WETLAND EVALUATION AND BIOLOGICAL ASSESSMENT REPORT

I-95 / Ellis Road Interchange and Ellis Road from I-95 to Wickham Road (CR 509) Project Development & Environment Study

Brevard County, Florida

Financial ID No. 426905-1-22-01

Federal Aid No. SFT1251R

Prepared For:

The Florida Department of Transportation, District 5

Prepared By:

RS&H, Inc.

October 2015

WETLAND EVALUATION AND BIOLOGICAL ASSESSMENT REPORT

I-95 / Ellis Road Interchange and
Ellis Road from I-95 to Wickham Road (CR 509)
Project Development & Environment Study

Brevard County, Florida

Financial ID No. 426905-1-22-01

Federal Aid No. SFT1251R

Prepared For:

The Florida Department of Transportation, District 5

Prepared By:

RS&H, Inc.

October 2015

PROJECT DEVELOPMENT SUMMARY REPORT
Ellis Road
Brevard County, Florida

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

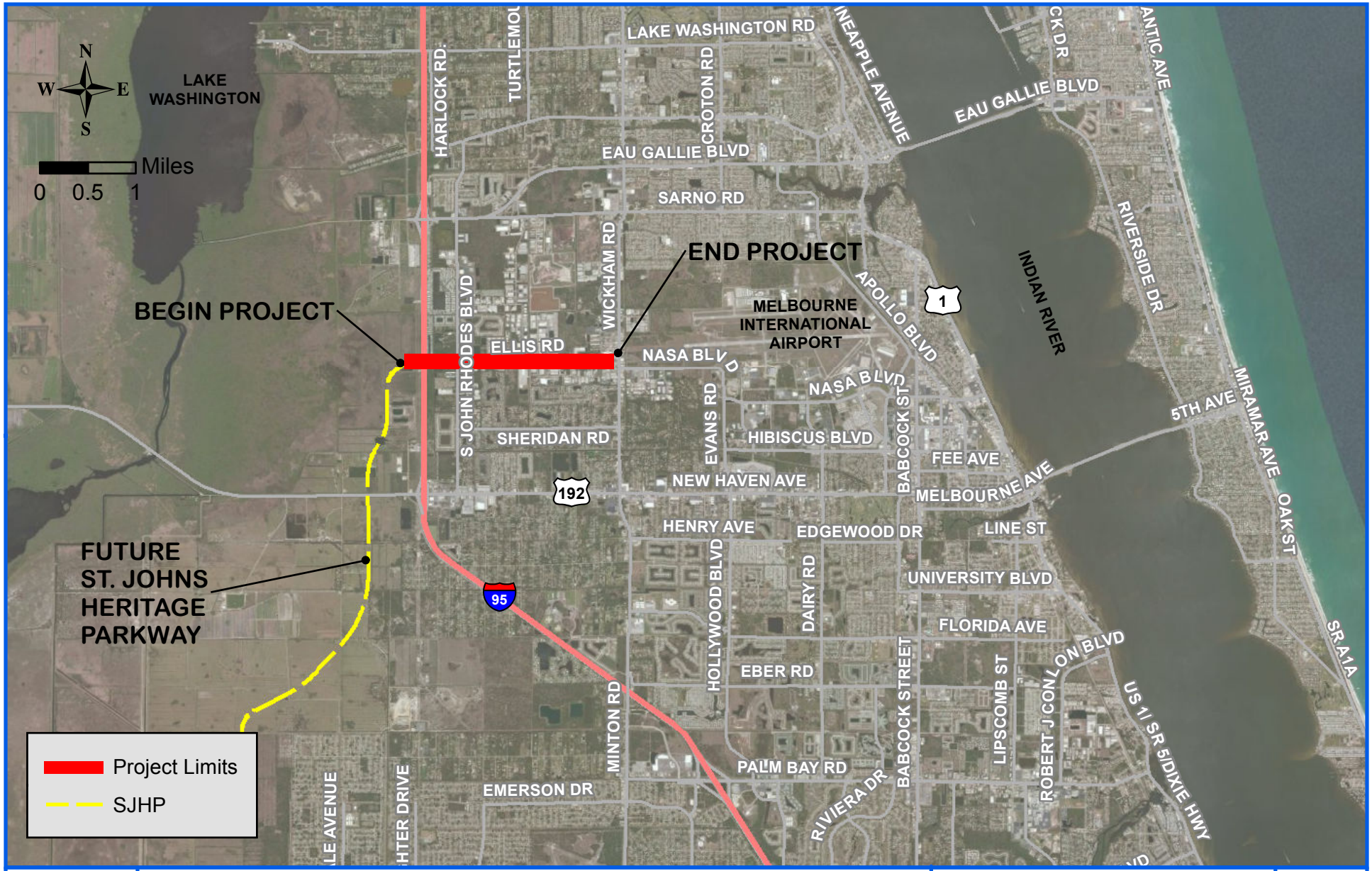
APPENDICES

1.0 Executive Summary

This Project Development and Environment Study (PD&E) examines a direct, multi-lane Strategic Intermodal System (SIS) connection from I-95 to Melbourne International Airport and Greyhound Bus Terminal. The improved Ellis Road will tie into St. Johns Heritage Parkway, a new four-lane arterial planned by Brevard County that begins at Malabar Road and ends at John Rodes Boulevard. A new interchange connecting Melbourne International Airport directly to I-95 will relieve Eau Gallie Boulevard / Sarno Road and US 192 as the only SIS Connectors. The improvements to and the extension of Ellis Road to I-95 will provide a direct connection between the interstate and the airport as well as mitigate capacity deficiencies at the existing I-95 interchanges at US 192 and Eau Gallie Boulevard / Sarno Road. Upon the improvements, Ellis Road will be designated as a "SIS Connector" for the Melbourne International Airport. Figure 1.1 displays the general location of the project.

Existing Ellis Road is a two lane roadway beginning at John Rodes Boulevard and ending at Wickham Road, where it ties into a recently constructed extension of NASA Boulevard. The posted speed is 35 mph. The existing land along Ellis Road is generally zoned industrial with some commercial zoning and is characterized by various businesses, industrial use, and vacant lots. Nineteen residential lots are clustered just west of Wickham Road. The existing right-of-way varies from approximately 70 to 100 feet. The L-15 Canal parallels Ellis Road on the north side of the roadway for approximately half of the project length. This canal drains into the M-1 Canal, which parallels I-95 on the east side of the interstate. The project is located within the Crane Creek Drainage Basin.

Several major utilities are located along the project corridor. Along the west side of I-95, a series of utility easements convey 8-inch and 26-inch gas mains as well as overhead electric distribution and transmission lines. Ellis Road also has a number of buried and overhead utilities, including water, sanitary sewer, buried fiber optic, gas, and overhead electric. Ellis Road passes through the jurisdiction of both West Melbourne and Melbourne.



	I-95 AT ELLIS ROAD PROJECT DEVELOPMENT AND ENVIRONMENTAL STUDY	PROJECT LOCATION MAP	FIGURE NO. 1.1

While the Ellis Road corridor is mostly developed, sizable undeveloped tracts exist along I-95 in the northwest quadrant of the future interchange with Ellis Road. This parcel, which borders the utility easements, is owned by Brevard County and contains a conservation easement encumbered by the Florida Department of Environmental Protection (FDEP). A sizable retirement community known as Lamplighter Village is located in the northeast quadrant of a future Ellis Road / I-95 junction. Other than the conservation easement, no significant cultural or environmental resources have been encountered within the project corridor.

1.1 Alternatives

This PD&E Study examines two typical sections:

- Standard Urban 45 mph typical section comprised of four lanes with a 22-foot median, curb and gutter, bicycle lanes, and sidewalk.
- SIS High Speed Urban 50 mph typical section comprised of four lanes with a 22-foot median, 4-foot inside shoulder, 6.5-foot outside shoulder, curb and gutter, and sidewalk.

For each typical section, alignments were examined by holding the north and south right-of-way lines. Best Fit alternatives were then developed for both typical sections for a total of six mainline alternatives analyzed with respect to wetland and surface water impacts.

At I-95 a modified diamond ramp configuration is examined in conjunction with two alignment alternatives across the interstate. While both alternatives avoid direct impacts to Lamplighter Village, Alternative 1 utilizes a retaining wall and Alternative 2 utilizes a fill section. A total of six ramp / alignment configurations are examined within the interchange area with respect to wetland and surface water impacts.

Beginning just west of I-95 to John Rodes Boulevard, six conceptual pond sites (unrelated to the 6 ramp / alignment configurations) are analyzed, including two regional ponds.

Along Ellis Road between John Rodes Boulevard and Wickham Road, six conceptual pond sites are analyzed. The pond sizes analyzed reflect typical sizes for attenuation and treatment, with the exception of the two regional pond concepts. If the regional ponds are utilized, the mainline ponds can be sized for attenuation-only, thereby significantly reducing the size of the overall mainline ponds. The wetland and surface water impacts for the Ellis Road ponds represent the worst-case impacts, as any reduction in size (due to downsizing for attenuation only) would reduce the potential for wetland impacts along Ellis Road.

The analysis of the interchange footprint, interchange ponds, mainline footprint, and mainline ponds were analyzed in eight separate wetland and surface water tabulations. The organization of impacts into eight tables is implemented to avoid confusion from the many possible interchange / alignment / pond combinations. In summary, the wetland and surface water analysis is separated into four distinct categories in this report:

- Beginning just west of I-95 to John Rodes Boulevard, six alignment / ramp combinations at the I-95 interchange are analyzed for wetland and surface water impacts;
- Beginning just west of I-95 to John Rodes Boulevard, six alternative pond locations are analyzed for wetland and surface water impacts;
- Between John Rodes Boulevard and just west of Wickham Road, six mainline Ellis Road alternatives are analyzed for wetland and surface water impacts;
- Between John Rodes Boulevard and Wickham Road, six mainline pond locations along Ellis Road are analyzed for wetland and surface water impacts;

For the purposes of wetland and surface water comparison, the Ellis Road pond locations analyzed in this report are based on the Best Fit alignment alternatives. Applying the pond locations to each of the six mainline alternatives considered requires minimal adjustment to the pond sites. Therefore, these adjustments would have a negligible effect on wetland and surface water impacts.

The impacts for the Preferred Alternative are a combination of the preferred interchange location, preferred stormwater treatment option (regional + attenuation ponds versus attenuation + treatment ponds), mainline alignment location, and the resulting mainline pond locations.

1.1.1 Preferred Alternative

The Preferred Alternative was chosen after considering impacts from the ramp alignment configurations through the interchange area and the impacts between the Standard 45 mph Urban versus the SIS 50 mph High Speed Urban alternatives. The Preferred Alternative consists of utilizing a southerly alignment through the interchange area in conjunction with west-side ramps located within the existing limited access right-of-way along I-95. This "tight" ramp configuration was suggested by the Value Engineering Study. Along Ellis Road, the Preferred Alternative consists of the Standard 45 mph Urban Best Fit Alternative. A regional pond concept was chosen as the preferred method of stormwater treatment.

The Preferred Alternative minimizes environmental impacts by utilizing several elements of the various interchange, pond, and alignment alternatives considered:

- It utilizes Alternative 2 across I-95 in conjunction with tight ramp alignments that are located within the existing right-of-way along the west side of I-95. Although these ramps require Mechanically Stabilized Earth (MSE) retaining walls along both sides of each ramp, this configuration along with the Ellis Road extension located on Alternative 2 eliminates impacts to the conservation easement and utility easements along the west side of I-95.
- It utilizes Regional Pond Alternative B, which allows the remaining ponds located along Ellis Road to be sized for attenuation only. Regional Pond B has no impacts to wetlands, unlike Regional Pond A, which has 2.80 acres of wetland impacts when Alternative 2 is utilized.
- It utilizes the Standard Urban 45 mph typical section, which requires less right-of-way than the SIS 50 mph High Speed Urban alternative.

The total number of wetland impacts of the Preferred Alternative (for the entire project) is 8.37 acres. The Preferred Alternative will directly impact 4.17 of acres of forested wetlands and 4.20 acres of wet prairie/marsh. Additionally, 13.20 acres of surface waters will be directly impacted. The Preferred Alternative avoids any direct impacts to the FDEP conservation easement west of I-95.

The proposed construction of the additional traffic lanes along Ellis Road and the construction of a new roadway and interchange with I-95 are not expected to adversely affect any federally or state listed species. There is no officially designated "Critical Habitat" along the project corridor. However, the project area is situated within USFWS designated Consultation Areas for the Florida scrub-jay, Audubon's caracara, Everglade snail kite and red-cockaded woodpecker. The proposed construction, for the most part, will impact highly disturbed remnant natural communities along a road corridor which is currently experiencing rapid urban growth.

Federally- and State-listed species having the potential to occur in the project study area include the American alligator, Florida scrub-jay, burrowing owl, southeastern American kestrel, Florida sandhill crane, bald eagle, wood stork, Audubon's crested caracara, listed wading birds (limpkin, little blue heron, snowy egret, tricolored heron and white ibis), gopher tortoises and associated commensals (gopher frog, Florida pine snake, Florida mouse and eastern indigo snake), and Sherman's fox squirrel. However, because of the quality of the habitat present and with the implementation of recommended protection and mitigation measures, these species and/or their habitats are not likely to be adversely affected by the construction of the I-95 interchange and the Ellis Road improvements.

The FDOT has determined the project has "no effect" on the Everglade snail kite and USFWS has concurred with this determination. The FDOT has determined the project "may affect, not likely to adversely affect" the Florida scrub-jay, Audubon's crested caracara, and eastern indigo snake. The results of surveys completed for these species, along with the request for concurrence with these determinations, were submitted to USFWS on May 27, 2015. USFWS has responded with their concurrence with these

determinations in a letter dated July 29, 2015 (see Appendix C, Agency Coordination). Additionally, the FDOT has determined that this project "may affect, not likely to adversely affect" the wood stork based on the use of the wood stork effect determination key and available mitigation. This information and the request for concurrence with this determination was submitted to USFWS on October 1, 2015. USFWS responded with their concurrence in a letter dated October 9, 2015 (see Appendix C, Agency Coordination).

1.2 Commitments

In order to ensure that adverse impacts to the protected species within the vicinity of the project corridor will not occur, FDOT/Brevard County will abide by the commitments listed below. Since these commitments pertain only to species and wetlands, the list of all project commitments are included in the *Categorical Exclusion Type 2* or *Project Development Summary Report.*

- The design scope will include a survey during preparation of permit applications, of all suitable gopher tortoise habitat to be impacted by the roadway and the ponds. If the species is found, coordination will be initiated with the appropriate resource agency and required permits will be obtained. If gopher tortoise burrows cannot be avoided, a relocation permit would be obtained and mitigation implemented.
- To avoid any potential impacts to the eastern indigo snake, the *Standard Protection Measures for the Eastern Indigo Snake* (Appendix D) will be implemented during site preparation and construction. To ensure the implementation of the standard protection measures, the following will be added as a general plan note:

  > Eastern indigo snake habitat has been identified within the project limits. Utilize the US Fish and Wildlife Service Standard Protection Measures for the Eastern Indigo Snake, at the US Fish and Wildlife Service Link: http://www.fws.gov/northflorida/IndigoSnakes/20130812_Eastern_indigo_snake_Standard_Protection_Measures.htm

- To ensure protection of the wood stork, FDOT/Brevard County will provide the appropriate compensatory mitigation for all unavoidable wetland impacts within a USFWS-approved mitigation bank.

- All construction impacts will be minimized or controlled by adherence to measures set forth in the FDOT's Standard Specification for Road and Bridge Construction.
- FHWA and FDOT will continue to coordinate with St. Johns River Water Management District (SJRWMD) to address the final preferred stormwater pond locations and any additional drainage concerns or issues during the design phase of project development.

2.0 Introduction

In accordance with Executive Order 11990, Protection of Wetlands, dated May 23, 1977 and US Department of Transportation Order 56601.A, Preservation of the Nation's Wetlands, dated August 24, 1978, a wetland evaluation analysis was conducted as part of the PD&E Study. The purpose of this evaluation was to ensure the protection, preservation, and enhancement of wetlands to the fullest extent practicable. This report documents the wetland evaluation and includes: 1) descriptions of the existing wetland and other surface water features within the study area; 2) qualitative and quantitative information regarding potential wetland impacts; 3) evaluations of wetland functions and values of impacted wetlands; 4) mitigation measures to compensate for any unavoidable wetland impacts; and 5) permitting requirements and agency coordination. The methods and results of this wetland evaluation are summarized in the following sections.

As part of the PD&E Study, an assessment of federally and state protected wildlife and plant species involvement was conducted in accordance with 50 CFR Part 402, the Endangered Species Act of 1973, as amended, and the PD&E Manual, Part 2 - Chapter 27 (FDOT, 1991). The objectives of this assessment were to determine if any protected species inhabit the project site, to determine if any protected species present would be adversely impacted by the proposed project, and if necessary, develop recommendations for avoidance and minimization of potential impacts. The methods and results of this assessment are summarized in the following sections.

This Wetland Evaluation and Environmental Assessment (WEBAR) is a combination of the Wetland Evaluation Report (formerly the WER) and Endangered Species Biological Assessment (formerly the ESBA). This report provides technical support for the findings in the project's Preliminary Engineering Report and Class of Action Determination.

3.0 Project Purpose & Description

The purpose of the reconstruction and extension of Ellis Road is to provide a direct connection between the interstate and the airport as well as address deficiencies at the existing I-95 interchanges at US 192 and Eau Gallie Boulevard.

As an integral component of the Florida SIS, I-95 links major activity centers with other modes of transportation, such as airports, bus hubs, seaports, spaceports, and train stations. Interstate access is provided via interchanges on SIS connectors, which may be state or local roads. Currently, the emerging SIS hubs at Melbourne International Airport and Melbourne Greyhound Bus Terminal are being connected to the SIS network via the US 192 interchange.

Melbourne International Airport is an important transportation mode hub but also a major employment area for Melbourne and Palm Bay. The City of Melbourne Comprehensive Plan shows that approximately 56% of the land use designated as "industrial" is vacant. Melbourne International Airport and its surroundings are the central component of the city's industrial area and occupy over 3,000 acres. This area is the primary economic driver for southern Brevard County. According to a December 2008 Space Coast Economic Development Commission Report, over 55,000 jobs are within three miles of the airport.

The Melbourne International Airport vicinity is the second-largest employment center in Brevard County, lagging behind only the Kennedy Space Center. This area is the hub of the largest high-tech, high-skilled industrialized area in east central Florida. The Airport's industrial park has the potential to grow over 300% in job attraction in future years and has had continuing growth despite the economic downturn in the US over the last two years. A Trip Generation Study conducted by the airport authority in March 2007 shows the potential development of an additional 3,700,000 square feet of office, warehousing, and retail on airport grounds. The ultimate build-out of the airport surroundings would result in approximately 113,700 daily vehicle trips, which would overwhelm any planned improvements on US 192 or Eau Gallie Boulevard and result in traffic operations below the LOS standards.

The proximity of I-95 to Melbourne International Airport is a primary stimulus for the study of an Ellis Road interchange and the upgrading of Ellis Road to a divided, four-lane facility.

A new interchange connecting Melbourne International Airport directly to I-95 disperse local access to I-95, thereby relieving Eau Gallie Blvd/Sarno Road and US 192 as the only SIS Connectors. The improvement to and extension of Ellis Road to provide this direct connection between the interstate and the airport, will address deficiencies at the existing I-95 interchanges at US 192 and Eau Gallie Boulevard / Sarno Road. Upon the improvements, Ellis Road will be designated as a "SIS Connector" for the airport.

Both US 192 and Eau Gallie Boulevard are part of the Florida Hurricane Evacuation Network and connect population bases along the eastern Florida shore to the mainland. US 192, also known as Space Coast Parkway, is the southern-most Brevard County causeway over the Indian River and the last crossing for over 25 miles. The closest causeway to the south is in Indian River County near the town of Wabasso. As seen in the Ellis Road Interchange Justification Report (IJR), future traffic volumes on Eau Gallie/ Sarno Road and US 192 will exceed the standard level of service (LOS) volumes due to the local reliance on this facility for access to I-95.

A new interchange connecting Melbourne International Airport directly to I-95 will disperse local access to I-95, thereby relieving Eau Gallie Blvd/Sarno Road and US 192. The improvement to and extension of Ellis Road to provide this direct connection between the interstate and the airport, will address deficiencies at the existing I-95 interchanges at US 192 and Eau Gallie Boulevard / Sarno Road.

3.1 No-Build Alternative

The No Build Alternative retains the existing roadway network. Under this scenario, existing Ellis Road would not be improved. The No-Build Alternative has certain advantages and disadvantages. The advantages of the No-Build Alternative include:

- No new design, utility, right of way, or construction costs, saving taxpayer dollars;
- No inconveniences to the motoring public during construction;
- No business or residential damages or displacements;
- No environmental degradation.

The disadvantages of the No Build Alternative include:

- No traffic relief for Eau Gallie Boulevard and New Haven Avenue;
- No direct route from I-95 to Melbourne International Airport;
- No access to I-95 for St. Johns Heritage Parkway at Ellis Road;
- Future failing level of service on the roadway network, particularly at the Eau Gallie Boulevard and New Haven Avenue interchanges;
- Increased congestion and potential crashes on the existing two-lane section;
- No treatment of stormwater runoff.

3.2 Transportation System Management

Transportation System Management (TSM) activities include improvements such as separate turn lanes, traffic signal timing optimization, and pavement marking improvements to enhance traffic safety and mobility. Projected traffic volumes on Ellis Road support the justification of additional lanes on the mainline. The implementation of TSM strategies will aid in local intersection safety and will be utilized in the proposed concepts. However, TSM improvements to Ellis Road do not sufficiently address the capacity problems or improve overall network efficiency such as, more direct access to Melbourne International Airport. The TSM alternative is not considered a viable option and no further evaluation of the TSM alternative is conducted in this study.

3.3 Build Alternatives – I-95 at Ellis Road

The concept of developing a new interchange along I-95 between the existing US 192 and Eau Gallie Boulevard interchanges has been considered in previous studies. An Interchange Feasibility Study was conducted as part of the PD&E Study completed by the Florida Department of Transportation (FDOT) in December 2003 for a future Palm Bay

Parkway (subsequently renamed as the St. Johns Heritage Parkway) from SR 514 (Malabar Road) to the intersection of John Rodes Boulevard and Ellis Road east of I-95. The Interchange Feasibility Study was conducted to evaluate the potential need for new interchange access in the vicinity of I-95 and the proposed Palm Bay Parkway corridor.

Subsequent to the Palm Bay Parkway PD&E Study and Interchange Feasibility Study, the Melbourne International Airport Authority prepared an Interchange Justification Report. The Melbourne International Airport is classified as an "Emerging SIS" hub and serves an important regional role for access to Port Canaveral and neighboring urban developments. The new interchange, and improvements along Ellis Road, will enhance accessibility to the Melbourne International Airport and reduce traffic loads on adjacent roadway facilities (US 192 and Eau Gallie Boulevard) as well as existing interchanges on I-95.

3.3.1 Ellis Road Alternative Alignments: West of I-95 to John Rodes Boulevard

Based on the proposed typical section through the interchange area, two alignment alternatives were considered across I-95. The primary constraints within the interchange area are:

- Proximity of Lamplighter Village;
- Brevard County conservation easement in northwest quadrant;
- Existing borrow pit;
- Existing M-1 Canal;
- Existing retention pond on the east side (constructed as part of I-95 widening);
- Existing wetlands in southeast and southwest quadrants; and,
- Existing 300-foot utility easements containing electrical transmission and distribution as well as 8-inch and 26-inch gas pipelines.

Through the interchange area, Alternative 1 is consistent with the alignment contained in Brevard County's 90% final design plans for St. Johns Heritage Parkway. This configuration requires a MSE retaining wall along Lamplighter Village and requires impacts to a conservation easement held by FDEP located in the northwest quadrant of the interchange. Alternative 2 is located approximately 80 feet south of Alternative 1 at the

center of I-95. Section 4.3.1 of the Project Development Summary Report describes these alignments in detail.

3.3.2 Ramp Alignment Alternatives in Northwest and Southwest Quadrants

Based on the two alignment alternatives carried across I-95, several ramp alternatives were examined for the ramps on the west side of I-95:

- "MSE Wall" ramp alignment requiring MSE wall between the east side of the ramps and the mainline;
- Alternative A (Tight) ramp alignment placing ramps within the utility easements but avoiding the poles;
- Alternative B (Wide) ramp alignment with the tangent portion of the ramp supported on MSE wall and 15 feet outside of the outermost FGT easement; and,
- Alternative C (Parclo) ramp configuration placing all ramps south of Ellis Road over I-95.
- Tight "MSE Wall" ramp alignments such that the ramps are within the existing right-of-way along the west side of I-95 (recommendation from Value Engineering Study).

Each of the four ramp configurations are analyzed for wetland and surface water impacts with both the Alternative 1 and 2 alignments of Ellis Road over I-95.

3.4 Build Alternatives – Ellis Road

To determine the optimal typical section and roadway alignment, two typical sections were carried forward for consideration. These two concepts consist of an urban 45 mph typical section and a high speed 50 mph urban typical section. Horizontal geometry based on these two typical sections is evaluated based on the following themes:

- Hold north right of way line;
- Hold south right of way line; and,
- Best Fit based on right of way impacts.

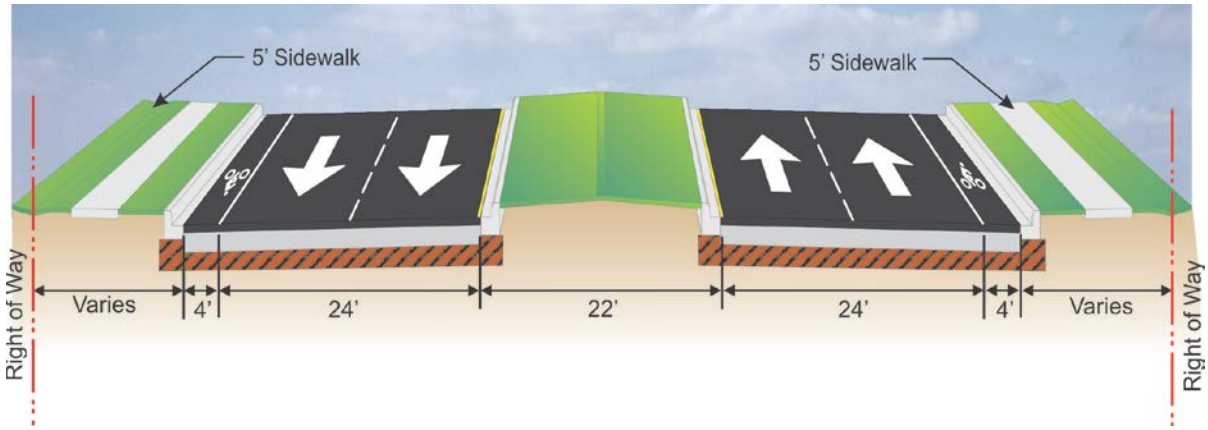
Six typical section / alignment combinations are carried forward in this report for a detailed analysis of wetland and surface water impacts.

Sections 4.4.1 to 4.4.2 of the Project Development Summary Report (PDSR) describe in detail the two typical sections and alignment configurations carried forward. Refer to Appendix A of the PDSR for 1"=100' scale concept plan sheets for each of these alternatives.

3.4.1 Standard Urban 45 mph

Figure 3.4.1 displays the urban 45 mph typical section analyzed in this PD&E Study. The typical section features four lanes separated by a 22-foot grass median flanked by curb and gutter on both sides. Beyond the edge of the traveled way is a 4-foot-wide bicycle lane, curb and gutter, and a 5-foot-wide sidewalk separated from the back of curb by three feet of sod. Two feet of turf is located behind the sidewalk to match to the adjacent existing ground. The minimum right-of-way width required for this typical section is 102 feet. Additional right-of-way will be needed for the canal and ditch sections and for slopes to tie into existing ground. Section 4 of the PDSR contains a detailed discussion of the various canal configurations examined.

Figure 3.4.1: Urban Typical Section

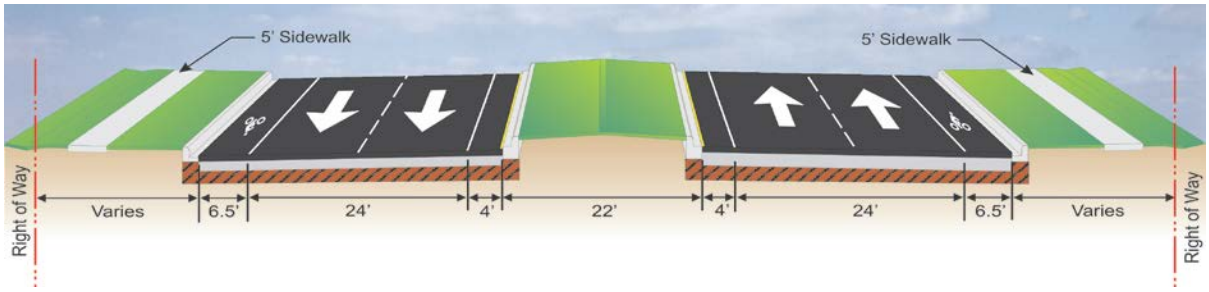


Appendix A of the PDSR displays the concept plan sheets for the Urban Hold North R/W, Urban Hold South R/W, and Urban Best Fit alternatives.

3.4.2 SIS High Speed (50 mph) Urban

Figure 3.4.2 displays the SIS high speed urban typical section analyzed in this PD&E Study. This typical section also meets the required design speed of 50 mph for an SIS facility. As with the urban typical section, the SIS high speed urban typical section features four lanes separated by a 30-foot median, which is comprised of 18 feet of grass, curb and gutter and eight total feet of inside shoulder. The inside yellow edge of pavement marking is offset by four feet from the edge of the curb and gutter, thereby meeting the clear zone requirements between the inside travel lanes. Beyond the edge of the travel lanes is a 6.5-foot-wide bicycle lane, curb and gutter, and a 5-foot-wide sidewalk separated from the back of curb by 8.25 feet of sod. The tie-down slope of the typical section begins 2 feet behind the proposed sidewalk. The minimum right-of-way width required for this typical section is 136 feet. Additional right-of-way will be needed for the canal and ditch sections and for slopes to tie into existing ground. Chapter 4 of the PDSR contains a detailed discussion of the various canal configurations examined.

Figure 3.4.2: SIS High Speed (50 mph) Urban Typical Section



Appendix A of the PDSR displays the concept plan sheets for the SIS high speed urban Hold North R/W, Hold South R/W, and Best Fit alternatives.

The Preferred Alternative is a combination of Alternative 2 through the interchange area and the Standard 45 mph Urban Best Fit Alternative. Concept plan sheets of the Preferred Alternative are located in Appendix B of the PDSR.

The Preferred Alternative avoids impacts to the conservation easement in the northwest quadrant and eliminates the need for a retaining wall on the north side of Ellis Road in the vicinity of Lamplighter Village. By avoiding the conservation easement, this alignment

demonstrates avoidance and minimization of environmental issues and will lessen the complexity of the permitting process and mitigation in future final design phases.

4.0 Environmental Characteristics

4.1 Existing Land Use

West of the I-95 corridor, the existing land use is undeveloped, consisting of shrub and herbaceous wetlands, vacant land, and wooded areas with a few unpaved access roads. An easement with multiple utilities in place runs along the west side of I-95 in the project area. There is a regulatory conservation easement located west of the aforementioned utility easement in the northwest quadrant of the proposed interchange. These parcels are owned by Brevard County and are encumbered by a conservation easement through the FDEP as mitigation for a county solid waste project that obtained an Environmental Resource Permit (ERP).

The community of Lamplighter Village is located along the east side of I-95 and north of Ellis Road. South of Ellis Road adjacent to I-95 is currently vacant land characterized by a mix of forested uplands and wetlands. Approximately 500 feet east of I-95 and running parallel to it is the M-1 Canal. Beginning at the M-1 Canal and moving eastward to John Rodes Boulevard, the existing land use is undeveloped, consisting of forested wetlands, woodland, vacant land that had previously been a commercial plant nursery, and a borrow pit. A tower on the northwest corner of Ellis Road and John Rodes Boulevard contains navigation equipment for the Melbourne International Airport. From John Rodes Boulevard to Wickham Road, the land use gradually changes from primarily undeveloped vacant land to dense commercial and light industrial development. Businesses along Ellis Road consist of commercial offices, warehouses, service centers, retail stores, and automobile repair facilities. A review of real estate records from the Brevard County Property Appraiser's Office found that Ellis Road has been historically used for industrial / commercial business. Nineteen residential lots are located on the north side of Ellis Road between Technology Drive and Lake Ibis Drive near the eastern terminus of the project.

IRA Ellis Warehouses, a local business, is planning to develop the parcel on the southeast corner of Ellis Road and John Rodes Boulevard. Suncoast Roofer Supply has a plan to develop the parcel just to the south of IRA Ellis Warehouses with access to Ellis Road on

the east side of IRA Ellis Warehouses. The airport has plans to construct a roadway connecting to Ellis Road from the north across from Technology Drive (east). Left and right turn lanes have been added to existing Ellis Road for this connection. Table 4.1.1 displays the land use and cover types encountered within the Ellis Road corridor.

Table 4.1.1: Land Use/ Land Cover Types Within the Ellis Road Corridor

FLUCFCS Code*	Land Use/Land Cover
100	Urban and Built Up
130	**Residential, High Density**
140	**Commercial and Services**
155	**Light Industrial**
170	**Institutional**
400	Upland Forest
411	**Pine Flatwoods**
422	**Brazilian Pepper**
425	**Temperate Hardwood**
428	**Cabbage Palm**
437	**Australian Pine**
500	Water
511	**Ditches**
512	**Canals**
534	**Reservoirs less than 10 acres**
600	Wetlands
617	**Mixed Wetland Hardwoods**
618	**Willow and Elderberry**
643	**Wet Prairie**
700	Barren Land
740	**Disturbed Land**
800	Transportation, Communication and Utilities
814	**Roads and Highways**
822	**Communication Facilities**
832	**Electrical Power Transmission Lines**

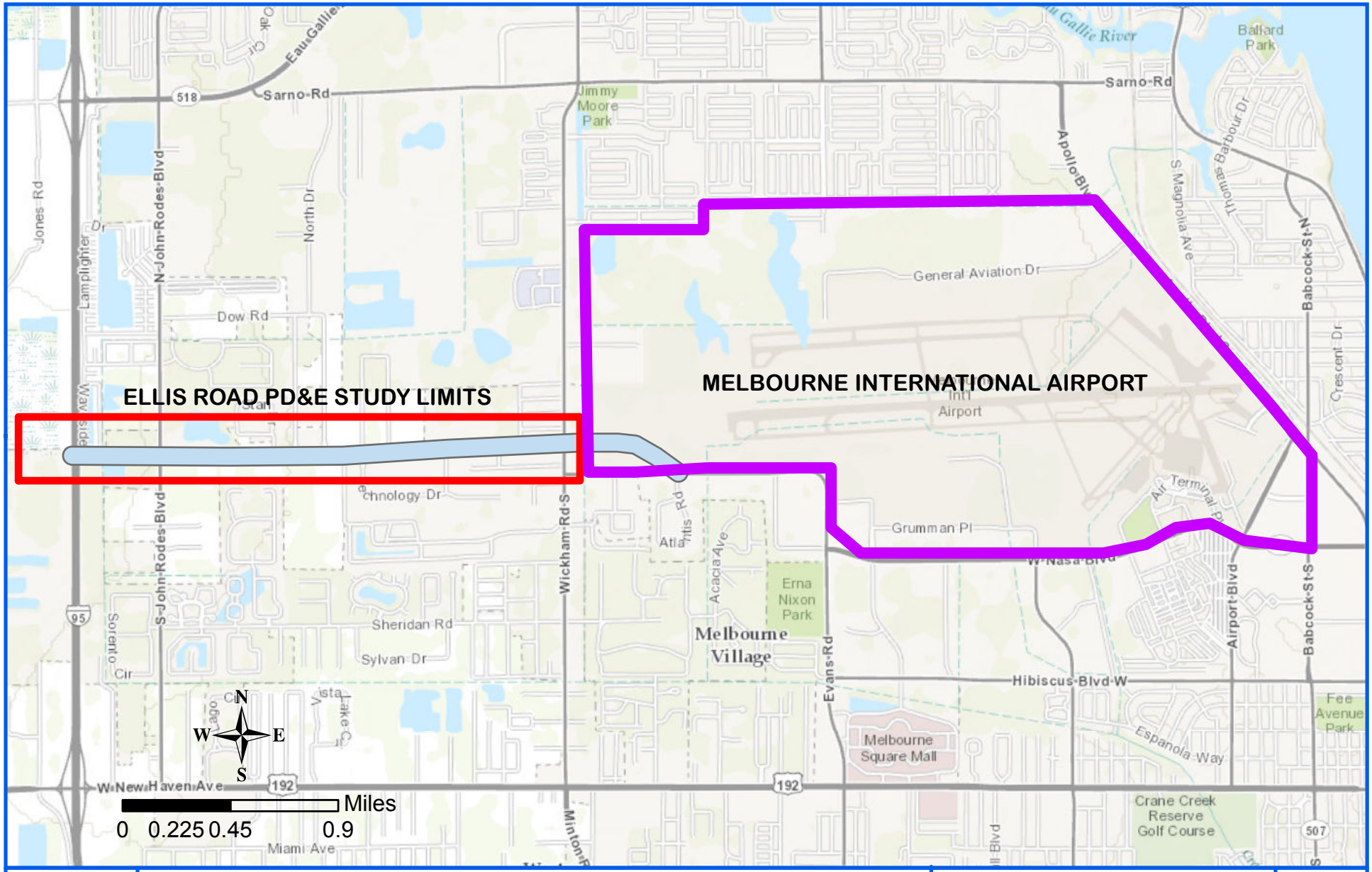
* Florida Land Use, Cover and Forms Classification System (FLUCFCS)

4.2 Melbourne International Airport and Future Land Use

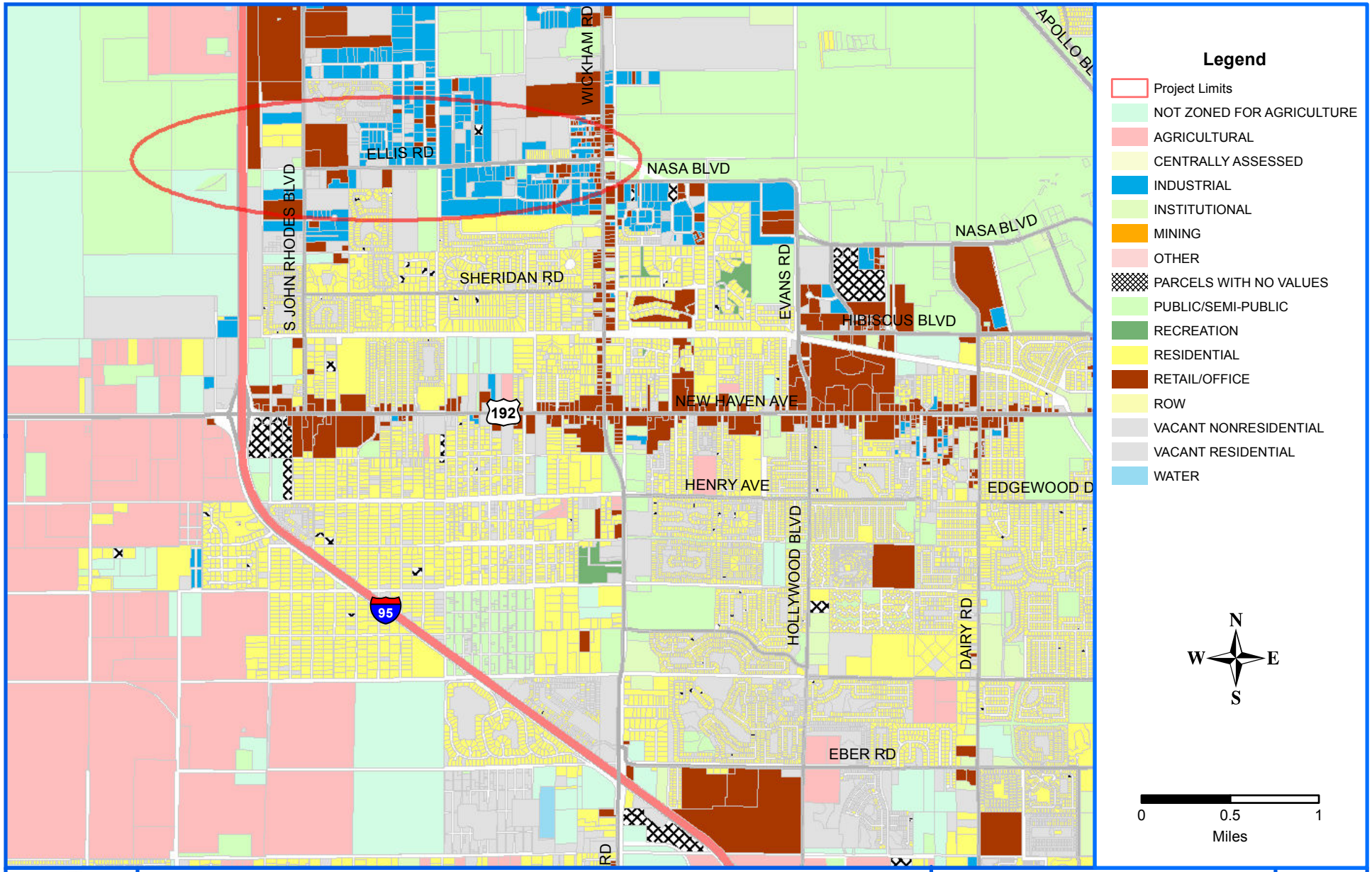
The proximity of I-95 to Melbourne International Airport is a primary stimulus for the study of an Ellis Road interchange and the upgrading of Ellis Road to a divided, four-lane facility. The purpose of the reconstruction and extension of Ellis Road is to provide a direct connection between the interstate and the airport as well as address deficiencies at the existing I-95 interchanges at US 192 and Eau Gallie Boulevard. Ellis Road is planned to be designated as a "SIS Connector."

As an integral component of the Florida SIS, I-95 links major activity centers with other modes of transportation, such as airports, bus hubs, seaports, spaceports, and train stations. Interstate access is provided via interchanges on SIS connectors, which may be state or local roads. Currently, the emerging SIS hubs at Melbourne International Airport and Melbourne Greyhound Bus Terminal are being connected to the SIS network via the US 192 interchange.

Figure 4.2.1 displays the Ellis Road project in conjunction with its proximity to I-95 and Melbourne International Airport. Figure 4.2.2 displays the land use of this area.



	I-95 AT ELLIS ROAD **PROJECT DEVELOPMENT AND ENVIRONMENTAL STUDY**	**MELBOURNE AIRPORT & VICINITY**	***FIGURE NO.*** **4.2.1**



I-95 AT ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENTAL STUDY

EXISTING LAND USE

FIGURE NO.

4.2.2

4.3 Geotechnical Data

A Contamination Screening Report (CSER) was prepared for this project and contains information on existing soils and hydrogeological features as shown below.

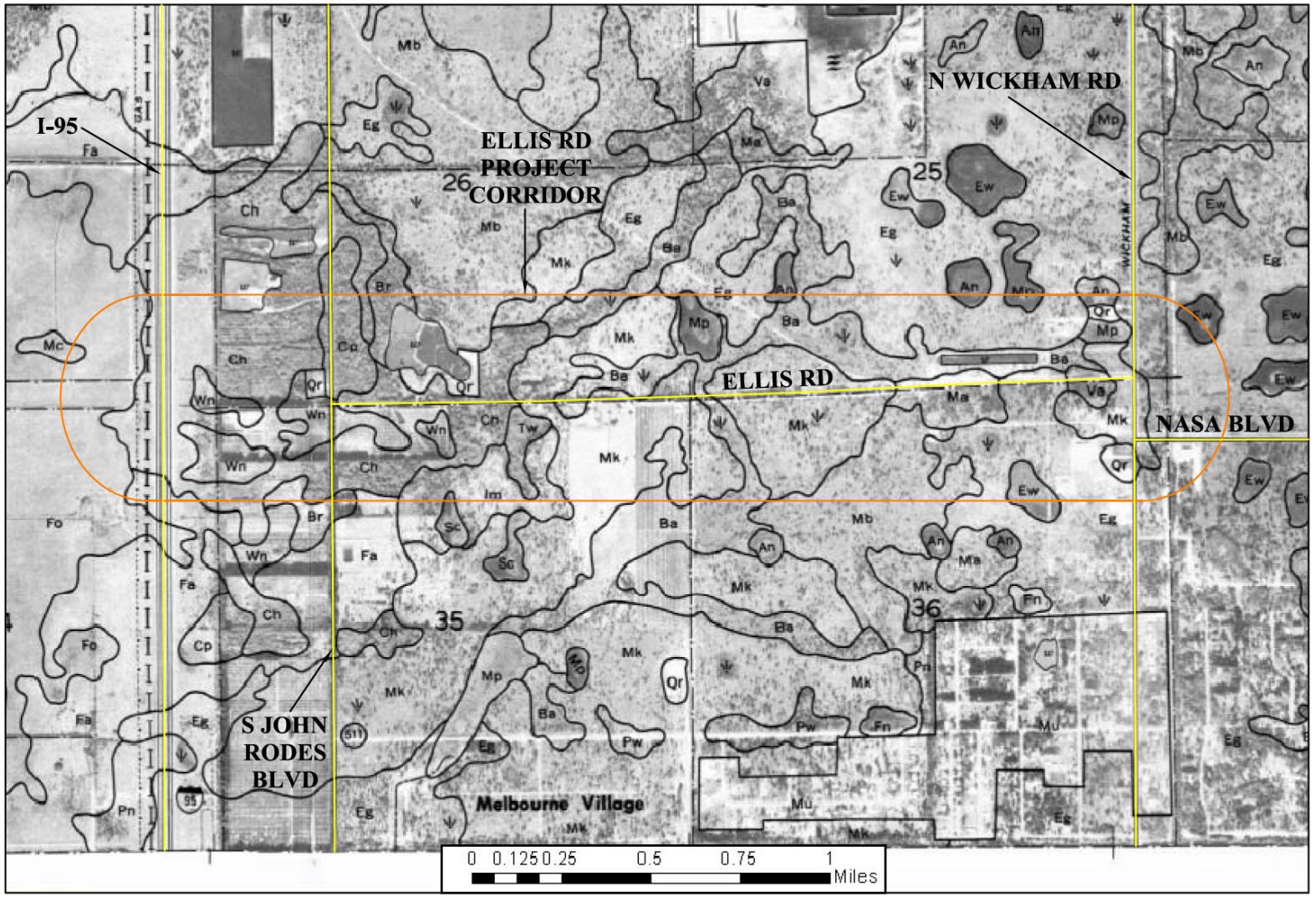
4.3.1 Soils

The "Soil Survey of Brevard County, Florida" published by the United States Department of Agriculture (USDA), Soil Conservation Service (SCS) was reviewed. The USDA soil survey indicates 11 primary mapping soil units are identified within the project vicinity and are presented on the following page in Table 4.3.1 and displayed on Figure 4.3.1.

Table 4.3.1: Soil Survey Summary

Soil Series	Depth (Inches)	Soil Description	AASHTO Classification	USDA SHGWT* (inches)	Risk of Corrosion	
					Uncoated Steel	Concrete
Basinger (Ba)	0-80	Sand	A-3	0-10	High	Moderate
Copeland (Cp)	0-15	Loamy fine sand	A-3	0-10	High	Low
	15-22	Sandy clay loam, sandy loam	A-2			
	22-30	Marl	--			
Chobee (Ch)	0-14	Sandy loam	A-2	0-10	Moderate	Low
	14-38	Sandy clay loam, sandy loam	A-2, A-6			
	38-63	Sandy clay loam, sandy loam, loamy sand	A-2, A-6			
Eau Gallie (Eg)	0-22	Sand	A-3	0-10	High	High
	22-35	Sand	A-2, A-3			Moderate
	35-55	Sand	A-3			Moderate
	55-61	Sandy clay loam, sandy loam, fine sandy loam	A-2			Low
	61-84	Loamy sand, sandy loam, loamy fine sand, fine sandy loam,	A-2			Low
Felda (Fa)	0-30	Sand	A-3	0-10	High	Low
	30-49	Sandy loam, sandy clay loam	A-2			

	49-62	Sandy loam, loamy sand, sand	A-2			
Chobee part of Fo	0-14	Sandy loam	A-2	0-10	Moderate	Low
	14-38	Sandy clay loam, sandy loam	A-2, A-6			
	38-63	Sandy clay loam, sandy loam, loamy sand	A-2, A-6			
Felda part of Fo	0-30	Sand	A-3	0-10	High	Low
	30-49	Sandy loam, sandy clay loam	A-2			
	49-62	Sandy loam, loamy sand, sand	A-2			
Malabar (Ma)	0-45	Sand	A-3	0-10	High	Low
	45-61	Sandy loam, sandy clay loam	A-2, A-6			
	61-65	Sand	A-3, A-2			
Myakka (Mk)	0-22	Sand	A-3	0-10	High	High
	22-35	Sand	A-2, A-3			
	35-46	Sand	A-2, A-3			
	46-63	Sand	A-3			
Quartzipsamments, smoothed (Qr)	--	--	--	--	--	--
Tomoka (Tw)	0-27	Muck	A-8	0-10	High	Low
	27-35	Sand	A-3		Low	Low
	35-55	Sandy clay loam, sandy loam	A-2		Moderate	Low
Valkaria (Va)	0-15	Sand	A-3	0-10	High	Low
	15-80	Sand	A-3			
Winder (Wn)	0-12	Loamy sand	A-2	0-10	High	Low
	12-17	Sandy loam	A-2			
	17-31	Sandy clay loam	A-2, A-6			
	31-47	Sandy clay loam, sandy loam	A-2			
	47-65	Sandy clay loam, sandy loam	A-2			



REFERENCE: United States Department of Agriculture (USDA)
Soil Conservation Service (SCS)

ADAPTED FROM FIGURE 5 OF CSER

LEGEND:

Ba	Basinger	Eg	Eau Gallie	Ma	Malabar	Tw	Tomoka
Cp	Copeland	Fa	Felda	Mk	Myakka	Va	Valkaria
Ch	Chobee	Fo	Floridina, Chobee & Felda Soil	Qr	Quartzipsamments, smoothed		

FDOT

I-95 AT ELLIS ROAD PD&E STUDY
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

SOILS MAP

FIGURE NO.

4.3.1

Information from the USDA Soil Survey is very general and may be outdated due to recent developments in the project site vicinity. Therefore, it may not reflect the actual soil and groundwater conditions, particularly where development has modified the natural soil conditions or surface and near surface drainage.

4.3.2 Hydrogeology

The geology of Brevard County is characterized by sedimentary strata. Groundwater in Brevard County occurs under artesian and non-artesian conditions. Non-artesian water (surface aquifer) occurs in the sediments of Pleistocene and Recent Age, whereas artesian water (Floridan Aquifer) is in the underlying limestone formations of Eocene Age.

4.4 Upland Habitat

Undeveloped areas are located primarily in the western part of the project corridor. These lands generally are forested and exhibit a high level of anthropogenic disturbance, such as unpaved trails/roads, abandoned agricultural fields, ditches, trash dumping, and landfilling of solid wastes. Upland natural communities present along the project corridor include pine flatwoods, Brazilian pepper (Schinus terebinthifolius), temperate hardwood hammock, cabbage palm (Sabal palmetto), Australian pine (Casuarina equisetifolia), and disturbed land.

The following provides brief descriptions of the upland habitats encountered within the study area.

Pine Flatwoods (FLUCFCS Code 411)

The pine flatwoods natural community at the project corridor is confined to several remnants with the largest being located at the Pond Site 4A. The latter area appears to be drier than the remaining pine flatwoods to the west along the project corridor. Slash pine (Pinus elliottii) is the dominant canopy species. The canopy is open at Pond Site 4A with spotty cabbage palm in the subcanopy. Saw palmetto (Serenoa repens) is a common associated species providing a shrub layer of varying density. The mesic flatwoods to the west are characterized by a closed canopy of slash pine with a moderate to dense subcanopy of water oak (Quercus nigra), laurel oak (Quercus laurifolia), sweetgum (Liquidambar

styraciflua), and cabbage palm. Shrub and groundcover species include wax myrtle (Myrica cerifera), saw palmetto, gallberry (Ilex glabra), blackberry (Rubus argutus), poison ivy (Toxicodendron radicans), muscadine grape (Vitis rotundifolia), yellow jessamine (Gelsemium sempervirens), and bracken fern (Pteridium aquilinum).

Vehicular access is unrestricted to the pine flatwoods throughout the project corridor; however, unpaved trails/roads were only present in the larger remnant at Pond Site 4A. Trash dumping was evident in all flatwoods areas along the project corridor. Several small stands of punk tree (Melaleuca quinquenervia) are located at the Pond 4A site; however, the lack of hydric soils and hydrologic indicators in these areas does not support a wetland classification.

Brazilian Pepper (FLUCFCS Code 422)

This vegetative community type is found in disturbed areas along the project corridor with the greatest concentrations in the western section (Regional Pond Sites A and B, Pond Sites 2A and 3A, and along the proposed roadway). This exotic and invasive species forms dense, monotypic stands. Groundcover is scarce due to the closed canopy which reduces light penetration to the forest floor.

Temperate Hardwood Hammock (FLUCFCS Code 425)

Temperate hardwood hammock is located in the western part of the project corridor and is the dominant vegetative community type at the southeastern quadrant of the proposed I-95/Ellis Road interchange and at Regional Pond Site A. The canopy is generally closed with typical species including live oak (Quercus virginiana), laurel oak, water oak, sweetgum, and cabbage palm. Slash pine is a minor component. Wax myrtle, poison ivy, and sapling mesic oaks are common species of the sparse shrub and groundcover strata present. Depressions which are colonized by forested wetlands are located within this community type. Brazilian pepper has invaded several disturbed areas within this plant community and in some cases completely replaced the native plant species.

Cabbage Palm (FLUCFCS Code 428)

Cabbage palm hammock is located west of I-95 at Pond Site 1A. Cabbage palm forms a dense, closed canopy. Mesic oaks are a minor component. The shrub and groundcover strata are sparse with wax myrtle and blue maidencane (Amphicarpum muhlenbergianum) being common species present. This community type grades to herbaceous or shrub-dominated wetlands to the west. Disturbance of this community type has been minimal due to limited vehicular access. A powerline easement borders the eastern edge of Pond Site 1A. A small, abandoned building (possibly a hunting shack) is located adjacent to the Pond 1A boundary.

Australian Pine (FLUCFCS Code 437)

The Australian pine community type is located along the banks of the M-1 (SW-7) and L-15 (SW-8) Canals and at Regional Pond Site B adjacent to a borrow pit. Like Brazilian pepper, this exotic and invasive species also forms dense, monotypic stands. No groundcover species were observed. The Australian pine is known to have allelopathic properties which preclude competition from groundcover species.

Disturbed Land (FLUCFCS Code 740)

Disturbed lands are found throughout the project corridor, but are dominant at Regional Pond Site B and Pond Sites 2A and 3A. Regional Pond Site B is an alternative for a regional treatment pond. Included within its border is the Pond Site 2A alternative.

Regional Pond Site B is comprised of three parcels of land. The northernmost parcel, which includes Pond Site 2A, is an abandoned plant nursery with a large borrow pit (SW-3) along the western edge adjacent to the M-1 (SW-7) Canal. Several palm trees planted in rows remain near the borrow pit. Plastic pots are scattered about the site. Brazilian pepper and Australian pine characterize approximately two- thirds of the uplands of this portion of site with ruderal forbs, grasses, and vines colonizing the remainder of the section. Common species present include beggartick (Bidens alba), creeping oxeye (Wedelia trilobata), ragweed (Ambrosia artemisiifolia), cogon grass (Imperata cylindrica), and muscadine grape. Vehicular access is restricted to this portion of the site.

The central portion of Regional Pond Site B is characterized by previously cleared land which has revegetated with Brazilian pepper and ruderal forbs and grasses similar to the previously described parcel. A small pond (SW-2) is located at the western end of this parcel next to the M-1 (SW-7) Canal. It appears that this was planned as an expansion of the adjacent business park, but the construction was never completed. Vehicular access is unrestricted through the existing business park to the east.

The remaining parcel of Regional Pond Site B appears to be currently used as a motocross race track. The parcel has been cleared of vegetation and areas adjacent to the dirt track are maintained as grassland. The site is fenced and vehicular access is restricted by a locked gate.

Pond Site 3A is located adjacent to an existing borrow pit. Currently, large piles of limerock and soil cover approximately two-thirds of the site. The limerock piles probably were deposited during the construction of the existing borrow pit. Pine flatwoods and temperate hardwood hammock occupy the remainder of the site. A trail/road runs along the western edge of the borrow pit; however, vehicular access to the site is restricted by a locked gate.

4.5 Surface Water Management Features

Surface water features at the project site include ditches, canals, stormwater treatment ponds, and borrow pits.

Ditches

FLUCFCS Code: 511 Ditches

NWI Code: POWHx Palustrine, Open Water, Permanently Flooded, Excavated

Ditches are located throughout the project corridor. Torpedo grass (Panicum repens), cattail (Typha latifolia), and primrose willow (Ludwigia peruviana) are common species within the ditches. The ditches are periodically maintenance dredged to facilitate the drainage function.

Canals

FLUCFCS Code: 512 Canals

NWI Code: POWHx Palustrine, Open Water, Permanently Flooded, Excavated

Four drainage canals are located within the project corridor. One canal is located west of I-95 and drains westward to the St. Johns River. It appears to historically have been part of the L-15 Canal. In this report it has been designated as SW-6. The L-11 Canal (SW-9) is situated in the central part of the project corridor while the M-1 Canal (SW-7) is located near the proposed I-95/Ellis Road interchange. The L-15 Canal (SW-8) runs alongside Ellis Road for the majority of its length and discharges to the M-1 (SW-7) Canal. The canals generally are characterized by open water with a narrow littoral zone of herbaceous wetland species such as torpedo grass or cattail. Like the ditches, the canals are periodically maintenance dredged to facilitate the drainage function.

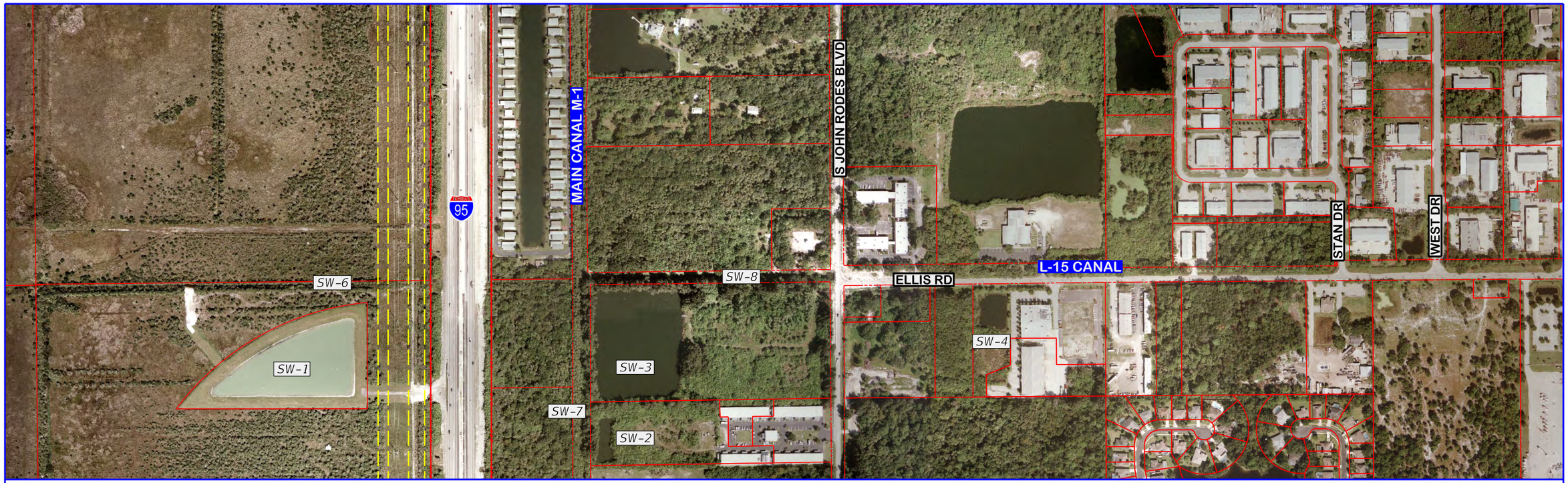
Reservoirs less than 10 acres

FLUCFCS Code: 534 Reservoirs less than 10 acres

NWI Code: POWHx Palustrine, Open Water, Permanently Flooded, Excavated

Stormwater treatment ponds are associated with various developments within the project area. These ponds generally have a narrow littoral shelf colonized by combination of species, such as coastalplain willow (Salix caroliniana), torpedo grass, cattail, and primrose willow. The ponds provide stormwater treatment and attenuation prior to discharging to drainage ditches. Borrow pits are also located along the project corridor. These reservoirs have been designated as SW-1, SW-2, SW-3, SW-4, and SW-5.

Figure 4.5.1 depicts the locations of the surface water systems within the project area. Descriptions of these features follow.



FDOT

I-95 AT ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

SW-5 EXISTING SURFACE WATERS

EXISTING R/W
EXISTING EASEMENT
EXISTING L/A
PROPERTY LINE

EXISTING SURFACE WATERS

FIGURE NO.
4.5.1

5.0 Wetlands

5.1 Methodology

Detailed identification of wetlands in the project area involved a combination of interpretation of current aerial photographs (1"= 200'; 1"= 400') and on-site ground truthing in 2010 and 2011. Other resources used in evaluating the wetlands included Brevard County soil survey maps (U.S. Department of Agriculture, Natural Resource Conservation Service 1974), the USGS Melbourne West topographic quadrangle map (USGS 1949, photorevised 1970; 7.5-minute), and the most current National Wetland Inventory map for the same quadrangle.

Standard federal and state definitions were utilized in the identification of wetlands in the project area per FDOT and Federal Highway Administration (FHWA) guidance. Characteristics of hydric soils, hydrophytic vegetation, and wetland hydrology are pertinent factors in all of these definitions. Wetlands throughout the project area were determined based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Department of the Army, Waterways Experiment Station, U.S. Army Corps of Engineers 1987) with the Atlantic and Gulf Coast Plain Region Supplement (November 2010), as well as on the unified statewide methodology of the FDEP and St. Johns River Water Management District (SJRWMD) specified in Chapter 62-340 F.A.C.

Wetlands were identified and described based on the *Florida Land Use, Cover and Forms Classification System* (FLUCFCS, 1999) and the U.S. Fish and Wildlife Service's (USFWS) classification system described in *Classification of Wetlands and Deep Water Habitats of the United States* (Cowardin *et al.* 1985). In order to evaluate the overall functionality of each system a Uniform Mitigation Assessment Method (UMAM) evaluation was conducted for every wetland system within the project boundaries. The UMAM data sheets are displayed in Appendix A.

All of the wetland systems found within the project corridor are currently impacted by their close proximity to heavily travelled roadways, by extensive historic drainage projects and

by the commercial, institutional, or residential development surrounding them. Table 5.1.1 provides a list of wetland and surface water habitat types that occur within the project boundary and the impacts that the build alternatives have on these areas. Figures 5.1.1A and B displays the locations of the wetland systems within the project area.

Table 5.1.1: Wetland & Surface Water Types Within the Ellis Road Project Limits

WETLAND ID	USFWS	FLUCFCS	COMMENTS
W-1	PSS1C	618	
W-2	PEM1C	643	
W-3	PEM1C	643	
W-4	PEM1C	643	
W-5	PEM1C	643	
W-6	PEM1C	643	
W-7	PFO1C	617	
W-8	PFO1C	617	
W-9	PFO1C	617	
W-10	PFO1C	617	
W-11	PFO1C	617	
W-12	PFO1C	617	
W-13	PFO1C	617	
W-14	PFO1C	617	
W-15	PFO1C	617	
W-16	PFO1C	617	
W-17	PFO1C	617	
W-18	PFO1C	617	
W-19	PFO1C	617	
SW-1	POWHx	534	
SW-2	POWHx	534	
SW-3	POWHx	534	
SW-4	POWHx	534	
SW-5	POWHx	534	
SW-6	POWHx	512	L-15 Canal
SW-7	POWHx	512	M-1 Canal
SW-8	POWHx	512	L-15 Canal
SW-9	POWHx	512	L-11 Canal

FDEP CONSERVATION EASEMENT
95
95
WAVESIDE DR
MAIN CANAL M-1
CO RD 511
JOHN RODES BLVD
ELLIS RD
L-15 CANAL
STAN DR
WEST DR
1
618/PSS1C
2
643/PEM1C
3
643/PEM1C
4
643/PEM1C
5
643/PEM1C
6
6
643/PEM1C
7
617/PF01C
8
617/PF01C
9
617/PF01C
10
617/PF01C
11
617/PF01C
12
617/PF01C
13
617/PF01C
14
617/PF01C
15
617/PF01C
16
617/PF01C
17
617/PF01C
18
617/PF01C
19
617/PF01C
SW-1
SW-2
SW-3
SW-4
N
0
250
500
Feet

FDOT

I-95 AT ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

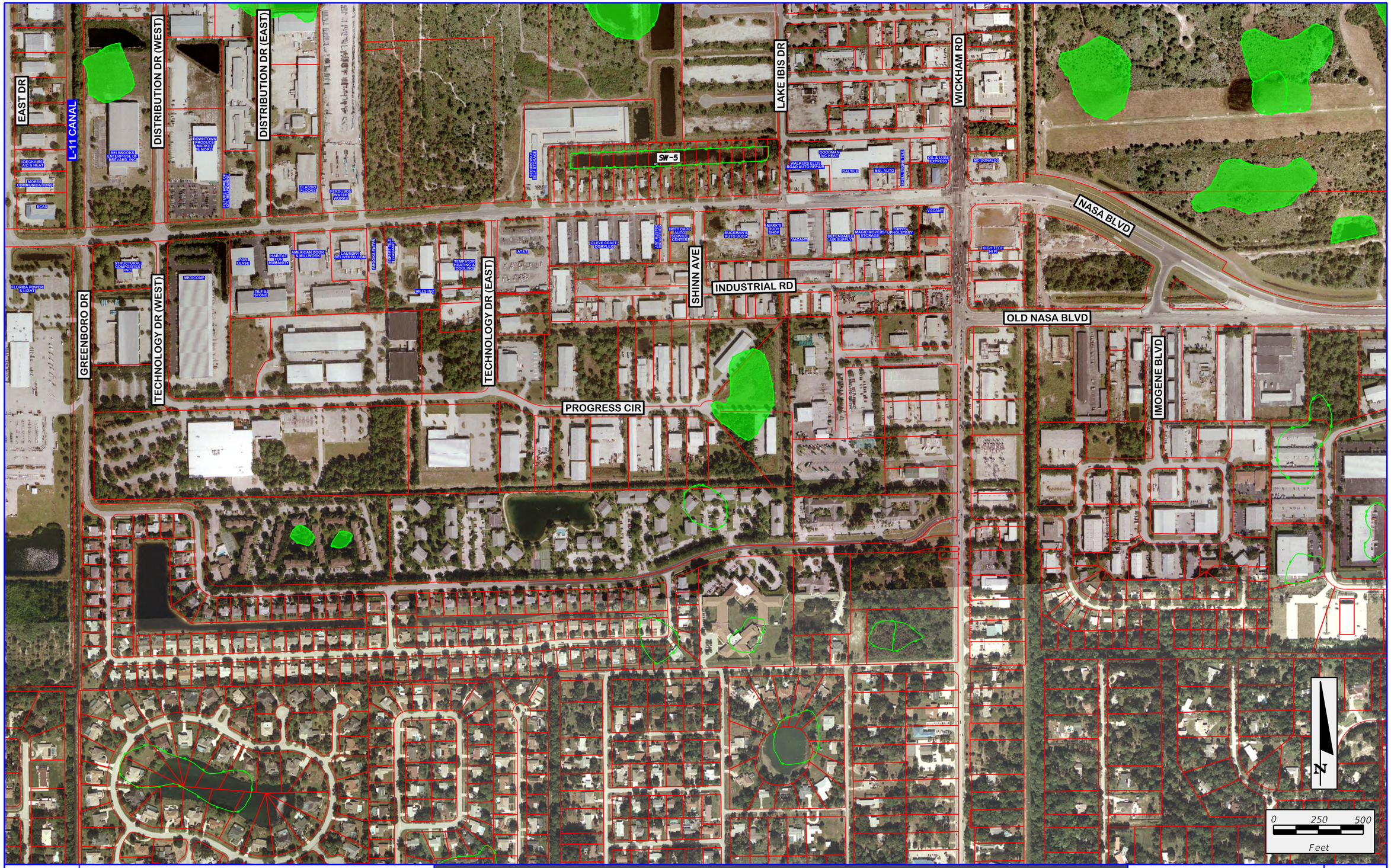
EXISTING WETLANDS

7
617/PF01C
WETLAND NO.
FLUCFCS/NWI CODES

EXISTING R/W
EXISTING L/A
EXISTING EASEMENT
PROPERTY LINE

EXISTING WETLANDS

FIGURE NO.
5.1.1A



FDOT

I-95 AT ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING WETLANDS

7
617/PF01C
WETLAND NO.
FLUCFCS/NWI CODES

EXISTING R/W
EXISTING L/A
EXISTING EASEMENT
PROPERTY LINE

EXISTING WETLANDS

FIGURE NO.
5.1.1B

5.2 Wetland Systems

A total of nineteen wetland systems were identified and classified during the field reviews. A description of these wetlands follows.

Wetland # 1 (W-1)

FLUCFCS Code: 618 Willow and Elderberry

NWI Code: PSS1C Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded

W-1 is a seasonally inundated, coastalplain willow-dominated wetland that extends off-site to the west. It is approximately 6.60 acres in size. It is bordered on the east by a powerline easement, on the north and west by cabbage palm hammock, and on the south by cleared and filled vacant land with several ponds. In addition to coastalplain willow, wax myrtle is a common species. Open water areas are present as well as sections dominated by spatterdock (Nuphar lutea) or pickerelweed (Pontederia cordata). This wetland discharges by sheet flow and ditches westward to the St. Johns River.

The habitat value of this wetland is moderate to high due to its location west of I-95 within the sparsely developed St. Johns River floodplain. A good wildlife corridor exists to the west. To the east, I-95 and the cleared powerline right-of-way negatively impact the habitat value. Foraging and breeding habitat is abundant and cover is adequate to support larger mammals and birds in addition to small mammals and herpetofauna. Since this wetland is located on private property, it does not provide any public use opportunities.

Wetland # 2 (W-2)

FLUCFCS Code: 643 Wet Prairie

NWI Code: PEM1C, Palustrine, Emergent, Persistent, Seasonally Flooded

W-2 is a 0.10-acre pocket of seasonally inundated, wet prairie located within a cabbage palm hammock immediately south of Pond Site 1A west of I-95. It appears that this wetland was created due to anthropogenic disturbance near a hunting shack and associated

trail/road. Groundcover is dominated by blue maidencane; however, wax myrtle is invading the system. Approximately one-third of W-2 is bordered by a restricted-access, unpaved trail/road with cabbage palm hammock surrounding the remainder. This wetland discharges by sheet flow and ditches westward to the St. Johns River.

The habitat value of this wetland is moderate to high due to its location west of I-95 within the sparsely developed St. Johns River floodplain. A nearby stormwater pond provides open water habitat in the general vicinity. An alligator (Alligator mississippiensis) and a snakebird (Anhinga anhinga) were observed at this pond during the corridor survey. A good wildlife corridor exists to the west. To the east I-95 and the cleared powerline right-of-way negatively impact the habitat value. Since this wetland is located on private property, it does not provide any public use opportunities.

Wetland # 3 (W-3)

FLUCFCS Code: 643 Wet Prairie
NWI Code: PEM1C, Palustrine, Emergent, Persistent, Seasonally Flooded

W-3 is an extensive, seasonally inundated, wet prairie system located at western edge of Pond 1A. It extends offsite to the west and is part of the St. Johns River floodplain. The 0.70-acre portion of this wetland located within the project limits is bordered on the east and south by cabbage palm hammock and on north by an existing stormwater treatment pond. Blue maidencane is the dominant groundcover species. Wax myrtle has invaded the upland-wetland interface. Sparsely distributed cabbage palm is also located in this area. W-3 discharges by sheet flow and ditches westward to the St. Johns River.

W-3 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. The habitat value of this wetland is moderate to high for the same reasons as previously stated for W-1. Foraging and breeding habitat is abundant and cover is adequate to support larger mammals and birds in addition to small mammals and herpetofauna. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 4 (W-4)

FLUCFCS Code: 643 Wet Prairie

NWI Code: PEM1C Palustrine, Emergent, Persistent, Seasonally Flooded

W-4 is a 1.11 acre, seasonally inundated, disturbed area between an existing stormwater pond and an elevated powerline easement trail/road. This wetland is located within a powerline easement and the groundcover is periodically mowed. W-4 has been classified as wet prairie; however, a slight depression and a roadside ditch within this wetland are characterized by species more indicative of marshes. W-4 is currently colonized with a mix of maidencane (Panicum hemitomon), pickerelweed, blue maidencane, willow, and mallow (cf. Kosteletzkya virginica). Spatterdock and cattails are common species within the roadside ditch. W-4 sheet flows to ditches which ultimately drain westward to the St. Johns River.

W-4 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. A good wildlife corridor to the St. Johns River exists and the adjacent land to the north is protected by a conservation easement. Foraging and breeding habitat is abundant and cover is adequate to support larger mammals and birds in addition to small mammals and herpetofauna. The wildlife habitat function has been negatively impacted by the close proximity of I-95 as well as the maintenance of the powerline easement. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 5 (W-5)

FLUCFCS Code: 643 Wet Prairie

NWI Code: PEM1C Palustrine, Emergent, Persistent, Seasonally Flooded

W-5 is an extensive, seasonally inundated, wet prairie system. It extends offsite to the west and is part of the St. Johns River floodplain. A maintained powerline easement and a stormwater treatment pond border W-5 on the east with undeveloped land on the remaining sides. A drainage ditch (SW-6) cuts across W-5 in an east-west orientation. The

portion of W-5 north of the SW-6 ditch is protected by a conservation easement. This wetland has been classified as wet prairie. Common species present include sand cordgrass (Spartina bakeri), camphorweed (Pluchea sp.), and blue maidencane with scattered wax myrtle and cabbage palm. W-4 discharges by sheet flow and ditches westward to the St. Johns River.

W-5 currently provides water quality treatment, flood attenuation and wildlife habitat functions. This wetland is located along the eastern edge of the vast, undeveloped St. Johns River floodplain, thus an excellent wildlife corridor exists. A portion of W-5 north of the SW-6 ditch is protected by a conservation easement as well as the adjacent land to the north. Foraging and breeding habitat is abundant and cover is adequate to support larger mammals and birds in addition to small mammals and herpetofauna. The wildlife habitat function has been negatively impacted by the close proximity of I-95 as well as the maintenance of the powerline easement. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 6 (W-6)

FLUCFCS Code: 643 Wet Prairie

NWI Code: PEM1C Palustrine, Emergent, Persistent, Seasonally Flooded

W-6 is a highly disturbed, seasonally inundated wetland located within an existing maintained powerline easement. It has been classified as wet prairie. W-6 is bordered on the east by I-95, on the north and south by the maintained powerline easement, and on the west by vacant land protected by a conservation easement. This wetland is currently colonized with a mix of maidencane, pickerelweed, blue maidencane, camphorweed, and other wetland grasses and forbs. It sheets flows to ditches which ultimately drain westward to the St. Johns River.

W-6 currently provides water quality treatment, flood attenuation and wildlife habitat functions. A good wildlife corridor to the St. Johns River exists and the adjacent land to the west is protected by a conservation easement. Foraging and breeding habitat is abundant

and cover is adequate to support larger mammals and birds in addition to small mammals and herpetofauna. The wildlife habitat function has been negatively impacted by the close proximity of I-95 as well as the maintenance of the powerline easement. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 7 (W-7)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-7 is a 1.52-acre, seasonally inundated, forested wetland. Red maple (Acer rubrum), laurel oak, Florida elm (Ulmus americana var. floridana) along with scattered cabbage palm form a closed canopy. Groundcover is sparse consisting of predominantly seedling and sapling canopy species. W-7 is bordered on the west by I-95, on the south by disturbed pine flatwoods, and on the remaining sides by disturbed temperate hardwood hammock which in some areas has been completely overrun by Brazilian pepper. A restricted access unpaved trail/road skirts the edge of this wetland. The M-1 Canal is located approximately 175' to the east. This wetland discharges by sheet flow to the I-95 right-of-way, then northward along the right-of-way edge to a canal that ultimately drains westward to the St. Johns River. No connection to the M-1 Canal was evident.

W-7 currently provides water quality treatment, flood attenuation and wildlife habitat functions. The habitat value of W-7 is moderate. It has been negatively impacted by its location between I-95 and light industrial/commercial development. Adjacent uplands with adequate cover exist; however, no viable wildlife corridor is present. Forage and nesting habitat is provided for small mammals, birds, reptiles and amphibians. Brazilian pepper has also negatively impacted the habitat value of the system. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 8 (W-8)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-8 is a 0.36-acre, seasonally inundated, forested wetland-dominated depression located within a temperate hardwood hammock. The canopy is closed with laurel oak and cabbage palm as the dominant canopy species. Groundcover is sparse consisting of predominantly seedling and sapling canopy species. A restricted-access, unpaved trail/road runs along the eastern border of this wetland. I-95 is situated approximately 350' to the west. The remaining sides are characterized by temperate hardwood hammock. The M-1 Canal is located approximately 100' to the east. W-8 discharges by sheet flow to the I-95 right-of-way, then northward along the right-of-way edge to a canal that ultimately drains westward to the St. Johns River. This wetland also appears to have no apparent connection to the M-1 Canal.

W-8 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. This wetland also has diminished wildlife functions due primarily to the location within an urbanized area. I-95 also acts as a barrier precluding a viable wildlife corridor to the undeveloped St. Johns River floodplain to the west. The uplands adjacent to W-8 provide adequate cover; however, Brazilian pepper is invading the area. The wetland hydrology has been negatively impacted by the M-1 Canal and I-95. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 9 (W-9)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-9 is a 0.99-acre, seasonally inundated, forested wetland-dominated depression located within a temperate hardwood hammock. Red maple, laurel oak, and Florida elm along with scattered cabbage palm form a closed canopy. Groundcover is sparse consisting of predominantly seedling and sapling canopy species. At the eastern edge, swamp dogwood

(Cornus foemina) forms a dense thicket. A restricted- access, unpaved trail/road runs along the eastern border of this wetland and I-95 is located at the western edge. The M-1 Canal is located approximately 180' to the east. W-9 discharges by sheet flow to the I-95 right-of-way, then northward along the right-of-way edge to a canal that ultimately drains westward to the St. Johns River. W-9 also appears to have no apparent connection to the M-1 Canal. The majority of W-9 is located within the boundary of Regional Pond Site A; however, a small portion is situated within the I-95/Ellis Road interchange.

W-9 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. This wetland also has diminished wildlife functions due primarily to the urban location as well as the I-95 barrier to wildlife movement. The uplands adjacent to W-9 provide adequate cover; however, Brazilian pepper is invading the area. The wetland hydrology has also been negatively impacted by the M-1 Canal and I-95. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 10 (W-10)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-10 is a 0.37-acre, seasonally inundated, forested wetland-dominated depression located within a temperate hardwood hammock. Red maple and laurel oak form a closed canopy. Groundcover is sparse consisting of predominantly seedling and sapling canopy species. At the eastern edge, swamp dogwood forms a dense thicket along with some Brazilian pepper. A restricted-access, unpaved trail/road runs along the eastern border of this wetland. I-95 is situated approximately 325' to the west. The remaining sides are characterized by temperate hardwood hammock. The M-1 Canal is located approximately 180' to the east. This wetland discharges by sheet flow to the I-95 right-of-way, then northward along the right-of-way edge to a canal that ultimately drains westward to the St. Johns River. W-10 also appears to have no apparent connection to the M-1 Canal. The majority of W-10 is located within the I-95/Ellis Road interchange; however, a small portion is situated within the boundary of Pond Site A.

W-10 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. Like the previously described wetlands east of I-95, this wetland also has diminished wildlife functions due primarily to the urban location as well as the I-95 barrier to wildlife movement. The uplands adjacent to W-10 provide adequate cover; however, Brazilian pepper is invading the area. The wetland hydrology has also been negatively impacted by the M-1 Canal and I-95. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 11 (W-11)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-11 is a 1.09-acre, seasonally inundated, forested wetland-dominated depression located within a temperate hardwood hammock. Florida elm, red maple, laurel oak, along with scattered cabbage palm form a closed canopy. Groundcover is sparse consisting of predominantly seedling and sapling canopy species. At the eastern edge, swamp dogwood forms a dense thicket. A small open area also exists and is colonized by blue maidencane with some wax myrtle, Brazilian pepper, and St. John's-Wort (Hypericum fasciculatum). I-95 borders W-11 on the west. A restricted-access, unpaved trail/road runs along the eastern border of this wetland. The remaining sides are characterized by temperate hardwood hammock. The M-1 Canal is located approximately 70' to the east. This wetland discharges by sheet flow to the I-95 right-of-way, then northward along the right-of-way edge to a canal that ultimately drains westward to the St. Johns River. W-11 also appears to have no apparent connection to the M-1 Canal. W-11 is located within the I-95/Ellis Road interchange.

W-11 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. Like the previously described wetlands east of I-95, this wetland also has diminished wildlife functions due primarily to the urban location as well as the I-95 barrier to wildlife movement. The uplands adjacent to W-11 provide adequate cover; however,

Brazilian pepper is invading the area. The wetland hydrology has also been negatively impacted by the M-1 Canal and I-95. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 12 (W-12)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-12 is a 0.42-acre, seasonally inundated, forested wetland-dominated depression located within a temperate hardwood hammock. Red maple, laurel oak, and elm form a closed canopy. Groundcover is sparse consisting of predominantly seedling and sapling canopy species. At the edge of the I-95 right-of-way, Brazilian pepper is dominant. I-95 borders W-10 on the west. A restricted-access, unpaved trail/road runs along the eastern border of this wetland. The remaining sides are characterized by temperate hardwood hammock. The M-1 Canal is located approximately 300 feet to the east. This wetland discharges by sheet flow to the I-95 right-of-way, then northward along the right-of-way edge to a canal that ultimately drains westward to the St. Johns River. W-12 also appears to have no apparent connection to the M-1 Canal. W-12 is located within the I-95/Ellis Road interchange.

W-12 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. Like the previously described wetlands east of I-95, this wetland also has diminished wildlife functions due primarily to the urban location as well as the I-95 barrier to wildlife movement. The uplands adjacent to W-12 provide adequate cover; however, Brazilian pepper is invading the area. The wetland hydrology has also been negatively impacted by the M-1 Canal and I-95. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 13 (W-13)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-13 is a 0.91-acre, seasonally inundated, forested wetland-dominated depression. Red maple, laurel oak, and elm form a closed canopy. Groundcover is sparse consisting of predominantly seedling and sapling canopy species and some swamp fern (Blechnum serrulatum). Brazilian pepper has invaded the wetland. W-13 is bordered on the south by temperate hardwood hammock, on west by I-95, on the north by a mobile home park, and on the east by a restricted-access, unpaved trail/road. The M-1 Canal is located approximately 60 feet to the east. A shallow east-west-oriented ditch bisects W-13. The ditch discharges to the I-95 right-of-way and flows to a canal that ultimately drains westward to the St. Johns River. W-13 also appears to have no apparent connection to the M-1 Canal.

W-13 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. Like the previously described wetlands east of I-95, this wetland also has diminished wildlife functions due primarily to the urban location as well as the I-95 barrier to wildlife movement. The uplands adjacent to W-13 provide adequate cover; however, Brazilian pepper is invading the area. The wetland hydrology has also been negatively impacted by the M-1 Canal and I-95. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 14 (W-14)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-14 is a seasonally inundated, forested wetland which extends offsite to the north. Less than 0.75 acres is located within the project limits. Red maple, laurel oak and Florida elm along with some cabbage palm form a closed canopy. Groundcover is sparse consisting of predominantly seedling and sapling canopy species and some swamp fern. Brazilian pepper

has invaded the edge of the system. It is bordered on the north by residential development, on the west by the M-1 Canal and associated spoil berm, on the south by the L-15 Canal with its maintenance road, and on the east by temperate hardwood hammock. Across the M-1 Canal is the previously mentioned mobile home park. Although no direct connection was observed, it is assumed that W-14 discharges to both the M-1 and L-15 Canals and ultimately to Crane Creek.

W-14 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. Like the previously described wetlands east of I-95, this wetland also has diminished wildlife functions due primarily to the urban location as well as the I-95 barrier to wildlife movement. The uplands adjacent to W-14 along the L-15 Canal are maintained as an unpaved road, while along the M-1 Canal, the berm is a monotypic forest of Brazilian pepper. The remaining sides of the wetland provide a better buffer with a cover of native species; however, low density residential development is present to the north. The wetland hydrology has also been negatively impacted by the M-1 and L-15 Canals as well as by I-95. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 15 (W-15)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-15 is a seasonally inundated, forested wetland located at Pond Site 3A. If this pond site is selected, them 1.03 acres of W-15 will be within the project limits. Red maple, laurel oak and Florida elm along with some cabbage palm form a closed canopy. Groundcover is sparse, consisting of predominantly seedling and sapling canopy species and some swamp fern. Brazilian pepper has invaded the system. This wetland extends offsite to the west. W-15 is bordered on the west by John Rodes Boulevard, on the south by a school, on the north by a single family residential development, and on the east by temperate hardwood hammock, disturbed land and a borrow pit. W-15 sheet flows to a ditch adjacent to John Rodes Boulevard which joins the L-15 Canal at the Ellis intersection and ultimately drains to Crane Creek.

W-15 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. The project site only includes a minor portion of this wetland system along its eastern boundary. The wildlife habitat function of this wetland system has been detrimentally impacted by the urbanization of the project vicinity. W-15 itself provides forage and nesting habitat for small mammals, birds, reptiles and amphibians; however, Brazilian pepper has negatively impacted the habitat value. Adjacent uplands are either developed or of insufficient size and vegetative composition to provide quality habitat. No viable wildlife corridor exists because the wetland is surrounded by development and heavily travelled roadways. The wetland hydrology has also been negatively impacted by various drainage ditches and canals in the general area. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 16 (W-16)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-16 is a 1.00-acre, seasonally inundated, forested wetland located along the north side of Ellis Road just east of the John Rodes Boulevard intersection. This wetland is a remnant of a much larger system that existed prior to the development of the general project vicinity. Red maple, laurel oak, and Florida elm along with some cabbage palm form a closed canopy. Groundcover species include seedling and sapling canopy species, swamp fern, poison ivy, and wild coffee (Psychotria nervosa). Brazilian pepper has invaded the system. W-16 is bordered on the east and west by commercial and institutional development, on the south by Ellis Road, and on the north by disturbed land and a borrow pit. Trash dumping was evident along the edge of this wetland. W-16 drains to the L-15 Canal and ultimately Crane Creek.

W-16 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. The wildlife habitat function of this wetland system has been detrimentally impacted by the urbanization of the project vicinity. W-16 provides limited forage and

nesting habitat for small mammals, birds, reptiles and amphibians; however, Brazilian pepper has negatively impacted the habitat value. Adjacent uplands are developed. No viable wildlife corridor exists because the wetland is surrounded by development and heavily travelled roadways. The wetland hydrology has also been negatively impacted by various drainage ditches and canals in the general area. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 17 (W-17)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-17 is a 0.87-acre, seasonally inundated, forested wetland remnant located along the north side of Ellis Road. Red maple, laurel oak, and Florida elm along with some cabbage palm form a closed canopy. Groundcover species include seedling and sapling canopy species, swamp fern, poison ivy, and wild coffee. Brazilian pepper has invaded the system. The historic wetland system was bisected by the construction of Ellis Road. W-18 is another remnant of this action. W-17 is bordered on the north and west by commercial development, on the south by Ellis Road, and on the east by temperate hardwood hammock. W-17 discharges to the L-15 Canal and ultimately Crane Creek and currently provides water quality treatment, flood attenuation, and wildlife habitat functions.

The wildlife habitat function of this wetland system has been detrimentally impacted by the urbanization of the project vicinity. W-17 provides limited forage and nesting habitat for small mammals, birds, reptiles and amphibians; however, Brazilian pepper has negatively impacted the habitat value. Adjacent uplands are developed or are of limited size to provide quality habitat. No viable wildlife corridor exists because the wetland is surrounded by development and heavily travelled roadways. The wetland hydrology has also been negatively impacted by the L-15 Canal and development in the general area. This wetland is also on private land and does not provide any public use opportunities.

Wetland # 18 (W-18)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-18 is a 0.19-acre, seasonally inundated, forested wetland remnant located along the south side of Ellis Road. Red maple and laurel oak are common canopy species. Groundcover species include seedling and sapling canopy species, swamp fern, and chain fern (Woodwardia virginica). The groundcover is periodically mowed by the current landowner in the project corridor. The historic wetland system was bisected by the construction of Ellis Road. W-17 is another remnant of this action. W-18 extends offsite to the south. It is bordered on the east and west by disturbed pine flatwoods or temperate hardwood hammock, on the south by residential development, and on the north by Ellis Road.

W-18 currently provides water quality treatment, flood attenuation and wildlife habitat functions. The wildlife habitat function of this wetland system has been detrimentally impacted by the urbanization of the project vicinity. W-18 provides limited forage and nesting habitat for small mammals, birds, reptiles and amphibians. The adjacent uplands are either developed or the groundcover mowed, thereby removing cover essential for wildlife utilization. No viable wildlife corridor exists because the wetland is surrounded by development and heavily travelled roadways. The wetland hydrology has also been negatively impacted by various drainage ditches and canals as well as development in the project vicinity. W-18 is also on private land and does not provide any public use opportunities.

Wetland # 19 (W-19)

FLUCFCS Code: 617 Mixed Wetland Hardwoods

NWI Code: PFO1C Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded

W-19 is a seasonally inundated, forested wetland which extends off-site to the southwest. Approximately 0.14 acres of this wetland is located within the project limits. W-1 is bordered on the south by residential development, on the east by commercial development,

on the west by temperate hardwood hammock and commercial development, and on the north by Ellis Road. Red maple, laurel oak and Florida elm along with some cabbage palm form a closed canopy. Groundcover species include seedling and sapling canopy species, swamp fern, poison ivy, and wild coffee. W-19 appears to discharge via a ditch to the L-15 Canal and ultimately Crane Creek.

W-19 currently provides water quality treatment, flood attenuation, and wildlife habitat functions. The wildlife habitat function of this wetland system has been detrimentally impacted by the urbanization of the project vicinity. W-19 provides limited forage and nesting habitat for small mammals, birds, reptiles and amphibians. Adjacent uplands are developed or are of limited size to provide quality habitat. No viable wildlife corridor exists because the wetland is surrounded by development and heavily travelled roadways. The wetland hydrology has also been negatively impacted by the L-15 Canal and development in the general area. This wetland is also on private land and does not provide any public use opportunities.

5.3 Wetland Assessment

State and federal agencies may exert jurisdiction over all wetland areas occurring within the study area. In most cases, wetland impacts will require permits from both agencies and compensatory mitigation will be required. The following sections describe state and federal wetland assessment methodologies used for preliminary wetland mitigation determinations.

Uniform Mitigation Assessment Method (UMAM)

In February 2004, Chapter 62-345, F.A.C. was enacted which adopted the statewide UMAM to determine the amount of mitigation required to offset impacts to wetlands and other surface waters. UMAM replaces the former mitigation ratio guidelines published in Section 12.3.2 of the SJRWMD Applicant's Handbook: *Management and Storage of Surface Waters* (March 2003). The UMAM has recently been accepted by the United States Army Corps of Engineers (USACE) as a suitable qualitative wetland assessment methodology. UMAM also

replaces the Wetland Rapid Assessment Procedure (WRAP), which was also previously utilized by SJRWMD, FDEP and USACE.

UMAM provides a standardized procedure for assessing the functions provided by wetlands, the amount (expressed as a percentage) that those functions are reduced by a proposed impact (assessment area), and the amount (acreage) of mitigation necessary to offset that loss. Once a determination that compensatory mitigation is necessary, the UMAM methodology is also used to quantify the amount (acreage) of mitigation, or credits required from a regional mitigation area or mitigation bank, respectively, necessary to offset the impact.

Similar to WRAP, UMAM is applied by the utilization of an assessment matrix, which analyzes three variables for wetland/other surface waters (i.e., indicators of wetland/other surface waters function) including:

- Location and Landscape;
- Water Environment; and,
- Vegetative Community Structure.

Each of these variables yields an overall UMAM score for a wetland ranging from 0 to 10, based on the level of function that benefit fish and wildlife. The matrix is used to provide guidance to determine an ecological numerical value for each of the three variables. For purposes of providing guidance, descriptions are given for four general categories of scores: optimal (10), moderate (7), minimal (4), and not present (0).

Using the baseline UMAM scores coupled with scientific evidence and professional experience, UMAM scores were also derived for the post construction or "with project" wetland status of the project site. To evaluate the total proposed loss of wetland form and function, the "without project" and "with project" UMAM scores are compared to produce an overall debit value for the project.

For purposes of the UMAM assessment, wetland area involved with project construction was identified based on the FLUCFCS code described for the wetland community type impacted by the proposed project. The matrix assessment score was assigned in accordance with the guidelines outlined in Chapter 62-345, Florida Administrative Code (February 2, 2004). The UMAM Assessment Worksheets for each wetland system identified in Section 5.2 are found in Appendix A. The existing condition or "without project" UMAM scores are listed below in Table 5.3.1. The UMAM scores will need to be re-evaluated at the time of permitting based on the specific areas that would be proposed to be impacted.

Table 5.3.1: UMAM Scores – Existing Conditions

WETLAND ID	UMAM SCORE (Impact Delta)		WETLAND ID	UMAM SCORE (Impact Delta)
W-1	0.87		W-11	0.73
W-2	0.87		W-12	0.73
W-3	0.87		W-13	0.70
W-4	0.83		W-14	0.70
W-5	0.87		W-15	0.70
W-6	0.83		W-16	0.57
W-7	0.73		W-17	0.63
W-8	0.73		W-18	0.60
W-9	0.73		W-19	0.67
W-10	0.73			

5.4 Wetland and Surface Water Impacts

A total of nineteen wetland systems and nine surface water features were identified within or adjacent to the project corridor. These systems were delineated and characterized. The overall quality was assessed for those wetlands and surface waters that could be potentially directly impacted by the project.

5.4.1 Direct Impacts

Direct impacts are defined as those effects caused by the proposed action which occur at the same time and place (40 CFR 1508.8). The direct impacts of the project include placement of fill for the road construction and its associated right-of-way as well as excavation and the placement of fill associated for the construction of stormwater treatment ponds.

Direct impacts to wetlands along the project corridor are anticipated to be minor due to the urbanization of the general vicinity. For the most part, an existing roadway will be widened. New roadway is to be constructed from John Rodes Boulevard westward. East of I-95, several wetland systems were previously bisected either by the initial construction of Ellis Road or by the excavation of various drainage canals and construction of their associated maintenance roads. The proposed construction will reduce the size and quality of these remnants. The wetland systems are for the most part small in size, highly disturbed, and surrounded by development. With the terminus of the project at the I-95 interchange, the impact should be minor since the wetlands present have already been highly disturbed by the powerline easement maintenance, as well as being affected by the close proximity to the heavily travelled I-95. The hydrologic impacts are expected to be insignificant since SJRWMD requires that the post-construction hydrologic conditions must be equivalent to the pre-construction hydrologic conditions. Water quality in the general area should improve as previously untreated areas are accommodated by the new stormwater treatment ponds. Water quality impacts during construction will be minimized by use of standard FDOT best management practices. Tables 6.4.1 through 6.4.8 summarize the wetland and surface water impacts per each alternative for Ellis Road, the I-95 interchange, and potential pond sites. Concept plan sheets showing the right-of-way footprints for each alternative examined and its respective wetland impacts are included on the figures that follow.

Figures 5.4.1A through F display the right-of-way footprints and associated wetland and surface water impacts for the Tight (A), Wide (B), and Parclo (C) configurations based on alignment Alternatives 1 and 2. Because the Wide and Parlco ramp configurations are not

carried forward at this time, pond-associated wetland impacts are quantified only for the Tight ramp configuration based on Alternatives 1 and 2. These pond-associated wetland impacts (based on interchange alternatives 1-A and 1-B) are shown in Figures 5.4.2A and B.

Figures 5.4.3A through F display the wetland and surface water impacts based on the right-of-way footprints of each mainline alternative, while Figures 5.4.4A and B display the wetland and surface water impacts based on the right-of-way footprints of the pond alternatives along Ellis Road.

At the end of Section 5 of this report, Figures 5.4.5A and B display the wetland and surface water impacts for the Preferred Alternative. These figures include the interchange area, Ellis Road area, and preferred pond sites as one comprehensive concept.

5.4.2 Indirect and Cumulative Impacts

The proposed construction will involve the expansion of the existing right-of-way through a highly urbanized area in the eastern portion of the project corridor between John Rodes Boulevard and Wickham Road. New roadway is to be constructed from John Rodes Boulevard westward to the I-95/Ellis Road interchange. Agriculture and conservation are the dominant land uses west of I-95. New stormwater treatment ponds will be located throughout the project corridor.

Indirect impacts are those reasonably foreseeable effects of the proposed construction which occur later in time or are located adjacent to the project. Indirect impacts may include effects associated with future land use changes, population growth rates and density, and effects to the existing ecosystems. These indirect impacts only occur if the project is constructed. Indirect impacts are also referred to as secondary impacts.

As a result of the proposed connection to I-95, Ellis Road and the St. Johns Heritage Parkway, the proposed project may accelerate future land use changes, especially to the agriculturally developed land west of I-95. East of I-95 is currently highly urbanized and the future land use plan involves infill and not a change in land use. However, west of I-95

agriculture and conservation are the primary land uses. Wetlands associated with the St. Johns River floodplain are numerous within the agriculturally zoned lands. The area currently provides valuable wetland and upland habitat for numerous wildlife species as well as providing an unobstructed wildlife corridor to the conservation lands to the west. The proposed Ellis Road/I-95 interchange is the northern terminus of a new roadway currently under design, the St. Johns Heritage Parkway. The Ellis Road project in combination with the St. Johns Heritage Parkway would essentially facilitate access to the lands west of I-95 and can be expected to promote conversion of the agriculturally zoned land and its wetlands to development. Concurrent increases in population density and rate of population growth are anticipated. The St. Johns Heritage Parkway is presently being reviewed by the regulatory agencies and the indirect and cumulative impacts of the roadway will be addressed prior to the issuance of the required state and federal permits.

Indirect impacts to the ambient air and water resources in the project vicinity are a common result of roadway construction. Vehicle exhaust emissions associated the internal combustion engine including carbon monoxide, sulfur dioxides and nitrogen oxides as well as particulates can degrade the atmospheric conditions in the project vicinity as well as detrimentally impact the adjacent upland and wetland communities. Stagnant areas can lead to the buildup of noxious gas. Acid rain fallout to adjacent areas can change the pH of the soil and thereby change the existing ecosystem. Since the roadway widening will facilitate the traffic flow on Ellis Road and the new roadway is designed as limited access for the remainder of the project, which also helps move traffic, the anticipated indirect impacts associated with air pollution are considered minor.

Indirect water quality impacts from roadway construction include pollutant loading to adjacent surface waters and wetlands from roadway runoff. Heavy metals and nutrients are two of the common types of pollutants. Litter is also a problem which affects both upland and wetland systems. Water quality in the general area should improve with implementation of the SJRWMD permit design conditions as previously untreated areas are accommodated by the new stormwater treatment ponds. Water quality impacts during construction will be minimized by use of standard FDOT best management practices.

The wetlands that will be altered by the new roadway, in addition to the direct impacts caused by fill, will be reduced further in size with a concurrent loss in functional value from the existing condition. Hydrologic changes, while slight, are also possible. An ecotone is the area where two different habitats meet. Generally, the diversity of these areas is increased since species from both of the habitats colonize the area. Disruption of the soils at wetland edge can potentially lead to the introduction of nuisance, invasive or weedy species to this ecotone and eventually into the wetland system. Light penetration as well as noise impacts to the ecotone and the adjacent wetland will also be experienced. A change in microclimate of the adjacent wetland system will occur as the ecotone is pushed further into the wetland remnant interior as the roadway is expanded.

Cumulative impacts result from the total effect of the proposed project when added to other past, present, and reasonably future projects or actions (40 CFR 1508.7). As discussed in Section 3.0 (Project Purpose & Description), the purpose and need of this project is to provide a connection between the Melbourne airport and I-95 as well as address deficiencies at the existing I-95 interchanges at US 192 and Eau Gallie Boulevard. All of these roadways are hurricane evacuation routes and maintenance of an acceptable traffic level of service (LOS) is essential.

Urban development has historically spread westward from the city of Melbourne at the Intracoastal Waterway to I-95. In the project vicinity, unlike sections to the north and south, little development has occurred west of I-95. The cumulative impact of this project revolves around the tie in with the proposed St. Johns Heritage Parkway since the land east of I-95 is currently highly urbanized. The proposed road will provide easy access to agriculturally zoned land with wetlands and uplands currently unprotected by conservation easements located west of I-95 and can be expected to promote land use changes in the general vicinity, like those to the north and south of the project corridor, adding to the level of cumulative impacts for the region. While these undeveloped properties could potentially be developed, the property owner would still be subject to the state, local and federal regulatory agencies.

5.4.3 Avoidance and Minimization

Avoidance and minimization of wetland impacts have been integral components of the alternative alignment designs and will continue to be evaluated during the design and permitting phase of this project. Specific measures have been taken in an effort to minimize wetland impacts, including using an optimized alignment that shifts the widening between both sides of the existing right-of-way to avoid impacting wetlands to the greatest extent possible. The interchange of the Preferred Alternative reduces the impacts to the high quality wetlands of the St. Johns River floodplain to the west by shifting the interchange location slightly to the south and modifying the curve parameters in combination with the utilization of the MSE retaining walls along the ramps within the northwest and southwest quadrants. These west-side ramps are located entirely within the existing right-of-way, thereby eliminating impacts to the utilities and wetlands to the west. This plan also precludes impacts to the existing FDEP Conservation Easement.

East of I-95 the utilization of Regional Pond B also minimizes wetland impacts to the forested wetland systems in the southeastern quadrant. The FDOT Quality Enhancement Strategies for wetland avoidance and minimization will be further refined and addressed during the design phase.

As a result of providing adequate mitigation and maintaining turbidity control throughout construction activities, temporary and permanent construction impacts are anticipated to be minor. In accordance with FDOT's *Standard Specifications for Road and Bridge Construction* (2007), all Best Management Practices for erosion control and water quality considerations will be adhered to during the construction phase of the project.

Tables 5.4.1: Wetland Impacts – Ellis Road at I-95 Interchange Alternatives

Wetland Number	Alternative						
	Tight Ramps w/ Alignment Alt 1 (1-A)	Tight Ramps w/ Alignment Alt 2 (2-A)	Wide Ramps w/ Alignment Alt 1 (1-B)	Wide Ramps w/ Alignment Alt 2 (2-B)	Parclo Ramps w/ Alignment Alt 1 (1-C)	Parclo Ramps w/ Alignment Alt 2 (2-C)	Preferred Alternative
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1			0.02	0.02	0.12	0.30	
2							
3							
4	1.11	1.11	1.11	1.11	1.11	1.11	1.11 (3)
5 (1)	2.53	2.26	3.92	3.27	4.98	4.23	2.04
5 (2)	0.95	0.02	1.59	0.96	0.89		
6	0.90	0.90	0.91	0.91	0.28		
7							
8							
9	0.10	0.19	0.10	0.20	0.10	0.20	0.19
10	0.37 (3)	0.37 (3)	0.37 (3)	0.37 (3)	0.37 (3)	0.37 (3)	0.37 (3)
11	1.09	1.09	1.09	1.09	1.09	1.09	1.09
12	0.42	0.42	0.42	0.42	0.42	0.42	0.42
13	0.91 (3)	0.91 (3)	0.91 (3)	0.91 (3)	0.91 (3)	0.91 (3)	0.91 (3)
14	0.62	0.49	0.62	0.49	0.62	0.49	0.49
15							
16							
17							
18							
19							
Total	**9.00**	**7.76**	**11.06**	**9.75**	**10.89**	**9.12**	**6.62**

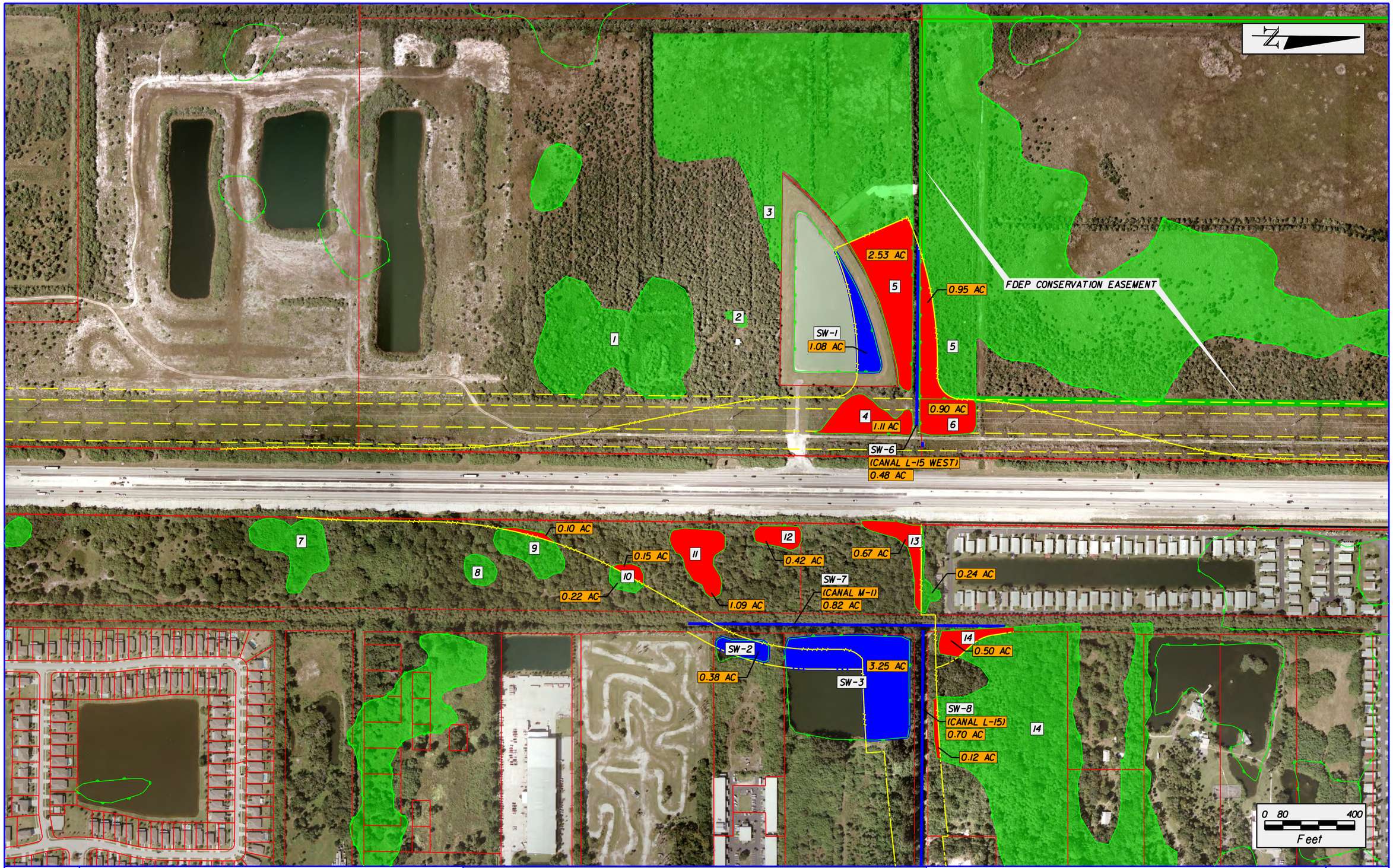
(1) Non-Conservation easement portion of Wetland No. 5

(2) Conservation easement portion of Wetland No. 5; The northern portion of W-5 north of SW-6 (Canal L-15 West) is encumbered by a conservation easement through the FDEP as mitigation for a county solid waste project that obtained an ERP. Since the conservation easement for these parcels was part of an ERP through the FDEP, any possible modification of this conservation easement must be coordinated through the FDEP

(3) Includes isolated wetland remnant less than one half acre not directly impacted by construction but requiring compensatory mitigation.

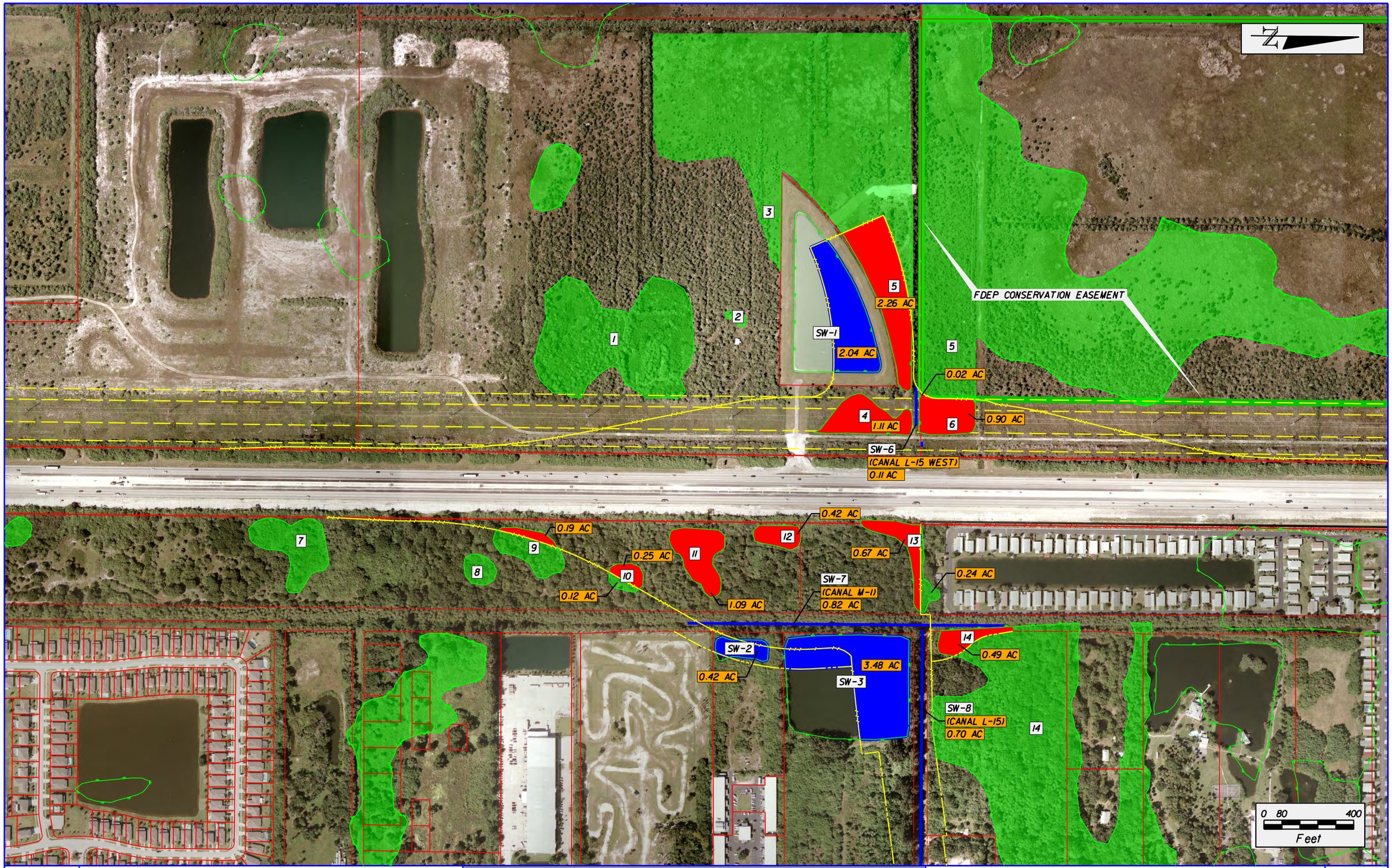
Table 5.4.2: Surface Water Impacts – Ellis Road at I-95 Interchange Alternatives

Surface Water Number	Alternative						
	Tight Ramps w/ Alignment Alt 1 (1-A)	Tight Ramps w/ Alignment Alt 2 (2-A)	Wide Ramps w/ Alignment Alt 1 (1-B)	Wide Ramps w/ Alignment Alt 2 (2-B)	Parclo Ramps w/ Alignment Alt 1 (1-C)	Parclo Ramps w/ Alignment Alt 1 (2-C)	Preferred Alternative
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
SW-1	1.08	2.04	1.13	2.55	2.09	3.19	1.37
SW-2	0.38	0.42	0.28	0.42	0.38	0.42	0.42
SW-3	3.25	3.48	3.15	3.48	3.25	3.48	3.48
SW-4							
SW-5							
SW-6	0.48	0.11	0.48	0.21	0.48		
SW-7	0.82	0.82	0.82	0.82	0.82	0.82	0.82
SW-8	0.70	0.70	0.70	0.70	0.70	0.70	0.70
SW-9							
Total	**6.71**	**7.57**	**6.56**	**8.18**	**7.72**	**8.61**	**6.79**



FDOT	ELLIS ROAD PROJECT DEVELOPMENT AND ENVIRONMENT STUDY	EXISTING ROW PROPOSED ROW SW-# / # SURFACE WATER/ WETLAND NUMBER WETLAND IMPACT SURFACE WATER IMPACT EXISTING WETLANDS	WETLAND/SURFACE WATER IMPACTS I-95 INTERCHANGE ALTERNATIVE 1-A

FIGURE NO.
5.4.1A



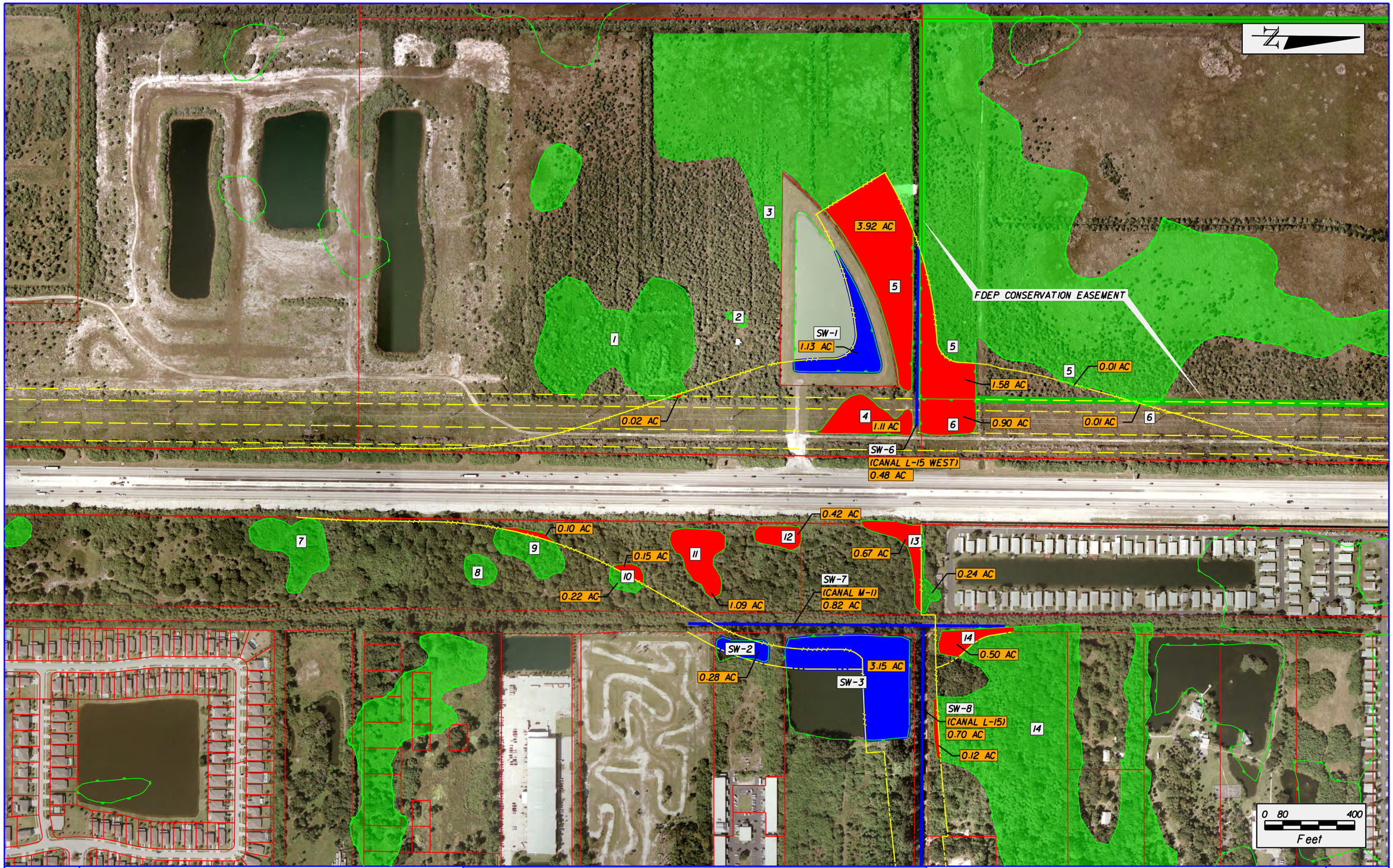
FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
I-95 INTERCHANGE ALTERNATIVE 2-A

FIGURE NO.
5.4.1B



FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
I-95 INTERCHANGE ALTERNATIVE 1-B

FIGURE NO.
5.4.1C

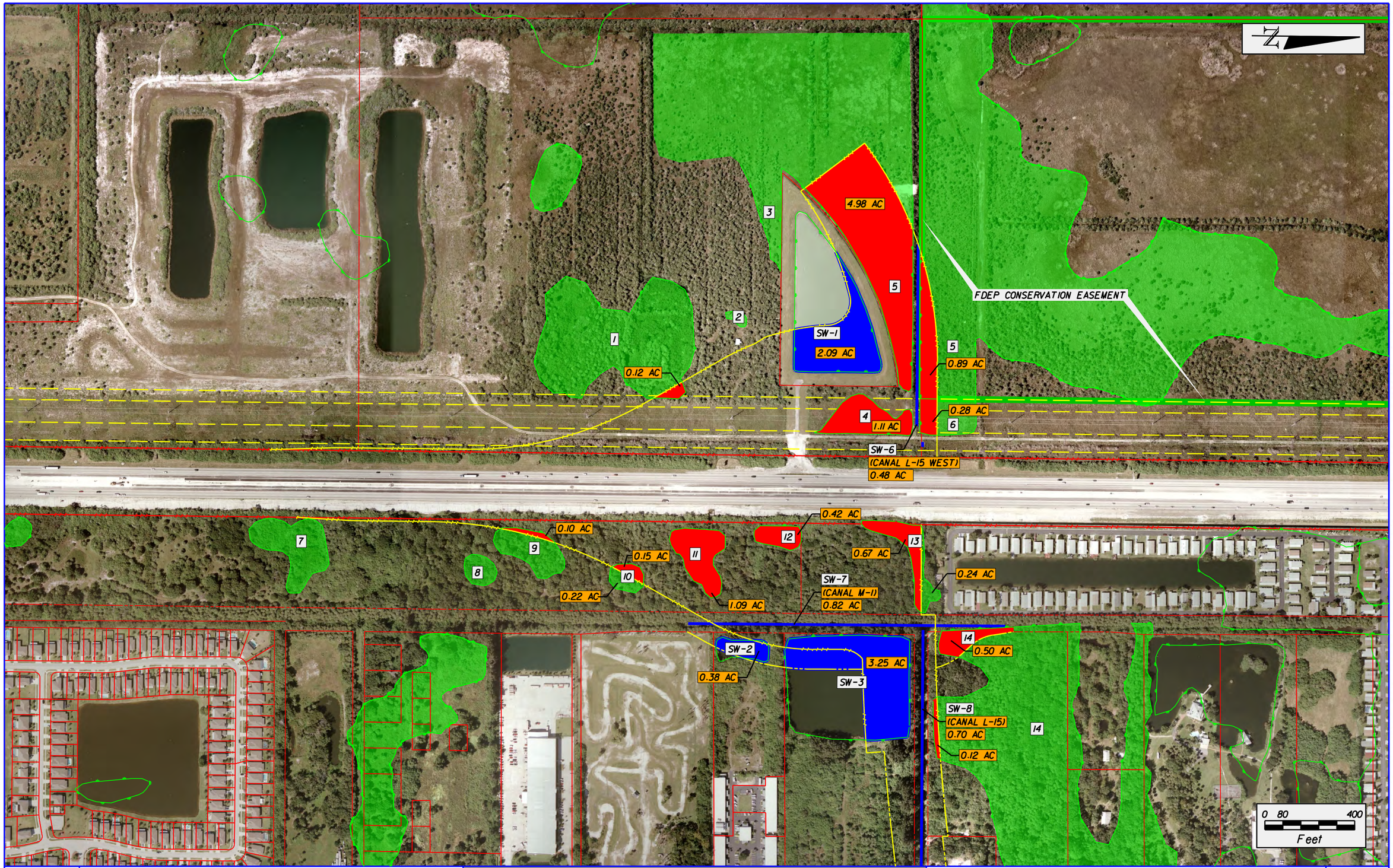
FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
I-95 INTERCHANGE ALTERNATIVE 2-B

FIGURE NO.
5.4.1D



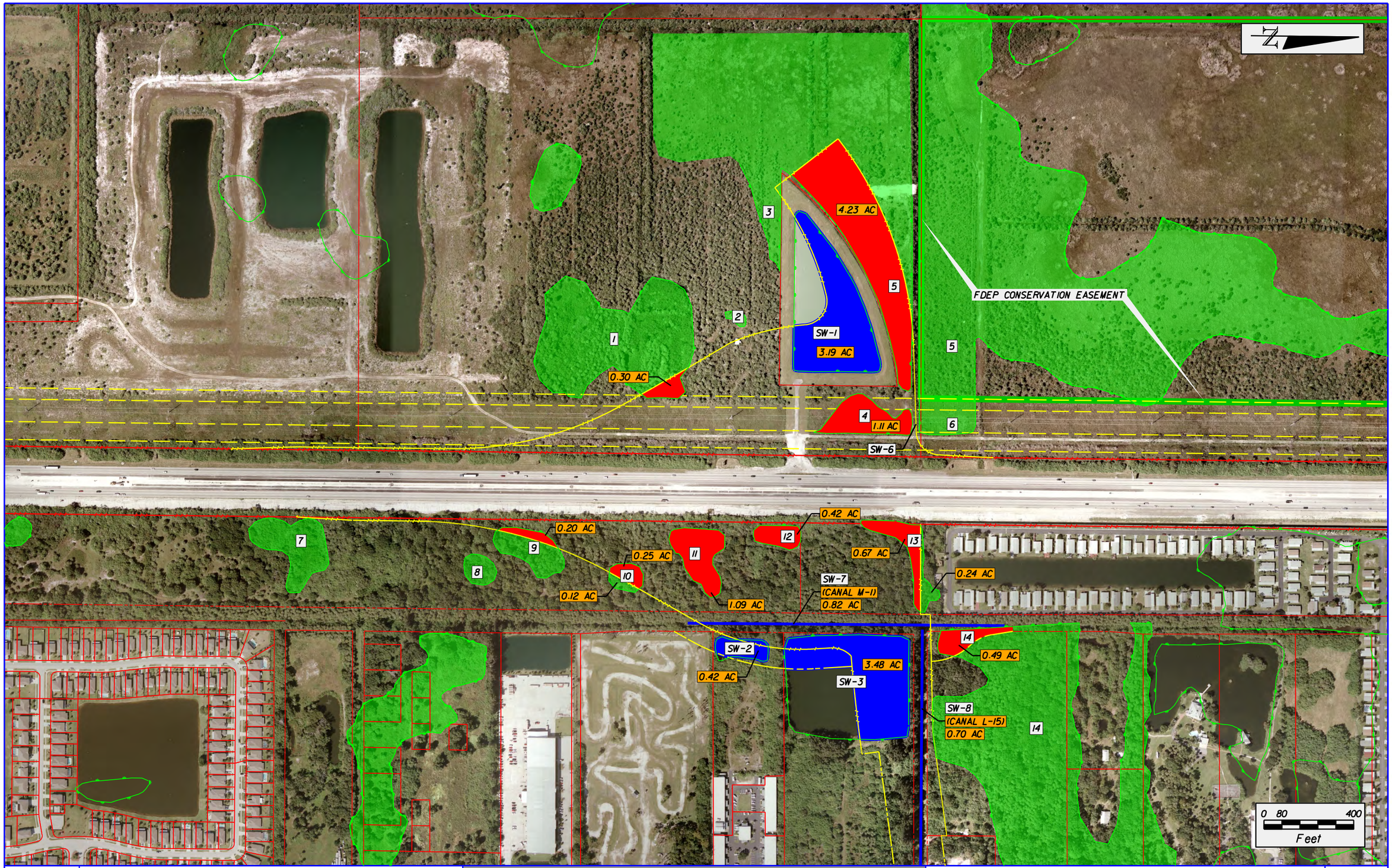
FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
I-95 INTERCHANGE ALTERNATIVE 1-C

FIGURE NO.
5.4.1E



FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
I-95 INTERCHANGE ALTERNATIVE 2-C

FIGURE NO.
5.4.1F

Table 5.4.3: Wetland Impacts – Ellis Road at Interchange Pond Alternatives

Wetland Number	Pond Alternative (Based on Interchange Alternative 1-A)					
	Pond 1A	Pond 1B	Regional Pond A	Regional Pond B	Pond 2A	Pond 2B
	Acres	Acres	Acres	Acres	Acres	Acres
1						
2	0.10					
3	0.06					
4						
5 (1)		5.01				
5 (2)						
6						
7						
8			0.36			
9			0.89			
10			0.22			0.22 (3)
11						(3)
12						(3)
13						
14						
Total	**0.16**	**5.01**	**1.47**	**0.00**	**0.00**	**0.22**

Wetland Number	Pond Alternative (Based on Interchange Alternative 2-A)					
	Pond 1A	Pond 1B	Regional Pond A	Regional Pond B	Pond 2A	Pond 2B
	Acres	Acres	Acres	Acres	Acres	Acres
1						
2	0.10					
3	0.06					
4						
5		5.02				
6						
7						
8			0.36			
9			0.80 (3)			
10			0.12 (3)			0.12 (3)
11						
12						
13						
14						
Total	**0.16**	**5.02**	**1.28**	**0.00**	**0.00**	**0.12**

Table 5.4.3 (Continued) - Wetland Impacts - Ellis Road at Interchange Pond Alternatives

Wetland Number	Preferred Alternative					
	Pond 1A	Pond 1B	Regional Pond A	Regional Pond B	Pond 2A	Pond 2B
	Acres			Acres		
1						
2						
3	0.70 (4)					
4						
5 (1)						
5 (2)						
6						
7						
8						
9						
10						
11						
12						
13						
14						
Total	**0.70**			**0.00**		

(1) Non-Conservation easement portion of Wetland No. 5

(2) Conservation easement portion of Wetland No. 5; The northern portion of W-5 north of SW-6 (Canal L-15 West) is encumbered by a conservation easement through the FDEP as mitigation for a county solid waste project that obtained an ERP. Since the conservation easement for these parcels was part of an ERP through the FDEP, any possible modification of this conservation

(3) Wetland Impacts within interchange footprint are included in the wetland impacts for the interchange alternative.

(4) The acreage for preferred Pond 1A does not match the totals for either Interchange Alternative 1-A or 2-A due to a slight reconfiguration of the Pond 1A for the Preferred Alternative.

Table 5.4.4: Surface Water Impacts - Ellis Road at Interchange Pond Alternatives

Wetland Number	Pond Alternative (Based on Interchange Alternative 1-A)					
	Pond 1A	Pond 1B	Regional Pond A	Regional Pond B	Pond 2A	Pond 2B
	Acres	Acres	Acres	Acres	Acres	Acres
SW-1	3.52					
SW-2				0.06		
SW-3				2.34		
Total	**3.52**	**0.00**	**0.00**	**2.40**	**0.00**	**0.00**

Wetland Number	Pond Alternative (Based on Interchange Alternative 2-A)					
	Pond 1A	Pond 1B	Regional Pond A	Regional Pond B	Pond 2A	Pond 2B
	Acres	Acres	Acres	Acres	Acres	Acres
SW-1	2.18					
SW-2				0.02		
SW-3				2.11		
Total	**2.18**	**0.00**	**0.00**	**2.13**	**0.00**	**0.00**

Wetland Number	Pond Alternative (Based on Preferred Alternative)					
	Pond 1A	Pond 1B	Regional Pond A	Regional Pond B	Pond 2A	Pond 2B
	Acres	Acres	Acres	Acres	Acres	Acres
SW-1	1.37					
SW-2				0.02		
SW-3				2.10		
Total	**1.37**	**0.00**	**0.00**	**2.12**	**0.00**	**0.00**

POND 1B

5.01 AC

3

0.06 AC

POND 1A

2

0.10 AC

SW-1

3.52 AC

1

5

FDEP CONSERVATION EASEMENT

5

4

6

NOTE: WETLAND IMPACTS FOR POND 2B WITHIN THE INTERCHANGE FOOTPRINT ARE NOT SHOWN HERE AND ARE INSTEAD INCLUDED WITH THE WETLAND QUANTITIES FOR INTERCHANGE 1-A.

1.52 AC

7

0.89 AC

9

REGIONAL POND A

8

0.36 AC

0.22 AC

10

POND 2B

11

POND 2B

12

POND 2B

13

14

SW-2

0.06 AC

SW-3

2.34 AC

REGIONAL POND B

14

POND 2A

0 80 400

Feet

FDOT

ELLIS ROAD

PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW

PROPOSED ROW

SW-# / # SURFACE WATER/ WETLAND NUMBER

WETLAND IMPACT

SURFACE WATER IMPACT

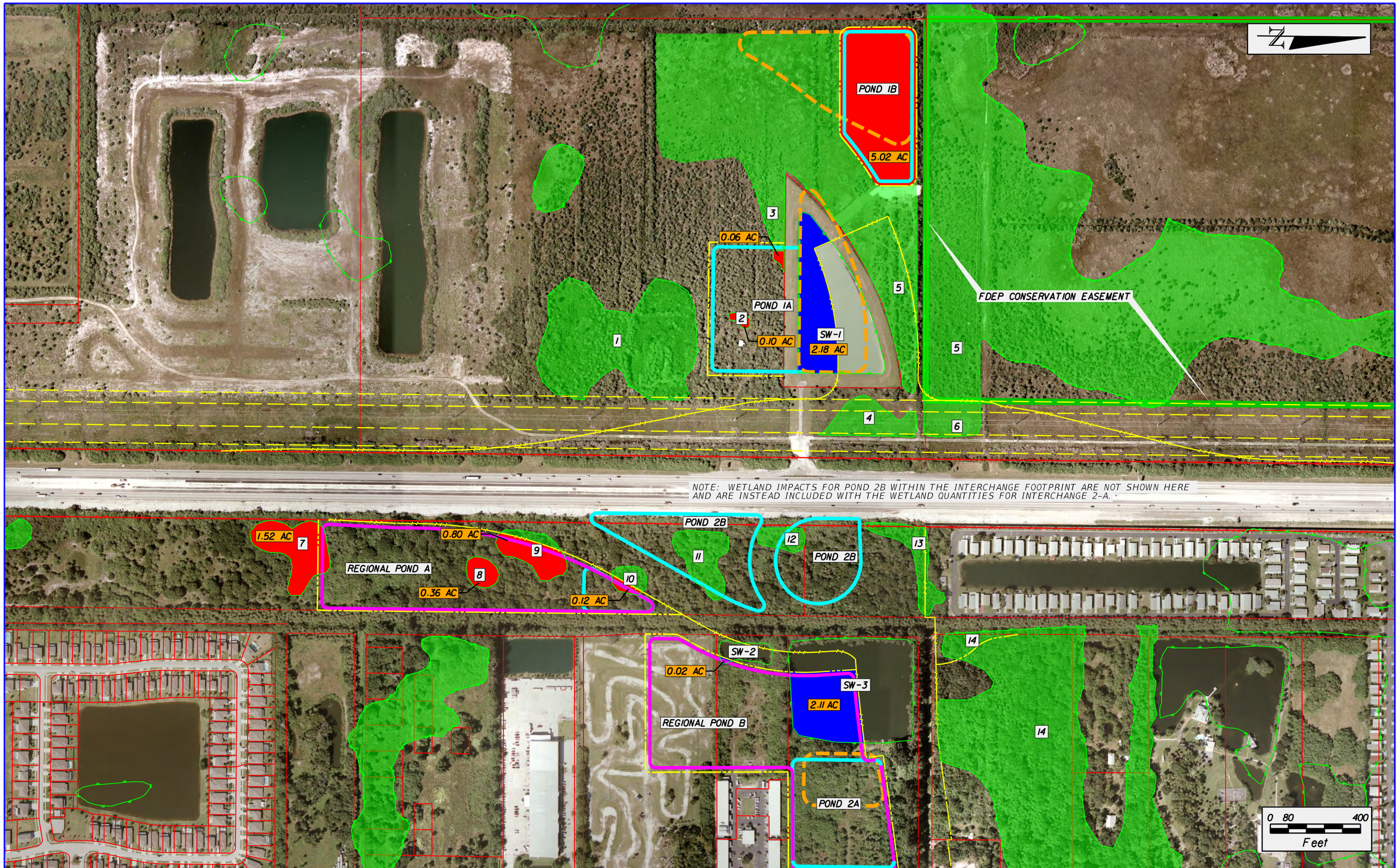
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS

POND ALTERNATIVES - INTERCHANGE 1-A

FIGURE NO.

5.4.2A



FDOT	ELLIS ROAD PROJECT DEVELOPMENT AND ENVIRONMENT STUDY	EXISTING ROW PROPOSED ROW SW-# / # SURFACE WATER/ WETLAND NUMBER WETLAND IMPACT SURFACE WATER IMPACT EXISTING WETLANDS	WETLAND/SURFACE WATER IMPACTS POND ALTERNATIVES - INTERCHANGE 2-A

FIGURE NO.
5.4.2B

Table 5.4.5: Wetland Impacts - Ellis Road Alternatives (John Rodes Boulevard to Wickham Road)

Wetland Number	Alternative						
	Standard Urban 45 mph Hold North	Standard Urban 45 mph Hold South	Standard Urban 45 mph Best Fit	SIS High Speed Urban 50 mph Hold North	SIS High Speed Urban 50 mph Hold South	SIS High Speed Urban 50 mph Best Fit	Preferred Alternative
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16		0.18 (2)	0.18 (2)		0.30 (3)	0.30 (3)	0.18 (2)
17	0.14	0.87 (1)	0.87 (1)	0.14	0.87 (1)	0.87 (1)	0.87 (1)
18	0.19			0.19			
19	0.02			0.14			
Total	**0.35**	**1.05**	**1.05**	**0.47**	**1.17**	**1.17**	**1.05**

(1) Includes isolated wetland remnant less than one half acre not directly impacted by construction but requiring mitigation.

(2) The direct impact of road construction is 0.18 acre. If Pond 3A is selected with this road alternative, then mitigation will be required for the entire one acre wetland.

(3) The direct impact of road construction is 0.30 acre. If Pond 3A selected with this road alternative, then mitigation will be required for the entire one acre wetland.

Table 5.4.6: Surface Water Impacts - Ellis Road Alternatives (John Rodes Boulevard to Wickham Road)

Surface Water Number	Alternative						
	Standard Urban 45 mph Hold North	Standard Urban 45 mph Hold South	Standard Urban 45 mph Best Fit	SIS High Speed Urban 50 mph Hold North	SIS High Speed Urban 50 mph Hold South	SIS High Speed Urban 50 mph Best Fit	Preferred Alternative
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
SW-1							
SW-2							
SW-3							
SW-4	0.17			0.26			
SW-5							
SW-6							
SW-7							
SW-8	2.86	2.86	2.86	2.86	2.86	2.86	2.86
SW-9	0.06	0.06	0.06	0.08	0.08	0.08	0.06
Total	**3.09**	**2.92**	**2.92**	**3.20**	**2.94**	**2.94**	**2.92**

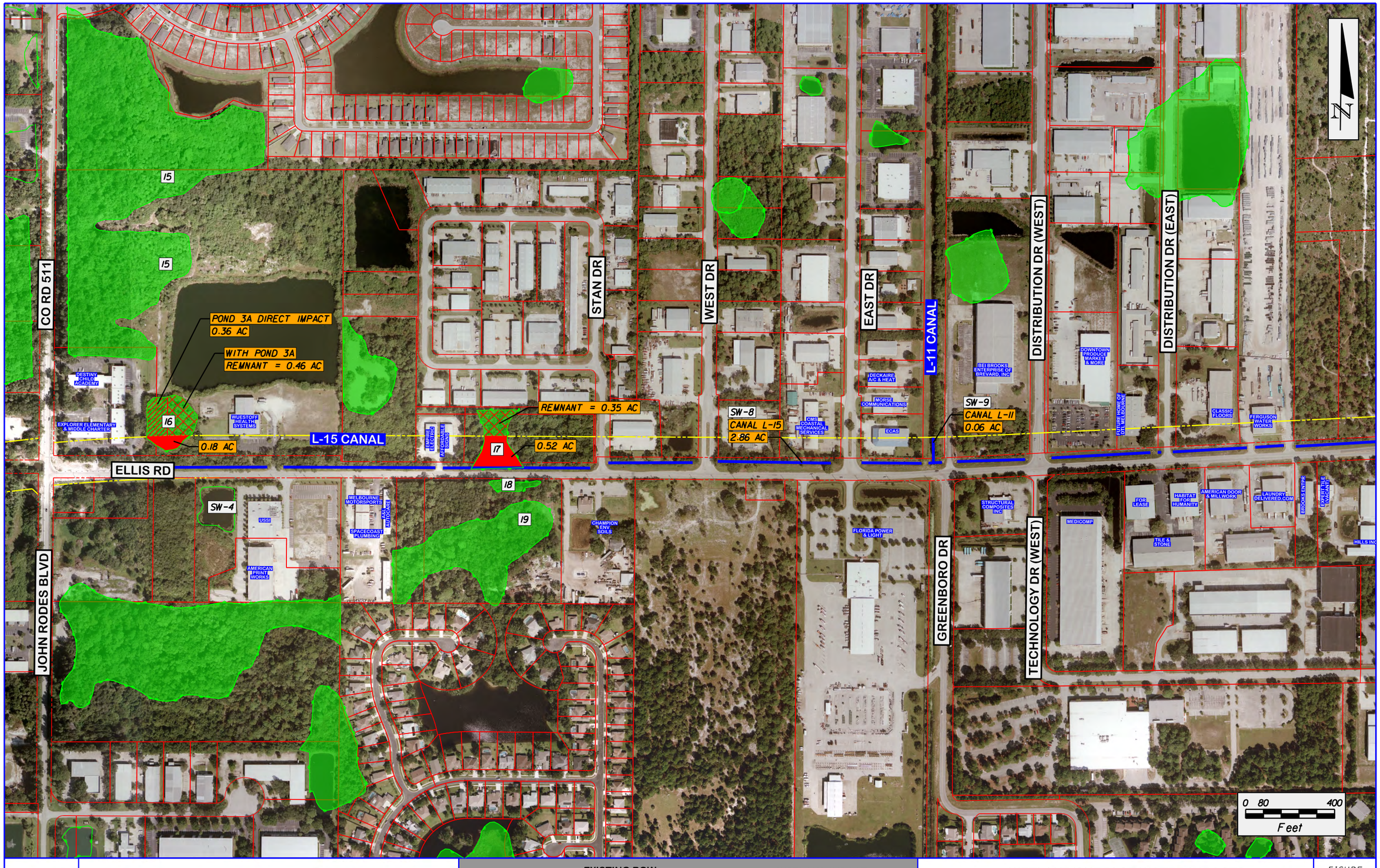
FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
STANDARD URBAN 45 mph
HOLD NORTH RIGHT-OF-WAY

FIGURE NO.
5.4.3A



FDOT	ELLIS ROAD PROJECT DEVELOPMENT AND ENVIRONMENT STUDY	EXISTING ROW PROPOSED ROW SW-# / # SURFACE WATER/ WETLAND NUMBER WETLAND IMPACT SURFACE WATER IMPACT EXISTING WETLANDS	WETLAND/SURFACE WATER IMPACTS STANDARD URBAN 45 mph HOLD SOUTH RIGHT-OF-WAY	FIGURE NO. 5.4.3B

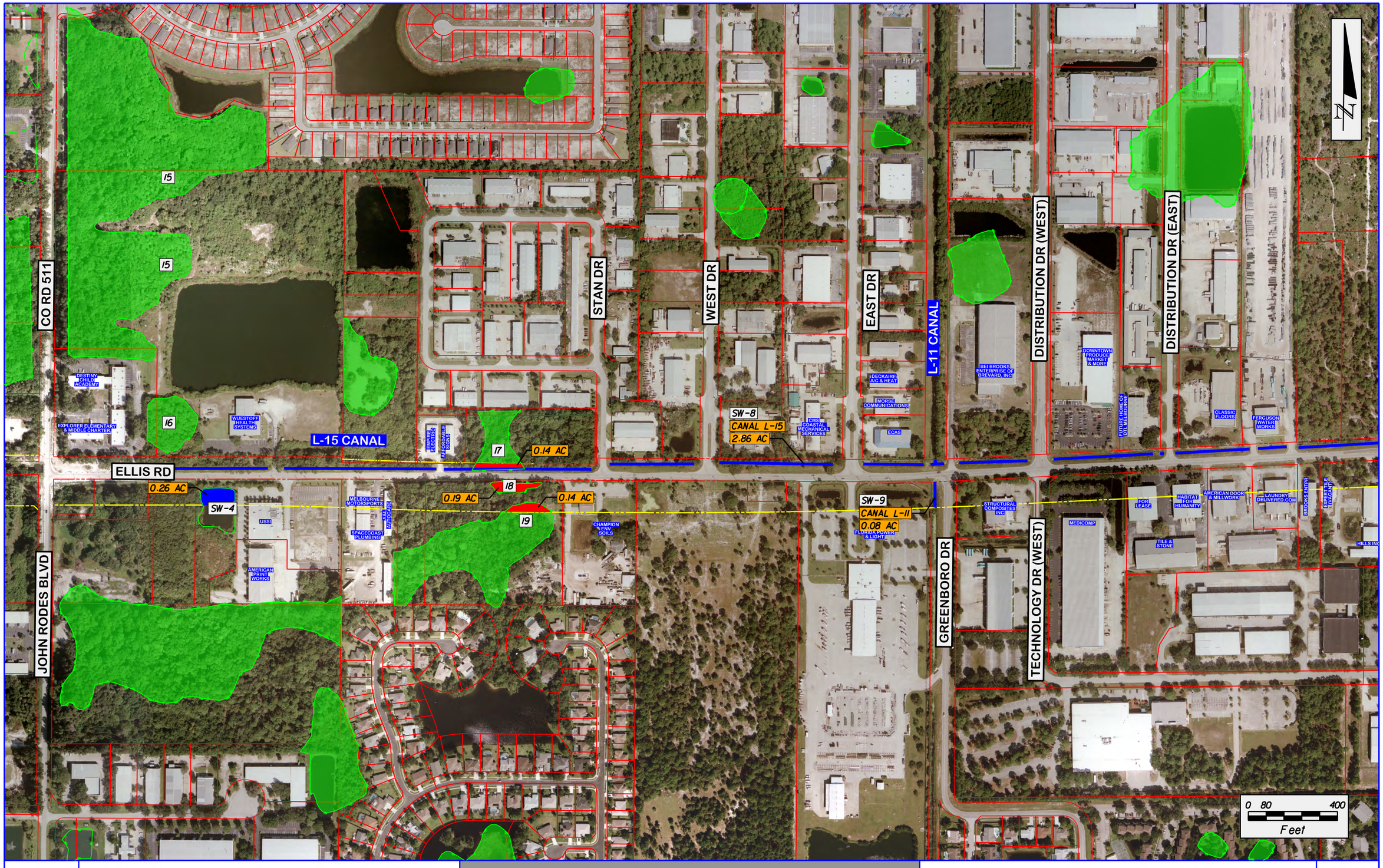
FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
STANDARD URBAN 45 mph
BEST FIT

FIGURE NO.
5.4.3C



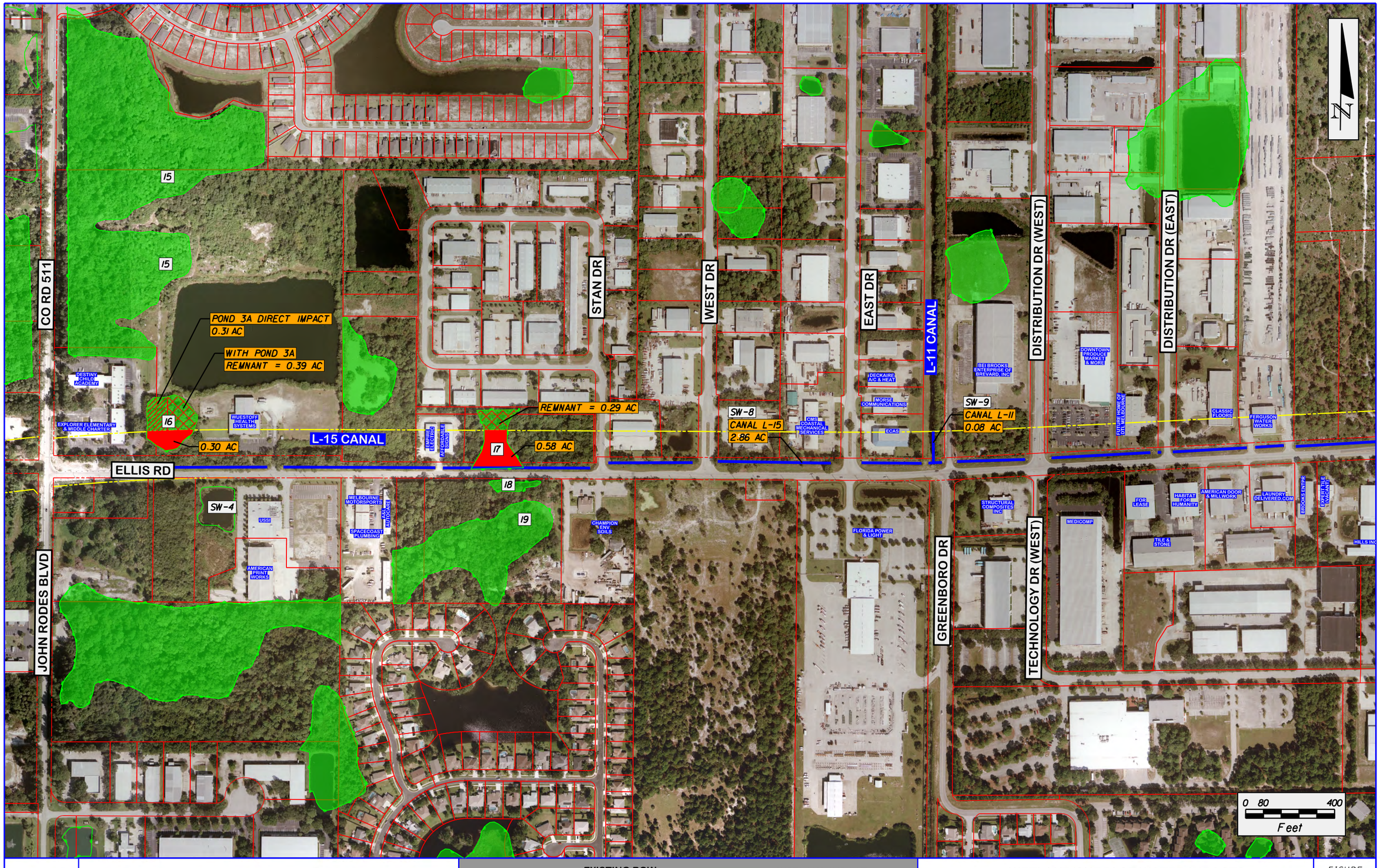
FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
SIS HIGH SPEED URBAN 50 mph
HOLD NORTH RIGHT-OF-WAY

FIGURE NO.
5.4.3D



FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
SIS HIGH SPEED URBAN 50 mph
HOLD SOUTH RIGHT-OF-WAY

FIGURE NO.
5.4.3E

FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
SIS HIGH SPEED URBAN 50 mph
BEST FIT

FIGURE NO.
5.4.3F

Table 5.4.7: Wetland Impacts - Ellis Road Pond Alternatives (John Rodes Boulevard to Wickham Road)

Wetland Number	Pond Alternative						
	Pond Site 3A	Pond Site 3B	Pond Site 4A	Pond Site 4B	Pond Site 5A	Pond Site 5B	Preferred Alternative
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15	1.05 (1)						
16	0.31 (2)						
17							
18							
19							
20							
Total	**1.36**	**0**	**0**	**0**	**0**	**0**	**0**

(1) Includes isolated wetland remnant less than one half acre not directly impacted by construction but requiring mitigation.

(2) The direct impact of the pond construction is 0.31 acre. If contructed in conjunction with either of the hold north road alternatives, then impact requiring mitigation equals 0.31 acre. All other road alternatives utilizing this pond will require mitigation for the entire one acre wetland.

Note: The preferred pond configuration is based on attenuation-only ponds between John Rodes Boulevard and Wickham Road.

Table 5.4.8: Surface Water Impacts - Ellis Road Pond Alternatives (John Rodes Boulevard to Wickham Road)

Surface Water Number	Alternative						
	Pond Site 3A	Pond Site 3B	Pond Site 4A	Pond Site 4B	Pond Site 5A	Pond Site 5B	Preferred Alternative
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
SW-1							
SW-2							
SW-3							
SW-4							
SW-5				2.16			2.16
SW-6							
SW-7							
SW-8							
SW-9							
Total	**0**	**0**	**0**	**2.16**	**0**	**0**	**2.16**

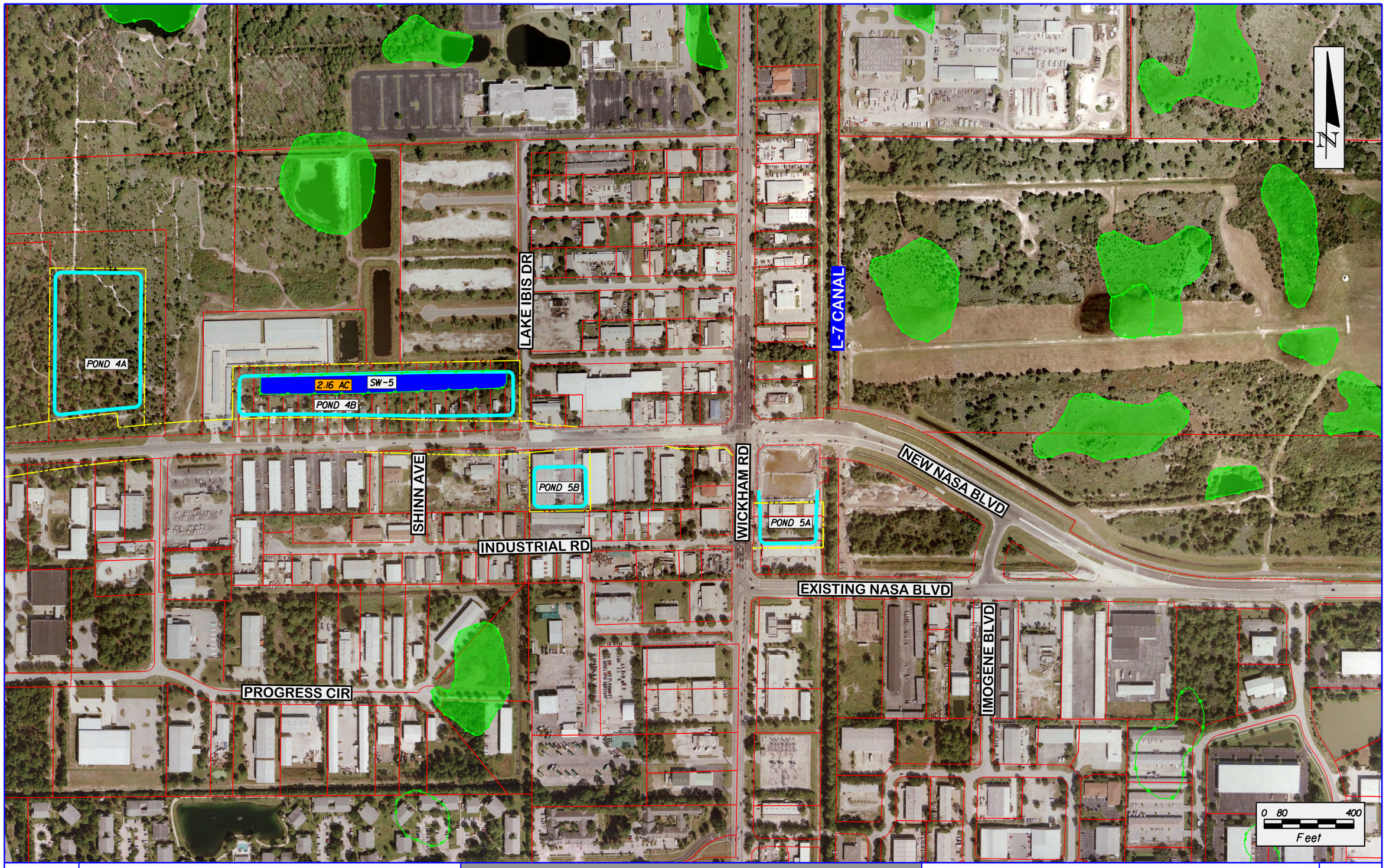
FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
POND ALTERNATIVES - ELLIS ROAD

FIGURE NO.
5.4.4A



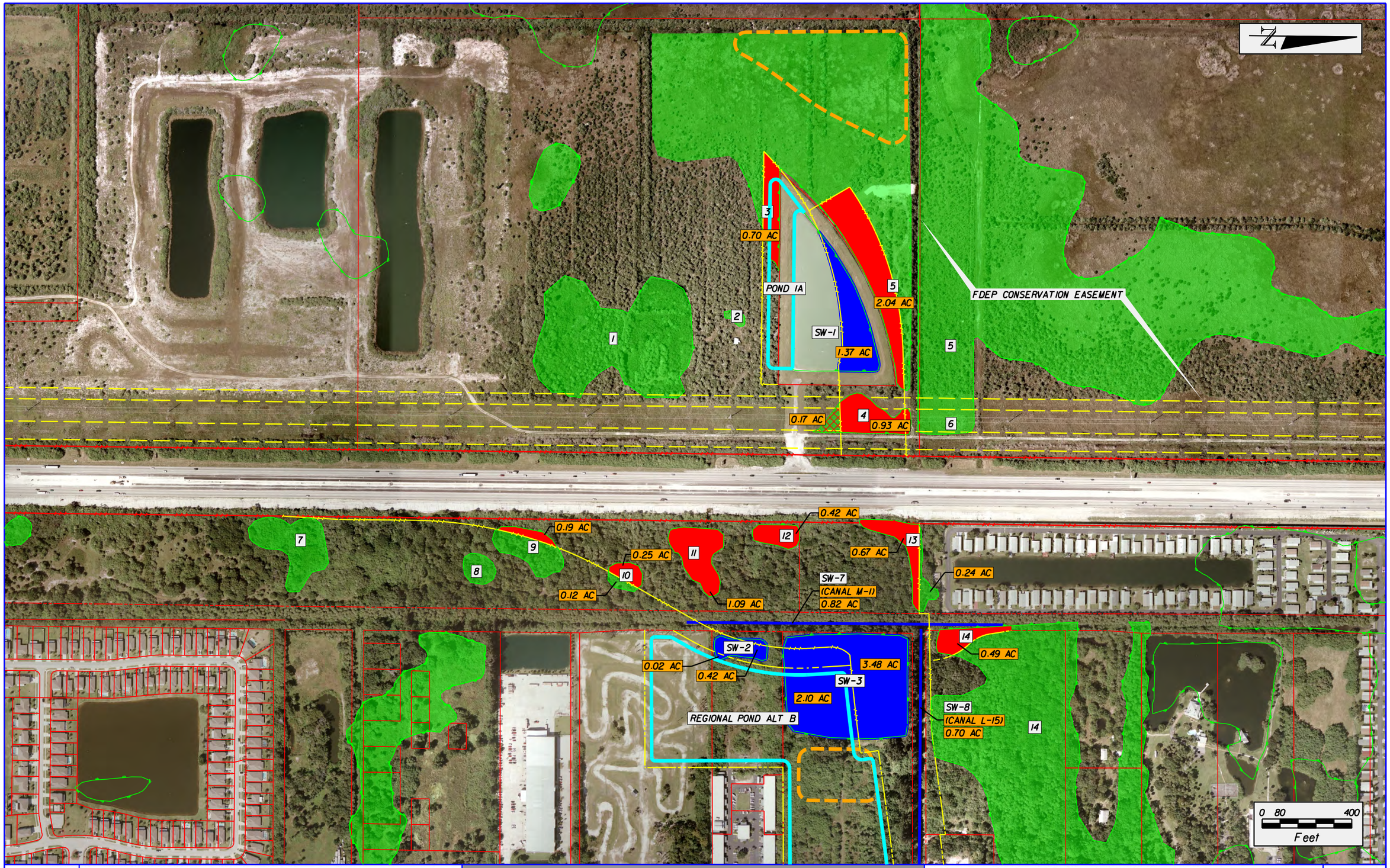
FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / #
SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
POND ALTERNATIVES - ELLIS ROAD

FIGURE NO.
5.4.4B



FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
I-95 INTERCHANGE
PREFERRED ALTERNATIVE

FIGURE NO.
5.4.5A

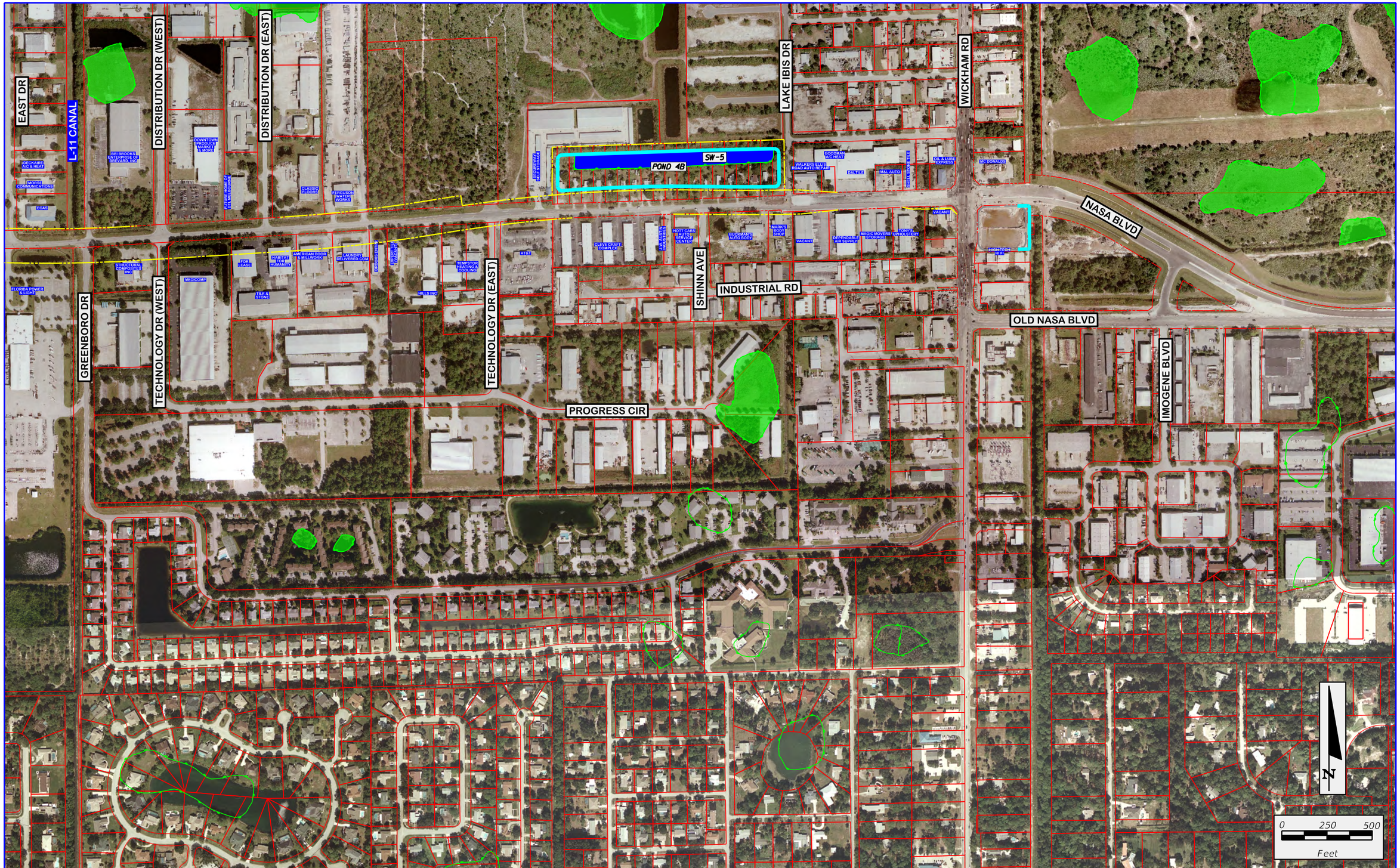
FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW
PROPOSED ROW
SW-# / # SURFACE WATER/ WETLAND NUMBER
WETLAND IMPACT
SURFACE WATER IMPACT
EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
PREFERRED ALTERNATIVE

FIGURE NO.
5.4.5B



FDOT

ELLIS ROAD
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY

EXISTING ROW	WETLAND IMPACT
PROPOSED ROW	SURFACE WATER IMPACT
SW-# / # SURFACE WATER/ WETLAND NUMBER	EXISTING WETLANDS

WETLAND/SURFACE WATER IMPACTS
PREFERRED ALTERNATIVE

FIGURE NO.
5.4.5C

5.5 Wetland Mitigation

Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S. to satisfy all mitigation requirements of Part IV. Chapter 373, F.S. and 33 U.S.C. s.1344.

If the project cannot be mitigated through S. 373.4137 F.S., then FDOT will develop a project-specific conceptual mitigation plan. Pursuant to USACE, SJRWMD, and FDEP policies, compensatory mitigation for unavoidable wetland impacts can be in the form of upland and/or wetland preservation, wetland restoration, wetland enhancement, wetland creation, or a combination of these methods. Additionally, if the project is located within the service area of a permitted wetland mitigation bank, then the purchase of credits from the bank may be acceptable.

In some cases, pursuant to Chapter 373.4137 F.S. (i.e., the Senate Bill), compensatory mitigation of wetland impacts can be implemented by the SJRWMD through funding supplied by FDOT. Mitigation for upland cut ditches is not required; however, ditches which overlap natural wetland areas are considered part of the adjacent wetland system and generally require compensatory mitigation.

Drainage basins have been established within the SJRWMD boundary. Stormwater treatment and attenuation criteria need to be met for any construction within these basins. The drainage basins are also utilized to determine the appropriateness of any proposed compensatory wetland mitigation plan. Generally speaking, mitigation within the same drainage basin as the impacted wetlands is preferred. The Ellis Road extension is located within the Southern St. Johns River (# 20) and the Central Indian River Lagoon (# 22) drainage basins.

The project site is located within the service area of three permitted mitigation banks -the Chown Gregory Wilcox (CGW) Mitigation Bank, the East Central Florida Regional Mitigation Bank and the Mary A Ranch Mitigation Bank. The CCW Mitigation Bank can only be utilized to compensate for salt water wetland impacts; therefore it is not a viable

option for this project. According to the SJRWMD website, the East Central Florida Regional Mitigation Bank currently (August 2012) does not have credits available for purchase. The Mary A Ranch bank credits were established utilizing UMAM for federally-required mitigation and by the ratio method for state purposes. The UMAM and Ratio analyses of the impacted wetlands will yield the number of credits that will need to be purchased to offset the loss of wetland functions. The Mary A Ranch Mitigation Bank currently has credits available for purchase; however, the purchase of these credits is only acceptable for impacts to herbaceous wetlands. Forested wetland impacts will need to be mitigated at another permitted bank or through a site specific plan utilizing the methods previously described. No permitted mitigation banks with credits available for palustrine forested wetland impacts within Basins # 20 and # 22 are currently operational. The Tosohatchee State Reserve, an FDOT-exclusive mitigation bank, has forested wetland mitigation credits available for purchase; however, the bank is located in a different basin from the project impacts and the project site is also outside the service area of this bank., therefore, the regulatory agencies would consider the use of this bank to have a cumulative impact upon the wetlands within the project basin. Additional credits would need to be purchased to compensate for the cumulative impacts. Mitigation located within the project impact basins is more likely to receive a favorable response from the regulatory agencies. The specifics of a conceptual mitigation plan, if required, will be developed during the permitting phase of the project.

The northern portion of W-5 north of SW-6 (Canal L-15 West) is encumbered by a conservation easement through the FDEP as mitigation for a county solid waste project that obtained an ERP. It is anticipated that the regulatory agencies will highly scrutinize any encroachments upon the existing conservation easement west of I-95 (W-5), since undeveloped land currently exists adjacent to the proposed interchange. Interchange Alternatives 1-A, 2-A, 1-B, 2-B and 1-C will impact this conservation easement, but the preferred alternative and none of the pond alternatives will impact it.

This conservation easement was established as mitigation for wetland impacts associated with the construction of a sewage treatment plant. Since the subject conservation easement

was part of an ERP through the FDEP, any modification of this conservation easement must be coordinated through the FDEP. The original FDEP permit would need to be modified. Essentially a new mitigation plan would be required to address the previously permitted impacts of the sewage treatment plant as well as the new impacts associated with the roadway construction. Any change to state-approved conservation easements also requires the endorsement of the Acquisition and Restoration Council (ARC). ARC consists of a ten member group with representatives from four state agencies, four appointees of the Governor, one appointee from Florida Fish and Wildlife Conservation Commission (FFWCC) and one appointee by the Commissioner of the Florida Department of Agriculture and Consumer Services (FDACS). Modifications need to be submitted to this body at least thirty days in advance of a scheduled meeting in order to be placed on the agenda. It is highly likely that ARC would require property replacement of an appropriate ecological value for impacts to conservation easements as opposed to a credit purchase from a wetland mitigation bank.

5.6 Permitting Requirements and Coordination

Preliminary coordination with the relevant regulatory agencies, including USACE, USFWS, National Marine Fisheries Service (NMFS), U.S. Environmental Protection Agency (USEPA), SJRWMD, FFWCC and FDEP was accomplished through the Environmental Screening Tool (EST) component of Efficient Transportation Decision Making (ETDM) Process. In general, the comments received consisted of statements regarding the need for wetland delineation and functional value assessment, the need to acquire the appropriate permits, the need for avoidance and minimization of wetlands impacts and for the compensatory mitigation of unavoidable impacts, and the need for maintenance of existing water quality. The comments received assigned the degree of impact to wetlands ranging from minimal to moderate.

Copies of the ETDM agency comments are included in the ETDM Summary Report contained within Appendix B. Coordination with the permitting agencies will continue throughout the PD&E Study phase, the final design and permitting phases, and the construction phase of the project.

It is anticipated that the following permits will be required:

- Environmental Resource Permit (ERP) – SJRWMD;
- Dredge and Fill Permit – USACE; and,
- National Pollutant Discharge Elimination System Permit – FDEP (USEPA).

5.7 Conclusions (Wetlands)

During the course of the PD&E Study, assessments of wetland and environmental resources within the project corridor have been conducted. The primary goal of these tasks was to determine the extent and characteristics of the wetlands located within and adjacent to the right-of-way. A total of nineteen wetland systems have been identified, classified, and characterized within or adjacent to the project corridor. All of the wetland systems found within the project corridor are currently impacted by their close proximity to heavily travelled roadways, by extensive historic drainage projects, and by the commercial, institutional or residential development surrounding them. Surface waters (i.e., ditches and canals) will also be impacted by the proposed roadway design.

In compliance with Presidential Executive Order 11990, consideration was given to protect wetland resources. However, given that the project has to occur adjacent to the existing right-of-way and the stormwater regulations must be met to receive state water quality certification, there is no viable option that would allow for the avoidance of the wetland systems within the project corridor. Best management practices will be used to reduce any indirect impacts to adjacent systems that fall outside of the project corridor. Compensatory mitigation will be offered for all unavoidable wetland impacts and will be subject to approval by SJRWMD and USACE prior to final authorization of the project.

The total number of wetland impacts of the Preferred Alternative (for the entire project) is 8.37 acres. The Preferred Alternative will directly impact 4.17 of acres of forested wetlands and 4.20 acres of wet prairie/marsh. Additionally, 13.20 acres of surface waters will be directly impacted. The Preferred Alternative also avoids any direct impacts to the FDEP Conservation Easement west of I-95.

6.0 Endangered Species Biological Assessment

6.1 Methodology

The project was evaluated for potential impacts to threatened and endangered plant and animal species in accordance with 50 CFR 402.12, Section 7(c) of the Endangered Species Act of 1973 as amended by Rules 39-25.002, 39-27.002 and 39-27.011 of the Wildlife Code of the State of Florida (Chapter 39, FAC) and Part 2, Chapter 27 of the FDOT PD&E Manual.

A literature review and computer search of the USFWS and FFWCC databases were used to obtain existing information concerning listed species within the study area. This includes a review of the FFWCC's *Florida's Endangered Species, Threatened Species and Species of Special Concern Official Lists* (October 2011), the FFWCC's Eagle Nest Locator web site, the FFWCC's *Florida's Breeding Bird Atlas: A Collaborative Study of Florida's Birdlife (January 6, 2003)*, the USFWS's Florida Species Accounts webpage and the Florida Natural Areas Inventory (FNAI) Biodiversity Matrix database of listed species within Brevard County at and in the vicinity of the project site. Table 6.2.1 contains a compilation of state and federally listed species potentially occurring within the project area. Cursory surveys of the project corridor were conducted in August 2010 and April/May 2011.

This biological assessment examines species that are listed as endangered, threatened, candidate, proposed endangered, or proposed threatened by the USFWS and NMFS pursuant to regulation 50 CFR 17.11-12. State listed species were also considered during this process and will be an integral part of the final permitting process.

6.2 Results

The project area is not located within any area designated as Critical Habitat by USFWS. However, the project area is situated within USFWS-designated Consultation Areas for the Florida scrub-jay, Audubon's caracara, snail kite and red-cockaded woodpecker. No endangered or threatened plant species listed by both USFWS and the FDACS are known to occur at the project area or were observed during the site surveys. The following is a

discussion of the protected species that could potentially occur within the project corridor based on the literature review and cursory site surveys.

6.2.1 Federally Protected Species

American alligator (Alligator mississippiensis)

The American alligator is a federally listed species (Threatened) due to the fact that it is easily confused with the American crocodile. However, the American crocodiles range does not include Brevard County and therefore there is no possibility of confusing these two species within the project area. The American alligator is listed by FFWCC as Federally-designated Threatened (Similarity of Appearance). The proposed project is anticipated to have "no effect" on the American alligator.

Eastern indigo snake (Drymarchon corais couperi).

The eastern indigo snake is a large non-venomous snake, which occurs throughout Florida and the coastal plain of Georgia. Prime habitat is high, dry, well-drained sandy soils. The species is often found in association with the gopher tortoise. The gopher tortoise burrow is commonly used as a den and for egg laying. Eastern indigo snakes are also found in swamps and flatwoods. The eastern indigo snake is listed as Threatened by USFWS and as Federally-designated Threatened by the FFWCC.

Suitable habitat for the species exists within the project corridor. A gopher tortoise burrow was discovered at Pond Site 4A, a pond site that has been dropped from further consideration. Therefore, no gopher tortoise burrows were discovered on the proposed road right-of-way. No eastern indigo snakes were observed during the survey. No documented occurrences of the eastern indigo snake along the project corridor were found in the FNAI database; however, the species is listed as potentially occurring in the project vicinity. Any gopher tortoises and commensal organisms will be relocated from the project site, per FFWCC regulations, prior to construction. The U.S. Fish and Wildlife Service Standard Protection Measures for the eastern Indigo Snake (included in Appendix D), which specify education of the construction contractor concerning avoidance of eastern indigo snakes and post-construction reporting, will be implemented during the construction phase.

In February 2013, FDOT submitted the January 2013 WEBAR with the above information to USFWS requesting a "*may affect, not likely to adversely affect*" (MANLAA) determination for the Eastern indigo snake. In May 2013, USFWS responded by informing the FDOT that without additional information, the agency could not concur with that determination. In January 2014, FDOT sent another request to USFWS asking for MANLAA concurrence based on the commitment by FDOT to complete the impact assessment during a future project phase. USFWS responded in a letter dated February 25, 2014 (see Appendix C, Agency Coordination) stating that they still would require additional information before they could agree on an effects determination. To satisfy this request, FDOT commissioned a gopher tortoise survey and habitat assessment for the project area.

In March 2015, a habitat assessment and gopher tortoise survey were conducted to assist in determining the effects of the project on the eastern indigo snake. The gopher tortoise survey covered 95% of the proposed right-of-way and only one potentially occupied gopher tortoise burrow was observed. The habitat assessment identified less than 1 acre of xeric habitat that is to be impacted by the project. Using this information along with the *USFWS Eastern Indigo Snake Programmatic Effect Determination Key (Key)*, the project was given a "*not likely to adversely affect"* determination for the Eastern indigo snake. A letter outlining this information as it relates to the Key and requesting concurrence with the determination was submitted to USFWS on May 27, 2015. FDOT received concurrence with this effects determination on July 29, 2015 (see Appendix C, Agency Coordination).

Florida scrub-jay (Aphelocoma coerulescens)

The Florida scrub-jay is listed as Threatened by USFWS and as Federally-designated Threatened by FFWCC. The project corridor is located within the USFWS-designated Consultation Area for the species. Florida scrub-jays have very specific habitat requirements. Optimal Florida scrub-jay habitat consists of low growing, scattered scrub canopy species with patches of bare sandy ground, such as those found in sand pine scrub, xeric oak scrub, scrubby flatwoods, and scrubby coastal strand habitats. A small amount of marginally suitable habitat occurs along the project corridor at Pond Site 4A. A Florida

scrub-jay vocalization tape was played at Pond Site 4A and vicinity during the August 2010 and May 2011 project corridor surveys. No Florida scrub-jays or evidence of their presence was observed during the site surveys. Florida scrub-jays have been documented at the Melbourne airport approximately one mile east of Pond Site 4A. While Pond Site 4A provides marginally suitable habitat, it is separated from the previously documented population by a heavily travelled roadway (Wickham Road) and commercially developed properties; therefore, the species is not likely to utilize the project area.

In February 2013, FDOT submitted the January 2013 WEBAR with these findings to USFWS requesting a "*may affect, not likely to adversely affect*" determination for the Florida scrub-jay. In May 2013, USFWS responded informing the FDOT that without a formal survey they could not concur with that determination. As a result, a formal Florida scrub-jay survey was initiated in October 2013.

In October 2013, the project area was again evaluated for potential Florida scrub-jay habitat. During the evaluation, only the one proposed pond site, Pond 4A, was determined to contain marginal scrub habitat that had the potential to support Florida scrub-jays. Subsequently, a Florida scrub-jay survey was performed within this area. During this survey, a single Florida scrub-jay was observed during a single survey event. In November 2013, a report was submitted to the FDOT containing the survey results. Subsequently, in December 2013 the FDOT submitted the report to the USFWS with the request of concurrence with a MANLAA determination. In an email dated January 8, 2014, the USFWS requested additional information regarding the reported Florida scrub-jay and habitat. The FDOT provided that information in a return email dated January 9, 2014. The USFWS then responded on January 21, 2014, that they did not concur with a MANLAA determination and that a spring survey would be recommended to further investigate the occurrence of Florida scrub-jays within Pond 4A, if that pond site was still to be used. The USFWS responded formally in a letter dated February 25, 2014, stating their recommendations (see Appendix C, Agency Coordination).

Pond 4A has been dropped from further consideration and is not included in the Preferred Alternative. However, a portion of this property adjacent to the right-of-way will still be acquired for the relocation of the L-15 Canal. In March 2015, FDOT requested that a second Florida scrub-jay survey be conducted to evaluate that area for any potential impacts to this species. No Florida scrub-jays were observed or heard during the March 2015 survey event. Due to the marginal habitat, the elimination of Pond 4A from the project, the small area of impact, and the absence of scrub-jays during the March 2015 survey, the project was given a "*may affect, not likely to adversely affect"* determination for the Florida scrub-jay. The Florida scrub-jay report along with the request for concurrence with this determination was submitted to USFWS on May 27, 2015. FDOT received concurrence with this effects determination on July 29, 2015 (see Appendix C, Agency Coordination).

Everglade snail kite (Rostrhamus sociabilis plumbeus)

The Everglade snail kite is listed as Endangered by USFWS and Federally-designated Endangered by FFWCC. The project site is located within a USFWS-designated Consultation Area for the species. The Everglade snail kite is a medium-sized raptor which feeds almost exclusively on apple snails. Large expanses of freshwater marshes with open water areas are the optimal habitat for the species. Nesting is primarily in low trees or shrubs, but non-woody emergent vegetation may also be utilized.

Marginal habitat for the species is located within the project corridor west of I-95. No Everglade snail kites or their nests were observed during the recent site surveys. No documented occurrences of the Everglade snail kite along the project corridor were found in the FNAI database. The species is not expected to utilize the project corridor. The proposed project is anticipated to have "no effect" on the Everglade snail kite. FDOT received concurrence with this determination in a letter from USFWS dated February 25, 2014. (see Appendix C, Agency Coordination).

Wood stork (Mycteria americana)

Wood storks are large, colonial-nesting wading birds. Primary nesting sites are cypress or mangrove swamps with foraging habitat consisting of marshes, ditches, and flooded

pasture. Small fish are the main dietary item. The wood stork is listed as Threatened by the USFWS and as Federally-designated Threatened by the FFWCC. The USFWS has recently implemented changes to its wood stork colony protection guidelines. These new guidelines state that impacts to appropriate wetland systems within a 15-mile radius of a colony may directly affect colony productivity. The radius area, known as the Core Foraging Area (CFA), is defined as the distance storks may fly from the colony to capture prey for their young.

A search of the USFWS's database indicates no wood stork rookeries within the project corridor with the nearest nest site being located approximately 3.75 miles to the west near Lake Washington. However, the project is located within the CFA of six rookeries. Marginal foraging and nesting habitat exists at the project corridor. A lone wood stork was observed foraging in a ditch adjacent to Ellis Road in the central part of the project corridor. No nests were observed during the site surveys. The U.S. Fish and Wildlife Service *Wood Stork Effect Determination Key* was utilized to assess the impact of the project on the wood stork or its habitat. The ditches, shallow littoral zones of the ponds and the marshes of the project currently provide suitable foraging habitat for the species. All of these habitat types will remain after construction, but unavoidable wetland and surface water impacts in excess of one half acre will occur within multiple CFAs as a result of the proposed construction. Additionally, the appropriate compensatory mitigation will be provided for all unavoidable wetland impacts within a USFWS-approved mitigation bank. As a result of the previously described actions, a finding of "may affect, not likely to adversely affect" is appropriate for the wood stork. FDOT requested concurrence with this determination in a letter to USFWS dated October 1, 2015. FDOT received concurrence with this determination in a letter from USFWS dated October 9, 2015. (see Appendix C, Agency Coordination).

Red-cockaded woodpecker (Picoides borealis)

The red-cockaded woodpecker (RCW) is classified as Endangered by the USFWS and as Federally-designated Endangered by the FFWCC. The species is a small woodpecker that utilizes open stands of old growth southern pines for nesting. Longleaf pine (Pinus palustris) is the preferred tree species for nesting; however, other pine species are acceptable. Forests with a significant hardwood understory are not utilized. Nest cavities are excavated in live trees that have red-heart disease. Active nest cavities constantly exude sap that serves as a defense mechanism against predators. Optimal foraging habitat consists of pine stands 60 years or older with tree diameters a minimum of ten inches.

No suitable nesting or foraging habitat is present within the project corridor. The USFWS Red-cockaded Woodpecker South Florida Survey Protocol (USFWS 2003) states that "if no suitable foraging habitat is present within the project area (that is, no pines 60 years or older will be impacted), then further evaluation is unnecessary and the red-cockaded woodpecker can be presumed absent." Additionally, the USFWS ETAT reviewer did not identify this species as a species of concern in regards to this project. No RCWs were observed at the project corridor or on adjacent properties during the 2010 and 2011 surveys. No occurrences of the RCWs along the project corridor were found in the FNAI database. The closest documented occurrence of this species is approximately 5 miles north of the project corridor. The species is not expected to utilize the project corridor. Due to the lack of appropriate habitat, no documented occurrences, and direction provided in the survey protocol, this project was deemed to have a "no effect" determination for the red-cockaded woodpecker.

Audubon's crested caracara (Polyborus plancus audubonii)

The Audubon's crested caracara is classified as Threatened by the USFWS and Federally designated Threatened by the FFWCC. The species is a large raptor that inhabits open areas, such as pasture and dry prairie, with cabbage palm, cabbage palm/live oak hammocks, and shallow ponds and sloughs. Cabbage palms are the preferred nesting trees. The Audubon's crested caracara exhibits an opportunistic feeding behavior. The diet consists of carrion, as well as a wide assortment of invertebrates and small vertebrates.

Suitable nesting and foraging habitat for the Audubon's crested caracara exists west of I-95 in the project corridor. No Audubon's crested caracaras or evidence of their presence was observed during the 2010 and 2011 site surveys. No documented occurrences of the Audubon's crested caracara along the project corridor were found in the FNAI database. A minor amount of potential nesting habitat may be eliminated by the Recommended Alternative.

In February 2013, FDOT submitted the January 2013 WEBAR with these findings to USFWS requesting a "may affect, not likely to adversely affect" determination for the Audubon's crested caracara. In May 2013, USFWS responded informing the FDOT that without a formal survey they could not concur with that determination. As a result, consultation regarding a survey for the Audubon's crested caracara was initiated with USFWS.

In January 2014, FDOT's consultant met with USFWS in regards to performing the survey. A consensus resulted at the meeting that suitable habitat exists within the 1500 meter buffer from the study area to the west of I-95, but that the survey should be completed at a later date. FDOT then submitted a letter, dated January 31, 2014, to USFWS asking for MANLAA concurrence based on the commitment by FDOT to complete the surveys during a future project phase. USFWS responded in a letter dated February 25, 2014 (see Appendix C, Agency Coordination) that they could not provide that concurrence without the results of a survey. FDOT then commissioned a survey to be conducted during the 2015 Audubon's crested caracara survey season.

In December 2014, FDOT's consultant met with USFWS again to obtain additional guidance before commencement of the survey and subsequently received concurrence from USFWS regarding survey design on January 5, 2015. The survey was performed between January 2015 and April 2015. During the survey three caracara sightings were recorded, but no evidence of nesting was observed. The lack of nest trees and the failure of observed caracaras to display territorial behavior or nesting behavior indicates those caracaras are

not using the proposed project corridor for nesting. Additionally, only during one of the three caracara observations was scouting or foraging behavior noted and this occurred on April 30, 2015. Since this scouting or foraging behavior was only witnessed at the termination of the nesting season and with the absence of observed nesting behavior within the survey area, the project was given a *"may affect, not likely to adversely affect"* determination for the Audubon's crested caracara. The Audubon's crested caracara report along with the request for concurrence with this determination was submitted to USFWS on May 27, 2015. FDOT received concurrence with this effects determination on July 29, 2015 (see Appendix C, Agency Coordination).

6.2.2 Non-Listed, Federally Protected Species

Bald eagle (Haliaeetus leucocephalus)

Although the bald eagle is not protected under state or federal threatened or endangered species regulations, they are protected under two other major federal laws: the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Protection zones with associated development restrictions are still maintained around active nests.

The bald eagle generally nests in large live trees near open bodies of water which provide optimum foraging habitat. Fish are the primary food source; however, birds, small mammals, and carrion are also consumed.

No bald eagles or their nests were observed at or in the immediate vicinity of the Ellis Road corridor at the time of the field review. A search of the FFWCC's Eagle Nest Locator database (2014) indicated that two bald eagle's nests are located within one mile of the project area. One is located approximately 0.8 miles to the southeast (ID BE058) and one located approximately one mile to the northeast (ID BE053) of the eastern terminus of the project area. In January 2015, an active bald eagle's nest was observed approximately 2,000 feet northwest of the western portion of the Preferred Alternative. The observed nest has not been identified by FFWCC as of 2014. If an active bald eagle nest is identified within the construction area during the final design and permitting phases, mitigation measures will be implemented to avoid disturbing the species. Mitigation measures may include

control of the timing and location of construction activities and establishment of a buffer zone around active nesting sites.

6.2.3 State Protected Species

The previously identified species are protected by both state and federal regulations. The following species are protected solely by the state of Florida:

Gopher tortoise (Gopherus polyphemus)

The gopher tortoise is a large terrestrial species, which inhabits well-drained uplands such as dunes, xeric scrub, coastal strand, and Florida sandhills. Burrows are constructed for protection from temperature, predators, and desiccation. Numerous vertebrate and invertebrate species have been documented as burrow commensals. The gopher tortoise is listed as Threatened by the FFWCC and as a candidate for listing by the USFWS.

Suitable habitat for the species exists along the eastern half of the project corridor. A single gopher tortoise and one active burrow were observed at Pond Site 4A during the project corridor survey. Suitable habitat for the species will be eliminated by the proposed construction. To minimize impacts to gopher tortoises and commensal species, during permitting, all potential gopher tortoise habitat that could be impacted by the project will be systematically surveyed according to the current guidelines published by FFWCC. If gopher tortoise burrows are found, all practicable design measures will be employed to avoid impacts to the burrows. For burrows which cannot be avoided, a permit will be obtained from FFWCC for relocation of gopher tortoises and commensals, and relocation will be performed at a time as close as practicable to the start of construction activities at the site of the burrows. As a result of the previously described actions, the proposed project is not anticipated to adversely affect the gopher tortoise.

Gopher frog (Lithobates capito)

The gopher frog is found in sandhill communities and in sand pine scrub habitats. It is a commensal species associated with gopher tortoise burrows. The species breeds in shallow grassy ponds. The gopher frog is listed as a Species of Special Concern (SSC) by the FFWCC

and is not listed by the USFWS. The status of the gopher frog is currently under review by FFWCC. It is proposed for removal from the protected species list.

Suitable habitat for this species exists along the eastern half of the project corridor. An active gopher tortoise burrow was observed at Pond Site 4A during the project corridor survey. No gopher frogs or evidence of their presence was observed during the site inspection. No documented occurrences of the gopher frog along the project corridor were found in the FNAI database; however, it is listed as potentially occurring in the project vicinity. If gopher tortoises are relocated as provided above, any gopher frogs found in the burrows will also be relocated. As a result of the previously described actions, the proposed project is not anticipated to adversely impact the gopher frog.

Florida pine snake (Pituophis melanoleucus mugitus)

The Florida pine snake utilizes sandy habitats throughout Northern and Central Florida and along the Atlantic Coastal Ridge in South Florida. It is considered a commensal of gopher tortoise burrows. Ground-dwelling birds and their eggs, mice, and pocket gophers are the primary food source. The species is currently listed as a SSC by FFWCC and is not listed by the USFWS. The status of the Florida pine snake is currently under review by FFWCC. It is proposed to be elevated to a Threatened status on the protected species list.

Suitable, but suboptimal habitat for the species exists along the eastern half of the project corridor. An active gopher tortoise burrow was observed at Pond Site 4A during the project corridor survey. No Florida pine snakes or evidence of their presence was observed during the site inspection. No documented occurrences of the Florida pine snake along the project corridor were found in the FNAI database; however, it is listed as potentially occurring in the project vicinity. If gopher tortoises are relocated as provided above, any Florida pine snakes found in the burrows will also be relocated. As a result of the previously described actions, the proposed project is not anticipated to adversely impact the Florida pine snake.

Burrowing owl (Athene cunicularia)

The burrowing owl is classified as a SSC by the FFWCC and is not listed by the USFWS. It is a small, ground-dwelling owl that prefers well-drained, open habitats with short herbaceous groundcover. Insects are the primary food; however, small reptiles, amphibians, small rodents, crayfish, spiders, and carrion are also consumed. The species makes extensive use of underground burrows. In the spring the burrows are used for nesting while in the winter the primary function is protection from avian predators.

Little suitable habitat for the species is present at the project corridor. No burrowing owls or evidence of their presence was observed during the site surveys. No documented occurrences of the burrowing owl along the project corridor were found in the FNAI database; however it is listed as potentially occurring in the project vicinity. The project, as proposed, is not anticipated to adversely impact the burrowing owl.

Southeastern American kestrel (Falco sparverius paulus)

The southeastern American kestrel is a small falcon found throughout Florida in a variety of habitats including pine flatwoods and open fields. Small invertebrates are the primary food source, but small mammals and reptiles are also taken. Abandoned woodpecker cavities in dead pine trees are a common nesting site. The southeastern American kestrel is listed as Threatened by FFWCC and is not listed by USFWS.

Few snags suitable for nesting are located at the project area. Adequate, suitable foraging habitat will remain after the proposed construction; therefore, the impact to the species will be minor. No southeastern American kestrels were observed during the site inspection. No documented occurrences of the southeastern American kestrel along the project corridor were found in the FNAI database. The project as proposed is not anticipated to adversely impact the southeastern American kestrel.

Florida sandhill crane (Grus canadensis pratensis)

The Florida sandhill crane is listed as Threatened by FFWCC and is not listed by USFWS. It inhabits freshwater marshes, prairies, pastures, and shallow flooded open areas. Fish

are the primary food source. Florida sandhill cranes typically nest in shallow water of lakes, ponds, and open marshes.

Suitable nesting habitat for the Florida sandhill crane exists west of I-95 within the project corridor. The open areas within and adjacent to the project corridor may provide suitable foraging habitat for the species. An individual was observed flying over the proposed I-95/Ellis Road interchange during the May 2011 site survey. No documented occurrences of the Florida sandhill crane along the project corridor were found in the FNAI database; however, it is listed as likely occurring in the project vicinity. Compensatory mitigation will be provided for all unavoidable wetland impacts; therefore, the proposed project is not anticipated to adversely impact the Florida sandhill crane.

Limpkin, little blue heron, snowy egret, tricolored heron, white ibis (Aramus guarauna, Egretta caerulea, Egretta thula, Egretta tricolor, Eudocimus albus)
These listed avian species are all classified as a SSC by FFWCC and are not listed by USFWS. The status of these species is currently under review by FFWCC. The little blue heron and tricolored heron are proposed to be elevated to a threatened classification while the remaining species are being evaluated for removal from the protected species list.

The preferred habitats include freshwater and brackish water wetlands. Nesting is primarily accomplished in or adjacent to wetlands. Small fish and crustaceans are the primary food source. All of these species can be expected to forage in the lakes, ponds, ditches, and wetlands of the project area.

No wading bird rookeries have been documented at the project corridor. None of the listed avian species or their nests was observed during the May 2010 and May 2011 site surveys. Marginal suitable nesting habitat is located in the project area. The ditches and ponds in the vicinity do provide suitable foraging habitat. Since the ditches and ponds that provide foraging habitat will remain after the proposed construction and compensatory mitigation will be provided for all unavoidable wetland impacts, the proposed project is not anticipated to adversely impact the any of these listed wading bird species.

Least tern (Sterna antillarum)

The least tern is listed as Threatened by FFWCC and is not listed by USFWS. It is a shorebird species that is associated with estuaries, beaches and dunes. Foraging is generally along tidal creeks, mud flats, sand bars and beaches. Least terns require sandy upper beaches with little vegetation for nesting. Dredged material spoil islands are also utilized. The least tern has been documented to use flat roofs as alternative nesting sites. Habitat loss is the primary threat to the viability of the species.

The density of the vegetation in the grassland habitat that will be impacted by the proposed action alternatives preclude nesting by this species. No documented occurrences of least terns along the project corridor were found in the FNAI database. No least terns were observed during the May 2010 and May 2011 surveys. The proposed construction is anticipated to have an insignificant impact on the Least Tern.

Florida mouse (Podomys floridanus)

The Florida mouse is classified as a SSC by the FFWCC and is not listed by the USFWS. The status of the Florida mouse is currently under review by FFWCC. It is proposed for removal from the protected species list.

It inhabits xeric upland communities with sandy soils such as scrub, sandhill, and ruderal sites. The Florida mouse is a documented commensal of the gopher tortoise, utilizing the burrow for protection from predators as well as adverse temperatures. The population of mice is highest in early successional stages of scrub and sandhill following fire, declining as the habitat becomes more dense and mesic in nature as it matures.

Marginal habitat for the species is present at the project area. Since gopher tortoise burrows were observed at Pond Site 4A, it is possible that the Florida mouse may be present at the project corridor. No Florida mice or evidence of their presence were observed during the site inspection. No documented occurrences of the Florida mouse along the project corridor were found in the FNAI database. They would be relocated along with any gopher tortoises or other burrow commensals in accordance with FFWCC regulations. The project, as proposed, is not anticipated to adversely impact the Florida mouse.

Sherman's fox squirrel (Sciurus niger shermani)

The Sherman's fox squirrel is classified as a SSC by the FFWCC and is not listed by the USFWS. The species prefers the Florida sandhills vegetative community type, but occurs on the margins of pine flatwoods, live oak forest, and cypress ponds.

Suitable, but suboptimal habitat exists at the project area. No Sherman's fox squirrels or evidence of their presence was observed during the site survey. No documented occurrences of the Sherman's fox squirrel along the project corridor were found in the FNAI database. The proposed project is not anticipated to adversely impact the Sherman's fox squirrel.

Table 6.2.1 displays the listed species encountered within the project limits and their corresponding likelihood of occurrence.

Table 6.2.1: Likelihood of Occurrence of Listed Species Within the Ellis Road Project Limits

Scientific Name	Common Name	Status		Habitat Preference	Likelihood of Occurrence
		Federal	State		
Reptiles and Amphibians					
Alligator mississippiensis	American alligator	T (S/A)	FT (S/A)	Rivers, wetlands and open water bodies	Individual observed in existing pond adjacent to Pond Site 1A
Drymarchon corais couperi	eastern indigo snake	T	FT	Mesic areas, xeric pinelands and scrub; typically winter in gopher tortoise burrows	Low
Gopherus polyphemus	gopher tortoise	C	T	Longleaf pine-xeric oak, sand pine scrub, hammocks, dry prairie, pine flatwoods and disturbed habitats	Individual observed at Pond Site 4A
Lithobates capito	gopher frog	-	SSC	Coastal xeric habitats and Lake Wales Ridge	Low
Pituophis melanoleucus mugitus	Florida pine snake	-	SSC	Longleaf pine-xeric oak, sand pine scrub, pine flatwoods and old field habitats	Low
Birds					
Aphelocoma coerulescens	Florida scrub-jay	T	FT	Oak scrub; low growing oaks with patches of bare sand; scrubby flatwoods	Individual observed in Pond Site 4A
Aramus guarauna	limpkin	-	SSC	Mangroves, freshwater marshes, swamps, springs and spring runs, and pond and river margins	High

Table 6.2.1: Likelihood of Occurrence of Listed Species Within the Ellis Road Project Limits

Scientific Name	Common Name	Status		Habitat Preference	Likelihood of Occurrence
		Federal	State		
Athene cunicularia	burrowing owl	-	SSC	Well-drained, open habitats with short herbaceous groundcover	Low
Egretta caerulea	little blue heron	-	SSC	Freshwater, brackish and saltwater wetlands	High
Egretta thula	snowy egret	-	SSC	Permanently and seasonally flooded wetlands, streams, lakes, swamps, and manmade impoundments and ditches	High
Egretta tricolor	tricolored heron	-	SSC	Prefers coastal environments; permanently and seasonally flooded wetlands, tidal creeks, ditches and edges of ponds and lakes	High
Eudocimus albus	white ibis	-	SSC	Freshwater and brackish marshes, salt flats and salt marsh meadows, forested wetlands, wet prairies, swales, seasonally inundated fields, and manmade ditches	High
Falco sparverius paulus	southeastern American kestrel	-	T	Open pine habitats, sandhill, woodland edges, prairies, pastures	Low

Table 6.2.1: Likelihood of Occurrence of Listed Species Within the Ellis Road Project Limits

Scientific Name	Common Name	Status		Habitat Preference	Likelihood of Occurrence
		Federal	State		
Grus canadensis pratensis	Florida sandhill crane	-	T	Prairies, freshwater marshes, and pasturelands	Observed flying over proposed I-95/Ellis Road interchange site
Haliaeetus leucocephalus	bald eagle*	-	-	Areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources	Closest known nest greater than 2000 ft from the project site
Mycteria americana	wood stork	T	FT	Inundated forested wetlands, freshwater marshes, swamps, lagoons, ponds, tidal creeks, and flooded pastures and ditches	Individual observed foraging in roadside ditch
Picoides borealis	red-cockaded woodpecker	E	FE	Open mature pine woodlands, forages in forested habitat types that include pines of various ages	Low
Polyborus plancus audubonii	Audubon's crested caracara	T	FT	Dry prairie and pasturelands with cabbage palm	Observed along the western terminus of the project area
Rostrhamus sociabilis plumbeus	Everglade snail kite	E	FE	Freshwater marshes interspersed with open water areas	Low
Sterna antillarum	least tern	-	T	Sandy upper beach, spoil islands; tidal mud flats	Low
Mammals					
Podomys floridanus	Florida mouse	-	SSC	Xeric upland communities with sandy	Low

Table 6.2.1: Likelihood of Occurrence of Listed Species Within the Ellis Road Project Limits

Scientific Name	Common Name	Status		Habitat Preference	Likelihood of Occurrence
		Federal	State		
				soils; scrub, sandhill, and ruderal sites	
Sciurus niger shermani	Sherman's fox squirrel	-	SSC	Sandhills, pine flatwoods, and pastures	Low

Legend

C= Candidate for listing; E = Endangered; FE = Federally-designated Endangered; T = Threatened; FT = Federally-designated Threatened; SSC = Species of Special Concern; FT (S/A) = Federally-designated Threatened species due to similarity of appearance; T (S/A) = Threatened/Similarity of Appearance; * Protected by Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act.

6.3 Essential Fish Habitat (EFH)

The National Marine Fisheries Service (NMFS) response to the ETDM advanced notification indicated that based upon the project location and the impact analysis provided that the proposed project would not directly impact EFH or National Oceanic and Atmospheric Administration (NOAA) trust fisheries resources.

6.4 Evaluation of Alternatives

Twenty two species that are federal or state listed were determined to occur or to potentially occur within the project area. No endangered or threatened plant species listed by both USFWS and the FDACS are known to occur at the project area or were observed during the site surveys. Based upon field surveys, literature reviews, implementation of protection measures and compensatory mitigation, it is anticipated that the Preferred Alternative will have "no effect" on the Everglade snail kite and the red-cockaded woodpecker and "may affect, but is not likely to adversely affect" the eastern indigo snake, Florida scrub-jay, Audubon's crested caracara and wood stork. The Preferred Alternative is not expected to adversely impact any state-listed species.

6.4.1 Direct Impacts

Direct impacts are defined as those effects caused by the proposed action which occur at the same time and place (40 CFR 1508.8). The direct impacts of the project include placement of fill for the road construction and its associated right-of-way as well as excavation and the placement of fill associated with the construction of stormwater treatment ponds.

Wildlife habitat would be affected by the construction of the Preferred Alternative even though no significant impact to any listed species is expected. Habitat types directly impacted by the proposed construction include pine flatwoods, Brazilian pepper, temperate hardwood hammock, cabbage palm hammock, Australian pine, mixed hardwood wetlands, willow and elderberry, wet prairie, disturbed land, and ditches and canals with associated emergent marsh littoral zones. An evaluation of the wetland impacts was previously discussed in this report.

The wildlife habitat present east of I-95 has been fragmented by past development of the area. The quality of the habitat present has been degraded by urbanization and lacks a corridor for passage of wildlife species to large undeveloped areas. Wildlife utilization is dominated by species common to urban areas. The construction of the Preferred Alternative would reduce the size of the habitat remnants; and maintain the fragmented nature of the habitat present in this section of the project area. The pine flatwoods within the project near the eastern terminus has the potential to provide foraging habitat for the Florida scrub-jay and refuge for the eastern indigo snake since a gopher tortoise burrow was observed on the property adjacent to the road right-of-way. Surveys determined that no Florida scrub-jays inhabited the area, and only one gopher tortoise burrow will be impacted by the project, thereby decreasing the likelihood of impacts to the eastern indigo snake. Additionally, only a small amount of habitat will be impacted. Therefore, impacts to these species are anticipated to be minor. The wetland systems may support the wood stork and other wading bird species. The amount of habitat that will be eliminated is small and compensatory mitigation will be provided through the regulatory permit process. Therefore, impacts to wetland-dependant species is anticipated to be minor.

West of I-95, the wildlife habitat present is of higher quality, being an expansive system contiguous with the St. Johns River. The Preferred Alternative will eliminate a portion of this habitat; however, the impact is located at the edge I-95 and will not directly cause fragmentation of the system. The cabbage palm hammock and adjacent open lands in this section of the project site provides potential nesting and foraging habitat for the Audubon's crested caracara. The amount of this habitat that will be eliminated is small compared to that available in the general vicinity. The quality of the habitat for nesting of the species is sub-optimal due to its close proximity to a busy roadway. A survey performed during the 2015 nesting season found no evidence of a caracara nest within 1500 meters of the project area. Due to the small amount of habitat to be affected, the close proximity of the habitat to the roadway, and the lack of nesting caracara near the project area any impacts to this species are anticipated to be minor.

6.4.2 Indirect and Cumulative Impacts

The proposed construction will involve the expansion of the existing right-of-way through a highly urbanized area in the eastern portion of the project corridor between John Rodes Boulevard and Wickham Road. New roadway is to be constructed from John Rodes Boulevard westward to the I-95/Ellis Road interchange. Agriculture and conservation are the dominant land uses west of I-95. New stormwater treatment ponds will be located throughout the project corridor.

Indirect impacts are those reasonably foreseeable effects of the proposed construction which occur later in time or are located adjacent to the project. Indirect impacts may include effects associated with future land use changes, population growth rates and density, and effects to the existing ecosystems. These indirect impacts only occur if the project is constructed. Indirect impacts are also referred to as secondary impacts.

As a result of the proposed connection to I-95, Ellis Road and the St. Johns Heritage Parkway, the proposed project may accelerate future land use changes, especially to the agriculturally developed land west of I-95. East of I-95 is currently highly urbanized and the future land use plan involves infill and not a change in land use. However, west of I-95 agriculture and conservation are the primary land uses. Wetlands associated with the St. Johns River floodplain are numerous within the agriculturally zoned lands. The uplands of this area, while having been disturbed in the past, are for the most part, undeveloped. The agricultural lands currently provide valuable wetland and upland habitat for numerous wildlife species as well as serving as an unobstructed wildlife corridor to the conservation lands to the west. The proposed Ellis Road/I-95 interchange is the northern terminus of a new roadway currently under design, the St. Johns Heritage Parkway. The Ellis Road project in combination with the St. Johns Heritage Parkway would essentially facilitate access to the lands west of I-95 and can be expected to promote conversion of the agriculturally zoned land to development with a concurrent increase in population density and rate of population growth. The conversion of undeveloped lands would result in a loss of wildlife habitat functions, potential fragmentation of the remaining habitat, noise, light and

air pollution impacts, and increased wildlife mortality due to conflicts with vehicular traffic as well as more interaction with the human population. The St. Johns Heritage Parkway is presently being reviewed by the regulatory agencies and the indirect and cumulative impacts of that roadway will be addressed prior to the issuance of the required state and federal permits.

Indirect impacts to the ambient air and water resources in the project vicinity are a common result of roadway construction. Vehicle exhaust emissions associated the internal combustion engine including carbon monoxide, sulfur dioxides and nitrogen oxides as well as particulates can degrade the atmospheric conditions in the project vicinity as well as detrimentally impact the adjacent upland and wetland communities. Stagnant areas can lead to the buildup of noxious gas. Acid rain fallout to adjacent areas can change the pH of the soil and thereby change the existing ecosystem. Since the roadway widening will facilitate the traffic flow on Ellis Road and the new roadway is designed as limited access for the remainder of the project, which also helps move traffic, the anticipated indirect impacts associated with air pollution are considered minor.

Indirect water quality impacts from roadway construction include pollutant loading to adjacent surface waters and wetlands from roadway runoff. Heavy metals and nutrients are two of the common types of pollutants. Litter is also a problem which affects both upland and wetland systems. Water quality in the general area should improve with implementation of the SJRWMD permit design conditions as previously untreated areas are accommodated by the new stormwater treatment ponds. Water quality impacts during construction will be minimized by use of standard FDOT best management practices.

The upland and wetlands that will be altered by the new roadway, in addition to the direct impacts caused by fill, will be reduced further in size with a concurrent loss in wildlife functional value from the existing condition. Hydrologic changes to wetlands, while slight, are also possible. An ecotone is the area where two different habitats meet. Generally, the diversity of these areas is increased since species from both of the habitats colonize the area. Disruption of the soils at wetland edge, for instance, can potentially lead to the

introduction of nuisance, invasive or weedy species to this ecotone and eventually into the wetland system. Light penetration as well as noise impacts to this ecotone will also be experienced. A change in microclimate of the adjacent wetland system will occur as the ecotone is pushed further into the wetland remnant interior as the roadway is expanded. All of these ecotone alterations can potentially impact the quality of the wildlife habitat.

Indirect impacts associated with traffic noise can detrimentally impact wildlife. Foraging, navigation, communication and avoidance of predators are all routine activities performed by wildlife which are, to some extent, dependent upon aural signals for successful achievement and survival of the species. Traffic-generated noise levels can have various impacts on wildlife populations. Generally, the wildlife present in an area has adapted to the ambient sound levels. Ambient noise levels in urban areas, such as east of I-95; contain a higher percentage of sounds generated by anthropogenic sources. In these areas, the increase in traffic-related noise levels related to widening an existing road, while a negative impact, is not as pronounced as the increase in noise levels associated with a new roadway constructed in an area with less ambient anthropogenic sounds, such as west of I-95. The intensity and duration of the traffic-related noise can have a bearing on the severity of the impact on wildlife species. Louder noise, such as those associated tractor trailers, projects a greater distance from the roadway increasing the area of negative influence. Elevated structures also increase the distance of the potential noise impact. Constant traffic noise would permanently alter the ambient noise levels. No documented nesting by listed species has been discovered near the project site, so traffic-related noise impacts should not significantly affect any of these animals.

Light pollution is another indirect impact associated with the construction of roadways. The sources can be the stationary right-of-way lighting or the individual vehicles utilizing the road. Light penetration into adjacent ecotones and habitats can cause disruption of wildlife behavior, such as movement through the landscape, foraging and nesting activity, and predator avoidance, and can increase traffic-related mortality.

Fragmentation of habitat is a concern with roadway projects. Wildlife movement can be impaired and exchange between fragments, if attempted, can lead to increased traffic-related mortality. The Preferred Alternative is either located within already fragmented habitat with small remnants surrounded by development or is located at the edge of I-95 and does not bisect any viable wildlife corridors. Road kill in the urban section can be expected to increase with increased design speed of the road. Species impacted in urban areas are generalist like the opossum and raccoon. The St. Johns Heritage Parkway, which ties into the Preferred Alternative at its western terminus, will fragment wildlife habitat.

The project is presently being reviewed by the regulatory agencies and the indirect and cumulative impacts of the roadway will be addressed prior to the issuance of the required state and federal permits.

Cumulative impacts result from the total effect of the proposed project when added to other past, present, and reasonably future projects or actions (40 CFR 1508.7). As discussed in Section 3.0 (Project Purpose & Description), the purpose and need of this project is to provide a connection between the Melbourne airport and I-95 as well as address deficiencies at the existing I-95 interchanges at US 192 and Eau Gallie Boulevard. All of these roadways are hurricane evacuation routes and maintenance of an acceptable traffic level of service (LOS) is essential.

Urban development has historically spread westward from the city of Melbourne at the Intracoastal Waterway to I-95. In the project vicinity, unlike sections to the north and south, little development has occurred west of I-95. The cumulative impact of this project revolves around the tie in with the proposed St. Johns Heritage Parkway since the land east of I-95 is currently highly urbanized. The proposed road will provide easy access to agriculturally zoned land with wetlands and uplands currently unprotected by conservation easements located west of I-95 and can be expected to promote land use changes in the general vicinity, like those to the north and south of the project corridor, adding to the level of cumulative impacts in the general area. While these undeveloped properties could potentially be developed, the property owner would still be subject to the state, local and federal regulatory agencies.

6.5 Conclusions (Listed Species)

The proposed construction of the additional traffic lanes along Ellis Road and the construction of a new roadway and interchange with I-95 are not expected to adversely affect any federally or state listed species. There is no officially designated "Critical Habitat" along the project corridor. However, the project area is situated within USFWS designated Consultation Areas for the Florida scrub-jay, Audubon's caracara, Everglade snail kite and red-cockaded woodpecker. The proposed construction, for the most part, will impact highly disturbed remnant natural communities along a road corridor which is currently experiencing rapid urban growth.

Federally- and State-listed species having the potential to occur in the project study area include the American alligator, Florida scrub-jay, burrowing owl, southeastern American kestrel, Florida sandhill crane, bald eagle, wood stork, Audubon's crested caracara, listed wading birds (limpkin, little blue heron, snowy egret, tricolored heron and white ibis), gopher tortoises and associated commensals (gopher frog, Florida pine snake, Florida mouse and eastern indigo snake), and Sherman's fox squirrel. However, because of the quality of the habitat present and with the implementation of recommended protection and mitigation measures, these species and/or their habitats are not likely to be adversely affected by the construction of the I-95 interchange and the Ellis Road improvements.

The FDOT has determined the project has "no effect" on the Everglade snail kite and USFWS has concurred with this determination. The FDOT has determined the project "may affect, not likely to adversely affect" the Florida scrub-jay, Audubon's crested caracara, and eastern indigo snake. The results of surveys completed for these species, along with the request for concurrence with these determinations, were submitted to USFWS on May 27, 2015. USFWS has responded with their concurrence with these determinations in a letter dated July 29, 2015 (see Appendix C, Agency Coordination). Additionally, the FDOT has determined that this project "may affect, not likely to adversely affect" the wood stork based on the use of the wood stork effect determination key and available mitigation. This information and the request for concurrence with this

determination was submitted to USFWS on October 1, 2015. USFWS responded with their concurrence in a letter dated October 9, 2015 (see Appendix C, Agency Coordination).

6.6 Commitments

In order to ensure that adverse impacts to the protected species within the vicinity of the project corridor will not occur, FDOT/Brevard County will abide by the commitments listed below. These commitments pertain only to species and wetlands. The list of all project commitments are included in the *Categorical Exclusion Type 2* and the *Project Development Summary Report.*

- The design scope will include a survey during preparation of permit applications, of all suitable gopher tortoise habitat to be impacted by the roadway and the ponds. If the species is found, coordination will be initiated with the appropriate resource agency and required permits will be obtained. If gopher tortoise burrows cannot be avoided, a relocation permit would be obtained and mitigation implemented.
- To avoid any potential impacts to the eastern indigo snake, the *Standard Protection Measures for the Eastern Indigo Snake* (Appendix D) will be implemented during site preparation and construction. To ensure the implementation of the standard protection measures, the following will be added as a general plan note:

  > Eastern indigo snake habitat has been identified within the project limits. Utilize the US Fish and Wildlife Service Standard Protection Measures for the Eastern Indigo Snake, at the US Fish and Wildlife Service Link: http://www.fws.gov/northflorida/IndigoSnakes/20130812_Eastern_indigo_snake_Standard_Protection_Measures.htm

- To ensure protection of the wood stork, FDOT/Brevard County will provide the appropriate compensatory mitigation for all unavoidable wetland impacts within a USFWS-approved mitigation bank.
- All construction impacts will be minimized or controlled by adherence to measures set forth in the FDOT's Standard Specification for Road and Bridge Construction.

- FHWA and FDOT will continue to coordinate with St. Johns River Water Management District (SJRWMD) to address the final preferred stormwater pond locations and any additional drainage concerns or issues during the design phase of project development.

7.0 References

Adamus, Christine, D. Clapp, and S. Brown. 1997. Surface water drainage basin boundaries, St. Johns River Water Management District: A reference guide. Palatka, FL. 110 p.

Bell, C. Ritchie and Bryan J. Taylor. 1982. Florida wildflowers and roadside plants. Laurel Hill Press, Chapel Hill, North Carolina. 308 pp.

Chafin, L. G. 2000. Field guide to the rare plants of Florida. Florida Natural Areas Inventory. Tallahassee. Florida

Coile, N. C. and M. A. Garland. 2003. Notes on Florida's endangered and threatened plants. Florida Department of Agriculture & Consumer Services. Gainesville. Florida. 122 pp.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1985. Classification of wetlands and deepwater habitats of the United States. Washington, DC: U.S. Department of the Interior Fish and Wildlife Service, Office of Biological Services. Revised edition. 131 pp.

Cox, James, Douglas Inkley and Randy Kautz. December 1987. Ecology and Habitat Protection Needs of Gopher Tortoise (*Gopherus polyphemus*) populations found on lands slated for large-scale development in Florida. Nongame Wildlife Program Technical Report No. 4. FGFWFC, Tallahassee, FL.

Federal Register. 1986. 33 CFR parts 320 through 330: Regulatory programs of the Corps of Engineers Final Rule.

Florida Department of Transportation, Surveying and Mapping, Thematic Mapping Section. 1999. Florida land use, cover and forms classification system handbook.

Tallahassee, FL. 91 p.

Florida Department of Environmental Protection. 1995. Florida Administrative Code Chapters 62-330, 62-340, 62-341, and 62-343.

Florida Department of Environmental Protection. 2004. Florida Administrative Code Chapter 62-345. Uniform Mitigation Assessment Method (UMAM).

Florida Fish and Wildlife Conservation Commission. Eagle Nest Locator. [Online]. FFWCC. https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx#search [2015, August 4].

Florida Fish and Wildlife Conservation Commission. Quick Maps Search [Online] http://atoll.floridamarine.org/QuickMaps/ [2011, May 20]

Florida Fish and Wildlife Conservation Commission. 2010, November. Florida's Endangered Species, Threatened Species, and Species of Special Concern Official Lists. FFWCC.

Florida Fish and Wildlife Conservation Commission. 2003, January 6. Florida's breeding bird atlas: A collaborative study of Florida's birdlife. http://myfwc.com/bba (Date accessed 5/20/2011).

Florida Natural Areas Inventory (FNAI). 2010. Guide to the natural communities of Florida: 2010 Edition. Florida Natural Areas Inventory. Tallahassee, Florida.

Florida Natural Areas Inventory. Tracking List for Brevard County. [Online]. http://www.fnai.org/bioticssearch.cfm . Tallahassee, Florida. [2011, May 20].

Florida Natural Areas Inventory. Biodiversity Matrix Query Results, [Online]. http://data.labins.org/mapping/FNAI_BioMatrix/GridSearch.cfm?sel_id=60223,60510

,60796,61080&extent=720579.3125,458600.25,727016.75,460209.625 [2011, April 20].

Gilbert, Katherine M., et.al. 1995. The Florida wetlands delineation manual. Florida Department of Environmental Protection, Tallahassee, Florida. 198 pp.

Hipes, D., D. R. Jackson, K. NeSmith, D. Printiss and K. Brandt. 2000. Field Guide to the Rare Animals of Florida. Florida Natural Areas Inventory, Tallahassee.

Kale, Herbert W. II, and David S. Maehr. 1990. Florida's Birds. Pineapple Press, Sarasota, FL.

McDairmit, Roy W. 1978. Rare and Endangered Biota of Florida, Volume Three, Amphibians and Reptiles. University Presses of Florida, Jacksonville.

Moler, Paul E. (ed.) 1992. Rare and Endangered Biota of Florida, Volume III. Amphibians and Reptiles. University Press of Florida. Gainesville,FL.

Myers, Ronald L. and John J. Ewel. 1990. Ecosystems of Florida. University of Central Florida Press. Orlando. Florida. 765 pp.

Rodgers, James A. Jr., Herbert W. Kale II and Henry T. Smith (eds.) 1996. Rare and Endangered Biota of Florida, Volume V. Birds. University Press of Florida, Gainesville, FL.

St. Johns River Water Management District. 2010. Applicant's handbook management and storage of surface water. [Online] SJRWMD http://www.floridaswater.com/handbooks/msswhandbook.html [December 27, 2010].

Taylor, Walter Kingsley. 1998. Florida Wildflowers in Their Natural Communities. University Press of Florida, Gainesville, FL.

Tobe, Dr. John D, et.al. 1998. Florida wetland plants: An identification manual. UF/IFAS Publications. Gainesville, Florida.

U.S. Army Corps of Engineers, Jacksonville District. 1988. A guide to selected Florida wetland plants and communities. Jacksonville, FL. CESAJP 1145-2-1. 319 p.

U.S. Army Corps of Engineers Waterways Experiment Station Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Technical Report Y-87-1. Vicksburg, MS.

U.S. Department of Agriculture, Natural Resource Conservation Service. 1974. Soil survey of Brevard County, Florida. Washington, DC.

U.S. Department of Agriculture, Natural Resource Conservation Service. 1995. Hydric soils of the United States. Washington, DC.

U.S. Department of the Interior, Fish and Wildlife Service. 1988. Melbourne West Quadrangle, Florida, national wetlands inventory map. Washington, DC.

U.S. Department of the Interior, Fish and Wildlife Service. 1996. National list of plant species that occur in wetlands: Region 2. Washington, DC.

U.S. Department of the Interior, Geological Survey 1949, photorevised 1970. Melbourne West Quadrangle, FL, 7.5-minute series topographic map. Washington, DC.

U.S. Environmental Protection Agency and U.S. Department of the Army. 1990. Memorandum of agreement between the Environmental Protection Agency and the Department of the Army concerning the determination of mitigation under the

Clean Water Act Section 404(b)(1) guidelines. [Washington, D.C.]

U.S. Geological Survey. 1949, Photorevised 1970. 7.5-minute series topographic maps. Washington, D.C., Melbourne West, Florida Quadrangle

Wunderlin, Richard P. 1998. Guide to the Vascular Plants of Florida. University Press of Florida,

Gainesville, Florida. 806 pp