POND SITING REPORT

Osceola Parkway Extension
(From SR 417 to Cyrils Drive)

Orange and Osceola County, FL
Project 599-223 (formerly 599-221)

Prepared for:

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Central Florida Expressway Authority
4974 ORL Tower Road
Orlando, Florida, 32807

Prepared By:
The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789

January 2020

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am a registered professional engineer in the State of Florida practicing engineering with The Balmoral Group and that I have supervised the preparation of and approve the analysis, findings, opinions, conclusions and technical advice hereby reported for:

PROJECT: Osceola Parkway Extension
(From SR 417 to Cyrils Drive)
Pond Siting Report
Project 599-223
Orange and Osceola Counties, Florida

The engineering work represented by this document was performed through the following duly authorized engineering business:

The Balmoral Group
165 Lincoln Ave
Winter Park, Florida, 32789
Telephone: (407) 629-2185
Certificate of Authorization No. 26123

This report provides the results of the preliminary analysis of the existing drainage conditions and the analysis required for the estimation of stormwater pond sizes for the proposed improvements including the potential pond locations for the Project Development and Environment Study for Osceola Parkway Extension (from SR 417 to Cyrils Drive). The results in this report are based on assumptions from existing permits and best available desktop data; no site-specific investigations were performed for this analysis. It is recommended that additional site specific analysis be performed to finalize the report or prior to purchasing any recommended sites. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of hydrologic analysis and hydraulic engineering as applied through professional judgment and experience.

Any engineering analysis, documents, conclusions or recommendations relied upon from other professional sources or provided with responsibility by the client are referenced accordingly in the following report.

FLORIDA REGISTERED ENGINEER:
Gregory S. Seidel, State of Florida, Professional Engineer, License No. 47571
This item has been electronically signed and sealed by:

Gregory S Seidel

Digitally signed by Gregory S Seidel
Date: 2020.01.07 17:23:11 -05'00'

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EXECUTIVE SUMMARY

The Balmoral Group has subcontracted with RS&H, Inc. to provide Project Development and Environment (PD&E) re-evaluation drainage design services for the Central Florida Expressway Authority (CFX) for the Osceola Parkway Extension improvements from SR 417 to Cyrils Drive (Project ID No. 599-223). The new roadway alignment will provide approximately 10 to 10.5 miles of limited access highway. There are four potential alignments currently being analyzed: two alignments are on the west side of Narcoossee Road and two alignments are on the east side of Narcoossee Road. The project begins at SR 417, near the Boggy Creek Interchange and extends south and then east staying just north of the Orange-Osceola County Line. After crossing Narcoossee Road, the alignments shift south and then east until connecting with Cyrils Drive. The study area of this PD&E Re-Evaluation includes portions of Orange County and Osceola County, Florida. This pond siting report is a continuation of the effort presented in the Pond Sizing and Siting Technical Memorandum, performed by CH2M Hill, Inc. in March 2018 and a re-evaluation of the Pond Sizing Report, prepared by Inwood Consulting Engineers in December 2016.

The objective of this report is to discuss, analyze and identify the stormwater management plan for the proposed roadway alignment. Stormwater management for water quality treatment and runoff attenuation will be provided using wet detention stormwater management facilities. Floodplain compensation estimates used the cup-for-cup method. The design of the stormwater facilities will comply with the standards set forth by CFX, South Florida Water Management District (SFWMD), Orange County, Osceola County, and Florida Department of Transportation (FDOT).

The ultimate typical section features an eight-lane section and two potential multi-use lanes with a concrete median barrier wall and onsite conveyance ditches. Pond sizing assumed a fully paved median creating a total width of 178-feet of impervious area along the mainline.

The project is located within the Kissimmee River Watershed in the SFWMD, and more specifically within the Lake Tohopekaliga basin. The project site is within Township 24 South, Range 30 East (Sections 27, 28, 29, 33, 34, 35); Township 24 South, Range 31 East (Sections 31, 32, 33); Township 24 South, Range 30 East (Sections 3, 4); and Township 25 South, Range 31 East (Sections 1, 2, 3, 4, 7, 8, 9, 10).

Required pond sizes for each basin were determined by evaluating runoff volume using the National Resource Conservation Service (NRCS) curve number (CN) method, calculating treatment volume requirements, and including floodplain impacts (as applicable). These volumes were summed and combined with landscaping, pond geometry, side slopes, freeboard, and maintenance berm assumptions to produce an estimated total required pond size. Pond size estimates include a 20% increase in area to account for landscaping aesthetics and tie-ins to the existing ground. Since this is a rough analysis for pond sizing capacity, recovery calculations for orifice sizing and permanent pool calculations are not included in the pond sizing considerations. Please note that the recommendations were based on pond sizes determined from preliminary data, reasonable engineering judgment, and assumptions. Pond size requirements may change during final design as more detailed information on Seasonal High Water Table (SHWT), wetland hydrologic information, and final roadway profile become available.

Design considerations for each pond site location included a desktop review of the best available data, which included hydraulic data, hydrology (land use cover, soil types, seasonal high water elevations, etc.), contamination sites, wetland limits, wildlife siting's, archaeological or historical sites, and conservation areas. No site-specific investigations have been performed or used in this analysis, this includes field survey, geotechnical testing, wetland delineation, threatened and endangered species observations, archaeological / cultural resources investigations, or contamination screenings. The analyses in this report are based on best available GIS data, permit research, and site field review. The results are summarized in **Table ES 1A** through **Table ES 4B** on the following pages.

TABLE ES 1A – ALTERNATIVE LAKE NONA ALTERNATIVE (404B) POND SITING MATRIX

Pond Site	Wetland Impacts (ac)	Wildlife Habitat Impacts	Contamination Risk	Floodplain Impact (ac)	Cultural or Archaeological Resources Impacts	Access Issues	Number of Property Owners	Pond R/W Area (ac)
404B_417_A	0	Low	Low	0	Low	None	N/A	9.3
1_A	0	Low	Low	0	Low	None	2	5.9
1_B	0	Low	Low	0	Low	None	2	4.1
1_C	0	Low	Low	0	Low	None	N/A	1.9
1_D	0	Low	Low	0	Low	None	N/A	3.7
2_A	1.95	Medium	Low	0	Low	None	N/A	11.2
3_A	0	Low	Low	0	Low	None	N/A	1.8
3_B	0.48	Medium	Low	0	Low	None	N/A	4.1
3_C	0.04	Medium	Low	0	Low	None	1	5.2
3_D	0	Low	Low	0	Low	None	1	5.2
4_A	0	Low	Low	0	Low	None	1	5.0
4_B	0	Low	Low	0	Low	None	1	4.9
5_A	0	Low	Low	0	Low	None	N/A	4.9
6_A	0	Medium	Low	9.48	Low	0.6 ac Easement	1	8.8
6_B	0	Low	Low	0	Low	None	5	8.2
FPC_3_A	0	Low	Low	4.28	Low	None	1	9.7
FPC_3_B	2.67	Medium	Low	5.45	Low	None	1	9.7

TABLE ES 1B: LAKE NONA ALTERNATIVE (404B): POND OPTION CONSTRUCTION COST

Basin	Option	Pond Site	Provided Pond Area	Pond Option Construction Cost
			ac	
B404B_417	Option 1	417_A	9.3	$1,577,571
B404B_001	Option 1	1_A	5.9	
		1_C	1.9	
		1_D	3.7	
		TOTAL	11.5	$1,660,551
	Option 2	1_B	4.1	
		1_C	1.9	
		1_D	3.7	
		TOTAL	9.7	$1,469,318
B404B_002	Option 1	2_A	11.2	$1,220,455
B404B_003	TP Option 1	3_A	1.8	
		3_B	4.1	
		3_C	5.2	
		TOTAL	11.1	$1,814,032
	TP Option 2	3_A	1.8	
		3_B	4.1	
		3_D	5.2	
		TOTAL	11.1	$1,814,032
	FPC Option 1	FPC_3_A	9.7	$996,106
	FPC Option 2	FPC_3_B	9.7	$996,106
B404B_004	Option 1	4_A	5.0	$795,135
	Option 2	4_B	4.9	$784,511
B404B_005	Option 1	5_A	4.9	$767,497
B404B_006	Option 1	6_A	8.8	$1,399,374
	Option 2	6_B	8.2	$1,335,629

TABLE ES 2A – BOGGY CREEK ALTERNATIVE (405) POND SITING MATRIX

Pond Site	Wetland Impacts (ac)	Wildlife Habitat Impacts	Contamination Risk	Floodplain Impact (ac)	Cultural or Archaeological Resources Impacts	Access Issues	Number of Property Owners	Pond R/W Area (ac)
1_A	0	Low	Low	0	Low	None	N/A	2.7
1_B	0	Low	Low	0	Low	None	N/A	4.6
1_C	0.20	Medium	Low	0	Low	None	2*	2.9
1_D	0	Low	Low	0	Low	None	N/A	2.0
2_A	0	Low	Medium	0	Low	None	1	2.1
3_A	2.09	Medium	Low	1.92	Low	None	1	11.1
3_B	0.59	Medium	Low	1.26	Low	None	3	11.1
4_A	0	Low	Low	0	Low	None	1	5.1
4_B	0	Low	Low	0	Low	None	1	4.9
5_A	0	Low	Low	0	Low	None	N/A	4.9
6_A	0	Medium	Low	9.48	Low	0.6 ac Easement	1	8.8
6_B	0	Low	Low	0	Low	None	5	8.2
FPC_1_A	0.65	Medium	Low	0.01	Low	None	3	7.8
FPC_3_A	0	Low	Low	4.15	Low	None	1	6.2
FPC_3_B	1.35	Medium	Low	3.95	Low	None	1	6.2

*One of the parcels is a remnant and required by roadway right-of-way

TABLE ES 2B – BOGGY CREEK ALTERNATIVE (405) POND OPTION CONSTRUCTION COST

Basin	Option	Pond Site	Provided Pond Area	Pond Option Construction Cost
			ac	
B405_417	N/A	N/A	--	N/A
B405_001	TP Option 1	1_A	2.7	
		1_B	4.6	
		1_C	2.9	
		1_D	2.0	
		TOTAL	12.2	$1,818,253
	FPC Option 1	FPC_1_A	7.8	$800,084
B405_002	Option 1	2_A	2.1	$300,000
B405_003	TP Option 1	3_A	11.1	$1,915,856
	TP Option 2	3_B	11.1	$1,915,856
	FPC Option 1	FPC_3_A	6.2	$636,621
	FPC Option 2	FPC_3_B	6.2	$636,621
B405_004	Option 1	4_A	5.1	$803,111
	Option 2	4_B	4.9	$781,863
B405_005	Option 1	5_A	4.9	$769,057
B405_006	Option 1	6_A	8.8	$1,561,569
	Option 2	6_B	8.2	$1,497,824

TABLE ES 3A – SPLIT OAK MINIMIZATION ALTERNATIVE (500-107C-1) POND SITING MATRIX

Pond Site	Wetland Impacts (ac)	Wildlife Habitat Impacts	Contamination Risk	Floodplain Impact (ac)	Cultural or Archaeological Resources Impacts	Access Issues	Number of Property Owners	Pond R/W Area (ac)
1_A	1.64	Medium	Low	14.70	Low	None	N/A	25.1
1_B	0	Low	Low	0.50	Low	None	2	8.8
1_C	0	Low	Low	0.34	Low	None	1	1.3
1_D	0	Low	Low	6.86	Low	None	1	10.0
2_A	0.57	Medium	Low	5.06	Low	None	1	14.3
2_B	0.53	Medium	Low	0.51	Low	0.7 ac Easement	1	14.2
3_A	1.40	Medium	Low	2.68	Low	None	N/A	15.9
4_A	0	Low	Low	0	Low	None	1	1.3
FPC_2_A	0	High	Low	1.99	Low	None	1	3.5
FPC_2_B	0.06	High	Low	1.07	Low	None	2	3.5

TABLE ES 3B – SPLIT OAK MINIMIZATION ALTERNATIVE (500-107C-1) POND OPTION CONSTRUCTION COSTS

Basin	Option	Pond Site	Provided Pond Area	Pond Option Construction Cost
			ac	
B500_107C-1_001	Option 1	1_A	25.1	
		1_B	8.8	
		1_C	1.3	
		TOTAL	35.2	$6,059,176
	Option 2	1_A	25.1	
		1_D	10.0	
		TOTAL	35.1	$6,048,551
B500_107C-1_002	TP Option 1	2_A	14.3	$2,495,287
	TP Option 2	2_B	14.2	
		Easement	0.7	
		TOTAL	14.9	$2,567,530
	FPC Option 1	FPC_2_A	3.5	$359,581
	FPC Option 2	FPC_2_B	3.5	
		TOTAL	3.9	$402,078
B500_107C-1_003	Option 1	3_A	15.9	$2,199,326
B500_107C-1_004	Option 1	4_A	1.3	$180,056

TABLE ES 4A – SPLIT OAK AVOIDANCE ALTERNATIVE (502-207D-1) POND SITING MATRIX

Pond Site	Wetland Impacts (ac)	Wildlife Habitat Impacts	Contamination Risk	Floodplain Impact (ac)	Cultural or Archaeological Resources Impacts	Access Issues	Number of Property Owners	Pond R/W Area (ac)
1_A	1.33	Medium	Low	11.33	Low	None	N/A	20.2
1_B	0	Low	Low	0.50	Low	None	2	8.8
1_C	0	Medium	Low	3.85	Low	None	1	6.3
2_A	2.95	Medium	Low	2.22	Low	None	1	23.0
2_B	0.22	Medium	Low	0.83	Low	None	1	23.0
3_A	4.43	Medium	Low	5.35	Low	None	N/A	16.3
3_B	1.63	Medium	Low	1.32	Low	None	3	23.4
3_C	6.53	Medium	Low	7.32	Low	None	3	22.8
5_A	10.44	Medium	Low	9.34	Low	None	N/A	12.4
FPC_3_A	4.34	Medium	Low	4.32	Low	None	2	17.2

TABLE ES 4B – SPLIT OAK AVOIDANCE ALTERNATIVE (502-207D-1) POND OPTION CONSTRUCTION COSTS

Basin	Option	Pond Site	Provided Pond Area	Pond Option Construction Cost
			ac	
B502_207D-1_001	Option 1	1_A	20.2	
		1_B	8.8	
		TOTAL	29.0	$4,746,758
	Option 2	1_A	20.2	
		1_C	6.3	
		TOTAL	26.5	$4,481,156
B502_207D-1_002	Option 1	2_A	23.0	$4,163,583
	Option 2	2_B	23.0	$4,162,399
B502_207D-1_003 & B502_207D-1_004	Option 1	3_A	16.3	
		FPC_3_A	17.2	
		TOTAL	33.5	$4,099,547
	Option 2	3_A	16.3	
		3_B	23.4	
		TOTAL	39.7	$6,894,314
	Option 3	3_A	16.3	
		3_C	22.2	
		TOTAL	38.5	$6,766,825
B502_207D-1_005	Option 1	5_A	12.4	$1,262,272

TABLE OF CONTENTS

List of Tables

APPENDICES

List of Figures in Appendix A

1. Introduction

The Balmoral Group has subcontracted with RS&H, Inc. to provide PD&E Re-evaluation drainage design services for the CFX for the new roadway alignment of approximately 10 to 10.5 miles of limited access highway. There are four potential alignments currently being analyzed: two alignments are on the west side of Narcoossee Road and two alignments are on the east side of Narcoossee Road. The project begins at SR 417, near Boggy Creek Interchange and extends south and then east staying just north of the Orange-Osceola County Line. After crossing Narcoossee Road, the alignments shift south and then east until connecting with Cyrils Drive. The study area of this PD&E Re-Evaluation includes portions of Orange County and Osceola County, Florida. This pond siting report is a continuation of the effort presented in the Pond Sizing and Siting Technical Memorandum, performed by CH2M Hill, Inc. in March 2018 and a re-evaluation of the Pond Sizing Report, prepared by Inwood Consulting Engineers in December 2016.

The objective of this report is to discuss, analyze and identify the stormwater management plan for each proposed roadway alignments analyzed. Stormwater management for water quality treatment and runoff attenuation will be provided using wet detention stormwater management facilities. Floodplain compensation estimates used the cup-for-cup method. The design of the stormwater facilities will comply with the standards set forth by CFX, SFWMD, Orange County, Osceola County, and FDOT. All exhibits for this report are included in **Appendix A**.

2. Project Description

The project is located in Orange and Osceola Counties, and within the SFWMD jurisdiction. The project site is within Township 24 South, Range 30 East (Sections 23, 24, 26, 27, 28, 33, 34, 35, and 36); Township 24 South, Range 31 East (Sections 31, 32 and 33); Township 25 South, Range 30 East (Sections 3 and 4); and Township 25 South, Range 31 East (Sections 2, 3, 4, 9, 10, and 11).

Several studies have been conducted to date to define corridors and potential build alternatives for this project. Following completion of the Osceola Parkway Extension Concept, Feasibility & Mobility Study in 2018, four build alternatives were carried forward into the PD&E Study. For this PD&E Study, the build alternatives have been refined based on input from the public and other local stakeholders. Further refinements will be made based upon future input from the Project Advisory Group (PAG) and the Environmental Advisory Group (EAG).

The project is located within the Kissimmee River Watershed in the SFWMD, and more specifically within the Lake Tohopekaliga (Lake Toho) basin. Within the Lake Toho basin, several smaller sub-basins exist, such as Boggy Creek, East Lake Tohopekaliga Drain, Jim Branch, C-29A Canal, and Center Lake Outlet basins. Boggy Creek flows south and discharges into East Lake Tohopekaliga (East Lake Toho). Jim Branch also flows south into Fells Cove and then East Lake Toho. C-29A Canal flows south to Ajay Lake, which discharges to Fells Cove and then to East Lake Toho. Center Lake Outfall flows south to Lake Myrtle.

The typical section which will be built for this project is a four lane corridor within 330 feet of Limited Access R/W (see Plate 1). This pond siting analysis utilized an ultimate typical section to determine pond sizes, and thereby, these pond sites will be able to accommodate the future roadway. The ultimate typical section features an eight-lane section and two potential multi-use lanes with a concrete median barrier wall and onsite conveyance ditches (See Plate 2). Pond sizing assumed a fully paved median creating a total width of 178-feet of impervious area along the mainline. Two alignments were evaluated from SR 417 to Narcoossee Road, Lake Nona Alternative (404B) and Boggy Creek Alternative (405), and two alignments were evaluated from Narcoossee Road to Cyrils Drive, Split Oak Minimization Alternative (500_107C-1) and Split Oak Avoidance Alternative (502_207D-1).

The report is based on the vertical datum NAVD88. Data sources based in NGVD29 are converted to NAVD88. The conversion from NGVD29 to NAVD88 is -1.01 using the U.S. Army Corps of Engineers Corpscon Version 6 software (i.e. 10.00 ft NGVD = 8.99 ft NAVD).

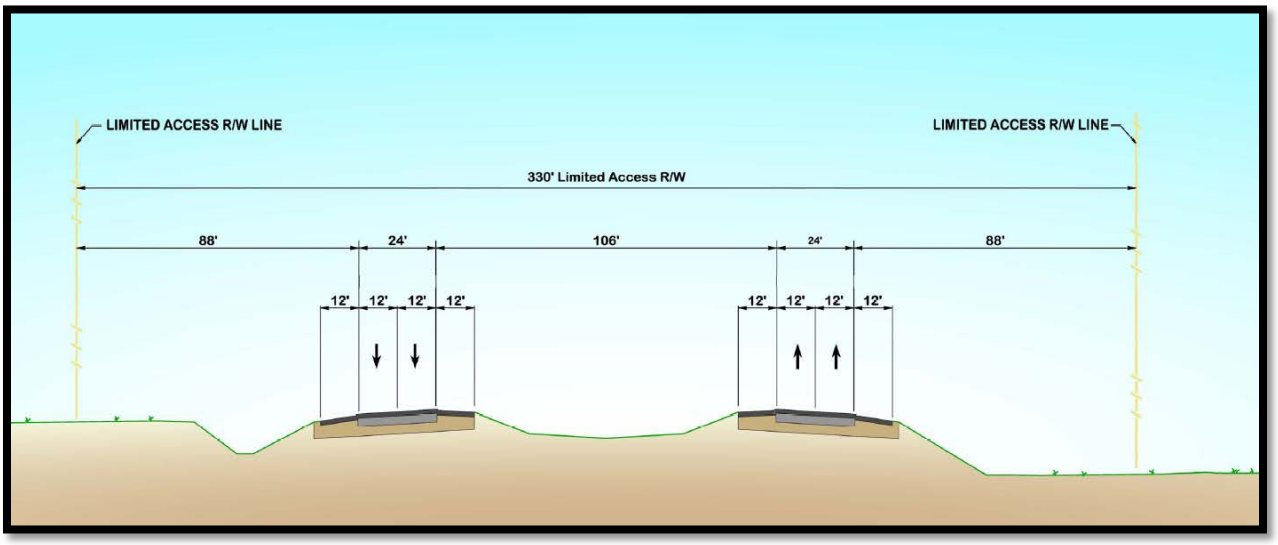


PLATE 1 - TYPICAL SECTION TO BE BUILT FOR OPE

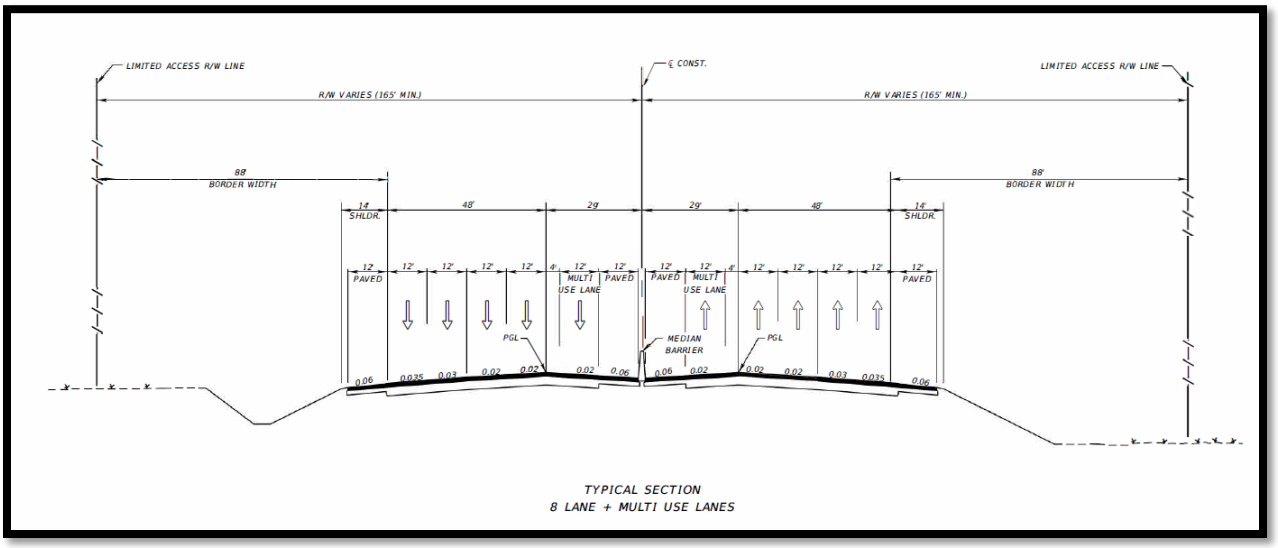


PLATE 2 – ULTIMATE TYPICAL SECTION USED FOR POND SIZING FOR OPE

3. Data Collection

The design team collected and reviewed data from the following sources:

- FDOT Drainage Manual, January 2019
- FDOT Drainage Design Guide, January 2019
- FDOT PD&E Manual, June 2019
- FDOT Design Manual, January 2019
- Federal Emergency Management Agency (FEMA), Panel Nos. 12095C0650F (Previous Maps 9/25/2009), 12095C0675F (Previous Maps 9/25/2009) for Orange County, Florida.
- Federal Emergency Management Agency (FEMA), Panel Nos. 12095C0650G (6/20/2018), 12095C0675G (6/20/2018) for Orange County, Florida; and 12097C0085G (6/18/2013), 12097C0105G (6/18/2013), 12097C0110G (6/18/2013) for Osceola County, Florida.
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) SSURGO Database of Orange and Osceola County, Florida
- USGS 7.5-Minute Quadrangle Maps for Narcoossee (1970), Saint Cloud North (1987), Pine Castle (1980), and Narcoossee NW (1980)
- U.S. National Park Service's National Register of Historic Places
- U.S. Fish and Wildlife Service (USFWS) datasets for National Wetland Inventory (NWI) (2017), Wood Stork Nesting Sites (2014), Florida Panther Focus Area (2007), Environmental Conservation Online System (ECOS) (2015)
- Florida Fish and Wildlife Conservation Commission-Fish and Wildlife Research Institute (FWC-FWRI) datasets for Gopher Tortoise Relocation Sites (2008), Florida Mortality Locations (2015)
- Florida Department of Environmental Protection (FDEP) and Water Management Districts (WMD) Mitigation Bank Service Areas (4/2017)
- FDEP datasets for Waste Cleanup Sites, Brownfields, Spring Locations (2016), WBID, Outstanding Florida Waters (OFW) (2018), Verified Impaired Waters (2018), Waters Not Attaining Standards (WNAS) (2018)
- FDEP and Florida Geological Survey (FGS) datasets for Spring Protective Areas (2005), Wells, Swallets
- FDEP and Department of Management Services (DMS) Florida State Owned Land and Record Information System (FL-SOLARIS) and Land Inventory Tracking System (LITS) (2016)
- Florida Natural Areas Inventory datasets for Florida Forever Projects (2015), Florida Conservation Lands (FLMA) (2016)
- Florida Ecological Greenways Network (2005)
- University of Florida – GeoPlan Center dataset for Florida Sand Skink and Blue-Tailed Mole Skink suitable habitat locations (2013)
- Osceola County LiDAR, 2015
- Orange County Digital Elevation Model (DEM), 2012
- Florida Department of Revenue 2017 Parcel Data
- Kissimmee River Watershed Total Maximum Daily Load (2013)
- Lake Okeechobee Basin Management Action Plan (BMAP) (2014)
- SFWMD and FDEP Permit Search
- Lake Toho Nutrient Reduction Plan, Final Report, prepared by CDM (December 2011)

- Draft Pond Sizing Report for Osceola Parkway Extension PD&E Study, Inwood Consulting Engineers (December 2016)
- Pond Sizing and Siting Technical Memorandum for Osceola Parkway Extension Concept, Feasibility, and Mobility Study, prepared by CH2M Hill, Inc. (February 2018)
- Basin Stormwater Management Master Plan Assessment, prepared by Singhofen & Associates, Inc. (January 2013)

Elevation information was obtained from Osceola County (2015) and Orange County (2012) to create a 10-foot Digital Elevation Model (DEM) using CatchmentSIM. This DEM was used to verify seasonal high groundwater table (SHGWT) estimates and 100-year floodplain elevations. Note, since this elevation information was obtained prior to some development within the study area (particularly around Lake Nona and Eagle Creek), existing permits and plans were used for topographic reference in these areas. No topographic survey was available for the project limits and no field survey was collected for this phase.

Several existing permits, floodplain evaluation analysis, and previous hydraulic studies were used to assist in making assumptions to establish SHGWT, 100-year floodplain elevations, wetland normal pool elevations, existing on-site storage and treatment, and existing cross drain information. **Table 1** shows the existing permits within the project study area that were used in the evaluation. The analysis in this report utilizes the best available information.

TABLE 1 - EXISTING PERMITS, PLANS, & PREVIOUS STUDIES

Name	Source
Boggy Creek Road Widening	SFWMD ERP No. 48-01177-P
Osceola Parkway to Turnpike	SFWMD Permit No. 49-00653-S
Boggy Creek Road at Jim Branch Creek	SFWMD Permit No. 49-02042-P
SR 417/Boggy Creek Road Interchange	Orange County Expressway Authority Project No. 417-301
Osceola Parkway Extension Location Hydraulics Report (Inwood, December 2016)	Florida Turnpike Enterprise FPID: 432134-1-22-01 & 432134-2-22-01
Southern Oaks Master and Phase 1 Drainage Calculations (Dewberry, August 2013)	SFWMD ERP App. No. 130930-10
Sunbridge Northeast District (NED) Cyrils Drive Phase 1	SFWMD ERP App. 170814-2
Sunbridge NED Phase 1 – West of C-30 Canal	SFWMD ERP App. 171106-4
Sunbridge East of Canal Phase 1	SFWMD ERP App. 180209-328
Del Webb Sunbridge	SFWMD ERP App. 180131-295
Poitras East Planned Development (PD) Federal Emergency Management Agency Letter of Map Revision (LOMR)	FEMA LOMR 002-17137
Poitras Property Borrow Pit No. 5	SFWMD ERP App. 000602-17
BP-S001 Poitras Property Borrow Pits	SFWMD ERP App. 010314-14
Lake Nona SW Grading Phase 2	SFWMD ERP App. 080515-14, SFWMD ERP App. 130822-7
Lake Nona South Parcels 16 & 17 Mass Grading	SFWMD ERP App. 091224-21
Turnberry Reserve	SFWMD ERP App. 030520-26

Within Orange County, the project study area includes a small portion of the Boggy Creek watershed and more predominant portion of the Lake Hart watershed. Coordination was performed with Orange County Stormwater Management Division to determine if any recent LiDAR/survey efforts had been performed since 2012. No recent activity had been completed per correspondence included in **Appendix F**. According to the Basin Stormwater Management Master Plan Assessment, prepared by Singhofen & Associates, Inc., dated January 2013, the Lake Hart watershed was ranked one of the least critical basins overall to update relative to the other basins. It is assumed that there is no recent modeling information being developed within this watershed that would be pertinent to this re-evaluation.

4. Design Criteria

The design of the stormwater facilities will comply with the standards set forth by CFX, SFWMD, Orange County, Osceola County, and FDOT. An Environmental Resource Permit will need to be acquired from SFWMD during the design of this project. A Pre-Application Meeting was held with the SFWMD on November 27, 2018 to discuss the project, and the outcomes are discussed in Sections 4.3 and 6.1.3 (See **Appendix F** for **Meeting Minutes**).

All basins are considered open basins. Wet detention systems were analyzed to provide water quality improvements, as well as water quantity attenuation for the project runoff. Wet detention is based on the high water table prevalent throughout the project limits. The stormwater ponds have been preliminarily designed and sized for the proposed alignments. Required pond sizes for each basin were calculated by evaluating runoff volume using the NRCS CN method, calculating treatment volume requirements, and reviewing floodplain impacts. These volumes were added together and combined with landscaping and maintenance berm assumptions to result in the total required pond size. Please refer to the summary below for the water quality, water quantity, and detention pond facilities configuration criterion used for the project.

4.1 Water Quality Criteria

Per Section 4.2.1 of the *2016 SFWMD Environmental Resource Permit Applicant's Handbook Volume II*, wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5-inches times the percentage of imperviousness, whichever is greater. Proposed offsite ponds are assumed to be wet detention.

Since this is a preliminary analysis for pond sizing capacity, recovery calculations for orifice sizing, and permanent pool calculations are not included in the pond sizing considerations.

Per Appendix E of the *2016 SFWMD Environmental Resource Permit Applicant's Handbook Volume II*, as a part of the review of ERP applications, the District evaluates whether discharges from a project will be directed to an Outstanding Florida Water (OFW) or a water body that has been identified as impaired pursuant Chapter 62-303, F.A.C. If a proposed project discharges to an OFW or an impaired water body, the District will require additional protective measures. For an impaired water body, this would include a site-specific pollutant loading analysis; and for an OFW, this would include pond storage of an additional 50% water quality treatment volume above the amounts required pursuant to Section 4.2.1, Volume II. The project study area does not discharge to an OFW, but East Lake Tohopekaliga Drain (WBID 3172C) is impaired for nutrients. The Lake Toho Nutrient Reduction Plan, Final Report, prepared by CDM (December 2011) provides additional information on this topic. The entire project study area is also within the Lake Okeechobee BMAP which indicates that the impaired basins require the 50% additional water quality volume storage mentioned above.

A preliminary pre versus post pollutant loading analysis has been performed for this study, as suggest by the SFWMD, since a Nutrient Reduction Plan has been implemented for Lake Toho. The Lake Nona Alternative was used to determine if pollutant loading reduction could be achieved. The Boggy Creek Alternative is very similar to the Lake Nona Alternative as far as

impaired basin involvement so it was assumed that results would also be similar for both alternatives. The Split Oak Minimization and Split Oak Avoidance Alternatives are not within impaired basins, and as such, a pollutant loading analysis is not necessary for these alternatives. The preliminary results, discussed further in Section 6.1.2 indicated that the required nutrient removal for both nitrogen and phosphorous is met for the overall Lake Nona Alternative (404B).

4.2 Water Quantity Criteria

Per Section 5.2.1 of the *2019 FDOT Drainage Manual*, the design must comply with the water quality, rate, and quantity requirements of *Section 334.044(15), F.S., Chapter 14-86, F.A.C.,* Rules of the Department of Transportation only in closed basins or areas subject to historical flooding. The Draft Pond Sizing Report for the Osceola Parkway Extension, dated December 2016, prepared by Inwood Consulting Engineers contained information regarding historic flooding. It was noted that there is historic flooding in the vicinity of Boggy Creek Road and within the Boggy Creek basin per SFWMD. Although this is the case, the proposed stormwater management facilities are expected to alleviate flooding, and not create adverse conditions.

Per Section 5.2.2 of the *2019 FDOT Drainage Manual*, the design must comply with state, Water Management District, and – when delegated by the state – local government stormwater management programs.

Per Section 3.2 of the *2016 SFWMD Environmental Resource Permit Applicant's Handbook Volume II, o*ff-site discharge rate is limited to rates not causing adverse impacts to existing off-site properties, and: (a) Historic discharge rates; or (b) Rates determined in previous Agency permit actions; or (c) Rates specified in District criteria. The project area does not discharge to any locations with rates specified in District criteria.

From previous permit documentation, Boggy Creek has an allowable discharge rate of 50 CSM (cubic feet per second per square mile); however due to the restrictive nature of the criteria, and examination of existing permits for the Boggy Creek widening project, and SR 417, it was concluded that since both projects were permitted by meeting the Pre versus Post limiting criteria, the calculations for this report will be based on that requirement. There is a potential that the proposed ponds will increase significantly in size if the criteria must be met; further discussion with the SFWMD during the design phase is warranted.

Per Section 3.3 of the *2016 SFWMD Environmental Resource Permit Applicant's Handbook Volume II*, unless otherwise specified by previous Agency permits or criteria, a storm event of three-day duration and 25-year return frequency shall be used in computing off-site discharge rates. Applicants are advised that local drainage districts or local governments may require more stringent design storm criteria. For this project, the local government criteria from Orange County and Osceola County will govern. All project basins are open basins. The criteria for the Orange County 25-year/24-hour storm event is 8.6 inches of rainfall and the criteria for the Osceola County 10-year/72-hour storm event is 8.0 inches of rainfall. For this PD&E Pond Siting Report, 8.6 inches of rainfall was used to establish attenuation storage for all proposed ponds to be slightly conservative. All criterion was discussed during the Pre-Application

Meeting at SFWMD and included in Sections 4.3 and 6.1.3 (See **Appendix F** for **Meeting Minutes**).

4.3 Floodplain Compensation Criteria

A Pre-Application Meeting was held with the SFWMD on November 27, 2018 to discuss the project (See **Appendix F**). The SFWMD will require cup-for-cup floodplain compensation between the 100-year elevation and estimated average wet season water table, and this volume can be provided within the proposed stormwater ponds. In addition, it was confirmed that stormwater modeling is not allowed to demonstrate compensation, only cup for cup compensation will be allowed.

4.4 Pond Geometry Criteria

It is assumed that all proposed ponds within the Osceola Parkway Extension will be wet detention facilities. Dimensions include 0.5-acre minimum surface area at the control elevation, and the pond bottom shall be a minimum of 12 feet below the control elevation. Side slopes shall not be steeper than 1:4, with a 20-foot wide berm. Maintain one foot of freeboard above the Design High Water (DHW) to the inside berm. Side slopes and berms shall be sodded.

Consistent with the Highway Beautification Policy, the pond aesthetics design approach should be developed early in order to include it in the determination of pond right-of-way (R/W) acquisition needs. *(2019 FDOT Drainage Manual Section 5.4.4.2).*

5. Existing Conditions

5.1 Land Use

The project corridor is a mixture of residential, open land, and conservation land. Land use west of Narcoossee road primarily consists of commercial, municipal, open land (urban), forested uplands, wetlands, residential, and water. East of Narcoossee Road, the existing land use consists of residential, forested uplands, agriculture, and water/wetlands. **Figure 5A,** Existing Land Use Map in **Appendix A** shows the existing land use within the project study area. The existing land use classifications shown on **Figure 5A** were defined by the SFWMD and were used to develop the curve number calculations. The limits of the City of Orlando/Greater Orlando Aviation Authority (GOAA) municipally owned parcels are shown as hatched on **Figure 5A.** Two of the parcels were previously used as borrow pits. These two parcels are shown as woods as classified by the SFWMD on **Figure 5A**. For the purpose of developing curve number calculations, the woods classification was conservatively used for the existing condition. One of the borrow pit parcels, referenced above, was recently sold from the City of Orlando/GOAA to Tavistock Development Company (Tdco LLC) in April 2018, according to the Orange County Property Appraiser. As a result, the existing land use could be redefined.

Regarding future land use, it appears there will be significant changes from existing land use in the western segment within Orange County. Per the City of Orlando's Future Lane Use Maps, Section 24 (**Figure 5C)**, Section 25 (**Figure 5D)**, and Section 26 (**Figure 5E**), the land use for the City of Orlando is comprised primarily of urban village and conservation within the project area. In Osceola County, the land use consists of rural and low density residential primarily.

Within the eastern alignments, the future land use within Osceola County is comprised of institutional, conservation, low density residential, and mixed use. Within Orange County, the land use is comprised of low density residential and planned development. The future land use within Orange County includes rural, planned development, preservation, and city owned lands. **Figure 5B** in **Appendix A** shows the future land use within the project study area in Orange and Osceola County.

For the purpose of developing proposed curve number calculations, the land use within the R/W was categorized in the calculations as either impervious, open space, or water.

5.2 Soils

The USDA NRCS soil characteristics were used to identify the soil types within and adjacent to the project limits. These are shown in **Figure 4** in **Appendix A**. Project soils include hydrologic soil groups: A, A/D, B/D, and C/D.

TABLE 2 - NRCS SOIL SURVEY INFORMATION (ORANGE COUNTY)

Soil Symbol	Soil Name	Hydrologic Soil Group	SHGWT Depth (feet)	Area % [1]
1	ARENTS, NEARLY LEVEL	A	2	0.1%
2	ARCHBOLD FINE SAND, 0 TO 5 PERCENT SLOPES	A	4	0.4%
3	BASINGER FINE SAND, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES	A/D	0	6.6%
4	CANDLER FINE SAND, 0 TO 5 PERCENT SLOPES	A	> 6	0.0%
19	HONTOON MUCK, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES	A/D	0	4.0%
20	IMMOKALEE FINE SAND	B/D	1	3.3%
23	MALABAR FINE SAND	A/D	0	0.0%
26	ONA FINE SAND, 0 TO 2 PERCENT SLOPES	B/D	1	1.0%
33	PITS	--	> 6	0.0%
34	POMELLO FINE SAND, 0 TO 5 PERCENT SLOPES	A	3	8.3%
37	ST. JOHNS FINE SAND	B/D	1	8.9%
40	SAMSULA MUCK, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES	A/D	0	9.7%
41	SAMSULA-HONTOON-BASINGER ASSOCIATION, DEPRESSIONAL	A/D	0	1.7%
42	SANIBEL MUCK	A/D	0	5.8%
44	SMYRNA-SMYRNA, WET, FINE SAND, 0 TO 2 PERCENT SLOPES	A/D	1	39.8%
46	TAVARES FINE SAND, 0 TO 5 PERCENT SLOPES	A	5	0.4%
54	ZOLFO FINE SAND, 0 TO 2 PERCENT SLOPES	A	3	0.6%
99	WATER	--	0	9.3%

1) Within Project Study Area within Orange County

TABLE 3 - NRCS SOIL SURVEY INFORMATION (OSCEOLA COUNTY)

Soil Symbol	Soil Name	Hydrologic Soil Group	SHGWT Depth (feet)	Area %[2]
1	ADAMSVILLE SAND, 0 TO 2 PERCENT SLOPES	A	3	4.1%
2	ADAMSVILLE VARIANT FINE SAND, 0 TO 5 PERCENT SLOPES	A	3	0.1%
4	ARENTS, 0 TO 5 PERCENT SLOPES	A	2	3.2%
5	BASINGER FINE SAND, 0 TO 2 PERCENT SLOPES	A/D	1	7.9%
6	BASINGER FINE SAND, DEPRESSIONAL, 0 TO 1 PERCENT SLOPES	A/D	0	0.0%
7	CANDLER SAND, 0 TO 5 PERCENT SLOPES	A	>6	0.1%
9	CASSIA FINE SAND, 0 TO 2 PERCENT SLOPES	A/D	2	0.7%
10	DELRAY LOAMY FINE SAND, DEPRESSIONAL	A/D	0	9.3%
15	HONTOON MUCK, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES	A/D	0	3.4%
16	IMMOKALEE FINE SAND, 0 TO 2 PERCENT SLOPES	B/D	1	0.5%
17	KALIGA MUCK, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES	C/D	0	0.1%
19	MALABAR FINE SAND, 0 TO 2 PERCENT SLOPES	A/D	0	7.4%
22	MYAKKA FINE SAND, 0 TO 2 PERCENT SLOPES	A/D	1	0.9%
24	NARCOOSSEE FINE SAND, 0 TO 2 PERCENT SLOPES	A	3	5.4%
27	ONA FINE SAND, 0 TO 2 PERCENT SLOPES	B/D	1	0.8%
31	PITS	--	>6	0.3%
32	PLACID FINE SAND, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES	A/D	0	0.1%
33	PLACID VARIANT FINE SAND	A/D	2	0.5%
34	POMELLO FINE SAND, 0 TO 5 PERCENT SLOPES	A	3	0.4%
36	POMPANO FINE SAND, 0 TO 2 PERCENT SLOPES	A/D	0	8.5%
37	POMPANO FINE SAND, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES	A/D	0	16.9%
38	RIVIERA FINE SAND, 0 TO 2 PERCENT SLOPES	A/D	0	1.7%
39	RIVIERA FINE SAND, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES	A/D	0	2.0%
40	SAMSULA MUCK, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES	A/D	0	8.7%
42	SMYRNA FINE SAND, 0 TO 2 PERCENT SLOPES	A/D	1	9.0%
43	ST. LUCIE FINE SAND, 0 TO 5 PERCENT SLOPES	A	>6	0.0%
44	TAVARES FINE SAND, 0 TO 5 PERCENT SLOPES	A	5	0.2%
99	WATER	--	0	7.7%

2) Within Project Study Area within Osceola County

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

To identify whether the area was in a drained or undrained condition, SHGWT estimates were collected from available data. Areas where the SHGWT was within two-feet of the existing ground were assumed to be an undrained condition and were classified as a D soils group. This was the case in all instances along the corridor.

5.3 Floodplains

The project limits are within the FEMA Flood Insurance Rate Map (FIRM) Panel No's. 12095C0650G and 12095C0675G for Orange County, effective 6/20/2018, and 12097C0085G, 12097C0105G, and 12097C0110G for Osceola County, effective 6/18/2013. The major floodplain impacts are associated with Jim Branch, Lake Myrtle and Lake Preston. Only flood zones classified as Zone X, Zone AE, and Zone A are present along the corridor. Zone X is an area of minimal flood hazard and was not evaluated for floodplain impacts. Zone AE has an established Base Flood Elevation (BFE) that has been approved by FEMA and ranges from 63 feet to 80 feet NAVD within the study area. Zone A has an identified area of inundation resulting from the 100-year storm event, but no BFE has been established.

The Boggy Creek Alternative (405) interchange with SR 417 crosses over the Boggy Creek FEMA-designated regulatory floodway. During the design phase, compensating for the impacts to this floodway and/or a FEMA-No Rise Certificate may be required and will need to be coordinated with the adjacent SR 417 Widening Project.

5.4 Existing Drainage Conditions

The project is located within the Kissimmee River Watershed within the jurisdiction of SFWMD, and more specifically within the Lake Tohopekaliga basin. The existing basins are open basins which discharge to creeks, canals, wetlands, and ultimately to the adjacent receiving water bodies. Receiving water bodies for the western segment are Boggy Creek and Jim Branch, both of which ultimately outfall to East Lake Toho. Receiving water bodies for the eastern segment are Ajay Lake and Lake Myrtle. Ajay Lake flows into Fells Cove and ultimately outfalls to East Lake Toho. Further east, Lake Myrtle ultimately outfalls to Alligator Lake. The ultimate outfall of the project study area is the Kissimmee River, which flows to Lake Okeechobee.

The project traverses through five watersheds, two of which are impaired according to FDEP Comprehensive Verified List (8/2018), as presented in **Table 4.** However, only one WBID (3172C) is impaired for nutrients.

TABLE 4 – FDEP WATERSHEDS

WBID	Waterbody	Parameter of Concern
3168B	Boggy Creek	Fecal Coliform
3172A	Jim Branch	None listed at this time
3172C	East Lake Tohopekaliga Drain	Nutrients (Macrophytes)
3171EA	C-29A Canal	None listed at this time
3174F	Lake Center Outlet	None listed at this time

The eastern segment of the project crosses the SFWMD C-29A Canal. Canal C-29A connects Lake Hart (upstream) and flows downstream to Ajay Lake, Fells Cove, and ultimately East Lake Tohopekaliga. Further east, the project corridor traverses a series of interconnected wetlands which ultimately outfall to Lake Myrtle. Further coordination with SFWMD will be necessary for desired discharge rates for the canals, and canal R/W permit requirements. The Pre-Application Meeting Minutes can be found in **Appendix F**.

The project corridor traverses Split Oak Forest Wildlife and Environment Area (SOFWEA), currently managed by the Florida Fish and Wildlife Conservation Commission (FFWCC) to enhance and preserve the habitat of the gopher tortoise and other wildlife and plants. SOFWEA was acquired with funds received through the FFWCC's Mitigation Park Program.

5.4.1 Existing Ponds

Since this is a new alignment, there are no existing stormwater management systems. There are existing ponds along SR 417 that accommodate the SR 417 mainline; however, it is assumed that the future widening of SR 417 will utilize any additional capacity reserved in these ponds.

Existing borrow pit ponds are proposed to be impacted by the proposed alignment. Based on permit review, these are no longer in use for active construction activities and do not provide any additional treatment or attenuation for offsite properties. These borrow pits, located on the Poitras property, are planned to be utilized for stormwater management for future developments.

An existing Narcoossee Road pond (aka Pond #2) is proposed to be impacted with the proposed alignment. The treatment and attenuation volume provided by that pond is included in the proposed pond for that basin.

Ponds intended to serve current and future private development may be impacted by the proposed alignment, especially in the areas of Lake Nona, Eagle Creek, Del Webb, and Sunbridge. The treatment and attenuation provided within these private ponds is not included in the proposed pond sizing calculations.

6. Proposed Stormwater Management

6.1 Pond Sizing Methodology

The required pond volume for the proposed improvements is calculated by the following:

$$Total\ Pond\ Volume\ Required = Required\ Treatment\ Volume + Required\ Attenuation\ Volume + Floodplain\ Impact\ Volume\ (if\ included)$$

The treatment volume includes the first flush runoff volume from the proposed developed site to be detained and treated prior to discharging downstream. The attenuation volume includes the storage of the additional runoff caused by the proposed development by minimizing the peak flowrate from the site to mimic pre-development conditions so as not to adversely impact offsite properties. The floodplain impact volume includes the storage lost due to the proposed development between the seasonal high water table and the 100-year base flood elevation. Floodplain impacts within the pond sites were not included in the pond sizing calculations.

The basin area includes the alignment corridor R/W, which was divided into several subbasins along floodplain or hydraulic boundaries from the existing topography or proposed roadway bridge crossings. Assumptions were made concerning the proposed basin divides for stormwater management as the proposed mainline roadway profiles were preliminary. It is assumed that each subbasin will have one pond, which is sized using the methodology described within the following sections. All assumptions were based on the best available data from desktop review.

Within this PD&E effort, it is assumed that each of the pond volume parameters are "stacked" instead of taking credit for any possible volume overlapping; this provides a conservative estimate which can be further evaluated during the final design phase. The methodology used to determine these parameters for calculating pond volumes are described within the following sections.

6.1.1 Treatment Volume

For the purposes of the PD&E study, all proposed ponds are assumed to be wet. The required treatment volume for wet ponds is larger than dry ponds and the water tables are generally shallow within the project area. It assumed that evaluation of pond types will be accomplished during the final design phase.

The SFWMD required treatment volume criterion for a wet detention pond is the greatest volume of either one inch over the basin or 2.5-inches over the new impervious area. The entire project is located with Lake Okeechobee BMAP, which requires an additional 50% of additional treatment volume for impaired basins.

$$Treatment\ Volume = Greater\ of\ 1"\ over\ Basin\ Area\ or\ 2.5"\ over\ New\ Impervious\ Area$$

If a basin is located within a verified impaired waterbody for nutrients, an additional 50% of treatment volume was added. This criterion only occurs within the basins located within the

East Lake Toho Watershed (WBID 3172C) along Lake Nona Alternative (404B) and Boggy Creek Alternative (405).

Existing roadway impervious areas that cross the alternative alignments were digitized via aerial imagery. The proposed roadway impervious area along the interchanges and side roads were digitized from the PD&E roadway design files. The ultimate typical section features an eight-lane section and two potential multi-use lanes with a concrete median barrier wall and onsite conveyance ditches. Pond sizing assumed a fully paved median creating a total width of 178-feet of impervious area along the mainline. The impervious area for the interchange ramps assumed shoulder widths of two foot inside and four foot outside for single lane ramps, and four foot inside and 10 foot outside for two-lane ramps where barrier walls were not shown.

6.1.2 Pollutant Loading Analysis

For the purposes of the PD&E study, a preliminary pollutant loading sample analysis was performed within one roadway alignment, Lake Nona Alternative, within the East Lake Tohopekaliga WBID, following the procedure within FDEP's *2010 Draft ERP Stormwater Quality Applicant's Handbook*.

For the existing or pre analysis, it was assumed that wetland areas would be categorized under the land use for water instead of brush or woods. For the proposed or post analysis, it was assumed that the roadway runoff is collected in the roadside ditches before conveyance into the stormwater management facility, and therefore, the roadway directly connected impervious area (DCIA) is zero. Also, the proposed analysis excludes the in-field wet pond areas from the basin as these areas will contribute to reducing the pollutant loading and should not be counted as DCIA.

The preliminary analysis shows that the required nutrient removal for both nitrogen and phosphorous is met for the overall Lake Nona Alternative (404B). The total pre loading is 383.16 kg/yr and 35.92 kg/yr for nitrogen and phosphorous, respectively; and the total post loading is 305.47 kg/yr and 31.80 kg/yr for nitrogen and phosphorous, respectively. This demonstrates the overall reduction for the total post loading over the total pre loading with this alignment using wet detention stormwater ponds for each basin. Individual Basins 01, 03, 05, and 06 show some increases in post development loading over the pre development loading for phosphorous and nitrogen, however, the stormwater management ponds in these basins will mitigate for these increases. The highest required pond removal efficiency for nitrogen is needed in Basin 06 at 21.0%; and the highest required pond removal efficiency for phosphorous is needed in Basin 03 at 58.4%. Wet detention facilities with large hydraulic residence times (200+ days) can reach removal efficiencies of approximately 80% for total phosphorus and 43% for total nitrogen. Therefore, the proposed wet detention ponds should be sufficient to meet pre development pollutant loading rates for this expressway. The preliminary pollutant loading analysis can be found in **Appendix B.**

6.1.3 Attenuation Volume

Criteria set forth by SFWMD, Orange County, and Osceola County was reviewed to determine the governing criteria from these agencies. It was determined that the controlling criteria for attenuation is the SFWMD requirement of the post-development peak flow rate not exceeding the pre-development peak flow rate for the 25-yr/72-hr storm event or local agency criteria. It was determined that the Osceola Parkway Extension Expressway design storm would require retaining the attenuation volume from 8.6-inches of rainfall to meet Orange County's 25-year/24-hour storm event, (see **Appendix F**, SFWMD Pre-Application Meeting Minutes). Since no routing is being performed during this PD&E phase, the attenuation volume will be based on the pre-post difference in volume generation, not peak discharge rate.

The Soil Conservation Service (SCS) Runoff Curve Number (CN) Method was used to determine the total runoff generation for the pre-development and post-development conditions. The SFWMD land cover and land use, dated 2014/15, was modified to include existing roadway impervious area along the corridors to determine the CN for the pre-development condition. The Osceola Parkway Extension alternative alignments were digitized to determine the difference in land use along the proposed corridors.

$$Runoff = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

$$S = \frac{1000}{CN} - 10$$

$$Volume = Runoff * Basin\ Area$$

$$Attenuation\ Volume\ =\ Post\ Development\ Volume\ -\ Pre\ Development\ Volume$$

For basins that have a lower CN in the post-development condition, (e.g. marsh land coverage is converted to impervious area and open – good land uses), the attenuation volume is assumed zero and no credit is provided for generating a lower runoff volume. See **Table 5** for the conversion between the Florida Land Use and Cover Classification System (FLUCCS) within the SFWMD land use file to the CN land use categories to determine the attenuation volume.

TABLE 5 - CONVERSION OF FLUCCS LAND USE DESCRIPTIONS TO SCS RUNOFF CURVE NUMBER CATEGORY

FLUCCS	SCS Runoff CN (TR-55)
ABANDONED GROVES	Row Crops - Straight Row
BAY SWAMPS	Woods - Good
CHANNELIZED WATERWAYS - CANALS	Water
CITRUS GROVES	Row Crops - Straight Row
COMMERCIAL AND SERVICES	Commercial
CYPRESS	Woods - Good
CYPRESS – DOMES/HEADS	Woods - Good
CYPRESS – MIXED HARDWOODS	Woods - Good
DISTURBED LAND	Open - Poor
EDUCATIONAL FACILITIES	Commercial
EMERGENT AQUATIC VEGETATION	Water
FIXED SINGLE FAMILY UNITS	Residential (size determined by FL DOR parcel data)
FRESHWATER MARSHES	Water
HERBACEOUS (DRY PRAIRIE)	Brush - Good
HIGH DENSITY UNDER CONSTRUCTION	Residential – 1/8 acre
HORSE FARMS	Farmsteads
IMPROVED PASTURES	Pasture - Good
INSTITUTIONAL	Commercial
LAKES	Water
MEDIUM DENSITY UNDER CONSTRUCTION	Residential (size determined by FL DOR parcel data)
MILITARY	Commercial
MIXED RANGELAND	Brush - Good
MIXED SHRUBS	Brush - Good
MIXED UNITS, FIXED AND MOBILE HOME UNITS	Residential (size determined by FL DOR parcel data)
MIXED WETLAND HARDWOODS	Woods - Good
MOBILE HOME UNITS	Residential – 1/4 acre
MULTIPLE DWELLING UNITS, LOW RISE	Residential – 1/8 acre
NATURAL RIVER, STREAM, WATERWAY	Water
ORNAMENTALS	Row Crops - Straight Row
PALMETTO PRAIRIES	Brush – Good
PARKS AND ZOOS	Open – Fair
PINE FLATWOODS	Woods – Good
RACE TRACKS	Open – Good

FLUCCS	SCS Runoff CN (TR-55)
RESERVOIRS	Water
ROADS AND HIGHWAYS	Streets and Roads – Paved; Including R/W
SALTWATER MARSHES/HALOPHYTIC HERBACEOUS PRAIRIE	Water
SAND PINE	Woods – Good
SHOPPING CENTERS	Commercial
SPOIL AREAS	Open – Good
TREE NURSERIES	Row Crops – Straight Row
UNIMPROVED PASTURES	Pasture – Fair
UPLAND HARDWOOD FORESTS	Woods – Good
UPLAND MIXED CONIFEROUS/HARDWOOD	Woods – Good
UPLAND SHRUB AND BRUSHLAND	Brush – Good
WET PINELANDS HYDRIC PINE	Woods – Good
WETLAND FORESTED MIXED	Woods – Good
UPLAND SHRUB AND BRUSHLAND	Brush - Good
XERIC OAK	Woods - Good

6.1.4 Floodplain Evaluation

For the floodplain evaluation, potential impacts to the FEMA mapped floodplains database, dated November 2018, were reviewed and quantified. FEMA FIRMs from previous (now historic) FIRMs in Orange County, dated 9/25/2009, and updated FIRMs, dated June 20, 2018, were reviewed. Only flood zones classified as Zone X, Zone AE, and Zone A are present along the corridor and only these FEMA-approved floodplain areas were reviewed and quantified for impacts. Natural historic depressions or wetlands were not evaluated for floodplain impacts as part of this PD&E study, but may require further evaluation in the design phase.

Zone X is an area of minimal flood hazard and was not evaluated for floodplain impacts. Zone AE has an established BFE that has been approved by FEMA. Zone A has an identified area of inundation resulting from the 100-year storm event, but no BFE has been established. To assess the floodplain impacts for each corridor, an approximate BFE and SHWT for the FEMA floodplain shapes was established. These elevations were estimated using the best available data and considered the following sources in **Table 6**. No site-specific information (i.e. geotechnical testing, wetland survey, topographic survey, etc.) was obtained for these estimates. No hydrologic/hydraulic modeling was performed. Some of the information reviewed utilized the NGVD 1929 vertical datum; this information was converted to NAVD.

TABLE 6 - DESCRIPTION OF DATA REVIEWED IN PRELIMINARY ANALYSIS

Data	Source	Relevance
FEMA Flood Insurance Study	FEMA Geodatabases (May 2016) & 2013 Flood Insurance Study (FIS) for Osceola County	High
DEM or Contours developed from source	2015 LiDAR data from Osceola County 2012 LiDAR data from Orange County	High
USGS 7.5-Minute Quad Maps with five-ft contours (ft, NGVD29)	USGS Quad Maps: Saint Cloud North, and Narcoossee.	High - Historic Maps dated1970-1987 & Current maps dated 2009
Infrared aerial imagery	2004 Osceola County	High
Historic aerial imagery	Google Earth (dating back to 1995) and UF Historical Imagery Library (dating back to 1947)	High
Geotechnical borings	SFWMD ERP Applications	High
Wet detention ponds normal water elevations	SFWMD ERP Applications	High
Wetland seasonal high water tables	SFWMD ERP Applications	High
Canal monitoring stations: Stage & Flow	SFWMD Arc Hydro database	High
Cross Drain Stages	Osceola Parkway Extension PD&E Location Hydraulics Report, Inwood (2016)	Medium
Depth to Surficial Aquifer Water Table	FDEP Florida Aquifer Vulnerability Assessment (FAVA)	Low – Information available is very coarse (6,000 feet x 6000 feet grid)
Soil coverage	NRCS coverage provided by USDA	High – Depth to water table information
Land use land coverage	SFWMD	Low – Ensure floodplain is still applicable
National Wetland Inventory	US Fish and Wildlife Service	Low – Used where other information could not be found.

6.1.4.1 Base Flood Elevation (BFE)

The BFE can vary across the extent of the floodplain based on local topography, the amount of vegetative cover, presence of urbanization, water control infrastructure,

and inflows to the floodplain. To estimate the BFE, the factors local to the area of potential impacts were weighted heavier. If the BFE was estimated from a provided source (i.e. Zone AE, permit data, etc.), the elevation was rounded to the nearest 0.1 foot; if the elevation was estimated from the DEM, it was rounded to the nearest half foot. The following ranking was applied in order to estimate the BFE:

1. FEMA established BFE (i.e. Zone AE sloping BFE, Stillwater BFE in FIS)
2. Modeled BFE as part of an ERP application
3. Floodplain compensation (FPC) pond information within an ERP application
4. Stage data from regulated lakes and canals (Using HEC SSP to estimate the 100-year stage)
5. Comparison of infrared and historic aerial images to the DEM to estimate high water elevations in previous years (i.e. inspection of tree line migration, etc.)
6. USGS 7.5 Minute Quad Maps with five-ft contours (NGVD29)
7. Comparison of FEMA-mapped floodplain shape and DEM or contours derived from DEM

6.1.4.2 Seasonal high water table (SHWT)

The SHWT is the elevation to which the water table can be expected to rise due to a normal wet season. The water table surface is generally parallel to the natural ground surface in relatively flat areas with uniform soil type.

To estimate the SHWT, the factors local to the area of potential impacts were weighted heavier. If the SHWT was estimated from a provided source (i.e. stage data, permit data, etc.), the elevation was rounded to the nearest 0.1 foot; if the elevation was estimated from the DEM, it was rounded to the nearest half foot. The following ranking was applied in order to estimate the SHWT:

1. Using stage data from regulated lakes and canals, comparison of the average annual max water elevation and the average wet season stage based on DEM review.
2. Estimates for the one-year storm event from a log-log graph of the FEMA FIS stages for 10-year through the 500-year storm using extrapolation.
3. Wet detention pond information in an ERP application; Note it is understood that the normal water elevation is not equivalent to the SHWT, but it can serve as a reliable approximation.
4. Tailwater information from an ERP application if tailwater (or initial stage of tailwater) is identified as being representative of the SHWT.
5. Comparison of adjacent wetland shapes to the DEM to estimate wetland SHWT.
6. Comparison of infrared and historic aerial images to the DEM to estimate water elevations in previous years (i.e. visible standing water, etc.).
7. NRCS soils depth to water table applied over the DEM.

6.1.4.3 Assessing Floodplain Impacts

For the alignments, the floodplain impact volume was calculated by the following:

$$Floodplain\ Impact\ Volume = Floodplain\ Depth\ x\ Average\ Inundation\ Area\ of\ the\ SHWT\ \&\ BFE$$

The floodplain depth is the difference between the BFE and the ground surface topography or the SHWT, whichever is higher. The minimum ground surface elevation within the 100-year inundation was used for the floodplain depth calculation if the SHWT was below ground.

The Inundation Area is the average of the area of the BFE and SHWT (area of zero if below ground) plotted on the project DEM within the proposed corridor R/W. The inundation plot was performed so that the BFE and SHWT elevations and areas would correspond to DEM.

Impacts were not considered where a floodplain was plotted within the corridor, which did not represent a FEMA floodplain. For example, there are existing ponds that will be impacted along each corridor that provide storage but are not a part of FEMA floodplain evaluation. With the exception of the borrow pits and Narcoossee Road Pond, these additional impacts are to be evaluated as necessary during the design phase.

Depending upon the two alternatives chosen, there will be 12 or 13 bridges assumed over waterways. Proposed bridge lengths were provided by RS&H. No floodplain impacts were assumed beneath these proposed bridge locations.

6.1.5 Pond Sizing

It is assumed that all proposed ponds within the Osceola Parkway Expressway will be wet detention facilities. From review of nearby CFX Contracts 450, 451, 417-304, 417-543, and 417-454, it was determined that the wet detention available storage for the treatment volume, attenuation volume, and floodplain impact volume is a three-foot design depth above the normal water level (NWL). The assumed pond geometry is a square shape, 1:4 side slopes, one-foot of freeboard, 20-foot maintenance berm, 20% additional area for landscaping and tie-in slopes, and a minimum of 0.5 acres at the normal water elevation, which resulted in the following equations to calculate the pond sizes:

$$Pond\ Length\ at\ Design\ Depth = \sqrt{\frac{Total\ Pond\ Volume\ Required * 43560\frac{ft^2}{ac}}{Design\ Depth}} + \left(\frac{Design\ Depth}{2} * (2 * 4)\right)$$

$$Pond\ Area\ at\ Normal\ Water\ Level\ (NWL) = \frac{(Pond\ Length\ at\ Design\ Depth - 2 * 4 * Design\ Depth)^2}{43560\,\frac{ft^2}{ac}} \geq 0.5\ ac$$

$$Required\ Pond\ Area\ (if\ NWL\ Area > 0.5\ ac)$$
$$= 1.2 * \frac{\left(Pond\ Length\ at\ Design\ Depth + \left(Freeboard\ Height * (2 * 4)\right) + 2 * Berm\ Width\right)^2}{43560\frac{ft^2}{ac}}$$

$$Required\ Pond\ Area\ (if\ NWL\ Are < 0.5\ ac)$$
$$= 1.2 * \frac{\left(\sqrt{0.5ac * 43560\frac{ft^2}{ac}} + \left(Design\ Depth + Freeboard\ Height\right) * (2 * 4)\right)^2}{43560\frac{ft^2}{ac}}$$

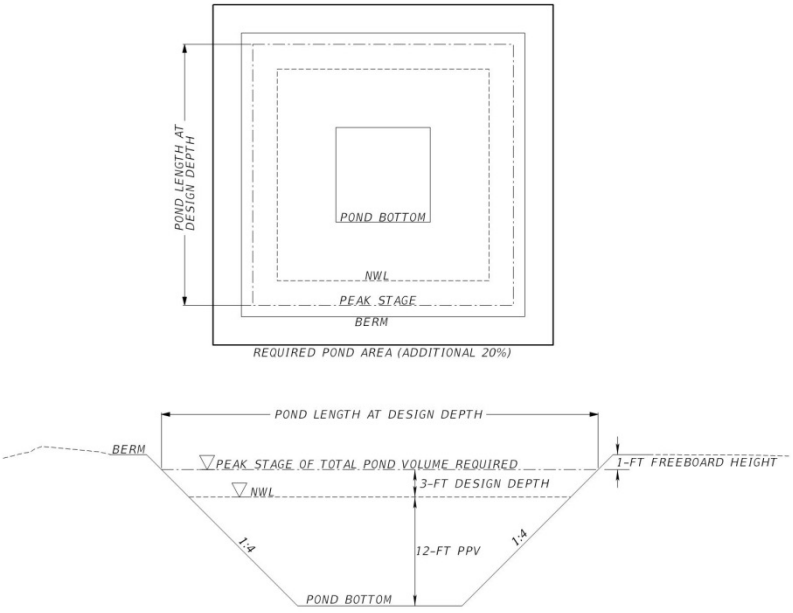


PLATE 3 - POND SIZING TYPICAL SECTION (NOT TO SCALE)

6.2 Basis of Evaluation

An alternative comparison analysis has been performed which consists of a description of each Stormwater Management Facility (SMF) location along with an analysis of the following parameters for each site. Note analysis of these parameters is based on a desktop review of the best available data. Any data used in the review of that parameter is listed and where available a date is provided. Field analysis of these parameters for all proposed sites will be necessary as design progresses.

Wetland Impacts: Pertains to impacts to wetland areas (National Wetland Inventory, 2017)

Wildlife Habitat Impacts: Pertains to impacts to wetland areas, FEMA effective floodplains, and to habitats for threatened, endangered, or significant wildlife species. According to the USFWS IPaC Endangered species resource, federally-listed endangered (E) or threatened (T) species

include the following for Osceola and Orange Counties within the project's vicinity: Florida Bonneted Bat (E), Florida Panther (E), Audubon's Crested Caracara (T), Everglade Snail Kite (E), Florida Grasshopper Sparrow (E), Florida Scrub-jay (T), Ivory-billed Woodpecker (E), Red-cockaded Woodpecker (E), Wood Stork (T), Bluetail Mole Skink (T), Eastern Indigo Snake (T), Sand Skink (T). This included a review of the following GIS layers: FDEP Florida Springs (2016), USFWS National Wetland Inventory (2017), Scrub Jay Service Area, Skink Suitability (2013), Florida Panther Focus Area, Wood Stork Nests (2014), Panther Mortality Locations (2015), and Gopher Tortoise Relocation Sites (2008). For this PD&E evaluation, the following rankings were used: "High" for pond sites located within a conservation area or the mitigation bank, "Medium" for pond sites that include wetlands identified by the NWI or SFWMD Land Cover Land Use (LCLU) code 6430 (saltwater marshes/halophytic herbaceous prairie) for 2014/2015, and "Low" is used if the site does not include wetlands identified within NWI or SFWMD LCLU.

Contamination Risk: Pertains to the presence of hazardous materials or petroleum contamination on or near the site location. The following references were reviewed to assist in developing rankings: DEP Cleanup Sites, Petroleum Contamination Monitoring (PCTS) Discharges, State Funded Cleanup Sites (2014), FDEP Waste Cleanup Inactive Sites (2016), FDEP Waste Cleanup Open Sites (2016). For this PD&E evaluation, the following rankings were used: "High" for pond sites that have identified contamination risk within the pond site, "Medium" for pond sites that have identified contamination risk within 500-feet from the pond site, "Low" for pond sites that are not near identified contamination risk.

Geotechnical Information: Addresses the underlying soil conditions within the pond footprint. While this factor was considered in selecting pond sites, no proposed sites are within an area of an identified brownfield, Florida Geologic Survey (FGS) swallet, or FGS well per the following references: NRCS Soils (2017), FDEP brownfield sites (2016), FGS wells, FGS swallets, FDEP Florida Subsidence Incident Reports. Therefore, this item is not included in the evaluation matrix. Additional geotechnical investigation for the specific pond sites will need to be performed to detect the presence of muck and unsuitable materials.

Floodplain Impacts: Floodplain impacts associated with the proposed roadway were included in the pond sizing calculations, but the floodplain impacts for the individual pond sites were not included in these calculations. Pond sites were selected in order to avoid further floodplain impacts. The area of impact, as defined by the FEMA dFIRM Flood Hazard Dataset, 2017, is listed in the evaluation matrix, in order to demonstrate that these impacts are in addition to the required pond size.

Cultural or Archaeological Resources Impacts: Addresses impacts to prehistoric/historic archaeological or historic structures for each site. This included a review of the National Register of Historic Places of Interest 2016 Database.

Permitability: Addresses impacts to permitting efforts to local, state, and federal agencies. This includes a review of the following sources: DEP Outstanding Florida Waters, Florida TMDLs (2018), Verified Impaired WBIDs (2018). Since this is consistent for all the alternatives, this was not included in the evaluation matrix.

Ownership/Number of Property Owners: Addresses the impacts to property owner(s) and identifies the number of impacted entities. This included a review of the following sources: Florida Department of Revenue Property Department (2017) & Florida Department of Revenue Property Department (2015)

Utilities: Addresses impacts to existing apparent utilities and known future utilities at each alternative location. This included a review of aerial imagery and the Antenna Structures (2017) shapefiles.

Access/Maintainability: Adequate area needed for regular cleaning, sediment removal, mowing and other required maintenance. This includes evaluation if a drainage easement would be required. This was evaluated based on the proximity of the site to existing R/W.

Cost: Economics associated with the pond construction costs. For the purpose of this PD&E Study, the construction costs are not all inclusive to the total cost associated with the construction of a pond and only include costs associated with Excavation, Sodding, and Clearing and Grubbing. It is assumed that all other construction costs (embankment, control structure, fencing, etc.) are equivalent between options. The cost of R/W acquisition is not included in the pond cost for this study. Construction Costs are provided in **Appendix C**.

6.3 Proposed Stormwater Facility Alternatives

The proposed Osceola Parkway Extension will introduce a new roadway alignment in some areas where there is no existing roadway, and will alter drainage patterns to some extent as a result. The proposed drainage patterns will follow the existing/historic drainage patterns as closely as possible. Cross drains will be proposed to convey existing ditches/streams, or function as equalizer pipes for existing depressional areas. The Location Hydraulics Report (LHR) for the project is under separate cover.

There are four alternative alignments which were analyzed within this PSR. Two of the alternative alignments are located west of Narcoossee Road; and two of the alternative alignments are located east of Narcoossee Road. These alternative alignments are Boggy Creek Alternative (405), Lake Nona Alternative (404B), Split Oak Minimization Alternative (500-107C-1), and Split Oak Avoidance Alternative (502-207D-1). There are between four and six basins per alternative. Generally, two potential pond option configurations were evaluated for each basin. A pond option was not sited within the interchange with SR 417 for Boggy Creek Alternative (405) as it is considered that stormwater management in this area will be performed with a future widening of SR 417. A few locations have only one potential pond option due to limited available R/W and utilization of remnant parcels.

6.3.1 Lake Nona Alternative (404B)

The Lake Nona Alternative (404B) begins at SR 417, one mile east of the interchange with Boggy Creek Road, and continues south until the alignment turns due east but stays just above the Orange/Osceola County line and ends at Narcoossee Road. There will be additional proposed ramps connecting the Osceola Parkway Extension with: SR 417, Laureate Boulevard,

Simpson Road Extension, and Narcoossee Road. Refer to **Figure 8** in **Appendix A** for the basin map and pond sizing parameters used for this Alternative.

All pond sites and FPC areas for this Alternative located within Orange County include the potential for the following species according to the USFWS 2016 Federally Listed Species information for Orange County (North Florida Ecological Services Office (ESO)). This area has potential for Audubon's Crested Caracara, Everglade Snail Kite, Florida Scrub-Jay, and Wood Stork. Plants include the Beautiful PawPaw, Britton's Beargrass, Florida Bonamia, Papery Whitlow-Wort, Scrub Buckwheat, Scrub Lupine, Scrub Plum, and Wide-Leaf Warea. Reptiles include the Eastern Indigo Snake and the Sand Skink. There is no specific wildlife data found in or adjacent to these sites.

Pond Site 4_B, the only pond site in Osceola County, includes the potential for the following species according to the USFWS 2016 Federally Listed Species information for Osceola County (South Florida ESO). Audubon's Crested Caracara, Everglade Snail Kite, Florida Grasshopper Sparrow, Florida Scrub-Jay, Red-Cockaded Woodpecker, and Wood Stork. Mammals include the Florida Panther and the West Indian Manatee. Plants include Britton's Beargrass, Florida Bonamia, Lewton's Polygala, Papery Whitlow-Wort, Pygmy Fringe-Tree, Sandlace, Scrub Buckwheat, Scrub lupine, Scrub Plum, Wide-Leaf Warea. Reptiles include the Bluetail Mole Skink, Eastern Indigo Snake, and Sand Skink. There is no specific wildlife data found in or adjacent to these sites.

Basin 404B-417

Basin 404B-417 extends from the proposed interchange with SR 417 (located 1.0 mile east of the interchange with Boggy Creek Road) south to a bridge at Lake Nona Boulevard. It includes the ramps that will connect SR 417 to the Osceola Parkway Extension. Due to the extensive updates at this interchange, a pond was sited southeast of and adjacent to the interchange.

The basin is located within the Boggy Creek basin (WBID 3168B), which is not impaired for nutrients. Basin 404B-417 includes a total area of 76.2 acres, which includes an additional 33.2 acres of impervious area. The required treatment volume is 6.9 ac-ft, which assumes only net impervious will rule for this basin since a portion of the basin is a part of SR 417. This portion of the proposed alternative is estimated to impact 4.0 ac-ft of floodplain. This basin requires a pond site that can accommodate 18.6 ac-ft for treatment, attenuation, and floodplain compensation volume. The estimated required pond area for this sub-basin is 9.3 acres.

One potential wet detention pond site, Pond 417_A, has been identified within Basin 404B-417. This site is located adjacent to and southeast of the interchange, and is on a remnant parcel. Refer to **Figure A.1** in **Appendix A** for the pond option location.

Pond Option 1 (consists of Ponds 417_A) has an estimated construction cost of $1,577,571. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond

cost for this study. Please see **Table ES 1B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that the two pond options described above will provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based off of assumptions and desktop review of existing databases, it is suggested to have site specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond Site 417_A

This pond site is within one parcel. The pond site consists of 9.3 acres of property property surrounded by proposed interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes with minor amounts of Immokalee fine sand (#20). The hydrologic soil group classification is Type A/D and Type B/D, respectively, according to the USDA NRCS. The estimated SHGWT at this location is 77.0 to 78.0 feet NAVD, based on a review of the adjacent wet detention ponds serving the Lake Nona Development under ERP Application No. 130822-7.

According to the SFWMD, the existing land use at the site is comprised of commercial. Wetland mitigation is not anticipated if Pond Site 417_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 404B-001

Basin 404B-001 extends from Lake Nona Boulevard to the interchange with the Simpson Road (CR 530) roadway extension. The basin is located within the East Lake Tohopekaliga Drain basin (WBID 3172C), which is impaired for nutrients. Basin 404B-001 includes a total area of 70.0 acres, which includes an additional 29.0 acres of impervious area. The required treatment volume is 9.1 ac-ft, which includes the additional 50% of treatment for the impaired water body. This portion of the proposed alternative is estimated to impact 2.9 ac-ft of floodplain storage; however, it is assumed that these floodplain impacts will be addressed within the cross drain analysis. This basin requires a pond site that can accommodate 17.0 ac-ft for treatment and attenuation volume. The estimated required pond area for this sub-basin is 8.5 acres.

Four potential wet detention pond sites, Pond 1_A, Pond 1_B, Pond 1_C, and Pond 1_D have been identified within Basin 404B-001. Two of these ponds are off-site and two ponds are located within the interchange with Simpson Road. The two pond options for this basin include utilizing both in-field ponds, 1_C and 1_D, with a single offsite pond site, either Pond 1_A or 1_B. Refer to **Figure A.2a** and **Figure A.2b** in **Appendix A** for the two pond options locations.

Pond Option 1 (consists of Ponds 1_A, 1_C, and 1_D) and Pond Option 2 (consists of Ponds 1_B, 1_C, and 1_D) have an estimated construction cost of $1,660,551 and $1,469,318, respectively. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 1B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that the two pond options described above will provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based off of assumptions and desktop review of existing databases, it is suggested to have site specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond Site 1_A

This pond site is within two parcels and a portion of Hidden Trail Road R/W and utilizes remnant remaining parcels resulting from the proposed alignment. The pond site consists of 5.9 acres of property adjacent to the interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are apparent utilities present on the property in the form of overhead power lines located at the southwest corner of the parcel.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is comprised of improved pastures and pine flatwoods. Wetland mitigation is not anticipated if Pond Site 1_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_B

This pond site is within two parcels and utilizes remnant remaining parcels resulting from the proposed alignment. The pond site consists of 4.1 acres of property adjacent to the road R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. For existing utilities, it should be noted that there is a residence currently on the parcel, therefore, there are likely minor electric/cable utilities present. There also appears to be a septic system on the property. Other than this, there are no other apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D according to the USDA NRCS and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is improved pastures. Wetland mitigation is not anticipated if Pond Site 1_B is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_C

This pond site is located within the proposed in-field area of the interchange with Simpson Road. The pond site consists of 1.9 acres of property within the interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is pine flatwoods and a small portion of improved pastures. Wetland mitigation is not anticipated if Pond Site 1_C is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of

the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_D

This pond site is located within the proposed in-field area of the interchange with Simpson Road. The pond site consists of 3.7 acres of property within the interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is pine flatwoods and a small portion of improved pastures. Wetland mitigation is not anticipated if Pond Site 1_D is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 404B-002

Basin 404B-002 includes the extension of Simpson Road (CR 530) from the Boggy Creek Road (CR 527A) and Simpson Road (CR 530) intersection to Hidden Trail Road.

The basin is located within the East Lake Tohopekaliga Drain basin (WBID 3172C), which is impaired for nutrients. Basin 404B-002 includes a total area of 15.0 acres, which includes an additional 5.9 acres of impervious area. The required treatment volume is 1.9 ac-ft, which includes the additional 50% of treatment for the impaired water body. This portion of the proposed alternative is estimated to impact 4.9 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 7.7 ac-ft for treatment, attenuation, and FPC volume. The estimated required pond area for this sub-basin is 4.3 acres.

One potential wet detention pond site, Pond 2A, has been identified within Basin 404B-002. This one pond site is located within the interchange with Simpson Road (CR 530) roadway extension. Another pond option was not evaluated for this basin due to the in-field area size is more than 2.5 times larger than the estimated required pond area. Refer to **Figure A.3** in **Appendix A** for the pond location.

Pond Option 1 (consists of Pond 2_A) has an estimated construction cost of $1,220,455. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. Please see **Table ES 1B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that the pond option will provide sufficient treatment, attenuation, and floodplain storage for the basin within the estimated pond design depth and footprint. This site has additional capacity for other basins if needed. Preliminary results are based off of assumptions, it is suggested to have further detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond Site 2_A

This pond site is within a remnant parcel located in the proposed interchange with Simpson Road (CR 530) roadway extension. The pond site consists of 11.2 acres of property within the interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is pine flatwoods. Wetland mitigation is anticipated if Pond Site 2_A is utilized as there are 1.95 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There is one DEP Petroleum Cleanup site located approximately 1.0 mile to the west, therefore, it does not appear that the site will pose a significant contamination risk. Two wells, as identified by FGS, exists about 1.0 mile west and 0.8 miles southwest of the proposed pond footprint. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 404B-003

Basin 404B-003 extends from the Simpson Road (CR 530) extension from Hidden Trail Road to Jim Branch (a waterway). The basin includes part of the Simpson Road interchange with the OPE.

Approximately half of the basin is located within the East Lake Tohopekaliga Drain basin (WBID 3172C), which is impaired for nutrients. Basin 404B-003 includes a total area of 83.6 acres, which includes an additional 31.3 acres of impervious area. The required treatment

volume is 10.5 ac-ft, which includes the additional 50% of treatment for the impaired water body. This basin requires a pond site that can accommodate 22.7 ac-ft for treatment and attenuation volume. The estimated required treatment pond area for this sub-basin is 11.1 acres.

This portion of the proposed alternative is estimated to impact 17.5 ac-ft of floodplain storage. Floodplain impacts associated with Jim Branch are assumed to be addressed within the Cross Drain Analysis and are not included in FPC volumes. The estimated required FPC area for this sub-basin is 9.7 acres.

Four potential wet detention pond sites, Pond 3_A, Pond 3_B, Pond 3_C, and Pond 3_D have been identified within Basin 404B-003. Two of these ponds are off-site and two ponds are located within the interchange with the Simpson Road (CR 530) roadway extension. The two pond options for this basin include utilizing the two in-field ponds, 3_A and 3_B, with a single offsite pond site, either Pond 3_C or 3_D. Refer to **Figure A.4a** and **Figure A.4b** in **Appendix A** for the two pond options locations.

Two potential FPC areas adjacent to the impacted floodplain have been identified and named FPC_3_A and FPC_3_B. Either site can be chosen to provide the necessary FPC within the basin. Refer to **Figure A.8a** and **Figure A.8b** in **Appendix A** for the two FPC area options locations.

Pond Option 1 (consists of Ponds 3_A, 3_B, and 3_C) and Pond Option 2 (consists of Ponds 3_A, 3_B, and 3_D) each have an estimated construction cost of $1,814,032 and $1,814,032, respectively. The FPC sites, FPC_3_A and FPC_3_B, each have an estimated construction cost of $996,106. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 1B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that the two pond options described above and the separate FPC sites will provide sufficient treatment, attenuation, and FPC within the estimated design depth and footprint. Preliminary results are based off of assumptions and desktop review of existing databases, it is suggested to have site specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond Site 3_A

This pond site is within one parcel which is in the proposed interchange with Simpson Road (CR 530) roadway extension. The pond site consists of 1.8 acres of property within the interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is pine flatwoods. Wetland mitigation is not anticipated if Pond Site 3_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There is one DEP Petroleum Cleanup site located approximately 1.2 miles to the west, therefore, it does not appear that the site will pose a significant contamination risk. Two wells, as identified by FGS, exist about 1.2 miles west and 1.1 miles southwest of the proposed pond footprint. No wells appear to exist within 500 feet of the pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 3_B

This pond site is within one parcel which is in the proposed interchange with Simpson Road (CR 530) roadway extension. The pond site consists of 4.1 acres of property within the interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is pine flatwoods. Wetland mitigation is anticipated if Pond Site 3_B is utilized as there are 0.48 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There is one DEP Petroleum Cleanup site located approximately 1.2 miles to the west, therefore, it does not appear that the site will pose a significant contamination risk. Two wells, as identified by FGS, exist about 1.2 miles west and 1.0 mile southwest of the proposed pond footprint. No wells appear to exist within 500 feet of the pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 3_C

This pond site is located within one parcel. The pond site consists of 5.2 acres of property adjacent to the road R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is primarily palmetto prairies with a small portion of mixed wetland hardwoods. Wetland mitigation is anticipated if Pond Site 3_C is utilized as the site appears to impact 0.04 acres of wetlands identified at this location per the National Wetland Inventory. The impact is a small corner of the pond, and it is possible that a buffer from the wetland could be provided. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 3_D

This pond site is located within one parcel. The pond site consists of 5.2 acres of property adjacent to the road R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes, and St. Johns Fine Sand. The hydrologic soil group classification is Type A/D and B/D, respectively, according to the USDA NRCS, and both have an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is primarily palmetto prairies with a portion of upland shrub and brushland. Wetland mitigation is not anticipated if Pond Site 3_D is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

FPC Area FPC_3_A

This FPC area is a 9.7-acre site located on one parcel. The site is located adjacent to the proposed R/W, so an easement is not necessary. It is situated to expand the impacted FEMA floodplain, Zone A (FP 53). The site was drawn to be located outside of the estimated 100-year stage in accordance to the DEM. However, the site does include approximately 4.3 acres

of FEMA floodplain shape, so additional floodplain compensation may be required from the site. Further evaluation of floodplain impacts should be performed in the design phase to insure the total required compensation volume and configuration is appropriate.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is pine flatwoods. Wetland mitigation is not anticipated if FPC_3_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

FPC Area FPC_3_B

This floodplain compensation area is a 9.7-acre site located on one parcel. The site is located adjacent to the proposed R/W, so an easement is not necessary. It is situated to expand the impacted FEMA floodplain, Zone A (FP 53). The site was drawn to be located outside of the estimated 100-year stage in accordance to the DEM. However, the site does include approximately 5.5 acres of FEMA floodplain shape, so additional floodplain compensation may be required from the site. Further evaluation of floodplain impacts should be performed in the design phase to insure the total required compensation volume and configuration is appropriate.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes; Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes; and St. Johns fine sand (#37). The hydrologic soil group classifications are Type A/D and B/D, according to the USDA NRCS, which have estimated SHGWT 0 to one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is upland shrub and brushland, cypress, pine flatwoods, palmetto prairies, and wetland forested mixed. Wetland mitigation is anticipated if FPC_3_B is utilized as there are 2.67 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 404B-004

Basin 404B-004 extends from Jim Branch (a waterway) to the borrow pits located on the Poitras East Property (owned by the Tavistock Development Company).

The basin is located within the Jim Branch basin (WBID 3172A), which is not impaired for nutrients. Basin 404B-004 includes a total area of 39.0 acres, which includes an additional 19.1 acres of impervious area. The required treatment volume is 4.0 ac-ft This portion of the proposed alternative is estimated to impact 1.2 ac-ft of floodplains at Jim Branch; however, it is assumed that these floodplain impacts will be addressed during the cross drain analysis. This basin requires a pond site that can accommodate 9.0 ac-ft for treatment and attenuation volume. The estimated required pond area for this sub-basin is 4.9 acres.

Two potential wet detention pond site options, Pond 4_A and Pond 4_B, have been identified within Basin 404B-004. Refer to **Figure A.5a** and **Figure A.5b** in **Appendix A** for the two pond options locations. The preliminary results indicate that both pond options will provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based on assumptions and desktop review of existing databases; it is suggested to have site specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond 4_A (Option 1) and 4_B (Option 2) have an estimated construction cost of $795,135 and $784,511, respectively. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 1B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that both pond options will provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based on assumptions and desktop review of existing databases; it is suggested to have site specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond Site 4_A

This pond site is located within one parcel. The pond site consists of 5.0 acres of property adjacent to the road R/W, and therefore, a drainage easement is not necessary. This site is located on a historic borrow pit. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Pomello fine sand (#34), 0 to 5 percent slopes and Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A and Type A/D, respectively, according to the USDA NRCS, and have

an estimated SHGWT of one-foot and three-feet below the natural ground for Smyrna-Smyrna and Pomello soils, respectively.

According to the SFWMD, the existing land use at the site is palmetto prairies, channelized waterways, and disturbed land. Wetland mitigation is not anticipated if Pond Site 4_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 4_B

This pond site is located within one parcel between Osceola Parkway Extension and Boggy Creek Road. The pond site consists of 4.9 acres of property adjacent to the road R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property, but there is some overhead electric along Boggy Creek Road R/W.

The soils encountered at this site are Sanibel muck (#42), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT at the natural ground (0-foot depth).

According to the SFWMD, the existing land use at the site is palmetto prairies. Wetland mitigation is not anticipated if Pond Site 4_B is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

The preliminary results indicate that Pond Site 4_B will provide sufficient pre/post attenuation within the estimated pond design depth and footprint. If this site is chosen, these results will need to be confirmed during final design.

Basin 404B-005

Basin 404B-005 extends from the west side of identified borrow pits located on TDCP Property to Narcoossee Road. This basin includes an interchange with Narcoossee Road.

Basin 404B-005 includes a total area of 53.8 acres, which includes an additional 28.0 acres of impervious area. The required treatment volume is 8.8 ac-ft, which includes the additional 50% of treatment for the impaired water body. This portion of the proposed alternative is not located within FEMA floodplains, so floodplain compensation is not anticipated. This basin requires a pond site that can accommodate 11.0 ac-ft for treatment and attenuation volume. The estimated required pond area for this sub-basin is 4.9 acres.

One potential wet detention pond site, Pond 5A, has been identified within Basin 404B-005. Refer to **Figure A.6** in **Appendix A** for the pond location. The preliminary results indicate that the pond option will provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based off of assumptions and desktop review of existing databases, it is suggested to have site specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond 5_A (Option 1) has an estimated construction cost of $767,497. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 1B** and **Appendix C** for supporting documentation for cost estimates.

Pond Site 5_A

This pond site is located within one parcel. The pond site consists of 4.9 acres within the road R/W; therefore, a drainage easement is not anticipated. The pond site is situated under OPE Alternative's bridge over the existing borrow pits. The pond site is intended to expand the existing borrow pits to accommodate the required treatment and attenuation for this basin, therefore, the required size does not include landscaping and additional area for tie-in slopes to the surrounding ground. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Pomello fine sand (#34), 0 to 5 percent slopes and Archbold fine sand (#2), 0 to 5 percent slopes. The hydrologic soil group classification is Type A for both soils, according to the USDA NRCS, and have an estimated SHGWT of three feet and four feet below the natural ground for Pomello and Archbold soils, respectively.

According to the SFWMD, the existing land use at the site is palmetto prairies. Wetland mitigation is not anticipated if Pond Site 5_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 404B-006

Basin 404B-006 extends along Narcoossee Road for approximately 7,500-feet, which contains the length of the roadway improvements to accommodate the OPE Alternative's interchange as well as the existing Narcoossee Road basin that is permitted to be treated by the existing Narcoossee Road treatment pond to be impacted by the OPE Alternative. Due to the OPE Alternative's interchange with Narcoossee Road, Clapp Simms Duda Road is proposed to be re-aligned with the existing Narcoossee Road and Boggy Creek intersection, and a cul-de-sac is proposed at the existing Narcoossee Road and Clapp Simms Duda Road intersection.

Basin 404B-006 includes a total area of 26.5 acres which is only comprised of Narcoossee Road and Clapp Simms Duda Road. Therefore, the pond for this basin will be maintained by Orange County, and will not be considered a joint-use facility with CFX. Due to the total impact to the existing Narcoossee Road treatment pond, the existing impervious area is based off the two-lane Pre-Development Narcoossee Roadway width used in the Narcoossee Road Widening ERP (Application No. 070322-11). Therefore, the additional impervious area from a two-lane Narcoossee Road to the proposed improvements is estimated at 13.2 acres. The required treatment volume is 4.1 ac-ft, which includes the additional 50% of treatment for the impaired water body. This portion of the proposed alternative is estimated to impact 0.1 ac-ft of floodplain along Narcoossee Road. FPC will be provided within the treatment pond. This basin requires a pond site that can accommodate 9.1 ac-ft for treatment, attenuation, and FPC volume. Since this basin is to treat Narcoossee Road, it is anticipated that the existing roadway profile will not be modified, therefore, the pond's design depth is approximately the same as the existing pond's depth. The estimated required pond area for this sub-basin is 8.2 acres.

Two potential wet detention pond site options, Pond 6_A and Pond 6_B, have been identified within Basin 404B-006. Refer to **Figure A.7a** and **Figure A.7b** in **Appendix A** for the two pond options locations. Preliminary calculations demonstrate that both sites will meet the proposed design criteria.

Pond 6_A (Option 1) and 6_B (Option 2) have an estimated construction cost of $1,339,374 and $1,335,629, respectively. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 1B** and **Appendix C** for supporting documentation for cost estimates.

Pond Site 6_A

This pond site is located within one parcel. The pond site consists of 8.8 acres of property, which is not adjacent to the road R/W; thereby a drainage easement is necessary. The site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes; and Hontoon muck (#19), frequently ponded, 0 to 1 percent slopes. The hydrologic soil group classification is Type A/D for all three soils, according to the USDA NRCS, and all have an estimated SHGWT at the natural ground (0-foot depth).

According to the SFWMD, the existing land use at the site is upland mixed coniferous/hardwood, unimproved pastures, and saltwater marshes/halophytic herbaceous prairie (LCLU 6430). Pond Site 6_A, includes impacts to LCLU 6430, a wetland classification described in Section 6.2. Wetland mitigation is not anticipated if Pond Site 6_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. The only wildlife data found in or adjacent to this site was the SFWMD impact to LCLU 6430. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There is one FDEP Petroleum Cleanup site located approximately 0.25 mile west of the pond site at the northwest corner of Boggy Creek Road and Narcoossee Road intersection. However, it does not appear that the site will pose a high contamination risk. No wells are located within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 6_B

This pond site is located at the southeast corner of the existing Narcoossee Road and Clapp Simms Duda Road. The pond is proposed to fully take nine parcels and partially take one parcel, which affects five property owners. The pond site consists of 8.2 acres of property that is adjacent to the road R/W, therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are overhead electric lines along the northbound side of Narcoossee Road, and it is anticipated that additional utilities will be on site at the locations of the existing homes.

The soils encountered at this site are Pomello fine sand (#34), 0 to 5 percent slopes; Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes; and Zolfo fine sand (#54), 0 to 2 percent slopes. The hydrologic soil group classifications are Type A and Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot and three-feet below the natural ground for Smyrna-Smyrna and Pomello soils, respectively.

According to the SFWMD, the existing land use at the site is upland hardwood forests and unimproved pastures. Wetland mitigation is not anticipated if Pond Site 6_B is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.1, Lake Nona Alternative.

There is one FDEP Petroleum Cleanup site located approximately 0.20 miles south of the pond site at the northwest corner of Boggy Creek Road and Narcoossee Road intersection.

However, it does not appear that the site will pose a high contamination risk. No wells are located within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

6.3.2 Boggy Creek Alternative (405)

The Boggy Creek Alternative (405) begins at SR 417 adding new ramps to the existing interchange with Boggy Creek Road, where it then goes south along the east side of Boggy Creek Road until the alignment turns due east but stays just above the Orange/Osceola County line and ends at a proposed interchange with Narcoossee Road. The alternative includes an interchange with Boggy Creek Road, an interchange on Poitras property to support future internal roadways on Poitras, and additional proposed ramps connecting the OPE with Narcoossee Road and Clapp Simms Duda Road in this location. Refer to **Figure 9** in **Appendix A** for the basin map and pond sizing parameters used for this Alternative.

All pond sites for this Alternative located within Orange County include the potential for the following species according to the USFWS 2016 Federally Listed Species information for Orange County (North Florida ESO). This area has potential for Audubon's Crested Caracara, Everglade Snail Kite, Florida Scrub-Jay, and Wood Stork. Plants include the Beautiful PawPaw, Britton's Beargrass, Florida Bonamia, Papery Whitlow-Wort, Scrub Buckwheat, Scrub Lupine, Scrub Plum, and Wide-Leaf Warea. Reptiles include the Eastern Indigo Snake and the Sand Skink. There is no specific wildlife data found in or adjacent to these sites.

Pond Sites 3_B and 4_B, the only pond sites in Osceola County, includes the potential for the following species according to the USFWS 2016 Federally Listed Species information for Osceola County (South Florida ESO). Audubon's Crested Caracara, Everglade Snail Kite, Florida Grasshopper Sparrow, Florida Scrub-Jay, Red-Cockaded Woodpecker, and Wood Stork. Mammals include the Florida Panther and the West Indian Manatee. Plants include Britton's Beargrass, Florida Bonamia, Lewton's Polygala, Papery Whitlow-Wort, Pygmy Fringe-Tree, Sandlace, Scrub Buckwheat, Scrub lupine, Scrub Plum, Wide-Leaf Warea. Reptiles include the Bluetail Mole Skink, Eastern Indigo Snake, and Sand Skink. There is no specific wildlife data found in or adjacent to these sites.

Basin 405-417

Basin 405-417 extends from the SR 417 and Boggy Creek interchange south to approximately 100 feet south of the proposed bridge at Lake Nona Boulevard (See **Appendix A**, **Figure 9**). It includes the new ramps that will connect SR 417 to the Osceola Parkway Extension. As previously mentioned, it is assumed that the stormwater management within this basin will be handled by the future SR 417 widening project.

The basin is located within the Boggy Creek basin (WBID 3168B), which is not impaired for nutrients. Basin 404B-417 includes a total area of 28.4 acres, which includes an additional 6.0 acres of impervious area. The required treatment volume is 1.3 ac-ft, which assumes only net impervious will rule for this basin since a portion of the basin is a part of SR 417. This portion of the proposed alternative is estimated to impact FEMA floodplains; however, it is assumed

that these floodplain impacts will be addressed by the SR 417 Widening Project. This basin requires a pond site that can accommodate 2.5 ac-ft for treatment and attenuation volume. It is presumed that this volume can be accommodated within the SR 417 interchange or existing ponds, and will be performed for the SR 417 Widening Project.

Boggy Creek, a FEMA Regulatory Floodway, lies just west of the interchange, and an existing culvert (two - 72 inch pipes) conveys a channel under Boggy Creek Road to Boggy Creek. No interchange pond sites are shown for this basin.

Basin 405-001

Basin 405-001 extends from approximately 100 feet south of the proposed bridge at Lake Nona Boulevard to 2,600-feet east of the turn due east and just above the Orange/Osceola County line, a total basin length of 8,580 feet. A proposed interchange is provided at the turn to the east to provide ramps to access Boggy Creek Road and Simpson Road (CR 530).

The basin is located within the East Lake Tohopekaliga Drain basin (WBID 3172C), which is impaired for nutrients. Basin 405-001 includes a total area of 97.2 acres, which includes an additional 41.7 acres of impervious area. The required treatment volume is 13.0 ac-ft, which includes the additional 50% of treatment for the impaired water body. A separate FPC pond is proposed for this basin. This basin requires a pond site that can accommodate 17.0 ac-ft for treatment and attenuation volume. The estimated required pond area for this sub-basin is 8.5 acres.

This portion of the proposed alternative is estimated to impact 19.2 ac-ft of FEMA floodplains. This includes the assumption that the impacts to Floodplain 53 within this basin are from the wetland slough tributary to Boggy Creek and will be addressed within the cross drain analysis. Also, the impacts to Floodplain 51 that is within Basin 405-002 are included with the Basin 405-001 floodplain impacts. The estimated required FPC area for this sub-basin is 7.7 acres.

Four potential wet detention pond sites, Pond 1A, Pond 1B, Pond 1C, and Pond 1D have been identified within Basin 405-001. These sites include three in-field pond areas and one offsite area, but all four of these ponds are located within the proposed interchange with Boggy Creek Road/Simpson Road. All four pond sites are used together for a single pond option for this basin. If this site is chosen, these results will need to be confirmed during final design. Refer to **Figure B.1** in **Appendix A** for pond site locations.

One FPC area adjacent to the impacted floodplain has been identified, FPC_3_A. If this site is chosen, these results will need to be confirmed during final design. Refer to **Figure B.7** in **Appendix A** for the FPC site location.

Pond Option 1 (consists of Ponds 1_A, 1_B, 1_C and 1_D) has an estimated construction cost of $1,818,253. The FPC site, FPC 1_A, has an estimated construction cost of $800,084. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe,

structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 2B** and **Appendix C** for supporting documentation for cost estimates.

Pond Site 1_A

This pond site is within two parcels and a portion of Happy Lane R/W within the in-field area of the proposed interchange with Boggy Creek Road/Simpson Road. The pond site consists of 2.7 acres of property within the interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are overhead electric lines present along the west side of Happy Lane.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is improved pastures. Wetland mitigation is not anticipated if Pond Site 1_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There is a DEP Petroleum Cleanup site 0.25 miles southwest, but it does not appear that the site will pose a contamination risk. One well, as identified by FGS, is approximately 0.25 miles southwest of the pond site, however, no wells were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_B

This pond site is within two parcels and a portion of Happy Lane R/W within the proposed interchange with Boggy Creek Road/Simpson Road. The pond site consists of 4.6 acres of property within the interchange, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There is overhead electric along Happy Lane that turn east within the northern parcel within the pond site.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is improved pastures, pine flatwoods, ornamentals, and horse farms. Wetland mitigation is not anticipated if Pond Site 1_B is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There is a DEP Petroleum Cleanup sites approximately 0.25 miles southwest of the pond site, but it does not appear that the site will pose a contamination risk. One well, as identified by FGS, was identified 0.25 miles southwest of the site, but it is not within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_C

This pond site is located on one parcel southwest of the proposed interchange with Boggy Creek Road/Simpson Road and utilizes a remnant remaining parcel from the alternative alignment. The pond site consists of 2.9 acres of property adjacent to the R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is improved pastures and pine flatwoods. Wetland mitigation is potentially anticipated if Pond Site 1_C is utilized as there is 0.20 acres of wetland identified in the north corner of the pond site per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There is a DEP Petroleum Cleanup site approximately 0.2 miles southwest of the pond site, but it does not appear that the site will pose a contamination risk. One well, as identified by FGS, was identified 0.2 miles southwest of the site, but it is not within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_D

This pond site is within two parcels, a portion of Happy Lane R/W, and a portion of an apparent utility R/W due east of the Boggy Creek Road and Simpson Road (CR 530) intersection. The site is located on the southwest side of the proposed interchange with Boggy Creek Road/Simpson Road. The pond site consists of 2.0 acres of property within the interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are overhead utilities visible within the apparent utility R/W.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is pine flatwoods and horse farms. Wetland mitigation is not anticipated if Pond Site 1_D is utilized as there are no wetlands

identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There is a DEP Petroleum Cleanup site approximately 0.2 miles southwest of the pond site, but it does not appear that the site will pose a contamination risk. One well, as identified by FGS, was identified 0.2 miles southwest of the site, but it is not within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

FPC Area FPC_1_A

This FPC area is a 7.8-acre site located on four parcels and a portion of Happy Lane R/W, which will affect three property owners. The site is located adjacent to the proposed R/W, so an easement is not necessary. It is situated to expand the existing FEMA floodplain, Zone A. The site was drawn to take as many remanent parcels created by the OPE Alternative that were adjacent to the FEMA Floodplain. Additional FPC for the site is not anticipated since the site includes approximately 0.01 acres of FEMA floodplain shape. Further evaluation of floodplain impacts should be performed in the design phase to insure the total required compensation volume and configuration is appropriate.

There are overhead utilities visible within the Happy Lane R/W. The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is pine flatwoods and horse farms. Wetland mitigation is anticipated if FPC_1_A is utilized as there 0.65 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There is a DEP Petroleum Cleanup site approximately 0.4 miles southwest of the pond site, but it does not appear that the site will pose a contamination risk. One well, as identified by FGS, was identified 0.4 miles southwest of the site, but it is not within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 405-002

Basin 405-002 includes the intersection improvements at the Boggy Creek Road (CR 527A) and Simpson Road (CR 530) intersection. The basin is located within the East Lake Tohopekaliga Drain basin (WBID 3172C), which is impaired for nutrients. Basin 404B-002 includes a total area of 8.5 acres, which includes an additional 0.7 acres of impervious area. The required treatment volume is 1.1 ac-ft, which is controlled by the basin area and includes the additional 50% of treatment for the impaired water body. This portion of the proposed

alternative is estimated to impact 2.0 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 3.2 ac-ft for treatment, attenuation, and FPC volume. The estimated required pond area for this sub-basin is 2.1 acres.

The existing pond treating Simpson Road within this basin area, permitted under Application No. 031231-10, was not considered. It is assumed that evaluation of this existing site will be a part of the design phase.

One potential wet detention pond site, Pond 2A, has been identified within Basin 405-002. This one pond site is located southwest of the OPE Alternative interchange with Boggy Creek Road/Simpson Road and utilizes a remnant remaining parcel from the alternative alignment. This site will be maintained by Orange County as it will serve the County owned roadways. Although this site will be adjacent to Pond 1_C for Basin 405-001, it is anticipated that the two sites will be individual and separate sites to avoid joint-use ponds. Preliminary calculations demonstrate that site will meet the proposed design criteria. Refer to **Figure B.2** in **Appendix A** for the pond site location.

Pond 2_A (Option 1) has an estimated construction cost of $300,000. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 2B** and **Appendix C** for supporting documentation for cost estimates.

Pond Site 2_A

This pond site is within one remnant parcel created by the OPE Alternative located in the proposed interchange with Boggy Creek Road/Simpson Road. The pond site consists of 2.1 acres of property southwest of the interchange R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

There are overhead utilities visible within the Happy Lane R/W. The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to the SFWMD, the existing land use at the site is pine flatwoods. Wetland mitigation is not anticipated if Pond Site 2_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There is one DEP Petroleum Cleanup site located approximately 400 feet to the west. One well, as identified by FGS, was identified about 100 feet southwest of the pond footprint. This site should be further evaluated for contamination if selected as a preferred site. There are no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 405-003

Basin 405-003 extends from 2,600-feet east of the Alternative's turn due east and just above the Orange/Osceola County line, approximately at Seth Road, to Jim Branch (a waterway). This results in a total basin length of 8,760 feet.

The majority of the basin is located within the East Lake Tohopekaliga Drain basin (WBID 3172C), which is impaired for nutrients. Basin 405-003 includes a total area of 84.1 acres, which includes an additional 39.3 acres of impervious area. The required treatment volume is 12.3 ac-ft, which includes the additional 50% of treatment for the impaired water body. A separate FPC pond is proposed for this basin. This basin requires a pond site that can accommodate 22.8 ac-ft for treatment and attenuation volume. The estimated required pond area for this sub-basin is 11.1 acres.

This portion of the proposed alternative is estimated to impact 18.6 ac-ft of FEMA floodplains associated with the wetland slough that is a tributary to Jim Branch. It is assumed, however, that the floodplain impacts at Jim Branch will be accommodated by the cross drain for the OPE Alternative. The estimated required FPC area for this sub-basin is 6.2 acres.

Two potential off-site wet detention pond sites, Pond 3_A and Pond 3_B, have been identified within Basin 405-003. These sites function as independent pond options for this basin. The preliminary results indicate that both pond options will provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based on assumptions and desktop review of existing databases; it is suggested to have site-specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design. Refer to **Figure B.3a** and **Figure B.3b** in **Appendix A** for pond site locations.

Two FPC areas, FPC_3_A and FPC_3_B, adjacent to the impacted floodplain have been identified for this basin. Either site can be chosen to provide the necessary FPC within the basin. Results will need to be confirmed during final design. Refer to **Figure B.8a** and **Figure B.8b** in **Appendix A** for the FPC site locations.

Pond 3_A (Option 1) and Pond 3_B (Option 2) both have an estimated construction cost of $1,915,856. The FPC sites, FPC 3_A and FPC 3_B, both have an estimated construction cost of $636,621. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 1B** and **Appendix C** for supporting documentation for cost estimates.

Pond Site 3_A

This pond site is within one parcel, and consists of 11.1 acres of property adjacent to the road R/W, and therefore, a drainage easement is not necessary. The site is situated west of Jim

Branch, south of Jim Branch tributary, and north of the OPE Alternative. The site is located within Zone A of the 100-year FEMA floodplain, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes; and Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes. The hydrologic soil group classification is Type A/D and Type B/D, respectively, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Smyrna-Smyrna and Basinger soils, respectively.

According to SFWMD, the existing land use at the site is palmetto prairies and mixed wetland hardwoods. Wetland mitigation is anticipated if Pond Site 3_A is utilized as there are 2.09 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as Identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 3_B

This pond site is within three parcels, and consists of 11.1 acres of property adjacent to the road R/W, and therefore, a drainage easement is not necessary. The site is situated south of the OPE Alternative and west of Jim Branch. Part of the site is located within Zone A of the 100-year FEMA floodplain, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Myakka fine sand (#22), 0 to 2 percent slopes; Smyrna fine sand (#42), 0 to 2 percent slopes; and Basinger fine sand (#5) 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D for all soil types, according to the USDA NRCS, and all have an estimated SHGWT of one-foot below the natural ground.

According to SFWMD, the existing land use at the site is improved pastures, palmetto prairies, and mixed wetland hardwoods. Wetland mitigation is anticipated if Pond Site 3_B is utilized as there are 0.59 acres of wetlands identified at this location per the National Wetland Inventory along Jim Branch. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as Identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

FPC Area FPC_3_A

This FPC area is a 6.2-acre site located on one parcel. The site is located adjacent to the proposed R/W, so an easement is not necessary. It is situated to expand the impacted FEMA floodplain, which is classified as Zone A. Additional FPC for the site may be required since the site includes approximately 4.15 acres of FEMA floodplain shape. Further evaluation of floodplain impacts should be performed in the design phase to insure the total required compensation volume and configuration is appropriate.

There are no apparent utilities present on the property. The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground (0-foot depth).

According to the SFWMD, the existing land use at the site is pine flatwoods. Wetland mitigation is not anticipated if FPC_3_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as Identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

FPC Area FPC_3_B

This FPC area is a 6.2-acre site located on one parcel. The site is located adjacent to the proposed R/W, so an easement is not necessary. It is situated to expand the impacted FEMA floodplain, which is classified as Zone A. Additional FPC for the site may be required since the site includes approximately 3.95 acres of FEMA floodplain shape. Further evaluation of floodplain impacts should be performed in the design phase to insure the total required compensation volume and configuration is appropriate.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes; Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes; and St. Johns fine sand (#37). The hydrologic soil group classifications are Type A/D and B/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Smyrna-Smyrna and Basinger soils, respectively.

According to the SFWMD, the existing land use at the site is upland shrub and brushland, cypress, pine flatwoods, palmetto prairies, and wetland forested mixed. Wetland mitigation is anticipated if FPC_3_B is utilized as there are 1.35 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as Identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 405-004

Basin 405-004 extends from Jim Branch (a waterway) to the identified borrow pits located on TDCP Property.

The basin is located within the Jim Branch basin (WBID 3172A), which is not impaired for nutrients. Basin 405-004 includes a total area of 42.9 acres, which includes an additional 19.6 acres of impervious area. The required treatment volume is 4.1 ac-ft This portion of the proposed alternative is estimated to impact floodplains at Jim Branch; however, it is assumed that these floodplain impacts will be addressed during the cross drain analysis. This basin requires a pond site that can accommodate 9.0 ac-ft for treatment and attenuation volume. The estimated required pond area for this sub-basin is 4.9 acres.

Two potential wet detention pond site options, Pond 4_A and Pond 4_B, have been identified within Basin 405-004. Refer to **Figure B.4a** and **Figure B.4b** in **Appendix A** for the two pond locations. The preliminary results indicate that both pond options will provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based on assumptions and desktop review of existing databases; it is suggested to have site specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond 4_A (Option 1) and Pond 4_B (Option 2) both have an estimated construction cost of $803,111 and $781,863, respectively. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 2B** and **Appendix C** for supporting documentation for cost estimates.

Pond Site 4_A

This pond site is located within one parcel. The pond site consists of 5.1 acres of property adjacent to the road R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Pomello fine sand (#34), 0 to 5 percent slopes and Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes. The hydrologic soil group classification is Type A and Type A/D, respectively, according to the USDA NRCS, and have an estimated SHGWT of one-foot and three-feet below the natural ground for Smyrna-Smyrna and Pomello soils, respectively.

According to the SFWMD, the existing land use at the site is palmetto prairies, channelized waterways, and disturbed land. Wetland mitigation is not anticipated if Pond Site 4_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 4_B

This pond site is located within one parcel between Osceola Parkway Extension and Boggy Creek Road. The pond site consists of 4.9 acres of property adjacent to the road R/W, and therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property, but there is some overhead electric along Boggy Creek Road R/W.

The soils encountered at this site are Sanibel muck (#42), 0 to 2 percent slopes. The hydrologic soil group classification is Type A/D, according to the USDA NRCS, and has an estimated SHGWT at the natural ground (0-foot depth).

According to the SFWMD, the existing land use at the site is palmetto prairies. Wetland mitigation is not anticipated if Pond Site 4_B is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, exist within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 405-005

Basin 405-005 extends from the west side of the identified borrow pits located on TDCP Property to Narcoossee Road. This basin includes an interchange with Narcoossee Road.

Basin 405-005 includes a total area of 53.8 acres, which includes an additional 27.8 acres of impervious area. The required treatment volume is 8.7 ac-ft, which includes the additional 50% of treatment for the impaired water body. This portion of the proposed alternative is not located within FEMA floodplains, so floodplain compensation is not anticipated. This basin

requires a pond site that can accommodate 11.1 ac-ft for treatment and attenuation volume. The estimated required pond area for this sub-basin is 4.9 acres.

One potential wet detention pond site, Pond 5A, has been identified within Basin 405-005. Refer to **Figure B.5** in **Appendix A** for the pond location. The preliminary results indicate that the pond option will provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based off of assumptions and desktop review of existing databases, it is suggested to have site specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond 5_A (Option 1) has an estimated construction cost of $769,057. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 2B** and **Appendix C** for supporting documentation for cost estimates.

Pond Site 5_A

This pond site is located within one parcel. The pond site consists of 4.9 acres within the road R/W; therefore, a drainage easement is not anticipated. The pond site is situated under OPE Alternative's bridge over the existing borrow pits. The pond site is intended to expand the existing borrow pits to accommodate the required treatment and attenuation for this basin, therefore, the required size does not include landscaping and additional area for tie-in slopes to the surrounding ground. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Pomello fine sand (#34), 0 to 5 percent slopes and Archbold fine sand (#2), 0 to 5 percent slopes. The hydrologic soil group classification is Type A for both soils, according to the USDA NRCS, and have an estimated SHGWT of three-feet and four-feet below the natural ground for Pomello Archbold and Archbold and soils, respectively.

According to the SFWMD, the existing land use at the site is palmetto prairies. Wetland mitigation is not anticipated if Pond Site 5_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 405-006

Basin 405-006 extends along Narcoossee Road for approximately 7,500-feet, which contains the length of the roadway improvements to accommodate the OPE Alternative's interchange as well as the existing Narcoossee Road basin that is permitted to be treated by the existing Narcoossee Road treatment pond that is impacted by the OPE Alternative. Due to the OPE Alternative's interchange with Narcoossee Road, Clapp Simms Duda Road is proposed to be re-aligned with the existing Narcoossee Road and Boggy Creek intersection, and a cul-de-sac is proposed at the existing Narcoossee Road and Clapp Simms Duda Road intersection.

Basin 405-006 includes a total area of 26.5 acres. Due to the total impact to the existing Narcoossee Road treatment pond, the existing impervious area is based off the two-lane Pre-Development Narcoossee Roadway width used in the Narcoossee Road Widening ERP (Application No. 070322-11). Therefore, the additional impervious area from a two-lane Narcoossee Road to the proposed improvements is estimated at 13.2 acres. The required treatment volume is 4.1 ac-ft, which includes the additional 50% of treatment for the impaired water body. This portion of the proposed alternative is estimated to impact 0.1 ac-ft of floodplain along Narcoossee Road. FPC will be provided within the treatment pond. This basin requires a pond site that can accommodate 9.1 ac-ft for treatment, attenuation, and FPC volume. Since this basin is to treat Narcoossee Road, it is anticipated that the existing roadway profile will not be modified, therefore, the pond's design depth is approximately the same as the existing pond's depth. The estimated required pond area for this sub-basin is 8.2 acres.

Two potential wet detention pond site options, Pond 6_A and Pond 6_B, have been identified within Basin 405-006. Refer to **Figure B.6a** and **Figure B.6b** in **Appendix A** for the two pond locations. Preliminary calculations demonstrate that both sites will meet the proposed design criteria.

Pond 6_A (Option 1) and Pond 6_B (Option 2) have an estimated construction cost of $1,561,569 and $1,497,824, respectively. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 2B** and **Appendix C** for supporting documentation for cost estimates.

Pond Site 6_A

This pond site is located within one parcel. The pond site consists of 8.8 acres of property, which is not adjacent to the road R/W; thereby a drainage easement is necessary. The site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes; and Hontoon muck (#19), frequently ponded, 0 to 1 percent slopes. The hydrologic soil group classification is Type A/D for all three soils, according to the USDA NRCS, and all have an estimated SHGWT at the natural ground (0-foot depth).

According to the SFWMD, the existing land use at the site is upland mixed coniferous/hardwood, unimproved pastures, and saltwater marshes/halophytic herbaceous prairie (LCLU 6430). Pond Site 6_A, includes impacts to LCLU 6430, a wetland classification described in Section 6.2. Wetland mitigation is not anticipated if Pond Site 6_A is utilized as there are no wetlands identified at this location per the National Wetland Inventory. The only wildlife data found in or adjacent to this site was the SFWMD impact to LCLU 6430. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There is one FDEP Petroleum Cleanup site located approximately 0.25 mile west of the pond site at the northwest corner of the Boggy Creek Road and Narcoossee Road intersection. However, it does not appear that the site will pose a high contamination risk. No wells are located within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 6_B

This pond site is located at the southeast corner of the existing Narcoossee Road and Clapp Simms Duda Road. The pond is proposed to fully take nine parcels and partially take one parcel, which affects five property owners. The pond site consists of 8.2 acres of property that is adjacent to the road R/W, therefore, a drainage easement is not necessary. The site is not located within the 100-year FEMA floodplain. There are overhead electric lines along the northbound side of Narcoossee Road, and it is anticipated that additional utilities will be on site at the locations of the existing homes.

The soils encountered at this site are Pomello fine sand (#34), 0 to 5 percent slopes; Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes; and Zolfo fine sand (#54), 0 to 2 percent slopes. The hydrologic soil group classifications are Type A and Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot and three-feet below the natural ground for Smyrna-Smyrna and Pomello soils, respectively.

According to the SFWMD, the existing land use at the site is upland hardoow forests and unimproved pastures. Wetland mitigation is not anticipated if Pond Site 6_B is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.2, Boggy Creek Alternative.

There is one FDEP Petroleum Cleanup site located approximately 0.20 miles south of the pond site at the northwest corner of the Boggy Creek Road and Narcoossee Road intersection. However, it does not appear that the site will pose a high contamination risk. No wells are located within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

6.3.3 Split Oak Minimization Alternative (500-107C-1)

Split Oak Minimization Alternative (500-107C-1) begins at the proposed Narcoossee Road interchange, and continues east running parallel to and north of Clapp Simms Duda Road until it reaches SFWMD C-29A Canal where it then turns southeast into Split Oak Forest. It then continues due east and connects with Cyrils Drive Extension east of Split Oak Forest and north of Del Webb. Refer to **Figure 10** in **Appendix A** for the basin map and pond sizing parameters used for this Alternative.

Pond Sites 1_A, 1_B, 1_C, and 1_D include the potential for the following species according to the USFWS 2016 Federally Listed Species information for Orange County (North Florida ESO). This area has potential for Audubon's Crested Caracara, Everglade Snail Kite, Florida Scrub-Jay, and Wood Stork. Plants include the Beautiful PawPaw, Britton's Beargrass, Florida Bonamia, Papery Whitlow-Wort, Scrub Buckwheat, Scrub Lupine, Scrub Plum, and Wide-Leaf Warea. Reptiles include the Eastern Indigo Snake and the Sand Skink. There is no specific wildlife data found in or adjacent to these sites.

Pond Sites 2_A, 2_B, FPC_2_A, FPC_2_B, 3_A, and 4_A, include the potential for the following species according to the USFWS 2016 Federally Listed Species information for Osceola County (South Florida ESO). Audubon's Crested Caracara, Everglade Snail Kite, Florida Grasshopper Sparrow, Florida Scrub-Jay, Red-Cockaded Woodpecker, and Wood Stork. Mammals include the Florida Panther and the West Indian Manatee. Plants include Britton's Beargrass, Florida Bonamia, Lewton's Polygala, Papery Whitlow-Wort, Pygmy Fringe-Tree, Sandlace, Scrub Buckwheat, Scrub lupine, Scrub Plum, Wide-Leaf Warea. Reptiles include the Bluetail Mole Skink, Eastern Indigo Snake, and Sand Skink. There is no specific wildlife data found in or adjacent to these sites.

Basin 500_107C-1_001

Basin 500_107C-1_001 extends from the proposed interchange with Narcoossee Road east to SFWMD C-29A Canal. The basin is located within the C-29A Canal basin (WBID 3171EA), which is not impaired. Basin 500_107C-1_001 includes a total area of 65.4 acres, which includes an additional 26.9 acres of impervious area. The required treatment volume is 5.6 ac-ft, which is controlled by the impervious area. This portion of the proposed alternative is estimated to impact 64.2 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 78.2 ac-ft for treatment, attenuation, and FPC volume. The estimated required pond area for this sub-basin is 34.9 acres.

Four potential wet detention pond sites, Pond 1_A, 1_B, 1_C, and 1_D, have been identified within the basin. One site is located within a remnant parcel within the interchange, and the other three are off-site pond locations. The two pond options for this basin include utilizing the property adjacent to the proposed R/W for Pond 1_A in conjunction with either Ponds 1_B and 1_C, or Pond 1_D. Refer to **Figure C.1a** and **Figure C.1b** in **Appendix A** for the pond locations.

Pond Option 1 (Ponds 1_A, 1_B, and 1_C) and Pond Option 2 (Ponds 1_A and 1_D) have an estimated construction cost of $6,059,176 and $6,048,551, respectively. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 3B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that both of the pond options can provide sufficient treatment, attenuation, and FPC within the estimated pond design depth and footprint. Preliminary results are based on assumptions; and it is suggested to have further detailed analysis to confirm the chosen pond option will meet criteria during final design.

Pond Site 1_A

This pond site is located on two remnant parcels, that utilize the basin area between the OPE mainline and Clapp Simms Duda Road. The pond site consists of 25.1 acres of property, which is within the interchange; therefore, a drainage easement is not necessary. The site is located within the 100-year FEMA floodplain, Zone AE, so additional pond area for FPC may be required for this site. There is currently a subdivision under construction at this pond site (ERP Application No. 170515-25), so it is anticipated that there are utilities present for the proposed infrastructure for a residential community.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes; Pomello fine sand (#34), 0 to 5 percent slopes; Zolfo fine sand (#54), 0 to 2 percent slopes; and Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes; Samsula Muck (#40), frequently ponded, 0 to 1 percent slopes; Hontoon Muck (#19), frequently ponded, 0 to 1 percent slopes; and Sanibel Muck (#42). The hydrologic soil group classifications are Type A and Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one foot and three feet below the natural ground for Smyrna-Smyrna and Pomello/Zolfo soils, respectively. Basinger, Samsula, Hontoon, and Sanibel soils all have an estimated SHGWT at the natural ground (0-foot depth).

According to SFWMD, the existing land use at the site is herbaceous (dry prairie), upland mixed coniferous/hardwood, upland shrub and brushland, and unimproved pastures. Wetland mitigation is anticipated if Pond Site 1_A is utilized as there are 1.64 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There is a DEP Petroleum Cleanup sites approximately 1,600 feet to the south, but it does not appear that the site will pose a significant contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_B

This pond site is located on two parcels between the connection road for Clapp Simms Duda Road and Narcoossee Road, and affects two property owners. The pond site consists of 8.8 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The southern corner of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Zolfo fine sand (#54), 0 to 2 percent slopes; Smyrna-Smyrna, wet fine sand (#44), 0 to 2 percent slopes; and Pomello fine sand (#34), 0 to 5 percent slopes. The hydrologic soil group classifications are Type A and Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot and three-feet below the natural ground for Smyrna-Smyrna and Pomello/Zolfo soils, respectively.

According to SFWMD, the existing land use at the site is upland hardwood forests and unimproved pastures. Wetland mitigation is not anticipated for this site, as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There is a DEP Petroleum Cleanup sites approximately 750 feet to the southwest, but it does not appear that the site will pose a significant contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_C

This pond site is located on one parcel south of the re-aligned Clapp Simms Duda Road. The pond site consists of 1.3 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The eastern side of the site is located within the 100-year FEMA floodplain, Zone A and Zone AE, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Zolfo fine sand (#54), 0 to 2 percent slopes; Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes; and Samsula muck, frequently ponded, 0 to 1 percent slopes. The hydrologic soil group classifications are Type A and Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot and three-feet below the natural ground for Smyrna-Smyrna and Pomello/Zolfo soils, respectively. Basinger and Samsula soils both have an estimated SHGWT at the natural ground.

According to SFWMD, the existing land use at the site is unimproved pastures, upland hardwood forests, and upland mixed coniferous/hardwood. Wetland mitigation is not anticipated for this site, as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential

listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There is a DEP Petroleum Cleanup sites approximately 1,600 feet to the southwest, but it does not appear that the site will pose a significant contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_D

This pond site is located on one parcel south of the re-aligned Clapp Simms Duda Road. The pond site consists of 10.0 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The eastern side of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Zolfo fine sand (#54), 0 to 2 percent slopes; Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes; and Samsula muck, frequently ponded, 0 to 1 percent slopes. The hydrologic soil group classifications are Type A and Type A/D, according to the USDA NRCS, and have an estimated SHGWT of three-feet below the natural ground and at natural ground for Smyrna-Smyrna and Pomello soils, respectively.

According to SFWMD, the existing land use at the site is unimproved pastures and upland mixed coniferous/hardwood. Wetland mitigation is not anticipated for this site, as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There is a DEP Petroleum Cleanup sites approximately 850 feet to the southwest, but it does not appear that the site will pose a significant contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 500 107C-002

Basin 500_107C-1_002 extends from the SFWMD C-29A Canal and continues southeast and then east to just north of Cyrils Drive and Absher Road. The basin is located within the C-29A Canal basin (WBID 3171EA) and the Lake Center Outlet (WBID 3174F), which are not impaired. Basin 500_107C-1_002 includes a total area of 80.1 acres, which includes an additional 43.0 acres of impervious area. The required treatment volume is 9.0 ac-ft, which is controlled by the impervious area. This portion of the proposed alternative is estimated to impact 7.0 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 29.7 ac-ft for treatment, attenuation, and FPC volume. The estimated required pond area for this sub-basin is 14.2 acres.

Two potential wet detention pond sites, Pond 2_A and 2_B, have been identified within the basin. Both sites are off-site pond locations. The two pond options for this basin include utilizing either Pond 2_A or Pond 2_B. Refer to **Figure C.2a** and **Figure C.2b** in **Appendix A** for the pond locations.

Two potential FPC areas adjacent to the impacted floodplain have been identified, FPC_2_A and FPC_2_B. Either site can be chosen to provide the necessary FPC within the basin. Refer to **Figure C.5a** and **Figure C.5b** in **Appendix A** for the two FPC area options locations.

Pond 2_A (Pond Option 1) and Pond 2_B (Pond Option 2) have an estimated construction cost of $2,495,287 and $2,567,530, respectively. The FPC sites, FPC_2_A and FPC_2_B have an estimated construction cost of $359,581 and $359,581, respectively. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 3B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that the two pond options described above and the separate FPC sites will provide sufficient treatment, attenuation, and FPC within the estimated design depth and footprint. Preliminary results are based off of assumptions and desktop review of existing databases, it is suggested to have site specific detailed analysis to minimize variables to confirm the chosen pond option will meet criteria during final design.

Pond Site 2_A

This pond site is located on one parcel on the west side of the proposed alignment. The pond site consists of 14.3 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The northern side of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Basinger fine sand (#5), 0 to 2 percent slopes; and Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; Placid fine sand (#32), frequently ponded, 0 to 1 percent slopes; and Smyrna fine sand (#42), 0 to 2 percent slopes. The hydrologic soil group classifications are Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Basinger/Smyrna and Samsula/Placid soils, respectively.

According to SFWMD, the existing land use at the site is improved pastures and upland mixed coniferous/hardwood. Wetland mitigation is anticipated for this site, as there are 0.57 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 2_B

This pond site is located on one parcel on the west side of the proposed alignment. The pond site consists of 14.2 acres of property, which is not directly adjacent to the road R/W; therefore, a drainage easement (0.7 acres) is necessary. The northwest corner of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Basinger fine sand (#5), 0 to 2 percent slopes; and Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; Placid fine sand (#32), frequently ponded, 0 to 1 percent slopes; and Smyrna fine sand (#42), 0 to 2 percent slopes. The hydrologic soil group classifications are Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Basinger/Smyrna and Samsula/Placid soils, respectively.

According to SFWMD, the existing land use at the site is improved pastures and pine flatwoods. Wetland mitigation is anticipated for this site, as there are 0.53 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

FPC Site 2_A

This pond site is located on one parcel on the south side of the proposed alignment within Split Oak Forest. The pond site consists of 3.5 acres of property, which is directly adjacent to the road R/W; therefore, a drainage easement is not necessary. The south side of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are power pole utilities along the north side of Cyrils Drive which are within the southern boundary of the pond site.

The soils encountered at this site are predominantly Immokalee fine sand (#16), 0 to 2 percent slopes. The hydrologic soil group classifications are Type B/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to SFWMD, the existing land use at the site is primarily pine flatwoods with a small portion of freshwater marshes/Graminoid prairie – marsh and herbaceous (dry prairie). There

are no wetlands identified at this location per the National Wetland Inventory and there is no specific wildlife data found in or adjacent to this site. However, the Split Oak Forest is a conservation area under the Florida Managed Areas database. Per the description in Section 6.2 the pond site was given a "High" ranking of impact to the Wildlife Habitat. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

FPC Site 2_B

This pond site is located on two parcels and a portion of Cyrils Drive R/W on the south side of the proposed alignment. The pond site consists of 3.5 acres of property, which is not directly adjacent to the road R/W; therefore, a drainage easement (0.4 acres) is necessary. The west side of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities on the site, however, there are buildings which may indicate minor utilities on site.

The soils encountered at this site are predominantly Immokalee fine sand (#16), 0 to 2 percent slopes and Pomello fine sand (#34), 0 to 5 percent slopes. The hydrologic soil group classifications are Type B/D and Type A, respectively, according to the USDA NRCS, and have an estimated SHGWT of one-foot and three-feet below the natural ground for Immokalee and Pomello soils, respectively.

According to SFWMD, the existing land use at the site is primarily pine flatwoods and herbaceous (dry prairie). Wetland mitigation is anticipated for this site, as there are 0.06 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. However, the Split Oak Forest is a conservation area under the Florida Managed Areas database. Per the description in Section 6.2 the pond site was given a "High" ranking of impact to the Wildlife Habitat. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 500_107C-003

Basin 500_107C-1_003 continues east and south and ends at the Cyrils Drive Extension. The basin is located within the Lake Center Outlet (WBID 3174F) and the C-29A Canal basin (WBID 3171EA), which are not impaired. Basin 500_107C-1_003 includes a total area of

100.5 acres, which includes an additional 37.7 acres of impervious area. The required treatment volume is 8.4 ac-ft, which is controlled by the basin area. This portion of the proposed alternative is estimated to impact 10.4 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 24.0 ac-ft for treatment, attenuation, and FPC volume. The estimated required pond area for this sub-basin is 11.7 acres.

One potential wet detention pond site, Pond 3_A has been identified within the basin. This site is an in-field pond location. There is only one pond option for this basin, which utilizes the in-field location, Pond 3_A. Refer to **Figure C.3** in **Appendix A** for the pond location.

Pond 3_A (Option 1) has an estimated construction cost of $2,199,326. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 3B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that the one pond option can provide sufficient treatment, attenuation, and FPC within the estimated pond design depth and footprint. Preliminary results are based on assumptions; and it is suggested to have further detailed analysis to confirm that the chosen pond option will meet criteria during final design.

Pond Site 3_A

This pond site is located on a remnant parcel within the mainline OPE interchange with Cyrils Drive. The pond site consists of 15.9 acres of property, which is within the interchange; therefore, a drainage easement is not necessary. The site is located within the 100-year FEMA floodplain, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Immokalee fine sand (#16); 0 to 2 percent slopes; Basinger fine sand (#5), 0 to 2 percent slopes; and Basinger fine sand (#6), depressional, 0 to 1 percent slopes. The hydrologic soil group classifications are Type A/D and Type B/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground for Immokalee/Basinger and Basinger depressional soils, respectively.

According to SFWMD, the existing land use at the site is unimproved pastures and freshwater marshes/Graminoid prairie – marsh. Wetland mitigation is anticipated if this site is utilized as there are 1.40 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within

500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 500_107C-004

Basin 500_107C-1_004 continues south from the OPE mainline to the Cyrils Drive Extension. The basin is located within the C-29A Canal basin (WBID 3171EA) and the Lake Center Outlet (WBID 3174F), which are not impaired. Basin 500_107C-1_004 includes a total area of 7.0 acres, which includes an additional 3.5 acres of impervious area. The required treatment volume is 0.7 ac-ft, which is controlled by the impervious area. This portion of the proposed alternative is estimated to impact 0.0 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 1.8 ac-ft for treatment and attenuation. The estimated required pond area for this sub-basin is 1.3 acres.

One potential wet detention pond site, Pond 4_A has been identified within the basin. This site is located southeast and adjacent to the interchange. Refer to **Figure C.4** in **Appendix A** for the pond location.

Pond 4_A (Option 1) has an estimated construction cost of $180,056. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 3B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that the one pond option can provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based on assumptions; and it is suggested to have further detailed analysis to confirm that the chosen pond option will meet criteria during final design.

Pond Site 4_A

This pond site is located on one parcel that is adjacent to the interchange and utilizes a remnant parcel on the south side of the interchange between the OPE mainline and Cyrils Drive. The pond site consists of 1.3 acres of property, which is adjacent to the interchange; therefore, a drainage easement is not necessary. The site is located not located within the 100-year FEMA floodplain. There are no apparent utilities present on the property.

The soils encountered at this site are Immokalee fine sand (#16); 0 to 2 percent slopes. The hydrologic soil group classifications are Type B/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot below the natural ground.

According to SFWMD, the existing land use at the site is unimproved pastures. Wetland mitigation is not anticipated if this site is utilized as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.3, Split Oak Minimization Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

6.3.4 Split Oak Avoidance Alternative (502 207D-1)

Split Oak Avoidance Alternative (502-207D-1) begins at the proposed Narcoossee Road interchange, and continues east running parallel to and north of Clapp Simms Duda Road until it reaches SFWMD C-29A Canal where it then turns southeast and avoids Split Oak Forest. It then continues due east and connects with Cyrils Drive Extension, creating a frontage road system. Refer to Figure 11 in Appendix A for the basin map and pond sizing parameters used for this Alternative.

Pond Sites 1_A, 1_B, and 1_C include the potential for the following species according to the USFWS 2016 Federally Listed Species information for Orange County (North Florida ESO). There is no specific wildlife data found in or adjacent to these sites. This area has potential for Audubon's Crested Caracara, Everglade Snail Kite, Florida Scrub-Jay, and Wood Stork. Plants include the Beautiful PawPaw, Britton's Beargrass, Florida Bonamia, Papery Whitlow-Wort, Scrub Buckwheat, Scrub Lupine, Scrub Plum, and Wide-Leaf Warea. Reptiles include the Eastern Indigo Snake and the Sand Skink.

Pond Sites 2_A, 2_B, 3_A, 3_B, 3_C, FPC_3_A, and 5_A, includes the potential for the following species according to the USFWS 2016 Federally Listed Species information for Osceola County (South Florida ESO). There is no specific wildlife data found in or adjacent to these sites. Audubon's Crested Caracara, Everglade Snail Kite, Florida Grasshopper Sparrow, Florida Scrub-Jay, Red-Cockaded Woodpecker, and Wood Stork. Mammals include the Florida Panther and the West Indian Manatee. Plants include Britton's Beargrass, Florida Bonamia, Lewton's Polygala, Papery Whitlow-Wort, Pygmy Fringe-Tree, Sandlace, Scrub Buckwheat, Scrub lupine, Scrub Plum, Wide-Leaf Warea. Reptiles include the Bluetail Mole Skink, Eastern Indigo Snake, and Sand Skink.

Basin 502_207D-001

Basin 502_207D_001 extends from the proposed interchange with Narcoossee Road east to SFWMD C-29A Canal. The basin is located within the C-29A Canal basin (WBID 3171EA), which is not impaired. Basin 502_207D_001 includes a total area of 63.0 acres, which includes an additional 26.8 acres of impervious area. The required treatment volume is 5.6 ac-ft, which is controlled by the impervious area. This portion of the proposed alternative is estimated to impact 45.3 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 58.1 ac-ft for treatment, attenuation, and FPC volume. The estimated required pond area for this sub-basin is 26.4 acres.

Three potential wet detention pond sites, Pond 1_A, 1_B, and 1_C have been identified within the basin. One site is located within a remnant parcel within the interchange, and the other

two are off-site pond locations. The two pond options for this basin include utilizing the remnant parcels within proposed R/W for Pond 1_A, in conjunction with either Ponds 1_B or 1_C offsite ponds. Refer to **Figure D.1a** and **Figure D.1b** in **Appendix A** for the pond locations.

Pond Option 1 (Ponds 1_A and 1_B) and Pond Option 2 (Ponds 1_A and 1_C) have an estimated construction cost of $4,746,758 and $4,481,156, respectively. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 4B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that both of the pond options can provide sufficient treatment, attenuation, and FPC within the estimated pond design depth and footprint. Preliminary results are based on assumptions; and it is suggested to have further detailed analysis to confirm the chosen pond option will meet criteria during final design.

Pond Site 1_A

This pond site is located on two remnant parcels, that utilize the basin area between the OPE mainline and Clapp Simms Duda Road. The pond site consists of 20.2 acres of property, which is adjacent to the interchange; therefore, a drainage easement is not necessary. The site is located within the 100-year FEMA floodplain, Zone AE, so additional pond area for FPC may be required for this site. There is currently a subdivision under construction at this pond site (ERP Application No. 170515-25), so it is anticipated that there are utilities present for the proposed infrastructure for a residential community.

The soils encountered at this site are Smyrna-Smyrna wet fine sand (#44), 0 to 2 percent slopes; Pomello fine sand (#34), 0 to 5 percent slopes; Zolfo fine sand (#54), 0 to 2 percent slopes; and Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes; Samsula Muck (#40), frequently ponded, 0 to 1 percent slopes; Hontoon Muck (#19), frequently ponded, 0 to 1 percent slopes; and Sanibel Muck (#42). The hydrologic soil group classifications are Type A and Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Smyrna-Smyrna and Basinger/Samsula/Hontoon/Sanibel soils, respectively. Pomello/Zolfo have an estimated SHGWT of three-feet below the natural ground.

According to SFWMD, the existing land use at the site is herbaceous (dry prairie), upland mixed coniferous/hardwood, upland shrub and brushland, and unimproved pastures. Wetland mitigation is anticipated if this site is utilized as there are 1.33 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There is a DEP Petroleum Cleanup sites approximately 1,600 feet to the south, but it does not appear that the site will pose a significant contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_B

This pond site is located on two parcels between the re-aligned Clapp Simms Duda Road and Narcoossee Road, and affects two property owners. The pond site consists of 8.8 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The southern corner of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Zolfo fine sand (#54), 0 to 2 percent slopes; Smyrna-Smyrna, wet fine sand (#44), 0 to 2 percent slopes; and Pomello fine sand (#34), 0 to 5 percent slopes. The hydrologic soil group classifications are Type A and Type A/D, according to the USDA NRCS, and has an estimated SHGWT of one-foot and three-feet below the natural ground for Smyrna-Smyrna and Pomello/Zolfo soils, respectively.

According to SFWMD, the existing land use at the site is upland hardwood forests and unimproved pastures. Wetland mitigation is not anticipated for this site, as there are no wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There is a DEP Petroleum Cleanup sites approximately 750 feet to the southwest, but it does not appear that the site will pose a significant contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 1_C

This pond site is located on one parcel south of the re-aligned Clapp Simms Duda Road. The pond site consists of 6.3 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The eastern side of the site is located within the 100-year FEMA floodplain, Zone A and Zone AE, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Zolfo fine sand (#54), 0 to 2 percent slopes; Basinger fine sand (#3), frequently ponded, 0 to 1 percent slopes; Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; and Hontoon muck (#19), frequently ponded, 0 to 1 percent slopes. The hydrologic soil group classifications are Type A and Type A/D, according to the USDA NRCS, and has an estimated SHGWT of three-feet below the natural ground and at natural ground for Zolfo and Basinger/Samsula/Hontoon soils, respectively.

According to SFWMD, the existing land use at the site is unimproved pastures, upland hardwood forests, upland mixed coniferous/hardwood, and a small portion of saltwater marshes/halophytic herbaceous prairie (LCLU 6430). Pond Site 1_C, includes impacts to LCLU 6430, a wetland classification described in Section 6.2. Wetland mitigation is not anticipated for this site, as there are no wetlands identified at this location per the National Wetland Inventory. The only wildlife data found in or adjacent to this site was the SFWMD impact to LCLU 6430. Potential listed species in Orange County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There is a DEP Petroleum Cleanup sites approximately 1,400 feet to the southwest, but it does not appear that the site will pose a significant contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 502_207D-002

Basin 502_207D_002 extends from SFWMD C-29A Canal and continues south to Cyrils Drive. The basin is located within the C-29A Canal basin (WBID 3171EA) and the Lake Center Outlet (WBID 3174F), which are not impaired. Basin 502_207D_002 includes a total area of 50.1 acres, which includes an additional 28.1 acres of impervious area. The required treatment volume is 5.9 ac-ft, which is controlled by the impervious area. This portion of the proposed alternative is estimated to impact 42.7 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 50.1 ac-ft for treatment, attenuation, and FPC volume. The estimated required pond area for this sub-basin is 23.0 acres.

Two potential wet detention pond sites, Pond 2_A and 2_B, have been identified within the basin. Both sites are off-site pond locations. The two pond options for this basin include utilizing either Pond 2_A or Pond 2_B. Refer to **Figure D.2a** and **Figure D.2b** in **Appendix A** for the pond locations.

Pond 2_A (Option 1) and Pond 2_B (Option 2) have an estimated construction cost of $4,163,583 and $4,162,399, respectively. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 4B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that both of the pond options can provide sufficient treatment, attenuation, and FPC within the estimated pond design depth and footprint. Preliminary results are based on assumptions; and it is suggested to have further detailed analysis to confirm the chosen pond option will meet criteria during final design.

Pond Site 2_A

This pond site is located on one parcel on the east side of the OPE mainline roadway. The pond site consists of 23.0 acres of property, which is adjacent to the road R/W; therefore, a

drainage easement is not necessary. The northwest side of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; Placid fine sand (#32), frequently ponded, 0 to 1 percent slopes; Basinger fine sand (#5), 0 to 2 percent slopes; and Smyrna fine sand (#42), 0 to 2 percent slopes. The hydrologic soil group classifications are Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Basinger/Smyrna and Samsula/Placid soils, respectively.

According to SFWMD, the existing land use at the site is improved pastures with small portions of upland mixed coniferous/hardwood and pine flatwoods. Wetland mitigation is anticipated for this site, as there are 2.95 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 2_B

This pond site is located on one parcel on the east side of the OPE mainline roadway. The pond site consists of 23.0 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The northwest side of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; Placid fine sand (#32), frequently ponded, 0 to 1 percent slopes; Basinger fine sand (#5), 0 to 2 percent slopes; Smyrna fine sand (#42), 0 to 2 percent slopes; and Immokalee fine sand (#16), 0 to 2 percent slopes. The hydrologic soil group classifications are Type A/D and Type B/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Basinger/Smyrna/Immokalee and Samsula/Placid soils, respectively.

According to SFWMD, the existing land use at the site is improved pastures and pine flatwoods. Wetland mitigation is anticipated for this site, as there are 0.22 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 502_207D-003 & Basin 502_207D-004

Basin 502_207D_003 and Basin 502_207D_004 have been combined and pond locations were provided for the combined basins. The combined basins are located in the vicinity of Cyrils Drive and are just south of the Split Oak Forest. These basins are located almost entirely within the Lake Center Outlet (WBID 3174F), but a small portion is within the C-29A Canal basin (WBID 3171EA). These WBIDs are not impaired. Basins 502_207D_003 and 502_207D_004 include a total area of 117.3 acres, which includes an additional 52.6 acres of impervious area. The required treatment volume is 10.9 ac-ft, which is controlled by the impervious area. This portion of the proposed alternative is estimated to impact 55.3 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 83.8 ac-ft for treatment, attenuation, and FPC volume. The estimated required pond area for this sub-basin is 37.3 acres. However, if a separate FPC site is provided, the required area for the FPC site and the separate pond site (for treatment and attenuation only) is 16.8 acres and 14.6 acres, respectively.

Three potential wet detention pond sites, Pond 3_A, 3_B, and 3_C and one FPC site, FPC_3A, have been identified within the basin. One site, Pond 3_A, is located within a remnant parcel within the OPE mainline footprint, and the other three are off-site pond locations. The three pond options for this basin includes the following combinations: Pond 3_A (remnant parcel pond) with FPC site, FPC_3A; Pond 3_A (remnant parcel pond) with Pond 3_B (off-site pond); and Pond 3_A (remnant parcel pond) with Pond 3_C (off-site pond). Refer to **Figure D.3a**, **Figure D.3b**, and **Figure D.3c** in **Appendix A** for the pond locations.

Pond Option 1 (Pond 3_A and FPC_3_A); Pond Option 2 (Pond 3_A and Pond 3_B); and Pond Option 3 (Pond 3_A and Pond 3_C) have an estimated construction cost of $4,099,547, 6,894,314, and $6,766,825, respectively. The construction cost for FPC sites, FPC_3_A, was provided as part of Pond Option 1. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 4B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that all three of the pond options can provide sufficient treatment, attenuation, and FPC within the estimated pond design depth and footprint. Preliminary results are based on assumptions; and it is suggested to have further detailed analysis to confirm the chosen pond option will meet criteria during final design.

Pond Site 3_A

This pond site is located on a remnant parcel within the mainline OPE R/W. The pond site consists of 16.3 acres of property, which is within the OPE R/W footprint; therefore, a drainage easement is not necessary. The site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are buildings/residences present on the existing parcels which may indicate the presence of minor utilities.

The soils encountered at this site are Myakka fine sand (#22), 0 to 2 percent slopes, Immokalee fine sand (#16); 0 to 2 percent slopes; Basinger fine sand (#5), 0 to 2 percent slopes; Hontoon muck (#15), frequently ponded, 0 to 1 percent slopes; Pomello fine sand (#34), 0 to 5 percent slopes; Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; and Basinger fine sand (#6), depressional, 0 to 1 percent slopes. The hydrologic soil group classifications are Type A, Type A/D, and Type B/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Myakka/Immokalee/Basinger and Hontoon/Samsula/Basinger depressional soils, respectively. Pomello soils have an estimated SHGWT of three-feet below the natural ground.

According to SFWMD, the existing land use at the site is improved pastures, mixed wetland hardwoods, pine flatwoods, herbaceous (dry prairie), upland mixed coniferous/ hardwood, mixed shrubs, cypress-mixed hardwoods, unimproved pastures, and freshwater marshes/Graminoid prairie – marsh. Wetland mitigation is anticipated if this site is utilized as there are 4.43 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 3_B

This pond site is located on three parcels on the south side of the OPE mainline roadway. The pond site consists of 23.4 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The northeast corner of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are no apparent major utilities present on the property although there are buildings/residence present on the site which indicates minor utilities may be present. There are apparent overhead power lines along Absher Road R/W which is on the west side and outside of the potential pond footprint.

The soils encountered at this site are Myakka fine sand (#22), 0 to 2 percent slopes, frequently ponded, 0 to 1 percent slopes; Pomello fine sand (#34), 0 to 5 percent slopes; Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; and Immokalee fine sand (#16), 0 to 2 percent

slopes. The hydrologic soil group classifications are Type A, Type A/D and Type B/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Myakka/Immokalee and Samsula soils, respectively. Pomello soils have an estimated SHGWT of three-feet below the natural ground.

According to SFWMD, the existing land use at the site is upland mixed coniferous/hardwood and herbaceous (dry prairie). Wetland mitigation is anticipated for this site, as there are 1.63 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Pond Site 3_C

This pond site is located on three parcels and a portion of Absher Road R/W on the south side of the OPE mainline roadway. The pond site consists of 22.8 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The west side and the northeast corner of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are apparent utilities present on the property in the form of overhead power lines within Absher Road R/W, and there are buildings/residence present on the site which indicates minor utilities may be present.

The soils encountered at this site are Hontoon muck (#15), frequently ponded, 0 to 1 percent slopes; Myakka fine sand (#22), 0 to 2 percent slopes, frequently ponded, 0 to 1 percent slopes; Pomello fine sand (#34), 0 to 5 percent slopes; Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; and Immokalee fine sand (#16), 0 to 2 percent slopes. The hydrologic soil group classifications are Type A, Type A/D and Type B/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Myakka/Immokalee and Hontoon/Samsula soils, respectively. Pomello soils have an estimated SHGWT of three-feet below the natural ground.

According to SFWMD, the existing land use at the site is mixed wetland hardwoods, freshwater marshes/graminoid prairie – marsh, upland mixed coniferous/hardwood and herbaceous (dry prairie). Wetland mitigation is anticipated for this site, as there are 6.53 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

FPC Site 3_A

This pond site is located on two parcels and a portion of Absher Road R/W on the south side of the OPE mainline roadway. The pond site consists of 17.2 acres of property, which is adjacent to the road R/W; therefore, a drainage easement is not necessary. The west side and the northeast corner of the site is located within the 100-year FEMA floodplain, Zone A, so additional pond area for FPC may be required for this site. There are apparent utilities present on the property in the form of overhead power lines within Absher Road R/W, and there are buildings/residence present on the site which indicates minor utilities may be present.

The soils encountered at this site are Hontoon muck (#15), frequently ponded, 0 to 1 percent slopes; Myakka fine sand (#22), 0 to 2 percent slopes, frequently ponded, 0 to 1 percent slopes; Pomello fine sand (#34), 0 to 5 percent slopes; Samsula muck (#40), frequently ponded, 0 to 1 percent slopes; and Immokalee fine sand (#16), 0 to 2 percent slopes. The hydrologic soil group classifications are Type A, Type A/D and Type B/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Myakka/Immokalee and Hontoon/Samsula soils, respectively. Pomello soils have an estimated SHGWT of three-feet below the natural ground.

According to SFWMD, the existing land use at the site is mixed wetland hardwoods, freshwater marshes/graminoid prairie – marsh, upland mixed coniferous/hardwood and herbaceous (dry prairie). Wetland mitigation is anticipated for this site, as there are 4.34 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

Basin 502_207D-005

Basin 502_207D_005 continues to the south and ends with an interchange with Cyrils Drive Extension. The basin is located within the Lake Center Outlet (WBID 3174F), which is not impaired. Basin 502_207D_005 includes a total area of 43.9 acres, which includes an additional 15.2 acres of impervious area. The required treatment volume is 3.7 ac-ft, which is controlled by the basin area. This portion of the proposed alternative is estimated to impact 0.8 ac-ft of floodplain storage. This basin requires a pond site that can accommodate 5.7 ac-ft for

treatment, attenuation, and FPC volume. The estimated required pond area for this sub-basin is 3.4 acres.

One potential wet detention pond site, Pond 5_A has been identified within the basin. This site is an interchange pond location. Refer to **Figure D.4** in **Appendix A** for the pond location.

Pond 5_A (Option 1) has an estimated construction cost of $1,262,272. The construction costs are for comparison purposes only, and are not all inclusive to the total cost of constructing the pond site; they include estimates for excavation, sodding, pipe, structures, and clearing & grubbing. The cost of R/W acquisition is not included in the pond cost for this study. Please see **Table ES 4B** and **Appendix C** for supporting documentation for cost estimates.

The preliminary results indicate that the one pond option can provide sufficient treatment and attenuation within the estimated pond design depth and footprint. Preliminary results are based on assumptions; and it is suggested to have further detailed analysis to confirm that the chosen pond option will meet criteria during final design.

Pond Site 5_A

This pond site is located on a remnant parcel within the mainline OPE interchange with Cyrils Drive. The pond site consists of 12.4 acres of property, which is within the interchange; therefore, a drainage easement is not necessary. The site is located within the 100-year FEMA floodplain, Zone AE, so additional pond area for FPC may be required for this site. There are no apparent utilities present on the property.

The soils encountered at this site are Hontoon muck (#15), frequently ponded, 0 to 1 percent slopes; and Smyrna fine sand (#42), 0 to 2 percent slopes. The hydrologic soil group classifications are Type A/D, according to the USDA NRCS, and have an estimated SHGWT of one-foot below the natural ground and at natural ground (0-foot depth) for Smyrna and Hontoon soils, respectively.

According to SFWMD, the existing land use at the site is pine flatwoods, freshwater marshes/Graminoid prairie – marsh, and wetland forested mixed. Wetland mitigation is anticipated if this site is utilized as there are 10.44 acres of wetlands identified at this location per the National Wetland Inventory. There is no specific wildlife data found in or adjacent to this site. Potential listed species in Osceola County are mentioned within the second and third paragraphs under Section 6.3.4, Split Oak Avoidance Alternative.

There are no DEP Petroleum Cleanup sites in the vicinity, therefore, it does not appear that the site will pose a contamination risk. No wells, as identified by FGS, were identified within 500-feet of the proposed pond footprint. There are also no cultural/historic resources within a 500-foot buffer of the potential parcel take.

7. Conclusion

The following **Tables 7A** and **7B** summarize the recommended pond sites for the preferred Lake Nona Alternative (404B) and Split Oak Minimization Alternative (500-107C-1):

TABLE 7 - LAKE NONA ALTERNATIVE (404B) RECOMMENDED POND OPTIONS

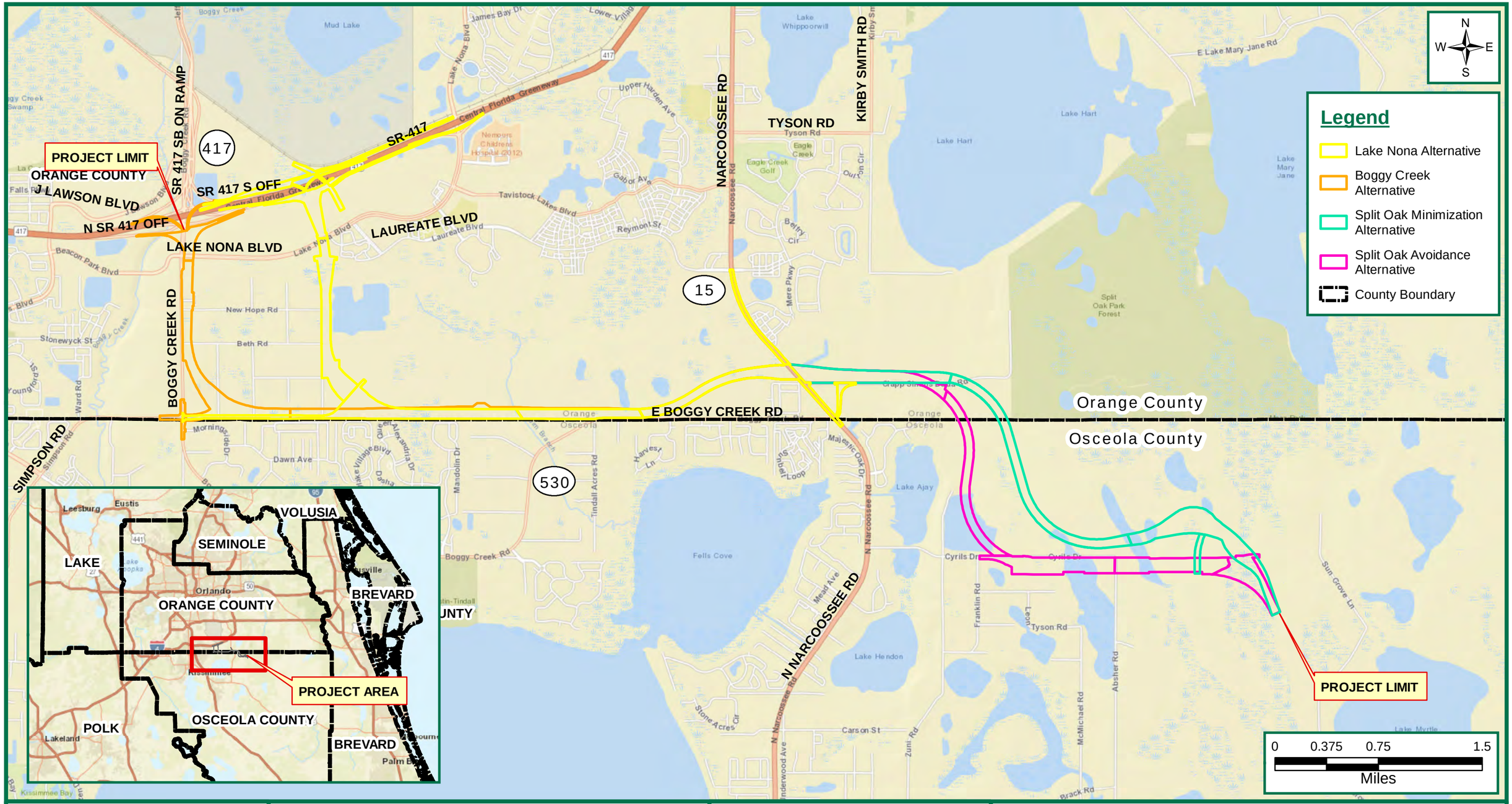
Basin	Recommended Pond Option	Sites within Recommended Pond Option
404B-417	1	Pond 417_A
404B-001	1	Ponds 1_A, 1_C, and 1_D
404B-002	1	Pond 2_A
404B-003	2	Ponds 3_A, 3_B, and 3_D, FPC_3_A
404B-004	1	Pond 4_A
404B-005	1	Pond 5_A
404B-006	1	Pond 6_A

TABLE 8 - SPLIT OAK MINIMIZATION ALTERNATIVE (500-107C-1) RECOMMENDED POND OPTIONS

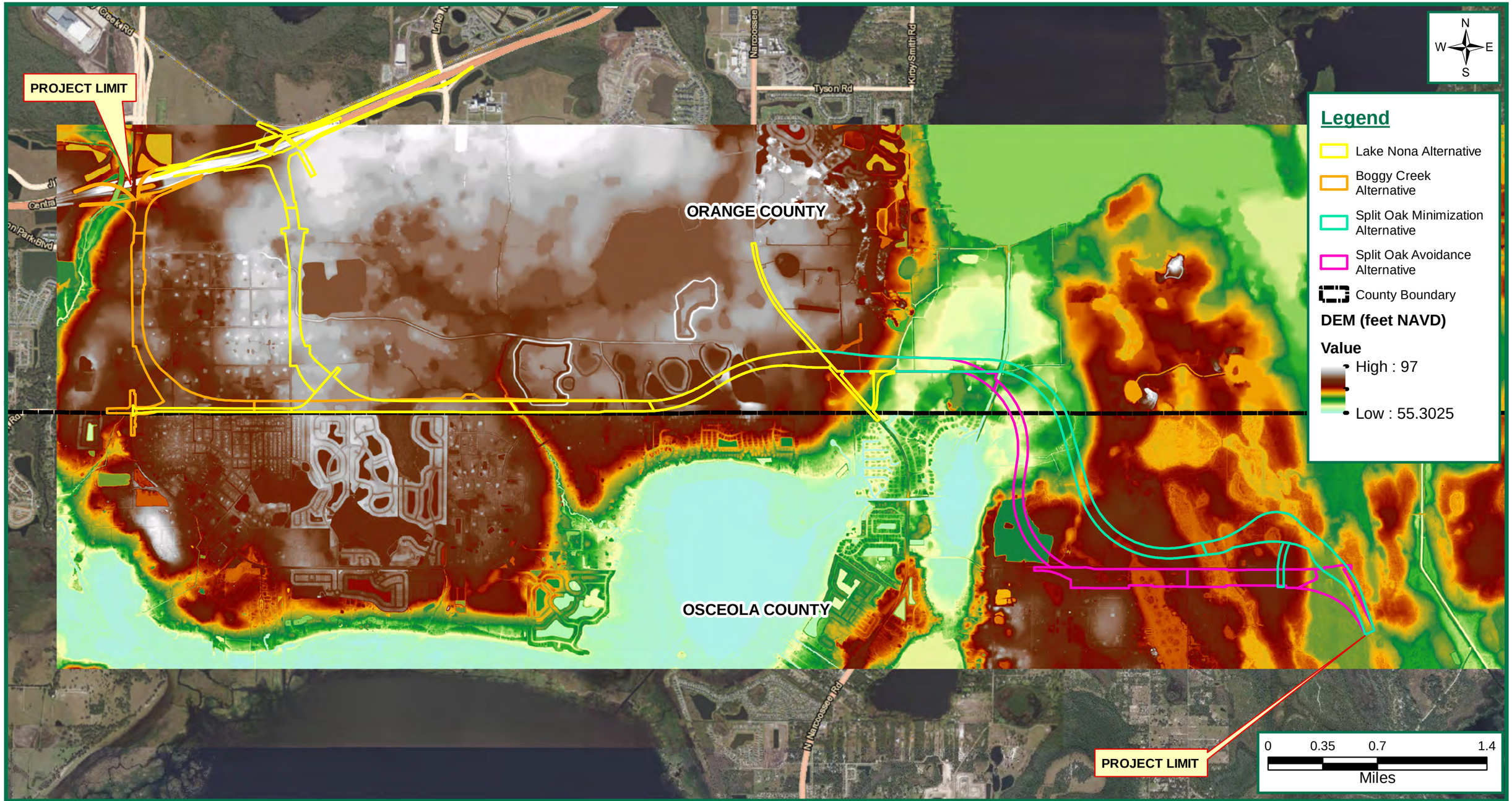
Basin	Recommended Pond Option	Sites within Recommended Pond Option
500_107C-1_001	2	Ponds 1_A and 1_D
500_107C-1_002	1	Pond 2_A, FPC_2_B
500_107C-1_003	1	Pond 3_A
500_107C-1_004	1	Pond 4_A

Appendix A

Maps and Figures



The Balmoral Group 165 Lincoln Avenue Winter Park, Florida 32789	**FIGURE 1** **PROJECT LOCATION MAP**	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	**OSCEOLA PARKWAY EXTENSION** **FROM SR 417 TO CYRILS DRIVE** **CFX PD&E Study** **ORANGE & OSCEOLA COUNTY, FLORIDA**



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165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE 2

DIGITIAL ELEVATION MODEL MAP

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCEOLA COUNTY, FLORIDA

Narcoossee (1970)
Saint Cloud North (1987)
Pine Castle (1980)
Narcoossee (1980)

N
W E
S

Legend

- Lake Nona Alternative
- Boggy Creek Alternative
- Split Oak Minimization Alternative
- Split Oak Avoidance Alternative
- Section - Township - Range
- County Boundary

0 0.35 0.7 1.4
Miles

The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

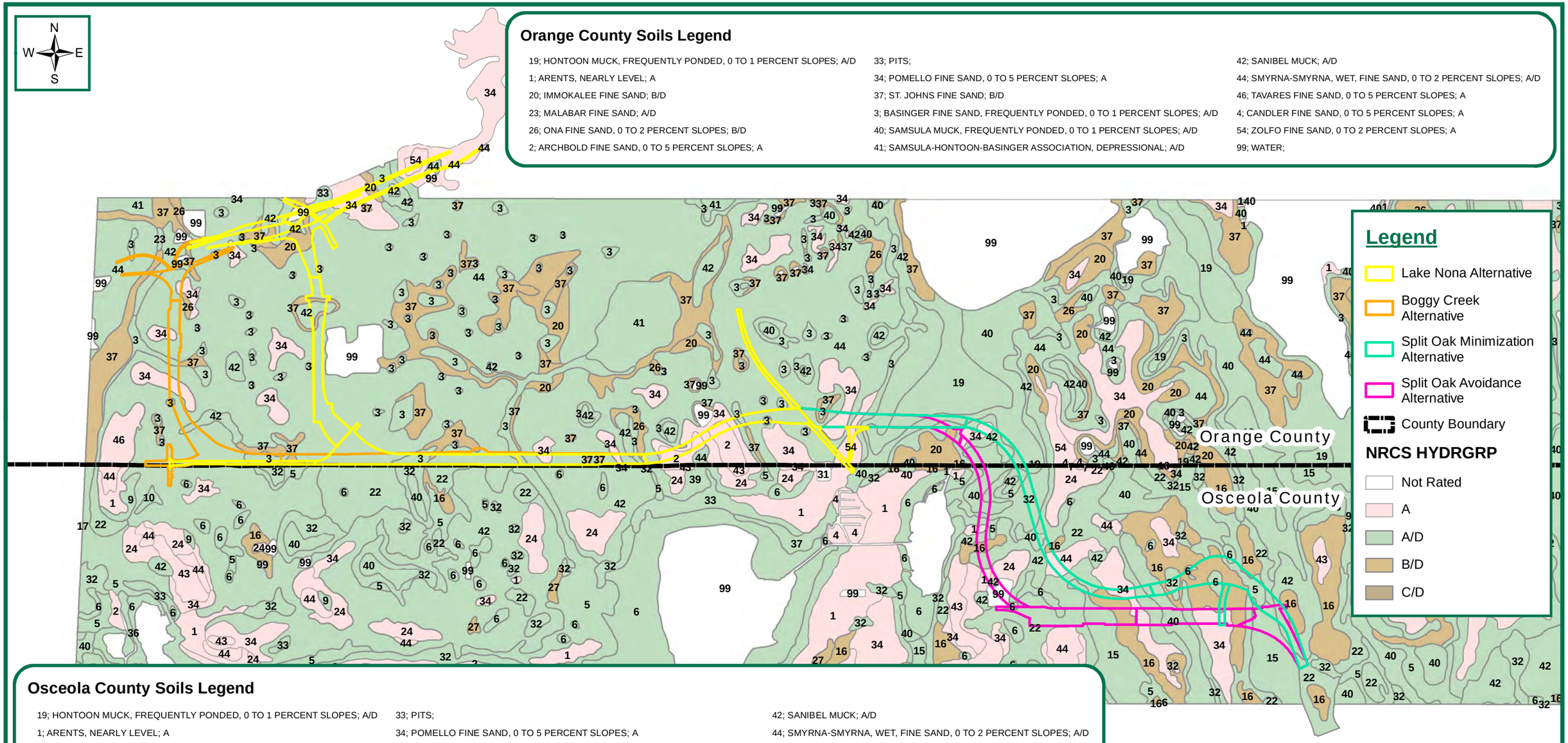
FIGURE 3

USGS QUADRANGLE MAP

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCEOLA COUNTY, FLORIDA



Orange County Soils Legend

19; HONTOON MUCK, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES; A/D
1; ARENTS, NEARLY LEVEL; A
20; IMMOKALEE FINE SAND; B/D
23; MALABAR FINE SAND; A/D
26; ONA FINE SAND, 0 TO 2 PERCENT SLOPES; B/D
2; ARCHBOLD FINE SAND, 0 TO 5 PERCENT SLOPES; A
33; PITS;
34; POMELLO FINE SAND, 0 TO 5 PERCENT SLOPES; A
37; ST. JOHNS FINE SAND; B/D
3; BASINGER FINE SAND, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES; A/D
40; SAMSULA MUCK, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES; A/D
41; SAMSULA-HONTOON-BASINGER ASSOCIATION, DEPRESSIONAL; A/D
42; SANIBEL MUCK; A/D
44; SMYRNA-SMYRNA, WET, FINE SAND, 0 TO 2 PERCENT SLOPES; A/D
46; TAVARES FINE SAND, 0 TO 5 PERCENT SLOPES; A
4; CANDLER FINE SAND, 0 TO 5 PERCENT SLOPES; A
54; ZOLFO FINE SAND, 0 TO 2 PERCENT SLOPES; A
99; WATER;

Osceola County Soils Legend

19; HONTOON MUCK, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES; A/D
1; ARENTS, NEARLY LEVEL; A
20; IMMOKALEE FINE SAND; B/D
23; MALABAR FINE SAND; A/D
26; ONA FINE SAND, 0 TO 2 PERCENT SLOPES; B/D
2; ARCHBOLD FINE SAND, 0 TO 5 PERCENT SLOPES; A
33; PITS;
34; POMELLO FINE SAND, 0 TO 5 PERCENT SLOPES; A
37; ST. JOHNS FINE SAND; B/D
3; BASINGER FINE SAND, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES; A/D
40; SAMSULA MUCK, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES; A/D
41; SAMSULA-HONTOON-BASINGER ASSOCIATION, DEPRESSIONAL; A/D
42; SANIBEL MUCK; A/D
44; SMYRNA-SMYRNA, WET, FINE SAND, 0 TO 2 PERCENT SLOPES; A/D
46; TAVARES FINE SAND, 0 TO 5 PERCENT SLOPES; A
4; CANDLER FINE SAND, 0 TO 5 PERCENT SLOPES; A
54; ZOLFO FINE SAND, 0 TO 2 PERCENT SLOPES; A
99; WATER;

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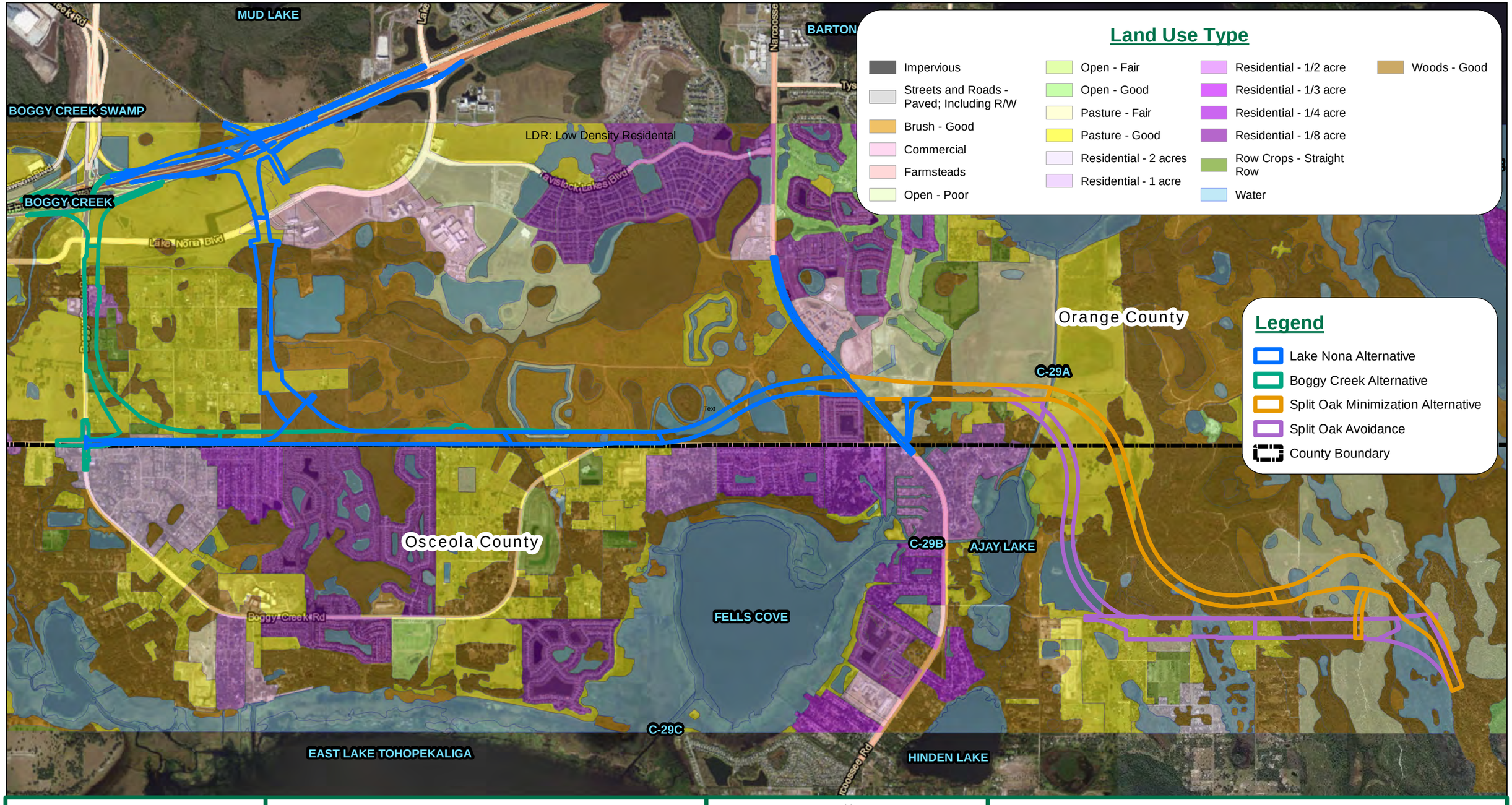
FIGURE 4

NRCS SOILS MAP

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCEOLA COUNTY, FLORIDA



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165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE 5A

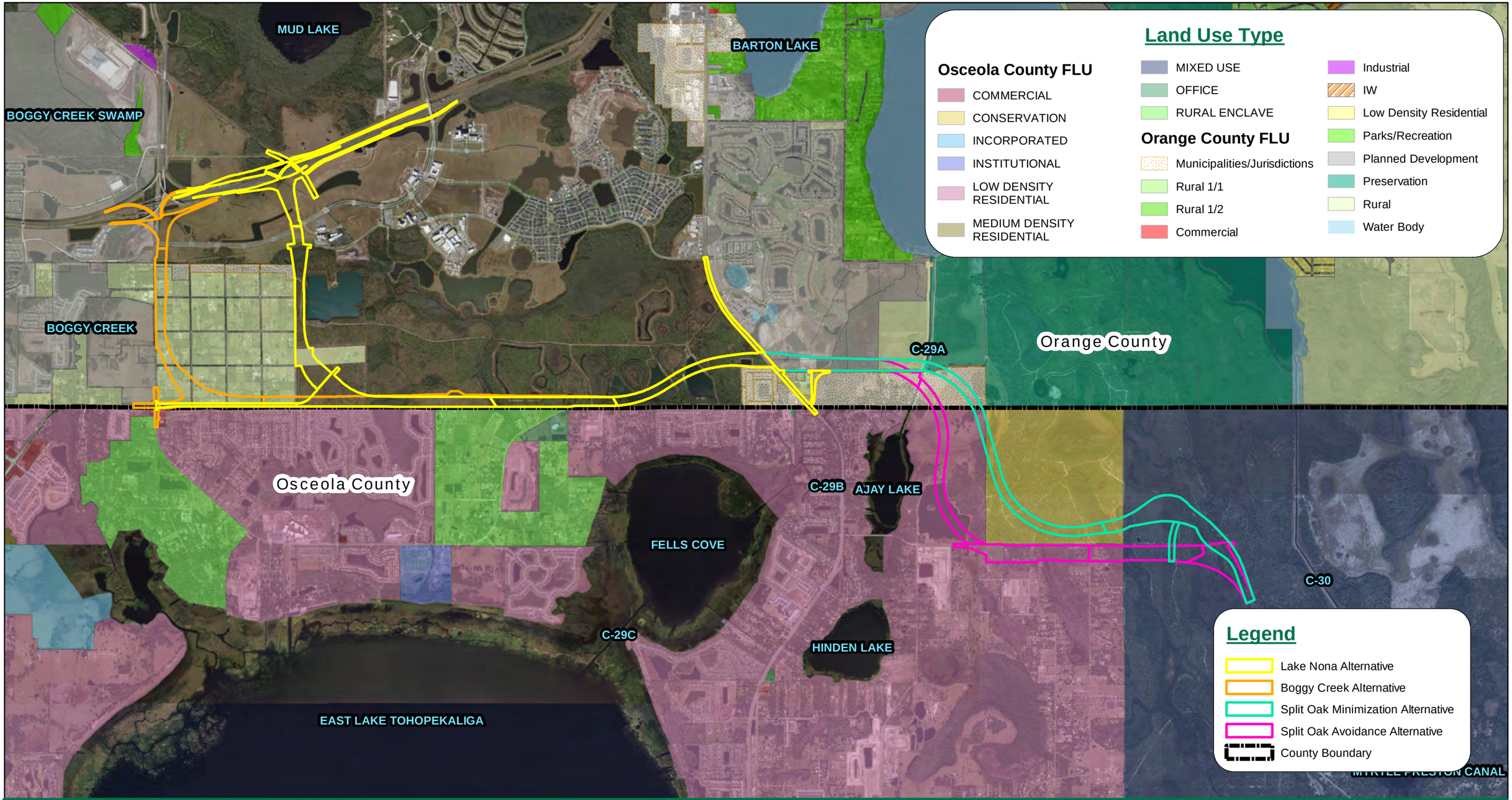
EXISTING LAND USE MAP

N
W E
S

0 0.3 0.6 1.2
Miles

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCEOLA COUNTY, FLORIDA



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE 5B

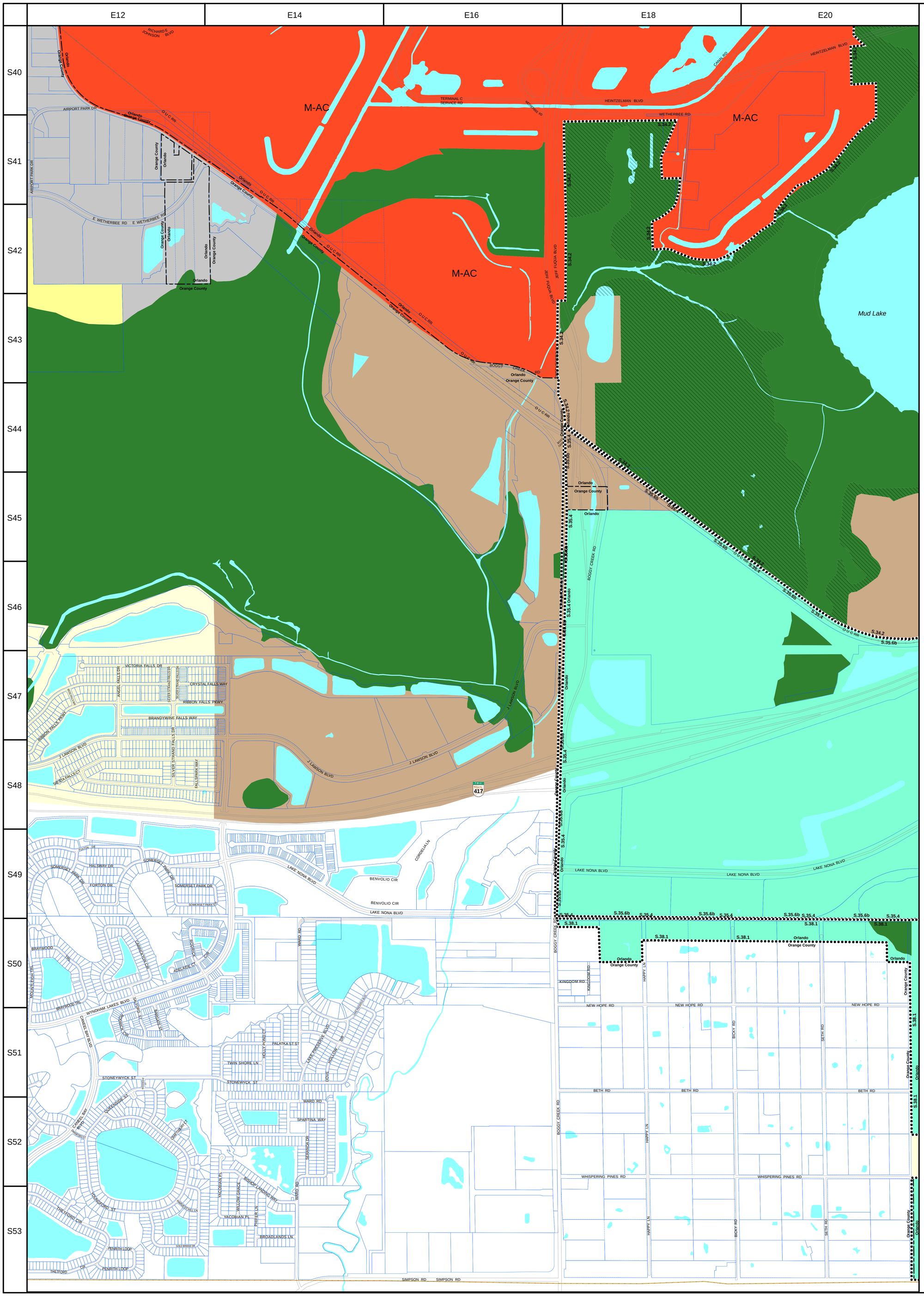
FUTURE LAND USE MAP

N
W E
S

0 0.375 0.75 1.5
Miles

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCEOLA COUNTY, FLORIDA



City of Orlando
Future Land Use
Map Series
Economic Development Department
City Planning Division

Future Land Use Map 24

Map 24 Effective Date: October 17, 2019
Updated Through 19-03ESR

LEGEND

Residential Low Intensity
Max.: 12 DU/Acre and/or 0.30 FAR
Min.: None

Residential Medium Intensity
Max.: 30 DU/Acre and/or 0.30 FAR
Min.: 12 DU/Acre

Residential High Intensity
Max.: 200 DU/Acre and/or 0.35 FAR
Min.: 30 DU/Acre

Mixed Use/Neighborhood Development
Max.: 12 DU/Acre and/or 0.4 FAR
Min.: None

Office Low Intensity
Max.: 21 DU/Acre and/or 0.4 FAR
Min.: None

Office Medium Intensity
Max.: 40 DU/Acre and/or 0.7 FAR
Min.: 12 DU/Acre and/or 0.3 FAR

Office High Intensity
Max.: 200 DU/Acre and/or 1.0 FAR
Min.: 30 DU/Acre and/or 0.4 FAR

Mixed Use Corridor Medium Intensity
Max.: 30 DU/Acre and/or 0.5 FAR
Min.: 15 DU/Acre

Mixed Use Corridor High Intensity
Max.: 200 DU/Acre and/or 1.0 FAR
Min.: 30 DU/Acre and/or 0.4 FAR

N-AC — **Neighborhood Activity Center**
Max.: 30 DU/Acre and/or 0.3 FAR
Min.: 15 DU/Acre

C-AC — **Community Activity Center**
Max.: 40 DU/Acre and/or 0.7 FAR
Min.: 20 DU/Acre and/or 0.35 FAR

U-AC — **Urban Activity Center**
Max.: 100 DU/Acre and/or 1.0 FAR
Min.: 30 DU/Acre and/or 0.5 FAR

M-AC — **Metropolitan Activity Center**
Max.: 200 DU/Acre and/or 3.0 FAR
Min.: 30 DU/Acre and/or 0.75 FAR

D-AC — **Downtown Activity Center**
Max.: 200 DU/Acre and/or 4.0 FAR
Min.: 75 DU/Acre and/or 0.75 FAR

Industrial
Max.: 40 DU/Acre **(1)** and/or 0.7 FAR
Min.: 12 DU/Acre **(1)**

Airport Support District Med. Intensity
See Goal 4 and Associated Objectives and Policies

Airport Support District High Intensity
See Goal 4 and Associated Objectives and Policies

Urban Village
Determined by Adopted GMP Subarea Policy, consistent with Future Land Use Policy 2.4.4

Public/Recreational & Institutional
Max.: None
Min.: None

Lake / Conservation
Max.: 1 DU/5 Acres; 0.05 FAR
Min.: None

Conservation
Max.: 1 DU/5 Acres; 0.05 FAR
Min.: None

Urban Reserve
Max.: 1 DU/10 Acres; 0.05 FAR
Min.: None

Transitional Wildlife Habitat Overlay

Resource Protection Overlay

2.1 — **Growth Management Plan Subarea Policy (See Future Land Use Element)**

Orlando / Orange County — **Jurisdiction Boundary**

N

0 250 500 1,000
Feet

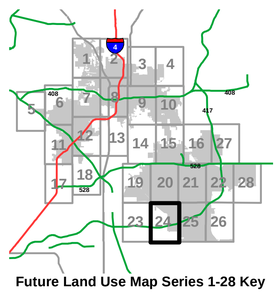
Notes/Definitions

FAR: Floor Area Ratio **DU:** Dwelling Units

GMP: Growth Management Plan

(1) Industrial Future Land Use Designation: Where allowed by the applicable Subarea Policy and Zoning District, residential uses may be allowed within the Traditional City through a Conditional Use Permit.

(2) Areas shown and assigned Future Land Use categories on the Official Future Land Use Map Series which are not within the Jurisdiction of the City of Orlando are only conceptual and do not assign any legally binding land uses to areas not within the city. Should these areas be annexed, a Growth Management Plan Amendment will be required to officially designate them on the Future Land Use Map.



Future Land Use Map Series 1-28 Key

City of Orlando / Orange County GIS (Printed: October 8, 2019)

NOTE: These maps are accurate as of the print date shown at the bottom of the legend. The maps are provided for reference only and should not be relied upon without reviewing the Official Future Land Use Map series kept in the City Planning Division, 6th Floor, Orlando City Hall.

FIGURE 5C

City of Orlando
Future Land Use
Map Series
Economic Development Department
City Planning Division

Future Land Use Map 25

Map 25 Effective Date: October 17, 2019
Updated Through 19-03ESR

LEGEND

Residential Low Intensity
Max.: 12 DU/Acre and/or 0.30 FAR
Min.: None

Residential Medium Intensity
Max.: 30 DU/Acre and/or 0.30 FAR
Min.: 12 DU/Acre

Residential High Intensity
Max.: 200 DU/Acre and/or 0.35 FAR
Min.: 30 DU/Acre

Mixed Use/Neighborhood Development
Max.: 12 DU/Acre and/or 0.4 FAR
Min.: None

Office Low Intensity
Max.: 21 DU/Acre and/or 0.4 FAR
Min.: None

Office Medium Intensity
Max.: 40 DU/Acre and/or 0.7 FAR
Min.: 12 DU/Acre and/or 0.3 FAR

Office High Intensity
Max.: 200 DU/Acre and/or 1.0 FAR
Min.: 30 DU/Acre and/or 0.4 FAR

Mixed Use Corridor Medium Intensity
Max.: 30 DU/Acre and/or 0.5 FAR
Min.: 15 DU/Acre

Mixed Use Corridor High Intensity
Max.: 200 DU/Acre and/or 1.0 FAR
Min.: 30 DU/Acre and/or 0.4 FAR

Neighborhood Activity Center
Max.: 30 DU/Acre and/or 0.3 FAR
Min.: 15 DU/Acre

Community Activity Center
Max.: 40 DU/Acre and/or 0.7 FAR
Min.: 20 DU/Acre and/or 0.35 FAR

Urban Activity Center
Max.: 100 DU/Acre and/or 1.0 FAR
Min.: 30 DU/Acre and/or 0.5 FAR

Metropolitan Activity Center
Max.: 200 DU/Acre and/or 3.0 FAR
Min.: 30 DU/Acre and/or 0.75 FAR

Downtown Activity Center
Max.: 200 DU/Acre and/or 4.0 FAR
Min.: 75 DU/Acre and/or 0.75 FAR

Industrial
Max.: 40 DU/Acre **(1)** and/or 0.7 FAR
Min.: 12 DU/Acre **(1)**

Airport Support District Med. Intensity
See Goal 4 and Associated Objectives and Policies

Airport Support District High Intensity
See Goal 4 and Associated Objectives and Policies

Urban Village
Determined by Adopted GMP Subarea Policy, consistent with Future Land Use Policy 2.4.4

Public/Recreational & Institutional
Max.: None
Min.: None

Lake / Conservation
Max.: 1 DU/5 Acres; 0.05 FAR
Min.: None

Conservation
Max.: 1 DU/5 Acres; 0.05 FAR
Min.: None

Urban Reserve
Max.: 1 DU/10 Acres; 0.05 FAR
Min.: None

Transitional Wildlife Habitat Overlay

Resource Protection Overlay

2.1 **Growth Management Plan Subarea Policy (See Future Land Use Element)**

Orlando / Orange County **Jurisdiction Boundary**

N

0 250 500 1,000
Feet

Notes/Definitions

FAR: Floor Area Ratio **DU:** Dwelling Units
GMP: Growth Management Plan

(1) Industrial Future Land Use Designation: Where allowed by the applicable Subarea Policy and Zoning District, residential uses may be allowed within the Traditional City through a Conditional Use Permit.

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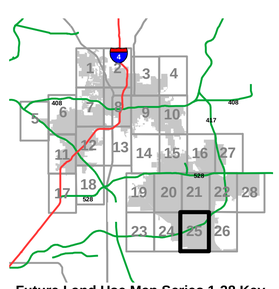

Future Land Use Map Series 1-28 Key

City of Orlando / Orange County GIS (Printed: October 8, 2019)

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FIGURE 5D

City of Orlando
Future Land Use
Map Series
Economic Development Department
City Planning Division

Future Land Use Map 26

Map 26 Effective Date: October 17, 2019
Updated Through 19-03ESR

LEGEND

Residential Low Intensity
Max.: 12 DU/Acre and/or 0.30 FAR
Min.: None

Residential Medium Intensity
Max.: 30 DU/Acre and/or 0.30 FAR
Min.: 12 DU/Acre

Residential High Intensity
Max.: 200 DU/Acre and/or 0.35 FAR
Min.: 30 DU/Acre

Mixed Use/Neighborhood Development
Max.: 12 DU/Acre and/or 0.4 FAR
Min.: None

Office Low Intensity
Max.: 21 DU/Acre and/or 0.4 FAR
Min.: None

Office Medium Intensity
Max.: 40 DU/Acre and/or 0.7 FAR
Min.: 12 DU/Acre and/or 0.3 FAR

Office High Intensity
Max.: 200 DU/Acre and/or 1.0 FAR
Min.: 30 DU/Acre and/or 0.4 FAR

Mixed Use Corridor Medium Intensity
Max.: 30 DU/Acre and/or 0.5 FAR
Min.: 15 DU/Acre

Mixed Use Corridor High Intensity
Max.: 200 DU/Acre and/or 1.0 FAR
Min.: 30 DU/Acre and/or 0.4 FAR

N-AC **Neighborhood Activity Center**
Max.: 30 DU/Acre and/or 0.3 FAR
Min.: 15 DU/Acre

C-AC **Community Activity Center**
Max.: 40 DU/Acre and/or 0.7 FAR
Min.: 20 DU/Acre and/or 0.35 FAR

U-AC **Urban Activity Center**
Max.: 100 DU/Acre and/or 1.0 FAR
Min.: 30 DU/Acre and/or 0.5 FAR

M-AC **Metropolitan Activity Center**
Max.: 200 DU/Acre and/or 3.0 FAR
Min.: 30 DU/Acre and/or 0.75 FAR

D-AC **Downtown Activity Center**
Max.: 200 DU/Acre and/or 4.0 FAR
Min.: 75 DU/Acre and/or 0.75 FAR

Industrial
Max.: 40 DU/Acre **(1)** and/or 0.7 FAR
Min.: 12 DU/Acre **(1)**

Airport Support District Med. Intensity
See Goal 4 and Associated Objectives and Policies

Airport Support District High Intensity
See Goal 4 and Associated Objectives and Policies

Urban Village
Determined by Adopted GMP Subarea Policy, consistent with Future Land Use Policy 2.4.4

Public/Recreational & Institutional
Max.: None
Min.: None

Lake / Conservation
Max.: 1 DU/5 Acres; 0.05 FAR
Min.: None

Conservation
Max.: 1 DU/5 Acres; 0.05 FAR
Min.: None

Urban Reserve
Max.: 1 DU/10 Acres; 0.05 FAR
Min.: None

Transitional Wildlife Habitat Overlay

Resource Protection Overlay

2.1 **Growth Management Plan Subarea Policy (See Future Land Use Element)**

Orlando / Orange County **Jurisdiction Boundary**

N

0 250 500 1,000
Feet

Notes/Definitions

FAR: Floor Area Ratio **DU:** Dwelling Units
GMP: Growth Management Plan

(1) Industrial Future Land Use Designation: Where allowed by the applicable Subarea Policy and Zoning District, residential uses may be allowed within the Traditional City through a Conditional Use Permit.

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Future Land Use Map Series 1-28 Key

City of Orlando / Orange County GIS (Printed: October 8, 2019)

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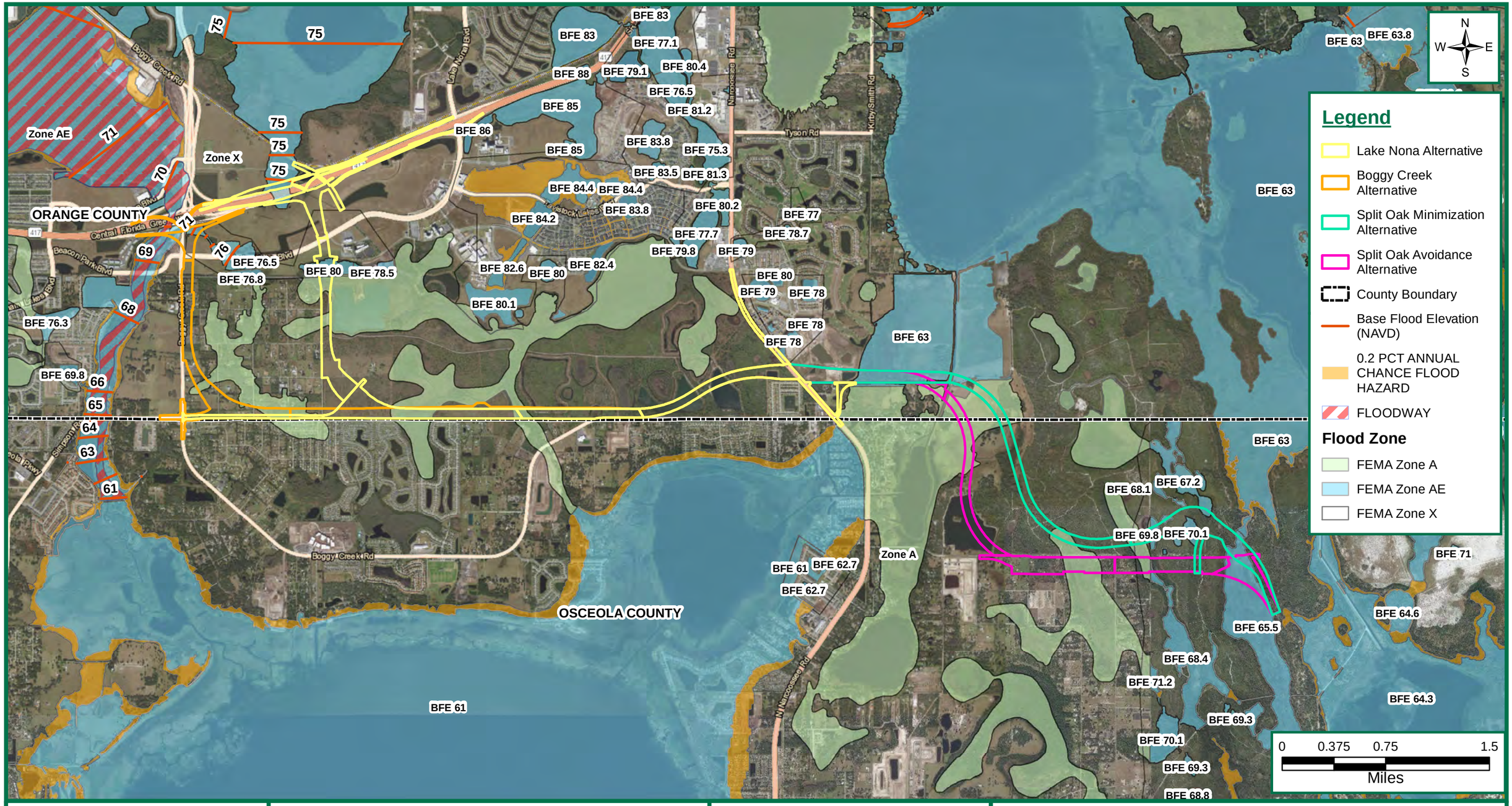
FIGURE 5E



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

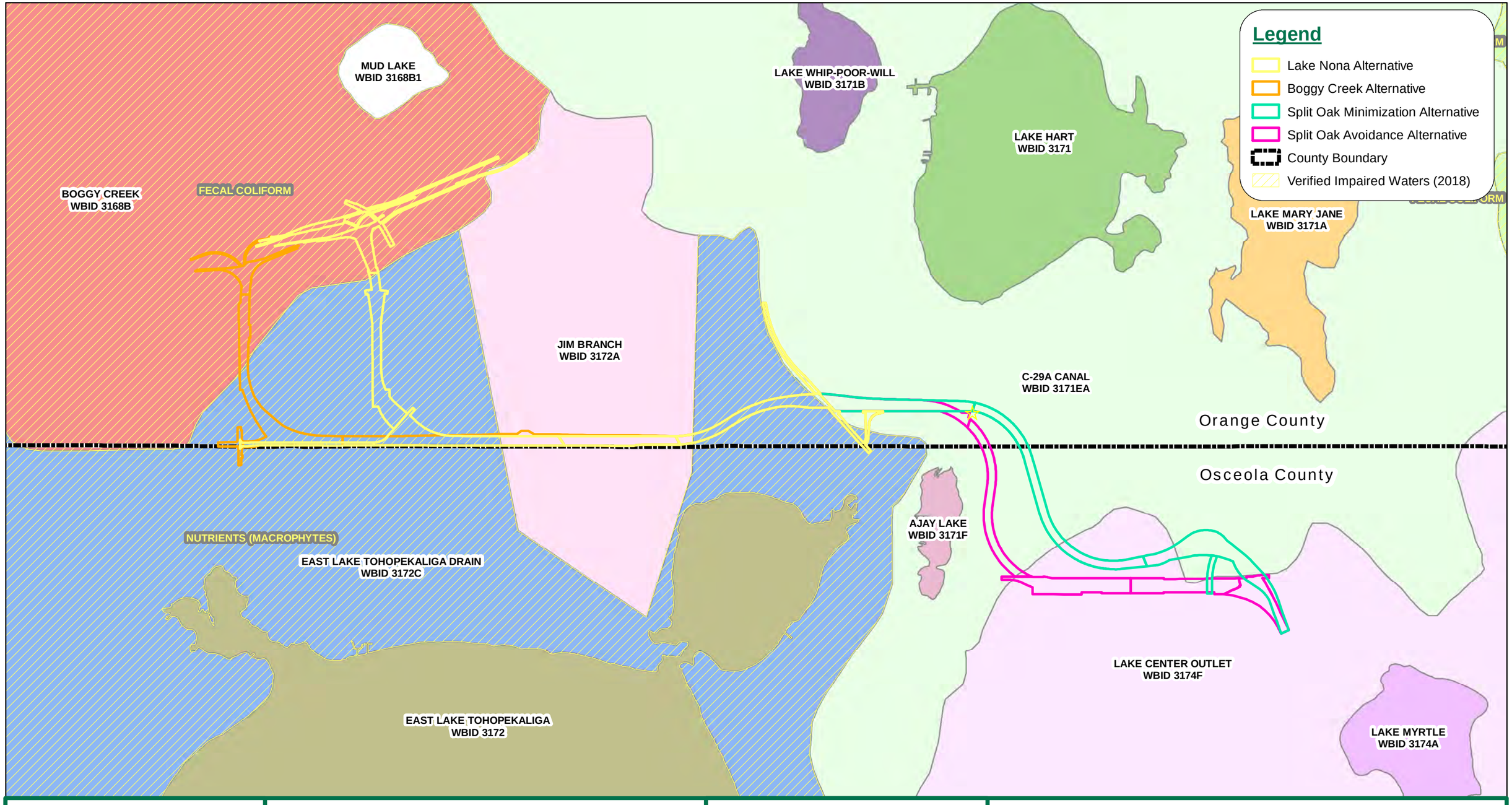
FIGURE 6

FEMA FLOODPLAIN MAP

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCEOLA COUNTY, FLORIDA



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE 7

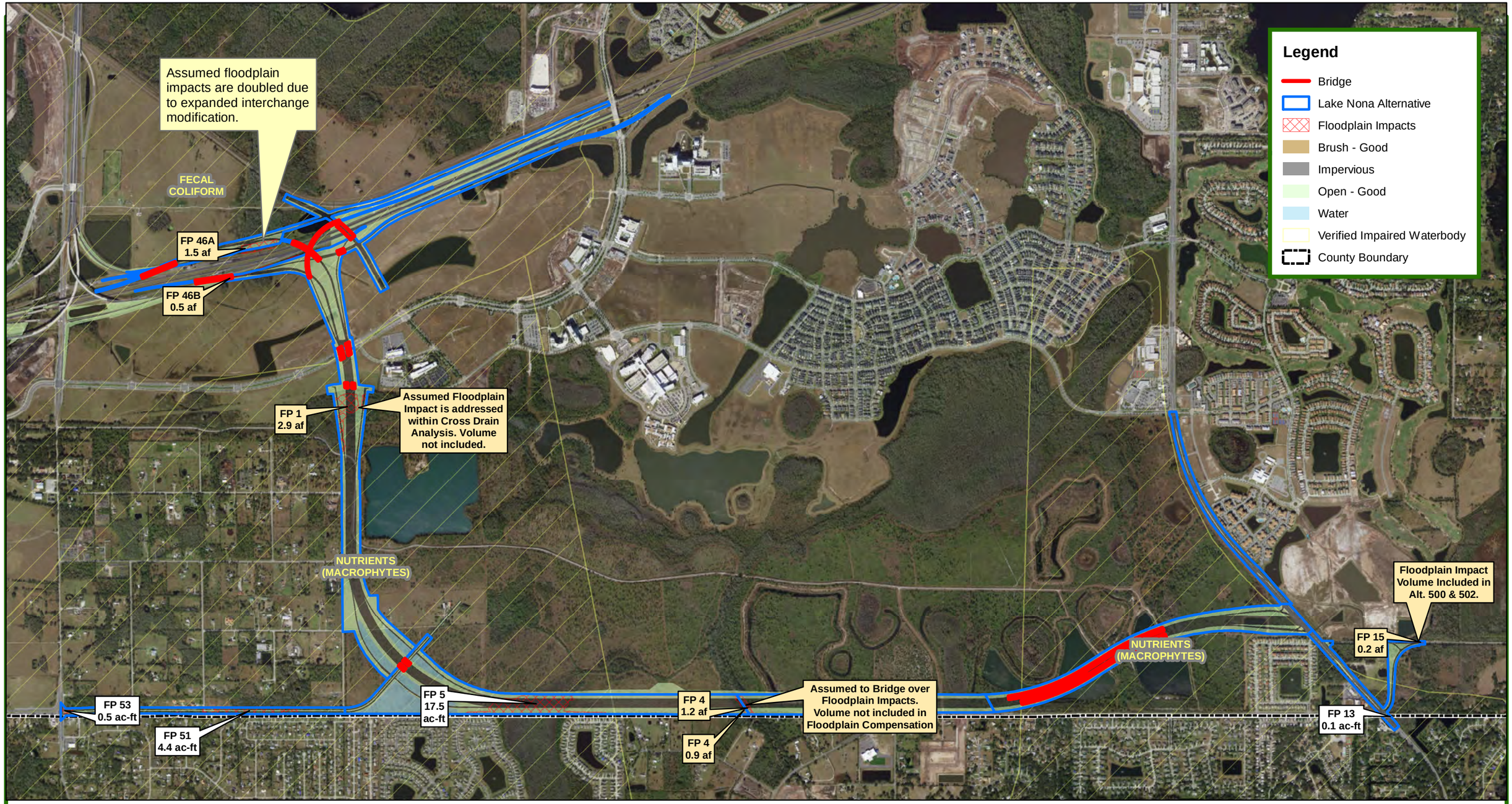
WBID MAP

N
W E
S

0 0.375 0.75 1.5 Miles

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCEOLA COUNTY, FLORIDA



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE 8

LAKE NONA ALTERNATIVE (404B) POND SIZING MAP

N
W E
S

0 0.175 0.35 0.7
Miles

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCEOLA COUNTY, FLORIDA

The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE 9

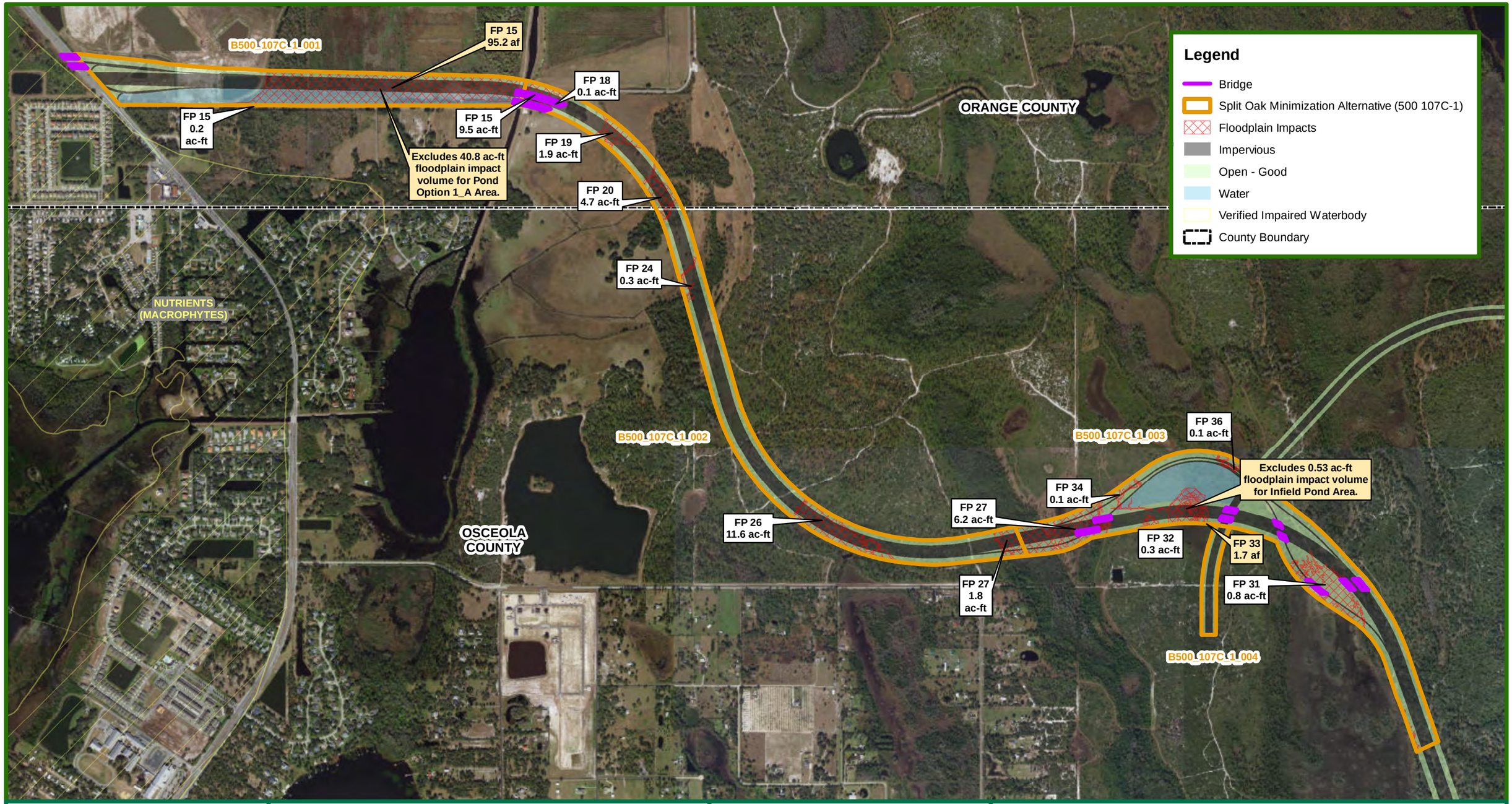
BOGGY CREEK ALTERNATIVE (405) POND SIZING MAP

N
W E
S

0 0.2 0.4 0.8
Miles

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCELOA COUNTY, FLORIDA



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE 10

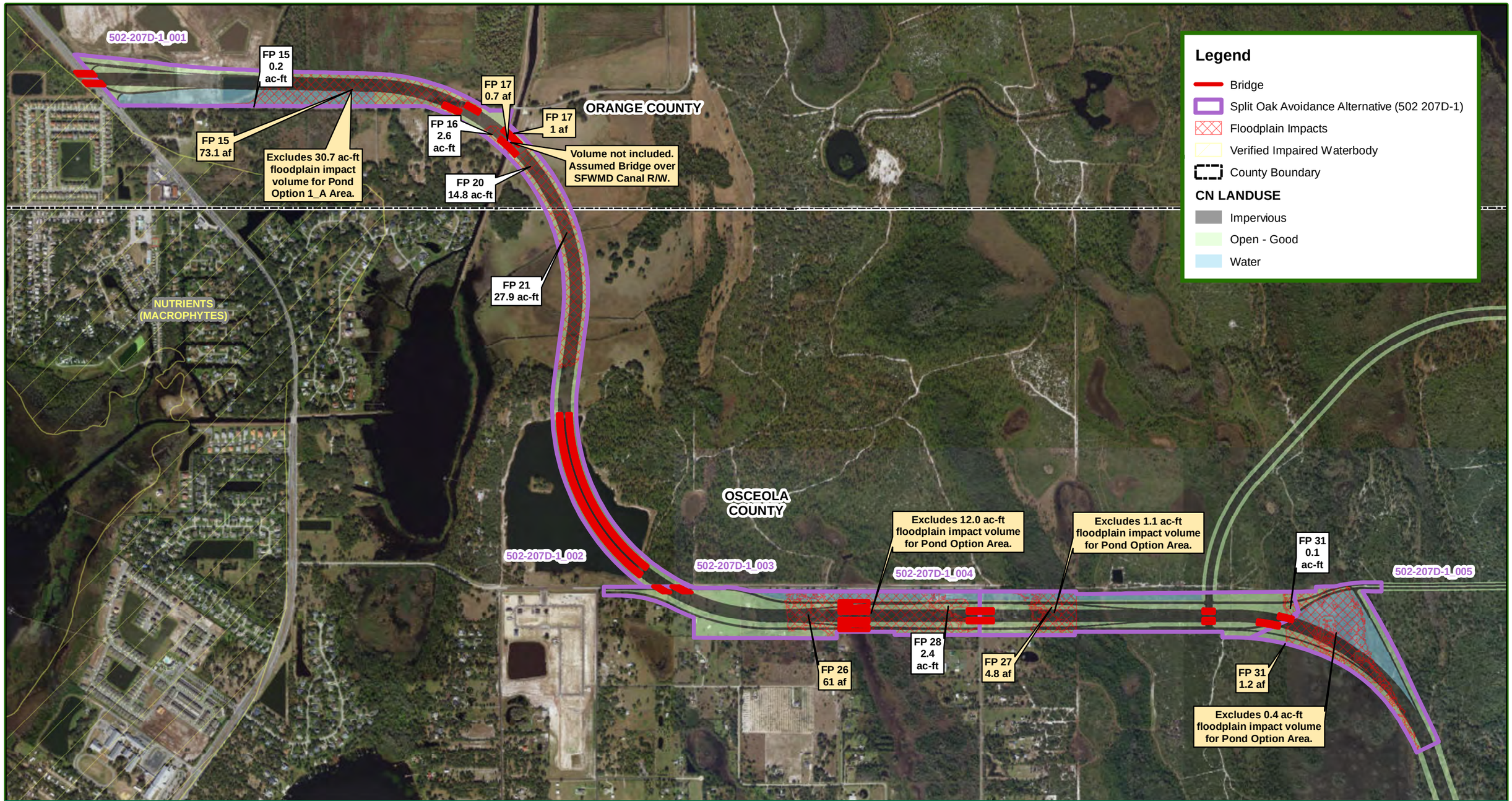
SPLIT OAK MINIMIZATION ALTERNATIVE (500 107C-1) POND SIZING MAP

N
W E
S

0 0.125 0.25 0.5
Miles

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCELOA COUNTY, FLORIDA



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE 11

SPLIT OAK AVOIDANCE ALTERNATIVE (502 207D-1) POND SIZING MAP

N
W E
S

0 0.125 0.25 0.5
Miles

OSCEOLA PARKWAY EXTENSION

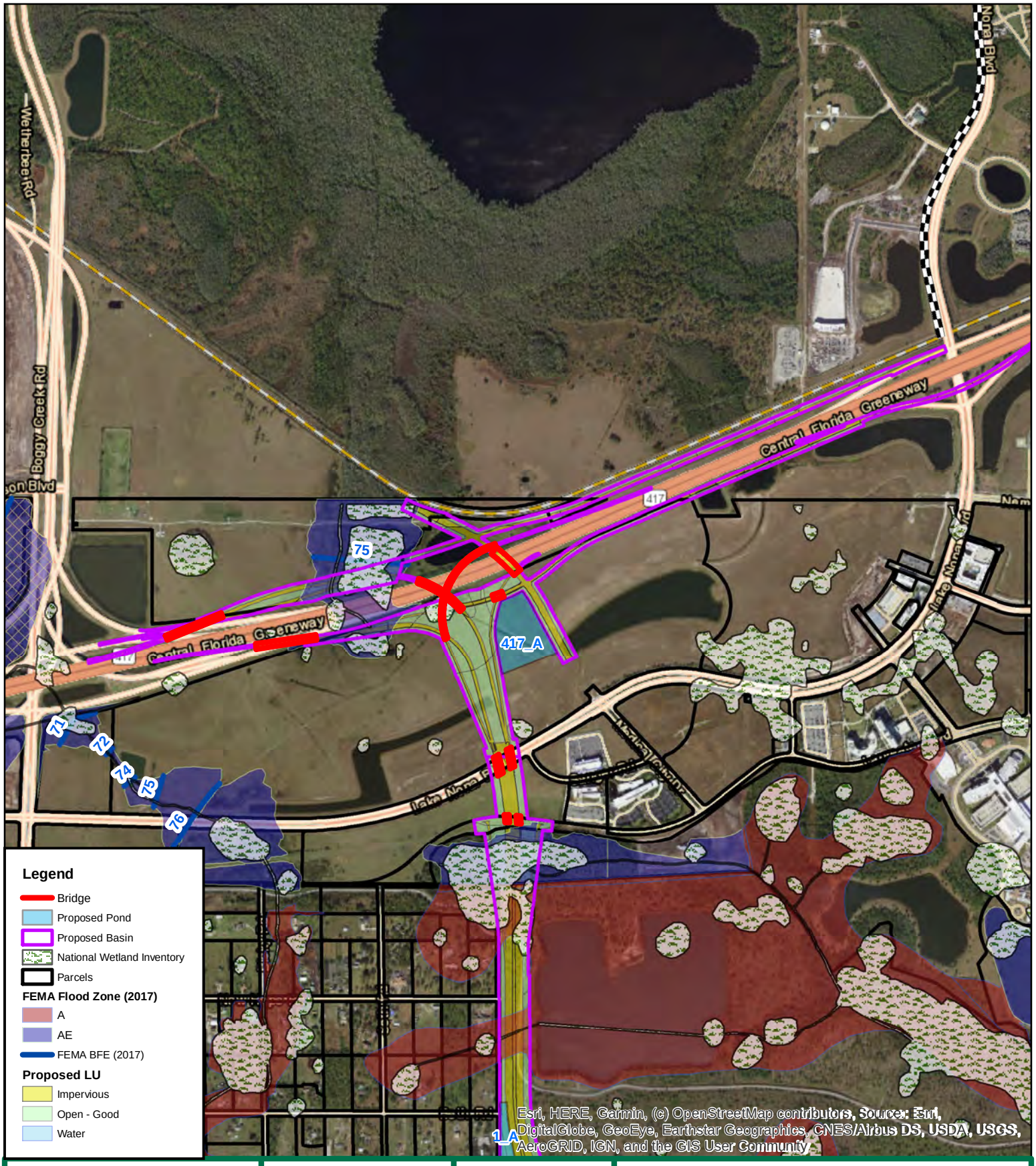
FROM SR 417 TO CYRILS DRIVE
CFX PD&E Study
ORANGE & OSCELOA COUNTY, FLORIDA

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Pond Parcel Summary

Table 1 - Lake Nona Alternative (404B)

Basin	Pond Site	Pond Area (ac)	Parcel No.	Property Owner	Total Parcel Area (ac)
B404B_001	404B_1_A	5.9	35-24-30-0000-00-011	CITY OF ORLANDO/GOAA	668.9
			35-24-30-0000-00-006	SARMIENTO LUIS	10.0
	404B_1_B	4.1	35-24-30-0000-00-006	SARMIENTO LUIS	10.0
			35-24-30-0000-00-010	CURI MARLENIS	3.7
			35-24-30-0000-00-007	CURI MARLENIS	1.3
	404B_1_C	1.9	Infield Area	--	--
	404B_1_D	3.7	Infield Area	--	--
B404B_002	404B_2_A	11.2	Infield Area	--	--
B404B_003	404B_3_A	1.8	Infield Area	--	--
	404B_3_B	4.1	Infield Area	--	--
	404B_3_C	5.2	35-24-30-0000-00-011	CITY OF ORLANDO/GOAA	668.9
	404B_3_D	5.2	35-24-30-0000-00-011	CITY OF ORLANDO/GOAA	668.9
	404B_FPC_3_A	9.7	35-24-30-0000-00-011	CITY OF ORLANDO/GOAA	668.9
	404B_FPC_3_B	9.7	35-24-30-0000-00-011	CITY OF ORLANDO/GOAA	668.9
B404B_004	404B_4_A	5.0	31-24-31-0000-00-001	TDCP LLC	992.2
	404B_4_B	4.9	01-25-30-0000-0022-0000	TDCP LLC	6.4
B404B_005	404B_5_A	4.9	31-24-31-0000-00-001	TDCP LLC	992.2
B404B_006	404B_6_A	8.8	32-24-31-0000-00-010	DIOCESE OF ORLANDO	42.4
	404B_6_B	8.2	32-24-31-0000-00-007	MASOODI NAZISH	1.2
			32-24-31-0000-00-017	MASOODI NAZISH	0.5
			32-24-31-0000-00-009	MASOODI NAZISH	0.5
			32-24-31-0000-00-018	MASOODI NAZISH	0.5
			32-24-31-0000-00-019	MASOODI NAZISH	1.1
			32-24-31-0000-00-016	MONSERRATE DIAZ TRUST	0.9
			32-24-31-0000-00-021	JACKSON RAYMOND A	0.9
			32-24-31-0000-00-020	KIRL INVESTMENTS LLC	0.9
			32-24-31-0000-00-008	ENFINGER PHYLLIS B	1.4
			32-24-31-0000-00-025	ENFINGER PHYLLIS B	8.8



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE A.1
Lake Nona Alternative (404B)

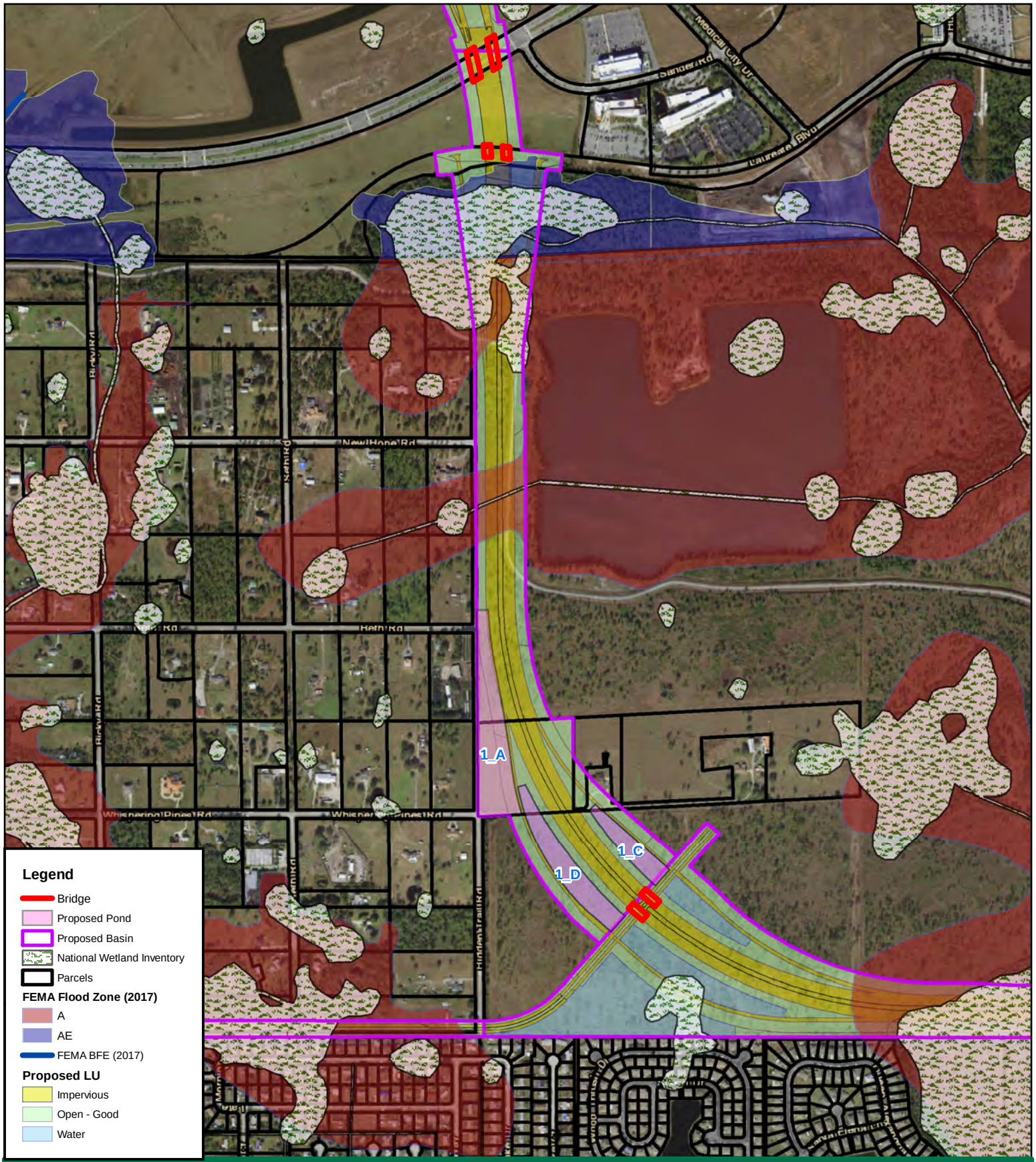
Basin 417 Pond 417_A

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 850 1,700 3,400
Feet



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE A.2a
Lake Nona Alternative (404B)

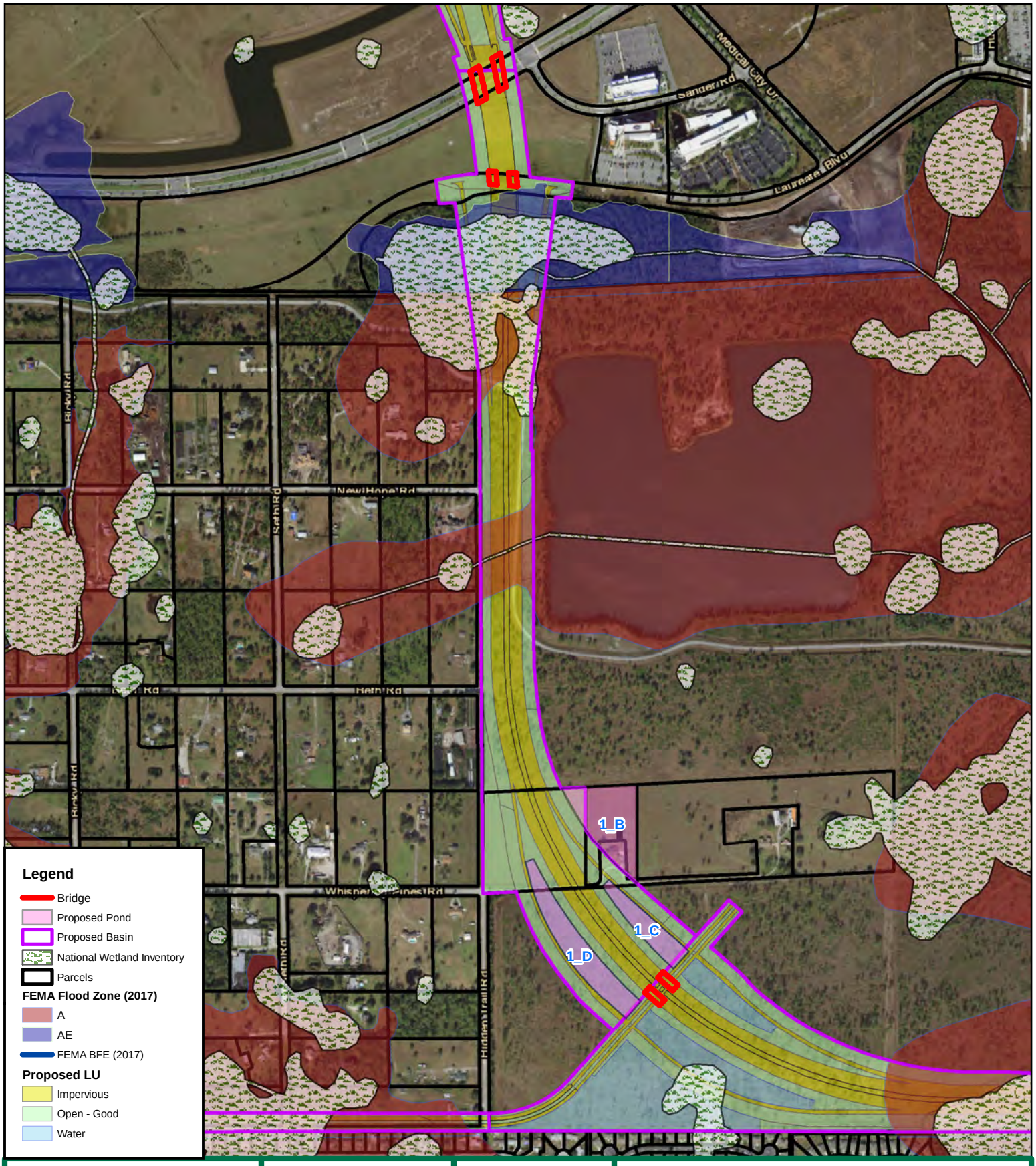
Basin 1 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000
Feet



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE A.2b
Lake Nona Alternative (404B)

Basin 1 Pond Option 2

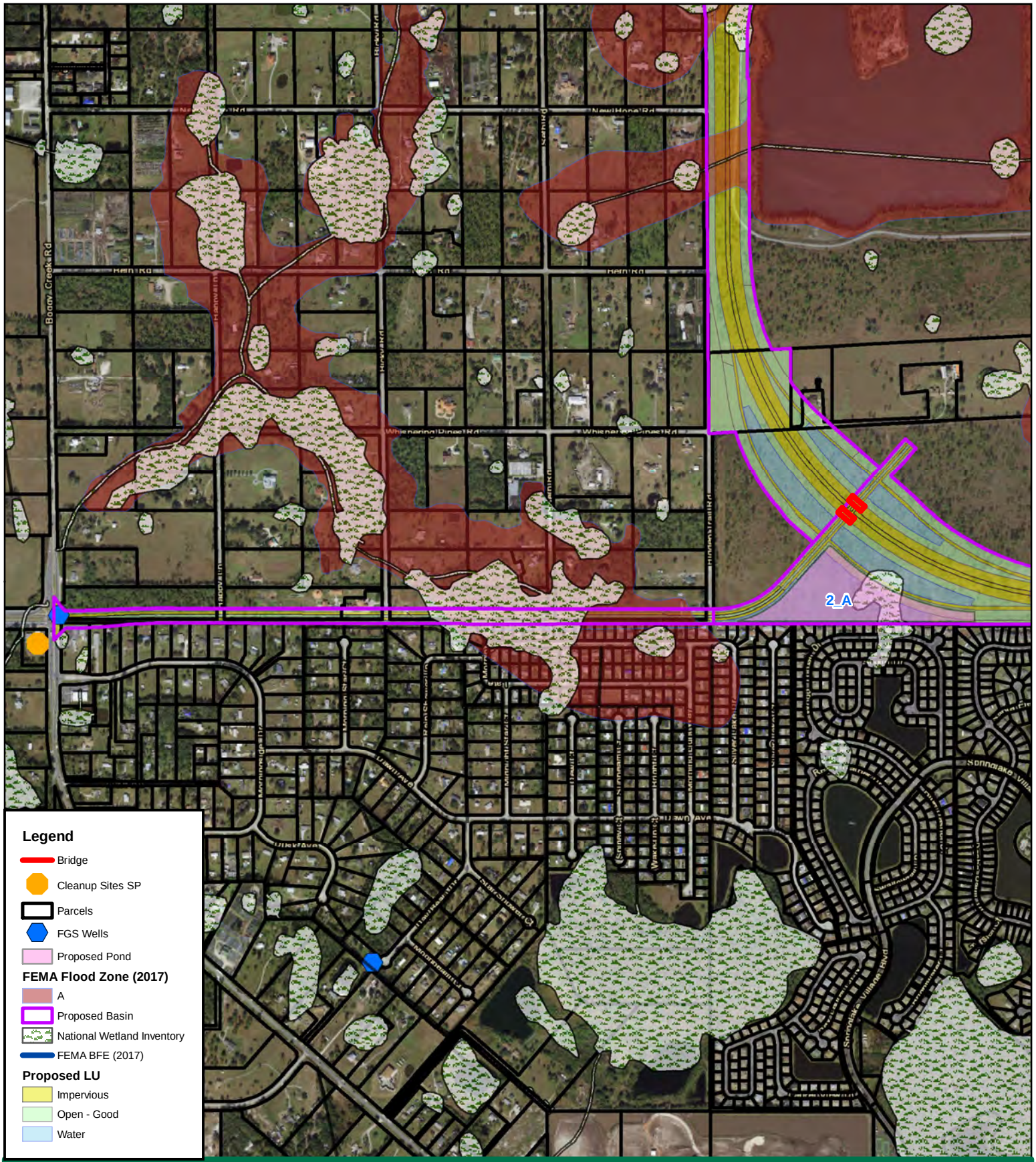
N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000
Feet

A.20



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE A.3
Lake Nona Alternative (404B)

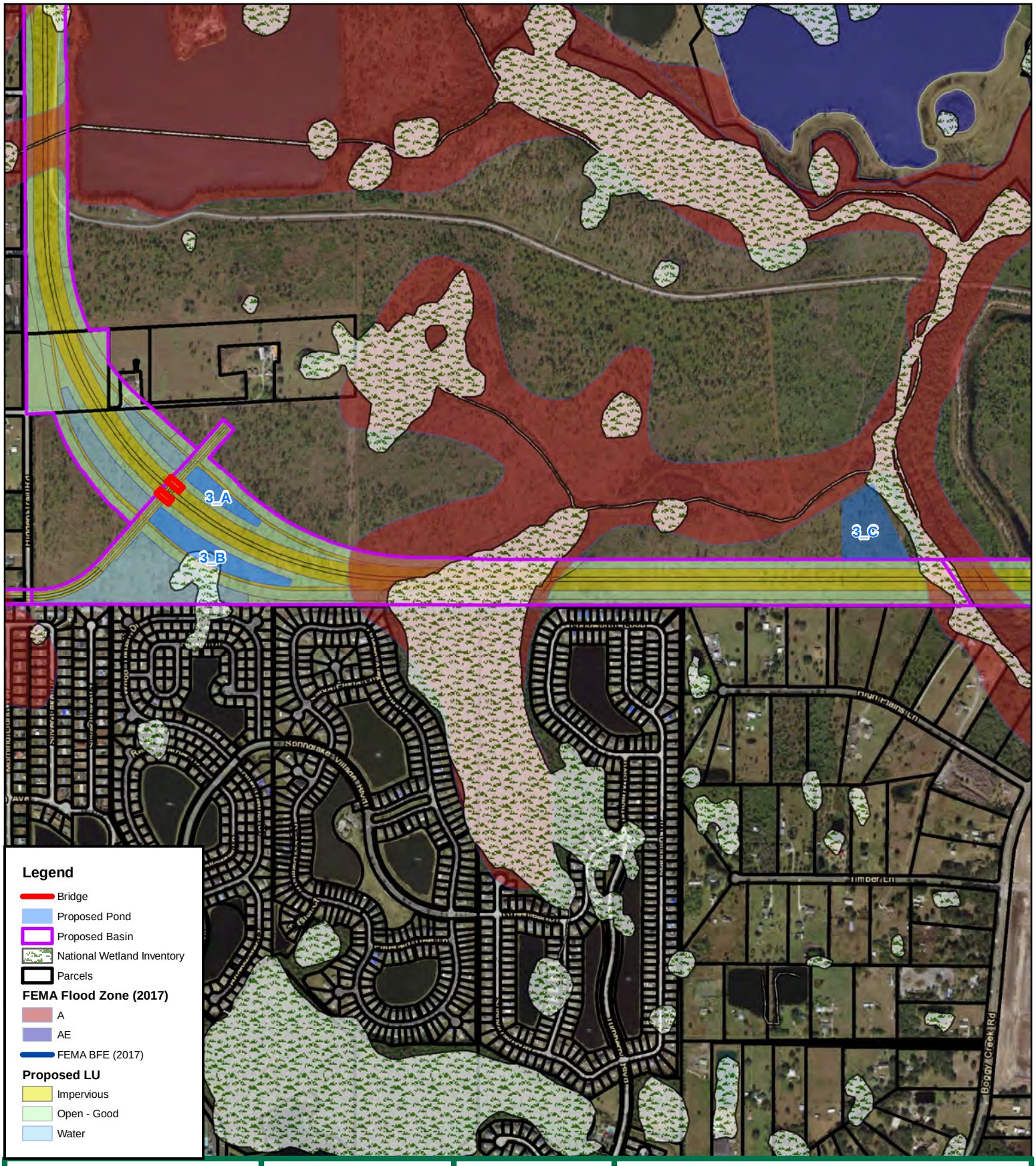
Basin 2 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 625 1,250 2,500
Feet



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE A.4a
Lake Nona Alternative (404B)

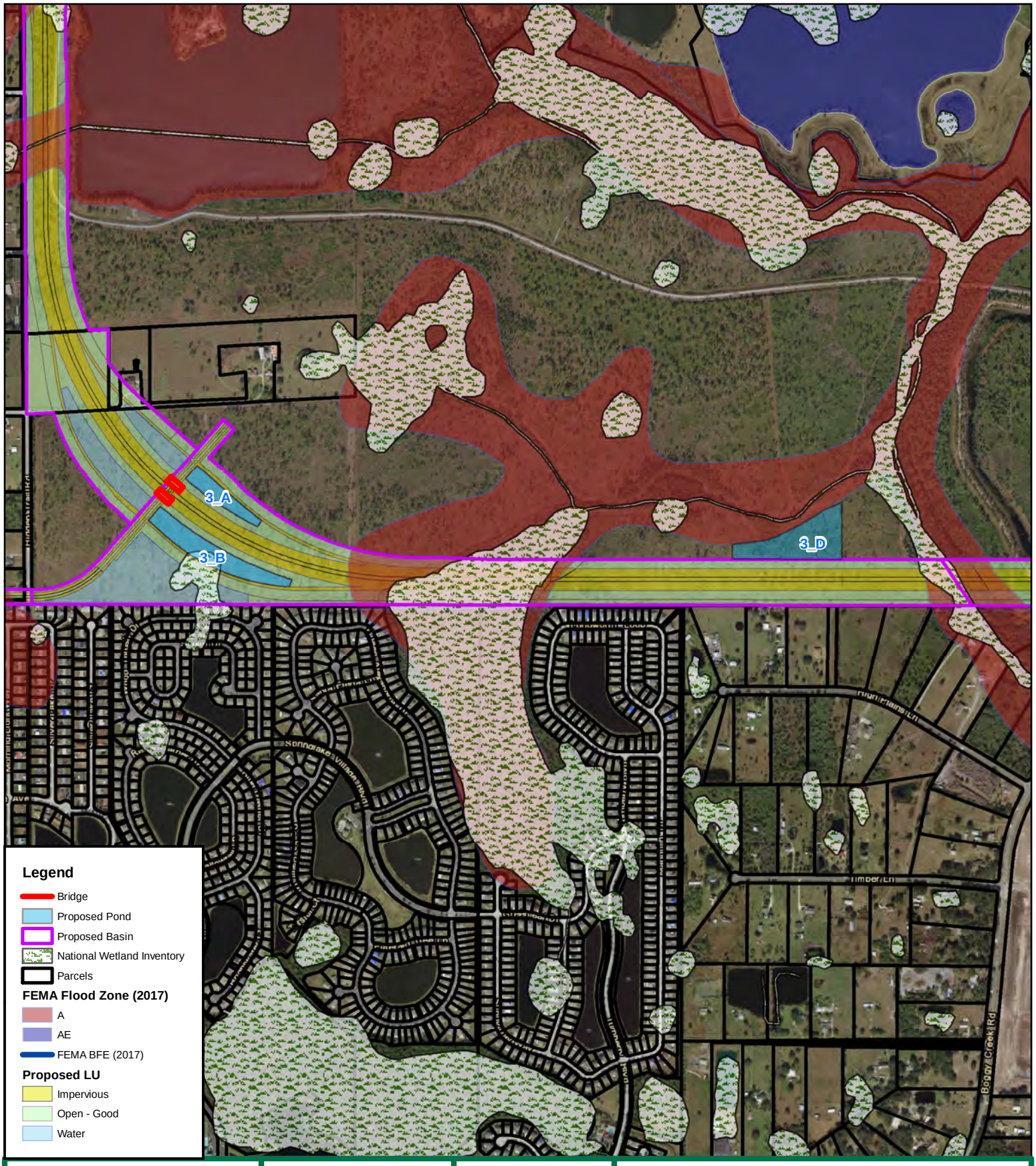
Basin 3 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 625 1,250 2,500 Feet



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE A.4b
Lake Nona Alternative (404B)

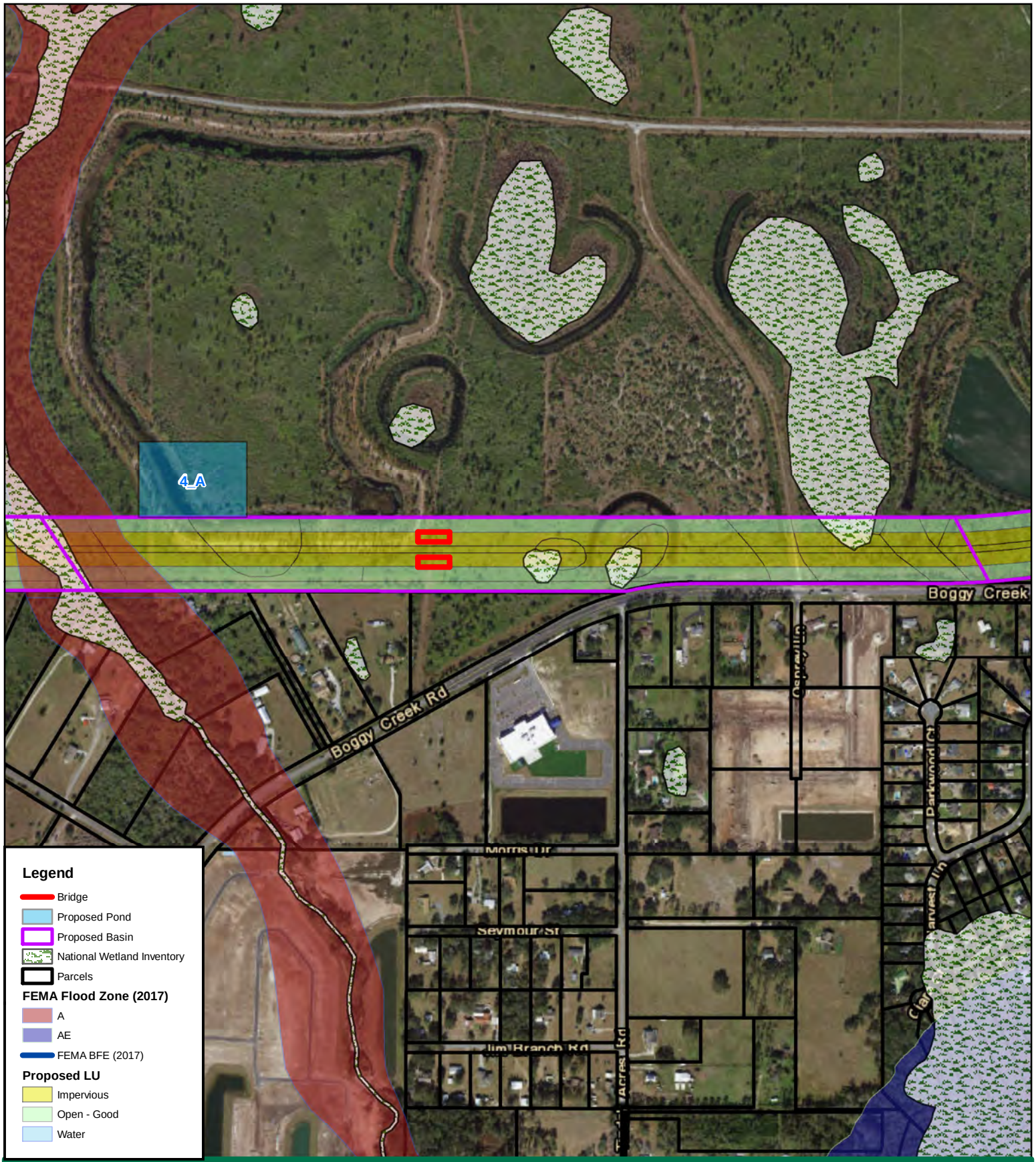
Basin 3 Pond Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 625 1,250 2,500 Feet



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE A.5a
Lake Nona Alternative (404B)

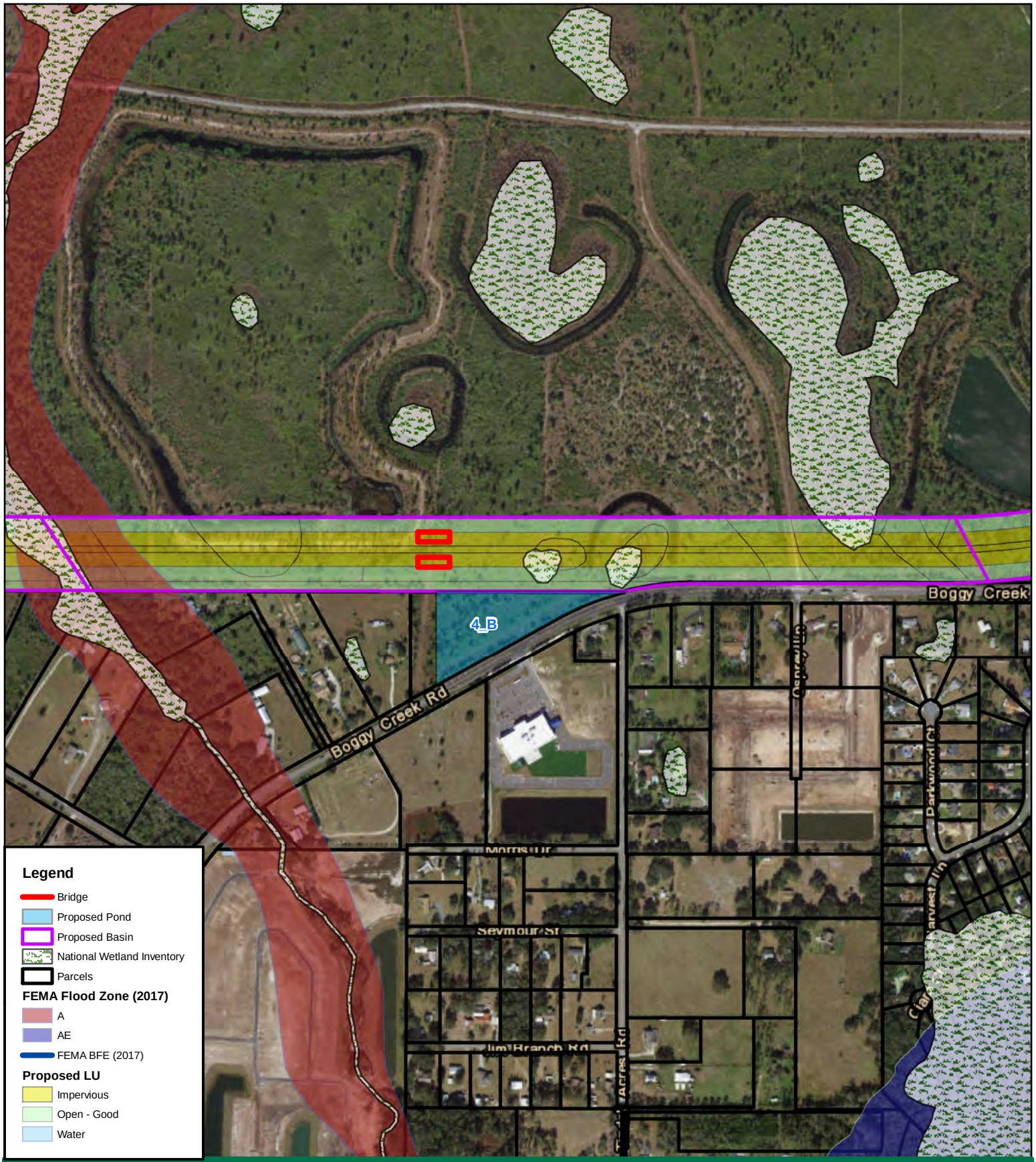
Basin 4 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRI.S DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 395 790 1,580 Feet



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE A.5b
Lake Nona Alternative (404B)

Basin 4 Pond Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 395 790 1,580
Feet

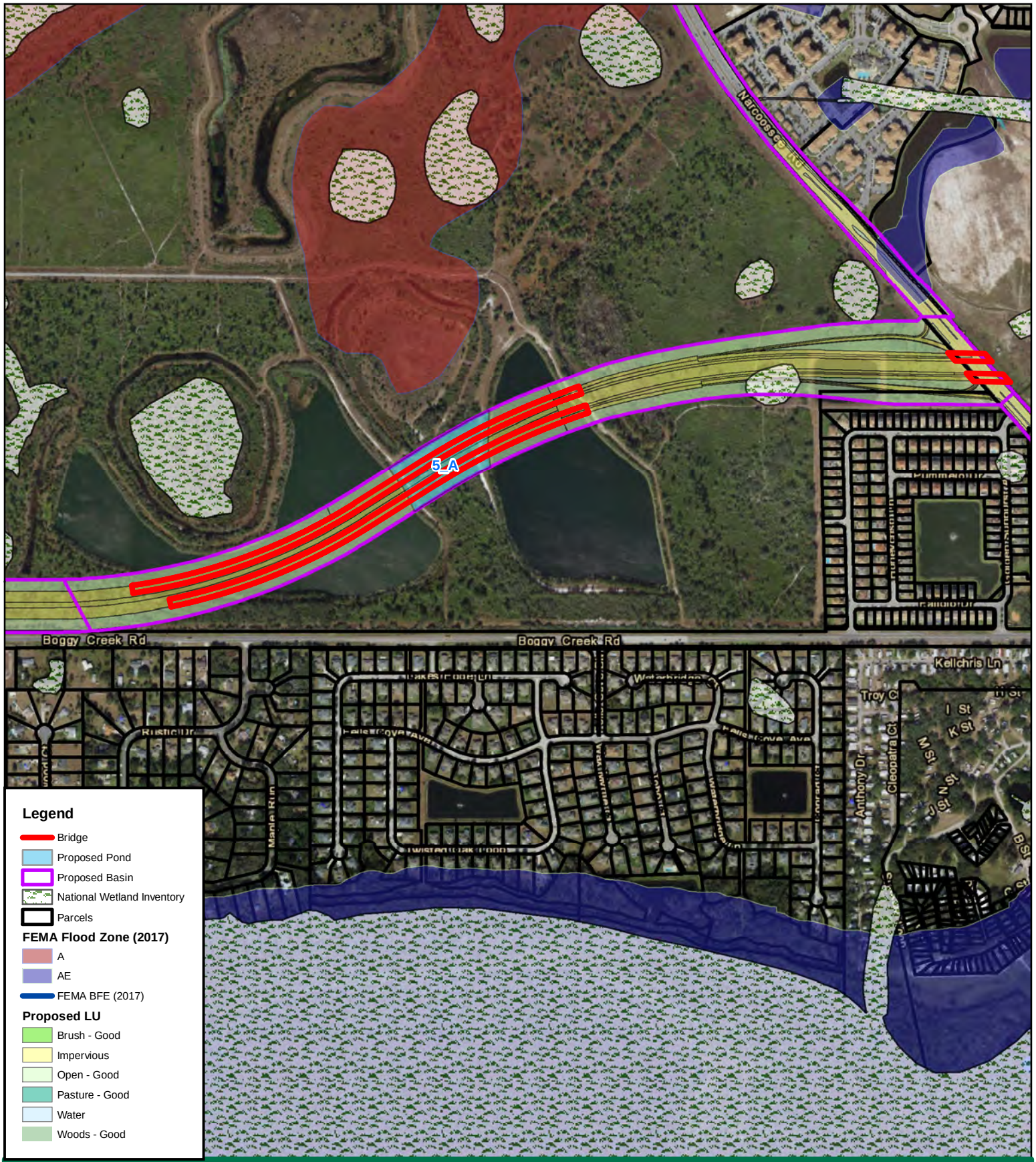


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FIGURE A.6
Lake Nona Alternative (404B)

Basin 5 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000
Feet

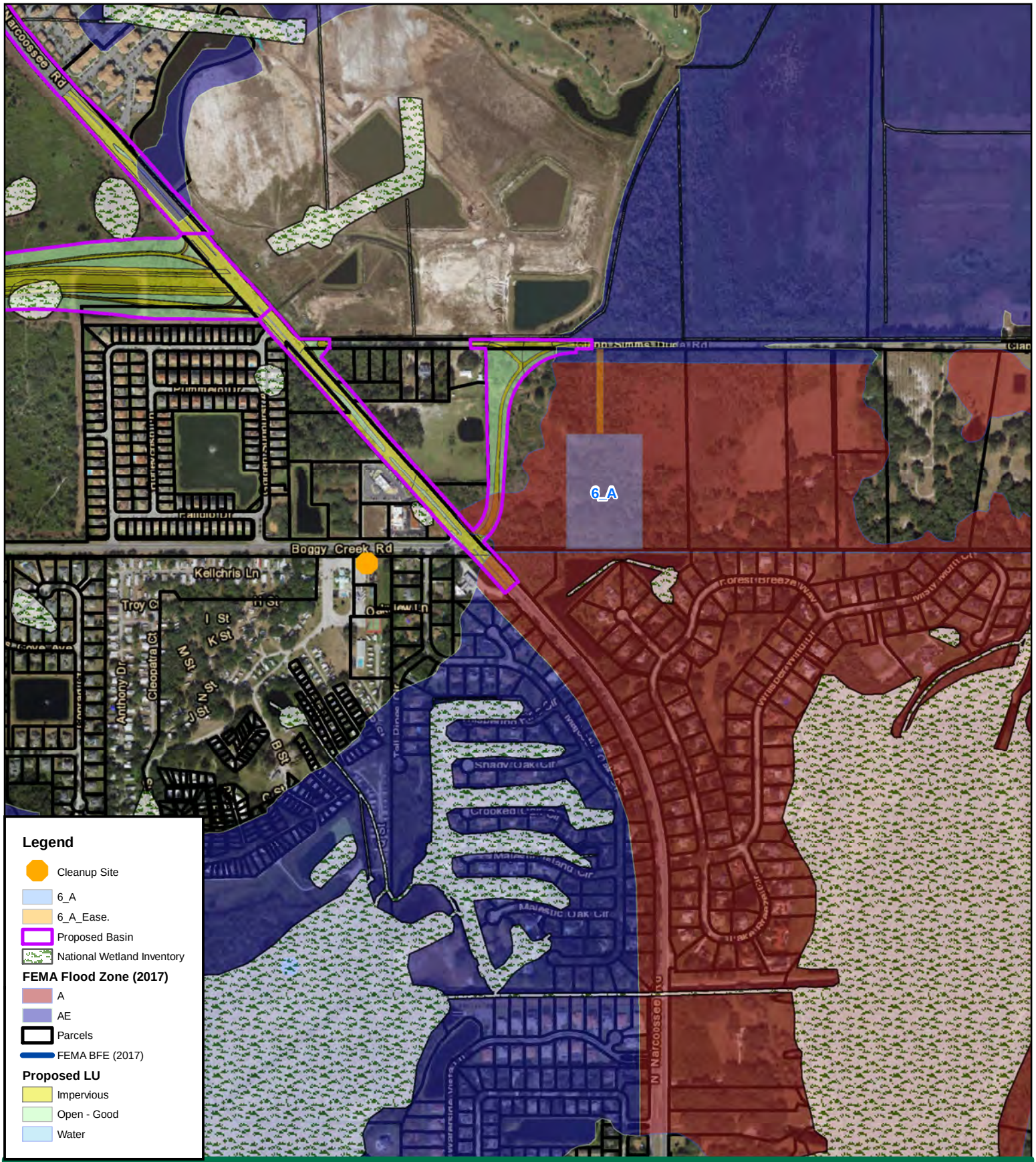

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FIGURE A.7a
Lake Nona Alternative (404B)

Basin 6 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000 Feet

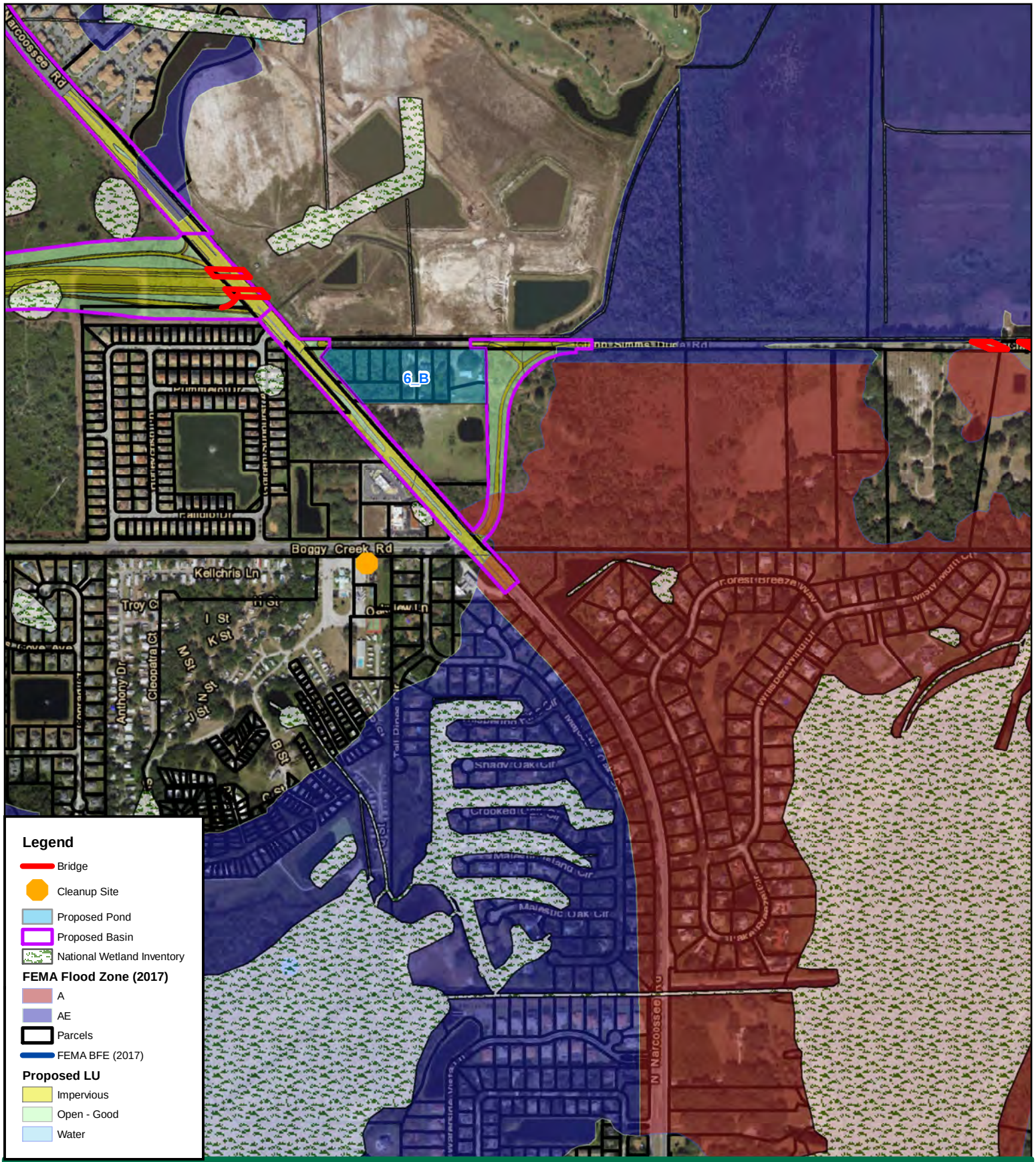

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FIGURE A.7b
Lake Nona Alternative (404B)

Basin 6 Pond Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000 Feet

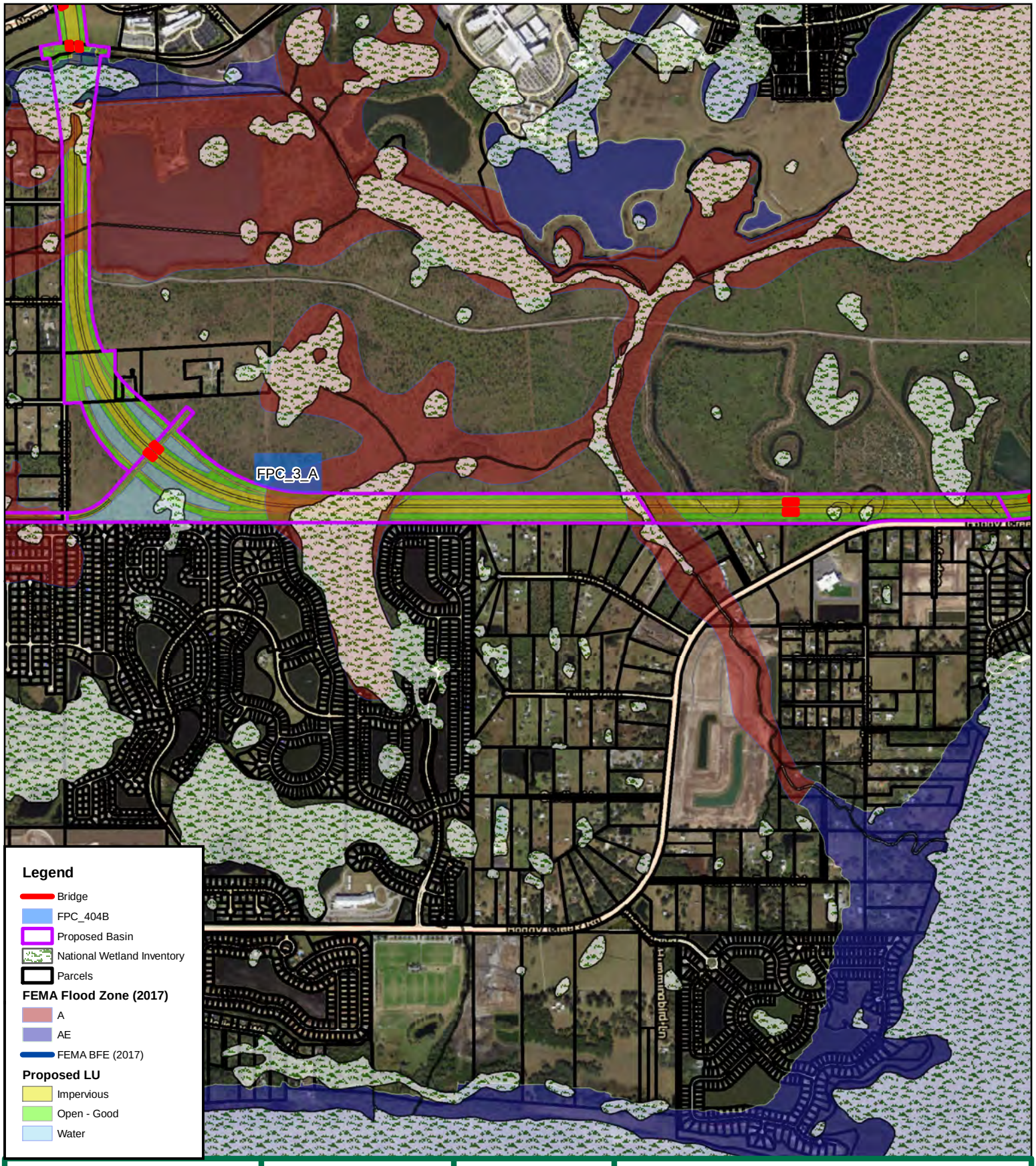

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FIGURE A.8a
Lake Nona Alternative (404B) FPC Site
Basin 3
FPC Site Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION
FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 1,000 2,000 4,000 Feet

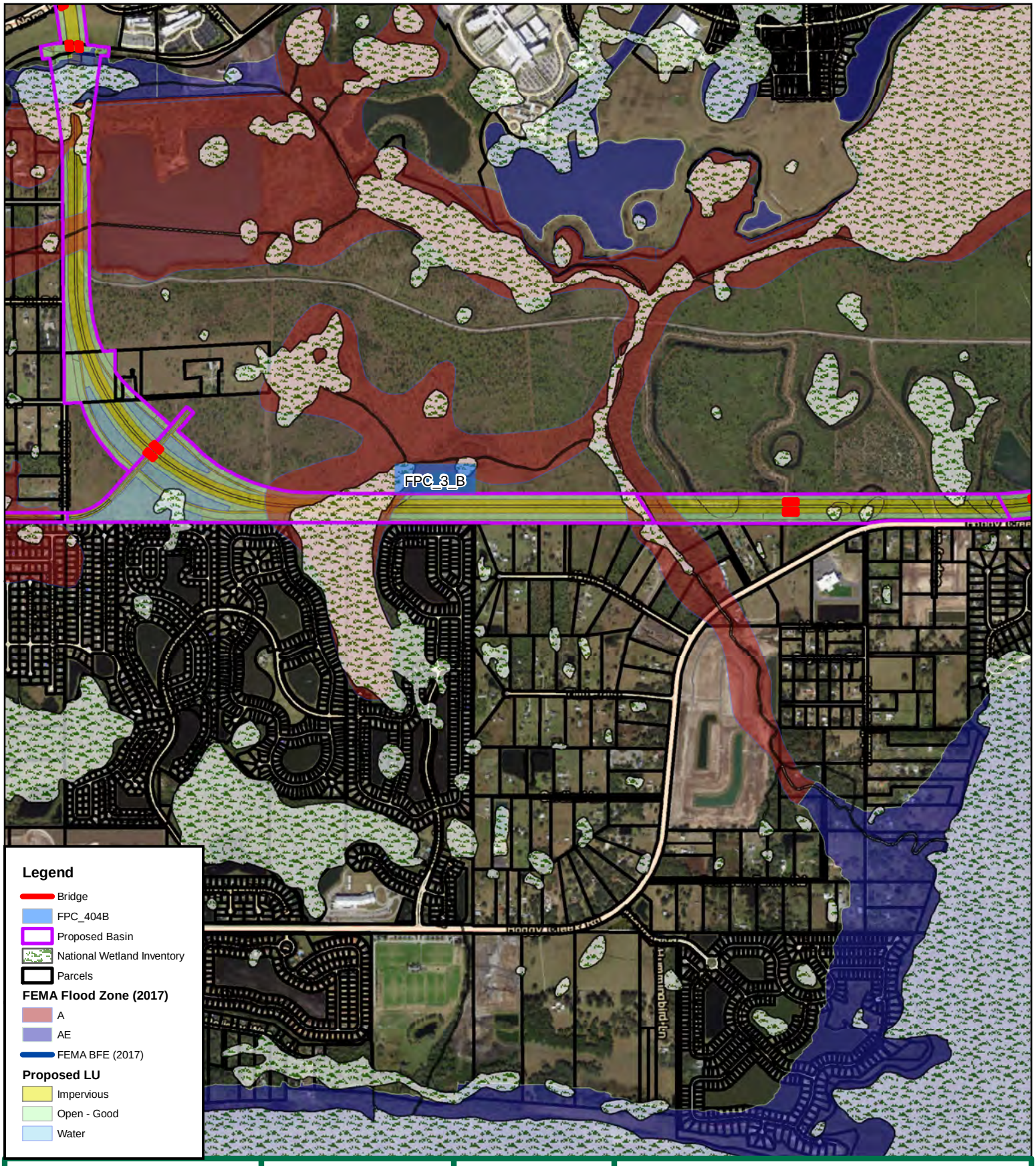

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FIGURE A.8b
Lake Nona Alternative (404B) FPC Site

Basin 3
FPC Site Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

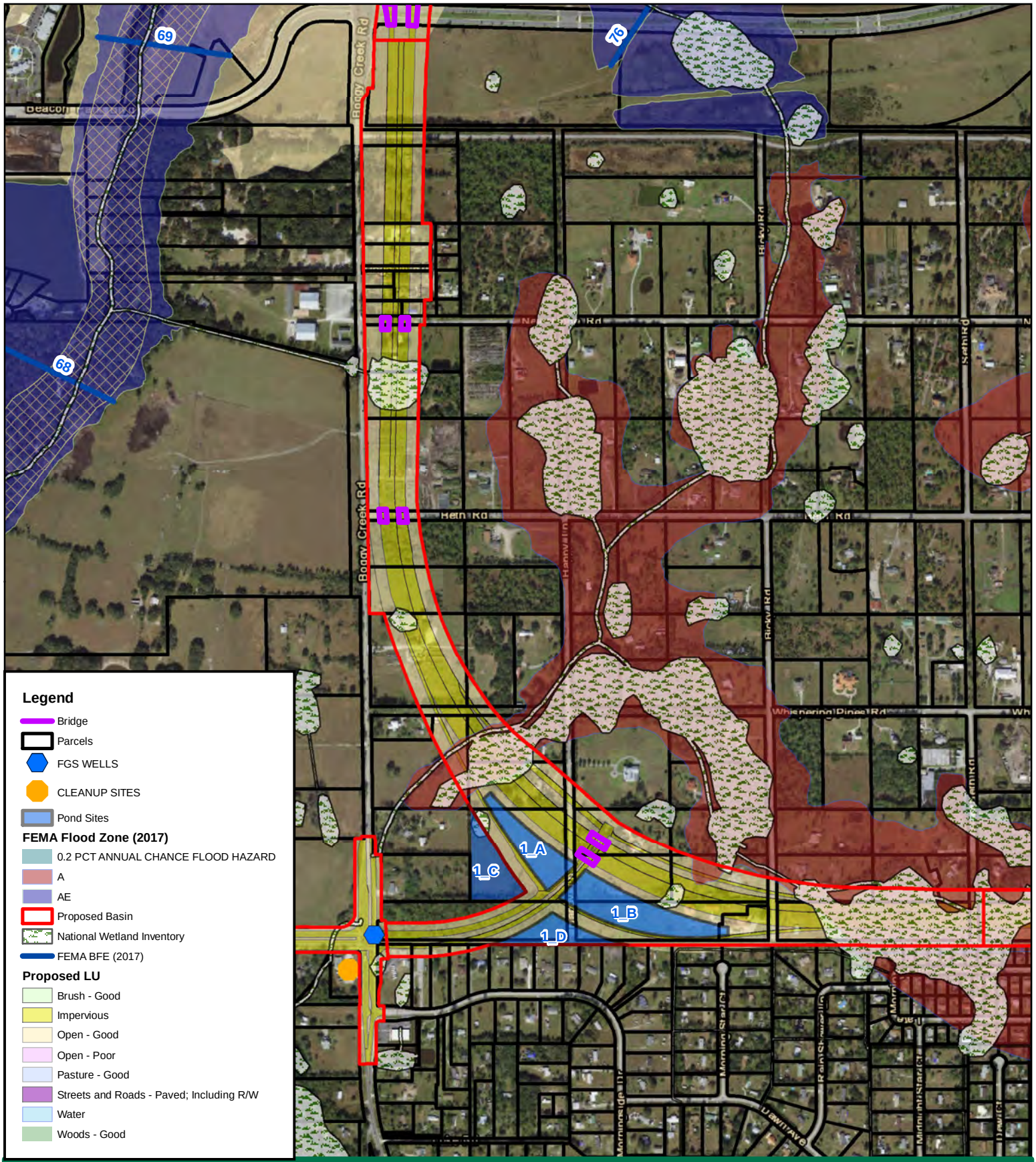
0 1,000 2,000 4,000
Feet

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Pond Parcel Summary

Table 2 - Alternative 405

Basin	Pond Site	Pond Area (ac)	Parcel No.	Property Owner	Total Parcel Area (ac)
B405_001	405_1_A	2.7	Infield Area	--	--
	405_1_B	4.6	Infield Area	--	--
	405_1_C	2.9	34-24-30-6368-00-571	BENNETT TERRY S TR	13.6
			34-24-30-6368-00-551	BOURLAND RUSSELL L	4.6
	405_1_D	2	Infield Area	--	--
	405_FPC_1_A	7.8	34-24-30-6368-00-550	BOURLAND RUSSELL L	4.6
			34-24-30-6368-00-551	BOURLAND RUSSELL L	4.6
			34-24-30-6368-00-540	SMITH STEPHEN M	9.1
			34-24-30-6368-00-590	CORREA GLORIA PATRICIA	4.6
B405_002	405_2_A	2.1	34-24-30-6368-00-680	MUN SUNG KU	7.4
B405_003	405_3_A	11.1	35-24-30-0000-00-011	CITY OF ORLANDO/GOAA	668.9
	405_3_B	11.1	01-25-30-3308-0001-0040	CUNNINGHAM GEORGE	5.0
			01-25-30-3308-0001-0050	WALKER FRANK D TR	5.0
			01-25-30-3308-0001-0060	RUSSELL DORTHY J	5.0
	405_FPC_3_A	6.2	35-24-30-0000-00-011	CITY OF ORLANDO/GOAA	668.9
	405_FPC_3_B	6.2	35-24-30-0000-00-011	CITY OF ORLANDO/GOAA	668.9
B405_004	405_4_A	5.1	31-24-31-0000-00-001	TDCP LLC	992.2
	405_4_B	4.9	01-25-30-0000-0022-0000	TDCP LLC	6.4
B405_005	405_5_A	4.9	31-24-31-0000-00-001	TDCP LLC	992.2
B405_006	405_6_A	8.8	32-24-31-0000-00-010	DIOCESE OF ORLANDO	42.4
	405_6_B	8.2	32-24-31-0000-00-007	MASOODI NAZISH	1.2
			32-24-31-0000-00-017	MASOODI NAZISH	0.5
			32-24-31-0000-00-009	MASOODI NAZISH	0.5
			32-24-31-0000-00-018	MASOODI NAZISH	0.5
			32-24-31-0000-00-019	MASOODI NAZISH	1.1
			32-24-31-0000-00-016	MONSERRATE DIAZ TRUST	0.9
			32-24-31-0000-00-021	JACKSON RAYMOND A	0.9
			32-24-31-0000-00-020	KIRL INVESTMENTS LLC	0.9
			32-24-31-0000-00-008	ENFINGER PHYLLIS B	1.4
			32-24-31-0000-00-025	ENFINGER PHYLLIS B	8.8



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165 Lincoln Avenue
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FIGURE B.1
Boggy Creek Alternative (405)

Basin 1 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000
Feet

A.32

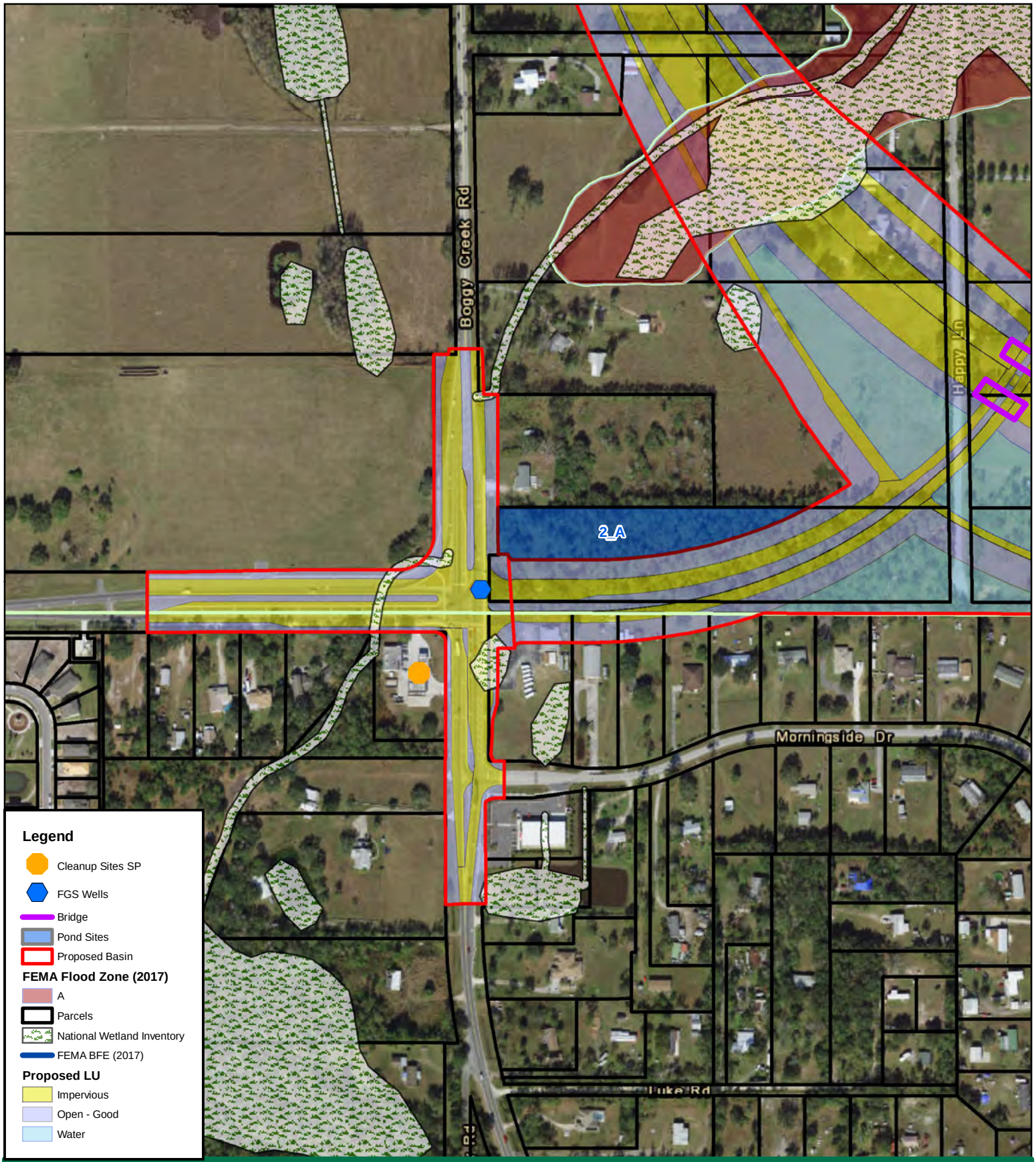

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FIGURE B.2
Boggy Creek Alternative (405)

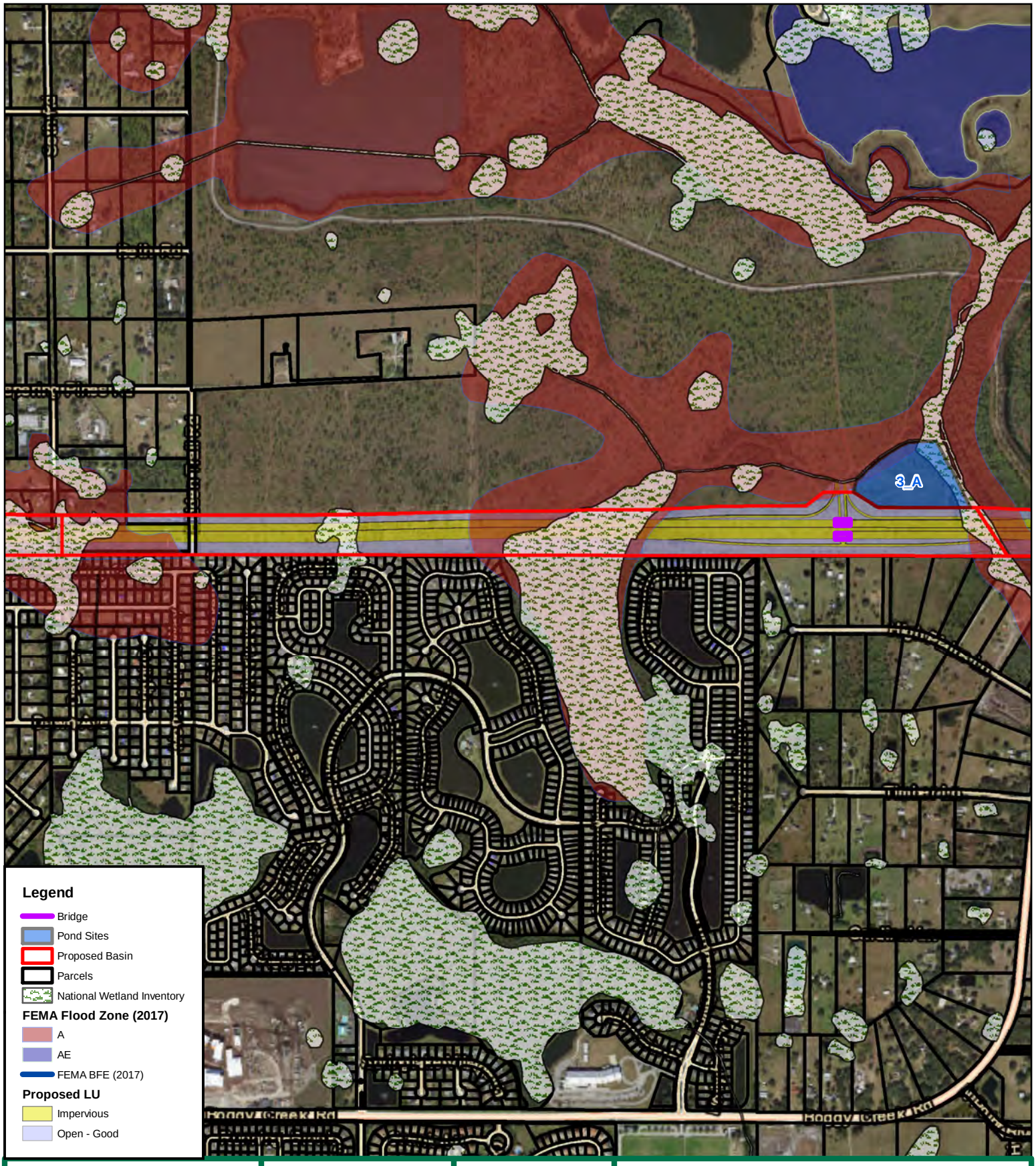
Basin 2 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 210 420 840
Feet



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165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE B.3a
Boggy Creek Alternative (405)

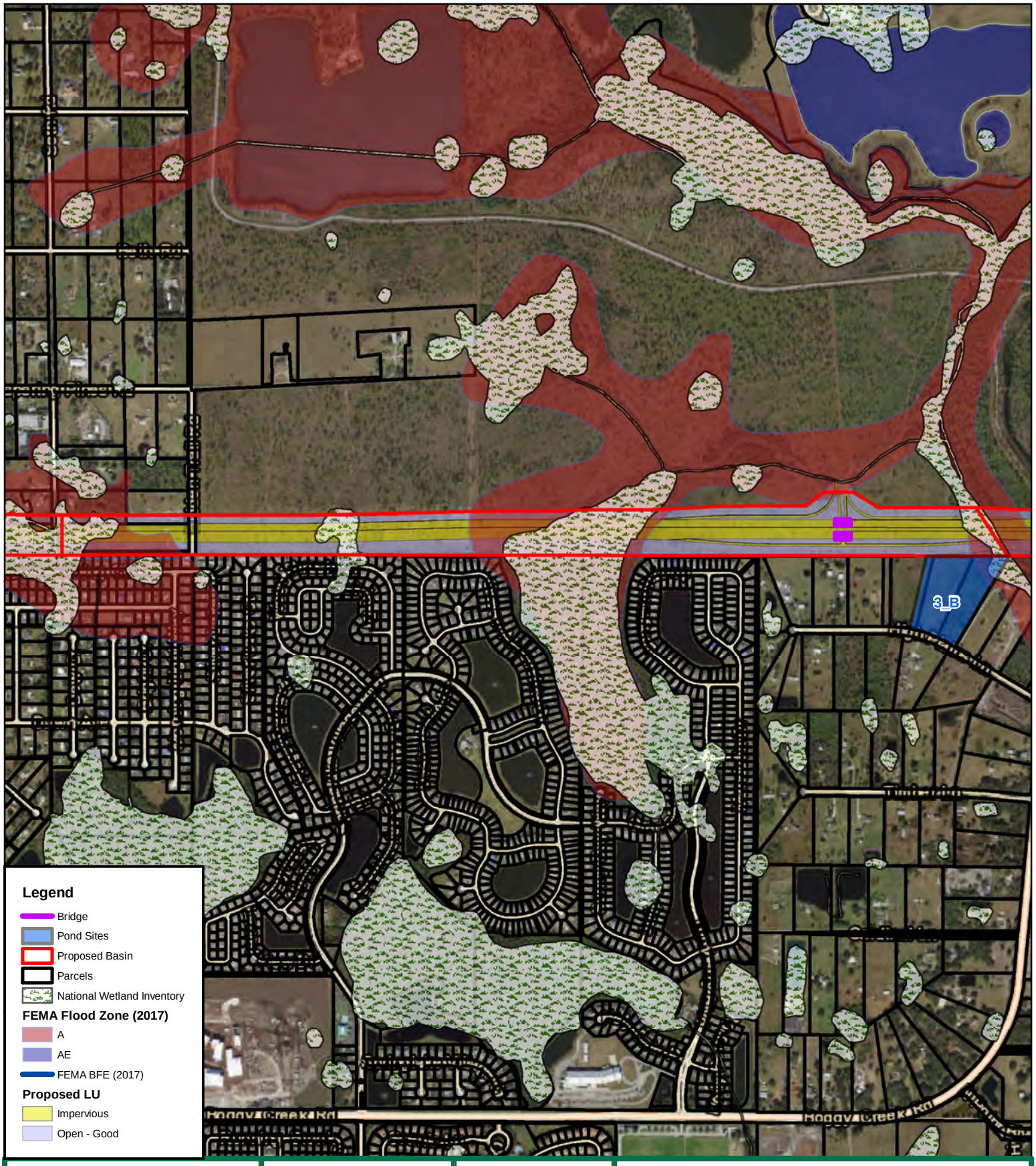
Basin 3 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 700 1,400 2,800
Feet



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165 Lincoln Avenue
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FIGURE B.3b
Boggy Creek Alternative (405)

Basin 3 Pond Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 700 1,400 2,800
Feet

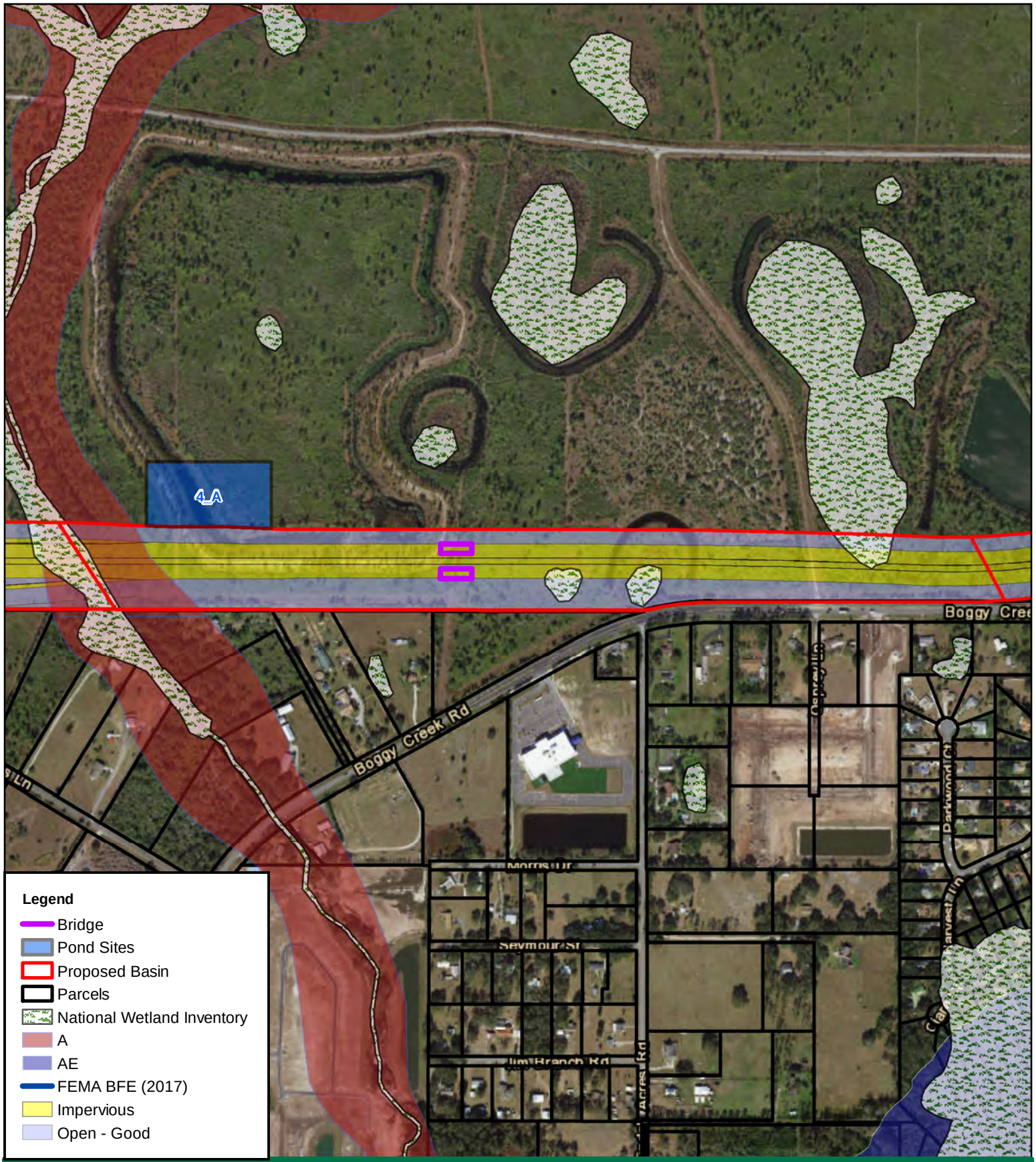

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FIGURE B.4a
Boggy Creek Alternative (405)

Basin 4 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 400 800 1,600
Feet

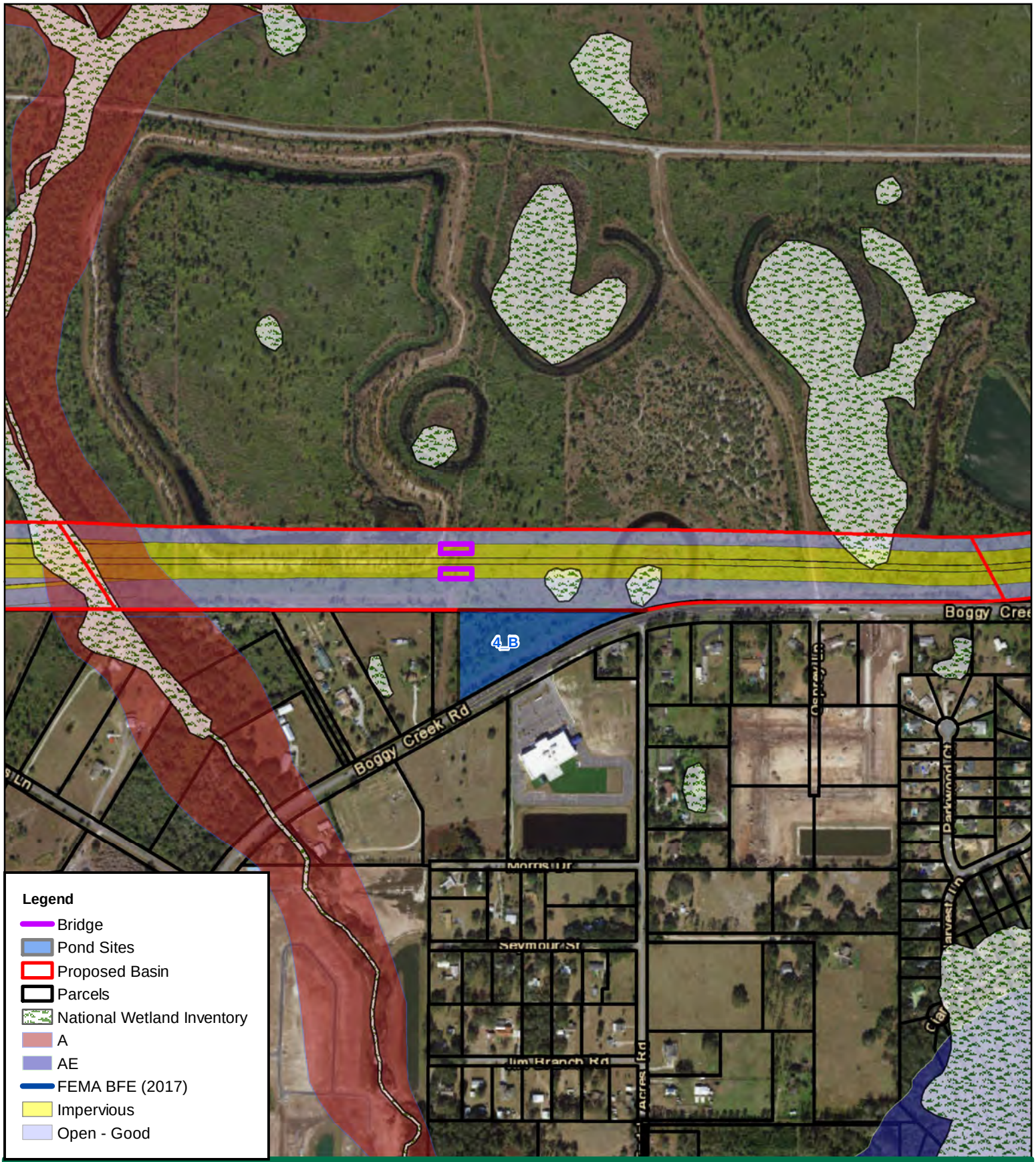

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FIGURE B.4b
Boggy Creek Alternative (405)

Basin 4 Pond Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 400 800 1,600
Feet

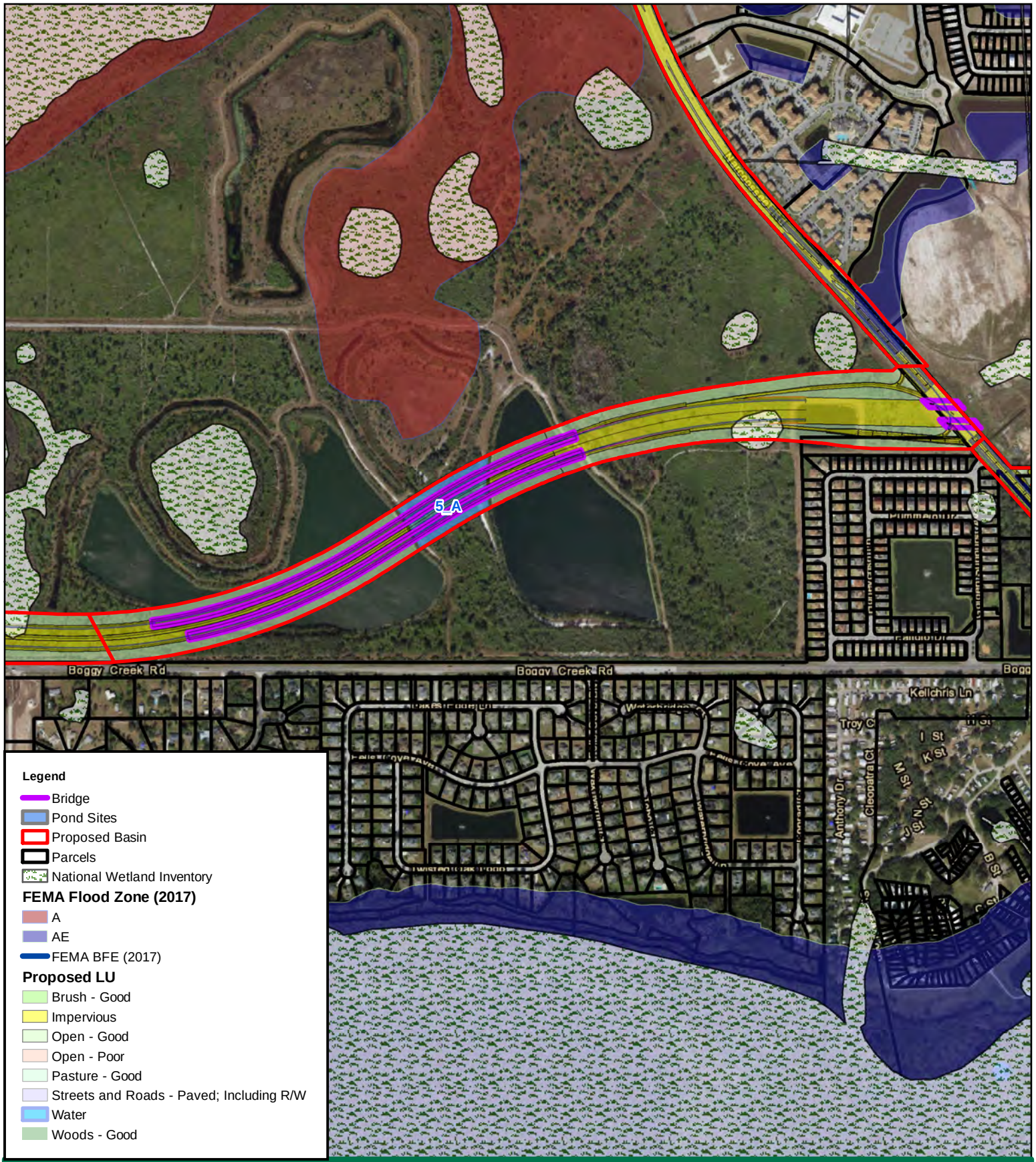

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FIGURE B.5
Boggy Creek Alternative (405)

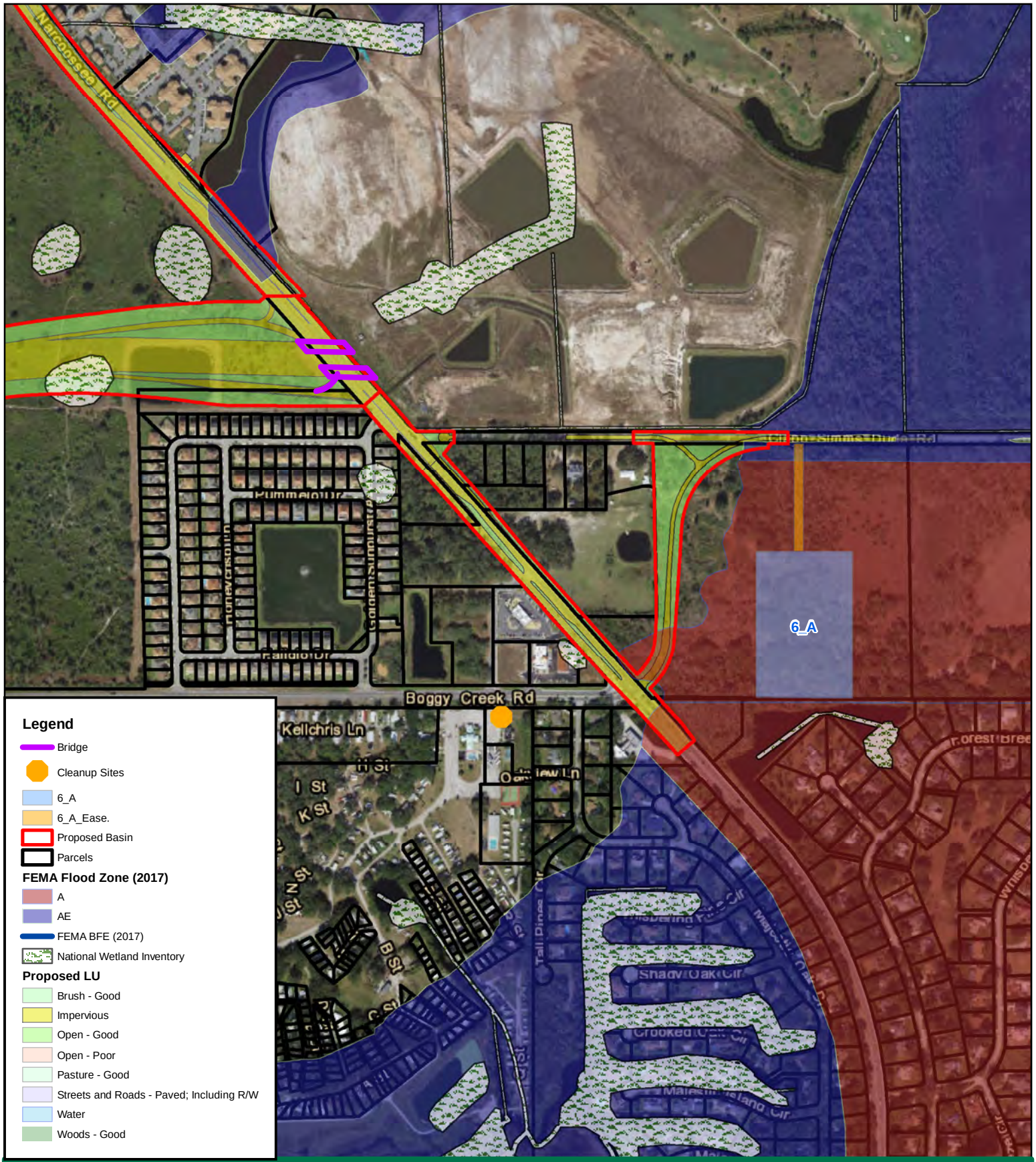
Basin 5
Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000 Feet



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165 Lincoln Avenue
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FIGURE B.6a
Boggy Creek Alternative (405)

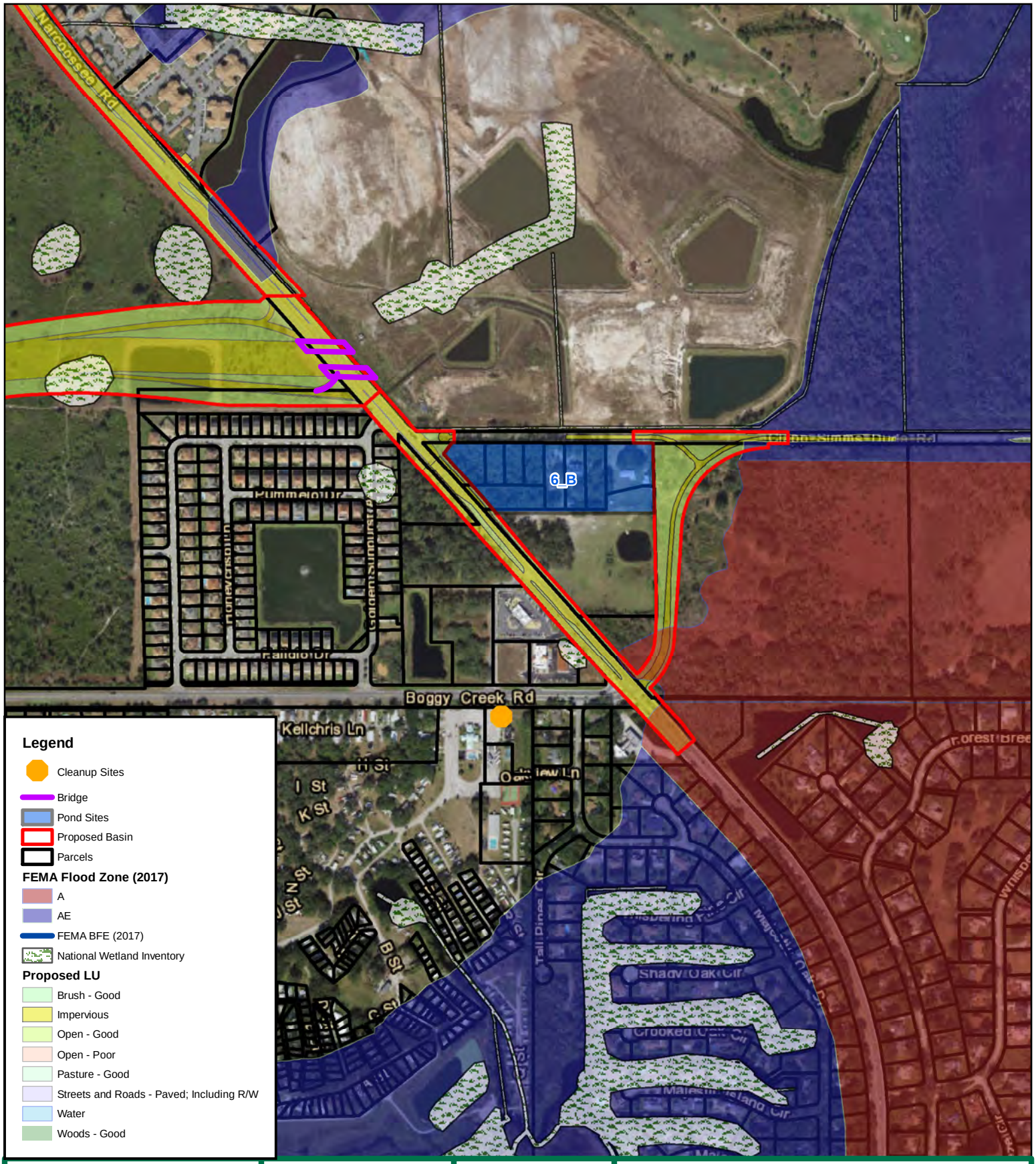
Basin 6
Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 400 800 1,600
Feet



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165 Lincoln Avenue
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FIGURE B.6b
Boggy Creek Alternative (405)

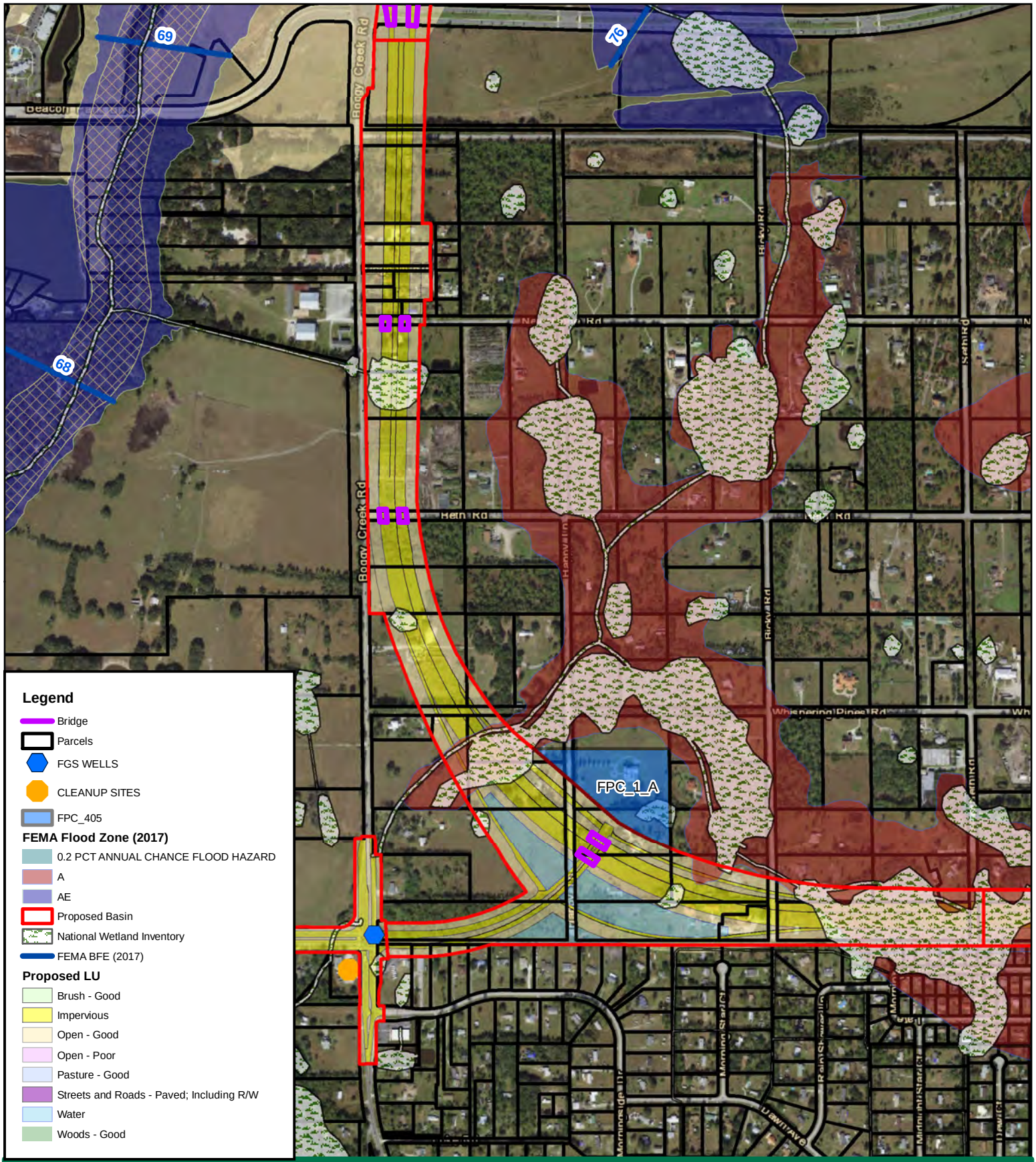
Basin 6 Pond Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 400 800 1,600
Feet



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165 Lincoln Avenue
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FIGURE B.7
Boggy Creek Alternative (405)
FPC Site
Basin 1
FPC Site Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION
FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000
Feet

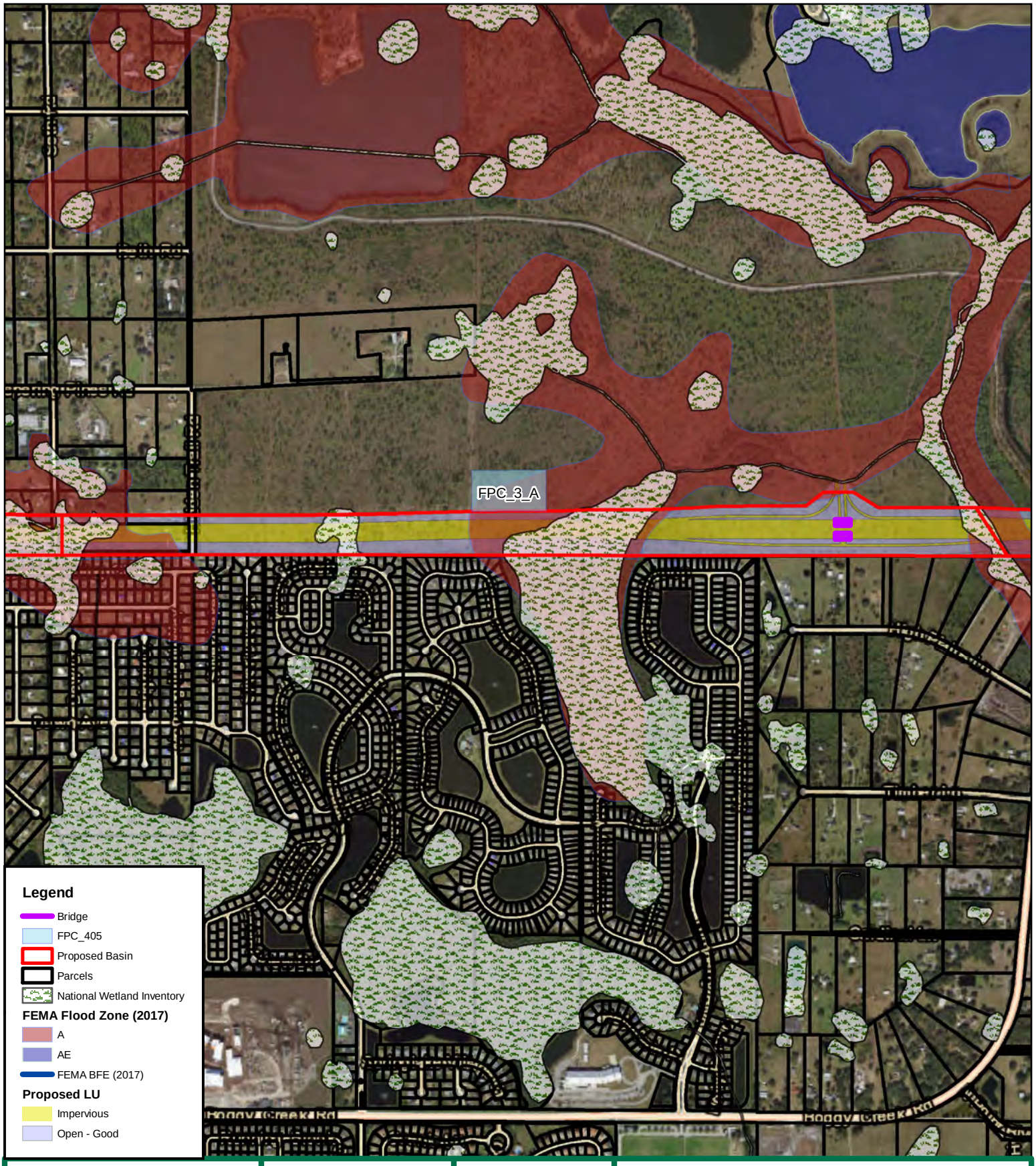

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FIGURE B.8a
Boggy Creek Alternative (405) FPC Site

Basin 3
FPC Site Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 700 1,400 2,800
Feet

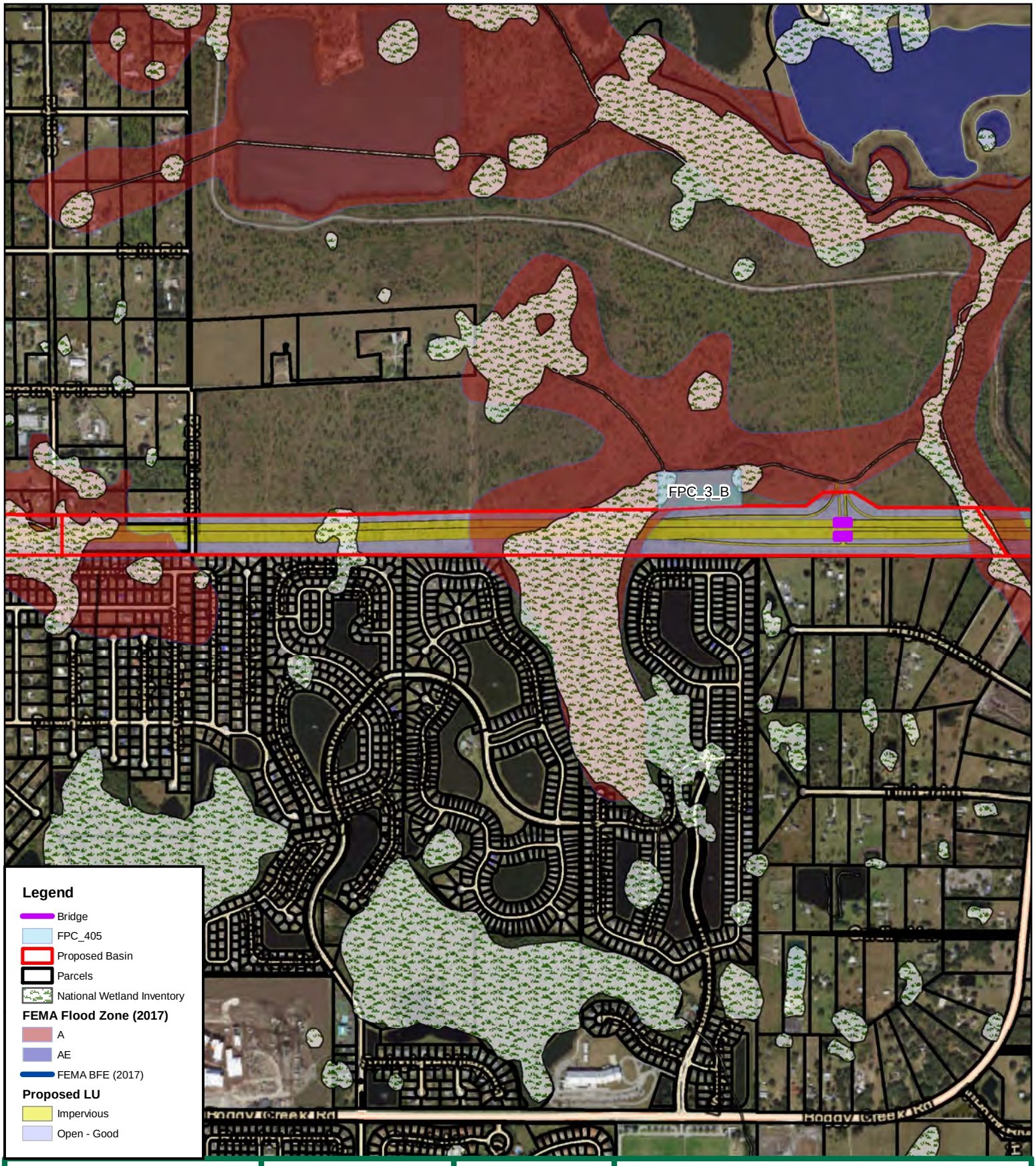

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FIGURE B.8b
Boggy Creek Alternative (405) FPC Site

Basin 3
FPC Site Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

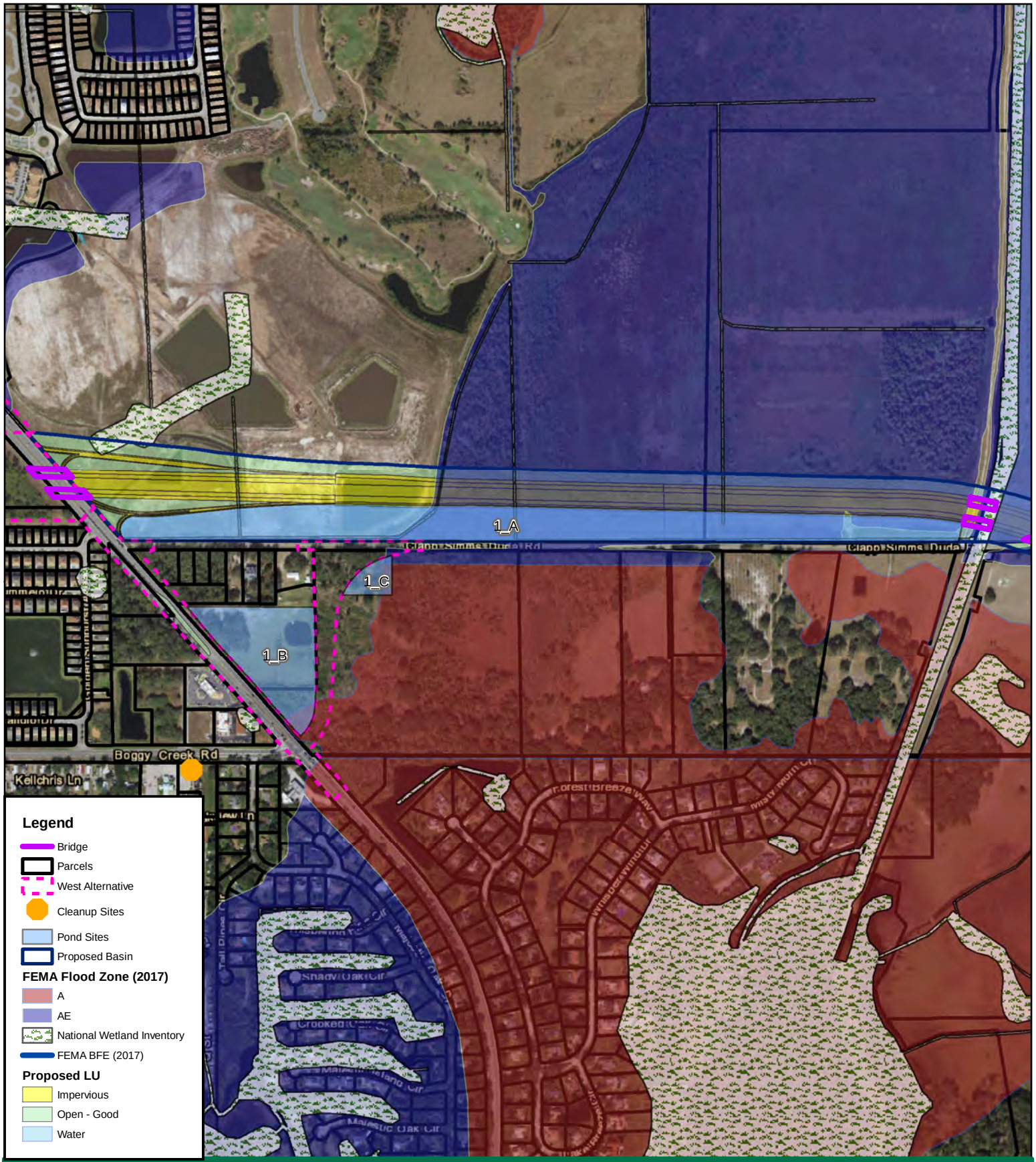
0 700 1,400 2,800
Feet

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Pond Parcel Summary

Table 3 - Alternative 500-107C-1

Basin	Pond Site	Pond Area (ac)	Parcel No.	Property Owner	Total Parcel Area (ac)
B500_107C-1_001	500_107C_1_A	25.1	Infield Area	--	--
	500_107C_1_B	8.8	32-24-31-0000-00-025	ENFINGER PHYLLIS B	8.8
			32-24-31-0000-00-010	DIOCESE OF ORLANDO	42.4
	500_107C_1_C	1.3	32-24-31-0000-00-010	DIOCESE OF ORLANDO	42.4
	500_107C_1_D	10	32-24-31-0000-00-010	DIOCESE OF ORLANDO	42.4
B500_107C-1_002	500_107C_2_A	14.3	04-25-31-4260-0001-0010	SPRINGHEAD NORTH LLC	109.1
	500_107C_2_B	14.2	04-25-31-4260-0001-0300	STANDARD PACIFIC OF FLORIDA	168.9
	500_107C_FPC_2_A	3.5	03-25-31-4260-0001-0010	OSCEOLA COUNTY	635.3
	500_107C_FPC_2_B	3.5	03-25-31-4260-0001-0010	OSCEOLA COUNTY	635.3
			10-25-31-2867-0001-0200	GALLATIN SUSAN L	5.1
B500_107C-1_003	500_107C_3_A	15.9	Infield Area	--	--
B500_107C-1_004	500_107C_4_A	1.3	02-25-31-0000-0010-0000	CENTRAL FLORIDA PROPERTY HOLDINGS 600 LLC	649.7



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165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE C.1a
Split Oak Minimization Alternative (500)

Basin 1: Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO NORTHEAST CONNECTOR EXPRESSWAY
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000
Feet

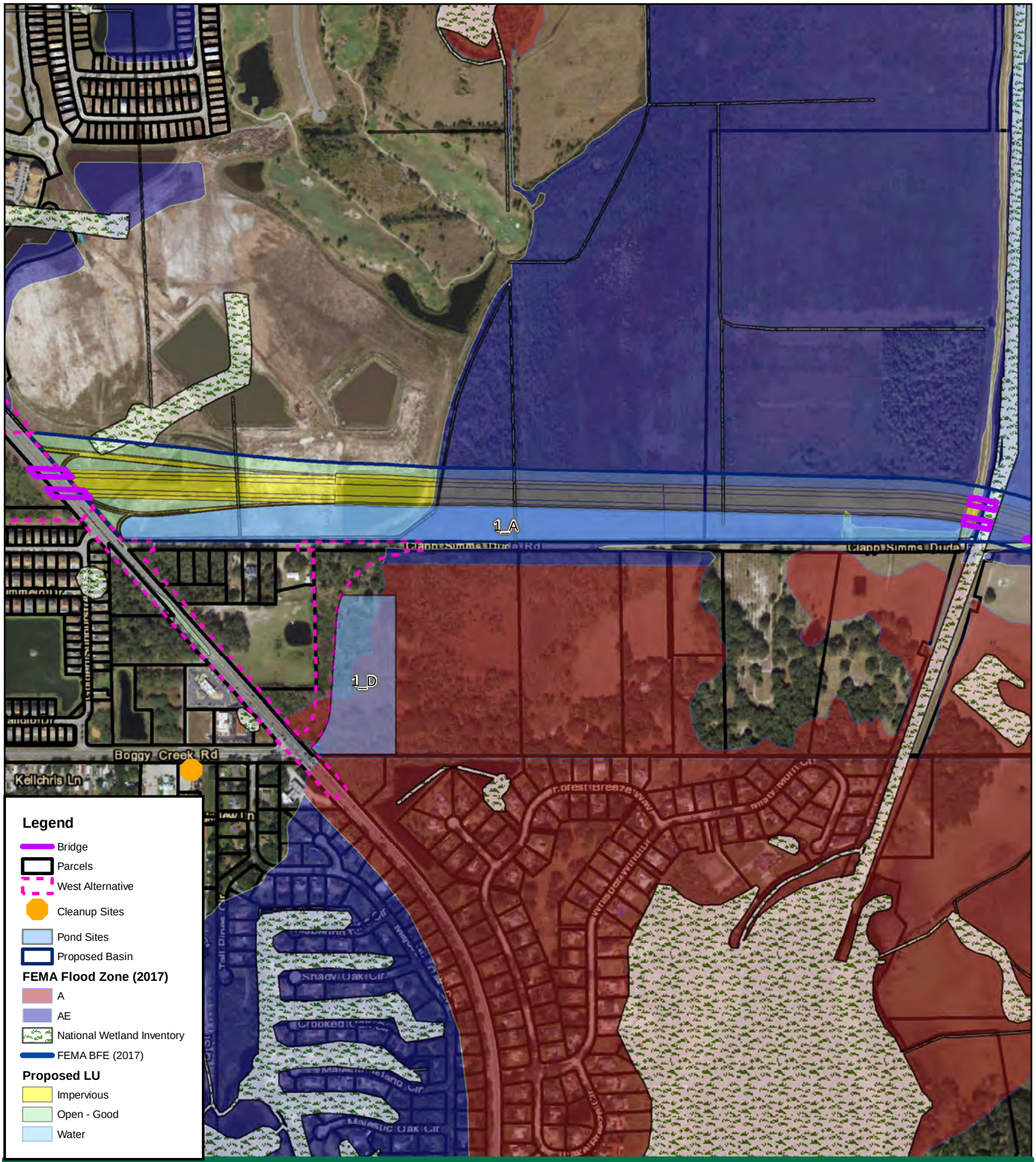

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FIGURE C.1b
Split Oak Minimization Alternative (500)

Basin 1 Pond Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 500 1,000 2,000
Feet

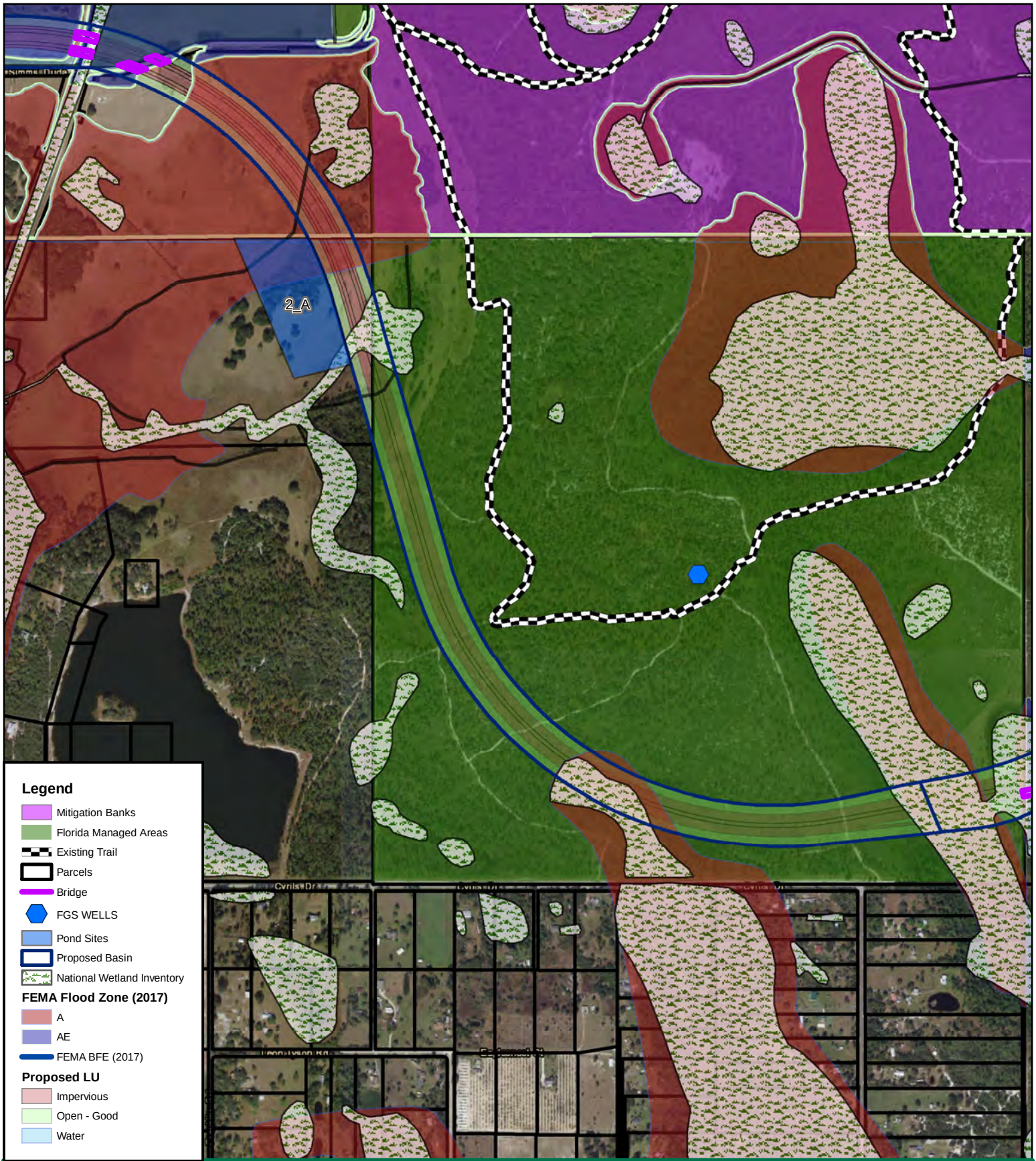

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FIGURE C.2a
Split Oak Minimization Alternative (500)

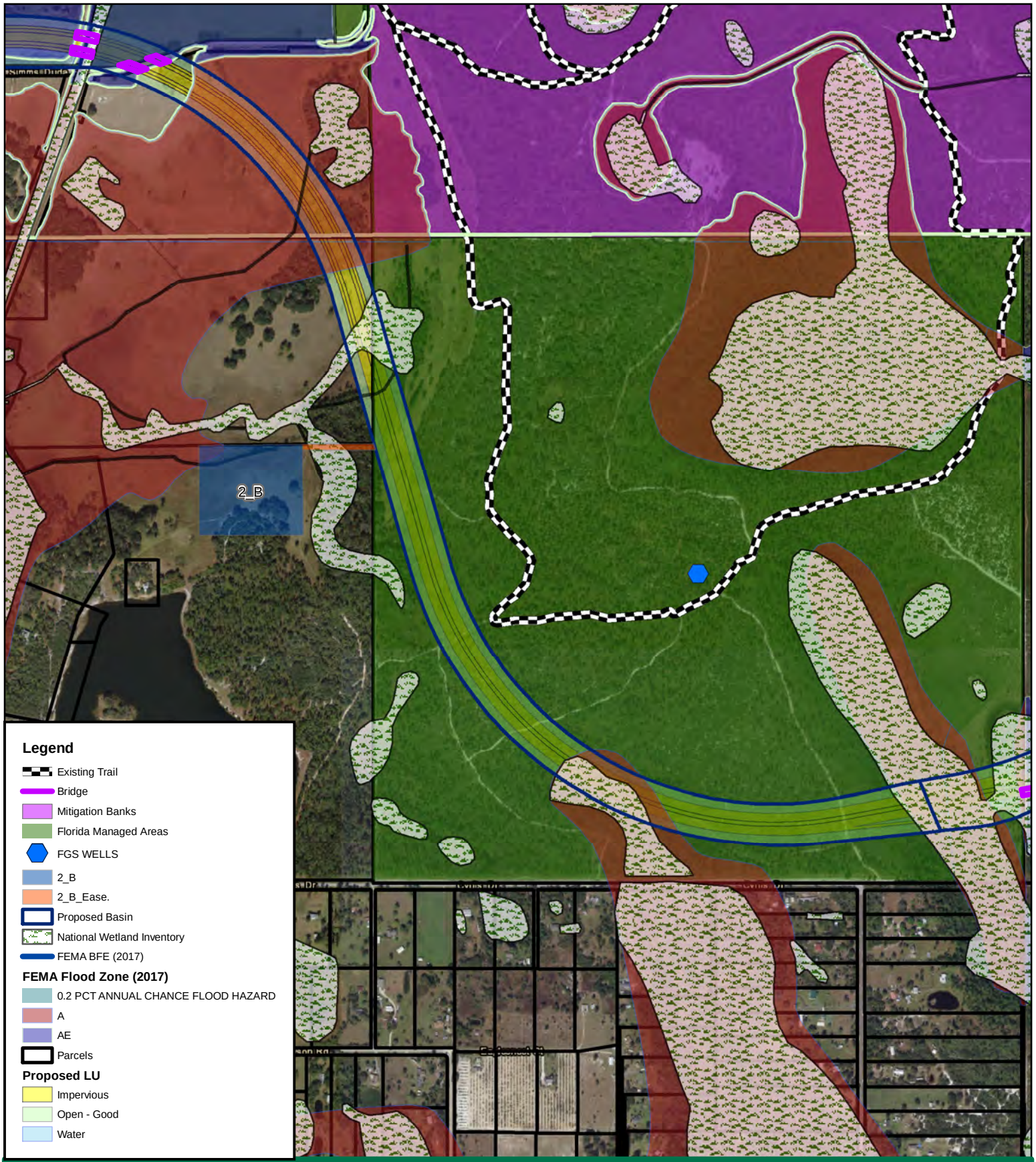
Basin 2
Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 625 1,250 2,500 Feet



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

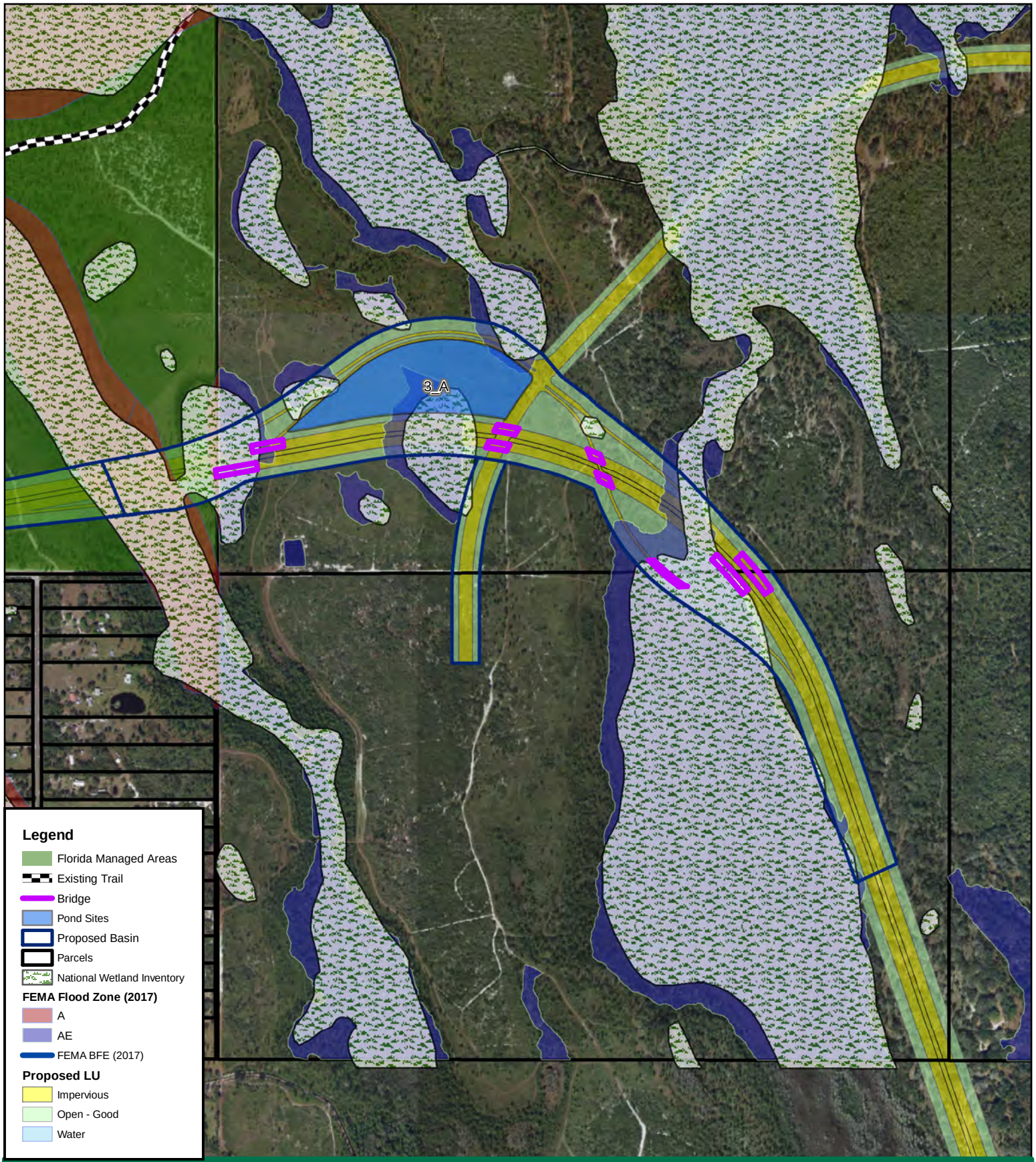
FIGURE C.2b
Split Oak Minimization Alternative (500)
Basin 2 Pond Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 625 1,250 2,500 Feet



The Balmoral Group
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Winter Park, Florida 32789

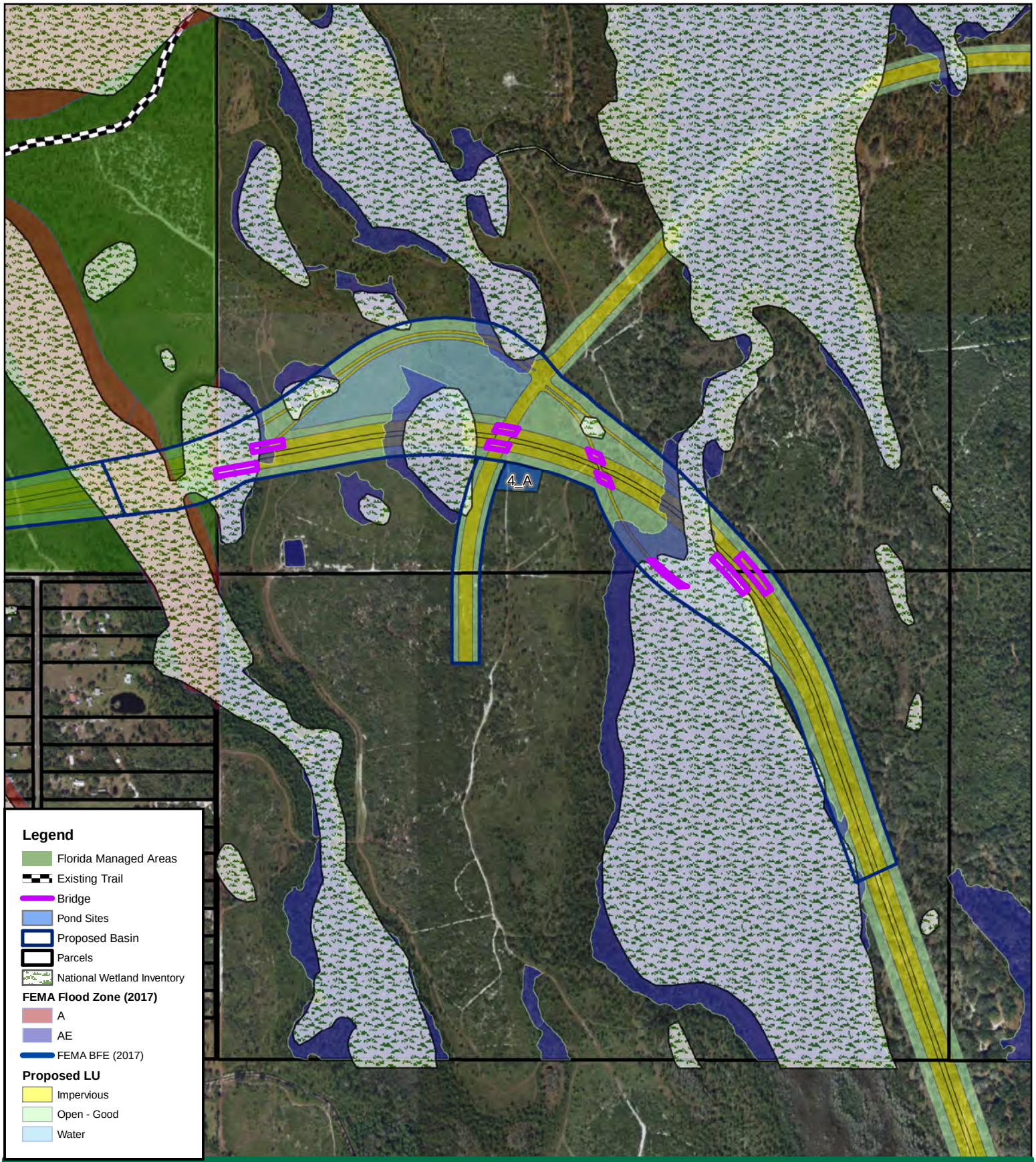
FIGURE C.3
Split Oak Minimization Alternative (500)
Basin 3 Pond Option 1

N
W E
S

0 550 1,100 2,200
Feet

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

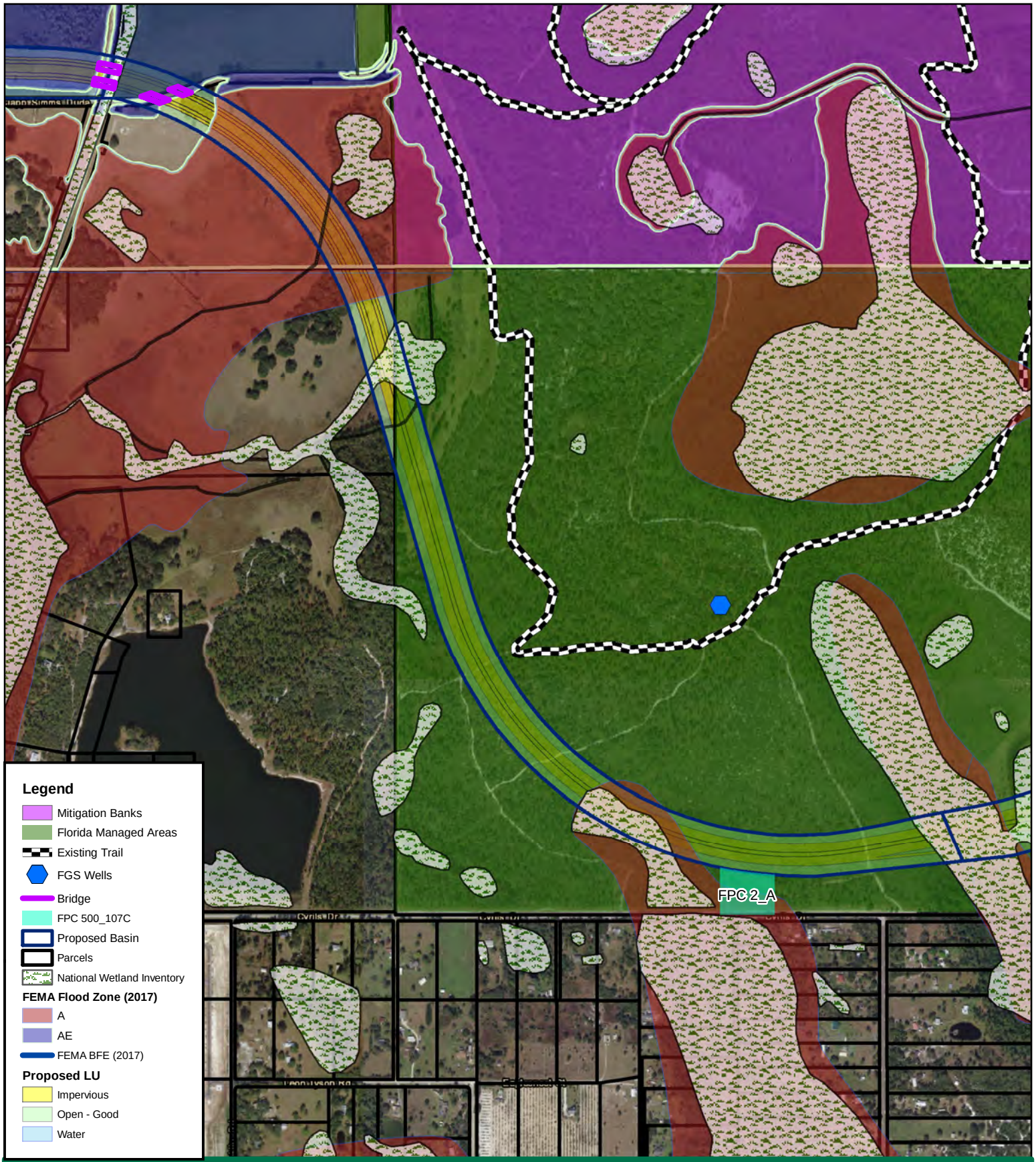
FIGURE C.4
Split Oak Minimization Alternative (500)
Basin 4 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 550 1,100 2,200
Feet



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165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE C.5a
Split Oak Minimization Alternative (500) FPC Site

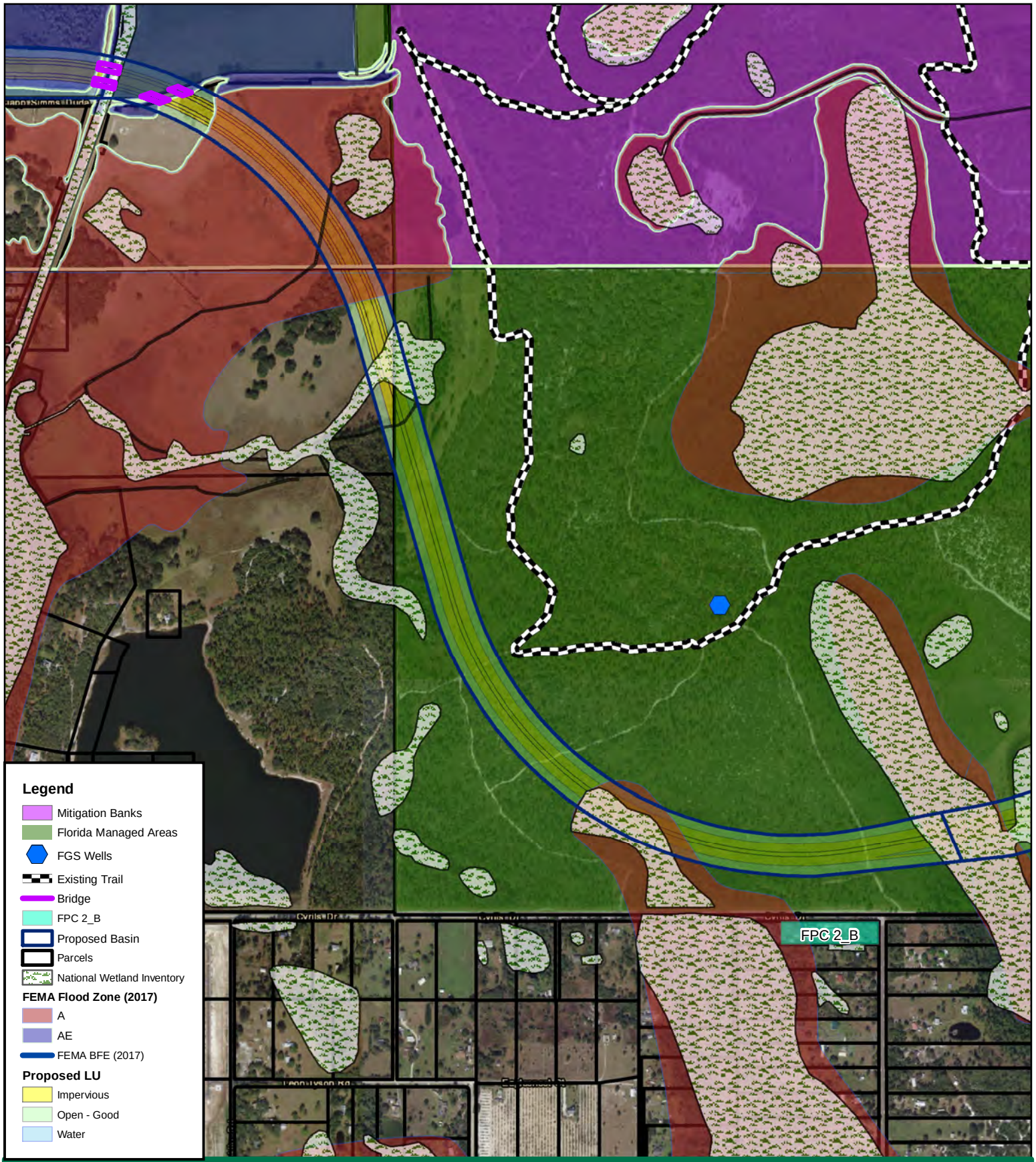
Basin 2
FPC Site Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 625 1,250 2,500 Feet



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE C.5b
Split Oak Minimization Alternative (500)
FPC Site

Basin 2
FPC Site Option 2

N
W E
S

0 625 1,250 2,500
Feet

OSCEOLA PARKWAY EXTENSION

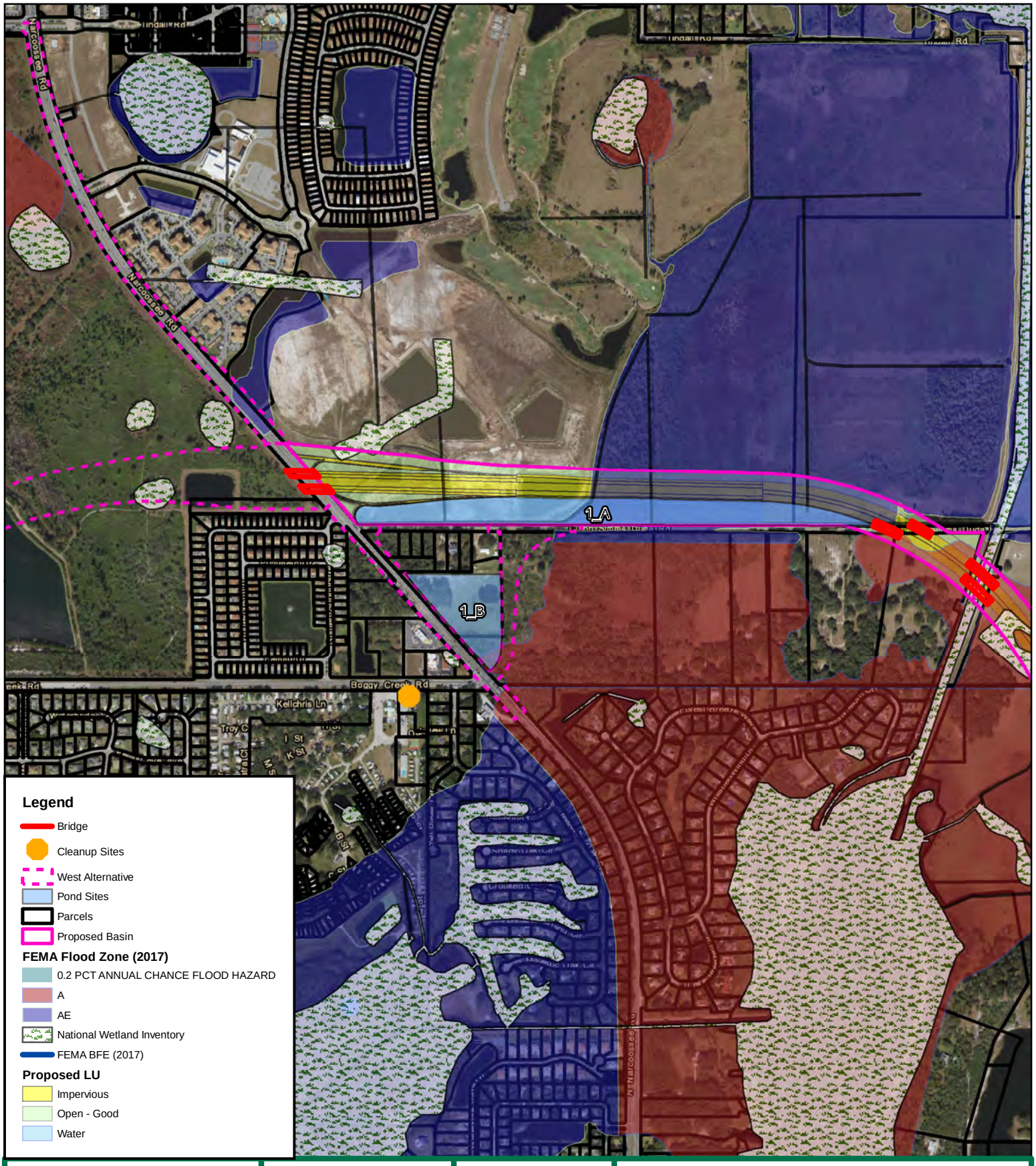
FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Pond Parcel Summary

Table 4 - Alternative 502-207D-1

Basin	Pond Site	Pond Area (ac)	Parcel No.	Property Owner	Total Parcel Area (ac)
B502_207D-1_001	502_207D_1_A	20.2	Infield Area	--	--
	502_207D_1_B	8.8	32-24-31-0000-00-025	ENFINGER PHYLLIS B	8.8
			32-24-31-0000-00-010	DIOCESE OF ORLANDO	42.4
	502_207D_1_C	6.3	32-24-31-0000-00-010	DIOCESE OF ORLANDO	42.4
B502_207D-1_002	502_207D_2_A	23.0	04-25-31-4260-0001-0010	SPRINGHEAD NORTH LLC	109.1
	502_207D_2_B	23.0	04-25-31-4260-0001-0300	STANDARD PACIFIC OF FLORIDA	168.9
B502_207D-1_003 & B502_207D-1_004	502_207D_3_A	16.3	Infield Area	--	--
	502_207D_3_B	24.3	10-25-31-2866-0001-0050	WRIGHT DARLENE ELAINE	11.7
			10-25-31-2866-0001-0060	WHITNEY ROBERT	5.8
			10-25-31-2866-0001-0070	JOSE ANDRADE REV TRUST	5.8
	502_207D_3_C	22.8	10-25-31-2866-0001-0050	WRIGHT DARLENE ELAINE	11.7
			10-25-31-2867-0001-0170	CHESNUT GILBERT L	5.3
			10-25-31-2867-0001-0160	HOUSE OF FREEDOM INC	5.3
	502_207D_FPC_3_A		10-25-31-2866-0001-0050	WRIGHT DARLENE ELAINE	11.7
			10-25-31-2867-0001-0170	CHESNUT GILBERT L	5.3
B502_207D-1_005	502_207D_5_A	12.4	Infield Area	--	--



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

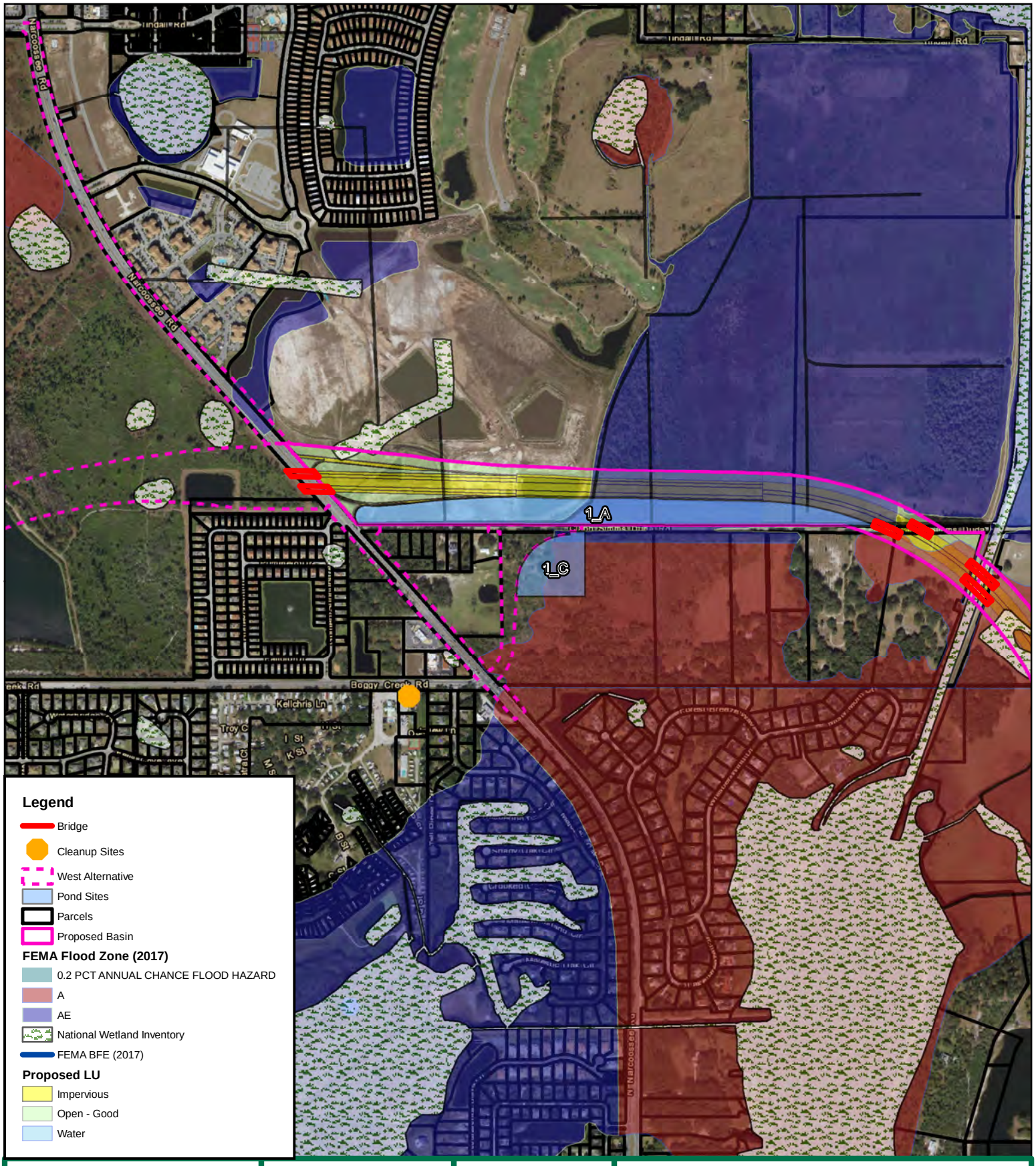
FIGURE D.1a
Split Oak Avoidance Alternative (502)
Basin 1 Pond Option 1

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 650 1,300 2,600
Feet



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE D.1b
Split Oak Avoidance Alternative (502)
Basin 1 Pond Option 2

N
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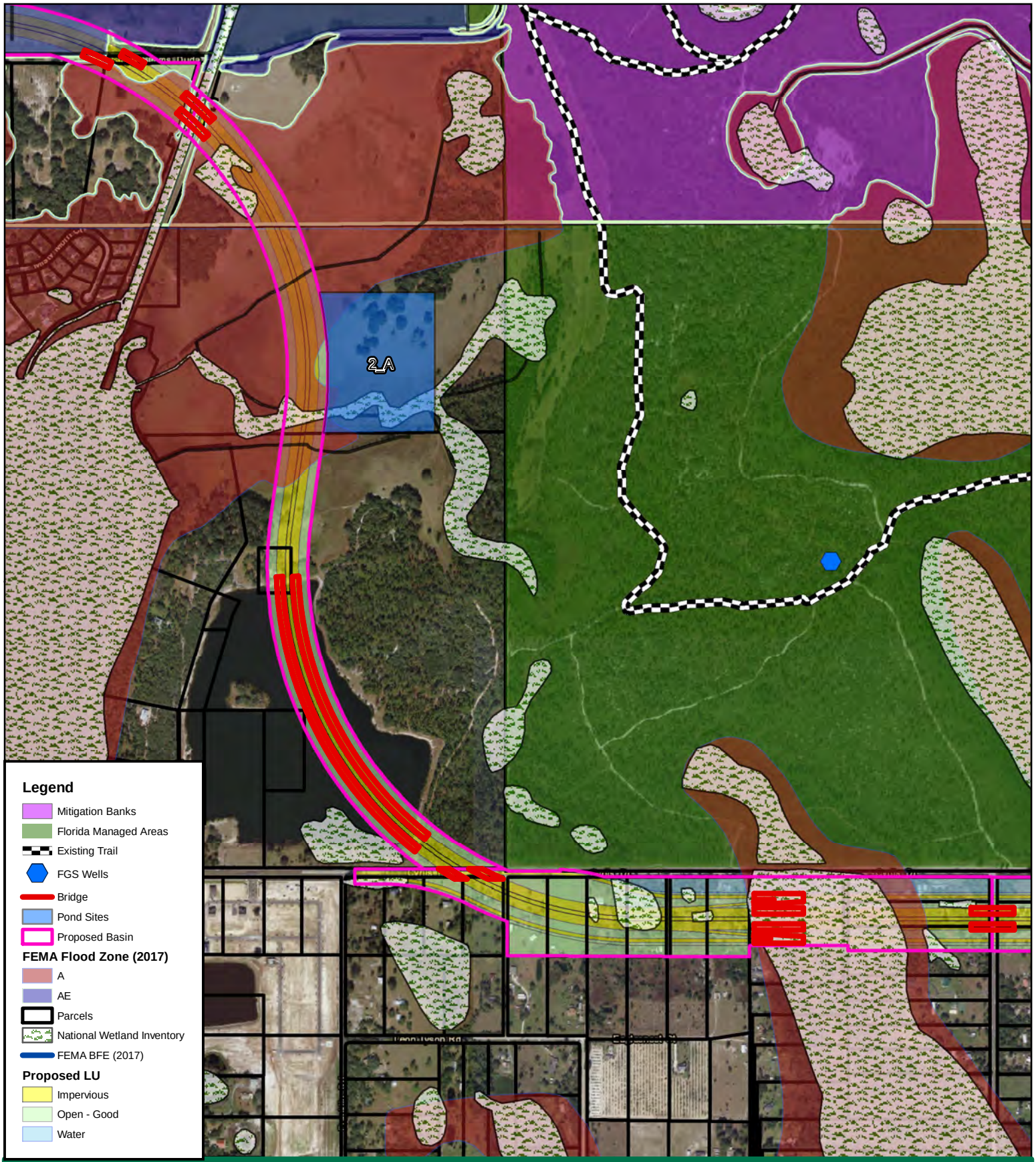
OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 650 1,300 2,600
Feet

A.55



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE D.2a
Split Oak Avoidance Alternative (502)
Basin 2 Pond Option 2

N
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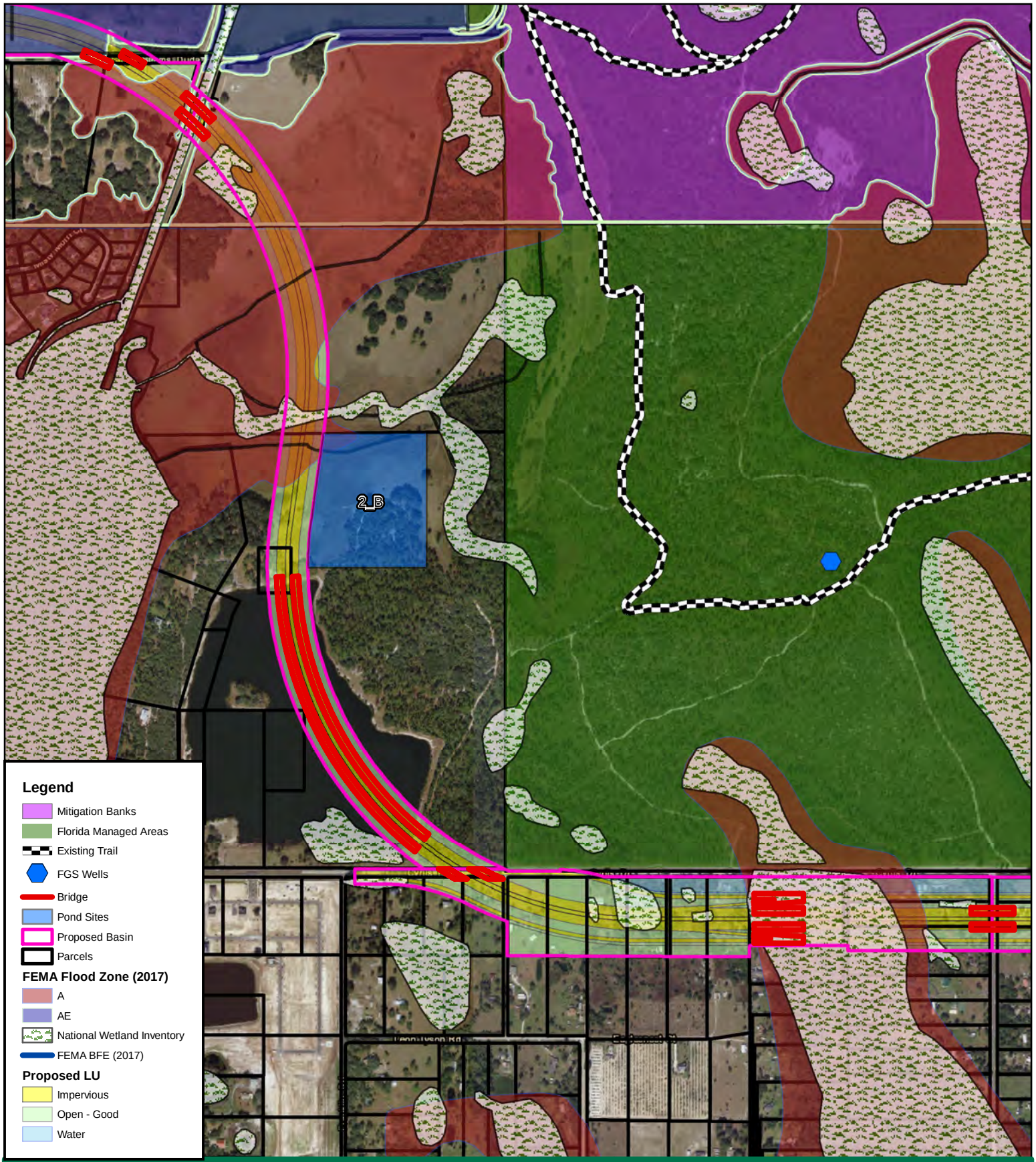
OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 625 1,250 2,500
Feet



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE D.2b
Split Oak Avoidance Alternative (502)

Basin 2 Pond Option 2

N
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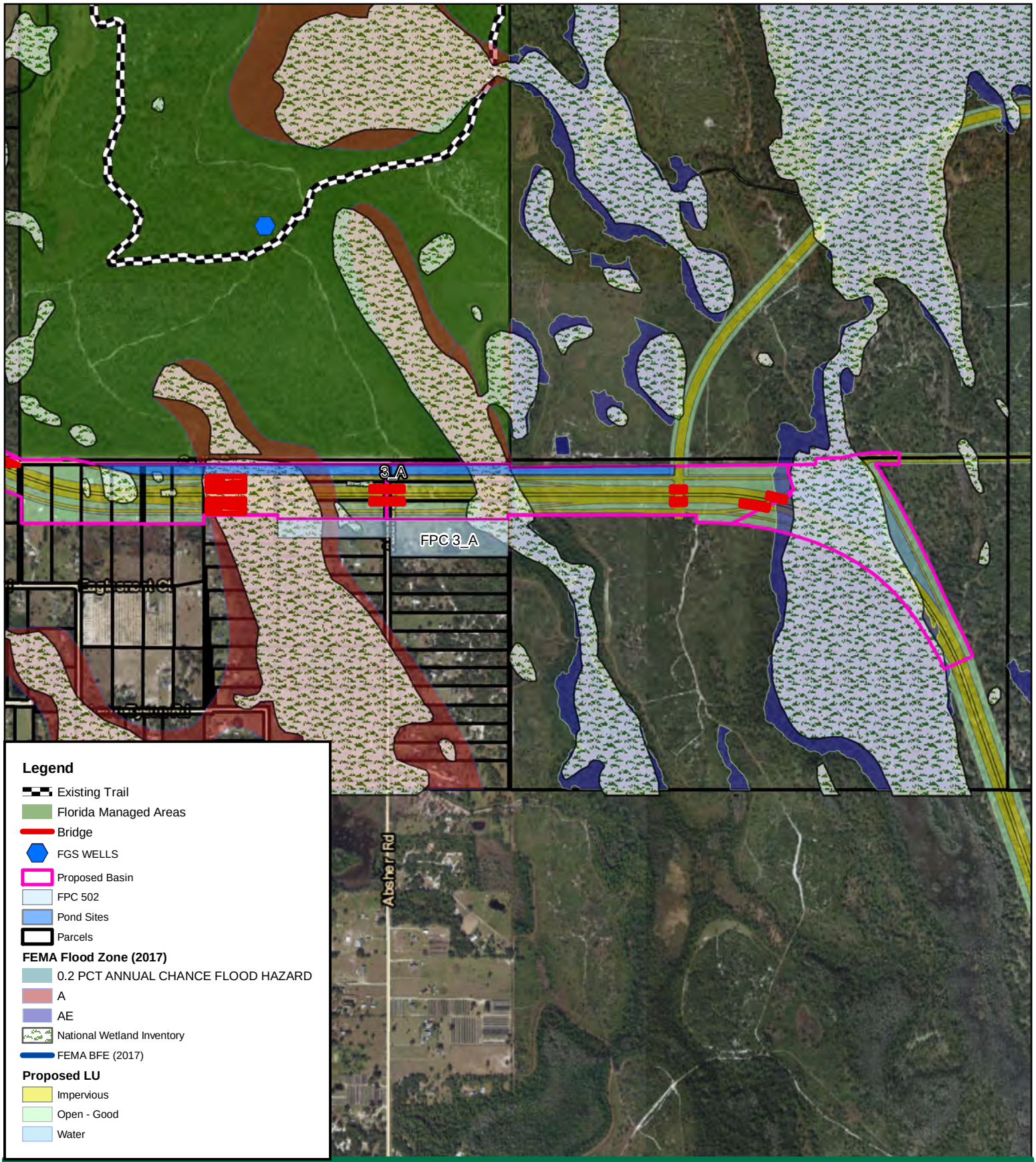
OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 625 1,250 2,500 Feet



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE D.3a
Split Oak Avoidance Alternative (502)

Basin 3
Pond & FPC Site Option 1

N
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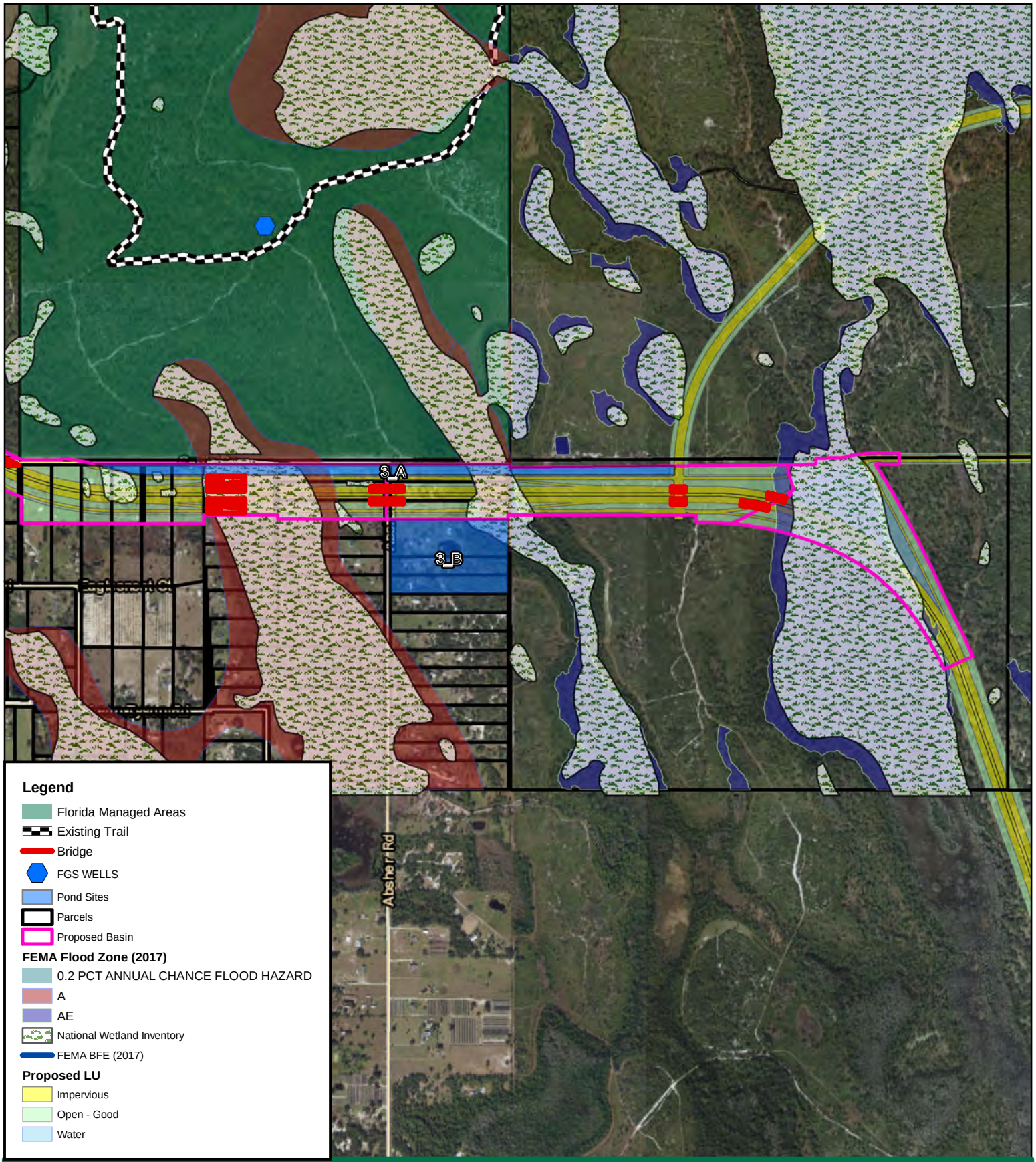
OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 800 1,600 3,200
Feet



The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

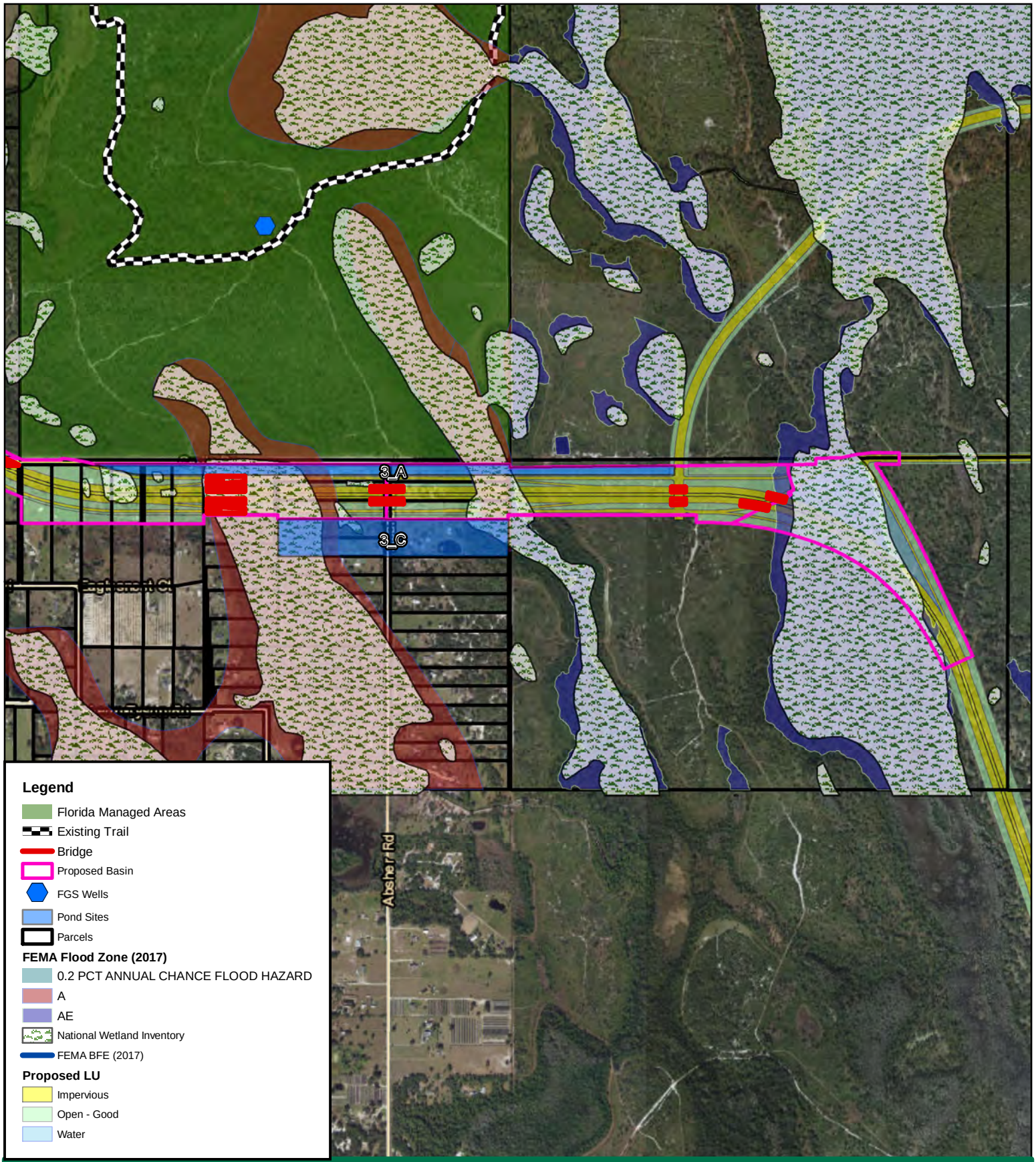
FIGURE D.3b
Split Oak Avoidance Alternative (502)
Basin 3 Pond Option 2

N
W E
S

OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 800 1,600 3,200
Feet



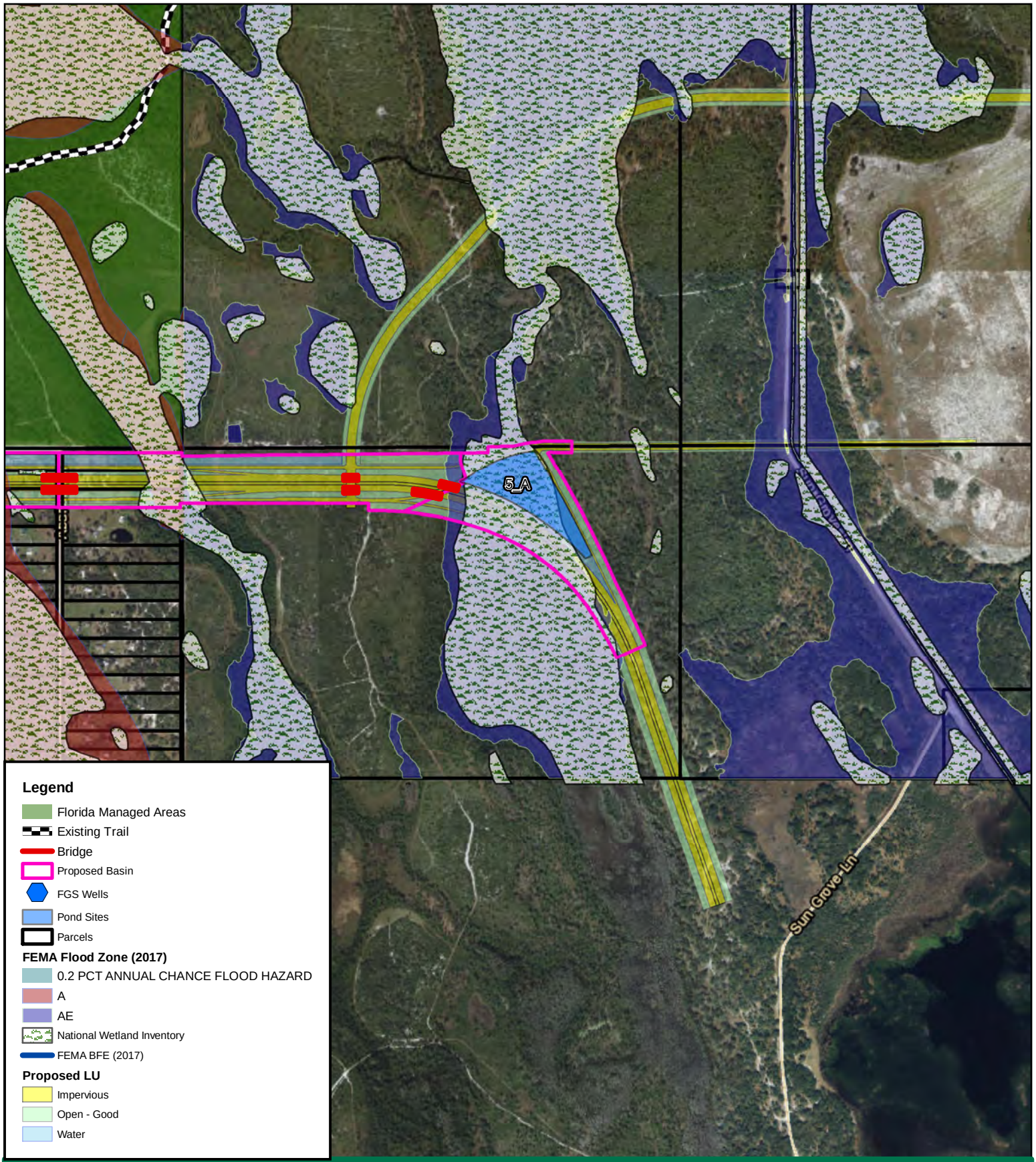
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE D.3c
Split Oak Avoidance Alternative (502)
Basin 3 Pond Option 3

N
W E
S

0 800 1,600 3,200
Feet

OSCEOLA PARKWAY EXTENSION
FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA



The Balmoral Group

165 Lincoln Avenue
Winter Park, Florida 32789

FIGURE D.4
Split Oak Avoidance Alternative (502)
Basin 4 Pond Option 1

N
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OSCEOLA PARKWAY EXTENSION

FROM SR 417 TO CYRILS DRIVE
CFX PD&E STUDY
ORANGE & OSCEOLA COUNTY, FLORIDA

0 800 1,600 3,200
Feet

Appendix B

Pond Calculations

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Notes:
(1) Attenuation volume zero if pre CN is greater than post CN (may occur due to existing water/wetland features)
(2) Interchange CN does not account for wet infield ponds. Open Space CN is used for infield areas; this will need to be further refined in design.

Rainfall (in) **8.6** *(Orange County: 25-yr/24-hr)*

Table B.1 - Attenuation Volume Summary

Lake Nona Alternative (404B)

		Existing				Proposed				Results
Basin	Area (ac)	Weighted CN	S	Runoff (in)	Runoff (ac-ft)	Weighted CN	S	Runoff (in)	Runoff (ac-ft)	Attenuation Volume (ac-ft)
B404B_417	76.2	76.0	3.16	5.71	36.24	86.0	1.63	6.91	43.90	7.7
B404B_001	70.0	78.1	2.80	5.96	34.77	89.3	1.20	7.31	42.66	7.9
B404B_002	15.0	81.0	2.35	6.31	7.89	87.4	1.44	7.08	8.85	1.0
B404B_003	83.6	76.0	3.16	5.71	39.76	90.6	1.04	7.47	52.03	12.3
B404B_004	39.0	73.7	3.57	5.43	17.65	86.6	1.55	6.99	22.71	5.1
B404B_005	53.8	77.7	2.87	5.91	26.51	81.9	2.21	6.42	28.78	2.3
B404B_006	26.5	67.2	4.89	4.64	10.25	85.5	1.70	6.85	15.14	4.9

For Basin 404B_006: Pre CN assumed to be equivalent to permitted Pre CN from ERP App. 070322-11 for Narcoossee Road's impacted Pond 2.

Boggy Creek Alternative (405)

		Existing				Proposed				Results
Basin	Area (ac)	Weighted CN	S	Runoff (in)	Runoff (ac-ft)	Weighted CN	S	Runoff (in)	Runoff (ac-ft)	Attenuation Volume (ac-ft)
B405_417	28.4	79.3	2.61	6.11	14.45	83.7	1.95	6.64	15.71	1.3
B405_001	97.2	79.9	2.52	6.18	50.04	88.2	1.34	7.18	58.16	8.1
B405_002	8.5	90.5	1.05	7.46	5.28	91.4	0.94	7.57	5.36	0.1
B405_003	84.1	76.0	3.16	5.71	40.00	88.4	1.31	7.20	50.49	10.5
B405_004	42.9	74.3	3.46	5.50	19.67	85.6	1.68	6.87	24.55	4.9
B405_005	53.8	77.7	2.87	5.91	26.51	82.1	2.18	6.44	28.89	2.4
B405_006	26.5	67.2	4.89	4.64	10.25	85.5	1.70	6.85	15.14	4.9

For Basin 404B_006: Pre CN assumed to be equivalent to permitted Pre CN from ERP App. 070322-11 for Narcoossee Road's impacted Pond 2.

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Notes:
(1) Attenuation volume zero if pre CN is greater than post CN (may occur due to existing water/wetland features)
(2) Interchange CN does not account for wet infield ponds. Open Space CN is used for infield areas; this will need to be further refined in design.

Rainfall (in) **8.6** *(Orange County: 25-yr/24-hr)*

Table B.1 - Attenuation Volume Summary

Split Oak Minimization Alternative (500_107C-1)

		Existing				Proposed				Results
Basin	Area (ac)	Weighted CN	S	Runoff (in)	Runoff (ac-ft)	Weighted CN	S	Runoff (in)	Runoff (ac-ft)	Attenuation Volume (ac-ft)
B500_107C-1_001	65.4	81.1	2.33	6.32	34.46	93.8	0.66	7.85	42.81	8.4
B500_107C-1_002	80.1	68.8	4.53	4.84	32.31	85.8	1.66	6.89	45.99	13.7
B500_107C-1_003	100.5	84.6	1.82	6.75	56.49	89.8	1.14	7.37	61.75	5.3
B500_107C-1_004	7.0	67.6	4.79	4.70	2.74	82.5	2.12	6.49	3.79	1.1

Split Oak Avoidance Alternative (502_207D-1)

		Existing				Proposed				Results
Basin	Area (ac)	Weighted CN	S	Runoff (in)	Runoff (ac-ft)	Weighted CN	S	Runoff (in)	Runoff (ac-ft)	Attenuation Volume (ac-ft)
B502_207D-1_001	63.0	80.4	2.44	6.24	32.75	91.8	0.89	7.61	39.97	7.2
B502_207D-1_002	52.3	84.3	1.86	6.71	29.24	87.3	1.45	7.07	30.82	1.6
B502_207D-1_003	62.1	82.2	2.17	6.46	33.41	90.0	1.11	7.40	38.28	4.9
B502_207D-1_004	55.2	62.4	6.03	4.07	18.74	85.3	1.72	6.83	31.42	12.7
B502_207D-1_005	43.9	90.0	1.11	7.40	27.06	92.9	0.76	7.75	28.34	1.3

Table B.2 - Treatment Volume Summary - Assumes Wet Detention Criteria

Lake Nona Alternative (404B)

Basin	Area (ac)	Existing Impervious Area (ac)	Proposed Impervious Area (ac)	Treatment Volume - Basin (ac-ft)	Treatment Volume - Impervious Area (ac-ft)	Treatment Volume Required (ac-ft)	Located in a Nutrient Imparied Waterbody	Treatment Volume with Additional 50% East Lake TOHO WBID (ac-ft)
B404B_417	76.2	2.9	36.1	6.4	6.9	6.9*	No	6.9
B404B_001	70.0	1.0	30.0	5.8	6.1	6.1	Yes	9.1
B404B_002	15.0	0.3	6.2	1.3	1.2	1.3	Yes	1.9
B404B_003	83.6	0.0	31.3	7.0	6.5	7.0	Yes	10.5
B404B_004	39.0	0.0	19.1	3.3	4.0	4.0	No	4.0
B404B_005	53.8	1.7	29.7	4.5	5.8	5.8	Yes	8.8
B404B_006	26.5	4.4**	17.6	2.2	2.7	2.7	Yes	4.1
Total	**364.1**	**10.3**	**170.1**	**30.3**	**33.3**	**33.7**		**45.2**

* Assume only Net Impervious will rule here.
** Uses the Pre-Development Average Impervious Width of 25.7-ft along Narcoossee Road within ERP App. 070322-11

Boggy Creek Alternative (405)

Basin	Area (ac)	Existing Impervious Area (ac)	Proposed Impervious Area (ac)	Treatment Volume - Basin (ac-ft)	Treatment Volume - Impervious Area (ac-ft)	Treatment Volume Required (ac-ft)	Located in Imparied Waterbody	Treatment Volume with Additional 50% BMAP (ac-ft)
B405_417	28.4	3.5	9.5	2.4	1.3	1.3*	No	1.3
B405_001	97.2	0.0	41.7	8.1	8.7	8.7	Yes	13.0
B405_002	8.5	4.7	5.4	0.7	0.1	0.7	Yes	1.1
B405_003	84.1	0.0	39.3	7.0	8.2	8.2	Yes	12.3
B405_004	42.9	0.0	19.6	3.6	4.1	4.1	No	4.1
B405_005	53.8	1.7	29.5	4.5	5.8	5.8	Yes	8.7
B405_006	26.5	4.4**	17.6	2.2	2.7	2.7	Yes	4.1
Total	**341.4**	**14.2**	**162.6**	**28.5**	**30.9**	**31.5**		**44.5**

* Assume only Net Impervious will rule here.
** Uses the Pre-Development Average Impervious Width of 25.7-ft along Narcoossee Road within ERP App. 070322-11

Table B.2 - Treatment Volume Summary - Assumes Wet Detention Criteria

Split Oak Minimization Alternative (500_107C-1)

Basin	Area (ac)	Existing Impervious Area (ac)	Proposed Impervious Area (ac)	Treatment Volume - Basin (ac-ft)	Treatment Volume - Impervious Area (ac-ft)	Treatment Volume Required (ac-ft)	Located in Imparied Waterbody	Treatment Volume with Additional 50% BMAP (ac-ft)
B500_107C-1_001	65.4	0.0	26.9	5.5	5.6	5.6	No	5.6
B500_107C-1_002	80.1	0.0	43.0	6.7	9.0	9.0	No	9.0
B500_107C-1_003	100.5	0.0	37.7	8.4	7.9	8.4	No	8.4
B500_107C-1_004	7.0	0.0	3.5	0.6	0.7	0.7	No	0.7
Total	**253.0**	**0.0**	**111.1**	**21.1**	**23.2**	**23.7**		**23.7**

Split Oak Avoidance Alternative (502_207D-1)

Basin	Area (ac)	Existing Impervious Area (ac)	Proposed Impervious Area (ac)	Treatment Volume - Basin (ac-ft)	Treatment Volume - Impervious Area (ac-ft)	Treatment Volume Required (ac-ft)	Located in Imparied Waterbody	Treatment Volume with Additional 50% BMAP (ac-ft)
B502_207D-1_001	63.0	0.0	26.8	5.3	5.6	5.6	No	5.6
B502_207D-1_002	52.3	0.0	28.1	4.4	5.9	5.9	No	5.9
B502_207D-1_003	62.1	0.0	26.5	5.2	5.5	5.5	No	5.5
B502_207D-1_004	55.2	0.0	26.0	4.6	5.4	5.4	No	5.4
B502_207D-1_005	43.9	0.0	15.2	3.7	3.2	3.7	No	3.7
Total	**276.5**	**0.0**	**122.7**	**23.0**	**25.6**	**26.1**		**26.1**

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Table B.3 - Floodplain Impacts

Lake Nona Alternative (404B)

Basin	Floodplain Impact IDs	Floodplain Impacts Total (ac-ft)	Min. SHWT Elev. (ft NAVD)	Min. BFE (ft NAVD)	Floodplain Compensation Depth (ft)	Floodplain Compensation Area (ac)
B404B_417	46A[(1)(2)], 46B[(1)(2)]	4.0	74	75	N/A	0.0
B404B_001	1[(3)]	0.0	79	80	N/A	0.0
B404B_002	51[(1)],53[(1)]	4.9	76	77	N/A	0.0
B404B_003	5	17.5	76.2	78.0	1.8	9.7
B404B_006	13[(1)]	0.1	59.5	61.5	N/A	0.0

[(1)] Floodplain Compensation Provided in Alternative's On-Site Treatment/Attenuation Pond

[(2)] Due to changes in Lake Nona interchange - assumed that impacts doubled

[(3)] Assume floodplain impacts will be accomodated with cross drain

Total Floodplain Impacted Volume (ac-ft)	**26.4 ac-ft**
Required Floodplain Compensation Area (ac)	**9.7 ac**

Boggy Creek Alternative (405)

Basin	Floodplain Impact IDs	Floodplain Impacts Total (ac-ft)	Min. SHWT Elev. (ft NAVD)	Min. BFE (ft NAVD)	Floodplain Compensation Depth (ft)	Floodplain Compensation Area (ac)
B405_417	47[(2)], 57[(2)]	N/A	N/A	N/A	N/A	0.0
B405_001	51, 52, 53[(3)]	19.2	72	74.5	2.5	7.7
B405_002	53[(1)]	2.0	72	74.5	N/A	0.0
B405_003	5	18.6	67	70	3	6.2
B405_006	13[(1)]	0.1	59.5	61.5	N/A	0.0

[(1)] Floodplain Compensation Provided in Alternative's On-Site Treatment/Attenuation Pond

[(2)] To be incldued in SR 417 Widening

[(3)] Assume floodplain impacts will be accomodated with cross drain

Total Floodplain Impacted Volume (ac-ft)	**40 ac-ft**
Required Floodplain Compensation Area (ac)	**13.9 ac**

Split Oak Minimization Alternative (500_107C-1)

Basin	Floodplain Impact IDs	Floodplain Impacts Total (ac-ft)	Min. SHWT Elev. (ft NAVD)	Min. BFE (ft NAVD)	Floodplain Compensation Depth (ft)	Floodplain Compensation Area (ac)
B500_107C-1_001	15[(1)(2)(3)]	64.2	57.5	63	N/A	0.0
B500_107C-1_002	18, 19, 20, 24[(1)]	7.0	60	61.5	N/A	0.0
B500_107C-1_002	26	11.6	70	73.3	3.3	3.5
B500_107C-1_003	27, 31, 32, 33, 34, 36, 37[(1)(3)]	10.4	60	63	N/A	0.0

[(1)] Floodplain Compensation Provided in Alternative's On-Site Treatment/Attenuation Pond

[(2)] Includes floodplain impacts from Alt. 404B/405

[(3)] Exculdes floodplain impact volume from offsite pond option areas.

Total Floodplain Impacted Volume (ac-ft)	**93 ac-ft**
Required Floodplain Compensation Area (ac)	**3.5 ac**

Split Oak Avoidance Alternative (502_207D-1)

Basin	Floodplain Impact IDs	Floodplain Impacts Total (ac-ft)	Min. SHWT Elev. (ft NAVD)	Min. BFE (ft NAVD)	Floodplain Compensation Depth (ft)	Floodplain Compensation Area (ac)
B502_207D-1_001	15 & 16[(1)(2)(3)] 17[(4)]	45.3	57.6	63	N/A	0.0
B502_207D-1_002	17[(4)], 20 & 21[(1)]	42.7	59	61.5	N/A	0.0
B502_207D-1_003	26[(3)], 28	51.4	70	73.3	3.3	15.6
B502_207D-1_004	27[(3)],31	3.9	70	73.3	3.3	1.2
B502_207D-1_005	31[(1)]	0.8	65.4	65.5	N/A	0.0

[(1)] Floodplain Compensation Provided in Alternative's On-Site Treatment/Attenuation Pond

[(2)] Includes floodplain impacts from Alt. 404B/405

[(3)] Exculdes floodplain impact volume from offsite pond option areas.

[(4)] Exculdes floodplain impact volume from SFWMD Canal R/W

Total Floodplain Impacted Volume (ac-ft)	**144 ac-ft**
Required Floodplain Compensation Area (ac)	**16.8 ac**

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Table B.4 - Required Pond Volume Calculations

Lake Nona Alternative (404B)

Basin	Attenuation Volume	Treatment Volume	Provided On-Site Floodplain Compensation	Total Required On-Site Pond Volume
	ac-ft	ac-ft	ac-ft	ac-ft
B404B_417	7.7	6.9	4.0	18.6
B404B_001	7.9	9.1	0.0	17.0
B404B_002	1.0	1.9	4.9	7.7
B404B_003	12.3	10.5	FPC Pond	22.7
B404B_004	5.1	4.0	--	9.0
B404B_005	2.3	8.8	--	11.0
B404B_006	4.9	4.1	0.1	9.1

Boggy Creek Alternative (405)

Basin	Attenuation Volume	Treatment Volume	Provided On-Site Floodplain Compensation	Total Required On-Site Pond Volume
	ac-ft	ac-ft	ac-ft	ac-ft
B405_417	1.3	1.3	0.0	2.5
B405_001	8.1	13.0	FPC Pond	21.2
B405_002	0.1	1.1	2.0	3.2
B405_003	10.5	12.3	FPC Pond	22.8
B405_004	4.9	4.1	--	9.0
B405_005	2.4	8.7	--	11.1
B405_006	4.9	4.1	0.1	9.1

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Table B.4 - Required Pond Volume Calculations

Split Oak Minimization Alternative (500_107C-1)

Basin	Attenuation Volume	Treatment Volume	Provided On-Site Floodplain Compensation	Total Required On-Site Pond Volume
	ac-ft	ac-ft	ac-ft	ac-ft
B500_107C-1_001	8.4	5.6	64.2	78.2
B500_107C-1_002	13.7	9.0	7.0	29.7
B500_107C-1_003	5.3	8.4	10.4	24.0
B500_107C-1_004	1.1	0.7	--	1.8

Split Oak Avoidance Alternative (502_207D-1)

Basin	Attenuation Volume	Treatment Volume	Provided On-Site Floodplain Compensation	Total Required On-Site Pond Volume
	ac-ft	ac-ft	ac-ft	ac-ft
B502_207D-1_001	7.2	5.6	45.3	58.1
B502_207D-1_002	1.6	5.9	42.7	50.1
B502_207D-1_003	4.9	5.5	FPC Pond	10.4
B502_207D-1_004	12.7	5.4	FPC Pond	18.1
B502_207D-1_005	1.3	3.7	0.8	5.7

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Table B.5 - Pond Sizing Calculations

Lake Nona Alternative (404B)

Basin	Required Volume	Additional Percent for Landscaping / Tie-In Area	DHW Design Depth	L & W at Outside Top of Berm	Required Pond Area*
	ac-ft	pct	ft	ft	ac
B404B_417	18.6	20%	3	580	9.3
B404B_001	17.0	20%	3	557	8.5
B404B_002	7.7	20%	3	396	4.3
B404B_003	22.7	20%	3	635	11.1
B404B_004	9.0	20%	3	423	4.9
B404B_005	11.0	0%	3	461	4.9
B404B_006	9.1	20%	1.65	545	8.2
Total	**95.1**				**51.2**

**Required Pond Area includes: 1 foot of freeboard above the design depth, assumes square shape, 4:1 side slopes, and a 20-ft maintenance berm with additional area for landscaping/tie-in slopes*

DOES NOT INCLUDE IMPACTS TO EXISTING PONDS except Narcoossee Rd Pond2

Boggy Creek Alternative (405)

Basin	Required Volume	Additional Percent for Landscaping / Tie-In Area	DHW Design Depth	L & W at Outside Top of Berm	Required Pond Area*
	ac-ft	pct	ft	ft	ac
B405_417	2.5	20%	3	252	1.7
B405_001	21.2	20%	3	615	10.4
B405_002	3.2	20%	3	274	2.1
B405_003	22.8	20%	3	635	11.1
B405_004	9.0	20%	3	421	4.9
B405_005	11.1	0%	3	461	4.9
B405_006	9.1	20%	1.65	545	8.2
Total	**78.7**				**43.3**

**Required Pond Area includes: 1 foot of freeboard above the design depth, assumes square shape, 4:1 side slopes, and a 20-ft maintenance berm with additional area for landscaping/tie-in slopes*

DOES NOT INCLUDE IMPACTS TO EXISTING PONDS except Narcoossee Rd Pond2

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Table B.5 - Pond Sizing Calculations

Split Oak Minimization Alternative (500_107C-1)

Basin	Required Volume	Additional Percent for Landscaping / Tie-In Area	DHW Design Depth	L & W at Outside Top of Berm	Required Pond Area*
	ac-ft	pct	ft	ft	ac
B500_107C-1_001	78.2	20%	3	1,126	34.9
B500_107C-1_002	29.7	20%	3	717	14.2
B500_107C-1_003	24.0	20%	3	651	11.7
B500_107C-1_004	1.8	20%	3	221	1.3
Total	**133.6**				**62.1**

**Required Pond Area includes: 1 foot of freeboard above the design depth, assumes square shape, 4:1 side slopes, and a 20-ft maintenance berm with additional area for landscaping/tie-in slopes*

Split Oak Avoidance Alternative (502_207D-1)

Basin	Required Volume	Additional Percent for Landscaping / Tie-In Area	DHW Design Depth	L & W at Outside Top of Berm	Required Pond Area*
	ac-ft	pct	ft	ft	ac
B502_207D-1_001	58.1	20%	3	979	26.4
B502_207D-1_002	50.1	20%	3	914	23.0
B502_207D-1_003	10.4	20%	3	449	5.6
B502_207D-1_004	18.1	20%	3	573	9.0
B502_207D-1_003 & 004 with FPC	83.8	20%	3	1,163	37.3
B502_207D-1_005	5.7	20%	3	349	3.4
Total	**226.2**				**104.7**

**Required Pond Area includes: 1 foot of freeboard above the design depth, assumes square shape, 4:1 side slopes, and a 20-ft maintenance berm with additional area for landscaping/tie-in slopes*

Table 1A. Curve Number Calculation Existing Conditions

BasinID	Pre Land Use for CN Tables	Hydrologic Soil Group	Non-DCIA CN	Area (ac)	Percent DCIA	Non-DCIA Area (ac)	Annual Runoff Coefficient
B404B_001	Woods - Good	D	77	37.24	0%	37.24	--
	Water[1]	--	100	6.98	100%	0.00	--
	Brush - Good	D	73	4.94	0%	4.94	--
	Commercial	D	95	1.07	0%	1.07	--
	Open - Good	D	80	0.00	0%	0.00	--
	Pasture - Good	D	80	18.77	0%	18.77	--
	Impervious	--	98	0.98	0%	0.98	--
	Pre B404B_001 TOTAL		**78.2**	**70.0**	**10.0%**	**63.00**	**0.170**
B404B_002	Woods - Good	D	77	3.24	0%	3.24	--
	Water[1]	--	100	2.26	100%	0.00	--
	Residential - 1 acre	D	84	0.70	0%	0.70	--
	Residential - 1/4 acre	D	87	0.34	0%	0.34	--
	Pasture - Good	D	80	4.63	0%	4.63	--
	Impervious	--	98	0.29	0%	0.29	--
	Farmsteads	D	80	3.49	0%	3.49	--
	Open - Good	D	80	0.04	0%	0.04	--
	Pre B404B_002 TOTAL		**80.1**	**15.0**	**15.0%**	**12.75**	**0.217**
B404B_003	Woods - Good	D	77	46.10	0%	46.10	--
	Residential - 1/8 acre	D	92	0.77	0%	0.77	--
	Residential - 1/4 acre	D	87	0.09	0%	0.09	--
	Pasture - Good	D	80	0.22	0%	0.22	--
	Brush - Good	D	98	25.03	0%	25.03	--
	Water[1]	--	100	11.38	100%	0.00	--
	Pre B404B_003 TOTAL		**84.5**	**83.6**	**13.6%**	**72.21**	**0.244**
B404B_005	Woods - Good	A	30	1.53	0%	1.53	--
	Woods - Good	D	77	3.34	0%	3.34	--
	Residential - 1/8 acre	D	92	0.01	0%	0.01	--
	Open - Poor	D	89	0.25	0%	0.25	--
	Impervious	D	98	1.70	0%	1.70	--
	Open - Good	D	80	0.16	0%	0.16	--
	Brush - Good	A	30	5.58	0%	5.58	--
	Brush - Good	D	73	18.72	0%	18.72	--
	Water[1]&[2]	--	100	22.54	100%	0.00	--
	Pre B404B_005 TOTAL		**65.2**	**53.8**	**41.9%**	**31.29**	**0.364**
B404B_006	Woods - Good	A	30	1.65	0%	1.65	--
	Woods - Good	D	77	1.97	0%	1.97	--
	Residential - 1/2 acre	A	54	0.05	0%	0.05	--
	Commercial	D	95	0.00	0%	0.00	--
	Pasture - Fair	A	49	3.33	0%	3.33	--
	Pasture - Fair	D	84	0.13	0%	0.13	--
	Pasture - Good	D	80	0.00	0%	0.00	--
	Open - Poor	D	89	0.72	0%	0.72	--
	Open - Poor	A	68	0.11	0%	0.11	--
	Impervious	D	98	15.71	0%	15.71	--
	Open - Good	D	80	2.68	0%	2.68	--
	Open - Good	A	39	0.16	0%	0.16	--
	Water[1]&[2]	--	100	0.00	100%	0.00	--
	Pre B404B_006 TOTAL		**83.3**	**26.5**	**0.0%**	**26.52**	**0.143**

[1] Water includes wetland areas (Cypress, Wetland Forested Mixed, etc.)

[2] Removed existing subdivision pond from Brush Good, Type D & added it to water (3 ac.)

Table 1B. Curve Number Calculation Proposed Conditions

BasinID	Post Land Use for CN Tables	Hydrologic Soil Group	Non-DCIA CN	Area (ac)	Percent DCIA[(1)]	Non-DCIA Area (ac)	Annual Runoff Coefficient
B404B_001	Impervious	--	98	30.04	0%	30.04	--
	Open - Good	D	80	31.44	0%	31.44	--
	Water[(2)]	--	100	0.00	100%	0.00	--
	Post B404B_001 TOTAL		**88.8**	**61.5**	**0.0%**	**61.49**	**0.222**
B404B_002	Impervious	--	98	6.19	0%	6.19	--
	Open - Good	D	80	8.81	0%	8.81	--
	Water	--	100	0.00	100%	0.00	--
	Post B404B_002 TOTAL		**87.4**	**15.0**	**0.0%**	**15.01**	**0.199**
B404B_003	Impervious	--	98	31.34	0%	31.34	--
	Open - Good	D	80	36.22	0%	36.22	--
	Water[(2)]	--	100	0.00	100%	0.00	--
	Post B404B_003 TOTAL		**88.4**	**67.6**	**0.0%**	**67.56**	**0.216**
B404B_005	Impervious	--	98	29.70	0%	29.70	--
	Open - Good	A	39	10.44	0%	10.44	--
	Open - Good	D	80	13.74	0%	13.74	--
	Water	--	100	0.00	100%	0.00	--
	Post B404B_005 TOTAL		**82.0**	**53.9**	**0.0%**	**53.88**	**0.131**
B404B_006	Impervious	--	98	17.62	0%	17.62	--
	Open - Good	A	39	4.17	0%	4.17	--
	Open - Good	D	80	4.71	0%	4.71	--
	Water	--	100	0.00	100%	0.00	--
	Post B404B_006 TOTAL		**85.5**	**26.5**	**0.0%**	**26.51**	**0.168**

(1) Assumes runoff collected in roadside ditches before collection into the SMF, therefore, roadway DCIA is zero.

(2) Pollutant Loading Analysis excludes infield pond areas

Table 2A. Existing Conditions Land Use for Event Mean Concentration				
BasinID	Pre Land Use for EMC Tables	Area (ac)	Event Mean Concentration (mg/L)	
			TN	TP
B404B_001	Undeve/Rangeland/Forest	49.16	1.15	0.055
	Low-Intensity Commercial	2.05	0.93	0.16
	Agricultural-Pasture	18.77	2.48	0.7
	Pre B404B_001 TOTAL	**70.0**	**1.50**	**0.231**
B404B_002	Undeve/Rangeland/Forest	5.50	1.15	0.055
	Single-Family	1.38	2.07	0.327
	Agricultural-Pasture	8.12	2.48	0.7
	Pre B404B_002 TOTAL	**15.0**	**1.95**	**0.429**
B404B_003	Undeve/Rangeland/Forest	82.51	1.15	0.055
	Single-Family	0.85	2.07	0.327
	Agricultural-Pasture	0.22	2.48	0.7
	Pre B404B_003 TOTAL	**83.6**	**1.16**	**0.060**
B404B_005	Undeve/Rangeland/Forest	51.96	1.15	0.055
	Single-Family	0.01	2.07	0.327
	Highway (Statewide)	1.86	1.52	0.2
	Pre B404B_005 TOTAL	**53.8**	**1.16**	**0.060**
B404B_006	Undeve/Rangeland/Forest	7.91	1.15	0.055
	Single-Family	0.05	2.07	0.327
	Highway (Statewide)	18.55	1.52	0.2
	Low-Intensity Commercial	0.00	0.93	0.16
	Pre B404B_006 TOTAL	**26.5**	**1.41**	**0.157**

Table 2B. Proposed Conditions Land Use for Event Mean Concentration

BasinID	Post Land Use for EMC Tables	Area (ac)	Event Mean Concentration (mg/L)	
			TN	TP
B404B_001	Highway (Statewide)	61.49	1.52	0.2
	Post B404B_001 TOTAL	**61.5**	**1.52**	**0.200**
B404B_002	Highway (Statewide)	15.01	1.52	0.2
	Post B404B_002 TOTAL	**15.0**	**1.52**	**0.200**
B404B_003	Highway (Statewide)	67.56	1.52	0.2
	Post B404B_003 TOTAL	**67.6**	**1.52**	**0.200**
B404B_005	Highway (Statewide)	53.88	1.52	0.2
	Post B404B_005 TOTAL	**53.9**	**1.52**	**0.200**
B404B_006	Highway (Statewide)	26.51	1.52	0.2
	Post B404B_006 TOTAL	**26.5**	**1.52**	**0.200**

Project: CFX PD&E PSR: Osceola Parkway Extension
Location: Orange & Osceola County, Florida

Designed By: ALE
Checked By: LCS

Date: 12/10/2019
Date: 12/10/2019

PRE/POST NITROGEN LOADING ANALYSIS

Pre Condition	Non-DCIA CN	Percent DCIA	Runoff Coefficient[1]		Annual Rainfall (in/yr)		Basin Area (acres)		Annual Runoff (ac-ft/yr)		Total N Event Mean Concentration (mg/L)		Inflow Mass Loading (kg/yr)	Treatment System	Pollutant Removal Efficiency (%)	Outflow Mass Loading (kg/yr)
B404B_001	78.2	10.0%	0.170		49	x	69.98	=	48.6	x	1.50	=	89.90			89.90
B404B_002	80.1	15.0%	0.217		49	x	15.01	=	13.3	x	1.95	=	32.06			32.06
B404B_003	84.5	13.6%	0.244		49	x	83.59	=	83.3	x	1.16	=	119.47			119.47
B404B_005	65.2	41.9%	0.364		49	x	53.83	=	80.0	x	1.16	=	114.78			114.78
B404B_006	83.3	0.0%	0.143		49	x	26.52	=	15.5	x	1.41	=	26.94			26.94
						Totals:	**248.93**		**240.7**				**383.16**		**TOTAL**	**383.16**

[1] *Interpolation for Zone 2 Mean Annual Runoff Coefficients as a function of DCIA Percentage and Non-DCIA Curve Number table (FDEP 2010 DRAFT Stormwater Quality Applicant's Handbook, Appendix E)*

Proposed Condition	Non-DCIA CN	Percent DCIA	Runoff Coefficient[1]		Annual Rainfall (in/yr)		Basin Area (acres)		Annual Runoff (ac-ft/yr)		Total N Event Mean Concentration (mg/L)		Inflow Mass Loading (kg/yr)	Treatment System	Required Pollutant Removal Efficiency from SMF (%)	Outflow Mass Loading (kg/yr)
B404B_001	88.8	0.0%	0.222	x	49	x	61.49	=	55.7	x	1.52	=	104.50		14.0	89.90
B404B_002	87.4	0.0%	0.199	x	49	x	15.01	=	12.2	x	1.52	=	22.86		0.0	22.86
B404B_003	88.4	0.0%	0.216	x	49	x	67.56	=	59.6	x	1.52	=	111.73		0.0	111.73
B404B_005	82	0.0%	0.131	x	49	x	53.88	=	28.8	x	1.52	=	54.04		0.0	54.04
B404B_006	85.5	0.0%	0.168	x	49	x	26.51	=	18.2	x	1.52	=	34.09		21.0	26.94
							Totals:	**224.44**		**174.5**			**327.22**		**TOTAL**	**305.47**

[1] *Interpolation for Zone 2 Mean Annual Runoff Coefficients as a function of DCIA Percentage and Non-DCIA Curve Number table (FDEP 2010 DRAFT Stormwater Quality Applicant's Handbook, Appendix E)*

Project: CFX PD&E PSR: Osceola Parkway Extension
Location: Orange & Osceola County, Florida

Designed By: ALE
Checked By: LCS

Date: 12/10/2019
Date: 12/10/2019

PRE/POST PHOSPHOROUS LOADING ANALYSIS

Pre Condition	Non-DCIA CN	Percent DCIA	Runoff Coefficient[1]		Annual Rainfall (in/yr)		Basin Area (acres)		Annual Runoff (ac-ft/yr)		Total N Event Mean Concentration (mg/L)		Inflow Mass Loading (kg/yr)	Treatment System	Pollutant Removal Efficiency (%)	Outflow Mass Loading (kg/yr)
B404B_001	78.2	10.0%	0.170		49	x	69.98	=	48.6	x	0.231	=	13.85			13.85
B404B_002	80.1	15.0%	0.217		49	x	15.01	=	13.3	x	0.429	=	7.04			7.04
B404B_003	84.5	13.6%	0.244		49	x	83.59	=	83.3	x	0.060	=	6.11			6.11
B404B_005	65.2	41.9%	0.364		49	x	53.83	=	80.0	x	0.060	=	5.93			5.93
B404B_006	83.3	0.0%	0.143		49	x	26.52	=	15.5	x	0.157	=	3.00			3.00
					Totals:		**248.93**		**240.7**				**35.92**		**TOTAL**	**35.92**

[1] *Interpolation for Zone 2 Mean Annual Runoff Coefficients as a function of DCIA Percentage and Non-DCIA Curve Number table (FDEP 2010 DRAFT Stormwater Quality Applicant's Handbook, Appendix E)*

Proposed Condition	Non-DCIA CN	Percent DCIA	Runoff Coefficient[1]		Annual Rainfall (in/yr)		Basin Area (acres)		Annual Runoff (ac-ft/yr)		Total N Event Mean Concentration (mg/L)		Inflow Mass Loading (kg/yr)	Treatment System	Required Pollutant Removal Efficiency from SMF (%)	Outflow Mass Loading (kg/yr)
B404B_001	88.8	0.0%	0.222	x	49	x	61.49	=	55.7	x	0.200	=	13.75		0.0	13.75
B404B_002	87.4	0.0%	0.199	x	49	x	15.01	=	12.2	x	0.200	=	3.01		0.0	3.01
B404B_003	88.4	0.0%	0.216	x	49	x	67.56	=	59.6	x	0.200	=	14.70		58.4	6.11
B404B_005	82	0.0%	0.131	x	49	x	53.88	=	28.8	x	0.200	=	7.11		16.6	5.93
B404B_006	85.5	0.0%	0.168	x	49	x	26.51	=	18.2	x	0.200	=	4.49		33.2	3.00
					Totals:		**224.44**		**174.5**				**43.06**		**TOTAL**	**31.80**

[1] *Interpolation for Zone 2 Mean Annual Runoff Coefficients as a function of DCIA Percentage and Non-DCIA Curve Number table (FDEP 2010 DRAFT Stormwater Quality Applicant's Handbook, Appendix E)*

Appendix C

Pond Option Construction Cost Estimates

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Freeboard: 1 ft
Slope: 4 :1

Berm: 20 ft
PPV Depth: 12 ft

Table B.6 - Pond Quantities & Construction Cost Estimates

Unit Costs for Pond Construction Costs

	Total Excavation Volume	Total Sodding	Clearing & Grubbing	Typical Retention Pond Unit Costs per Acre[1]
Unit Cost[(2)]	$5.30	$2.50	$17,000.00	$77,141

(1) Includes Embankment, Fence, Gate, Pipes & Structure in typical unit cost
(2) Unit Costs from CFX (provided by RS&H)

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Freeboard: 1 ft
Slope: 4 :1
Berm: 20 ft

Table B.6 - Pond Quantities & Construction Cost Estimates

Lake Nona Alternative (404B): Treatment Pond Volume Estimates

Basin	Required Treatment Pond Volume ac-ft	Required Treatment Pond Area ac	Estimated Normal Water Level Area ac	Pond Bottom Area[1] ac	Permanent Pool Volume[1] ac-ft	Total Treatment Pond Excavation Volume[2] ac-ft
B404B_417	18.6	9.3	5.91	3.88	58.7	77.3
B404B_001	17.0	8.5	5.39	3.46	53.1	70.1
B404B_002	7.7	4.3	2.40	1.18	21.5	29.2
B404B_003	22.7	11.1	7.26	4.99	73.5	96.2
B404B_004	9.0	4.9	2.82	1.48	25.8	34.9
B404B_005	11.0	4.9	3.46	1.96	32.5	43.5
B404B_006	9.1	8.2	5.36	3.44	52.8	61.9

[1] *Assumes a 12-ft Permanent Pool Depth*
[2] *Excavation Volume = Required Pond Volume + Permanent Pool Volume*

Lake Nona Alternative (404B): Pond Quantities by Option

Basin	Option	Pond Site	Provided Pond Area ac	Excavation Volume[1] CY	Sodding[2] SY	Clearing & Grubbing[3] AC	Pond Option Construction Cost	
B404B_417	Option 1	404B_417_A	9.3	**124,718**	**16,423**	9.3	$1,577,571	
B404B_001	Option 1	1_A	5.9			5.9		
		1_C	1.9			0.0		Infield
		1_D	3.7			0.0		Infield
		TOTAL	11.5	113,050	29,588	5.9	$1,660,551	
	Option 2	1_B	4.1			4.1		
		1_C	1.9			0.0		Infield
		1_D	3.7			0.0		Infield
		TOTAL	9.7	113,050	20,876	4.1	$1,469,318	
B404B_002	Option 1	2_A	11.2	47,165	42,602	0.0	$1,220,455	Infield
B404B_003	TP Option 1	3_A	1.8			0.0		Infield
		3_B	4.1			0.0		Infield
		3_C	5.2			5.2		
		TOTAL	11.1	155,266	18,585	5.2	$1,814,032	
	TP Option 2	3_A	1.8			0.0		Infield
		3_B	4.1			0.0		Infield
		3_D	5.2			5.2		
		TOTAL	11.1	155,266	18,585	5.2	$1,814,032	
	FPC Option 1	FPC_3_A	9.7	15,649	0	9.7	$996,106	
	FPC Option 2	FPC_3_B	9.7	15,649	0	9.7	$996,106	
B404B_004	Option 1	4_A	5.0	56,230	10,564	5.0	$795,135	
	Option 2	4_B	4.9	56,230	10,080	4.9	$784,511	
B404B_005	Option 1	5_A	4.9	70,197	6,985	0.0	$767,497	Infield
B404B_006	Option 1	6_A	8.8	99,871	16,647	8.8	$1,399,374	
	Option 2	6_B	8.2	99,871	13,743	8.2	$1,335,629	

[1] *Excavation Volume = Required Pond Volume + Permanent Pool Volume (for Treatment Ponds), or Total Floodplain Impact Volume (for FPC Ponds)*
[2] *Sodding = Total Provided Pond Area - Estimated Normal Water Level Area (includes infields and easements, excludes FPC Ponds)*
[3] *Clearing & Grubbing = Total Provided Pond Area (excludes infield areas)*

Lake Nona Alternative (404B) Pond Quantity & Construction Cost Summary[1]

Basin	Option for Quantity Estimate	Total Excavation Volume CY	Total Sodding SY	Clearing & Grubbing AC	Pond Construction Cost Per Alternative
B404B_417	Option 1	124,718	16,423	9.3	$1,577,571
B404B_001	Option 1	113,050	29,588	5.9	$1,660,551
B404B_002	Option 1	47,165	42,602	0.0	$1,220,455
B404B_003	TP Option 1 + FPC Option 1	170,915	18,585	14.9	$2,810,138
B404B_004	Option 1	56,230	10,564	5.0	$795,135
B404B_005	Option 1	70,197	6,985	0.0	$767,497
B404B_006	Option 1	99,871	16,647	8.8	$1,399,374
	Alt 404B Totals	**682,147**	**141,394**	**43.9**	**$10,230,721**

[1] *Uses quantity of the largest pond option per basin*

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Freeboard: 1 ft
Slope: 4 :1
Berm: 20 ft

Table B.6 - Pond Quantities & Construction Cost Estimates

Boggy Creek Alternative (405): Treatment Pond Volume Estimates

Basin	Required Pond Volume ac-ft	Required Pond Area ac	Estimated Normal Water Level Area ac	Pond Bottom Area[1] ac	Permanent Pool Volume[1] ac-ft	Total Excavation Volume[2] ac-ft
B405_417	2.5	1.7	--	--	--	--
B405_001	21.2	10.4	6.75	4.57	67.9	89.1
B405_002	3.2	2.1	0.94	0.26	7.2	10.3
B405_003	22.8	11.1	7.27	5.00	73.7	96.4
B405_004	9.0	4.9	2.79	1.47	25.5	34.5
B405_005	11.1	4.9	3.47	1.97	32.6	43.7
B405_006	9.1	8.2	7.36	5.08	74.6	83.7

(1) Assumes a 12-ft Permanent Pool Depth
(2) Excavation Volume = Required Pond Volume + Permanent Pool Volume
(3) Uses quantity of the largest pond option

Boggy Creek Alternative (405): Pond Quantities by Option

Basin	Option	Pond Site	Provided Pond Area ac	Excavation Volume[1] CY	Sodding[2] SY	Clearing & Grubbing[3] AC	Pond Option Construction Cost	
B405_417	N/A	N/A	--	--	--	--	N/A	
B405_001	TP Option 1	1_A	2.7			0		Infield
		1_B	4.6			0		Infield
		1_C	2.9			2.9		
		1_D	2.0			0		Infield
		TOTAL	12.2	143,757	26,371	2.9	$1,818,253	
	FPC Option 1	FPC_1_A	7.8	12,413	0	7.8	$800,084	
B405_002	Option 1	2_A	2.1	16,646	5,632	2.1	$300,000	
B405_003	TP Option 1	3_A	11.1	155,586	18,516	11.1	$1,915,856	
	TP Option 2	3_B	11.1	155,586	18,516	11.1	$1,915,856	
	FPC Option 1	FPC_3_A	6.2	9,990	0	6.2	$636,621	
	FPC Option 2	FPC_3_B	6.2	9,990	0	6.2	$636,621	
B405_004	Option 1	4_A	5.1	55,672	11,173	5.1	$803,111	
	Option 2	4_B	4.9	55,672	10,205	4.9	$781,863	
B405_005	Option 1	5_A	4.9	70,526	6,913	0.0	$769,057	Infield
B405_006	Option 1	6_A	8.8	135,039	6,970	8.8	$1,561,569	
	Option 2	6_B	8.2	135,039	4,066	8.2	$1,497,824	

(1) Excavation Volume = Required Pond Volume + Permanent Pool Volume (for Treatment Ponds), or Total Floodplain Impact Volume (for FPC Ponds)
(2) Sodding = Total Provided Pond Area - Estimated Normal Water Level Area (includes infields and easements, excludes FPC Ponds)
(3) Clearing & Grubbing = Total Provided Pond Area (excludes infield areas)

Boggy Creek Alternative (405) Pond Quantity Summary[1]

Basin	Option for Quantity Estimate	Total Excavation Volume CY	Total Sodding SY	Clearing & Grubbing AC	Pond Construction Cost Per Alternative
B405_417	N/A	--	--	--	N/A
B405_001	TP Option 1 + FPC Option 1	156,169	26,371	10.7	$2,618,337
B405_002	Option 1	16,646	5,632	2.1	$300,000
B405_003	TP Option 1 + FPC Option 1	165,576	18,516	17.3	$2,552,477
B405_004	Option 1	55,672	11,173	5.1	$803,111
B405_005	Option 1	70,526	6,913	0.0	$769,057
B404B_006	Option 1	135,039	6,970	8.8	$1,561,569
	Alt 405 Totals	599,628	75,574	44.0	**$8,604,551**

(1) Uses quantity of the largest pond option per basin

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Freeboard: 1 ft
Slope: 4 :1
Berm: 20 ft

Table B.6 - Pond Quantities & Construction Cost Estimates

Split Oak Minimization Alternative (500_107C-1)

Basin	Required Pond Volume ac-ft	Required Pond Area ac	Estimated Normal Water Level Area ac	Pond Bottom Area[1] ac	Permanent Pool Volume[1] ac-ft	Total Excavation Volume[2] ac-ft
B500_107C-1_001	78.2	34.9	25.47	21.04	279.1	357.2
B500_107C-1_002	29.7	14.2	9.53	6.90	98.6	128.3
B500_107C-1_003	24.0	11.7	7.68	5.34	78.1	102.1
B500_107C-1_004	1.8	1.3	0.51	0.06	3.4	5.2

[1] *Assumes a 12-ft Permanent Pool Depth*
[2] *Excavation Volume = Required Pond Volume + Permanent Pool Volume*
[3] *Uses quantity of the largest pond option*

Split Oak Minimization Alternative (500_107C-1): Treatment Pond Quantities by Option

Basin	Option	Pond Site	Provided Pond Area ac	Excavation Volume[1] CY	Sodding[2] SY	Clearing & Grubbing[3] AC	Pond Option Construction Cost	
B500_107C-1_001	Option 1	1_A	25.1			0.0		Infield
		1_B	8.8			8.8		
		1_C	1.3			1.3		
		TOTAL	35.2	576,300	47,094	10.1	$6,059,176	
	Option 2	1_A	25.1			0.0		Infield
		1_D	10.0			10.0		
		TOTAL	35.1	576,300	46,610	10.0	$6,048,551	
B500_107C-1_002	TP Option 1	2_A	14.3	206,919	22,845	14.3	$2,495,287	
	TP Option 2	2_B	14.2			14.2		
		Easement	0.7			0.7		
		TOTAL	14.9	206,919	26,136	14.9	$2,567,530	
	FPC Option 1	FPC_2_A	3.5	5,677	0	3.5	$359,581	
	FPC Option 2	FPC_2_B	3.5		0	3.5		
		TOTAL	3.5	5,677	0	3.5	$359,581	
B500_107C-1_003	Option 1	3_A	15.9	164,778	39,786	0.0	$2,199,326	Infield
B500_107C-1_004	Option 1	4_A	1.3	8,406	3,995	1.3	$180,056	

[1] *Excavation Volume = Required Pond Volume + Permanent Pool Volume (for Treatment Ponds), or Total Floodplain Impact Volume (for FPC Ponds)*
[2] *Sodding = Total Provided Pond Area - Estimated Normal Water Level Area (includes infields and easements, excludes FPC Ponds)*
[3] *Clearing & Grubbing = Total Provided Pond Area (excludes infield areas)*

Split Oak Minimization Alternative (500_107C-1) Pond Quantity Summary[1]

Basin	Option for Quantity Estimate	Total Excavation Volume CY	Total Sodding SY	Clearing & Grubbing AC	Pond Construction Cost Per Alternative
B500_107C-1_001	Option 1	576,300	47,094	10.1	**$6,059,176**
B500_107C-1_002	TP Option 2 + FPC Option 2	212,596	26,136	18.4	**$2,927,112**
B500_107C-1_003	Option 1	164,778	39,786	0.0	**$2,199,326**
B500_107C-1_004	Option 1	8,406	3,995	1.3	**$180,056**
	Alt 500 Totals	**962,080**	**117,011**	**29.9**	**$11,365,669**

[1] *Uses quantity of the largest pond option per basin*

Project: CFX PD&E Study: Pond Siting Report for Osceola Parkway Extension
Location: Orange and Osceola Counties, Florida

Freeboard: 1 ft
Slope: 4 :1
Berm: 20 ft

Table B.6 - Pond Quantities & Construction Cost Estimates

Split Oak Avoidance Alternative (502_207D-1)

Basin	Required Pond Volume ac-ft	Required Pond Area ac	Estimated Normal Water Level Area ac	Pond Bottom Area[1] ac	Permanent Pool Volume[1] ac-ft	Total Treatment Pond Excavation Volume[2] ac-ft
B502_207D-1_001	58.1	26.4	18.86	15.07	203.6	261.7
B502_207D-1_002	50.1	23.0	16.25	12.75	174.0	224.1
B502_207D-1_003	10.4	5.6	3.26	1.81	30.4	40.8
B502_207D-1_004	18.1	9.0	5.75	3.76	57.1	75.2
B502_207D-1_003 & 004 with FPC	83.8	37.3	27.32	22.73	300.3	384.1
B502_207D-1_005	5.7	3.4	1.75	0.74	15.0	20.7

[1] *Assumes a 12-ft Permanent Pool Depth*
[2] *Excavation Volume = Required Pond Volume + Permanent Pool Volume*
[3] *Sodding = Required Pond Area - Normal Water Level Area*
[3] *Uses quantity of the largest pond option*

Split Oak Avoidance Alternative (502_207D-1): Treatment Pond Quantities by Option

Basin	Option	Pond Site	Provided Pond Area ac	Excavation Volume[1] CY	Sodding[2] SY	Clearing & Grubbing[3] AC	Pond Option Construction Cost	
B502_207D-1_001	Option 1	1_A	20.2			0		Infield
		1_B	8.8			8.8		
		TOTAL	29.0	422,140	49,094	8.8	$4,746,758	
	Option 2	1_A	20.2			0		Infield
		1_C	6.3			6.3		
		TOTAL	26.5	422,140	36,994	6.3	$4,481,156	
B502_207D-1_002	Option 1	2_A	23.0	361,562	32,706	23.0	$4,163,583	
	Option 2	2_B	23.0	361,562	32,652	23.0	$4,162,399	
B502_207D-1_003 & B502_207D-1_004	Option 1	3_A	16.3	187,068	35,286	0		Infield
		FPC_3_A	17.2	27,029.9	0.0	17.2		
		TOTAL	33.5	214,098	35,286	17.2	$4,099,547	
	Option 2	3_A	16.3			0		Infield
		3_B	23.4			23.4		
		TOTAL	39.7	619,677	59,898	23.4	$6,894,314	
	Option 3	3_A	16.3			0		Infield
		3_C	22.2			22.2		
		TOTAL	38.5	619,677	54,090	22.2	$6,766,825	
B502_207D-1_005	Option 1	5_A	12.4	33,370	51,546	0	$1,262,272	Infield

[1] *Excavation Volume = Required Pond Volume + Permanent Pool Volume (for Treatment Ponds), or Total Floodplain Impact Volume (for FPC Ponds)*
[2] *Sodding = Total Provided Pond Area - Estimated Normal Water Level Area (includes infields and easements, excludes FPC Ponds)*
[3] *Clearing & Grubbing = Total Provided Pond Area (excludes infield areas)*

Split Oak Avoidance Alternative (502_207D-1) Pond Quantity Summary[1]

Basin	Option for Quantity Estimate	Total Excavation Volume CY	Total Sodding SY	Clearing & Grubbing AC	Pond Construction Cost Per Alternative
B502_207D-1_001	Option 1	422,140.2	49,094	8.8	$4,746,758
B502_207D-1_002	Option 1	361,562.4	32,706	23.0	$4,163,583
B502_207D-1_003 & B502_207D-1_004	Option 2	619,676.7	59,898	23.4	$6,894,314
B502_207D-1_005	Option 1	33,370.4	51,546	0.0	$1,262,272
	Alt 502 Totals	**1,436,750**	**193,244**	**55.2**	**$17,066,927**

[1] *Uses quantity of the largest pond option per basin*

Appendix D

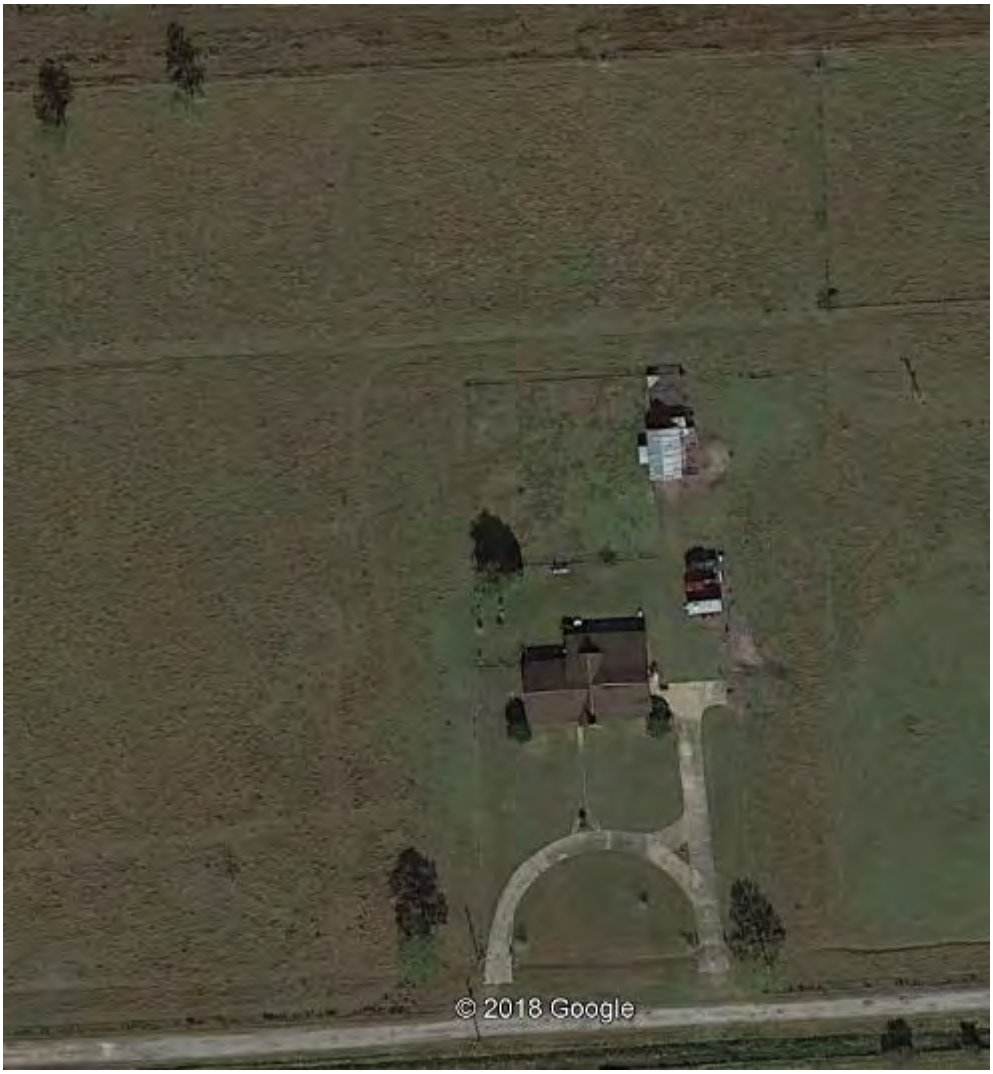
Pond Site Aerial Photos

Lake Nona Alternative (404B) Pond Aerial Photos

North – top of all photos

Pond 417_A

Pond 1_A



Pond 1_B

Pond 1_C

Pond 1_D

Pond 3_A

Pond 3_B (NE side of photo) and Pond 2_A (SW side of photo)

Pond 3-C

Pond 3_D

Pond 4_A

Pond 5_A

Pond 6_A

Pond 6_B

FPC_3_A

FPC_3_B

Boggy Creek Alternative (405)

Pond 1_A

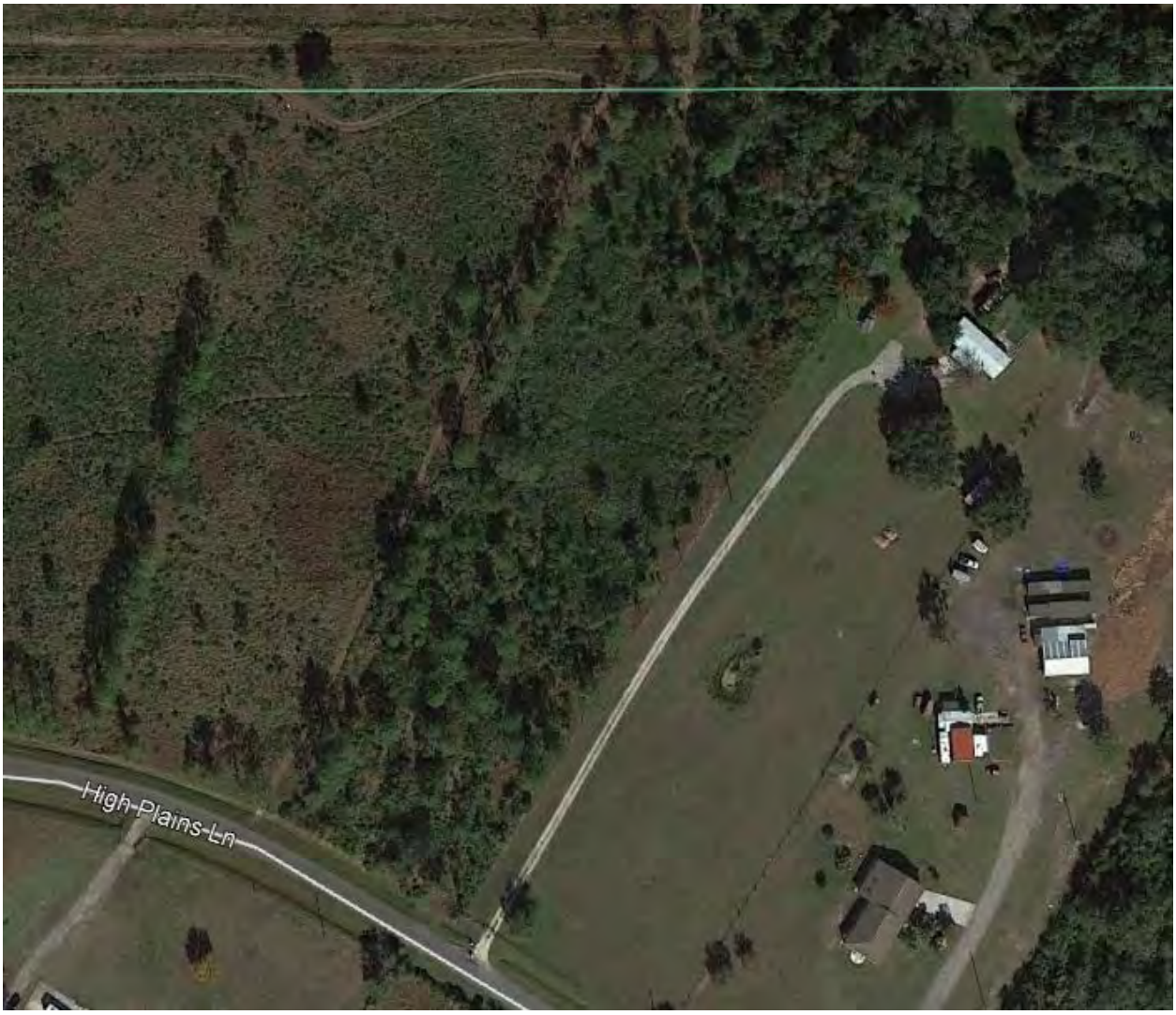
Pond 1_B

Pond 1_C

Pond 1_D

Pond 2_A

Pond 3_A



Pond 3_B

Pond 4_A

Pond 4_B

Pond 5_A

Pond 6_A

Pond 6_B

FPC_1_A

FPC_3_A

FPC_3_B

Split Oak Minimization Alternative (500)

Pond 1_A

Pond 1_B

Pond 1_C

Pond 1_D

Pond 2_A

Pond 2_B

Pond 3_A

Pond 4_A

FPC_2_A

FPC_2_B

Split Oak Avoidance Alternative (502)

Pond 1_A

Pond 1_B

Pond 1_C

Pond 2_A

Pond 2_B

Pond 3_A

Pond 3_B

Pond 3_C

Pond 5_A

FPC_3_A

Appendix E

Existing Plans & Permitted Documents

Application No. 070322-11: Narcoossee Road (CR 15) Widening

Project:	Narcoossee Road
Project Number:	NR1-J1

Basin:	**Basin 2**	Calculated by:	CJA	Date:	9/14/2007
Basin Analysis (pre/post):	**Runoff Calcs (Pre)**	Checked by:	BJS	Date:	9/14/2007

Avg. R / W Impervious Width (ft)	25.7
Avg. R / W Pervious Width (ft)	89.3
Total R / W Width (ft)	115
Total Length (ft)	5000

Sta 30+00.00 - 80+00.00 (Full Right-of-Way)

Basin Area (Ac):	17.75

Calculate Basin Runoff Curve Number - CN

Pervious/Impervious	Land-Use Description	Soil Name	Soil Group		Area (ac)	CN	Product
IMPERVIOUS:	Roadway R / W		N/A		2.95	98.00	289.10
				Total Impervious	2.95		289.10
PERVIOUS:							
Residential	1/3 Acre Lot				0.00	57.00	0.00
Pond	Dry				4.55	61.00	277.55
Woods	Good				0.00	39.00	0.00
Open Space R / W	Good	Smyrna	B		10.25	61.00	625.26
				Total Pervious	14.80		902.81
				Total Area	**17.75**		**1191.91**
						CCN	**67.15**

Calculate Runoff Volume, V(R)

Basin Type	Design Storm	Agency	P (in)	S (in)	R (in)	V(R) (ac-ft)
Open	25 yr, 72 hr	SFWMD	11.7	4.89	7.36	10.89
	25 yr, 24hr	SFWMD	8.6	4.89	4.64	6.87

Sample Calculations:

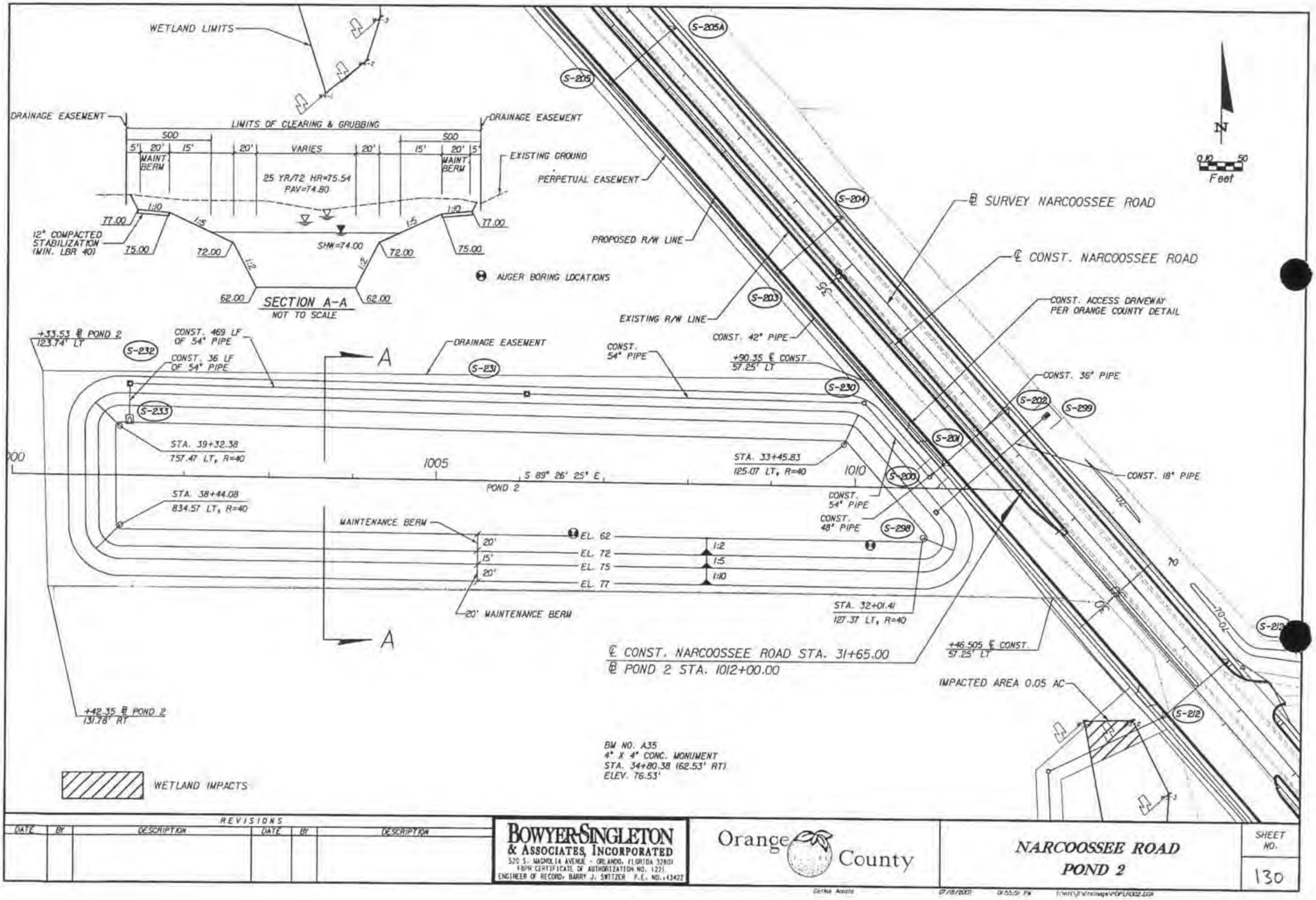
Determine Soil Storage, S				
S = (1000/CN) - 10	for CN =	67.1	S =	4.89

Determine Runoff, R	for P =	11.7		
R = (P - 0.2*S)2/(P+(0.8*S))	S =	4.89	R =	7.36

Determine Runoff Volume, V(R)				
V(R) = R/12 * Area	for R =	7.36	V(R) =	10.89

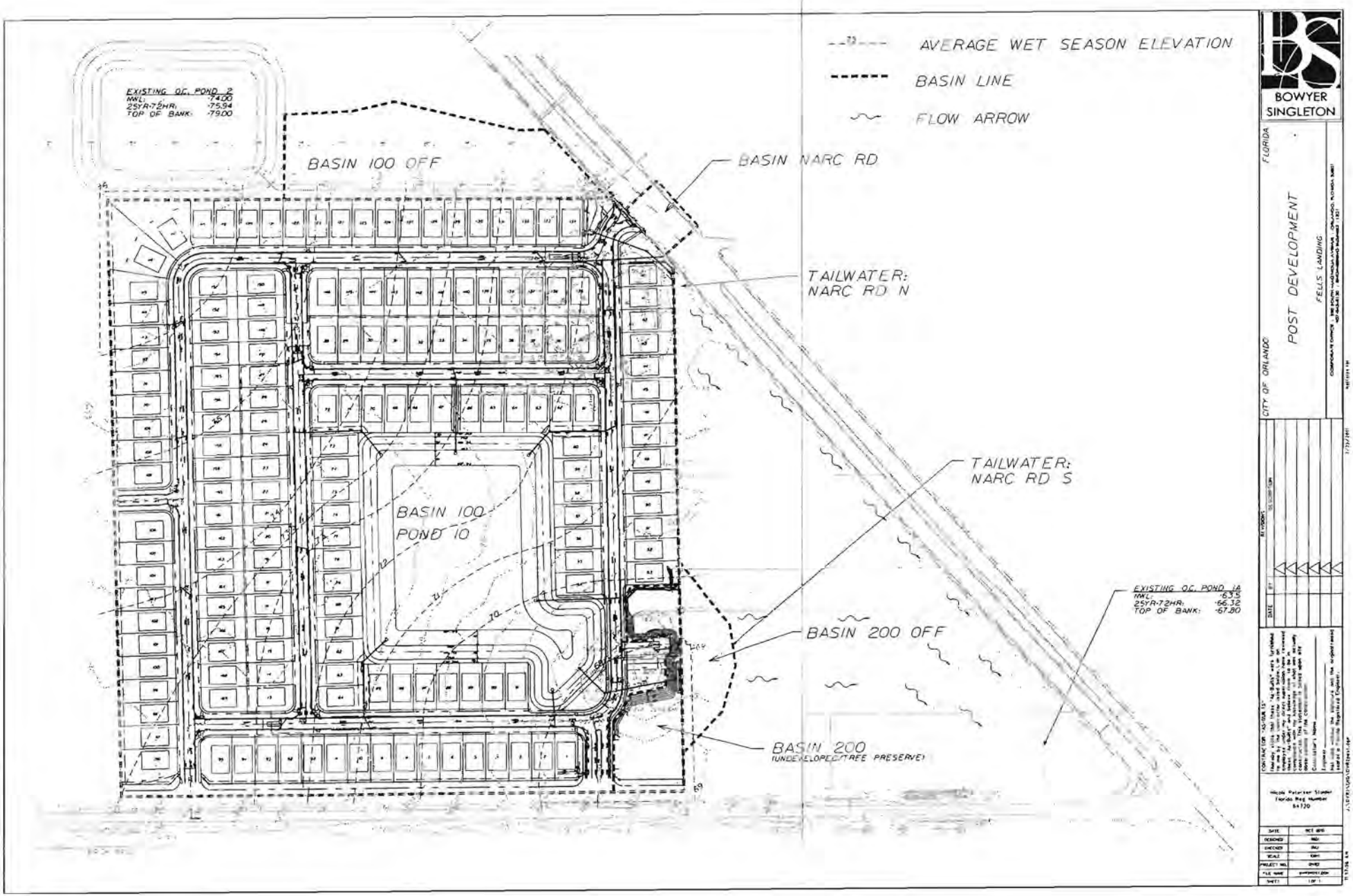
Application No. 070322-11 Page 12 of 18 Exhibit 2

SCANNED



E.4

ERP Application No. 071023-23: Fells Landing



Appendix F

Correspondence

MEETING NOTES

SFWMD Pre-Application Meeting

Osceola Parkway Extension (599-223) & Poinciana Parkway Extension (599-224A) Project Development & Environmental (PD&E) Study

Osceola and Orange Counties

Location: SFWMD Orlando Service Center; Date: Tuesday, November 27, 2018; Time: 8:30 am

1. **INTRODUCTION – See Attached Sign In sheet**

2. **PROJECTS OVERVIEW and STATUS**
   a. Osceola Parkway Extension - Construct new limited access facility from SR 417 to Sunbridge Parkway; Permit for 8-lane typical section (Osceola and Orange County)
   b. Poinciana Parkway Extension – Construct new limited access facility from Poinciana Parkway to CR 532; (Osceola and Polk County)

3. **STORMWATER CRITERIA**
   a. Water Quantity
      i. Mr. Daron confirmed that SFWMD will follow the attenuation criteria set forth by Counties (Orange and Osceola) as this is considered the historic discharge rates for these areas:
         1. Osceola County: 10-year/72-hour storm event (using SFWMD72 distribution) (8.0 inches)
         2. Orange County: 25-year/24-hour with Orange distribution (8.6 inches) (*Osceola Parkway Extension only*)
   b. Water Quality
      i. Standard Wet detention criteria: Greater of the first one (1) inch of runoff from the total developed project or runoff from two and one-half (2.5) inches over the net new impervious area
      ii. Additional treatment and/or nutrient loading requirements are required if the proposed improvements are within an impaired WBID:
         1. Mr. Daron confirmed that Phosphorous Loading calculations are not required if the only basis is because the project is within the Lake Okeechobee BMAP
         2. *Poinciana Parkway Extension*- Mr. Ady recommended that CFX follow the criteria set forth in the previous Poinciana Parkway permit as a template for this project
      iii. In the area of the Reedy Creek Mitigation Bank, alternative treatment systems may be considered such as providing linear treatment swales which discharge via sheet flow to the adjacent wetlands, but are not sized for attenuation in order to avoid wetland impacts.
   c. Floodplain compensation options -
      i. Cup for Cup between the 100-year elevation and estimated average wet season water table
      ii. Can be provided within the proposed stormwater ponds
      iii. Mr. Daron confirmed that stormwater modeling is not allowed to demonstrate compensation, only cup for cup
   d. Other-
      i. As part of the permit application, a list of impacted permitted facilities should be provided for the District's use in tracking future compliance

ii. Mr. Daron confirmed that the District will allow flexibility in the dimensional criteria for wet detention ponds for linear transportation projects
iii. Any impacts to District lands (i.e. conservation, Canal R/W, etc.) will require further coordination outside of the Regulatory department.
iv. Existing borrow pits
    1. If they were previously permitted to provide floodplain compensation, then any impacts to this volume would need to be mitigated. If the borrow pits were not permitted for floodplain compensation, then floodplain impacts would not need to be considered.
    2. Existing borrow pits can be evaluated to be converted into stormwater ponds
    3. Permitted Pre-development discharge can provide proof of discharge, but may need to be evaluated for reasonableness prior to use in comparison against the post-development discharge
    4. Pre-post volume may be required where there was no permitted pre-development discharge

4. ENVIRONMENTAL

a. Osceola Parkway Extension
    i. Advanced Notification Package originally submitted by Florida's Turnpike in April 2012
    ii. PEIR completed in May 2017. Recommended alternative included 144 acres of wetland impacts
    iii. PEIR Reevaluation initiated in July 2017 to evaluate additional alternatives
        1. Ms. Gough outlined that the goal of this reevaluation was to develop an avoidance alternative for impacts to Split Oak Forest and to work with some of the adjacent landowners.
        2. Ms. Gough noted that there has been ongoing discussion with Florida Communities Trust regarding potential impacts to Split Oak Forest.
    iv. Mr. Dailey outlined the alternatives which are currently under consideration.
        1. Boggy Creek Alternative (west of Narcoossee Road)
        2. Lake Nona Alternative (west of Narcoossee Road)
        3. Alternative 107C-1 (east of Narcoossee Road)
        4. Alternative 207D-1 (Split Oak Forest avoidance alternative)
    v. Natural Resource Evaluation update being prepared to evaluate wetland and potential species habitat effects.
        1. Mr. Dailey noted that there are several bald eagle nests located within the project corridor and the project is also within the consultation area for the caracara and scrub-jay.
        2. Mr. Ady noted that either of the alignments will impact District-owned lands.
        3. Mr. Ady noted that it will be important to demonstrate avoidance and minimization of wetland impacts.
    vi. Mitigation Opportunities – there are multiple mitigation bank options in this area.
    vii. Permit discussion: Mr. Daron noted that if the project impacts an existing permitted facility, the permittee will be responsible for making sure that they are still in compliance.

b. Poinciana Parkway Extension
    i. Advanced Notification Package submitted in September 2018.
    ii. Environmental Advisory Group Meeting held August 15, 2018. SFWMD in attendance.
    iii. Alternatives 1, 4 and 5 carried forward from previous Feasibility Study.
    iv. Alternatives 4 and 5 extend into Reedy Creek Mitigation Bank and Upper Lakes Basin Watershed. Alternative 1 minimizes impacts to Reedy Creek Mitigation Bank, and avoids Upper Lakes Basin. But Alternative 1 has greater impacts to existing and proposed

developments, listed species and business/residential impacts.

v. Natural Resource Evaluation being prepared to evaluate wetland and species habitat effects.
vi. Evaluating avoidance, minimization and mitigation.
vii. Open discussion regarding effects

Mr. Ady suggested the existing Poinciana Parkway permit is a good template for evaluating the impacts, direct and secondary, the wetland assessments etc.

Ms. Gough asked about the lead agency for future permitting because the alternative alignments fall within both SFWMD and Southwest Florida Water Management District jurisdiction. Hydrologically the drainage basins discharge /drain to Reedy Creek. There could be a Memorandum of Agreement (MOA) between the SFWMD and SWFWMD, but Mr. Ady suggested that we meet with SWFWMD to discuss as they would need to agree.

Need to look at avoidance and minimization strategies and the previous permit provides a good template for this consideration as well.

Mitigation may be within the Reedy Creek bank, but sufficient credits may not be available. Additional mitigation options may be evaluated. Additionally, an evaluation of the effects on the bank needs to be evaluated and again the District indicated the previous permit may be a good template. The team has begun coordination with the bank owners/consultants.

Because there are impacts to the SFWMD Upper Lakes Basin, coordination with SFWMD Real Estate division will be needed during design and permitting.

Mr. Ady stressed the point that impacts need to be minimized.

Modica and Associates with Kimley-Horn has conducted field evaluations of the wetlands and listed species surveys will begin in January. All of this will be summarized in the PD&E documentation.

5. ACTION ITEMS

SIGN IN SHEET

SFWMD Pre-Application Meeting

Osceola Parkway Extension (599-223) & Poinciana Parkway Extension (599-224A) Project Development & Environmental (PD&E) Study Osceola and Orange Counties

Location: SFWMD Orlando Service Center; Date: Tuesday November 27, 2018; Time: 8:30 pm

NAME	AGENCY/FIRM	PHONE NUMBER	EMAIL	INITIALS
Mark Daron, P.E.	SFWMD	407-858-6100	mdaron@sfwmd.gov	
Marc Ady	SFWMD	407-858-6100	mady@sfwmd.gov	
Nicole Gough	Dewberry (CFX GEC)	407-843-5120	ngough@dewberry.com	
John Rice, P.E.	RS&H	407-893-5843	john.rice@rsandh.com	
Chris Dailey	RS&H	813-636-2722	chirs.dailey@rsandh.com	
Clif Tate, P.E.	Kimley-Horn	407-427-1628	clif.tate@kimley-horn.com	
Lynn Kiefer	Kimley-Horn	772-794-4075	lynn.kiefer@kimley-horn.com	
Gregory Seidel, P.E.	The Balmoral Group	407-629-2185 Ext. 103	gseidel@balmoralgroup.us	
Jennifer Nunn, P.E.	The Balmoral Group	407-629-2185 Ext. 108	jnunn@balmoralgroup.us	

RS&H

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MEETING MINUTES:

Project Name:	Osceola Parkway Extension Re-evaluation
Project Number:	CFX Contract # 001250
Meeting Date:	March 8, 2019; 9:00 a.m.
Meeting Place:	CFX Headquarters 3rd Floor Sandpiper Room
Participants:	See Participant List
Subject:	Pond Meeting with CFX, Tavistock & Balmoral

On Friday, March 8, 2019 a meeting was held at CFX headquarters. The purpose of the meeting was to discuss the proposed pond sites. The below notes have been arranged to reflect the flow of the discussions that ensued.

East Segment (Split Oak Minimization Alternative)

- The pond sites shown on the roll plots are preliminary estimates and have not been modeled or finalized. The ponds are based on right-of-way to right-of-way calculations. An assumption is that CFX wants to keep the ditches dry within the right-of-way.
- The East segment will need to replace the existing Narcoossee Road pond that is adjacent to Fells Landing. This replacement pond will be separate from the Osceola Parkway Extension (OPE) ponds. Narcoossee Road is a high point.
- Basin 1 on the east side will require a combination of ponds. The combinations can be as follows:
    - 1A + 1B & 1C; or
    - 1A + 1D.
- Tavistock owns the two parcels south of Clapp Simms Duda Road and east of Canal C-29A.
    - Suggest moving Pond 1D east of Canal C-29A onto the Tavistock property. (Follow up – the floodplain east of the canal has a different elevation and most likely cannot be relocated. Also note that the floodplain impact was reduced for this section.)
- The preferred pond combination for Basin 1 is 1A+1D.
- South Florida Water Management will require a "cup for cup" analysis based on the effective FEMA Maps.

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- The roadway profile is proposed to be three feet above the existing ground and the ditches 1 foot above the seasonal high water table. The profile will accommodate five feet above floodplains and a minimum of 16.5 feet of clearance above existing roadways. Therefore, a large portion of the OPE is elevated, compared to the existing ground.
- RS&H will send plan and profile files to Tavistock.
- Floodplain Compensation (FPC) ponds are not required to be wet – these areas may consist of graded areas that could be planted.
- Recommend FPC 2B since it stays out of Split Oak.
- Ponds 3A and 4A are within the interchange footprint and are considered good pond locations by Tavistock. Pond 4A is very close to a pond location already proposed by Tavistock for their development.
- Previous discussions regarding the Split Oak remainder included a potential linear park (~20 acres) with a trail head and a pervious parking area. Mitigation credits are likely present in the area of the park location and would have to be mitigated to build the park. That mitigation could become part of the CFX mitigation plan. At this time, unknown whether a park will be pursued in the remainder by Osceola County or Tavistock.
- The four-lane Cyrils Drive alternative includes a shared use path on the south side of the road, near the residential housing. A five-foot sidewalk is proposed on the Split Oak side of the road.
- Tavistock is responsible for the Cyrils Drive widening from Narcoossee Road to Absher, including the acquisition of property.
- If Pond1D is moving forward as a preferred pond location – it would be beneficial to move Pond 2A onto the same parcel, to leave the maximum developable property available.
- Pond 2A is preferred over 2B because it is located on Tavistock property.
- Ponds within the proposed roadway right-of-way do not have multiple pond options. Only ponds that require additional right-of-way have two pond options.
- Ponds associated with local roadways will ultimately be transferred to the appropriate local authority (ie. Cyrils Drive pond – transferred to Osceola County).

East Segment (Split Oak Avoidance Alternative)

- The pond associated with the Split Oak Avoidance Alternative as similar to the Split Oak Minimization Alternative. Basin 1 alternatives are identical.

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- Question was asked if Pond 2A could be moved to the west side of OPE. Greg will evaluate whether this is possible.
- Del Webb is developing from north to south – ground has been broken.
- Basin three requires a combination of ponds as follows:
    - 3A + 3B + FPC
    - 3A + 3C
- The preferred pond for this basin would be 3A + 3C.
- Although Pond 3A appears to be narrow it is about 120 feet wide (berm to berm). The Water Management District has shown flexibility on transportation projects and may allow ponds that are less than 100 feet wide.
- Pond 3B is expected to have significant value and will be moved south of Cyrils Drive. In its current location, it does not allow for a sales center and walking path into Split Oak.
- The expired Planned Development (PD) for the Lennar property includes a spine road connecting Cyrils Drive to Clapp Simms Duda Road.
- Part of the development plans require that Clapp Simms Duda Road be widened, including the bridge over the Canal C-29A.

West Segment (Lake Nona Alternative)

- The two large borrow pits just west of Fells Landing are planned to be permitted as ponds for the Poitras developments. The plan is to connect the two borrow pits into one large pond. OPE alternative will be revised to show one large bridge over this pond, as opposed to two sets of bridges. CFX runoff will be treated and attenuated in the area between the ponds, possibly as a joint use as part of the larger facility.
- If the local / system interchange at SR 417 is possible – is the Boggy Creek interchange needed and is it in a good location? Tavistock will review and determine if this interchange is needed and if it is in the most appropriate location.
- The Poitras development is currently in the process of remapping the floodplains for the Poitras property. However, the current floodplain maps will be utilized for the development of ponds.
- Greg suggested an agreement with Tavistock for the ponds related to OPE since they are the most familiar with their development plans and the best location for pond sites. CFX could provide the requirements to the Tavistock's engineers for incorporation into their permitting.
- Osceola County is requiring Tavistock to widen Boggy Creek Road to a four-lane urban typical section from Narcoossee Road to Simpson Road. This will mostly be done within

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the existing right-of-way. Tavistock indicated that the widening will not affect the current alignment for the OPE expressway. That widening will require additional ponds and Tavistock is planning on locating them on the Poitras property.

- Tavistock is unsure if there is enough capacity for the Poitras ponds, Boggy Creek Road widening ponds, and the OPE ponds on the Poitras property.
- Basin 3 requires ponds 3A and 3B which are included in the interchange as well as either pond 3C or 3D. Pond 3D should be moved onto the Poitras property to reduce the number of parcel impacts.
- Pond 4B is located on the parcel where one of the interior Poitras roads will connect to Boggy Creek Road. Pond 4B has excess capacity and can be reduced in size so that the road can also be accommodated on this parcel.
- A CDD has been set up for Poitras East and is anticipated to be set up for Poitras West once Tavistock acquires this property.
- The property that Pulte just acquired from Poitras East has a main access from the road north of the property which has a signal at Narcoossee Road. The direct access to Narcoossee Road from the Pulte property driveway closest to the OPE ramps is anticipated to be right-in, right-out.
- Pond 1A and 1B will be moved south onto remnant parcels to reduce the number of parcel impacts..
- Ponds 5A and 6A need to be moved so they occur between the borrow pits.
- The required pond acreage tables will be sent to Tavistock once pond sites are updated per today's meeting. The volume estimates will also be included.

West Segment (Boggy Creek Alternative)

- Clint asked Rene to check if Tavistock controls the property under the Boggy Creek at SR 417 Eastbound to Southbound ramp.
- Same pond changes as with the Lake Nona alternative

Summary of Decisions / Action Items

1. **ACTION:** RS&H will send the plan and profile files to Tavistock [Complete].
2. **ACTION:** Tavistock will provide thoughts on the Lake Nona Alternative with respect to the Boggy Creek interchange location.

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3. **ACTION:** Balmoral to update pond sites based on discussion from today's meeting and send updated pond acreage tables.

Participant List: (see following page)

Name	Representing	Email
Glenn Pressimone	CFX	Glenn.Pressimone@CFXWay.com
Jonathan Williamson	Dewberry	jwilliamson@dewberry.com
Clint Beaty	Tavistock	cbeaty@tavistock.com
Rene Schneider	Tavistock	rene.schneider@tavistock.com
Heather Isaacs	Tavistock	hisaacs@tavistock.com
Greg Seidel	Balmoral	GSeidel@balmoralgroup.us
Dan Kristoff	RS&H	Daniel.Kristoff@rsandh.com
Kelsey Lucas	RS&H	Kelsey.Lucas@rsandh.com

Compiled By: Kelsey Lucas (Kelsey.lucas@rsandh.com; 904-256-2249), and
Dan Kristoff (daniel.kristoff@rsandh.com, 904-256-2150)

MEETING NOTES *(in italics)*

CFX and Tavistock Drainage Coordination Meeting

Osceola Parkway Extension (599-223)
Project Development & Environmental (PD&E) Study
Osceola and Orange Counties

Location: D. W McIntosh and Associates Office – Winter Park, FL; Date: Wednesday, November 21, 2018; Time: 10:30 am

1. **PURPOSE –**

   The purpose of the meeting is to coordinate existing floodplain and seasonal high water table elevations through the Poitros Property currently owned by Tavistock.

2. **INTRODUCTIONS**

3. **PROJECTS OVERVIEW and STATUS**

   PD&E Study for proposed Osceola Parkway Extension - Construct new limited access facility from SR 417 to Sunbridge Parkway; Permit for 8-lane typical section (Osceola and Orange County)

   Mr. Seidel presented the attached exhibits showing the current alignments under evaluation and the results of the current research with relation to existing Floodplain elevations, what is considered a floodplain and existing seasonal high water elevations.

4. **COORDINATION ITEMS**

   a. Seasonal High Groundwater

      Mr. Seidel indicated CFX's interest in coordinating the hydrologic data associated with the Poitros property so that proper estimates may be made during the PD&E study to size pond sites and floodplain compensation sites. He noted that the groundwater elevations are critical in determining the vertical storage available in the ponds and floodplain compensation areas.

      Mr. McIntosh indicated that some of these items were still in the preliminary stages across the length of the alignment.

   b. FEMA Floodplain Elevations

      Mr. McIntosh indicated that a pre-application meeting was being held with the SFWMD to discuss the disposition of the borrow areas with relation to FEMA mapped floodplains along with other project elements and that his firm would be better able to coordinate both these items after the meeting with SFWMD.

      Mr. Jackson (via phone) asked about possible pond sites at this time. Mr. Seidel responded that the pond sites would be evaluated once the sizes were determined based on multiple factors that include environmental impact and hydraulic feasibility. He noted that different pond

site locations may have different sizes based on topography and outfall locations. Mr. Seidel also noted that once the stormwater management needs of CFX are determined and pond and floodplain compensation areas sized, it is possible that joint use pond discussions would follow.

5. ACTION ITEMS

a. *McIntosh to meet with SFWMD.*

b. *CFX to continue analysis and adjust calculations once seasonal high water tables and floodplains are provided by Tavistock.*

ATTENDEES

NAME	AGENCY/FIRM	PHONE NUMBER	EMAIL
Lance Jackson	Tavistock	407.816.6679	lance.jackson@tavistock.com
Donald McIntosh	McIntosh	407.644.4068	dmcintosh@dwma.com
Jeff Newton	McIntosh	407.644.4068	jjnewton@dwma.com
Garth Ritter	McIntosh	407.644.4068	gritter@dwma.com
Greg Seidel	Balmoral Group	407.629.2185	gseidel@balmoralgroup.us

SHGWT Elevation

FEMA Floodplain Elevation

Legend

- Basin Alt 404B
- Basin Alt 405
- Basin Alt 500_107C-1
- Basin Alt 502_207D-1
- FEMA Analysis Area
- SHGWT Inundation Shape
- BFE Inundation Shape
- Parcels
- FEMA BFE (2017)

FEMA Flood Zone (2017)

- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- A
- AE

Esri, HERE, Garmin, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

SHGWT Elevation

FEMA Floodplain Elevation

Legend

- Basin Alt 404B
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- FEMA BFE (2017)

FEMA Flood Zone (2017)

- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- A
- AE

Amanda Exposito

From: Grace.ChuaCorn@ocfl.net
Sent: Tuesday, June 19, 2018 6:09 PM
To: Jennifer Nunn
Cc: Daniel.Negron@ocfl.net; Mike.Drozeck@ocfl.net
Subject: RE: CFX Osceola Parkway - LiDAR information

Hello Jennifer,

I am not aware of any more recent LiDAR data in Public Works. My division have some ongoing LiDAR acquisition efforts but they are not yet complete. You can reach out to Orange County GIS by email, GIS@ocfl.net or by phone, 407-836-0066 to find out more information.

Based on US Interagency Elevation Inventory, the recently publicly available Osceola County FL LiDAR might cover or partly cover your study area. It was collected in January 2016 as part of USGS 3DEP partnership with SFWMD and I recommend reaching out to Christine Carlson, Lead Geospatial Data Steward for SFWMD by phone, 561-682-6143 on how to request for the data.

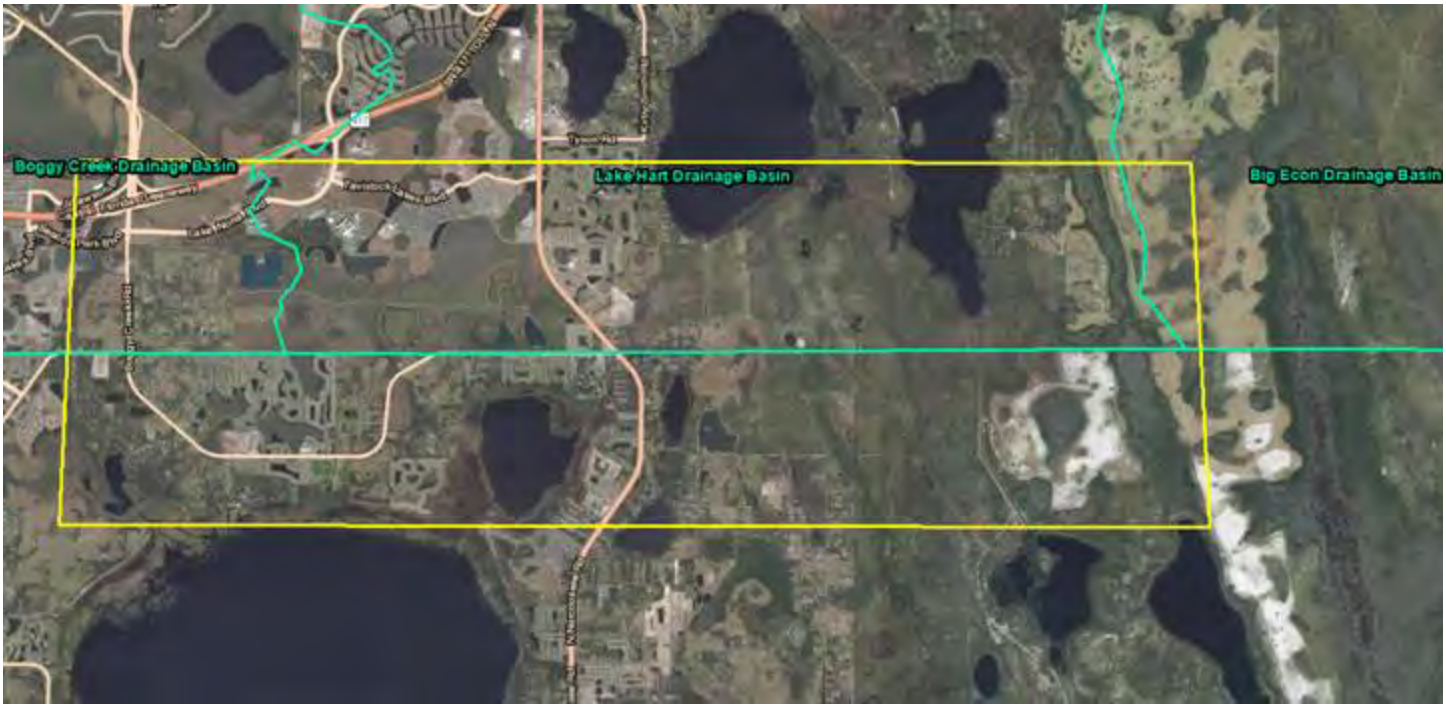
Regards,

Grace L. Chua Corn, EI, CFM, GISP
Stormwater Management Division
Orange County Public Works
4200 South John Young Parkway
Orlando, Florida 32839
407.836.7965
Grace.ChuaCorn@ocfl.net

From: Jennifer Nunn [mailto:jnunn@balmoralgroup.us]
Sent: Tuesday, June 19, 2018 10:34 AM
To: Chua Corn, Grace L <Grace.ChuaCorn@ocfl.net>
Subject: CFX Osceola Parkway - LiDAR information

Grace,
We are currently performing the drainage evaluation for the Osceola Parkway PD&E study for the Central Florida Expressway Authority which crosses the Boggy Creek and Lake Hart watersheds within Orange County. I was wondering if there is any recent topo (LiDAR) information available for this area to assist with our analysis. The most recent information I have is 2012.

Please let me know if there is someone else I should be coordinating with. Thanks for your help.



Thanks,

Jennifer A. Nunn, P.E., D.WRE

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