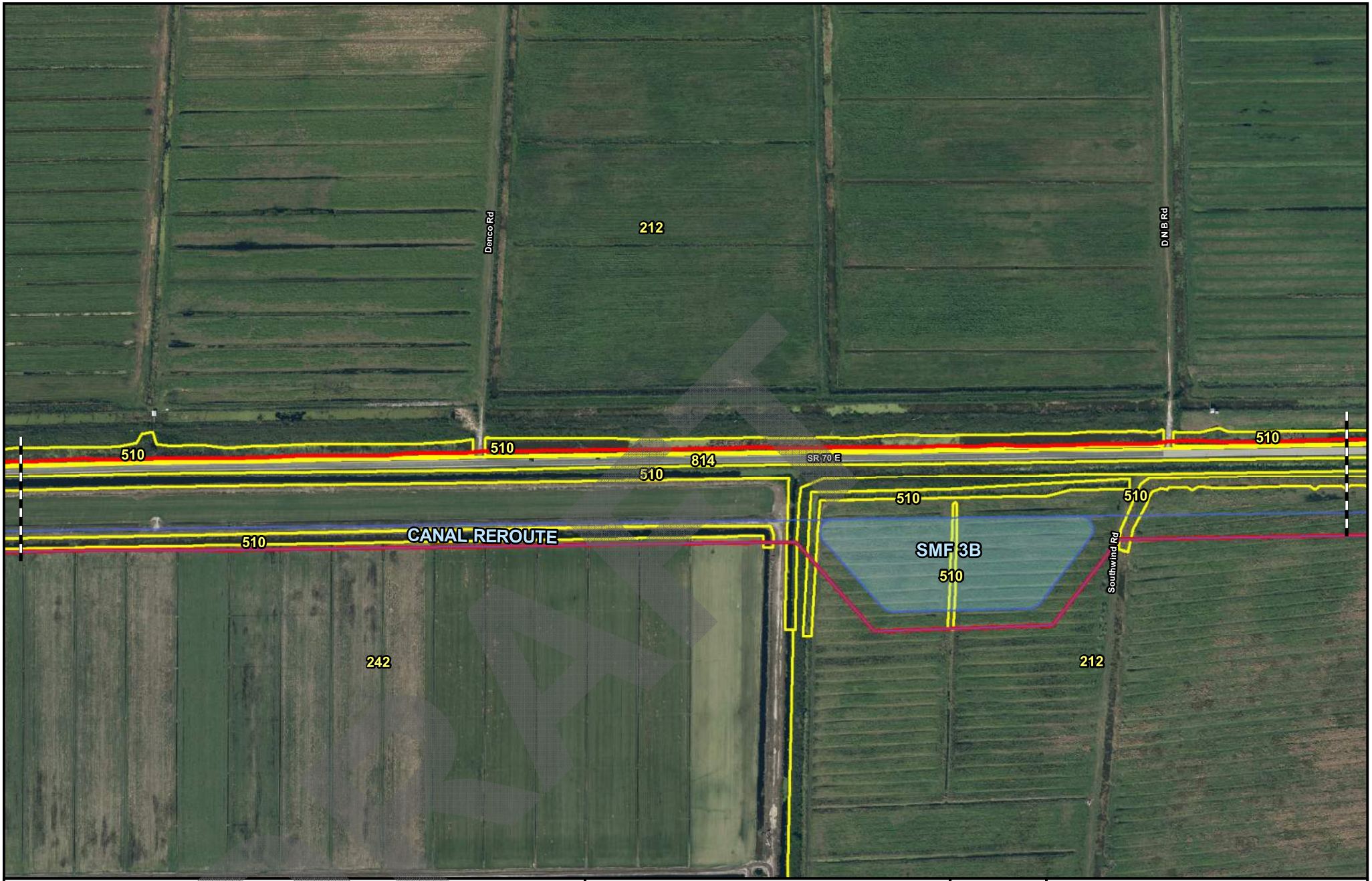


Project Study Area

Proposed Pond

212: Unimproved Pastures

242: Sod Farms

510: Streams and Waterways

814: Roads and Highways

# Land Use Map

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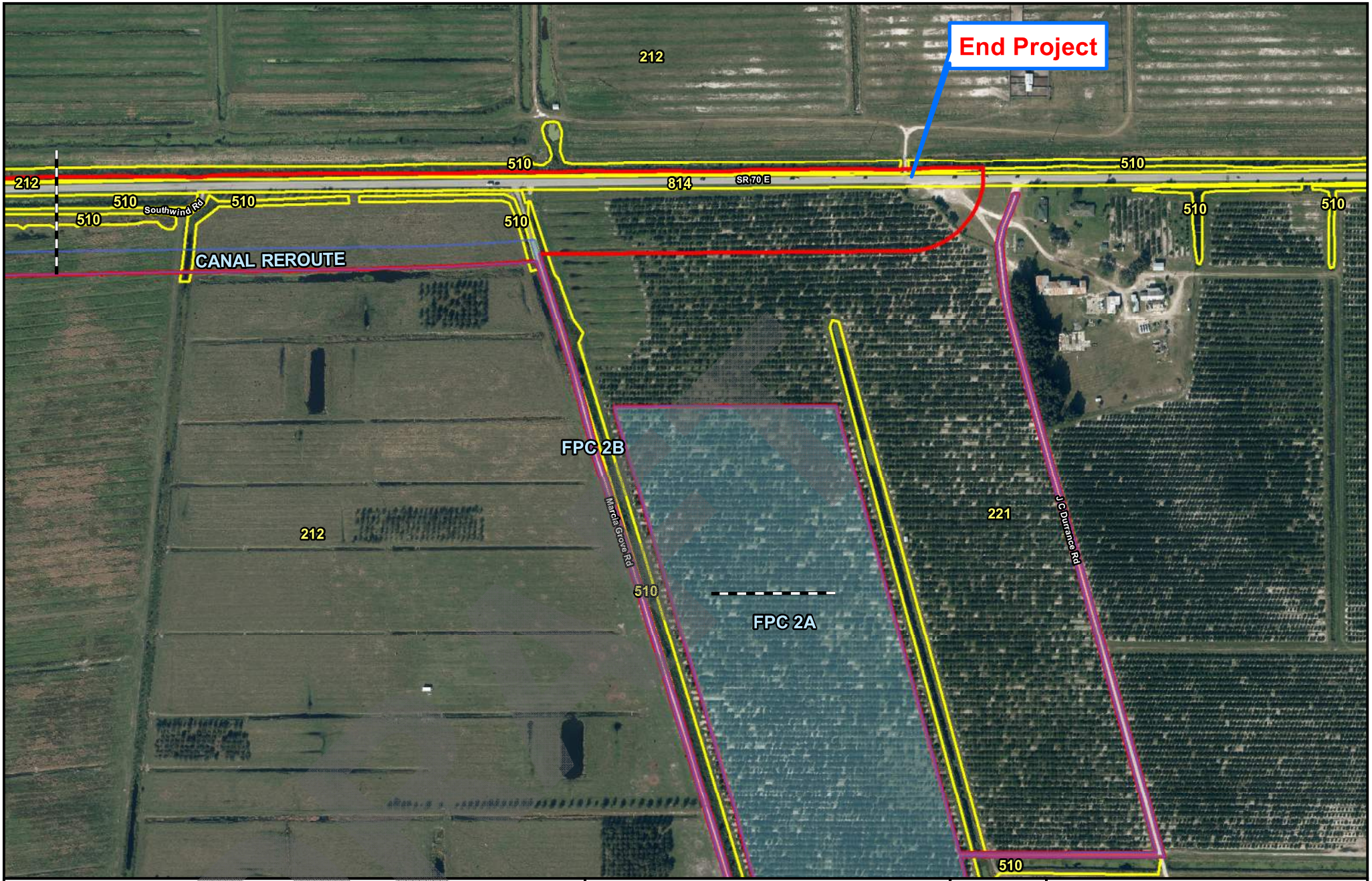


Project Study Area

Proposed Pond

212: Unimproved Pastures

221: Citrus Groves

510: Streams and Waterways

814: Roads and Highways

# Land Use Map

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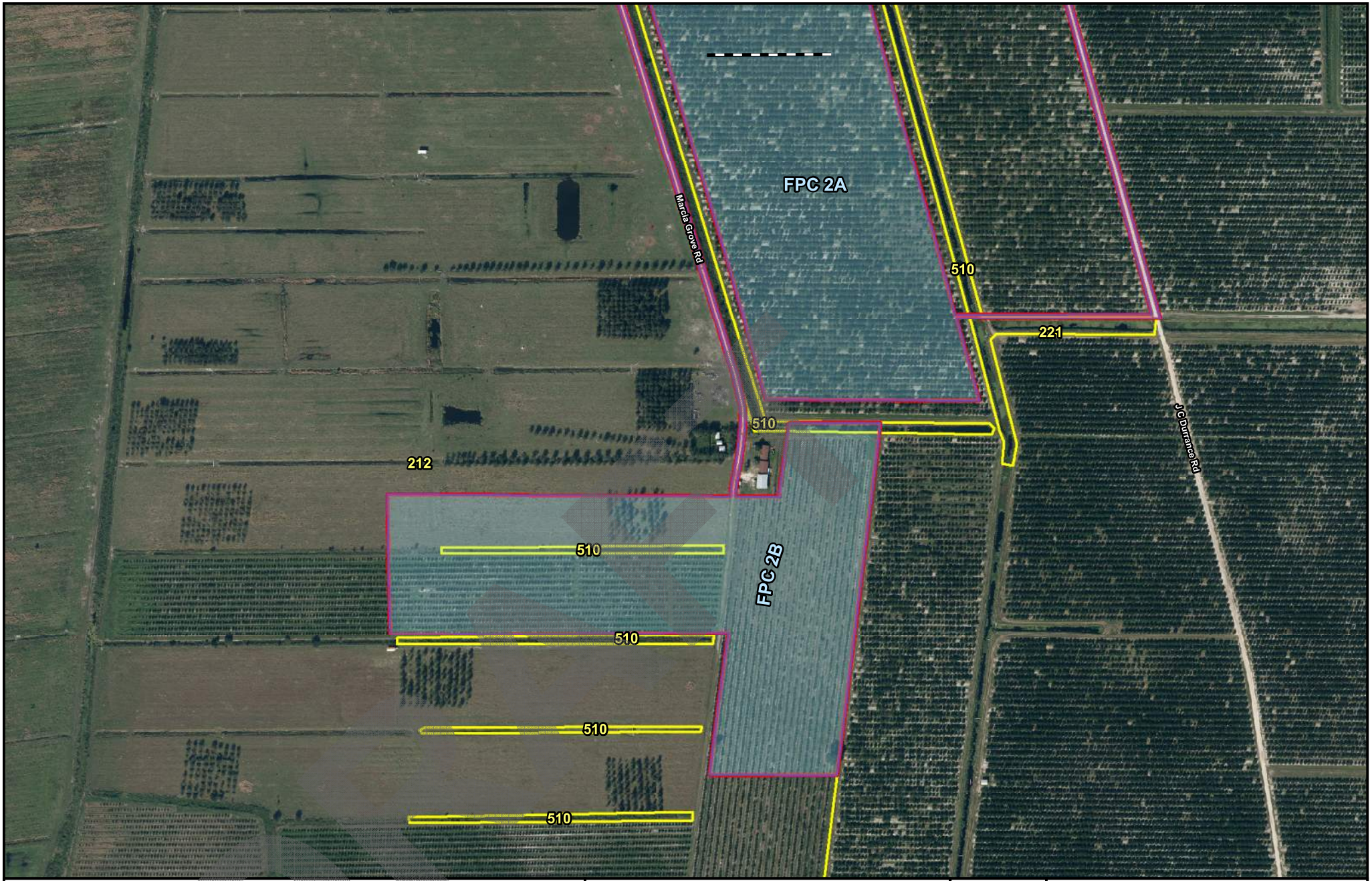


Project Study Area

Proposed Pond

212: Unimproved Pastures

221: Citrus Groves

510: Streams and Waterways

# Land Use Map

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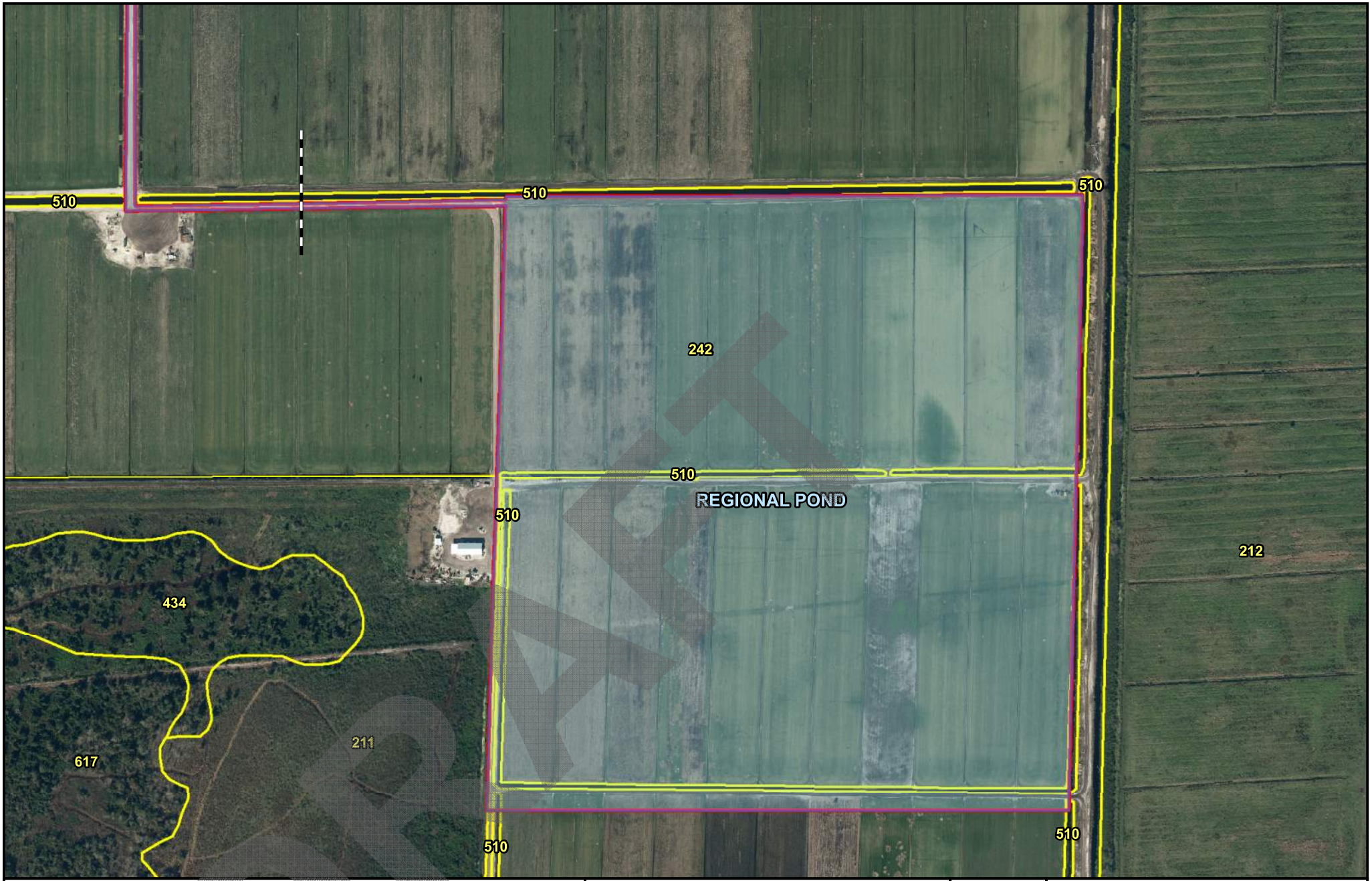


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Project Study Area

Proposed Pond

211: Improved Pastures

212: Unimproved Pastures

242: Sod Farms

434: Upland Mixed Coniferous / Hardwood

510: Streams and Waterways

617: Mixed Wetland Hardwoods

# Land Use Map

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Path: D:\Projects\M\41450652201 SR70 - CR29 to Lonesome\NonSubmittal Design\GIS\Maps\Figures\PSR\SR 70_Lonesome_ Attachment A Land Use Map.mxd 2/22/2021

# Attachment B

## Protected Species Maps

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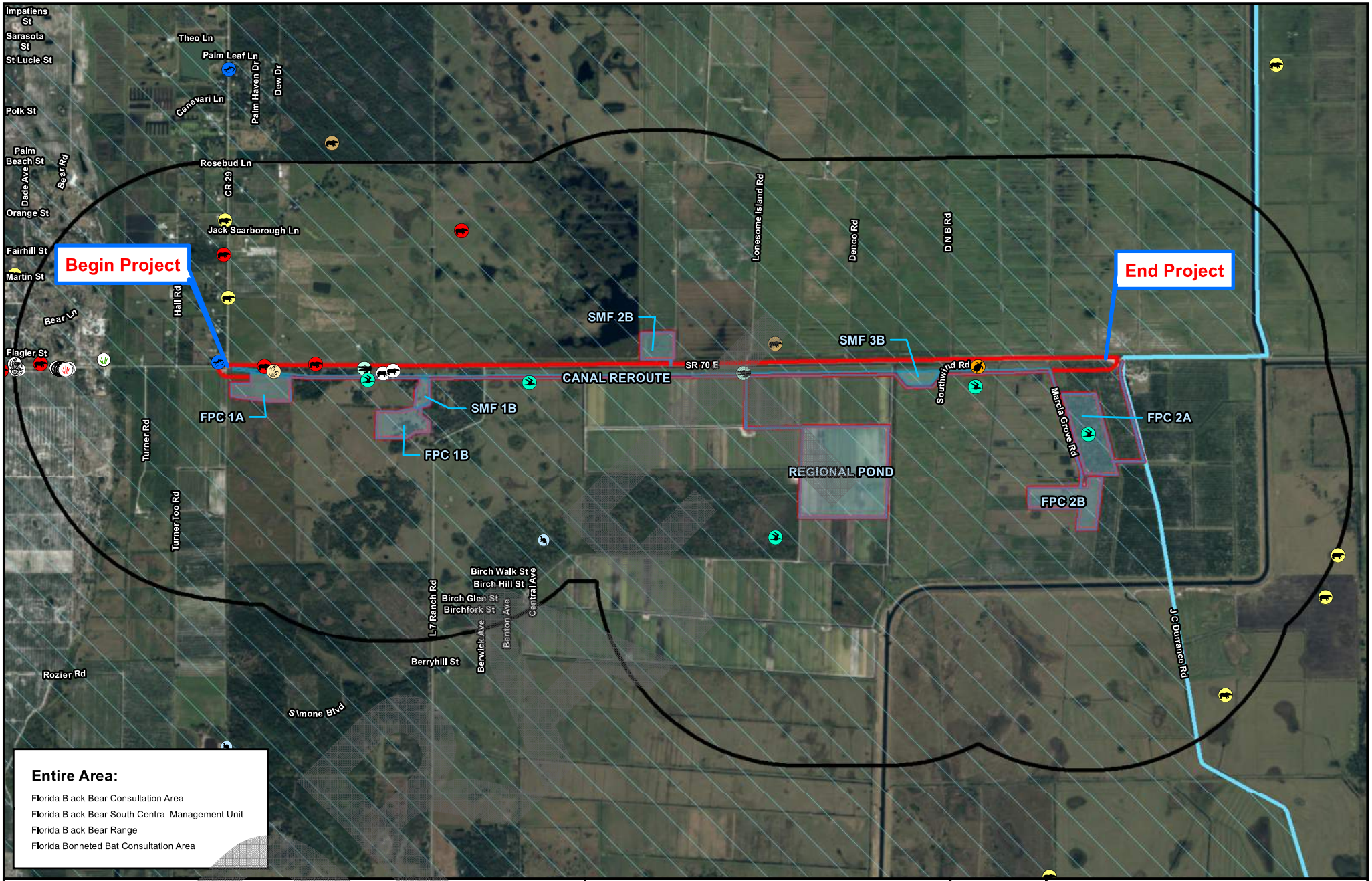



# Protected Non-Avian Species Map

SR 70 from CR 29 to Lonesome Island Road
Project Development & Environment Study
FPID No. 414506-5-22-01
Highlands County, FL

**Appendix B-1** Page 1 of 1

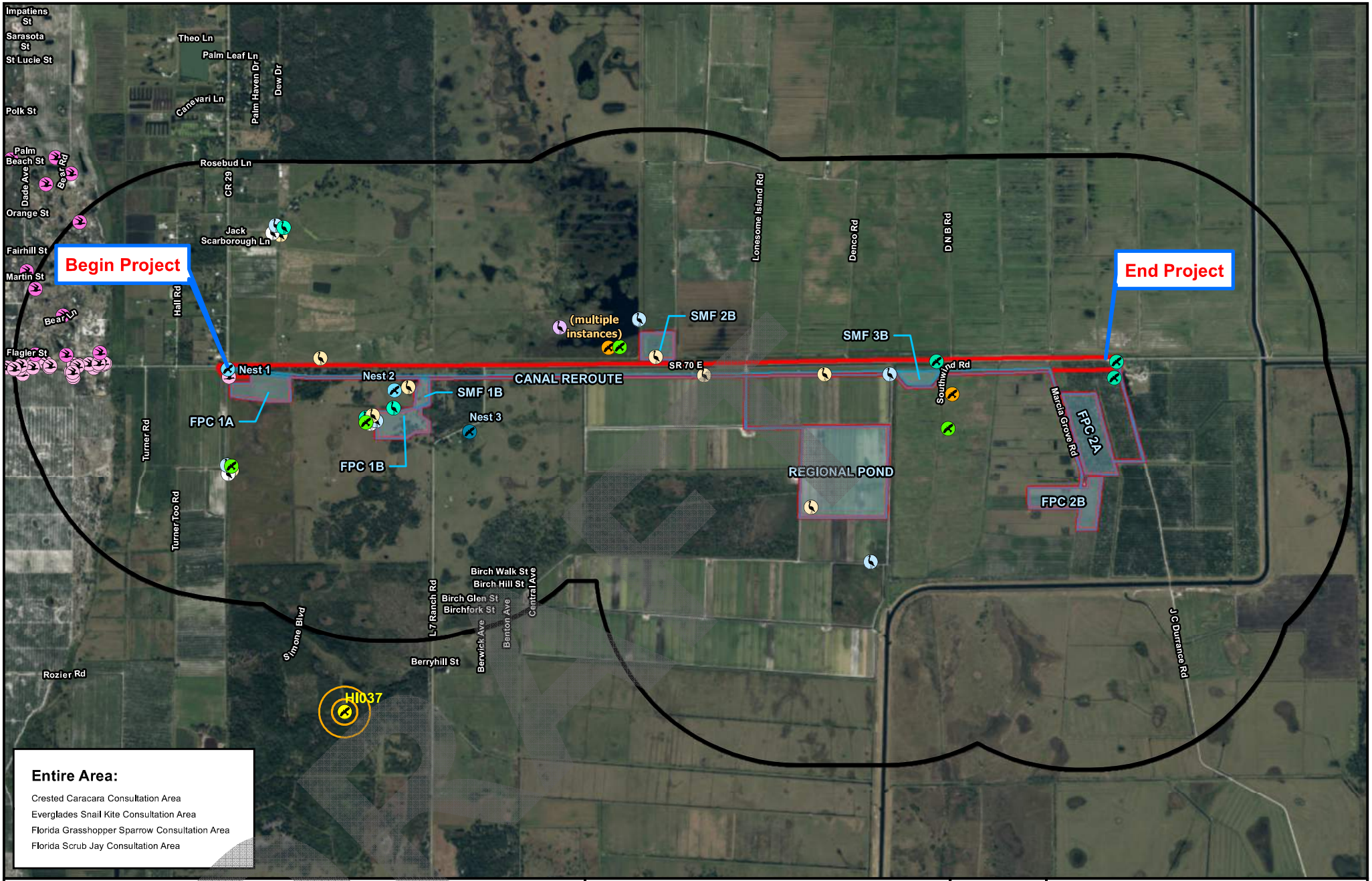
N W E S

3,000 1,500 0 3,000

Feet

Kisinger Campo & Associates, Corp.
201 N. Franklin Street, Suite 400
Tampa, FL 33602
Phone: 813/871-5331

Path: D:\Projects\M\41450652201 SR70 - CR29 to Lonesome\NonSubmittal Design\GIS\Maps\Figures\PSR\SR 70_Lonesome_ Attachment B Protected Species Map_NonAvian.mxd 2/22/2021




# Protected Avian Species Map

SR 70 from CR 29 to Lonesome Island Road
Project Development & Environment Study
FPID No. 414506-5-22-01
Highlands County, FL

**Attachment B-2** Page 1 of 1


Kisinger Campo & Associates, Corp.
201 N. Franklin Street, Suite 400
Tampa, FL 33602
Phone: 813/871-5331


Path: D:\Projects\M\41450652201 SR70 - CR29 to Lonesome\NonSubmittal Design\GIS\Maps\Figures\PSR\SR 70_Lonesome_ Attachment B Protected Species Map_Avian.mxd 2/22/2021

# APPENDIX G

# CONTAMINATION REPORT

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# Contamination Matrix

Pond Alternatives
SR 70 PD&E Study from CR 29 to Lonesome Island Road
Highlands County
FPID: 414506-1-22-01
Tierra Project No. 6511-18-031E
Date: February 2, 2021

| Pond Alternative Name | Regulatory sites within 500 feet | Contamination Concern | Discussion | Contamination Risk Rating (No, Low, Medium, High) |
|---|---|---|---|---|
| FPC 1A | none | groves/row crops | AERIAL PHOTOGRAPH REVIEW<br>pasture 1994 to 1999<br>groves/row crops depicted in 2004<br>pasture 2005 to 2017<br><br>REGULATORY REVIEW<br>None noted | Low |
| FPC 1B | none | groves/row crops | AERIAL PHOTOGRAPH REVIEW<br>pasture 1994<br>groves/row crops 1999 to 2004<br>pasture 2005 to 2017<br><br>REGULATORY REVIEW<br>None noted | Low |

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# Contamination Matrix

Pond Alternatives
SR 70 PD&E Study from CR 29 to Lonesome Island Road
Highlands County
FPID: 414506-1-22-01
Tierra Project No. 6511-18-031E
Date: February 2, 2021

| Pond Alternative Name | Regulatory sites within 500 feet | Contamination Concern | Discussion | Contamination Risk Rating (No, Low, Medium, High) |
|---|---|---|---|---|
| FPC 2A | TANKS 8519808<br>TANKS 9101697 (historical listing)<br>VOLCLNUP 327346<br>STCERC 327346CLN<br>STCERC COM_327346CLN<br>STCERC ERIC_13309CLN<br><br>EDM No. 2 | 1.) Pesticides/herbicides at the decon station<br>2.) A history of discharges associated with this facility | AERIAL PHOTOGRAPH REVIEW<br>FPC 2A: Groves 1994 to 2017 (most current). Since source contamination concerns such as ASTs, storage/maintenance structures, mix/load areas, etc.) were not depicted onsite, FPC 2A is considered a low contamination risk. ACCESS EASEMENT: unpaved road (DC Bar Ranch Rd) 1994 to 2017. "Premier Citrus Sunray" was noted on signage located near the north end of the access easement (intersection of SR 70/DC Bar Ranch Road). A decon station, including one or two ASTs (likely a decon agent) is depicted 230 feet south of SR 70 within the access easement from 1999 to 2014. Decon agents may include herbicides and pesticides. Three other tank locations are depicted over 300 feet east of the access easement. Structures and storage areas are depicted 100 feet east of the access easement. Given the location of the decon station within the access easement, FPC 2A is assigned a risk rating of MEDIUM.<br><br>REGULATORY REVIEW<br>FPC 2A and and the access easement are located within Premier Citrus - Sunray Groves (former South East Groves -Sunray Grove), 4101 SR 70, Lake Placid. The maintenace/storage/office structures associated with this facility are located over 800 feet northeast of FPC 2A. As discussed in the aerial review, a decon station associated with this facility is located within the access easement. EDM's report states this site has seven ASTs ranging from 2,000-gallons to 10,000-gallons in size.Five ASTs remain active, while two were removed in 2002 and 2005. Given a hisotry of discharges (note multiple database listings) associated with this facility, FPC 2A is assigned a risk rating of MEDIUM. | **Medium** |

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# Contamination Matrix

Pond Alternatives
SR 70 PD&E Study from CR 29 to Lonesome Island Road
Highlands County
FPID: 414506-1-22-01
Tierra Project No. 6511-18-031E
Date: February 2, 2021

| Pond Alternative Name | Regulatory sites within 500 feet | Contamination Concern | Discussion | Contamination Risk Rating (No, Low, Medium, High) |
|---|---|---|---|---|
| FPC 2B | TANKS Fac. ID: 8944575<br><br>EDM No. 1 | 1.) Petroleum and/or agrichemical ASTs located at the irrigation well located near the west boundary of FPC 2B.<br>2.) Petroleum and/or agrichemical chemical ASTs located at the irrigation well located near the south boundary of FPC 2B.<br>3.) Petroleum AST(s) at the fuel point located within the access easement. | AERIAL PHOTOGRAPH REVIEW<br>FPC 2B: Groves are depicted onsite from 1994 to 2017 (most current). Two possible irrigation wells are depicted. The first is depicted near the west boundary since at least 1994. A covered shed, possibly with one or more ASTs (petroleum and agrichemicals) is also depicted at this location. The second is depicted near the south boundary since at least 2008 and appears to be electric (utility poles depicted).<br>ACCESS EASEMENT: The access easement is depicted as a mostly paved road (Dosia Smith Road) with two bridges or cattle grates. If they are bridges, an asbestos survey may be warranted. A tank farm and farm equipment are depicted within the access easement 50 feet north of FPC 2B. The irrgation wells and tank farm are assigned a MEDIUM risk rating. Potential herbidice and pesticide impacts within the groves is considered a low contamination risk to FPC 2B.<br>OFFSITE: A storage/maintenance facility is depicted adjacent northwest of FPC 2B, and adjacent east of the access easement. Since it is located 50 feet offsite, impacts associated with this facility are considered low risk to FPC 2B.<br><br>REGULATORY DATABASE REVIEW<br>One site, identified as EDM No. 1 Smith Estate Dosia C., located at 130 Dosia Smith Road, Lake Placid, was identified on EDM regulatory report and is located within the access easement and adjacent areas northwest of FPC 2B: This facility has two registered ASTs.: one 1,000-gallon unleaded gasoline AST was removed in March 2000; and one 550-gallon diesel AST was installed in March 2000. No discharges were reported. It appears the tank farm is with the access easement noted during the aerial review.<br><br>RISK RATING: Given the ASTs located within FPC 2B and the access easement, FPC 2B is assigned a risk rating of MEDIUM. | **Medium** |

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# Contamination Matrix

Pond Alternatives
SR 70 PD&E Study from CR 29 to Lonesome Island Road
Highlands County
FPID: 414506-1-22-01
Tierra Project No. 6511-18-031E
Date: February 2, 2021

| Pond Alternative Name | Regulatory sites within 500 feet | Contamination Concern | Discussion | Contamination Risk Rating (No, Low, Medium, High) |
|---|---|---|---|---|
| SMF 1B | none | - | AERIAL PHOTOGRAPH REVIEW<br>pasture 1994 to 20217<br><br>REGULATORY REVIEW<br>None noted | No |
| SMF 2B | none | - | AERIAL PHOTOGRAPH REVIEW<br>low, wet and overgrown 1994 to 2017<br><br>REGULATORY REVIEW<br>None noted | No |
| SMF 3B | none | groves | AERIAL PHOTOGRAPH REVIEW<br>groves 1994 to 2017<br><br>REGULATORY REVIEW<br>None noted | Low |
| Regional Pond | none | groves | AERIAL PHOTOGRAPH REVIEW<br>REGIONAL POND: pasture 1994 to 1999,<br>groves/row crops 1999 to 2017,<br>ditch filled in southern half in 2004<br>ACCESS EASEMENT: pasture 1994 to 1999, unpaved road 1999 to 2017<br><br>REGULATORY REVIEW<br>None noted | Low |

*Regulatory information reported in Environmental Data Management, Inc. report dated February 2, 2021*
*Aerial review performed using Google Earth from 1994 to 2017*

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APPENDIX H

SOILS REPORT

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Highlands County, Florida

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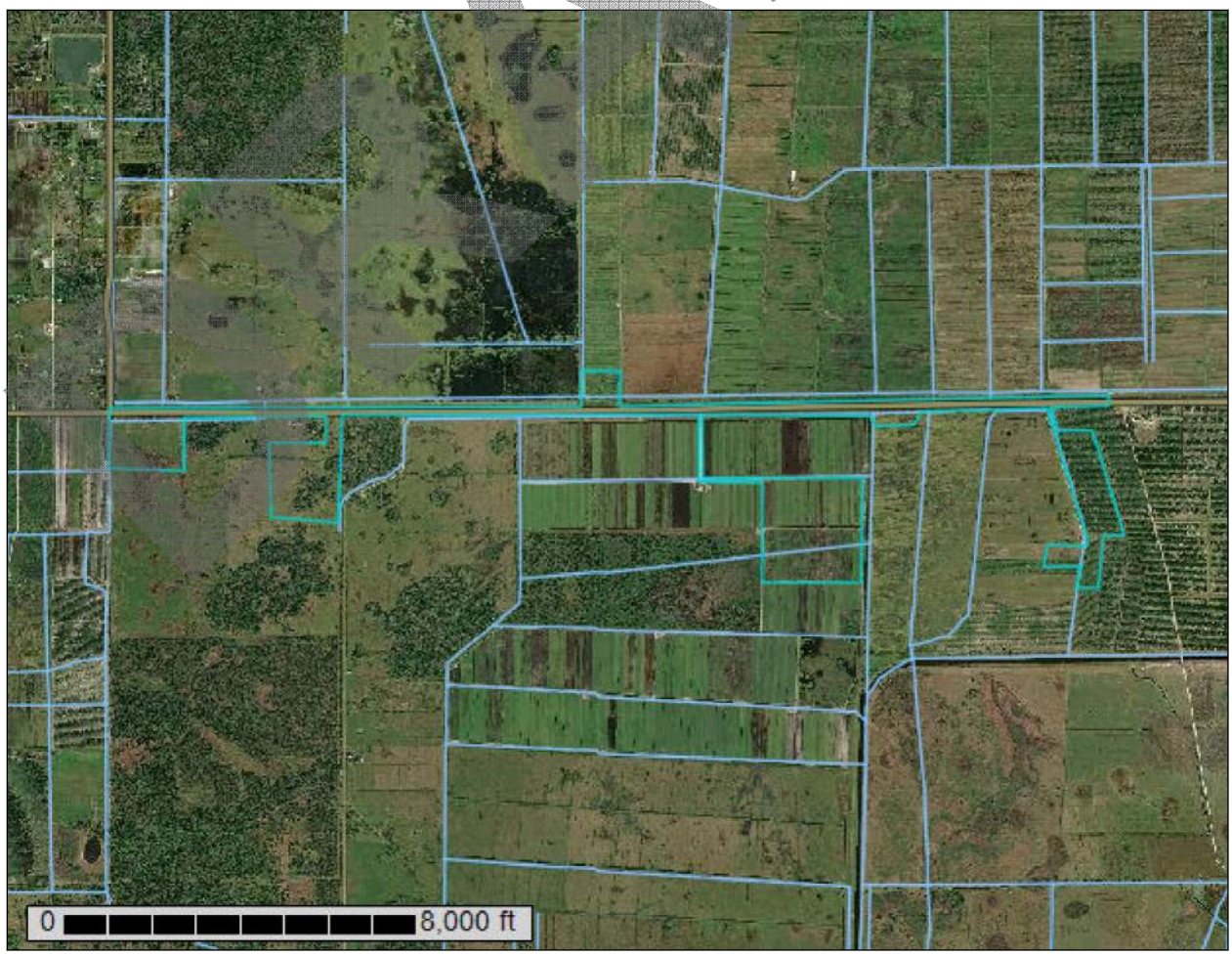


April 22, 2021

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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# Contents



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# How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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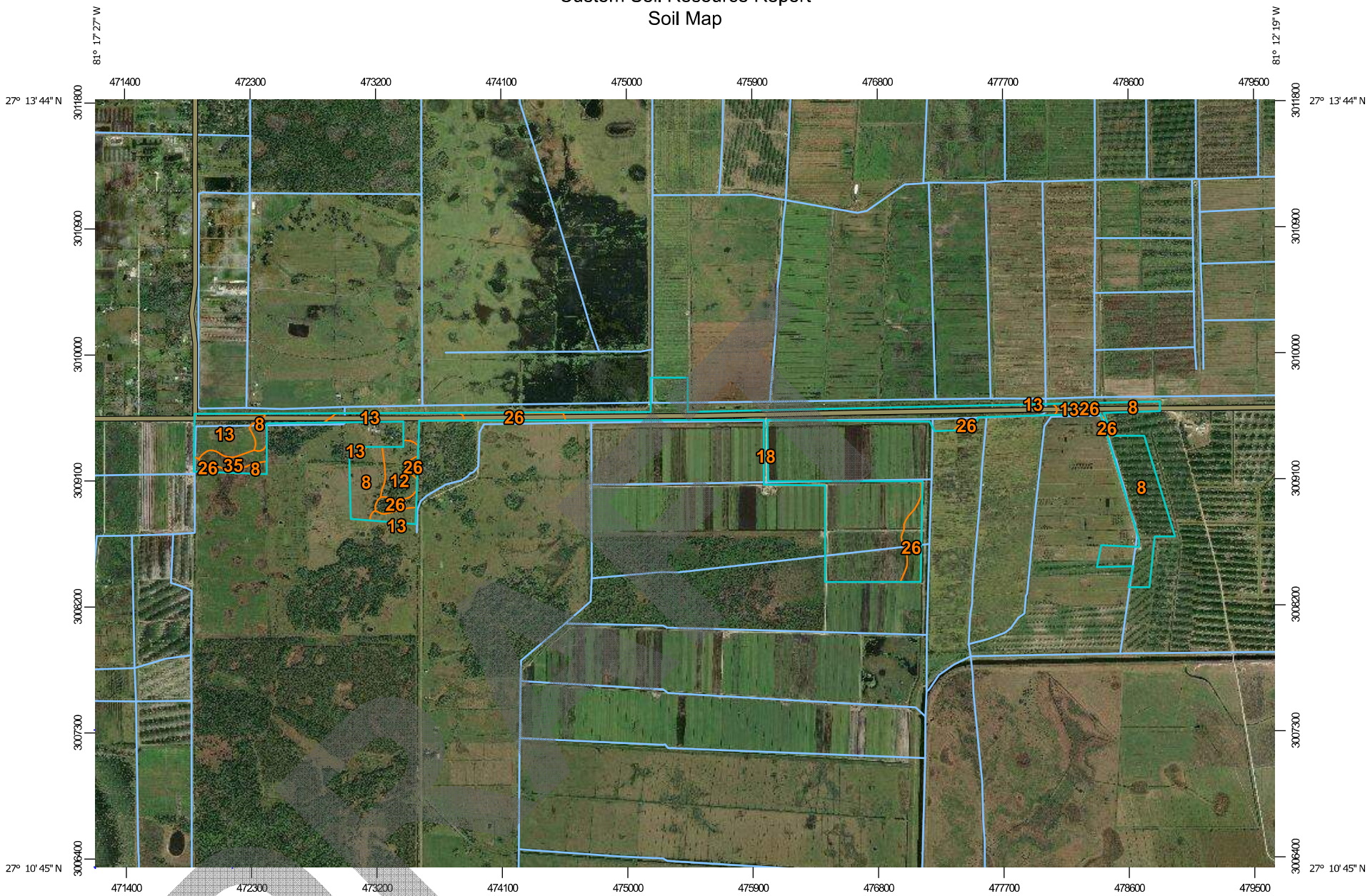
# Custom Soil Resource Report
## Soil Map



## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Highlands County, Florida
Survey Area Data: Version 20, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 20, 2011—Dec 9, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 8 | Immokalee sand, 0 to 2 percent slopes | 120.1 | 26.2% |
| 12 | Basinger fine sand, 0 to 2 percent slopes | 20.6 | 4.5% |
| 13 | Felda fine sand, 0 to 2 percent slopes | 61.6 | 13.4% |
| 18 | Kaliga muck, frequently ponded, 0 to 1 percent slopes | 200.9 | 43.9% |
| 26 | Tequesta muck, frequently ponded, 0 to 1 percent slopes | 42.7 | 9.3% |
| 35 | Sanibel muck | 11.9 | 2.6% |
| **Totals for Area of Interest** | | **457.9** | **100.0%** |

# Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

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was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

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# Highlands County, Florida

## 8—Immokalee sand, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* 2s3ll
*Elevation:* 0 to 150 feet
*Mean annual precipitation:* 42 to 57 inches
*Mean annual air temperature:* 70 to 77 degrees F
*Frost-free period:* 350 to 365 days
*Farmland classification:* Farmland of unique importance

### Map Unit Composition

*Immokalee and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Immokalee

#### Setting

*Landform:* Flatwoods on marine terraces
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear
*Parent material:* Sandy marine deposits

#### Typical profile

*A - 0 to 9 inches:* sand
*E - 9 to 36 inches:* sand
*Bh - 36 to 55 inches:* sand
*C - 55 to 80 inches:* sand

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 4.0
*Available water capacity:* Very low (about 3.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* B/D
*Forage suitability group:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
*Hydric soil rating:* No

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**Minor Components**

**Valkaria**

*Percent of map unit:* 5 percent
*Landform:* Drainageways on flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
*Hydric soil rating:* Yes

**Oldsmar**

*Percent of map unit:* 4 percent
*Landform:* Flatwoods on marine terraces
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
*Hydric soil rating:* No

**Pomello**

*Percent of map unit:* 3 percent
*Landform:* Ridges on marine terraces, knolls on marine terraces
*Landform position (two-dimensional):* Backslope, summit
*Landform position (three-dimensional):* Side slope, interfluve, riser
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear
*Ecological site:* R155XY001FL - Sand Pine Scrub
*Other vegetative classification:* Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
*Hydric soil rating:* No

**Satellite**

*Percent of map unit:* 2 percent
*Landform:* Drainageways on flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Other vegetative classification:* Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
*Hydric soil rating:* No

**Felda**

*Percent of map unit:* 1 percent
*Landform:* Drainageways on marine terraces, flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Ecological site:* R155XY011FL - Slough
*Other vegetative classification:* Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
*Hydric soil rating:* Yes

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## 12—Basinger fine sand, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* 2svym
*Elevation:* 0 to 100 feet
*Mean annual precipitation:* 42 to 63 inches
*Mean annual air temperature:* 68 to 77 degrees F
*Frost-free period:* 350 to 365 days
*Farmland classification:* Farmland of unique importance

### Map Unit Composition

*Basinger and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Basinger

#### Setting

*Landform:* Flats on marine terraces, drainageways on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear, concave
*Parent material:* Sandy marine deposits

#### Typical profile

*Ag - 0 to 2 inches:* fine sand
*Eg - 2 to 18 inches:* fine sand
*Bh/E - 18 to 36 inches:* fine sand
*Cg - 36 to 80 inches:* fine sand

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)
*Depth to water table:* About 0 to 12 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 4.0
*Available water capacity:* Low (about 5.9 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* A/D
*Forage suitability group:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

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*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
*Hydric soil rating:* Yes

**Minor Components**

**Myakka**

*Percent of map unit:* 6 percent
*Landform:* Flatwoods on marine terraces, drainageways on marine terraces
*Landform position (three-dimensional):* Tread, talf, dip
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
*Hydric soil rating:* No

**Immokalee**

*Percent of map unit:* 4 percent
*Landform:* Flatwoods on marine terraces
*Landform position (three-dimensional):* Riser, talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
*Hydric soil rating:* No

**Pompano**

*Percent of map unit:* 4 percent
*Landform:* Flats on marine terraces, drainageways on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
*Hydric soil rating:* Yes

**Placid**

*Percent of map unit:* 4 percent
*Landform:* Depressions on marine terraces, drainageways on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
*Hydric soil rating:* Yes

**Anclote**

*Percent of map unit:* 1 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Concave, convex
*Across-slope shape:* Concave, linear
*Other vegetative classification:* Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
*Hydric soil rating:* Yes

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**Felda**

*Percent of map unit:* 1 percent
*Landform:* Drainageways on marine terraces, flats on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Ecological site:* R155XY011FL - Slough
*Other vegetative classification:* Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
*Hydric soil rating:* Yes

## 13—Felda fine sand, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2tzvy
*Elevation:* 0 to 180 feet
*Mean annual precipitation:* 40 to 60 inches
*Mean annual air temperature:* 70 to 77 degrees F
*Frost-free period:* 350 to 365 days
*Farmland classification:* Farmland of unique importance

**Map Unit Composition**

*Felda and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Felda**

**Setting**

*Landform:* Drainageways on marine terraces, flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Parent material:* Sandy and loamy marine deposits

**Typical profile**

*A - 0 to 4 inches:* fine sand
*Eg - 4 to 35 inches:* fine sand
*Btg - 35 to 43 inches:* fine sandy loam
*Cg - 43 to 80 inches:* extremely paragravelly fine sand

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)
*Depth to water table:* About 3 to 18 inches
*Frequency of flooding:* None

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*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 4 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 4.0
*Available water capacity:* Low (about 5.2 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* A/D
*Ecological site:* R155XY011FL - Slough
*Forage suitability group:* Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
*Other vegetative classification:* Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
*Hydric soil rating:* Yes

**Minor Components**

**Wabasso**

*Percent of map unit:* 6 percent
*Landform:* Flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, talf
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
*Hydric soil rating:* No

**Oldsmar**

*Percent of map unit:* 5 percent
*Landform:* Flatwoods on marine terraces
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
*Hydric soil rating:* No

**Valkaria**

*Percent of map unit:* 4 percent
*Landform:* Drainageways on flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
*Hydric soil rating:* Yes

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## 18—Kaliga muck, frequently ponded, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* 2tzw6
*Elevation:* 0 to 130 feet
*Mean annual precipitation:* 44 to 55 inches
*Mean annual air temperature:* 70 to 77 degrees F
*Frost-free period:* 350 to 365 days
*Farmland classification:* Farmland of unique importance

### Map Unit Composition

*Kaliga and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Kaliga

#### Setting

*Landform:* Depressions on flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, talf, dip
*Down-slope shape:* Linear, concave
*Across-slope shape:* Concave, linear
*Parent material:* Herbaceous organic material over loamy marine deposits

#### Typical profile

*Oa - 0 to 25 inches:* muck
*C1 - 25 to 35 inches:* fine sandy loam
*C2 - 35 to 60 inches:* sandy clay loam
*C3 - 60 to 80 inches:* sandy clay loam

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Very poorly drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 4.0
*Available water capacity:* Very high (about 15.3 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7w
*Hydrologic Soil Group:* C/D
*Forage suitability group:* Organic soils in depressions and on flood plains (G155XB645FL)

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*Other vegetative classification:* Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
*Hydric soil rating:* Yes

**Minor Components**

**Samsula**
*Percent of map unit:* 5 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
*Hydric soil rating:* Yes

**Tequesta**
*Percent of map unit:* 4 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Organic soils in depressions and on flood plains (G156AC645FL), Freshwater Marshes and Ponds (R156BY010FL)
*Hydric soil rating:* Yes

**Chobee**
*Percent of map unit:* 4 percent
*Landform:* Depressions on flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Concave, linear
*Across-slope shape:* Concave, linear
*Other vegetative classification:* Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
*Hydric soil rating:* Yes

**Felda**
*Percent of map unit:* 4 percent
*Landform:* Depressions on marine terraces, flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Ecological site:* R155XY011FL - Slough
*Other vegetative classification:* Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
*Hydric soil rating:* Yes

**Placid**
*Percent of map unit:* 3 percent
*Landform:* Depressions on marine terraces, drainageways on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
*Hydric soil rating:* Yes

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## 26—Tequesta muck, frequently ponded, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* 2tzwx
*Elevation:* 0 to 40 feet
*Mean annual precipitation:* 47 to 61 inches
*Mean annual air temperature:* 70 to 77 degrees F
*Frost-free period:* 360 to 365 days
*Farmland classification:* Farmland of unique importance

### Map Unit Composition

*Tequesta and similar soils:* 87 percent
*Minor components:* 13 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Tequesta

#### Setting

*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Herbaceous organic material over sandy and loamy marine deposits

#### Typical profile

*Oa - 0 to 12 inches:* muck
*A - 12 to 25 inches:* fine sand
*Eg - 25 to 44 inches:* fine sand
*Btg/E - 44 to 56 inches:* fine sandy loam
*Btg - 56 to 72 inches:* fine sandy loam
*2Ck - 72 to 80 inches:* sand

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Very poorly drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 5.95 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 4 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 4.0
*Available water capacity:* High (about 9.4 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

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*Land capability classification (nonirrigated):* 7w
*Hydrologic Soil Group:* A/D
*Forage suitability group:* Organic soils in depressions and on flood plains (G156AC645FL)
*Other vegetative classification:* Organic soils in depressions and on flood plains (G156AC645FL), Freshwater Marshes and Ponds (R156BY010FL)
*Hydric soil rating:* Yes

**Minor Components**

**Basinger**

*Percent of map unit:* 4 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Linear, concave
*Across-slope shape:* Linear, concave
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
*Hydric soil rating:* Yes

**Sanibel**

*Percent of map unit:* 3 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Tread, dip
*Down-slope shape:* Concave, linear
*Across-slope shape:* Concave
*Other vegetative classification:* Organic soils in depressions and on flood plains (G155XB645FL)
*Hydric soil rating:* Yes

**Holopaw**

*Percent of map unit:* 3 percent
*Landform:* Drainageways on marine terraces, flats on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Linear, convex
*Across-slope shape:* Concave, linear
*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
*Hydric soil rating:* Yes

**Kaliga**

*Percent of map unit:* 3 percent
*Landform:* Depressions on flatwoods on marine terraces
*Landform position (three-dimensional):* Tread, dip, talf
*Down-slope shape:* Concave, linear
*Across-slope shape:* Concave, linear
*Other vegetative classification:* Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
*Hydric soil rating:* Yes

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## 35—Sanibel muck

### Map Unit Setting

*National map unit symbol:* 1jfww
*Elevation:* 10 to 130 feet
*Mean annual precipitation:* 47 to 55 inches
*Mean annual air temperature:* 68 to 75 degrees F
*Frost-free period:* 277 to 307 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Sanibel and similar soils:* 77 percent
*Minor components:* 23 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Sanibel

#### Setting

*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Thin organic material over sandy marine deposits

#### Typical profile

*Oa - 0 to 7 inches:* muck
*A - 7 to 15 inches:* mucky fine sand
*Cg - 15 to 80 inches:* sand

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Very poorly drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 4.0
*Available water capacity:* Moderate (about 6.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* A/D
*Forage suitability group:* Organic soils in depressions and on flood plains (G155XB645FL)

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*Other vegetative classification:* Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
*Hydric soil rating:* Yes

**Minor Components**

**Placid, depressional**
*Percent of map unit:* 5 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
*Hydric soil rating:* Yes

**Basinger, depressional**
*Percent of map unit:* 5 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
*Hydric soil rating:* Yes

**Kaliga**
*Percent of map unit:* 5 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Organic soils in depressions and on flood plains (G155XB645FL)
*Hydric soil rating:* Yes

**Samsula**
*Percent of map unit:* 4 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Organic soils in depressions and on flood plains (G155XB645FL)
*Hydric soil rating:* Yes

**Tequesta**
*Percent of map unit:* 4 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Organic soils in depressions and on flood plains (G155XB645FL)
*Hydric soil rating:* Yes

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# Soil Information for All Uses

## Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

## Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

### Water Features

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

*Hydrologic soil groups* are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or

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soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

*Surface runoff* refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

*Water table* refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top ( *upper limit* ) and base ( *lower limit* ) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. The kind of water table, apparent or perched, is given if a seasonal high water table exists in the soil. A water table is perched if free water is restricted from moving downward in the soil by a restrictive feature, in most cases a hardpan; there is a dry layer of soil underneath a wet layer. A water table is apparent if free water is present in all horizons from its upper boundary to below 2 meters or to the depth of observation. The water table kind listed is for the first major component in the map unit.

*Ponding* is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

*Flooding* is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

*Duration* and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual

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weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

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| Map unit symbol and soil name | Hydrologic group | Surface runoff | Most likely months | Water table | | | Ponding | | | Flooding | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Upper limit | Lower limit | Kind | Surface depth | Duration | Frequency | Duration | Frequency |
| | | | | *Ft* | *Ft* | | *Ft* | | | | |
| 8—Immokalee sand, 0 to 2 percent slopes | | | | | | | | | | | |
| Immokalee | B/D | Very high | Jan | 0.5-2.5 | 6.0 | Apparent | — | — | None | — | None |
| | | | Feb | 1.0-5.0 | 6.0 | Apparent | — | — | None | — | None |
| | | | Mar | 1.5-5.0 | 6.0 | Apparent | — | — | None | — | None |
| | | | Apr-May | 2.0-6.0 | 6.0 | Apparent | — | — | None | — | None |
| | | | Jun-Nov | 0.5-1.5 | 6.0 | Apparent | — | — | None | — | None |
| | | | Dec | 0.5-2.5 | 6.0 | Apparent | — | — | None | — | None |
| 12—Basinger fine sand, 0 to 2 percent slopes | | | | | | | | | | | |
| Basinger | A/D | Negligible | Jan | 0.5-2.5 | 6.0 | Apparent | — | — | — | — | None |
| | | | Feb | 1.0-5.0 | 6.0 | Apparent | — | — | — | — | None |
| | | | Mar | 1.5-5.0 | 6.0 | Apparent | — | — | — | — | None |
| | | | Apr-May | 2.0-6.0 | 6.0 | Apparent | — | — | — | — | None |
| | | | Jun | 0.5-1.5 | 6.0 | Apparent | — | — | — | — | None |
| | | | Jul-Oct | 0.0-1.0 | 6.0 | Apparent | 0.0-0.5 | Brief (2 to 7 days) | Frequent | — | None |
| | | | Nov | 0.5-1.5 | 6.0 | Apparent | — | — | — | — | None |
| | | | Dec | 0.5-2.5 | 6.0 | Apparent | — | — | — | — | None |

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| Map unit symbol and soil name | Hydrologic group | Surface runoff | Most likely months | Water table | | | Ponding | | | Flooding | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Upper limit | Lower limit | Kind | Surface depth | Duration | Frequency | Duration | Frequency |
| | | | | *Ft* | *Ft* | | *Ft* | | | | |
| 13—Felda fine sand, 0 to 2 percent slopes | | | | | | | | | | | |
| Felda | A/D | Very high | Jan | 0.5-2.5 | 6.0 | Apparent | — | — | None | — | None |
| | | | Feb | 1.0-5.0 | 6.0 | Apparent | — | — | None | — | None |
| | | | Mar | 1.5-5.0 | 6.0 | Apparent | — | — | None | — | None |
| | | | Apr-May | 2.0-6.0 | 6.0 | Apparent | — | — | None | — | None |
| | | | Jun | 0.5-1.5 | 6.0 | Apparent | — | — | None | — | None |
| | | | Jul-Oct | 0.3-1.5 | 6.0 | Apparent | — | — | None | — | None |
| | | | Nov | 0.5-1.5 | 6.0 | Apparent | — | — | None | — | None |
| | | | Dec | 0.5-2.5 | 6.0 | Apparent | — | — | None | — | None |
| 18—Kaliga muck, frequently ponded, 0 to 1 percent slopes | | | | | | | | | | | |
| Kaliga | C/D | Negligible | Jan | 0.0 | 6.0 | Apparent | 0.0-2.0 | Very long (more than 30 days) | Frequent | — | None |
| | | | Feb-May | 0.0-1.0 | 6.0 | Apparent | 0.0-2.0 | Very long (more than 30 days) | Frequent | — | None |
| | | | Jun-Dec | 0.0 | 6.0 | Apparent | 0.0-2.0 | Very long (more than 30 days) | Frequent | — | None |

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| Map unit symbol and soil name | Hydrologic group | Surface runoff | Most likely months | Water table | | | Ponding | | | Flooding | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Upper limit | Lower limit | Kind | Surface depth | Duration | Frequency | Duration | Frequency |
| | | | | *Ft* | *Ft* | | *Ft* | | | | |
| 26—Tequesta muck, frequently ponded, 0 to 1 percent slopes | | | | | | | | | | | |
| Tequesta | A/D | Negligible | Jan | 0.0-0.5 | 6.0 | Apparent | 0.0-2.0 | Very long (more than 30 days) | Frequent | — | None |
| | | | Feb | 0.0-1.0 | 6.0 | Apparent | 0.0-2.0 | Very long (more than 30 days) | Frequent | — | None |
| | | | Mar | 0.5-1.5 | 6.0 | Apparent | — | — | — | — | None |
| | | | Apr-May | 0.5-2.0 | 6.0 | Apparent | — | — | — | — | None |
| | | | Jun | 0.0-0.5 | 6.0 | Apparent | 0.0-2.0 | Very long (more than 30 days) | Frequent | — | None |
| | | | Jul-Oct | 0.0 | 6.0 | Apparent | 0.0-2.0 | Very long (more than 30 days) | Frequent | — | None |
| | | | Nov-Dec | 0.0-0.5 | 6.0 | Apparent | 0.0-2.0 | Very long (more than 30 days) | Frequent | — | None |
| 35—Sanibel muck | | | | | | | | | | | |
| Sanibel | A/D | Negligible | Jan-Feb | 0.0 | 6.0 | Apparent | 0.0-1.0 | Very long (more than 30 days) | Frequent | — | None |
| | | | Mar-May | — | — | — | — | — | — | — | None |
| | | | Jun-Dec | 0.0 | 6.0 | Apparent | 0.0-1.0 | Very long (more than 30 days) | Frequent | — | None |

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# APPENDIX I

# EXHIBITS

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| REVISIONS | | | |
|---|---|---|---|
| DATE | DESCRIPTION | DATE | DESCRIPTION |
| | | | |

Kisinger Campo & Associates Corp.
201 N. Franklin Street, Suite 400
Tampa, Florida 33602
Florida Certificate of Authorization No. 02317

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

| ROAD NO. | COUNTY | FINANCIAL PROJECT ID |
|---|---|---|
| SR 70 | HIGHLANDS | 414506-1-22-01 |

# POST-DEVELOPMENT EXHIBIT 1

SHEET NO.


DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES. THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

| REVISIONS | | | |
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# POST-DEVELOPMENT EXHIBIT 2

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# POST-DEVELOPMENT EXHIBIT 3

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# POST-DEVELOPMENT EXHIBIT 4

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# POST-DEVELOPMENT EXHIBIT 5

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| REVISIONS | | | |
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|---|---|---|
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# MASTER DRAINAGE MAP

SHEET NO.



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# APPENDIX J

# CONSTRUCTION COST ESTIMATES

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| Kisinger Campo & Associat | *By:* JTS | *Date:* 2/18/2021 | *FPID:* 414506-5-22-01 |
|---|---|---|---|

# COST ESTIMATE

| **Linear** | | | | | |
|---|---|---|---|---|---|
| *Description* | *Unit* | *Quantity* | *Unit Price* | | *Cost* |
| Pipe (Assume 36") | LF | 600 | $183.73 | $ | 110,238.00 |
| Mitered End Section - Rnd 36" | EA | 0 | $5,500.00 | $ | - |
| Control Structure - Type D Inlet (<10'): | EA | 6 | $4,540.00 | $ | 27,240.00 |
| Excavation | CY | 0 | $10.05 | $ | - |
| Pond Maintenance (30 Years) | AC/YR | 1.0 | $ 1,500.00 | $ | 46,185.00 |
| Other Misc. Pond Costs (Easements) | | | | $ | 20,000.00 |
| | | | **TOTAL:** | **$** | **203,663** |

*FDOT Historical Cost Current 12 Month Moving Area Averages: Area 09

*Landscaping is not within the scope of this project

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Kisinger Campo & Associates

*By:* JTS *Date:* 2/18/2021 *FPID:* 414506-5-22-01

## COST ESTIMATE

| **SMF 1** | | | | |
|---|---|---|---|---|
| *Description* | *Unit* | *Quantity* | *Unit Price* | *Cost* |
| Pipe (Assume 36") | LF | 300 | $183.73 | $ 55,119.00 |
| Mitered End Section - Rnd 36" | EA | 1 | $5,500.00 | $ 5,500.00 |
| Control Structure - Type D Inlet (<10'): | EA | 1 | $4,540.00 | $ 4,540.00 |
| Excavation | CY | 15,714 | $10.05 | $ 157,924.36 |
| Pond Maintenance (30 Years) | AC/YR | 0.2 | $ 1,500.00 | $ 7,305.00 |
| Other Misc. Pond Costs (Easements) | | | | $ 10,000.00 |
| | | | **TOTAL:** | **$ 240,388** |

*FDOT Historical Cost Current 12 Month Moving Area Averages: Area 09

*Landscaping is not within the scope of this project

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*By:* JTS *Date:* 2/18/2021 *FPID:* 414506-5-22-01

## COST ESTIMATE

| **SMF 2** | | | | |
|---|---|---|---|---|
| *Description* | *Unit* | *Quantity* | *Unit Price* | *Cost* |
| Pipe (Assume 36") | LF | 200 | $183.73 | $ 36,746.00 |
| Mitered End Section - Rnd 36" | EA | 1 | $5,500.00 | $ 5,500.00 |
| Control Structure - Type D Inlet (<10'): | EA | 1 | $4,540.00 | $ 4,540.00 |
| Excavation | CY | 31,008 | $10.05 | $ 311,633.08 |
| Pond Maintenance (30 Years) | AC/YR | 0.3 | $ 1,500.00 | $ 14,415.00 |
| Other Misc. Pond Costs (Easements) | | | | $ 10,000.00 |
| | | | **TOTAL:** | **$ 382,834** |

*FDOT Historical Cost Current 12 Month Moving Area Averages: Area 09

*Landscaping is not within the scope of this project

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Kisinger Campo & Associates

*By:* JTS *Date:* 2/18/2021 *FPID:* 414506-5-22-01

## COST ESTIMATE

| SMF 3 | | | | |
|---|---|---|---|---|
| *Description* | *Unit* | *Quantity* | *Unit Price* | *Cost* |
| Pipe (Assume 36") | LF | 200 | $183.73 | $ 36,746.00 |
| Mitered End Section - Rnd 36" | EA | 1 | $5,500.00 | $ 5,500.00 |
| Control Structure - Type D Inlet (<10'): | EA | 1 | $4,540.00 | $ 4,540.00 |
| Excavation | CY | 19,489 | $10.05 | $ 195,865.12 |
| Pond Maintenance (30 Years) | AC/YR | 0.2 | $ 1,500.00 | $ 9,060.00 |
| Other Misc. Pond Costs (Easements) | | | | $ 10,000.00 |
| | | | **TOTAL:** | **$ 261,711** |

*FDOT Historical Cost Current 12 Month Moving Area Averages: Area 09

*Landscaping is not within the scope of this project

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*By:* JTS *Date:* 2/18/2021 *FPID:* 414506-5-22-01

## COST ESTIMATE

| **Regional** | | | | |
|---|---|---|---|---|
| *Description* | *Unit* | *Quantity* | *Unit Price* | *Cost* |
| Pipe (Assume 36") | LF | 3000 | $183.73 | $ 551,190.00 |
| Mitered End Section - Rnd 36" | EA | 1 | $5,500.00 | $ 5,500.00 |
| Control Structure - Type D Inlet (<10'): | EA | 1 | $4,540.00 | $ 4,540.00 |
| Excavation | CY | 66,211 | $10.05 | $ 665,422.56 |
| Pond Maintenance (30 Years) | AC/YR | 0.7 | $ 1,500.00 | $ 30,780.00 |
| Other Misc. Pond Costs (Easements) | | | | $ 20,000.00 |
| | | | **TOTAL:** | **$ 1,277,433** |

*FDOT Historical Cost Current 12 Month Moving Area Averages: Area 09

*Landscaping is not within the scope of this project

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*By:* JTS *Date:* 2/18/2021 *FPID:* 414506-5-22-01

# COST ESTIMATE

| **FPC 1A** | | | | |
|---|---|---|---|---|
| *Description* | *Unit* | *Quantity* | *Unit Price* | *Cost* |
| Pipe (Assume 24") | LF | 100 | $105.04 | $ 10,504.00 |
| Mitered End Section - Rnd 24" | EA | 2 | $2,055.17 | $ 4,110.34 |
| Excavation | CY | 30,653 | $10.05 | $ 308,066.00 |
| Pond Maintenance (30 Years) | AC/YR | 0.6 | $ 1,500.00 | $ 28,500.00 |
| Other Misc. Pond Costs (Easements) | | | | $ 10,000.00 |
| | | | **TOTAL:** | **$ 361,180** |

*FDOT Historical Cost Current 12 Month Moving Area Averages: Area 09

*Landscaping is not within the scope of this project

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# COST ESTIMATE

| **FPC 2A** | | | | |
|---|---|---|---|---|
| *Description* | *Unit* | *Quantity* | *Unit Price* | *Cost* |
| Pipe (Assume 36") | LF | 100 | $183.73 | $ 18,373.00 |
| Mitered End Section - Rnd 36" | EA | 2 | $5,500.00 | $ 11,000.00 |
| Excavation | CY | 50,820 | $10.05 | $ 510,741.00 |
| Pond Maintenance (30 Years) | AC/YR | 1.1 | $ 1,500.00 | $ 47,250.00 |
| Other Misc. Pond Costs (Easements) | | | | $ 10,000.00 |
| | | | **TOTAL:** | **$ 597,364** |

*FDOT Historical Cost Current 12 Month Moving Area Averages: Area 09

*Landscaping is not within the scope of this project

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Kisinger Campo & Associates

*By:* JTS *Date:* 2/18/2021 *FPID:* 414506-5-22-01

# COST ESTIMATE

| **FPC 1B** | | | | |
|---|---|---|---|---|
| *Description* | *Unit* | *Quantity* | *Unit Price* | *Cost* |
| Pipe (Assume 24") | LF | 1,000 | $105.04 | $ 105,040.00 |
| Mitered End Section - Rnd 24" | EA | 2 | $2,055.17 | $ 4,110.34 |
| Excavation | CY | 35,493 | $10.05 | $ 356,708.00 |
| Pond Maintenance (30 Years) | AC/YR | 0.6 | $ 1,500.00 | $ 28,500.00 |
| Other Misc. Pond Costs (Easements) | | | | $ 10,000.00 |
| | | | **TOTAL:** | **$ 504,358** |

*FDOT Historical Cost Current 12 Month Moving Area Averages: Area 09

*Landscaping is not within the scope of this project

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Kisinger Campo & Associates

*By:* JTS *Date:* 2/18/2021 *FPID:* 414506-5-22-01

# COST ESTIMATE

| **FPC 2B** | | | | |
|---|---|---|---|---|
| *Description* | *Unit* | *Quantity* | *Unit Price* | *Cost* |
| Pipe (Assume 36") | LF | 500 | $183.73 | $ 91,865.00 |
| Mitered End Section - Rnd 36" | EA | 2 | $5,500.00 | $ 11,000.00 |
| Excavation | CY | 50,820 | $10.05 | $ 510,741.00 |
| Pond Maintenance (30 Years) | AC/YR | 1.1 | $ 1,500.00 | $ 47,250.00 |
| Other Misc. Pond Costs (Easements) | | | | $ 10,000.00 |
| | | | **TOTAL:** | **$ 670,856** |

*FDOT Historical Cost Current 12 Month Moving Area Averages: Area 09

*Landscaping is not within the scope of this project

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