DRAFT

POND SITING REPORT

Florida Department of Transportation

Florida's Turnpike Enterprise

Turnpike at I-95 Direct Connection Interchange Project Development and Environment Study

Limits of Project: Approximately 2 miles north and south of SE Bridge Road (CR 708) along Florida's Turnpike (SR 91) and I-95 (SR 9)

Martin County, Florida

Financial Management Number: 446975-1

ETDM No. 14444

September 2025

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022 and executed by the Federal Highway Administration and FDOT.

EXECUTIVE SUMMARY

Florida's Turnpike Enterprise (FTE) is conducting a Project Development and Environment (PD&E) study to evaluate the potential for a new system-to-system direct connection interchange between Florida's Turnpike (SR 91) and Interstate 95 (I-95) at SE Bridge Road (CR 708) in Martin County, Florida. The study area begins approximately two miles south of SE Bridge Road at Mile Post (MP) 123.44 and extends approximately two miles north of SE Bridge Road to MP 127.53. The proposed interchange concept aims to improve traffic operations for the north-south through trips in the project area and to enhance traffic conditions on existing local roadways that currently serve as connections between SR 91 and I-95. A Type 2 Categorical Exclusion is being prepared as part of this PD&E study, which will satisfy all applicable federal and state environmental requirements, including the National Environmental Policy Act (NEPA), to qualify the project for federal-aid funding in future phases such as design, right-of-way acquisition, and construction.

The project falls within the jurisdiction of the South Florida Water Management District (SFWMD) and one local water district, the Hobe-St. Lucie Conservancy District (HSLCD). It is divided into 4 sub-basins based on the existing LiDAR topography, proposed roadway profile, roadside ditch configurations, and the locations of culverts and cross drains.

Within the study area, stormwater runoff from SR 91 sheet flows from the roadway into roadside ditches, which lead to existing culverts and cross drains throughout the corridor. These culverts and drains discharge into irrigation canals or creeks, then ultimately discharging into the South Fork St. Lucie River and Kitchen Creek. The general surface water flow within the project limits is from west to east. The HSLCD maintains a canal that runs parallel to SR 91 from SE Bridge Road to the south, which intercepts offsite flow and conveys it to the south. Runoff from the Interstate 95 corridor sheet flows into roadside swales which ultimately discharge into Kitchen Creek.

The vertical datum used for this study is the North American Vertical Datum of 1988 (NAVD 88). To convert from NAVD 88 to National Geodetic Vertical Datum of 1929 (NGVD 29), add 1.503 feet.

Based on the SFWMD permit records, the Turnpike mainline is permitted from MP 114 to MP 137 (Permit No. 43-00568-S, Application 900108-S). This permit is for 2.5-inches of pre-treatment of the 20 foot paved shoulders and median barrier via the roadside ditch adjacent to the southbound lanes. However, this treatment area will be filled with the proposed widening. Treatment volume required for replacement of impacts to systems serving existing pavement will be provided in the proposed pond areas. During the pre-application meeting with SFWMD, it was determined that this is the permit that should be modified for the proposed improvements.

Three pond site alternatives have been identified for each basin within the project limits. Due to the high seasonal groundwater table (SHGWT) throughout the corridor, wet detention ponds are recommended. Offsite discharges for this project are expected to occur within FDOT right-of-way (R/W). A twenty percent

contingency factor was used, plus a ten percent increase in the pond size was applied to all calculated pond sizes for aesthetics and beautification. **Table 1** summarizes the anticipated water quality and water quantity requirements per basin.

Table 1: Water Quality and Quantity Requirements by Basin

Basin Name	Basin Area (ac)	Required Water Quality Volume (ac-ft)	Provided Water Quality Volume (ac-ft)
Basin 1	106.32	5.40	5.40
Basin 2	102.26	0.48	0.48
Basin 3	190.89	7.92	7.92
Basin 4	81.71	6.15	6.15

Thirteen pond sites across four basins were evaluated within the study area. The pond sites were evaluated on the basis of several factors including, total cost of each alternative including the R/W cost, FEMA flood zone, wetland impacts, habitat and environmental impacts, as well as ease of hydraulic connectivity to the pond site. Florida Gas Transmission (FGT) operates three gas lines located adjacent to SR 91 northbound lanes. The preferred pond alternatives were selected based on the sites that minimized impacts and optimized hydraulic connectivity. Basins 1, 2, and 4 each had three pond sites evaluated, while Basin 3 included four sites, one of which was split between two locations due to sizing constraints. A summary of the preferred pond alternatives is provided in **Table 2**.

Table 2: Preferred Pond Alternatives Summary

Basin	Preferred Alternative	Total Pond Size (ac)[1]	Parcel(s)	Estimated Construction Cost
Basin 1	Pond 1 – Alt 2	8.80	34-39-41-000-004-00000-3	$1,189,978
Basin 2	Pond 2 – Alt 2	2.09	34-39-41-000-004-00000-3	$282,620
Basin 3	Pond 3 – Alt 2	17.38	28-39-41-000-001-00030-5	$2,350,207
Basin 4	Pond 4 – Alt 1	11.99	21-39-41-000-009-00030-3	$1,621,345

1. Total pond size includes pond, berm, tie downs, and easements.

The Environmental Look Around (ELA)/Watershed Approach to Evaluate Regional Stormwater Solutions (WATERSS) process was implemented by coordinating with local stakeholders to identify opportunities for water sharing. Meetings were held with SFWMD, SFWMD Comprehensive Everglades Restoration Plan (CERP) staff, Martin County, FDOT District Four, and HSLCD. No opportunities were identified during these discussions with stakeholders.

Floodplain considerations for the project are based on the current effective Flood Insurance Study (FIS) for Martin County (February 19, 2020). The entirety of the study area is shown to be within FEMA Flood Zone X. Therefore, there are no floodway encroachments associated with this project. The Martin County

floodplain coordinator was contacted to confirm the limits of Flood Zone X within the county and to ensure the proposed action would be consistent with their water management plan.

Every wetland and cross drain have an associated floodplain per the Florida Department of Transportation and the Federal Highway Administration. Cross drain extensions are associated with transverse floodplain impacts. These impacts to flood elevations will be minimized by designing cross drains facilities in accordance with the FDOT Drainage Manual and no adverse impacts to floodplains are anticipated as a result of this project. Modifications to existing drainage structures, extending cross drains, and widening of bridges included in this project will result in an insignificant change in their capacity to carry floodwater. These modifications will cause minimal increases in flood heights and flood limits which will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant change in flood risks or damage. There will be no significant change in the potential for interruption or termination of emergency services or emergency evacuation routes as the result of modifications to existing drainage structures. Therefore, it has been determined that this encroachment is not significant.

No sovereign submerged lands were identified within the project corridor based on the Florida Department of Environmental Protection's Map Direct Gallery.

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1.0 INTRODUCTION

The intent of this Pond Siting Report (PSR) is to estimate the required volume for stormwater mitigation and identify right-of-way needs for any off-site stormwater management facilities associated with the new interchange and the widening of the Turnpike mainline from MP 123.44 to MP 127.53. This report aims to minimize cultural and environmental impacts, as well as reduce right-of-way, maintenance, and construction costs. The conclusions and recommendations are based on the best available data, using conceptual roadway alignments and typical sections. Pond sizing calculations will be refined during the design phase as survey and geotechnical data become available.

Thirteen pond site alternatives have been identified for the project site (with four preferred alternatives chosen). Pond sizing calculations were performed for the project limits and can be found within the report.

2.0 PROJECT DESCRIPTION

2.1 PROJECT DESCRIPTION

The project involves the evaluation of a new connection via a system-to-system direct connection interchange to/from SR 91 and I-95 at SE Bridge Road in Martin County, Florida. The study area begins approximately two miles south of SE Bridge Road at Mile Post (MP) 123.44 and extends approximately two miles north of SE Bridge Road to MP 127.53. A map of the project limits is shown in **Figure 1**.

The existing limited-access right-of-way along SR 91 is generally 300 feet wide. SR 91 is classified as a Rural Principal Arterial Expressway. The existing typical section consists of a four-lane divided facility with 12-foot travel lanes. As part of the mainline widening, the proposed typical section for SR 91 will include an eight-lane divided facility with 12-foot travel lanes. The posted speed limit along the project corridor is 70 miles per hour. A Florida Gas Transmission (FGT) easement runs along the east side of SR 91 for the entire project limits. A Type 2 Categorical Exclusion is being prepared. The PD&E study satisfies all applicable requirements, including the National Environmental Policy Act (NEPA), to qualify for federal-aid funding of subsequent development phases (design, right-of-way acquisition, and construction).

2.2 PURPOSE & NEED

The purpose of this project is to improve traffic operations for north-south through trips in the project area and to improve traffic operations on existing local roadways that provide a connection between I-95 and SR 91 near the existing I-95/SE Bridge Road interchange in Martin County, Florida.

Figure 1: Project Location Map

2.3 PREFERRED ALTERNATIVE

The preferred alternative for the Turnpike at I-95 direct connection interchange study includes the construction of four system-to-system ramps to accommodate all directional movements between SR 91 and I-95 near SE Bridge Road in Martin County. South of SE Bridge Road, the ramps will serve northbound I-95 to northbound SR 91 and southbound SR 91 to southbound I-95 movements. North of SE Bridge Road, ramps will accommodate northbound SR 91 to northbound I-95 and southbound I-95 to southbound SR 91 movements. Additionally, SR 91 will be widened from four to eight lanes, with all widening occurring to the west side to avoid impacts to existing FGT infrastructure located along the east side of SR 91. A two-lane collector-distributor (CD) road is proposed between the northbound SR 91 to northbound I-95 and northbound I-95 to northbound SR 91 ramps to facilitate safe and efficient weaving operations. No geometric changes are proposed for I-95, as all ramp tie-ins will occur at the outer edges of the existing facility. While the SE Bridge Road typical section will remain unchanged, the existing bridge will be reconstructed to accommodate SR 91 widening and to span the southbound SR 91 to southbound I-95 ramp. Two tolling points are proposed—one on the ramp from the CD road to northbound I-95 and the

other on the ramp from southbound I-95 to southbound SR 91. All ramps will be single-lane facilities, with a 15-foot-wide lane and a design speed of 50 miles per hour. **Figure 2** shows the proposed interchange alternative.

Figure 2: Proposed Turnpike at I-95 Direct Connection Interchange Alternative

2.4 PROJECT LOCATION

The PD&E study limits include approximately four miles of the Turnpike mainline (SR 91), MP 123.44 to MP 127.53, near Hobe Sound in Martin County. A Project Location Map is provided in **Section 2.2** above. Refer to **Appendix C** for a USGS Quadrangle Map. The project is located within the sections, townships, and ranges shown in **Table 3.**

Table 3: Sections, Townships, Ranges within Project Limits

Range	Township	Section(s)
41E	40S	11
41E	40S	2
41E	40S	3
41E	39S	34
41E	39S	33
41E	39S	27
41E	39S	28
41E	39S	22
41E	39S	21
41E	39S	16

2.5 DATUM

The vertical datum used for this study is the North American Vertical Datum of 1988 (NAVD 88). To convert from NAVD 88 to National Geodetic Vertical Datum of 1929 (NGVD 29), add 1.503 feet. Please refer to **Appendix C** for the NOAA Online Vertical Datum Transformation.

2.6 EXISTING ROADWAY CHARACTERISTICS

The existing Turnpike roadway within the project site consists of four travel lanes with a 20-foot paved median, including a concrete barrier wall, and 10-foot paved outside shoulders on both sides. **Figure 3** shows the existing mainline typical section.

Figure 3: Existing Mainline Typical Section

2.7 PROPOSED ROADWAY CHARACTERISTICS

The proposed future improvements include widening the mainline from four to eight 12-foot lanes by adding two general toll lanes in each direction and widening both the inside and outside shoulders from 10 feet to 12 feet. **Figure 4** shows the proposed mainline typical section.

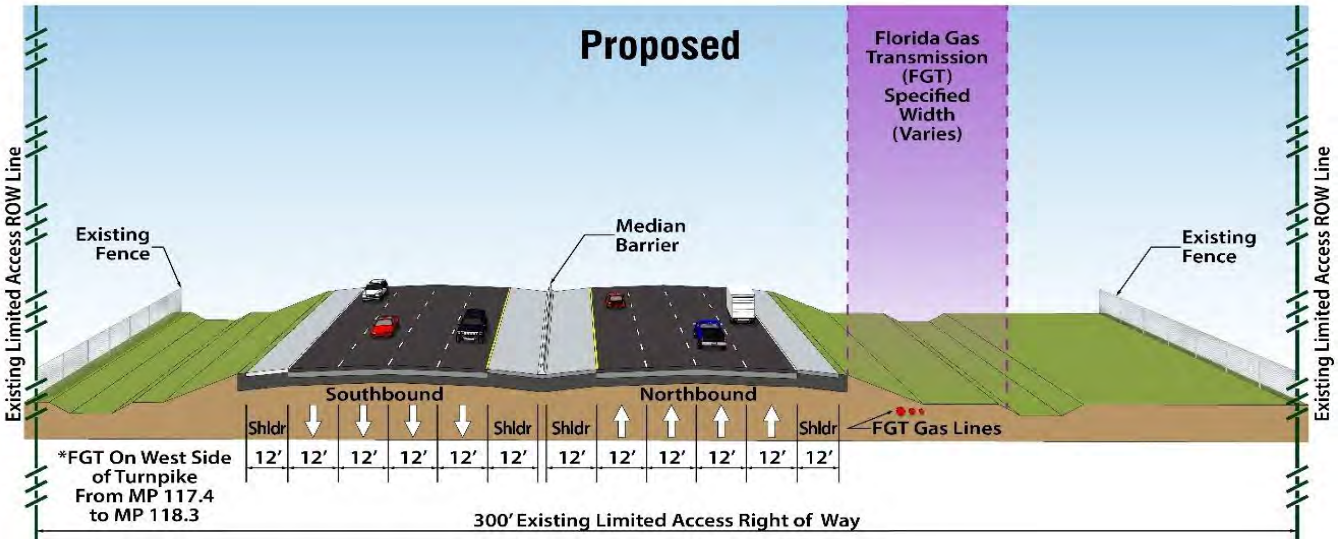


Figure 4: Proposed Mainline Typical Section

The study includes the addition of one (1) new interchange access location at SE Bridge Road (MP 125.5). There is no connection between the interchange and SE Bridge Road. Each of the four proposed ramps will include a single 15-foot lane with 6-foot shoulders on either side.

The existing bridge structures that SE Bridge Road uses to cross the Florida Turnpike will need to be reconstructed along with the roadway.

3.0 DATA COLLECTION

The following sources were used in the preparation of this Pond Siting Report:

- FDEP Map Direct
- FDOT Drainage Manual (2025)
- FDOT Drainage Design Guide (2024)
- FDOT Project Development and Environment Manual (2024)
- FEMA Flood Map Service Center
- NRCS Web Soil Survey
- SFWMD ePermitting
- SFWMD ERP Applicant's Handbook, Volume I (2024)
- SFWMD ERP Applicant's Handbook, Volume II (2024)

4.0 DESIGN CRITERIA

4.1 PERMITS AND APPROVALS

The study area lies within the jurisdiction of the South Florida Water Management District (SFWMD). It is anticipated that the project will require the following permits and approvals:

- USACE – Section 404 Dredge and Fill Permit
- USFWS – Section 7 Consultation
- SFWMD – Individual Environmental Resource Permit
- FDEP – National Pollutant Discharge Elimination System

4.2 APPLICABLE CRITERIA

The proposed pond alternatives provided in this report were designed in accordance with SFWMD and FDOT design criteria. The ponds were sized to accommodate the future (8-lane) condition.

The new state stormwater rule went into effect June 2024. Per the rule, any PD&E that was started before this time and has an approved Location and Design Concept Acceptance (LDCA) before June 2026 will be considered "grandfathered" and not subject to the new water quality standards. This project is anticipated to have LDCA before June 2026. Therefore, the criteria listed below are based on the 2018 FDEP Applicants Handbook Volume I, 2018.

4.2.1 SFWMD CRITERIA

- Off-site discharge rate is limited to rates not causing adverse impacts to existing off-site properties, and (SFWMD ERP Applicant's Handbook (AH), Volume II, Section 3.1):
    - Historic discharge rates; or
    - Rates determined in previous Agency permit actions; or
    - Rates specified in District criteria (SFWMD ERP AH, Volume II, Appendix A)
    - Minimum bleeder criteria (SFWMD Subsection 5.1(b) of SFWMD ERP AH, Volume II.
        - Systems which are limited by a discharge structure with an orifice no larger than the minimum dimensions described herein shall be presumed to meet the discharge quantity criteria except for projects which are required to have zero discharge. Applicants are advised that local drainage districts or local governments may have more stringent gravity control device criteria.
- A storm event of 3-day duration and 25-year return frequency shall be used in computing off-site discharge rates (SFWMD ERP AH, Volume II, Section 3.2).
- No net encroachment into the floodplain, between the average wet season water table and that encompassed by the 100-year event, which will adversely affect the existing rights of others, will be allowed (SFWMD ERP AH, Volume II, Section 3.5).
- Provision must be made to replace or otherwise mitigate the loss of historic basin storage provided by the project site (SFWMD ERP AH, Volume II, Section 3.6).

- Onsite works such as swales and dikes shall be used to allow the passage of drainage from offsite areas to downstream areas. Diking of project development areas or other equivalent methods shall be used to contain water at or above stages identified in the project discharge computations (SFWMD ERP AH, Volume II, Section 3.7).
- Stormwater Management (SWM) systems shall be designed to (SFWMD ERP AH, Volume II, Section 3.9):
    - Maintain existing water table elevations in existing wellfield cones of depression.
    - Preserve site environmental values (see Section 10.0 of AH Vol. I). (SFWMD ERP AH, Volume I, Section 10.0).
    - Not waste freshwater.
    - Not lower water tables which would adversely affect the existing rights of others; and
    - Preserve site ground water recharge characteristics
- Detention and control elevations shall be set to accomplish the requirements of Section 3.9 of this Volume and are subject to the following criteria (SFWMD ERP AH, Volume II, Section 3.10):
    - Wetland protection elevations.
    - Consistency with surrounding land and project control elevations and water tables.
    - Possible restrictions by other agencies to include tree protection and landscape ordinances.
    - Consistency with water use permits; and
    - A maximum depth of 6.0 feet below natural ground.
- Lakes which potentially may adversely affect wetland areas shall be separated from the wetland preservation, creation, or restoration areas by a minimum distance as determined by the following criteria (SFWMD ERP AH, Volume II, Section 3.11):
    - A separation distance (shortest distance between the wetland jurisdictional line and the edge of water in the proposed waterbody at the proposed control elevation) producing a gradient less than or equal to 0.005 ft/ft (vertical/horizontal) using the difference in the elevation of the jurisdictional boundary of the wetland and the basin control elevation to calculate the driving head. Staff will consider elevations differing from the jurisdictional boundary of the wetland to calculate the driving head. The applicant will be required to submit monitoring data or other relevant hydrologic data from the site to substantiate the reason for using a different starting elevation. Existing conditions alone will not be considered sufficient reason to use a different elevation if there is evidence that activities on or adjacent to the project site may be responsible for lowering water tables which may be currently having an adverse impact on the subject wetlands. In these cases, preservation of the wetlands cannot be assured by simply maintaining the existing conditions.
    - If the gradient resulting from any separation distance and the driving head as defined above is between 0.005 ft/ft and 0.015 ft/ft, then calculations will be required which demonstrate that the drawdown in the adjacent wetland(s) will be of a magnitude which will not result in adverse impacts on the wetland. A drawdown of more than 12 vertical inches in a 90-day period with no recharge shall be presumed to be an adverse impact.

  - If the gradient is equal to or greater than 0.015 ft/ft, then construction of an impermeable barrier or other equivalent action must be taken to mitigate for the impact of the proposed excavation between the wetland and the excavation.
  - The Agency will review modeling results which demonstrate that a gradient equal to or greater than 0.015 ft/ft will not have an adverse impact on the adjacent wetland. Model input data shall be derived from a detailed soil profile constructed from a minimum of three separate sampling locations with permeability testing results on selected samples. Two-dimensional modeling may be necessary to represent the site geometry.

- An evaluation of the impact of the proposed SWM system on sources of water supply must be submitted with the ERP application. Cumulative impacts which may result from the construction and operation of the proposed SWM system must be evaluated in conjunction with the cumulative withdrawals of existing legal uses of water (SFWMD ERP AH, Volume II, Section 3.12).
- Projects having greater than 40% impervious area, and which discharge directly to the following receiving waters shall provide a minimum of 20% of the load reduction as required by AH Vol. I in a retention BMP (Best Management Practices) as part of the required retention/detention. Receiving waters being addressed are (SFWMD ERP AH, Volume II, Section 4.1.1):
  - Lake Okeechobee and the Kissimmee River.
  - Waterbodies designated as Class I or Class II waters by the Department.
  - Canals back-pumped to Lake Okeechobee or to the Conservation areas or proposed for back-pumping.
  - Other areas, such as the Savannas in St. Lucie and Martin Counties; the Six Mile Cypress Strand; the Big Cypress National Preserve area in Collier County; lands acquired by the District pursuant to Section 373.59, F.S. Water Management Lands Trust Fund (Save Our Rivers); and mitigation bank lands.
  - Outstanding Florida Waters as defined in Chapter 62-302, F.A.C.; and Aquatic Preserves as created and provided for in Chapter 258, F.S.; and
  - Waterbodies within a District-permitted public water supply wellfield cone-of-depression which are not separated from the aquifer by strata at least 10 feet thick and having an average saturated hydraulic conductivity of less than 0.10 foot per day, where the cone-of-depression is defined by one of the following:
    - In those areas of the District where no local wellfield protection ordinance has been adopted by the local governing body, the one-foot drawdown line as expressed in the water table aquifer under conditions of no rainfall and 100 days of pumpage at the permitted average daily pumpage rate (where significant canal recharge is indicated, canal recharge representative of a 1 in 100-year drought will be considered).
  - In cases of widening existing urban public highway projects, the District shall reduce the water quality requirements if the applicant provides documentation which demonstrates that all reasonable design alternatives have been considered, and which provides evidence that the alternatives are all cost prohibitive.

  - Pursuant to Subsection 62-555.312(3), F.A.C., stormwater retention and detention systems are classified as moderate sanitary hazards with respect to public and private drinking water wells. Stormwater treatment facilities shall not be constructed within 100 feet of a public drinking water well and shall not be constructed within 75 feet of a private drinking water well.
- Natural areas and existing waterbodies may be used for retention/detention purposes when not in conflict with environmental (see Subsection 10.2.2.4 of AH Vol. I), water quality, (see Subsections 10.2.4 through 10.2.4.5 of AH Vol. I), or public use considerations. Candidate areas for such purposes include (SFWMD ERP AH, Volume II, Section 4.2):
  - Previously degraded areas. For the purpose of this section, impaired waterbodies as defined by the Department are not considered previously degraded areas.
  - Man-made areas such as borrow pits
  - Extensive areas which have the ability to absorb impacts easily; and
  - Areas incorporated into a system with mitigation features.
- The creation of waterbodies shall meet both of the following criteria (SFWMD ERP AH, Volume II, Section 4.5):
  - Entrapped salt water, resulting from inland migration of salt water or penetration of the freshwater/saltwater interface, will not adversely impact existing legal water users; and
  - Excavation of the water body shall not penetrate a water-bearing formation exhibiting poorer water quality for example, in terms of chloride concentrations.
- Runoff shall be discharged from impervious surfaces through retention areas, detention devices, filtering and cleansing devices, or subjected to some other type of BMP prior to discharge from the project site. For projects which include substantial paved areas, such as shopping centers, large highway intersections with frequent stopped traffic, and high-density developments, provisions shall be made for the removal of oil, grease, and sediment from storm water discharges (SFWMD ERP AH, Volume II, Section 4.6).
- The flow path of water from the inlets to the outlet of the pond must be maximized to promote good mixing with no dead spots, minimize short circuiting, and maximize pollutant removal efficiency and mixing. If short flow paths are unavoidable, the effective flow path can be increased by adding diversion barriers such as islands, peninsulas, or baffles to the pond. Inlet structures shall be designed to dissipate the energy of water entering the pond (SFWMD ERP AH, Volume II, Section 5.3.1).
- Unless otherwise noted, all dimensions are measured at or from the control elevation (SFWMD ERP AH, Volume II, Section 5.3.2).
  - Area: 0.50-acre minimum.
  - Depth: Minimum depth necessary to meet the permanent pool volume requirements of AH Vol. I.
  - Littoral Zone:
    - Area: Shall be the lesser of 20% of the wet retention/detention area or 2.5% of the total of the retention/detention area (including side slopes) plus the basin contributing area. If the applicant seeks to use littoral zones as a water quality

BMP, as described in AH Vol. I, the area of littoral zone shall be no less than 20% of the wet retention/detention area.

- Depth: Shallow, littoral zones are desirable for water quality enhancement purposes. Such areas are defined for purposes of this criteria as the portion of wet retention/detention bodies shallower than 6.0 feet as measured from below the control elevation.
- Plantings: Shall consist of aquatic plants native to Florida and appropriate for the conditions in the wet retention/detention area.

o Side slopes:

- For purposes of public safety, water quality enhancement and maintenance, all wet retention /detention areas shall be designed with side slopes no steeper than 4:1 (horizontal:vertical) from top of bank out to a minimum depth of 2.0 feet below the control elevation, or an equivalent substitute.
- Constructed side slopes steeper than 3.5:1 shall be considered a substantial deviation during the consideration of operation permit issuance.
- Side slopes shall be topsoiled and stabilized through seeding or planting from 2.0 feet below to 1.0 feet above the control elevation to promote vegetative growth.
- Side slope vegetation growth survival shall be a consideration of operation permit issuance.
- Side slope dimensional criteria for above ground impoundments (AGIs) are set forth in Appendix B of the SFWMD ERP AH Vol II.

- Minimum perimeter maintenance and operation easements of 20.0 feet width at slopes no steeper than 4:1 shall be provided beyond the control elevation water line. These easements shall be legally reserved to the operation entity and for that purpose by dedication on the plat, deed restrictions, easements, or other equivalent documents, so that subsequent owners or others may not remove such areas from their intended use. Water management areas, including 20.0-foot-wide maintenance easements at a minimum, shall be connected to a public road or other location from which operation and maintenance access is legally and physically available (SFWMD ERP AH, Volume II, Section 5.4).

A Pre-Application Meeting was held with SFWMD on November 16, 2017, to confirm the criteria provided above for the previously related PD&E study (FPID 423374-1; Florida Turnpike (SR 91) PD&E Study from North of Jupiter to North of Fort Pierce in Palm Beach, Martin, and St. Lucie Counties; ETDM No. 14295). Please refer to **Appendix E** for the Pre-Application Meeting Minutes. In addition to the criteria provided above, SFWMD confirmed that the required water quality volume is 2.5 inches over the new impervious area in areas of reconstruction and widening, but clarified that full treatment of new and existing impervious should be provided, if feasible. SFWMD stated that if in the existing condition, water quality is being provided for the existing impervious area, then that treatment volume should be included, even if there is no existing permit. The required treatment estimates provided in this report are conservative and include full treatment of both existing and proposed impervious area. However, it is anticipated that only 2.5 inches over the new impervious area will be required in the final design. The conservative nature

of the estimates can offset potential increases in pond sizes due to unknowns, such as geotechnical findings and survey.

During the Pre-Application Meeting, SFWMD confirmed that nutrient loading calculations are required for any direct discharge to water bodies that are impaired for nutrients, specifically total nitrogen (TN) or total phosphorus (TP). This criterion is not applicable to the project area.

The study limits fall within several WBIDs; however, they are not currently impaired for TN or TP:

- WBID 3210D – South Fork St Lucie River (freshwater segment)
- WBID 3224C1 – Cypress Creek
- WBID 3224C2 – Moonshine Creek

There is a Basin Management Action Plan (BMAP) for St. Lucie River and Estuary Basin, but Florida's Turnpike Enterprise (FTE) is a de minimis stakeholder and has not been assigned an allocation for total nitrogen (TN) nor total phosphorus (TP).

4.2.2 FDOT CRITERIA

- PGA is coordinating with the District's NPDES Coordinator, Environmental Permits Coordinator, and the District Drainage Engineer regarding the proposed stormwater management strategy as the project area falls partially within the St. Lucie – Loxahatchee BMAP (FDOT Drainage Manual, Chapter 5.4.1.1).
- Water quantity (volume and rate control) criteria are not applicable where it can be demonstrated that downstream conveyance and storage systems have adequate capacity or will be improved to have adequate capacity increased quantity and rate of runoff created by the project (FDOT Drainage Manual, Chapter 5.4.1.2.4).
- Water quantity and rate control criteria can be waived when the downstream property owner(s) agrees to accept the increased quantity and rate of runoff created by the project. This will require flood rights coordination with legal and R/W. Refer to Appendix B – Acquisition of Real Property Rights (FDOT Drainage Manual, Chapter 5.4.1.2.5).
- Stormwater Management Facility (SMF) pond control structures consist of ditch bottom inlets in conjunction with outfall pipes. Do not use trapezoidal weirs, shaped into the pond berm, as primary control structures except where inlets and pipes are not feasible, and has been approved by District Drainage Engineer. Start initial pond routing at the control elevation unless otherwise required by the Water Management District permit. No pump or any other mechanical means may control any component of a permanent stormwater system (FDOT Drainage Manual, Chapter 5.4.1.3).
- The Base Clearance Water Elevation (BCWE) for roadside treatment swales will be set at the weir elevation (FDOT Drainage Manual, Chapter 5.4.1.5).
- Design stormwater management facilities with due consideration of the need for protective treatment to prevent hazards to persons. General guidance on protective treatment is provided

in Section 3.7. Use flat slopes when practical. Only fence retention areas in accordance with Section 5.4.4.2 (4) (FDOT Drainage Manual, Chapter 5.4.3).

- Design SMFs consistent with the Highway Beautification Policy and Context Sensitive Solutions Policy. Integrate facilities with existing and proposed landscaping and adjoining land uses. Depending on the availability of time, space, and funding, consider attractive pond shapes, tree plantings, selective clearing, and other strategies to preserve or improve aesthetics. Rely on an interdisciplinary team consisting of the Landscape Architect, Drainage Engineer, and local maintenance office. Collaborate with the Landscape Architect to address an aesthetic design approach early enough within the project production schedule to include it in the determination of pond right-of-way acquisition needs (FDOT Drainage Manual, Chapter 5.4.4.2).
- Design ponds to provide a minimum 20 feet of horizontal clearance between the top edge of the control elevation and the right-of-way line. Provide at least 15 feet adjacent to the pond at a slope of 1:8 or flatter. Create the inside edge of the maintenance berm to have a minimum radius of 30 feet toward the pond and be a minimum of one foot above the maximum design stage elevation. Sod the berm area. Discuss maintenance needs with the Department before acquiring additional right-of-way to construct maintenance access around the full perimeter (FDOT Drainage Manual, Chapter 5.4.4.2.1).
- For facilities designed to be wet, sod pond slopes to the control elevation of the pond. For facilities designed to be dry, sod pond slopes to the bottom of the slope (FDOT Drainage Manual, Chapter 5.4.4.2.2).
- As a safety factor for hydrologic inaccuracies, grading irregularities, control structure clogging, and downstream stage uncertainties, at least one foot of freeboard is required above the maximum design stage of the pond. For linear treatment swales, the minimum freeboard is 0.5 foot (FDOT Drainage Manual, Chapter 5.4.4.2.3).
- With facilities designed to be wet, provide a minimum permanent pool depth of six feet to minimize aquatic growth (FDOT Drainage Manual, Chapter 5.4.4.2.4).
    - It should be noted that this conflicts with the SFWMD criteria for max depth below natural ground. Coordination will be required during the design phase to determine and document controlling criteria.

4.2.3 FAA RECOMMENDATIONS

The Tailwinds Airpark is located approximately 2.85 miles (15,067 feet) from the south end of the project (see Table 4). Federal Aviation Authority (FAA) Advisory Circular (AC) No. 150/5200-33C issued on February 21, 2020 provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. Stormwater management facilities are one such attractant. The guidance is for public-use airports and is not a regulation, is not mandatory, and is not legally binding. Conformity with this AC is voluntary.

Table 4: Airports Within Five Miles of the Project

Airport Name	Approx. Distance to Proposed Project
Tailwinds Airpark	2.85 miles

For airports serving piston-powered aircraft, the Advisory Circular recommends a separation distance of 5,000 feet from these airports for any of the hazardous wildlife attractants. For airports serving turbine-powered aircraft, the FAA recommends a separation distance of 10,000 feet from these airports for any of the hazardous wildlife attractants. The proposed project distance exceeds both thresholds.

For all airports, the FAA recommends a distance of 5 miles between the closest point of the airport's aircraft operations area and the hazardous wildlife attractant. Special attention should be given to hazardous wildlife attractants that could cause hazardous wildlife movement into or across the approach or departure airspace. The closest proposed stormwater management facility is located 4.04 miles (21,322 feet) from the airport. The airport's runway runs east-west. The project is located to the north of the airfield. The ponds will not affect the approach or departure airspace. In addition, numerous natural and manmade wildlife attractants are located between the airfield and the proposed project.

Due to the airport being private and the distance from the proposed project, the design measures identified in the Advisory Circular to reduce wildlife attractants should not apply.

5.0 ENVIRONMENTAL LOOK AROUND

The Florida Department of Transportation's Environmental Look Around (ELA) and Watershed Approach to Evaluate Regional Stormwater Solutions (WATERSS) were established to integrate watershed-level planning into the transportation project development process. Its primary purpose is to identify opportunities for regional stormwater solutions that improve water quality, enhance flood protection, and reduce the environmental impacts of roadway projects. By considering stormwater management at a watershed scale, this approach promotes cost-effective, sustainable infrastructure while aligning with state and federal regulatory requirements. The ELA process further strengthens interagency coordination and early environmental screening, ensuring that stormwater solutions are consistent with long-term watershed management goals and resilient to future growth and climate challenges.

As part of the PD&E conducted in 2017 for the widening of SR 91 from Jupiter to Ft. Pierce (FPID 423374-1) the ELA process was evaluated for the approximately 11-mile study area. During the study, emails were distributed to local stakeholders, which included SFWMD, Martin County, and FDOT District Four, for the purpose of determining watershed-wide stormwater needs and alternative permitting approaches based on regional stormwater needs and opportunities. No opportunities were identified during this 2017 PD&E in the vicinity of the current study area. Email correspondence as well as meeting minutes from the original coordination are included in **Appendix E**.

The ELA/WATERSS process was conducted as part of this PD&E to identify any potential opportunities that may have arisen since the last PD&E study. Meetings were held with SFWMD, FDOT District Four, and Martin County, and Hobe-St. Lucie Conservancy District (HSLCD). Meeting minutes are provided in **Appendix E**.

The project corridor is adjacent to two miles of SFWMD-owned property and two miles of Florida Forever lands. One alternative is to make use of SFWMD-owned lands and Florida Forever acquisitions. There is a plan to construct a flow through marsh on the Florida Forever land to capture agricultural discharge and provide attenuation. The Florida Forever property was purchased with SWERP funds. There are no current opportunities for funding the flow through marsh. A meeting with SFWMD and the Comprehensive Everglades Restoration Plan (CERP) staff was held on July 23, 2025, to discuss stormwater opportunities. Staff stated the primary objective of the wetlands are natural water retention and hydrologic restoration. No opportunities were identified during the meeting.

An additional meeting was held with the SFWMD and the United States Army Corps of Engineers during the FDOT District Four monthly interagency meeting held on August 21, 2025. Based on conversations with SFWMD staff, they were not aware of any opportunities at present or in the near future.

Based on the meeting held with FDOT District Four on February 14, 2025, no opportunities were identified.

A meeting was held with HSLCD and Martin County on September 12, 2025, to discuss opportunities associated with the farmland located adjacent to the corridor. Though the farmland is owned by private individuals, the irrigation canals and deep injection wells operated by these individuals are permitted and monitored by the HSLCD. The HSLCD staff were not aware of any immediate need from the private landowners for additional water; however, they stated they would coordinate with these individuals. Though immediate opportunities were available, continued coordination with the HSLCD is recommended. Martin County owns the roadside ditches located adjacent to SE Bridge Road. No opportunities were identified.

6.0 EXISTING AND PROPOSED CONDITIONS

6.1 EXISTING DRAINAGE CONDITIONS

The existing Turnpike roadway within the project limits in Martin County extends from milepost (MP) 123.44 to MP 127.53, covering approximately four miles. This section includes four travel lanes, a 20-foot paved median with a concrete barrier wall, and 10-foot paved outside shoulders on both sides. Stormwater runoff sheet flows from the roadway into roadside ditches, which then drain into existing culverts and cross drains along the corridor. These culverts and drains discharge into nearby irrigation canals or creeks, such as Phipp Canal, prior to discharging to Kitching Creek and South Fork St. Lucie River. Notably, Kitching Creek discharges into the Loxahatchee River which is designated as an Outstanding Florida Waters (OFW) and a Wild and Scenic River.

The project area is divided into four sub-basins based on the existing roadway profile, ditch configurations, and the locations of culverts and cross drains. All sub-basins within the project limits are classified as open basins.

Table 5 identifies the project limits and corresponding stationing for the proposed improvements. For reference within this report, the existing project limits and proposed interchange ramps have been delineated according to the respective basin boundaries, with locations specified using mile markers and stationing references.

Table 5: Project Stationing Split by Basin and Project Section

Project Section	Basin 1	Basin 2	Basin 3	Basin 4
Turnpike	MP 124.59 – MP 125.39	n/a	MP 125.39 – MP 126.5	MP 126.5 – MP 127.68
I-95	n/a	MP 95.0 – MP 96.33	MP 96.33 – MP 96.93	MP 96.93 – MP 97.81
Ramp A	n/a	n/a	STA 100+00.00 – STA 123+21.30	STA 123+21.30 – STA 144+39.73
Ramp B	n/a	n/a	STA 200+00.00 – STA 234+40.00	STA 234+40.00 – STA 246+08.93
Ramp C	STA 323+56.37 – STA 360+41.14	n/a	STA 360+41.14 – STA 414+20.00	n/a
Ramp D	STA 435+70.00 – STA 469+00.00	n/a	n/a	n/a

The project is located within the SFWMD and the Hobe-St. Lucie Conservancy District, shown in **Table 6**.

Table 6: Secondary Drainage Districts within project limits

Secondary District Name	Approximate Project Limits (MP)	Basins within Secondary District
Hobe-St. Lucie Conservancy District	MP 122.5 to MP 125.2	Basins 1-2

Note: Hobe-St. Lucie Conservancy District extends beyond project limits to the south.

Based on the SFWMD permit records, the Turnpike mainline is permitted from MP 114 to MP 137 (Permit No. 43-00568-S, Application 900108-S). This permit is for 2.5-inches of pre-treatment of the 20 foot paved shoulders and median barrier via the roadside ditch adjacent to the southbound lanes. However, this treatment area will be filled with the proposed widening. Treatment volume required for replacement of impacts to systems serving existing pavement will be provided in the proposed pond areas. Refer to **Appendix E** for excerpts of the permit documents. During the pre-application meeting with SFWMD, it was determined that this is the permit that should be modified for the proposed improvements.

Other permitted areas within the project include parcels identified as potential pond sites, as well as areas along the Turnpike and I-95 mainlines where previous improvements have been completed. **Table 7** lists the additional existing permits.

Table 7: Existing SFWMD Permits within project limits

Permit Name or Area	Approx. Location	SFWMD Permit Number
Turnpike Bridge Replacements, General Permit Mod	MP 123.44 – MP 127.53	43-00568-S
Florida's Turnpike Median Barrier & Paving, General Permit Mod	MP 123.44 – MP 127.53	43-00568-S
Turnpike Protection Project - Martin County, Environmental Resource (De minimis Exemption)	MP 123.44 – MP 127.53	43-02323-P
W I M Visual Barrier, I-95, 429204-1-52-01 Environmental Resource (General Permit Modification)	MP 123.44 – MP 127.53	43-00196-S
Harmony Ranch (Box Ranch) Canal Relocation, Environmental Resource (Construction/Operation Modification)	MP 126.5 – MP 127.58	43-00087-S-12

6.1.1 CONTRIBUTING OFF-SITE AREAS

In general, adjacent off-site areas provide no direct contribution to runoff and are conveyed from west to east via cross drains along the Turnpike mainline (SR 91). Cross drains may be necessary to maintain flows across the ramp areas. This is discussed in the **Location Hydraulics Report** submitted under separate cover. There is one offsite development with a drainage connection permit which is discussed in the following section.

6.1.2 DRAINAGE CONNECTION PERMITS

The FTE Drainage Connection Permit KMZ file was reviewed to identify developments discharging into the project's right-of-way. **Table 8** provides details regarding the single permit located within the project limits.

Table 8: Drainage Connection Permits

Drainage Connection Permit No.	Project Name	Location	Permit No.
TP-89-DC-030-05	Harmony Ranch	NW Quadrant of Interchange between SE Bridge RD and Turnpike (West of STA 480+00)	43-00087-S-05 (SFWMD)

The Drainage Connection Permit identified in **Table 8** allows discharge into the roadside ditches along the Turnpike mainline. The proposed widening of the Turnpike mainline (SR 91) may impact these ditches. During the final design phase, the proposed drainage system will need to accommodate the discharges covered under this permit. If design constraints necessitate intercepting these discharges into the on-site conveyance system, they will need to be routed through the proposed ponds, which would increase the required pond volumes.

6.1.3 EXISTING WELLS

According to the SFWMD ERP Applicant's Handbook, Volume II, Section 4.2.2, stormwater treatment facilities must not be constructed within 100 feet of a public drinking water well or within 75 feet of a private drinking water well. Information from the Florida Department of Environmental Protection Map Direct website, which identifies public and private water supply wells, was reviewed. According to the information gathered, there were no wells within a 1,000-foot offset from the Turnpike baseline nor any wells within 100 feet of any of the pond sites analyzed in this report.

6.1.4 EXISTING BASINS DRAINAGE CHARACTERISTICS

BASIN 1

Basin 1 is an open drainage basin that begins at Turnpike Baseline of Survey Station 124.59 and ends at Station 125.39. The drainage area includes the roadway right-of-way between these stations, as well as a portion of land between the Turnpike and I-95 that will be incorporated into the proposed improvements.

The total existing basin area is approximately 106.32 acres, which includes a proposed pond site of 8.25 acres.

Within the existing Turnpike right-of-way, stormwater runoff is collected by roadside ditches and conveyed through two culverts and two bridge culverts before discharging to a wetland that drains into Kitching Creek, a tributary of the Loxahatchee River. The names and locations of the drainage structures have been listed in **Table 9.** Stormwater runoff within the infield area generally flows from east to west, ultimately draining into the existing stormwater management ponds.

At the time of this report, there appears to be no contributing offsite areas draining towards the basin.

Table 9: Existing Drainage Structures Within Basin 1

Structure Identification	Location	Waterbody Crossing
Box Culvert #890084	MP 124.6	Unnamed Drainage Ditch
Culvert #89Q006	MP 124.6	Unnamed Drainage Ditch
Bridge Culvert #890075	MP 125.2	Unnamed Drainage Ditch
Box Culvert #89Q007	MP 125.3	Unnamed Drainage Ditch

BASIN 2

Basin 2 is an open drainage basin that begins at I-95 Baseline of Survey Station 95.0 and ends at Station 96.33. The drainage area includes the roadway right-of-way between these stations, as well as a portion of SE Bridge Road and a small section of land between the Turnpike and I-95 that will be incorporated into the proposed improvements. The total existing basin area is approximately 102.26 acres, which includes a proposed pond site of 2.09 acres.

Stormwater runoff within the existing I-95 right-of-way is managed through grassed roadside swales and median swales, which serve to detain runoff within the right-of-way. The small section of land between the Turnpike and I-95 generally flows from east to west, ultimately discharging into the existing stormwater management ponds. The I-95/SE Bridge Road (SR 708) interchange includes four infield sedimentation areas that capture all stormwater runoff.

At the time of this report, there appears to be no contributing offsite areas draining towards the basin.

BASIN 3

Basin 3 is an open drainage basin that begins at Turnpike Baseline of Survey Station 125.39 and ends at Station 126.5. The drainage area includes the Turnpike right-of-way between these stations, a section of the I-95 right-of-way between Milepost 96.33 and Milepost 96.93, and the infield area between the two corridors, which will be incorporated into the proposed improvements. The total existing basin area is approximately 190.89 acres, which includes a proposed pond site of 15.73 acres.

Within the existing Turnpike right-of-way, stormwater runoff is collected by roadside ditches and conveyed to three primary discharge points, depending on location:

- *South of SE Bridge Road:* Runoff is conveyed through a bridge culvert to a wetland that drains into Kitching Creek, a tributary of the Loxahatchee River.
- *North of SE Bridge Road:* Runoff is conveyed through a bridge culvert to a wetland draining into the South Fork of the St. Lucie River. The South Fork flows from south to north and discharges into the Atlantic Ocean via the St. Lucie Canal (C-44) and the St. Lucie River. Notably, the C-44 Canal is listed as impaired for copper.
- *Near MP 96.92:* Runoff is directed through a concrete box culvert and a bridge culvert to Phipp Canal, which drains eastward to the South Fork of the St. Lucie River.

Stormwater runoff from the infield area generally flows from east to west, ultimately draining into existing stormwater management ponds.

Stormwater within the existing I-95 right-of-way is managed using grassed roadside swales and median swales, which provide detention within the right-of-way. Additionally, dual bridges have been utilized to maintain the existing flow of Phipp Canal. The names and locations of all drainage structures within the basin are listed in **Table 10.**

At the time of this report, there are no known contributing offsite areas draining toward Basin 3.

Table 10: Existing Drainage Structures Within Basin 3

Structure Identification	Location	Waterbody Crossing
Box Culvert #89Q007	MP 125.3	Unnamed Drainage Ditch
Bridge Culvert #890076	MP 125.9	Unnamed Drainage Ditch
Box Culvert #89Q008	MP 126.45	Phipp Canal
Bridge Culvert #890082	MP 126.47	Phipp Canal
Bridge #890131/#890130	MP 96.92	Phipp Canal

BASIN 4

Basin 4 is an open drainage basin that begins at Turnpike Baseline of Survey Station 126.5 and ends at Station 127.68. The drainage area includes the Turnpike right-of-way between these stations, a section of the I-95 right-of-way between Milepost 96.93 and Milepost 97.81, and the infield area between the two corridors, which will be incorporated into the proposed improvements. The total existing basin area is approximately 81.71 acres, which includes a proposed pond site of 11.11 acres.

Within the existing Turnpike right-of-way, stormwater runoff is collected by roadside ditches and conveyed to two primary discharge points, divided at a natural high point located near Milepost 127.5 on the Turnpike:

- *South of the high point:* Runoff is conveyed via roadside ditches through two culverts and a bridge culvert to Phipp Canal, which drains to the South Fork of the St. Lucie River.
- *North of the high point:* Runoff is conveyed through roadside ditches and discharged via a bridge culvert over an unnamed drainage canal into adjacent Turnpike-owned ditches. The flow ultimately reaches the South Fork of the St. Lucie River.

Stormwater runoff from the infield area generally flows from east to west, ultimately discharging into the existing stormwater management ponds.

Within the existing I-95 right-of-way, stormwater is managed through grassed roadside swales and median swales, which provide detention within the corridor. Additionally, this basin utilizes portions of the same bridges identified in the previous section for maintaining the flow of Phipp Canal.

At the time of this report, there are no known contributing offsite areas draining toward Basin 4.

The names and locations of all drainage structures within Basin 4 are listed in **Table 11.**

Table 11: Existing Drainage Structures Within Basin 3

Structure Identification	Location	Waterbody Crossing
Bridge Culvert #890082	MP 126.47	Phipp Canal
Culvert #89Q009	MP 126.97	Unnamed Drainage Ditch
Bridge Culvert #890077	MP 127.3	Unnamed Drainage Canal
Bridge #890131/#890130	MP 96.92	Phipp Canal

Table 12 summarizes the existing drainage basin characteristics.

Table 12: Existing Drainage Basin Characteristics

Basin Name	Basin Area (ac)	Ultimate Outfall	Receiving Water Classification
Basin 1	106.32	Kitching Creek	Class III
Basin 2	102.26	Kitching Creek	Class III
Basin 3	190.89	S Fork St Lucie River	Class III, Class III, Impaired - Copper
Basin 4	81.71	S Fork St Lucie River	Class III, Class III, Impaired - Copper

6.2 PROPOSED DRAINAGE CONDITIONS

The existing Turnpike roadway from Milepost (MP) 123.44 to MP 127.53 consists of four travel lanes, a 20-foot paved median with a concrete barrier wall, and 10-foot paved outside shoulders on both sides. The proposed typical section includes an eight-lane divided highway with four 12-foot travel lanes, a 12-foot inside shoulder, and a 12-foot outside shoulder in each direction, separated by a barrier wall. Runoff from the outside lanes and shoulders will continue to sheet flow toward roadside ditches, where it will be collected by ditch bottom inlets and conveyed to stormwater management ponds. Runoff from the inside lanes and shoulders will be collected via barrier wall inlets and similarly routed to stormwater management ponds. Due to the high seasonal high water table elevations observed along the corridor, off-site pond locations have been conservatively identified utilizing a 20% contingency factor within the defined pond siting limits. The design of stormwater management facilities shall adhere to the Highway Beautification Policy and Context Sensitive Solutions Policy. Facilities should be integrated with existing and proposed landscaping and adjacent land uses. Depending on the availability of time, space, and funding, consideration shall be given to attractive pond shapes, tree plantings, selective clearing, and other strategies to preserve or improve aesthetics. A 10% sizing factor has been added to the overall pond size to accommodate landscaping.

The proposed basin limits are the same as in the existing conditions.

Existing drainage canals will be affected by the proposed improvements and will need to be relocated. Specifically, in the southwest quadrant of the existing intersection at SE Bridge Road and the Turnpike, the proposed Ramp C and emergency access lanes will impact a drainage canal that currently borders the adjacent parcel (Parcel ID: 33-39-41-000-001-00000-1) and the Turnpike. Additionally, a drainage canal located just south of Phipp Canal on Parcel ID: 28-39-41-000-001-00020-7 will be impacted by the construction of Ramp C and the Turnpike widening. The eastern portion of this canal will need to be relocated outside the right-of-way limits. Refer to the **Location Hydraulics Report** submitted under separate cover for offsite drainage patterns and canal relocation.

6.2.1 POND SITING

Three pond sites have been provided for each basin within the project's study limits, as available information, such as seasonal high-water table (SHWT) elevations, is relatively consistent across pond alternatives. A Geotechnical Technical Memorandum prepared by Tierra, Inc. in September 2024 utilized the USDA Soil Survey of Martin County along with existing soil borings completed in the general project vicinity. As of this report, site-specific borings have not been conducted at the proposed interchange. Preliminary findings suggest that near-surface subsurface conditions primarily consist of sandy soils within the top 7 feet, with occasional pockets of plastic soils found 3 to 4 feet below natural grade. Although the USDA Soil Survey does not indicate organic soils, low-lying or ponded areas may contain surficial organic material. Pre-development (natural) seasonal high groundwater table (SHGWT) levels are reported to be within 1.5 feet of natural ground surface, with some soil units showing SHGWT levels above grade. For calculation purposes of this report, SHWT levels have been estimated using surrounding LIDAR terrain elevations and subtracting 1.0 feet per the Martin County USDA Soil Survey Report created in 2023. Refer

to **Appendix F** for the Geotechnical Technical Memorandum and the Martin County USDA Soil Survey Report.

Existing FGT gas lines and easement are located on the east side of the SR 91 corridor. FGT requires the following for drainage culverts and ditches crossing their lines:

- Ditch crossings must have 3 feet of vertical clearance over the gas lines.
- Culverts crossings must have at least 2 feet of vertical clearance over the gas lines.

BASIN 1

In the proposed condition, the basin area remains 106.32 acres with an 8.80 acre proposed pond site and no offsite areas. The improvements will increase the impervious area by 17.02 acres. No geotechnical borings were performed for the pond site alternatives within this basin. The SR 91 corridor is bounded by the Hope/St. Lucie Canal on the west side and the FGT gas lines on the east side. In the ultimate condition, project runoff will be conveyed by roadside ditches to a proposed wet detention pond adjacent to the project. The pond will be designed to detain the required attenuation volume along with the required treatment volume. Additionally, the pond size estimate has been increased to accommodate pond aesthetics, and any potential adverse siting conditions. The pond will outfall near existing bridge culvert #890075 and stormwater runoff will maintain historical drainage patterns towards Kitching Creek.

BASIN 2

In the proposed condition, the basin area remains 102.26 acres with a 2.09 acre proposed pond site and no offsite areas. The improvements will increase the impervious area by 2.28 acres. In the ultimate condition, project runoff from proposed Ramps C and D will be conveyed to a proposed wet detention pond adjacent to the project. Treatment and attenuation for the SE Bridge Road and the I-95 corridor (SR 708) portion will continue to be provided in the existing interchange infield areas and the existing grassed swales. This basin discharges to the roadside ditch of SE Bridge Road and continues east until the ditch enters a wetland located adjacent to the roadway. This wetland discharges to Kitching Creek. The pond will be designed to detain the required attenuation volume along with the required treatment volume. Additionally, the pond size estimate has been increased to accommodate pond aesthetics, and any potential adverse siting conditions. The pond will outfall near existing bridge culvert #890075 and stormwater runoff will maintain historical drainage patterns towards Kitching Creek.

BASIN 3

In the proposed condition, the basin area remains 190.89 acres with a 17.38 acre proposed pond site and no offsite areas. The improvements will increase the impervious area by 26.28 acres. No geotechnical borings were performed for the pond site alternatives within this basin. This basin discharges into Phipp Canal. In the ultimate condition, project runoff will be conveyed by roadside ditches to a proposed wet detention pond adjacent to the project. The pond will be designed to detain the required attenuation volume along with the required treatment volume. Additionally, the pond size estimate has been increased to accommodate pond aesthetics, and any potential adverse siting conditions. The pond will

outfall near existing bridge culvert #890076 and stormwater runoff will maintain historical drainage pattern into Phipp Canal and continue to the South Fork of the St. Lucie River.

BASIN 4

In the proposed condition, the basin area remains 81.71 acres with an 11.99 acre proposed pond site and no offsite areas. The improvements will increase the impervious area by 17.23 acres. No geotechnical borings were performed for the pond site alternatives within this basin. This basin discharges into Phipp Canal. In the ultimate condition, project runoff will be conveyed by roadside ditches to a proposed wet detention pond adjacent to the project. The pond will be designed to detain the required attenuation volume along with the required treatment volume. Additionally, the pond size estimate has been increased to accommodate pond aesthetics, any potential adverse siting conditions. The pond will outfall near existing culvert #89Q008 and stormwater runoff will maintain historical drainage pattern into Phipp Canal and continue to the South Fork of the St. Lucie River.

Table 13: Proposed Drainage Basin Characteristics

Basin Name	Ultimate Outfall	Required Water Quality Volume (ac-ft)	Provided Water Quality Volume (ac-ft)
Basin 1	Kitching Creek	5.40	5.40
Basin 2	Kitching Creek	0.48	0.48
Basin 3	S Fork St Lucie River	7.92	7.92
Basin 4	S Fork St Lucie River	6.15	6.15

7.0 FLOODPLAIN AND ENVIRONMENTAL INFORMATION

7.1 FLOODPLAINS

The study area is depicted on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panels for Martin County. The panel numbers and their effective dates are provided in **Table 14.** Refer to **Appendix C** for the FEMA FIRMs.

Table 14: FEMA Panels

FEMA Panel Name	FEMA Panel Number	Effective Date
FIRM Martin County, Florida and Incorporated Areas	12085C0315G	March 16, 2015
FIRM Martin County, Florida and Incorporated Areas	12085C0284H	February 19, 2020
FIRM Martin County, Florida and Incorporated Areas	12085C0303H	February 19, 2020

Floodplain considerations for the project are based on the current effective Flood Insurance Study (FIS) for Martin County (February 19, 2020). The entirety of the study area is shown to be within FEMA Flood Zone X; therefore, there are no floodway encroachments associated with this project. The Martin County floodplain coordinator was contacted to confirm the limits of Flood Zone X within the county and to ensure the proposed action would be consistent with their water management plan.

Every wetland and cross drain have an associated floodplain per the Florida Department of Transportation and the Federal Highway Administration. Cross drain extensions are associated with transverse floodplain impacts. These impacts to flood elevations will be minimized by designing cross drain facilities in accordance with the FDOT Drainage Manual and no adverse impacts to floodplains are anticipated as a result of this project. Modifications to existing drainage structures, extending cross drains, and widening of bridges included in this project will result in an insignificant change in their capacity to carry floodwater. These modifications will cause minimal increases in flood heights and flood limits which will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant change in flood risks or damage. There will be no significant change in the potential for interruption or termination of emergency services or emergency evacuation routes as the result of modifications to existing drainage structures. Therefore, it has been determined that this encroachment is not significant. For additional information on the floodplains, refer to the **Final Location Hydraulics Report**.

No sovereign submerged lands were identified within the project corridor based on the Florida Department of Environmental Protection's Map Direct Gallery.

7.2 WETLANDS/SURFACE WATER IMPACTS

A Preliminary Pond Site Alternatives Environmental Memorandum created in August 2024, identified several potential areas for wetland impacts utilizing draft pond site alternatives. At the time of this report, all pond site alternatives are delineated with the intent to avoid direct impacts to these areas where possible. Please refer to **Appendix A** for the Drainage Map, which delineate existing wetland boundaries within the project corridor. Further information regarding the pond site alternatives and their associated wetland impacts is provided **Table 18** through **Table 21** in **Section 9.0** of this report.

Between Milepost (MP) 123.44 and MP 127.53, several of the proposed pond alternatives will potentially result in surface water impacts. The Preliminary Pond Site Alternatives Environmental Memorandum previously discussed, includes a land use table that identifies streams and waterways within the project area. While these are classified as surface waters, they were originally constructed for agricultural purposes and may not represent natural hydrologic conditions or pose significant impediments to the existing environment. Further information regarding the pond site alternatives and their associated surface water impacts is provided in **Table 18** through **Table 21** in **Section 9.0** of this report.

7.3 PROTECTED SPECIES

A Preliminary Pond Site Alternatives Environmental Memorandum was submitted under separate cover by Kisinger Campo & Associates, Corp. in August 2024 to identify potential impacts to listed species within the project area. The memorandum identified the following protected species as potentially present within the proposed pond alternatives: Florida Grasshopper Sparrow, Audubon's Crested Caracara, Red-cockaded Woodpecker, Everglade snail kite, Florida Bonneted Bat, Wood Stork. The memorandum provides a detailed assessment of potential impacts to these species in relation to the proposed improvements. The listed species could be impacted for all pond alternatives, with the exemption of the Red-cockaded Woodpecker, which may be impacted by pond alternatives, Pond 3B – Alternative 1 and Pond 4 – Alternative 3 only.

7.4 CULTURAL RESOURCES

A Preliminary Cultural Resources and Archaeological Sites Evaluation Memo (CRAS) was completed by others in August 2024 to assess the presence of previously recorded cultural resources within or adjacent to the pond siting alternatives considered and evaluate the archaeological site probability for each pond location. Initial analysis indicates that all pond alternatives have low potential for affecting archeological or historical resources in the area. See **Table 18** for CRAS results for each pond alternative.

7.5 CONTAMINATION

A Contamination Screening Evaluation Report dated June 17, 2025, was prepared for this project by Florida's Turnpike Enterprise Environmental Management Office (EMO). Several medium-rated risks were identified including two vehicle crash fuel spill incidents along I-95 and existing or fallow citrus groves, crop fields, or nurseries at portions of proposed R/W along the west side of SR 91, north crossover, south

crossover, emergency access roads east and west of SR 91, and east side of I-95. The CSER does not include risk rating evaluation of the proposed drainage alternatives. Contamination risk ratings for the pond siting alternatives were provided in an EMO memorandum and have been used to populate the pond siting matrices within this document.

7.6 CONSERVATION EASEMENTS

No conservation easements are located within the project study area for the proposed roadway improvements or pond siting alternatives.

8.0 STORMWATER PONDS

Three pond site alternatives (with one preferred alternative) were identified within the project limits; MP 123.44 and MP 127.53.

8.1 POND SIZING AND LOCATION CONSIDERATIONS

8.1.1 POND SIZING CONSIDERATIONS

The pond sizes were estimated based on SFWMD request to provide treatment for both existing and proposed impervious areas. Refer to **Appendix E** for SFWMD pre-app meeting minutes. The ponds provide 2.5 inches of treatment over each sub-basin's impervious area. The ponds also attenuate for the 25-year/72-hour storm, per SFWMD permitting criteria for wet detention treatment facilities. Additional considerations such as anticipated seasonal high groundwater table, low edge of pavement, and tailwater conditions were used in the pond sizing calculations provided in **Appendix B**. Tailwater elevations used for the pond sizing calculations were determined by the pond outfall type and location. When observed data is not available for tailwater stages, the following was used for each outfall type.

- Wetland: approximate seasonal high water elevation plus 6 inches.
- Roadside swale: bottom elevation plus 1 foot.
- Canal: Top of bank subtract 1 foot.

The design of stormwater management facilities shall be consistent with the Highway Beautification Policy and Context Sensitive Solutions Policy. Integrating facilities with existing and proposed landscaping and adjoining land uses. Depending on the availability of time, space, and funding, consideration shall be given to attractive pond shapes, tree plantings, selective clearing, and other strategies to preserve or improve aesthetics.

The required volume to provide the necessary presumptive treatment within these limits was estimated by applying a 20% increase to the calculated pond size. An additional 10% contingency was added to the total pond site for landscaping. **Appendix B** contains pond sizing calculations.

Per FDOT Drainage Manual criteria, sea level rise needs to be taken into consideration and tailwater elevations adjusted accordingly in coastal areas. This project is not located within a tidally influenced region and will not be affected by sea level rise.

Table 15: Proposed Pond Sizes

Basin Name	Proposed Stormwater Management System	Basin Area (ac)	Required Water Quality Volume (ac-ft)	Provided Water Quality Volume (ac-ft)	Total Required Pond Size (ac)
Basin 1	Wet Detention	106.32	5.40	5.40	8.80
Basin 2	Wet Detention	102.26	0.48	0.48	2.09
Basin 3	Wet Detention	190.89	7.92	7.92	17.38
Basin 4	Wet Detention	81.71	6.15	6.15	11.99

8.1.2 POND LOCATION CONSIDERATIONS

The location of the pond alternatives were identified primarily based on hydraulic connectivity to the project. Three alternatives were identified for each basin with considerations given to each location based on wetlands, species, cultural resources, and other factors outlined in the pond selection matrix in **Appendix D.** Where possible, FTE-owned parcels were used to provide stormwater needs for the proposed improvements. FTE provided all current parcels owned by FTE throughout the project corridor. Two parcels were identified within the project study area. Pond 1 – Alternative 1 utilizes the FDOT parcel located adjacent to SE Bridge Road. Please refer to **Figures 5** for FTE-owned parcels within the project limits.

In addition, parcels owned by other government agencies were considered, where possible, to provide stormwater needs for the proposed improvements. These agencies include:

- South Florida Water Management District
- Martin County

Figure 5: FTE Owned Parcels Along Project Corridor, MP 125

9.0 RESULTS

Per the scope pond sizing calculations were provided for the basins directly associated with the system-to-system interchange located from MP 123.44 to MP 127.53. A total of thirteen pond sites have been evaluated as part of this pond siting report.

The pond alternatives were evaluated on the following parameters:

- Right-of-way
- Construction
- Contamination
- Utilities
- Listed Species Impacts
- Wetlands/Surface Waters
- Maintenance
- Cultural Resources
- Public Opinion
- Aesthetics
- Cost

The evaluation matrix included in **Appendix D** summarizes the sited pond alternatives and lists the items above that were considered in the evaluation of a preferred pond alternative.

BASIN 1

- Pond 1 – Alternative 1 is located on the west side of the relocated Hope-St. Lucie canal, partially on a parcel owned by the FDOT. The proposed drainage system will need to be placed below the relocated Hobe-St. Lucie canal resulting in significant dewatering during construction and cost. Cultural resource impacts have been identified as being low. Potential contamination has been identified as medium.
- Pond 2 – Alternative 2 is located adjacent to the proposed corridor. This alternative has fewer impacts on wetlands, existing land use, and potential contamination when compared to the other two options. Therefore, this is the preferred alternative. Contamination and cultural resources have been identified as low.
- Pond 3 – Alternative 3 is located between SR 91 and I-95. This alternative utilizes an existing borrow pond. Though the pond already exists, this pond will require a significant amount of piping to get runoff to the pond. In addition to construction cost, the vegetation around the pond will need to be cleared for a maintenance berm, which has environmental impacts. Contamination and cultural resources have been identified as low.

BASIN 2

- Pond 2 – Alternative 1 is located on the west side of the I-95 corridor on a vacant parcel. Minor wetland impacts have been identified with this parcel. Contamination and cultural resources have been identified as low. Construction costs for all three sites are similar.
- Pond 2 – Alternative 2 is located adjacent to the proposed improvements. This alternative has no wetland impacts. Contamination and cultural resources have been identified as low. This site has been selected as the preferred alternative.
- Pond 2 – Alternative 3 is located on the east side of the I-95 corridor. Wetlands and cultural resource impacts have been identified as being low. Potential contamination has been identified as medium.

BASIN 3

- Pond 3A and 3B – Alternative 1 is comprised of two locations to obtain the total treatment and attenuation volume required. These ponds are located within the infield area between SR 91 and I-95 just north of SE Bridge Road. Construction costs are higher with this alternative due to the double ponds. An easement is required to accommodate the drainage pipes to Pond 3A, which would need to cross the FGT gas lines. Wetland impacts are anticipated for this alternative. This pond alternative includes potential impacts to the Red Cockaded Woodpecker, whereas the other alternatives do not. Cultural resources and contamination impacts have been identified as low.
- Pond 3 – Alternative 2 is located on west of the SR 91 corridor and has been selected as the preferred alternative due to its proximity to the project area and its minimal impact on the surrounding environment. No wetlands are anticipated with this alternative. Cultural resources and contamination impacts have been identified as low.
- Pond 3 – Alternative 3 is located within the infield area between SR 91 and I-95. This alternative is an existing borrow pit. Drainage culverts would need to cross FGT gas lines to access the pond. Wetland impacts are anticipated for this alternative. Cultural resources and contamination impacts have been identified as low.

BASIN 4

- Pond 4 – Alternative 1 has been ranked as the preferred option, as it is incidental to the right-of-way acquisition for Ramps A and B. Wetland impacts are anticipated for this alternative. Cultural resources and contamination impacts have been identified as low.
- Pond 4 – Alternative 2 is located on the west side of SR 91. No wetlands are anticipated with this alternative. Cultural resource impacts have been identified as being low. Potential contamination has been identified as medium.
- Pond 4 – Alternative 3 is an existing borrow pit known as Dickerson Borrow Pit located on the east side of I-95. Though the cost of constructing the pond will be lower, this alternative will require a significant amount of pipe to convey stormwater around I-95 into the pond. This pond alternative includes potential impacts to the Red Cockaded Woodpecker, whereas the

other alternatives do not. Cultural resources and contamination impacts have been identified as low.

Table 16 below lists the preferred pond alternatives and the estimated construction costs.

Table 16: Preferred Pond Sites

Basin	Preferred Alternative	Pond Size[1]	Parcel(s)	Estimated Construction Cost
Basin 1	Pond 1 – Alt 2	8.80	34-39-41-000-004-00000-3	$1,189,978
Basin 2	Pond 2 – Alt 2	2.09	34-39-41-000-004-00000-3	$282,620
Basin 3	Pond 3 – Alt 2	17.38	28-39-41-000-001-00030-5	$2,350,207
Basin 4	Pond 4 – Alt 1	11.99	21-39-41-000-009-00030-3	$1,621,345

1. Total pond size includes pond, berm, tie downs, and easements.

10.0 CONCLUSIONS

Proposed stormwater management facilities are recommended to accommodate the proposed widening and interchange improvements. This Pond Siting Report (PSR) estimates the volume required to mitigate FDOT and SFWMD stormwater requirements and identify right-of-way for any necessary off-site stormwater management facilities. Pond site alternatives have been identified between MP 123.44 and MP 127.53, with three alternatives proposed within each basin. The alternatives were first identified based on available space and a review of existing drainage patterns. Each pond alternative was evaluated on the basis of several factors including, total cost of each alternative, FEMA flood zone, wetland impacts, habitat and environmental impacts, as well as ease of hydraulic connectivity to the pond site. The preferred pond alternatives were selected based on the sites that minimized impacts and optimized hydraulic connectivity based on these parameters. Pond sizing calculations are provided for the remainder of the basins within the project limits. Given the high seasonal groundwater table (SHGWT) throughout the project corridor, wet detention ponds are recommended.

The Loxahatchee River is identified as an Outstanding Florida Waters (OFW) which mandates for direct discharge to these water bodies to have an additional 50% treatment. The offsite discharges for this project are expected to occur within FDOT R/W and the additional 50% treatment criteria does not apply, since there are no direct discharges to the OFW's.

The Turnpike mainline is bordered by FGT on the east and a drainage canal on the west within the project corridor. Given the design constraints, it is recommended to convert the existing ditch over the FGT line to a treatment swale. It is recommended that this approach be coordinated with FGT early in the design phase to ensure it is a feasible option.

Federal Emergency Management Agency (FEMA) floodplains are prevalent throughout the corridor. There is one regulatory floodway lying just north of the project corridor: South Fork St. Lucie River. Per the project limits, as well as the identified pond alternatives, there does not appear to be any encroachments. However, due to the proximity to the project site, it is recommended that further evaluation should be conducted during the design phase.

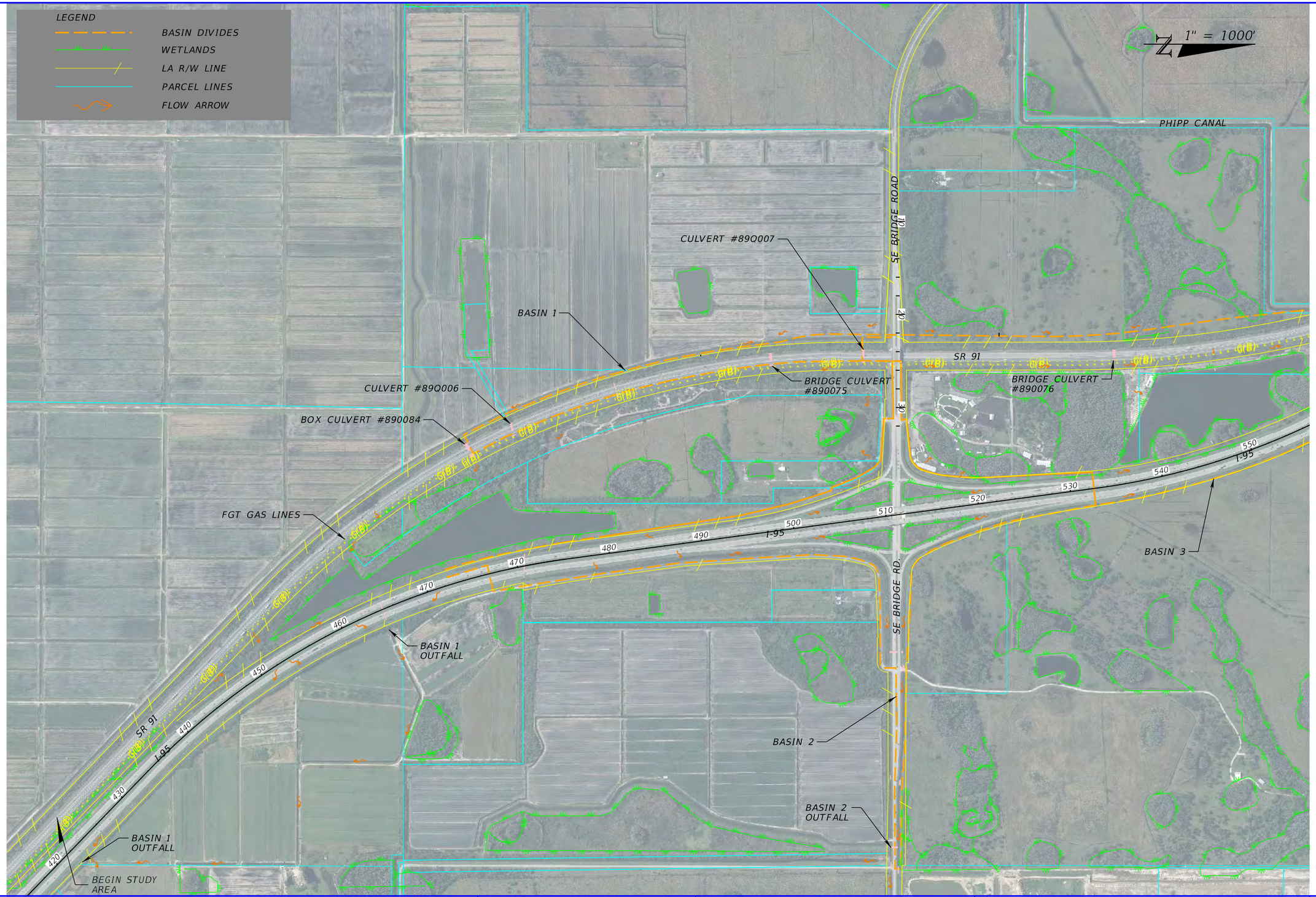
Additional coordination with SFWMD and the Hobe-St. Lucie Conservancy District is recommended during the design phase to revisit the non-conventional permitting approaches discussed in this report.

11.0 REFERENCES

- FDEP Map Direct
- FDOT Drainage Manual (2025)
- FDOT Drainage Design Guide (2024)
- FDOT Project Development and Environment Manual (2024)
- FEMA Flood Map Service Center
- NRCS Web Soil Survey
- SFWMD ePermitting
- SFWMD ERP Applicant's Handbook, Volume I (2024)
- SFWMD ERP Applicant's Handbook, Volume II (2024)

APPENDIX A

DRAINAGE MAP



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DATE	DESCRIPTION	DATE	DESCRIPTION	,	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		1
					SR 91	MARTIN	446975-1-22-01		

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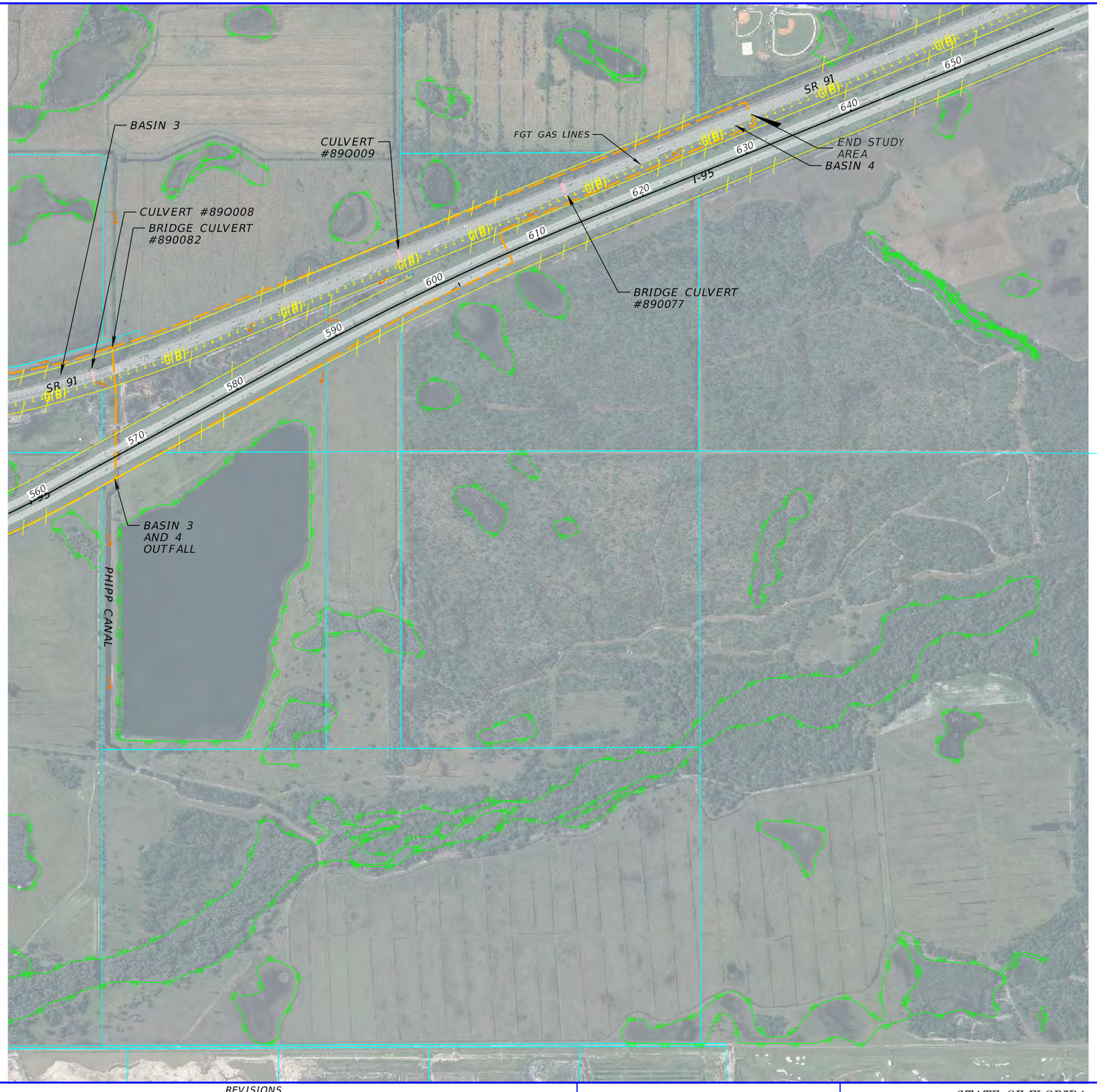

1" = 1000'

LEGEND

- BASIN DIVIDES
- WETLANDS
- LA R/W LINE
- PARCEL LINES
- FLOW ARROW

REVISIONS				LICENSE NUMBER:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			EXISTING DRAINAGE MAP	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	,	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		2
					SR 91	MARTIN	446975-1-22-01		

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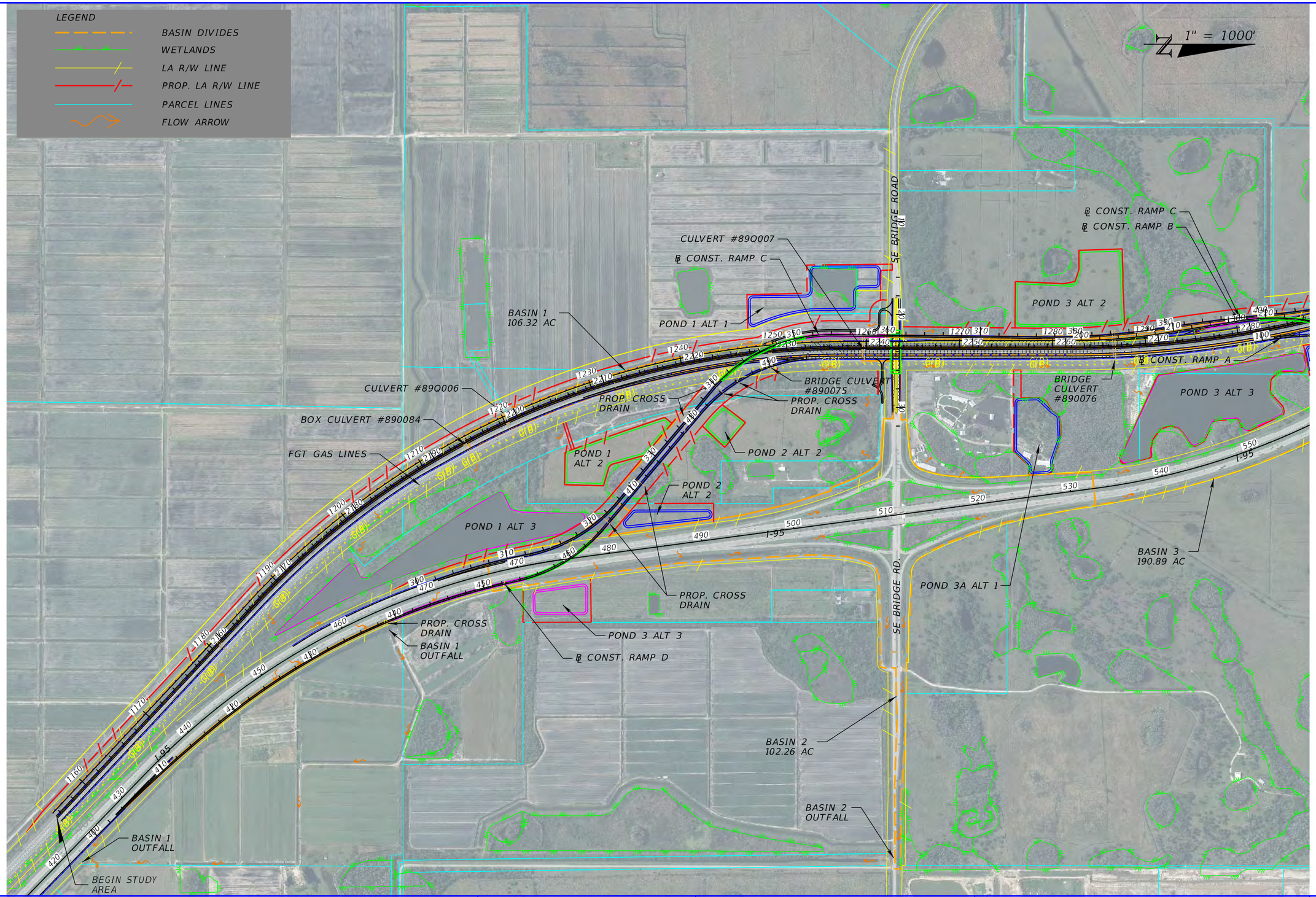

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION	LICENSE NUMBER: ,	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	MARTIN	446975-1-22-01

PROPOSED DRAINAGE MAP

SHEET NO. 1

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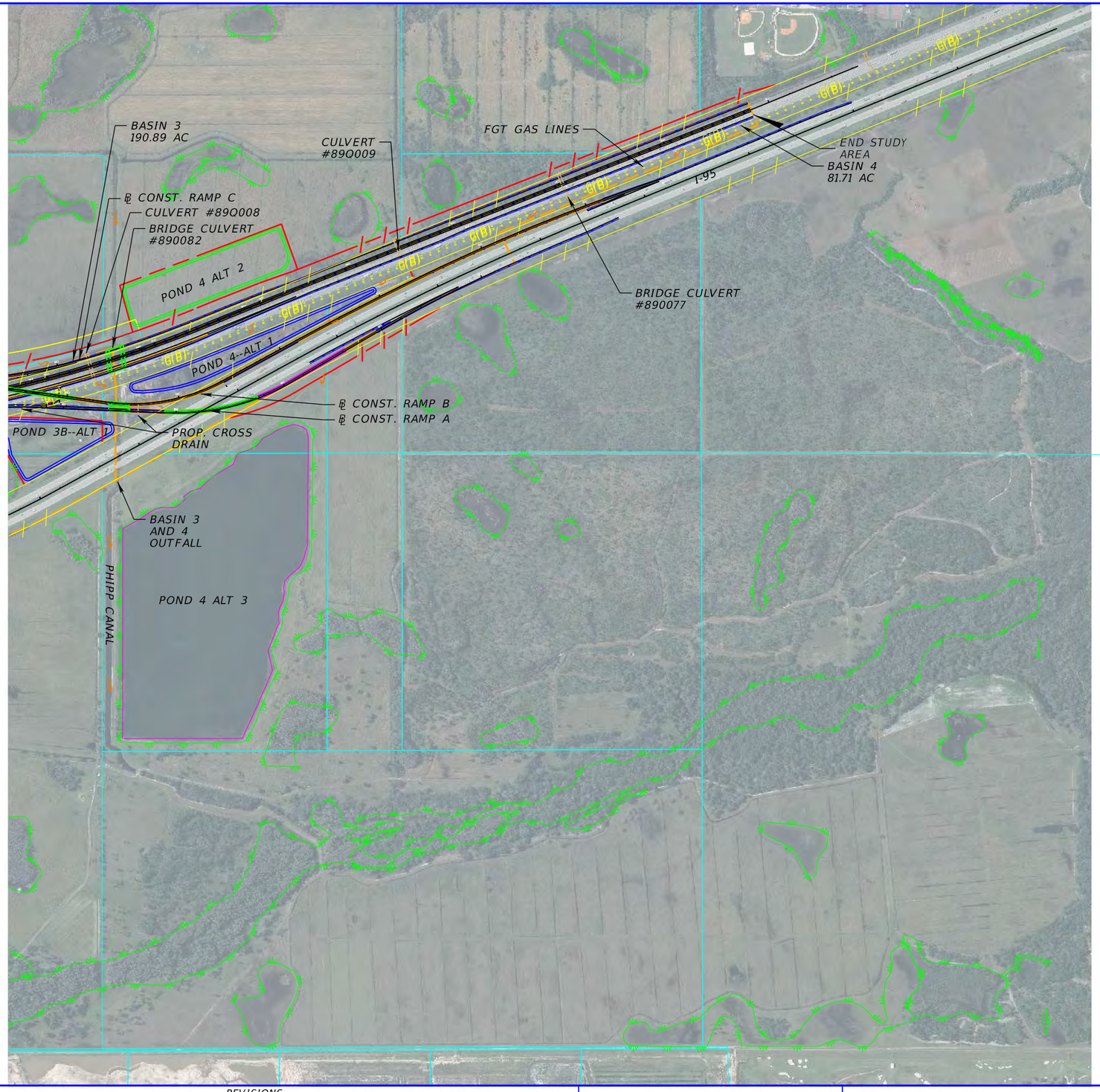

1" = 1000'

LEGEND

- BASIN DIVIDES
- WETLANDS
- LA R/W LINE
- PROP. LA R/W LINE
- PARCEL LINES
- FLOW ARROW

REVISIONS					STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	LICENSE NUMBER: ,	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	PROPOSED DRAINAGE MAP	2
					SR 91	MARTIN	446975-1-22-01		

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APPENDIX B

PRE AND POST DEVELOPMENT CALCULATIONS

EXPLANATION OF POND SIZING CALCULATIONS

The available pond sites vary in geometric shape. As the shape will affect the size of the pond, the geometric constraints must be considered in the calculations. To simplify the report, all shapes are estimated as rectangles of an equivalent ratio of length to width. For example, a square pond has a length to width ration of 1.0. Pond sites with high length-to-width ratios generally require comparatively more area.

The following abbreviations are used throughout the calculations:

R1 = Long dimension of a rectangle
R2 = Short dimension of a rectangle
L = Height of trapezoid or short side of triangle
B = Long side of triangle

F.B. = freeboard
T.D. = treatment depth
A.D. = attenuation depth
AHW = allowable high water
DHW = design high water
TW = tailwater for design event
SHWT seasonal high water table

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 1

	Pre	***Post***
From Station	323+55	323+55
To Station	357+32	357+32
Basin Length	Varies	Varies
R/W to R/W Width	Varies	Varies
Total Area	106.32 ac	106.32 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike NB
Shoulder	10.00 ft	2	20.00 ft	4400.00 ft	Turnpike NB
Travel Lanes	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike SB
Shoulder	10.00 ft	2	20.00 ft	4400.00 ft	Turnpike SB
Contingency		0%			

Impervious Area 8.89 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	4	48.00 ft	4400.00 ft	Turnpike NB
Shoulder	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike NB
Travel Lanes	12.00 ft	4	48.00 ft	4400.00 ft	Turnpike SB
Shoulder	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike SB
Travel Lanes	15.00 ft	1	15.00 ft	3800.00 ft	Turnpike NB off Ramp
Shoulder	6.00 ft	2	12.00 ft	3800.00 ft	Turnpike NB off Ramp
Travel Lanes	15.00 ft	1	15.00 ft	3870.00 ft	Turnpike NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	3870.00 ft	Turnpike NB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	3700.00 ft	Turnpike SB off Ramp
Shoulder	6.00 ft	2	12.00 ft	3700.00 ft	Turnpike SB off Ramp
Contingency		20%			

Impervious Area 25.91 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	25.91 ac	17.02 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**3.55 ac-ft**
Treatment Volume for existing pavement	**1.85 ac-ft**
Total Treatment volume	**5.40 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 1

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
25.91 ac	9.57 ac	35.48 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		8.89 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	24.99 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	8.89 ac	98	24.55
Wood/Forest (Fair cover)	0.50 ac	79	1.11
Pasture/Range (Good)	1.10 ac	80	2.48
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	24.99 ac	80.52	56.72
		CN_{pre} =	84.86

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 1.78 in.
Q_{pre} = 10.29 in.
Pre-development runoff volume = **30.43 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 1

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
25.91 ac	9.57 ac	35.48 ac

Total Area to be attenuated for	HSG		
Roadway			25.91 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		7.66 ac
Open Space Composite			1.91 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	25.91 ac	98	71.57
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	7.66 ac	98	21.15
Open Space	1.91 ac	80.52	4.34
		CN_{post} =	97.06

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.30 in.
Q_{post} = 11.84 in.
Post-development runoff volume = **35.02 ac-ft**

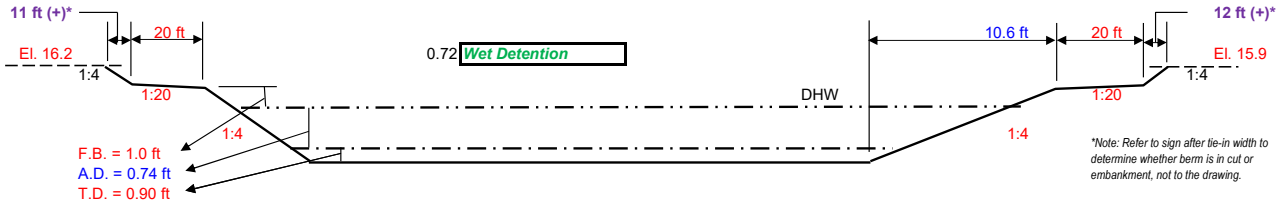
Attenuation volume required (Post-Pre) **4.59 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 1

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	19.44
Approx. hydraulic clearance from LEOP =	1.00 ft
Approx. Control Elevation (wet)/Pond Bottom (dry) =	15.20
Seasonal High Ground Water Elevation (SHGWT)=	15.20
SHGWT Check for Dry Retention Only	N/A
Tailwater Elevation (TW) =	15.00
Allowable High Water (AHW)=	16.84
Design Highwater (DHW)=	16.84
Head loss (0.08%) from LEOP to SMF (2000 ft) =	1.60 ft
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft
Available depth for T.D. + A.D. =	1.64 ft

** TW elevation source: Hobe-St. Lucie Canal*
AHW = Control elevtion + Available depth for T.D. + A.D.

Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose): Rectangle

Treatment area provided at treatment depth (T.D.)	6.00 ac
Treatment volume provided	5.40 ac-ft
Long Rectangular dimension at pond bottom (R1)	1022 ft
Short Rectangular dimension at pond bottom (R2)	256 ft
Attenuation volume provided	4.66 ac-ft
Long Rectangular dimension at tie-in (R1)	1106 ft
Short Rectangular dimension at tie-in (R2)	339 ft

Treatment Volume Required
5.40 ac-ft
Attenuation Volume Required
4.59 ac-ft

Total Area Calculated: 8.70 ac

Minimum Total Area Required (10% Landscaping Contingency): **9.57 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 2

	Pre	***Post***
From Station	323+55	323+55
To Station	357+32	357+32
Basin Length	Varies	Varies
R/W to R/W Width	Varies	Varies
Total Area	106.32 ac	106.32 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike NB
Shoulder	10.00 ft	2	20.00 ft	4400.00 ft	Turnpike NB
Travel Lanes	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike SB
Shoulder	10.00 ft	2	20.00 ft	4400.00 ft	Turnpike SB
Contingency		0%			

Impervious Area 8.89 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	4	48.00 ft	4400.00 ft	Turnpike NB
Shoulder	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike NB
Travel Lanes	12.00 ft	4	48.00 ft	4400.00 ft	Turnpike SB
Shoulder	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike SB
Travel Lanes	15.00 ft	1	15.00 ft	3800.00 ft	Turnpike NB off Ramp
Shoulder	6.00 ft	2	12.00 ft	3800.00 ft	Turnpike NB off Ramp
Travel Lanes	15.00 ft	1	15.00 ft	3870.00 ft	Turnpike NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	3870.00 ft	Turnpike NB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	3700.00 ft	Turnpike SB off Ramp
Shoulder	6.00 ft	2	12.00 ft	3700.00 ft	Turnpike SB off Ramp
Contingency		20%			

Impervious Area 25.91 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	25.91 ac	17.02 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**3.55 ac-ft**
Treatment Volume for existing pavement	**1.85 ac-ft**
Total Treatment volume	**5.40 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 2

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
25.91 ac	8.80 ac	34.71 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		8.89 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	24.22 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	8.89 ac	98	25.10
Wood/Forest (Fair cover)	0.50 ac	79	1.14
Pasture/Range (Good)	1.10 ac	80	2.54
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	24.22 ac	80.52	56.19
		CN_{pre} =	84.96

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 1.77 in.
Q_{pre} = 10.31 in.
Pre-development runoff volume = **29.81 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 2

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
25.91 ac	8.80 ac	34.71 ac

Total Area to be attenuated for	HSG		
Roadway			25.91 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		7.04 ac
Open Space Composite			1.76 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	25.91 ac	98	73.16
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	7.04 ac	98	19.88
Open Space	1.76 ac	80.52	4.08
		CN_{post} =	97.11

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.30 in.
Q_{post} = 11.85 in.
Post-development runoff volume = **34.28 ac-ft**

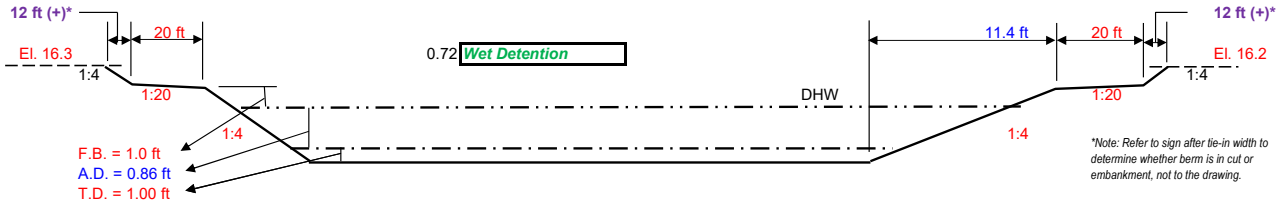
Attenuation volume required (Post-Pre) **4.47 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 2

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	19.86
Approx. hydraulic clearance from LEOP =	1.00 ft
Approx. Control Elevation (wet)/Pond Bottom (dry) =	15.40
Seasonal High Ground Water Elevation (SHGWT)=	15.40
SHGWT Check for Dry Retention Only	N/A
Tailwater Elevation (TW) =	14.00
Allowable High Water (AHW)=	17.26
Design Highwater (DHW)=	17.26
Head loss (0.08%) from LEOP to SMF (2000 ft) =	1.60 ft
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft
Available depth for T.D. + A.D. =	1.86 ft

** TW elevation source: SR 91 SB borrow ditch. Bottom plus 1-ft*
AHW = Control elevtion + Available depth for T.D. + A.D.

Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose) Rectangle

Treatment area provided at treatment depth (T.D.)	5.40 ac
Treatment volume provided	5.40 ac-ft
Long Rectangular dimension at pond bottom (R1)	970 ft
Short Rectangular dimension at pond bottom (R2)	243 ft
Attenuation volume provided	4.89 ac-ft
Long Rectangular dimension at tie-in (R1)	1057 ft
Short Rectangular dimension at tie-in (R2)	330 ft

Treatment Volume Required
5.40 ac-ft
Attenuation Volume Required
4.47 ac-ft

Total Area Calculated:	8.00 ac
Minimum Total Area Required (10% Landscaping Contingency):	**8.80 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 3

	Pre	***Post***
From Station	323+55	323+55
To Station	357+32	357+32
Basin Length	Varies	Varies
R/W to R/W Width	Varies	Varies
Total Area	106.32 ac	106.32 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike NB
Shoulder	10.00 ft	2	20.00 ft	4400.00 ft	Turnpike NB
Travel Lanes	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike SB
Shoulder	10.00 ft	2	20.00 ft	4400.00 ft	Turnpike SB
Contingency		0%			

Impervious Area 8.89 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	4	48.00 ft	4400.00 ft	Turnpike NB
Shoulder	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike NB
Travel Lanes	12.00 ft	4	48.00 ft	4400.00 ft	Turnpike SB
Shoulder	12.00 ft	2	24.00 ft	4400.00 ft	Turnpike SB
Travel Lanes	15.00 ft	1	15.00 ft	3800.00 ft	Turnpike NB off Ramp
Shoulder	6.00 ft	2	12.00 ft	3800.00 ft	Turnpike NB off Ramp
Travel Lanes	15.00 ft	1	15.00 ft	3870.00 ft	Turnpike NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	3870.00 ft	Turnpike NB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	3700.00 ft	Turnpike SB off Ramp
Shoulder	6.00 ft	2	12.00 ft	3700.00 ft	Turnpike SB off Ramp
Contingency		20%			

Impervious Area 25.91 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	25.91 ac	17.02 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**3.55 ac-ft**
Treatment Volume for existing pavement	**1.85 ac-ft**
Total Treatment volume	**5.40 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 3

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
25.91 ac	6.82 ac	32.73 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		8.89 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	22.24 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	8.89 ac	98	26.61
Wood/Forest (Fair cover)	0.50 ac	79	1.21
Pasture/Range (Good)	1.10 ac	80	2.69
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	22.24 ac	80.52	54.72
		CN_{pre} =	85.23

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 1.73 in.
Q_{pre} = 10.34 in.
Pre-development runoff volume = **28.21 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 3

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
25.91 ac	6.82 ac	32.73 ac

Total Area to be attenuated for	HSG		
Roadway			25.91 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		5.46 ac
Open Space Composite			1.36 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	25.91 ac	98	77.58
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	5.46 ac	98	16.34
Open Space	1.36 ac	80.52	3.36
		CN_{post} =	97.27

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.28 in.
Q_{post} = 11.87 in.
Post-development runoff volume = **32.38 ac-ft**

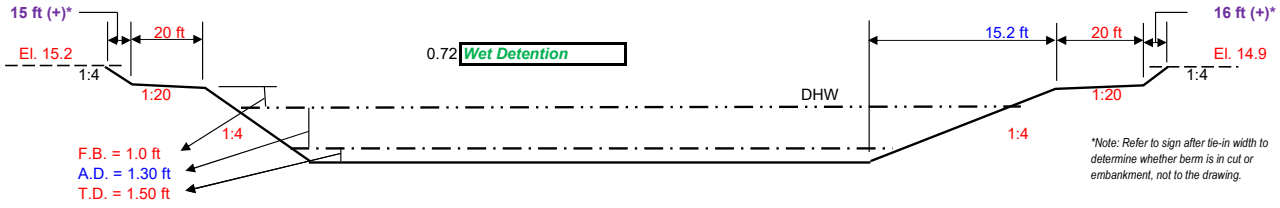
Attenuation volume required (Post-Pre) **4.17 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 1
SMF Name: Pond 1 - Alt 3

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	19.60	
Approx. hydraulic clearance from LEOP =	1.00 ft	
Approx. Control Elevation (wet)/Pond Bottom (dry) =	14.20	
Seasonal High Ground Water Elevation (SHGWT)=	14.20	
SHGWT Check for Dry Retention Only	N/A	
Tailwater Elevation (TW) =	13.00	* TW elevation source: Existing borrow pit has no outfall
Allowable High Water (AHW)=	17.00	AHW = Control elevtion + Available depth for T.D. + A.D.
Design Highwater (DHW)=	17.00	
Head loss (0.08%) from LEOP to SMF (2000 ft) =	1.60 ft	
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft	
Available depth for T.D. + A.D. =	**2.80 ft**	Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose) Rectangle

Treatment area provided at treatment depth (T.D.)	3.60 ac
Treatment volume provided	5.40 ac-ft
Long Rectangular dimension at pond bottom (R1)	792 ft
Short Rectangular dimension at pond bottom (R2)	198 ft
Attenuation volume provided	5.20 ac-ft
Long Rectangular dimension at tie-in (R1)	894 ft
Short Rectangular dimension at tie-in (R2)	300 ft

Treatment Volume Required
5.40 ac-ft
Attenuation Volume Required
4.17 ac-ft

Total Area Calculated:	6.20 ac
Minimum Total Area Required (10% Landscaping Contingency):	**6.82 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 1

	Pre	***Post***
From Station	303+30	303+30
To Station	323+55	323+55
Basin Length	Varies	Varies
R/W to R/W Width	Varies	Varies
Total Area	102.26 ac	102.26 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	15.00 ft	1	15.00 ft	2025.00 ft	I-95 SB on Ramp-New
Shoulder	6.00 ft	2	12.00 ft	2025.00 ft	I-95 SB on Ramp-New
Travel Lanes	15.00 ft	1	15.00 ft	1045.00 ft	I-95 NB off Ramp-New
Shoulder	6.00 ft	2	12.00 ft	1045.00 ft	I-95 NB off Ramp-New
Contingency		20%			

Impervious Area 2.28 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	N/A	2.28 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**0.48 ac-ft**
Treatment Volume for existing pavement	**0.00 ac-ft**
Total Treatment volume	**0.48 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 1

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
2.28 ac	2.20 ac	4.48 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		0.00 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	2.88 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	0.00 ac	98	0.00
Wood/Forest (Fair cover)	0.50 ac	79	8.81
Pasture/Range (Good)	1.10 ac	80	19.63
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	2.88 ac	80.52	51.79
		CN_{pre} =	80.22

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 2.47 in.
Q_{pre} = 9.67 in.
Pre-development runoff volume = **3.61 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 1

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	Total Area
2.28 ac	2.20 ac	4.48 ac

Total Area to be attenuated for	HSG		
Roadway			2.28 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		1.76 ac
Open Space Composite			0.44 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	2.28 ac	98	49.91
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	1.76 ac	98	38.47
Open Space	0.44 ac	80.52	7.90
		CN_{post} =	96.28

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.39 in.
Q_{post} = 11.75 in.
Post-development runoff volume = **4.39 ac-ft**

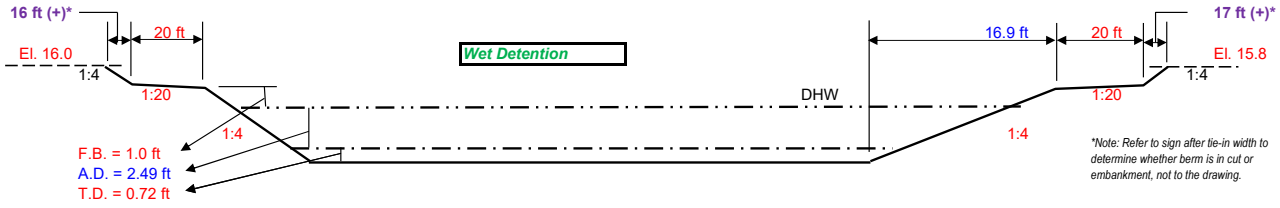
Attenuation volume required (Post-Pre) **0.78 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 1

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	19.12	
Approx. hydraulic clearance from LEOP =	1.00 ft	
Approx. Control Elevation (wet)/Pond Bottom (dry) =	14.90	
Seasonal High Ground Water Elevation (SHGWT)=	14.90	
SHGWT Check for Dry Retention Only	N/A	
Tailwater Elevation (TW) =	14.50	* TW elevation source: I-95 southbound roadside swale plus 1-ft
Allowable High Water (AHW)=	18.11	AHW = Control elevtion + Available depth for T.D. + A.D.
Design Highwater (DHW)=	18.11	
Head loss (0.08%) from LEOP to SMF (1 ft) =	0.00 ft	
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft	
Available depth for T.D. + A.D. =	3.21 ft	Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose) Rectangle

Treatment area provided at treatment depth (T.D.)	0.66 ac
Treatment volume provided	0.48 ac-ft
Long Rectangular dimension at pond bottom (R1)	339 ft
Short Rectangular dimension at pond bottom (R2)	85 ft
Attenuation volume provided	2.05 ac-ft
Long Rectangular dimension at tie-in (R1)	447 ft
Short Rectangular dimension at tie-in (R2)	192 ft

Treatment Volume Required
0.48 ac-ft
Attenuation Volume Required
0.78 ac-ft

Total Area Calculated: 2.00 ac

Minimum Total Area Required (10% Landscaping Contingency): **2.20 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 2

	Pre	***Post***
From Station	303+30	303+30
To Station	323+55	323+55
Basin Length	Varies	Varies
R/W to R/W Width	Varies	Varies
Total Area	102.26 ac	102.26 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	15.00 ft	1	15.00 ft	2025.00 ft	I-95 SB on Ramp-New
Shoulder	6.00 ft	2	12.00 ft	2025.00 ft	I-95 SB on Ramp-New
Travel Lanes	15.00 ft	1	15.00 ft	1045.00 ft	I-95 NB off Ramp-New
Shoulder	6.00 ft	2	12.00 ft	1045.00 ft	I-95 NB off Ramp-New
Contingency		20%			

Impervious Area 2.28 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	N/A	2.28 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**0.48 ac-ft**
Treatment Volume for existing pavement	**0.00 ac-ft**
Total Treatment volume	**0.48 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 2

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
2.28 ac	2.09 ac	4.37 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		0.00 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	2.77 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	0.00 ac	98	0.00
Wood/Forest (Fair cover)	0.50 ac	79	9.03
Pasture/Range (Good)	1.10 ac	80	20.12
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	2.77 ac	80.52	51.06
		CN_{pre} =	80.22

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 2.47 in.
Q_{pre} = 9.67 in.
Pre-development runoff volume = **3.52 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 2

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	Total Area
2.28 ac	2.09 ac	4.37 ac

Total Area to be attenuated for	HSG		
Roadway			2.28 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		1.67 ac
Open Space Composite			0.42 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	2.28 ac	98	51.17
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	1.67 ac	98	37.47
Open Space	0.42 ac	80.52	7.70
		CN_{post} =	96.33

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.38 in.
Q_{post} = 11.75 in.
Post-development runoff volume = **4.28 ac-ft**

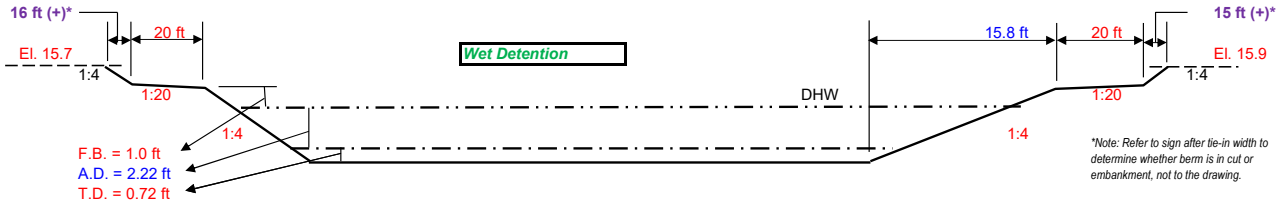
Attenuation volume required (Post-Pre) **0.76 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 2

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	18.64
Approx. hydraulic clearance from LEOP =	1.00 ft
Approx. Control Elevation (wet)/Pond Bottom (dry) =	14.70
Seasonal High Ground Water Elevation (SHGWT)=	14.70
SHGWT Check for Dry Retention Only	N/A
Tailwater Elevation (TW) =	14.50
Allowable High Water (AHW)=	17.64
Design Highwater (DHW)=	17.64
Head loss (0.08%) from LEOP to SMF (1 ft) =	0.00 ft
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft
Available depth for T.D. + A.D. =	2.94 ft

** TW elevation source: Adjacent wetland elevations plus 6-inches*
AHW = Control elevtion + Available depth for T.D. + A.D.
Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose) Rectangle

Treatment area provided at treatment depth (T.D.)	0.66 ac
Treatment volume provided	0.48 ac-ft
Long Rectangular dimension at pond bottom (R1)	339 ft
Short Rectangular dimension at pond bottom (R2)	85 ft
Attenuation volume provided	1.79 ac-ft
Long Rectangular dimension at tie-in (R1)	442 ft
Short Rectangular dimension at tie-in (R2)	187 ft

Treatment Volume Required
0.48 ac-ft
Attenuation Volume Required
0.76 ac-ft

Total Area Calculated: 1.90 ac
Minimum Total Area Required (10% Landscaping Contingency): **2.09 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 3

	Pre	***Post***
From Station	303+30	303+30
To Station	323+55	323+55
Basin Length	Varies	Varies
R/W to R/W Width	Varies	Varies
Total Area	102.26 ac	102.26 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	15.00 ft	1	15.00 ft	2025.00 ft	I-95 SB on Ramp-New
Shoulder	6.00 ft	2	12.00 ft	2025.00 ft	I-95 SB on Ramp-New
Travel Lanes	15.00 ft	1	15.00 ft	1045.00 ft	I-95 NB off Ramp-New
Shoulder	6.00 ft	2	12.00 ft	1045.00 ft	I-95 NB off Ramp-New
Contingency		20%			

Impervious Area 2.28 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	N/A	2.28 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**0.48 ac-ft**
Treatment Volume for existing pavement	**0.00 ac-ft**
Total Treatment volume	**0.48 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 3

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
2.28 ac	2.31 ac	4.59 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		0.00 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	2.99 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	0.00 ac	98	0.00
Wood/Forest (Fair cover)	0.50 ac	79	8.60
Pasture/Range (Good)	1.10 ac	80	19.16
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	2.99 ac	80.52	52.47
		CN_{pre} =	80.23

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 2.46 in.
Q_{pre} = 9.67 in.
Pre-development runoff volume = **3.70 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 3

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	Total Area
2.28 ac	2.31 ac	4.59 ac

Total Area to be attenuated for	HSG		
Roadway			2.28 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		1.85 ac
Open Space Composite			0.46 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	2.28 ac	98	48.72
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	1.85 ac	98	39.43
Open Space	0.46 ac	80.52	8.10
		CN_{post} =	96.24

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.39 in.
Q_{post} = 11.74 in.
Post-development runoff volume = **4.50 ac-ft**

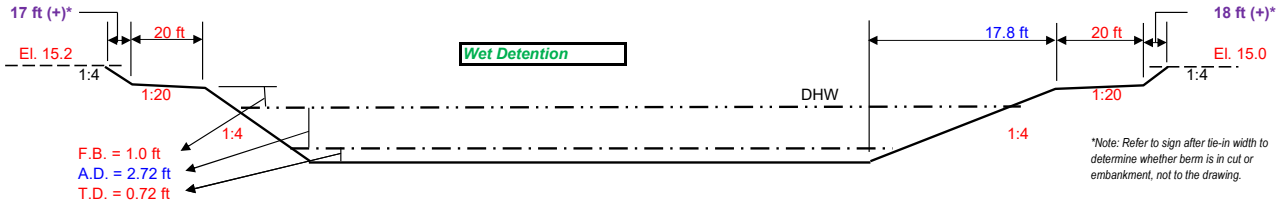
Attenuation volume required (Post-Pre) **0.79 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 2
SMF Name: Pond 2 - Alt 3

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	18.44	
Approx. hydraulic clearance from LEOP =	1.00 ft	
Approx. Control Elevation (wet)/Pond Bottom (dry) =	14.00	
Seasonal High Ground Water Elevation (SHGWT)=	14.00	
SHGWT Check for Dry Retention Only	N/A	
Tailwater Elevation (TW) =	13.90	* TW elevation source: Irrigation canal bottom plus 1-ft
Allowable High Water (AHW)=	17.44	AHW = Control elevtion + Available depth for T.D. + A.D.
Design Highwater (DHW)=	17.44	
Head loss (0.08%) from LEOP to SMF (1 ft) =	0.00 ft	
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft	
Available depth for T.D. + A.D. =	3.44 ft	Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose) Rectangle

Treatment area provided at treatment depth (T.D.)	0.66 ac
Treatment volume provided	0.48 ac-ft
Long Rectangular dimension at pond bottom (R1)	339 ft
Short Rectangular dimension at pond bottom (R2)	85 ft
Attenuation volume provided	2.26 ac-ft
Long Rectangular dimension at tie-in (R1)	450 ft
Short Rectangular dimension at tie-in (R2)	195 ft

Treatment Volume Required
0.48 ac-ft
Attenuation Volume Required
0.79 ac-ft

Total Area Calculated: 2.10 ac

Minimum Total Area Required (10% Landscaping Contingency): **2.31 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3A & 3B - Alt 1

	Pre	***Post***
From Station	357+32	357+32
To Station	415+00	415+00
Basin Length	Various	Various
R/W to R/W Width	Various	Various
Total Area	190.89 ac	190.89 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	2	24.00 ft	5800.00 ft	TPK NB
Shoulder	10.00 ft	2	20.00 ft	5800.00 ft	TPK NB
Travel Lanes	12.00 ft	2	24.00 ft	5800.00 ft	TPK SB
Shoulder	10.00 ft	2	20.00 ft	5800.00 ft	TPK SB
Contingency		0%			

Impervious Area 11.72 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	4	48.00 ft	5800.00 ft	TPK NB
Shoulder	12.00 ft	2	24.00 ft	5800.00 ft	TPK NB
Travel Lanes	12.00 ft	4	48.00 ft	5800.00 ft	TPK SB
Shoulder	12.00 ft	2	24.00 ft	5800.00 ft	TPK SB
Travel Lanes	15.00 ft	1	15.00 ft	3200.00 ft	TPK SB on Ramp
Shoulder	6.00 ft	2	12.00 ft	3200.00 ft	TPK SB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	5470.00 ft	TPK SB off Ramp
Shoulder	6.00 ft	2	12.00 ft	5470.00 ft	TPK SB off Ramp
Travel Lanes	12.00 ft	2	24.00 ft	4450.00 ft	TPK NB off Ramp
Shoulder	12.00 ft	2	24.00 ft	4450.00 ft	TPK NB off Ramp
Travel Lanes	15.00 ft	1	15.00 ft	1375.00 ft	TPK NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	1375.00 ft	TPK NB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	2200.00 ft	TPK NB off Ramp
Shoulder	6.00 ft	2	12.00 ft	2200.00 ft	TPK NB off Ramp
Contingency		20%			

Impervious Area 38.00 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	38.00 ac	26.28 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**5.48 ac-ft**
Treatment Volume for existing pavement	**2.44 ac-ft**
Total Treatment volume	**7.92 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3A & 3B - Alt 1

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
38.00 ac	14.41 ac	52.41 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		11.72 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	39.09 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	11.72 ac	98	21.91
Wood/Forest (Fair cover)	0.50 ac	79	0.75
Pasture/Range (Good)	1.10 ac	80	1.68
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	39.09 ac	80.52	60.06
		CN_{pre} =	84.40

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 1.85 in.
Q_{pre} = 10.23 in.
Pre-development runoff volume = **44.69 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3A & 3B - Alt 1

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
38.00 ac	14.41 ac	52.41 ac

Total Area to be attenuated for	HSG		
Roadway			38.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		11.53 ac
Open Space Composite			2.88 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	38.00 ac	98	71.06
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	11.53 ac	98	21.56
Open Space	2.88 ac	80.52	4.43
		CN_{post} =	97.04

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.31 in.
Q_{post} = 11.84 in.
Post-development runoff volume = **51.72 ac-ft**

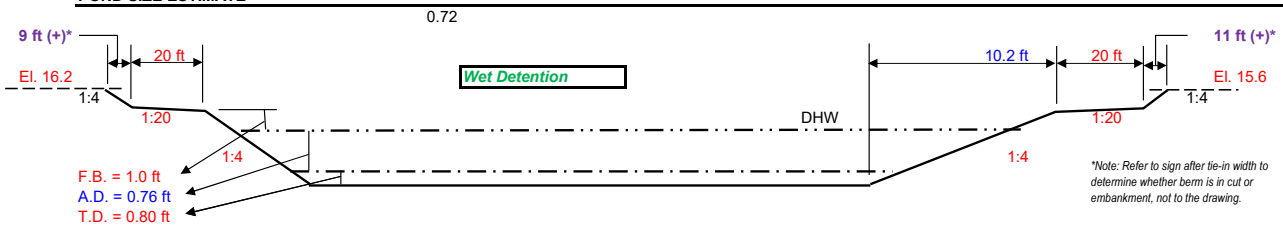
Attenuation volume required (Post-Pre) **7.03 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3A & 3B - Alt 1

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	18.96	
Approx. hydraulic clearance from LEOP =	1.00 ft	
Approx. Control Elevation (wet)/Pond Bottom (dry) =	14.80	
Seasonal High Ground Water Elevation (SHGWT)=	14.80	
SHGWT Check for Dry Retention Only	N/A	
Tailwater Elevation (TW) =	14.70	* TW elevation source: Adjacent wetland plus 6-inches
Allowable High Water (AHW)=	16.36	3
Design Highwater (DHW)=	16.36	
Head loss (0.08%) from LEOP to SMF (2000 ft) =	1.60 ft	
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft	
Available depth for T.D. + A.D. =	1.56 ft	Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose) Rectangle

Treatment area provided at treatment depth (T.D.)	9.90 ac
Treatment volume provided	7.92 ac-ft
Long Rectangular dimension at pond bottom (R1)	1313 ft
Short Rectangular dimension at pond bottom (R2)	328 ft
Attenuation volume provided	7.74 ac-ft
Long Rectangular dimension at tie-in (R1)	1393 ft
Short Rectangular dimension at tie-in (R2)	408 ft

Treatment Volume Required
7.92 ac-ft
Attenuation Volume Required
7.03 ac-ft

Total Area Calculated:	13.10 ac
Minimum Total Area Required (10% Landscaping Contingency):	**14.41 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3 - Alt 2

	Pre	***Post***
From Station	357+32	357+32
To Station	415+00	415+00
Basin Length	Various	Various
R/W to R/W Width	Various	Various
Total Area	190.89 ac	190.89 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	2	24.00 ft	5800.00 ft	TPK NB
Shoulder	10.00 ft	2	20.00 ft	5800.00 ft	TPK NB
Travel Lanes	12.00 ft	2	24.00 ft	5800.00 ft	TPK SB
Shoulder	10.00 ft	2	20.00 ft	5800.00 ft	TPK SB
Contingency		0%			

Impervious Area 11.72 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	4	48.00 ft	5800.00 ft	TPK NB
Shoulder	12.00 ft	2	24.00 ft	5800.00 ft	TPK NB
Travel Lanes	12.00 ft	4	48.00 ft	5800.00 ft	TPK SB
Shoulder	12.00 ft	2	24.00 ft	5800.00 ft	TPK SB
Travel Lanes	15.00 ft	1	15.00 ft	3200.00 ft	TPK SB on Ramp
Shoulder	6.00 ft	2	12.00 ft	3200.00 ft	TPK SB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	5470.00 ft	TPK SB off Ramp
Shoulder	6.00 ft	2	12.00 ft	5470.00 ft	TPK SB off Ramp
Travel Lanes	12.00 ft	2	24.00 ft	4450.00 ft	TPK NB off Ramp
Shoulder	12.00 ft	2	24.00 ft	4450.00 ft	TPK NB off Ramp
Travel Lanes	15.00 ft	1	15.00 ft	1375.00 ft	TPK NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	1375.00 ft	TPK NB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	2200.00 ft	TPK NB off Ramp
Shoulder	6.00 ft	2	12.00 ft	2200.00 ft	TPK NB off Ramp
Contingency		20%			

Impervious Area 38.00 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	38.00 ac	26.28 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**5.48 ac-ft**
Treatment Volume for existing pavement	**2.44 ac-ft**
Total Treatment volume	**7.92 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3 - Alt 2

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
38.00 ac	17.38 ac	55.38 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		11.72 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	42.06 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	11.72 ac	98	20.73
Wood/Forest (Fair cover)	0.50 ac	79	0.71
Pasture/Range (Good)	1.10 ac	80	1.59
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	42.06 ac	80.52	61.16
		CN_{pre} =	84.19

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 1.88 in.
Q_{pre} = 10.20 in.
Pre-development runoff volume = **47.09 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3 - Alt 2

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
38.00 ac	17.38 ac	55.38 ac

Total Area to be attenuated for	HSG		
Roadway			38.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		13.90 ac
Open Space Composite			3.48 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	38.00 ac	98	67.24
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	13.90 ac	98	24.60
Open Space	3.48 ac	80.52	5.05
		CN_{post} =	96.90

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.32 in.
Q_{post} = 11.82 in.
Post-development runoff volume = **54.57 ac-ft**

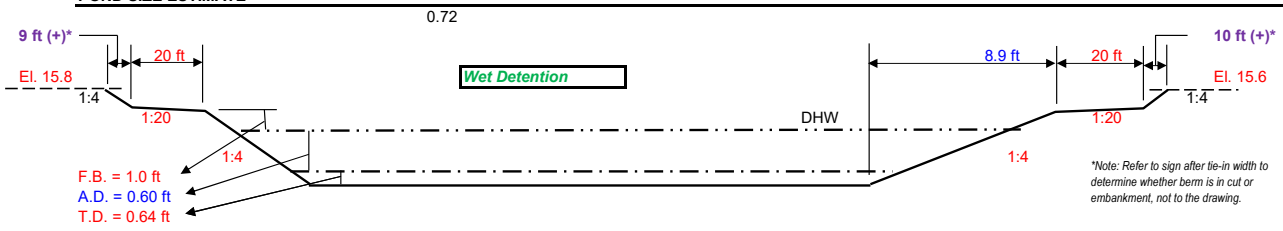
Attenuation volume required (Post-Pre) **7.48 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3 - Alt 2

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	18.64
Approx. hydraulic clearance from LEOP =	1.00 ft
Approx. Control Elevation (wet)/Pond Bottom (dry) =	14.80
Seasonal High Ground Water Elevation (SHGWT)=	14.80
SHGWT Check for Dry Retention Only	N/A
Tailwater Elevation (TW) =	14.00
Allowable High Water (AHW)=	16.04
Design Highwater (DHW)=	16.04
Head loss (0.08%) from LEOP to SMF (2000 ft) =	1.60 ft
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft
Available depth for T.D. + A.D. =	1.24 ft

** TW elevation source: SR 91 SB borrow ditch. Bottom plus 1-ft*
AHW = Control elevtion + Available depth for T.D. + A.D.

Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose) Rectangle

Treatment area provided at treatment depth (T.D.)	12.37 ac
Treatment volume provided	7.92 ac-ft
Long Rectangular dimension at pond bottom (R1)	1468 ft
Short Rectangular dimension at pond bottom (R2)	367 ft
Attenuation volume provided	7.61 ac-ft
Long Rectangular dimension at tie-in (R1)	1545 ft
Short Rectangular dimension at tie-in (R2)	444 ft

Treatment Volume Required
7.92 ac-ft
Attenuation Volume Required
7.48 ac-ft

Total Area Calculated:	15.80 ac
Minimum Total Area Required (10% Landscaping Contingency):	**17.38 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3 - Alt 3

	Pre	***Post***
From Station	357+32	357+32
To Station	415+00	415+00
Basin Length	Various	Various
R/W to R/W Width	Various	Various
Total Area	190.89 ac	190.89 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	2	24.00 ft	5800.00 ft	TPK NB
Shoulder	10.00 ft	2	20.00 ft	5800.00 ft	TPK NB
Travel Lanes	12.00 ft	2	24.00 ft	5800.00 ft	TPK SB
Shoulder	10.00 ft	2	20.00 ft	5800.00 ft	TPK SB
Contingency		0%			

Impervious Area 11.72 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	4	48.00 ft	5800.00 ft	TPK NB
Shoulder	12.00 ft	2	24.00 ft	5800.00 ft	TPK NB
Travel Lanes	12.00 ft	4	48.00 ft	5800.00 ft	TPK SB
Shoulder	12.00 ft	2	24.00 ft	5800.00 ft	TPK SB
Travel Lanes	15.00 ft	1	15.00 ft	3200.00 ft	TPK SB on Ramp
Shoulder	6.00 ft	2	12.00 ft	3200.00 ft	TPK SB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	5470.00 ft	TPK SB off Ramp
Shoulder	6.00 ft	2	12.00 ft	5470.00 ft	TPK SB off Ramp
Travel Lanes	12.00 ft	2	24.00 ft	4450.00 ft	TPK NB off Ramp
Shoulder	12.00 ft	2	24.00 ft	4450.00 ft	TPK NB off Ramp
Travel Lanes	15.00 ft	1	15.00 ft	1375.00 ft	TPK NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	1375.00 ft	TPK NB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	2200.00 ft	TPK NB off Ramp
Shoulder	6.00 ft	2	12.00 ft	2200.00 ft	TPK NB off Ramp
Contingency		20%			

Impervious Area 38.00 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	38.00 ac	26.28 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**5.48 ac-ft**
Treatment Volume for existing pavement	**2.44 ac-ft**
Total Treatment volume	**7.92 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3 - Alt 3

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
38.00 ac	17.38 ac	55.38 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		11.72 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	42.06 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	11.72 ac	98	20.73
Wood/Forest (Fair cover)	0.50 ac	79	0.71
Pasture/Range (Good)	1.10 ac	80	1.59
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	42.06 ac	80.52	61.16
		CN_{pre} =	84.19

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 1.88 in.
Q_{pre} = 10.20 in.
Pre-development runoff volume = **47.09 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3 - Alt 3

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
38.00 ac	17.38 ac	55.38 ac

Total Area to be attenuated for	HSG	
Roadway		38.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Wetland/Water	D	13.90 ac
Open Space Composite		3.48 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	38.00 ac	98	67.24
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	13.90 ac	98	24.60
Open Space	3.48 ac	80.52	5.05
		CN_{post} =	96.90

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.32 in.
Q_{post} = 11.82 in.
Post-development runoff volume = **54.57 ac-ft**

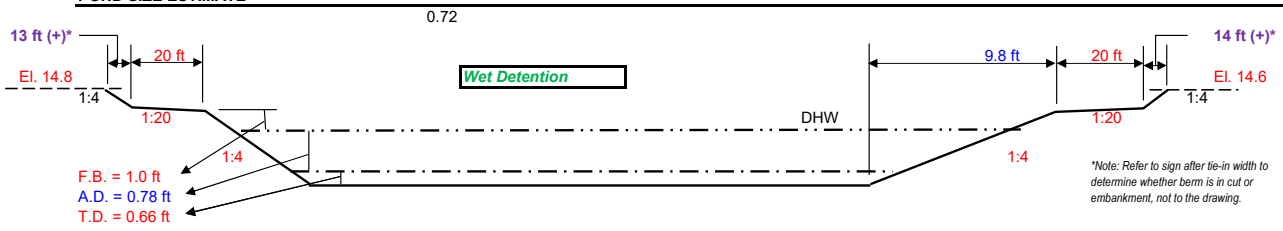
Attenuation volume required (Post-Pre) **7.48 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 3
SMF Name: Pond 3 - Alt 3

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	18.64
Approx. hydraulic clearance from LEOP =	1.00 ft
Approx. Control Elevation (wet)/Pond Bottom (dry) =	14.60
Seasonal High Ground Water Elevation (SHGWT)=	14.60
SHGWT Check for Dry Retention Only	N/A
Tailwater Elevation (TW) =	13.00
Allowable High Water (AHW)=	16.04
Design Highwater (DHW)=	16.04
Head loss (0.08%) from LEOP to SMF (2000 ft) =	1.60 ft
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft
Available depth for T.D. + A.D. =	1.44 ft

** TW elevation source: Existing borrow pit has no outfall*
AHW = Control elevtion + Available depth for T.D. + A.D.
Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose): Rectangle

Treatment area provided at treatment depth (T.D.)	12.00 ac
Treatment volume provided	7.92 ac-ft
Long Rectangular dimension at pond bottom (R1)	1446 ft
Short Rectangular dimension at pond bottom (R2)	362 ft
Attenuation volume provided	9.63 ac-ft
Long Rectangular dimension at tie-in (R1)	1532 ft
Short Rectangular dimension at tie-in (R2)	448 ft

Treatment Volume Required
7.92 ac-ft
Attenuation Volume Required
7.48 ac-ft

Total Area Calculated:	15.80 ac
Minimum Total Area Required (10% Landscaping Contingency):	**17.38 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 1

	Pre	***Post***
From Station	234+40	234+40
To Station	246+20	246+20
Basin Length	Various	Various
R/W to R/W Width	Various	Various
Total Area	81.71 ac	81.71 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	2	24.00 ft	6090.00 ft	TPK NB
Shoulder	10.00 ft	2	20.00 ft	6090.00 ft	TPK NB
Travel Lanes	12.00 ft	2	24.00 ft	6090.00 ft	TPK SB
Shoulder	10.00 ft	2	20.00 ft	6090.00 ft	TPK SB
Contingency		0%			

Impervious Area 12.30 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	4	48.00 ft	6090.00 ft	TPK NB
Shoulder	12.00 ft	2	24.00 ft	6090.00 ft	TPK NB
Travel Lanes	12.00 ft	4	48.00 ft	6090.00 ft	TPK SB
Shoulder	12.00 ft	2	24.00 ft	6090.00 ft	TPK SB
Travel Lanes	15.00 ft	1	15.00 ft	1800.00 ft	TPK NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	1800.00 ft	TPK NB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	2690.00 ft	I-95 SB off Ramp
Shoulder	6.00 ft	2	12.00 ft	2690.00 ft	I-95 SB off Ramp
Travel Lanes	15.00 ft	1	15.00 ft	2730.00 ft	I-95 NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	2730.00 ft	I-95 NB on Ramp
Contingency		20%			

Impervious Area 29.53 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	29.53 ac	17.23 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**3.59 ac-ft**
Treatment Volume for existing pavement	**2.56 ac-ft**
Total Treatment volume	**6.15 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 1

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
29.53 ac	11.99 ac	41.52 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		12.30 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	27.62 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	12.30 ac	98	29.04
Wood/Forest (Fair cover)	0.50 ac	79	0.95
Pasture/Range (Good)	1.10 ac	80	2.12
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	27.62 ac	80.52	53.56
		CN_{pre} =	85.67

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 1.67 in.
Q_{pre} = 10.40 in.
Pre-development runoff volume = **35.98 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 1

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
29.53 ac	11.99 ac	41.52 ac

Total Area to be attenuated for	HSG		
Roadway			29.53 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		9.59 ac
Open Space Composite			2.40 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	29.53 ac	98	69.70
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	9.59 ac	98	22.64
Open Space	2.40 ac	80.52	4.65
		CN_{post} =	96.99

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.31 in.
Q_{post} = 11.84 in.
Post-development runoff volume = **40.95 ac-ft**

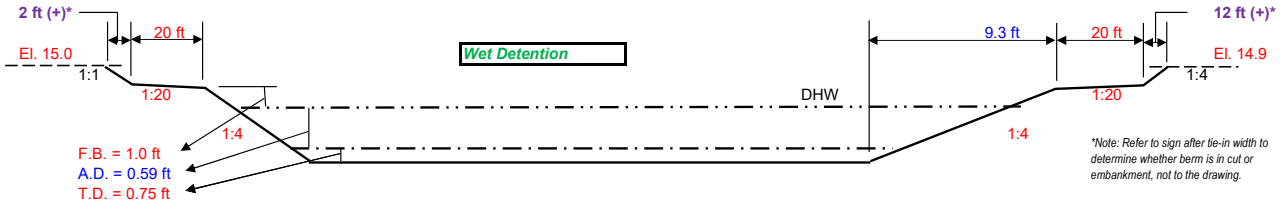
Attenuation volume required (Post-Pre) **4.97 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 1

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	18.54
Approx. hydraulic clearance from LEOP =	1.00 ft
Approx. Control Elevation (wet)/Pond Bottom (dry) =	14.60
Seasonal High Ground Water Elevation (SHGWT)=	14.60
SHGWT Check for Dry Retention Only	N/A
Tailwater Elevation (TW) =	12.33
Allowable High Water (AHW)=	15.94
Design Highwater (DHW)=	15.94
Head loss (0.08%) from LEOP to SMF (2000 ft) =	1.60 ft
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft
Available depth for T.D. + A.D. =	1.34 ft

** TW elevation source: Phipp Canal . Top of bank subtract 1-ft*
AHW = Control elevtion + Available depth for T.D. + A.D.

Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose) Rectangle

Treatment area provided at treatment depth (T.D.)	8.20 ac
Treatment volume provided	6.15 ac-ft
Long Rectangular dimension at pond bottom (R1)	1195 ft
Short Rectangular dimension at pond bottom (R2)	299 ft
Attenuation volume provided	5.01 ac-ft
Long Rectangular dimension at tie-in (R1)	1268 ft
Short Rectangular dimension at tie-in (R2)	372 ft

Treatment Volume Required
6.15 ac-ft
Attenuation Volume Required
4.97 ac-ft

Total Area Calculated:	10.90 ac
Minimum Total Area Required (10% Landscaping Contingency):	**11.99 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 2

	Pre	***Post***
From Station	234+40	234+40
To Station	246+20	246+20
Basin Length	Various	Various
R/W to R/W Width	Various	Various
Total Area	81.71 ac	81.71 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	2	24.00 ft	6090.00 ft	TPK NB
Shoulder	10.00 ft	2	20.00 ft	6090.00 ft	TPK NB
Travel Lanes	12.00 ft	2	24.00 ft	6090.00 ft	TPK SB
Shoulder	10.00 ft	2	20.00 ft	6090.00 ft	TPK SB
Contingency		0%			

Impervious Area 12.30 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	4	48.00 ft	6090.00 ft	TPK NB
Shoulder	12.00 ft	2	24.00 ft	6090.00 ft	TPK NB
Travel Lanes	12.00 ft	4	48.00 ft	6090.00 ft	TPK SB
Shoulder	12.00 ft	2	24.00 ft	6090.00 ft	TPK SB
Travel Lanes	15.00 ft	1	15.00 ft	1800.00 ft	TPK NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	1800.00 ft	TPK NB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	2690.00 ft	I-95 SB off Ramp
Shoulder	6.00 ft	2	12.00 ft	2690.00 ft	I-95 SB off Ramp
Travel Lanes	15.00 ft	1	15.00 ft	2730.00 ft	I-95 NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	2730.00 ft	I-95 NB on Ramp
Contingency		20%			

Impervious Area 29.53 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	29.53 ac	17.23 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**3.59 ac-ft**
Treatment Volume for existing pavement	**2.56 ac-ft**
Total Treatment volume	**6.15 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 2

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
29.53 ac	11.99 ac	41.52 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		12.30 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	27.62 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	12.30 ac	98	29.04
Wood/Forest (Fair cover)	0.50 ac	79	0.95
Pasture/Range (Good)	1.10 ac	80	2.12
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	27.62 ac	80.52	53.56
		CN_{pre} =	85.67

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 1.67 in.
Q_{pre} = 10.40 in.
Pre-development runoff volume = **35.98 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 2

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
29.53 ac	11.99 ac	41.52 ac

Total Area to be attenuated for	HSG		
Roadway			29.53 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		9.59 ac
Open Space Composite			2.40 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	29.53 ac	98	69.70
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	9.59 ac	98	22.64
Open Space	2.40 ac	80.52	4.65
		CN_{post} =	96.99

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.31 in.
Q_{post} = 11.84 in.
Post-development runoff volume = **40.95 ac-ft**

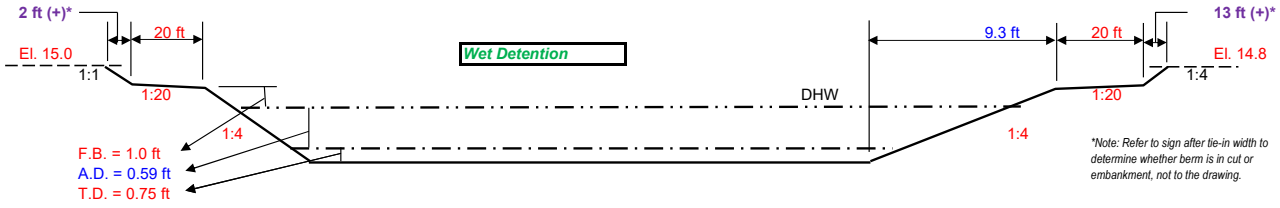
Attenuation volume required (Post-Pre) **4.97 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 2

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	18.54	
Approx. hydraulic clearance from LEOP =	1.00 ft	
Approx. Control Elevation (wet)/Pond Bottom (dry) =	14.60	
Seasonal High Ground Water Elevation (SHGWT)=	14.60	
SHGWT Check for Dry Retention Only	N/A	
Tailwater Elevation (TW) =	12.50	* TW elevation source: SR 91 SB borrow ditch. Bottom plus 1-ft
Allowable High Water (AHW)=	15.94	AHW = Control elevtion + Available depth for T.D. + A.D.
Design Highwater (DHW)=	15.94	
Head loss (0.08%) from LEOP to SMF (2000 ft) =	1.60 ft	
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft	
Available depth for T.D. + A.D. =	1.34 ft	Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose) Rectangle

Treatment area provided at treatment depth (T.D.)	8.20 ac
Treatment volume provided	6.15 ac-ft
Long Rectangular dimension at pond bottom (R1)	1195 ft
Short Rectangular dimension at pond bottom (R2)	299 ft
Attenuation volume provided	5.01 ac-ft
Long Rectangular dimension at tie-in (R1)	1269 ft
Short Rectangular dimension at tie-in (R2)	372 ft

Treatment Volume Required
6.15 ac-ft
Attenuation Volume Required
4.97 ac-ft

Total Area Calculated: 10.90 ac

Minimum Total Area Required (10% Landscaping Contingency): **11.99 ac**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 3

	Pre	***Post***
From Station	234+40	234+40
To Station	246+20	246+20
Basin Length	Various	Various
R/W to R/W Width	Various	Various
Total Area	81.71 ac	81.71 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	2	24.00 ft	6090.00 ft	TPK NB
Shoulder	10.00 ft	2	20.00 ft	6090.00 ft	TPK NB
Travel Lanes	12.00 ft	2	24.00 ft	6090.00 ft	TPK SB
Shoulder	10.00 ft	2	20.00 ft	6090.00 ft	TPK SB
Contingency		0%			

Impervious Area 12.30 ac

Post-development Impervious Areas (choose)	Width	Number	Total Width	Distance	Notes
Travel Lanes	12.00 ft	4	48.00 ft	6090.00 ft	TPK NB
Shoulder	12.00 ft	2	24.00 ft	6090.00 ft	TPK NB
Travel Lanes	12.00 ft	4	48.00 ft	6090.00 ft	TPK SB
Shoulder	12.00 ft	2	24.00 ft	6090.00 ft	TPK SB
Travel Lanes	15.00 ft	1	15.00 ft	1800.00 ft	TPK NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	1800.00 ft	TPK NB on Ramp
Travel Lanes	15.00 ft	1	15.00 ft	2690.00 ft	I-95 SB off Ramp
Shoulder	6.00 ft	2	12.00 ft	2690.00 ft	I-95 SB off Ramp
Travel Lanes	15.00 ft	1	15.00 ft	2730.00 ft	I-95 NB on Ramp
Shoulder	6.00 ft	2	12.00 ft	2730.00 ft	I-95 NB on Ramp
Contingency		20%			

Impervious Area 29.53 ac

TREATMENT CALCULATIONS

		Total Imp. Area	Add'l Imp.	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	2.50 in.	29.53 ac	17.23 ac	N/A	N/A
Area to be Treated (choose)	Total Imp. Area				

Treatment Volume required (New Impervious)	**3.59 ac-ft**
Treatment Volume for existing pavement	**2.56 ac-ft**
Total Treatment volume	**6.15 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 3

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	NOAA Atlas 14
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	12.2 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
29.53 ac	7.26 ac	36.79 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		12.30 ac
Wood/Forest (Fair cover)	D	0.50 ac
Pasture/Range (Good)	D	1.10 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space	See below	22.89 ac

CN Calculations

Soil Types (provide)	Wabasso	Pineda-Riviera	Riviera	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Fair 50%-75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	33%	33%	33%	*Open Space CN*
CN	80	84	80	80.52

	Area	*CN*	*Weighted CN*
Roadway	12.30 ac	98	32.77
Wood/Forest (Fair cover)	0.50 ac	79	1.07
Pasture/Range (Good)	1.10 ac	80	2.39
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	22.89 ac	80.52	50.09
		CN_{pre} =	86.33

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{pre} = 1.58 in.
Q_{pre} = 10.49 in.
Pre-development runoff volume = **32.15 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 3

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
29.53 ac	7.26 ac	36.79 ac

Total Area to be attenuated for	HSG		
Roadway			29.53 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Gravel Roads	D		0.00 ac
Wetland/Water	D		5.81 ac
Open Space Composite			1.45 ac

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	29.53 ac	98	78.66
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	5.81 ac	98	15.47
Open Space	1.45 ac	80.52	3.18
		CN_{post} =	97.31

NRCS Method for Attenuation Volume:

$$S = \frac{1{,}000}{CN} - 10$$

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

S_{post} = 0.28 in.
Q_{post} = 11.87 in.
Post-development runoff volume = **36.40 ac-ft**

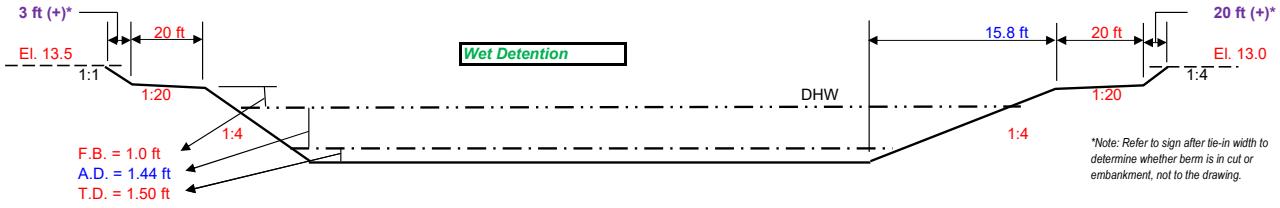
Attenuation volume required (Post-Pre) **4.26 ac-ft**

Patel, Greene & Associates, LLC

Designed By: CY
Date: 9/11/2025
Checked By: ES
Date: 9/16/2026

Subject: FPID 446975-1, I-95 Interchange
Description Pond Sizing Calculations
Basin: Basin 4
SMF Name: Pond 4 - Alt 3

POND SIZE ESTIMATE



T.D. ok

Approx. low edge of pavement elevation (LEOP)=	18.54
Approx. hydraulic clearance from LEOP =	1.00 ft
Approx. Control Elevation (wet)/Pond Bottom (dry) =	13.00
Seasonal High Ground Water Elevation (SHGWT)=	13.00
SHGWT Check for Dry Retention Only	N/A
Tailwater Elevation (TW) =	13.00
Allowable High Water (AHW)=	15.94
Design Highwater (DHW)=	15.94
Head loss (0.08%) from LEOP to SMF (2000 ft) =	1.60 ft
Head loss (0.08%) from SMF to Outfall (300 ft) =	0.24 ft
Available depth for T.D. + A.D. =	2.94 ft

** TW elevation source: Existing borrow pit has no outfall*
AHW = Control elevtion + Available depth for T.D. + A.D.
Available Depth = LEOP - Pond control EL. - hydraulic clearance - head loss from LEOP to SMF

Equivalent Rectangular Ratio (choose): Rectangle

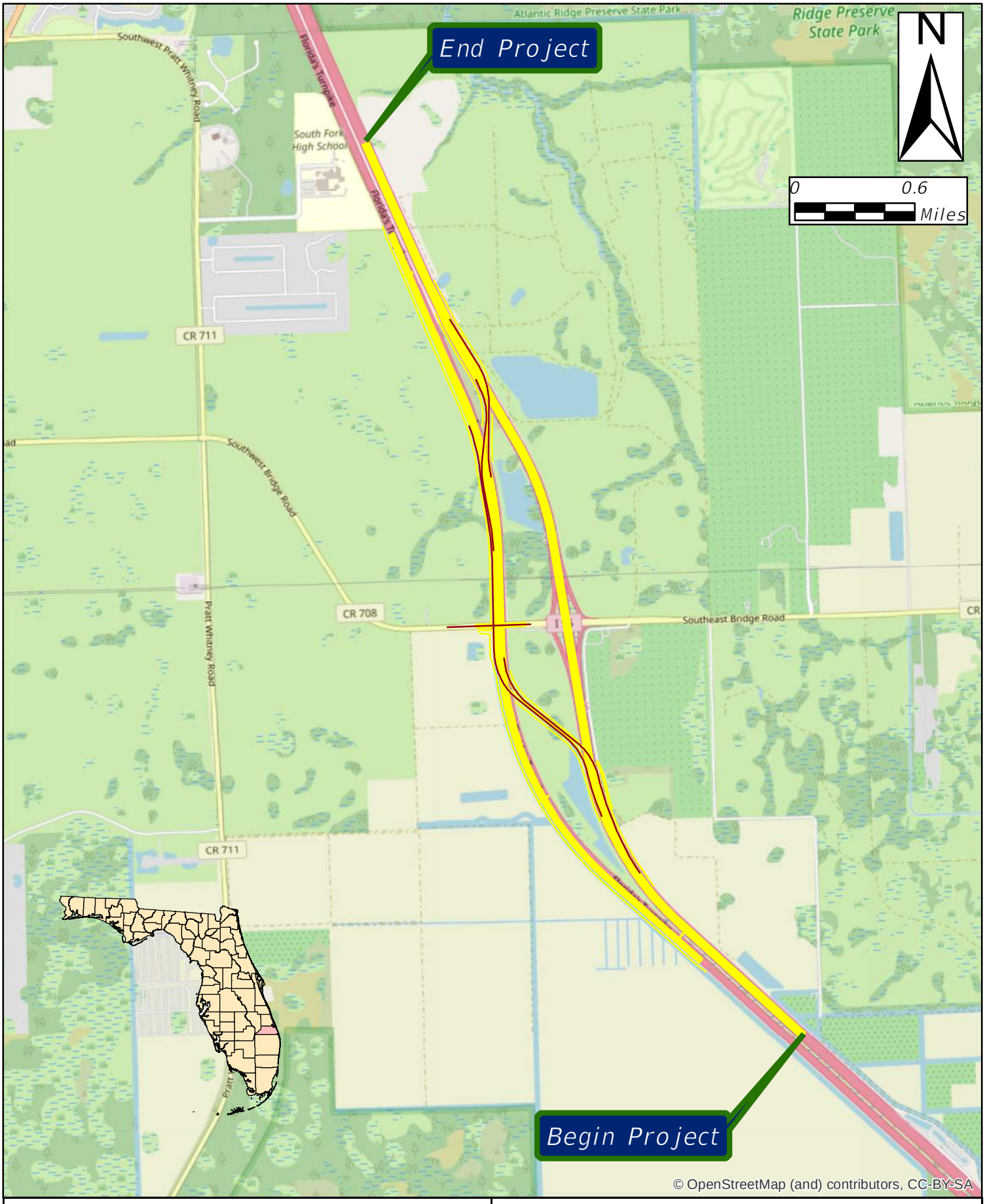
Treatment area provided at treatment depth (T.D.)	4.10 ac
Treatment volume provided	6.15 ac-ft
Long Rectangular dimension at pond bottom (R1)	845 ft
Short Rectangular dimension at pond bottom (R2)	211 ft
Attenuation volume provided	6.53 ac-ft
Long Rectangular dimension at tie-in (R1)	940 ft
Short Rectangular dimension at tie-in (R2)	306 ft

Treatment Volume Required
6.15 ac-ft
Attenuation Volume Required
4.26 ac-ft

Total Area Calculated:	6.60 ac
Minimum Total Area Required (10% Landscaping Contingency):	**7.26 ac**

APPENDIX C

DESIGN INFORMATION AND EXHIBITS

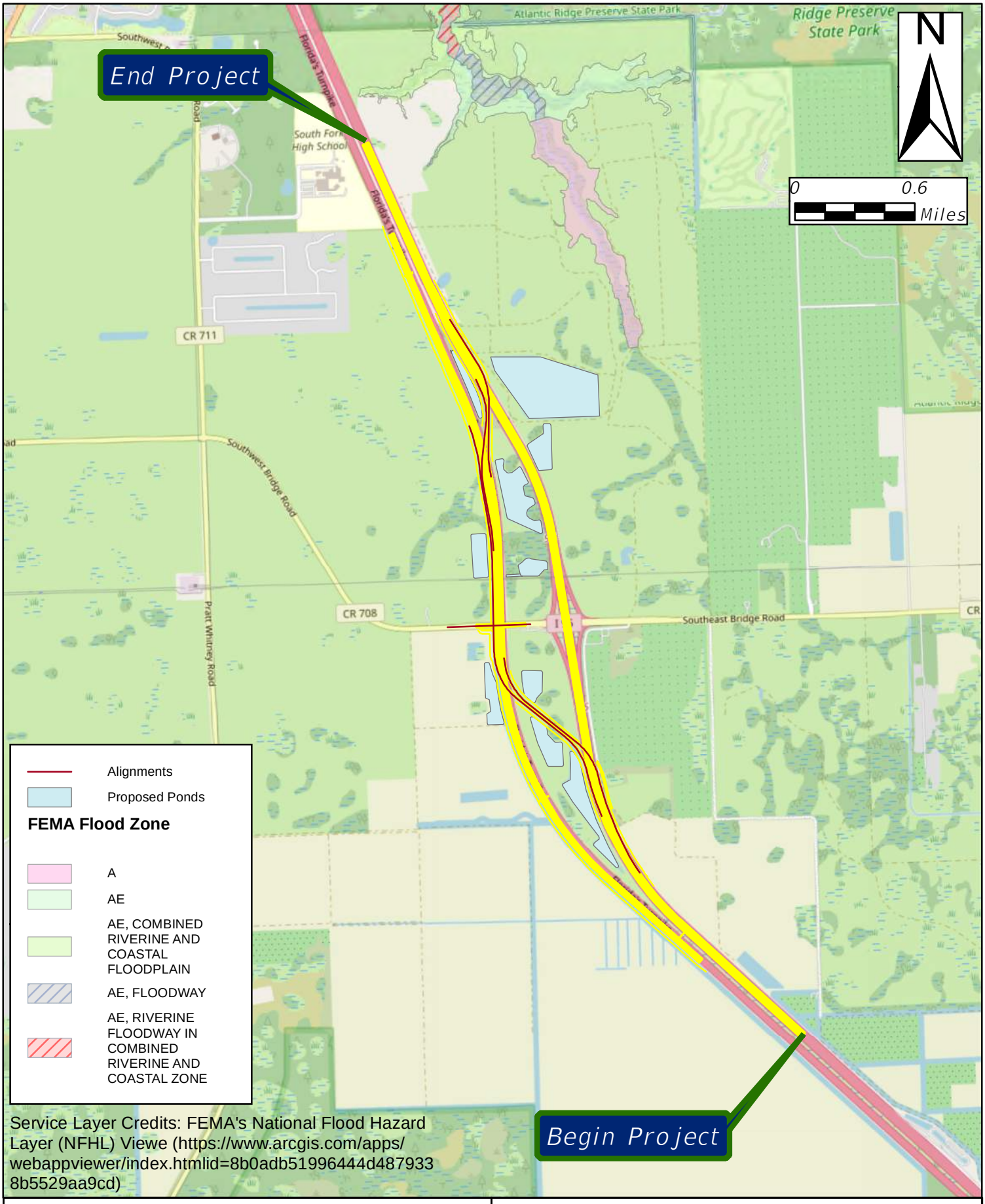


Patel, Greene & Associates, LLC
12570 Telecom Drive
Temple Terrace, FL 33637

Project Location Map

I-95 Direct Connection Interchange PD&E Study

FPID: 446975-1-22-01 Date: 9/16/2025



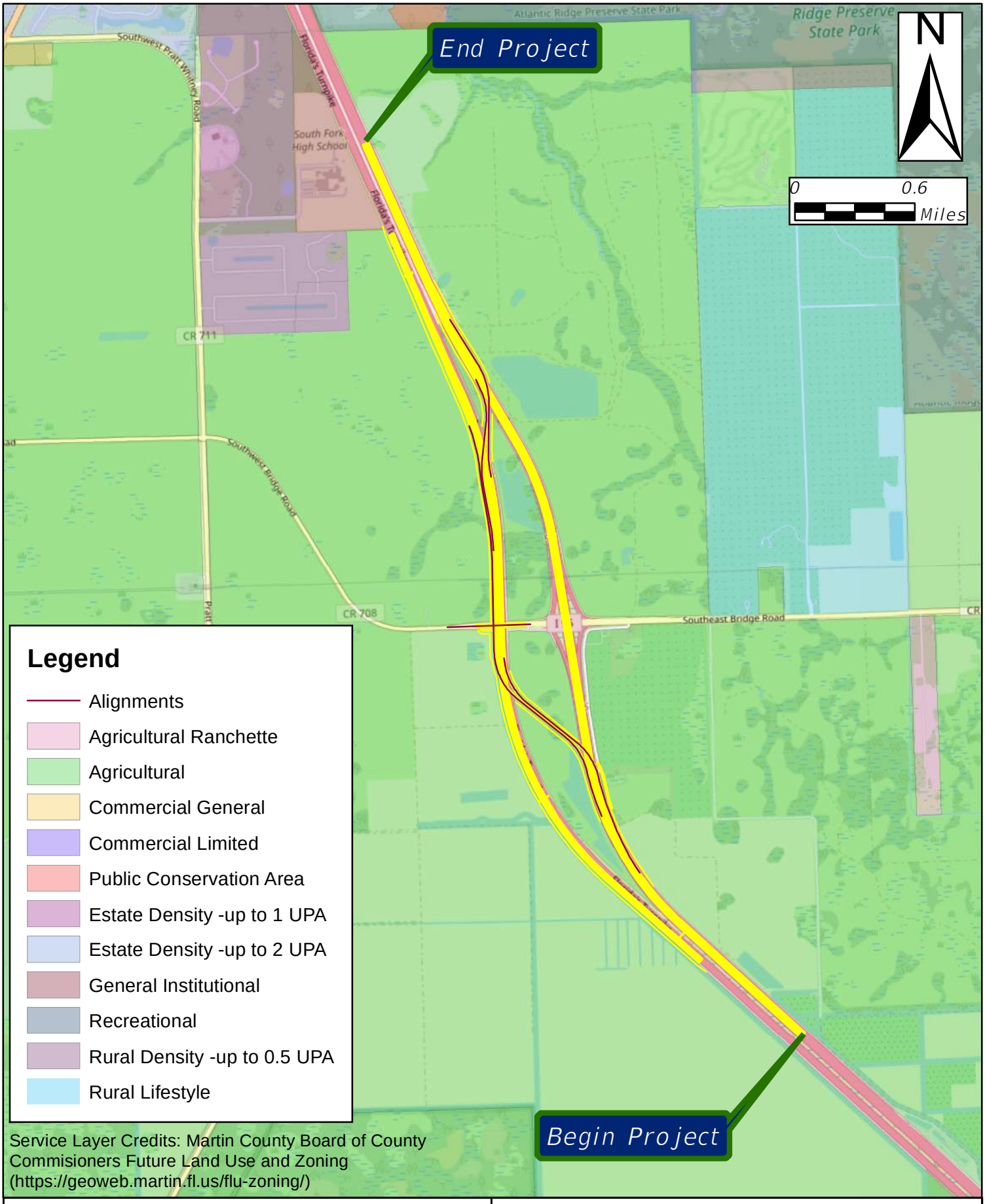
Service Layer Credits: FEMA's National Flood Hazard Layer (NFHL) Viewe (https://www.arcgis.com/apps/webappviewer/index.htmlid=8b0adb51996444d4879338b5529aa9cd)

Patel, Greene & Associates, LLC
12570 Telecom Drive
Temple Terrace, FL 33637

FEMA Map

I-95 Direct Connection Interchange PD&E Study

FPID: 446975-1-22-01 *Date: 9/16/2025*



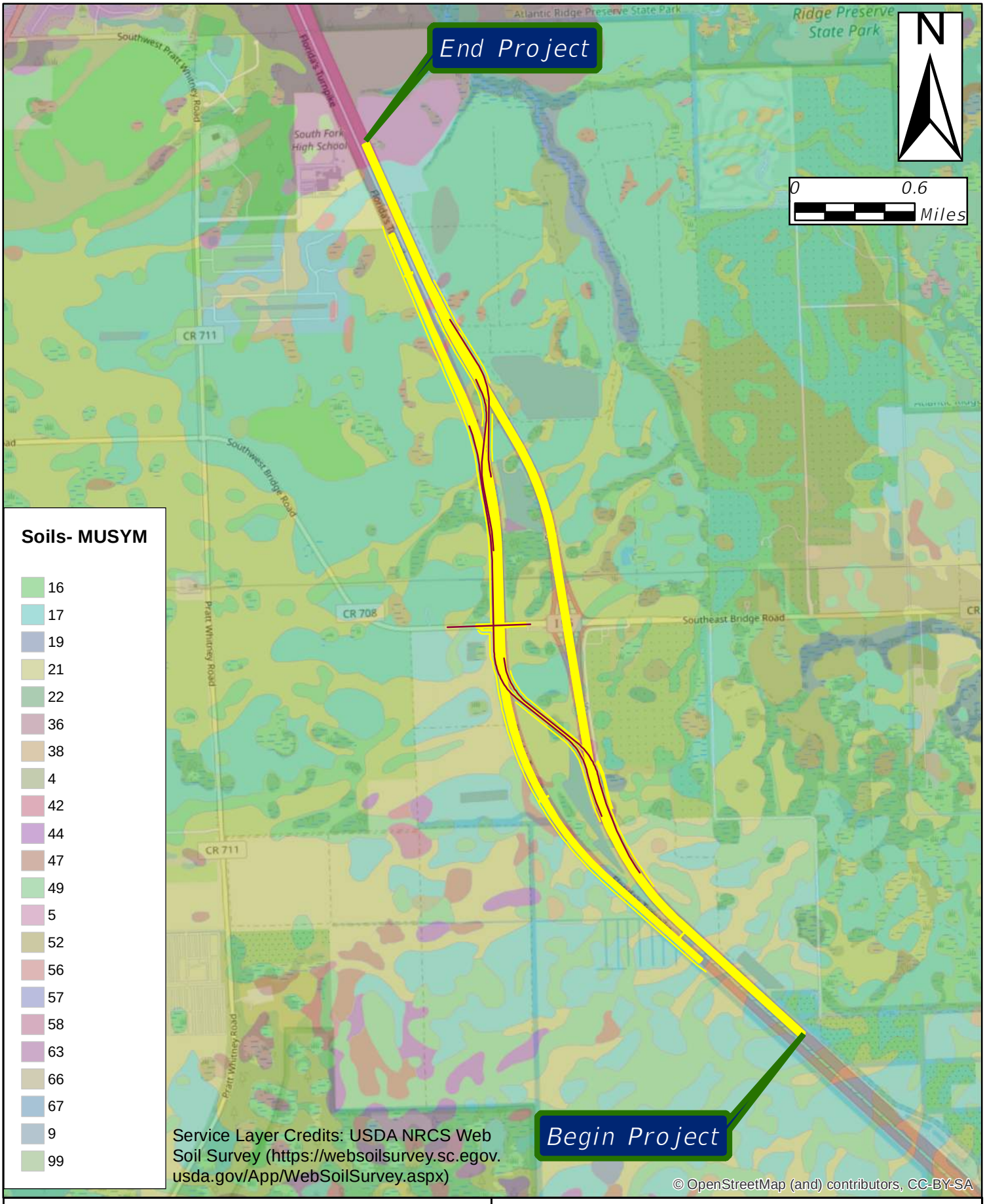
Service Layer Credits: Martin County Board of County Commisioners Future Land Use and Zoning (https://geoweb.martin.fl.us/flu-zoning/)

Patel, Greene & Associates, LLC
12570 Telecom Drive
Temple Terrace, FL 33637

Future Land Use Map

I-95 Direct Connection Interchange PD&E Study

FPID: 446975-1-22-01 *Date: 9/16/2025*



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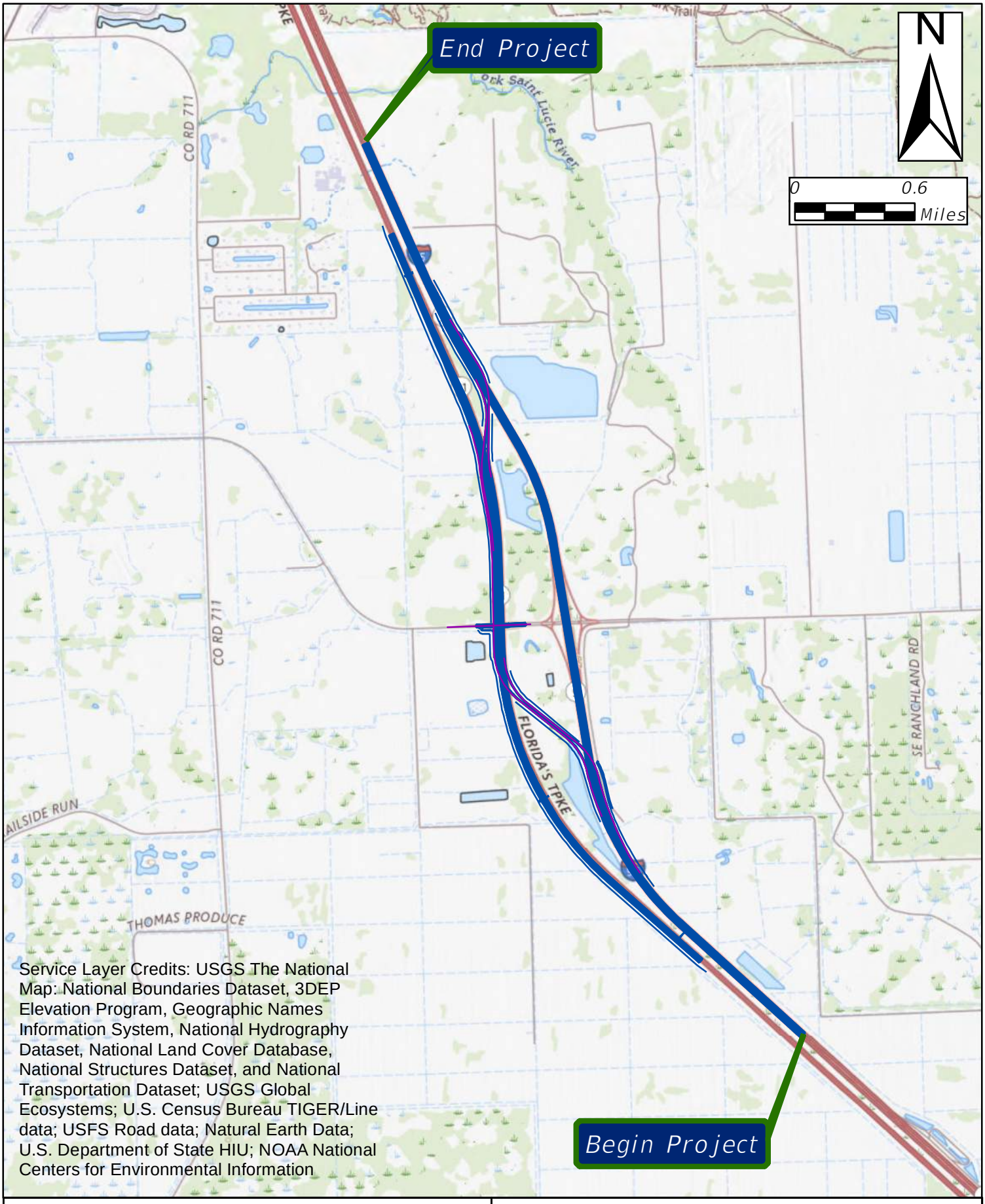
Temple Terrace, FL 33637

Soils Map

I-95 Direct Connection Interchange PD&E Study

FPID: 446975-1-22-01 Date: 9/16/2025



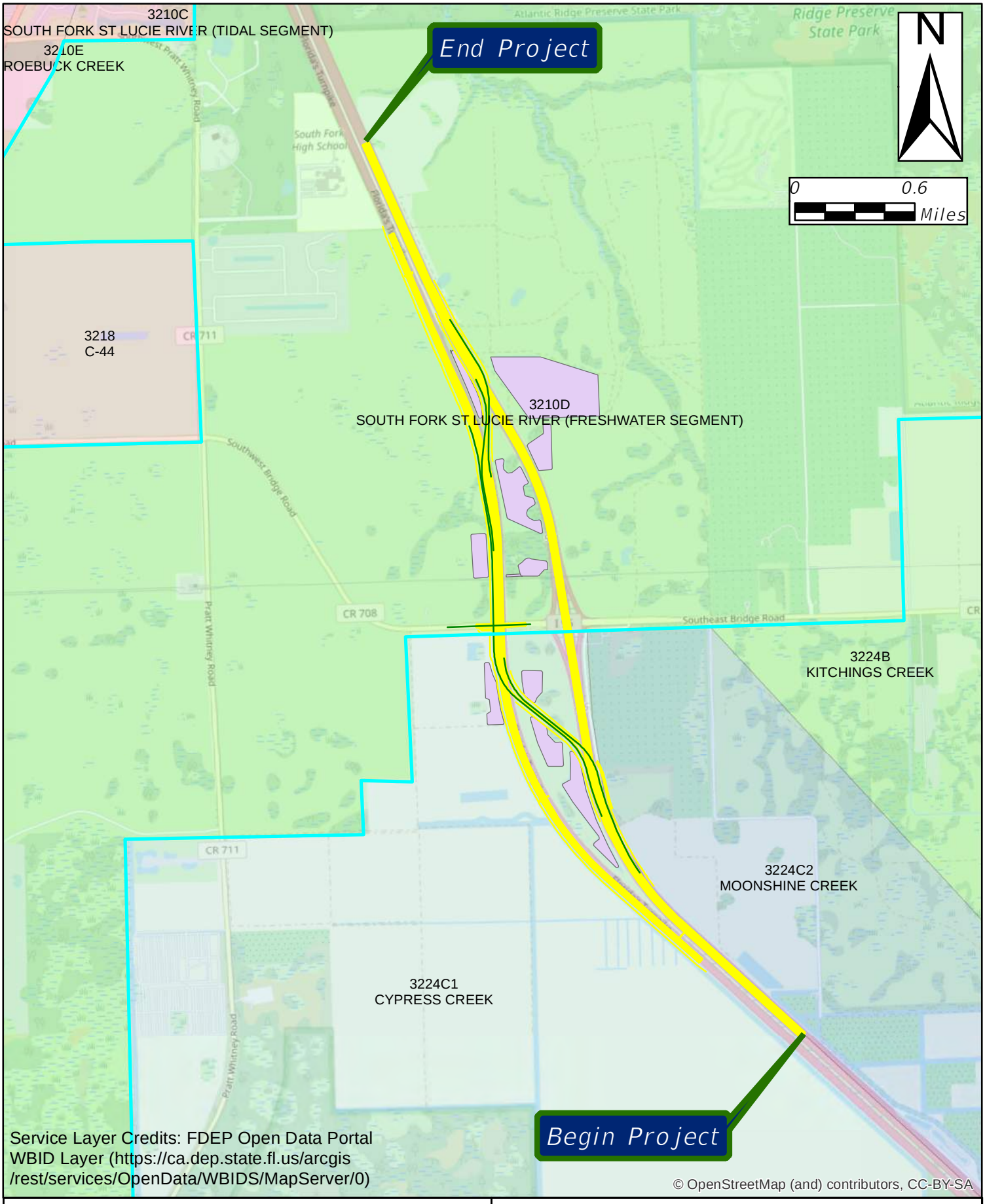
Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information

Patel, Greene & Associates, LLC
12570 Telecom Drive
Temple Terrace, FL 33637

USGS Topo Map

I-95 Direct Connection Interchange PD&E Study

FPID: 446975-1-22-01 *Date: 9/16/2025*



Patel, Greene & Associates, LLC
12570 Telecom Drive
Temple Terrace, FL 33637

WBID Map

I-95 Direct Connection Interchange PD&E Study

FPID: 446975-1-22-01 *Date: 9/16/2025*

NOAA ONLINE VERTICAL DATUM TRANSFORMATION

Regional Information

* Region : Contiguous United States

Horizontal Information

	Source	Target
Reference Frame:	NAD83(2011)	NAD 1927
Coor. System:	Geographic (Longitude, Latitude)	Geographic (Longitude, Latitude)
Unit:	meter (m)	meter (m)
Zone:	AL E - 0101	AL E - 0101

Vertical Information

	Source	Target
Reference Frame:	NAVD 88	NGVD 1929
Unit:	foot (International) (ft)	foot (International) (ft)
	Height Sounding	Height Sounding
	GEOID model:	GEOID model:

Point Conversion | ASCII File Conversion

	Input		Output
Latitude:	27.043798 (e.g. 33.7586 or 33 45 30.9600)	Transform	Latitude: 27.0434682755
Longitude:	-80.236864 (e.g. -118.7691 or -118 46 8.7600)	Reset	Longitude: -80.2370983116
Height:	(e.g. 3.037)	DMS	Height: 1.503
	Drive to on map / Reset Map		Drive to on map / Reset Map

to DMS

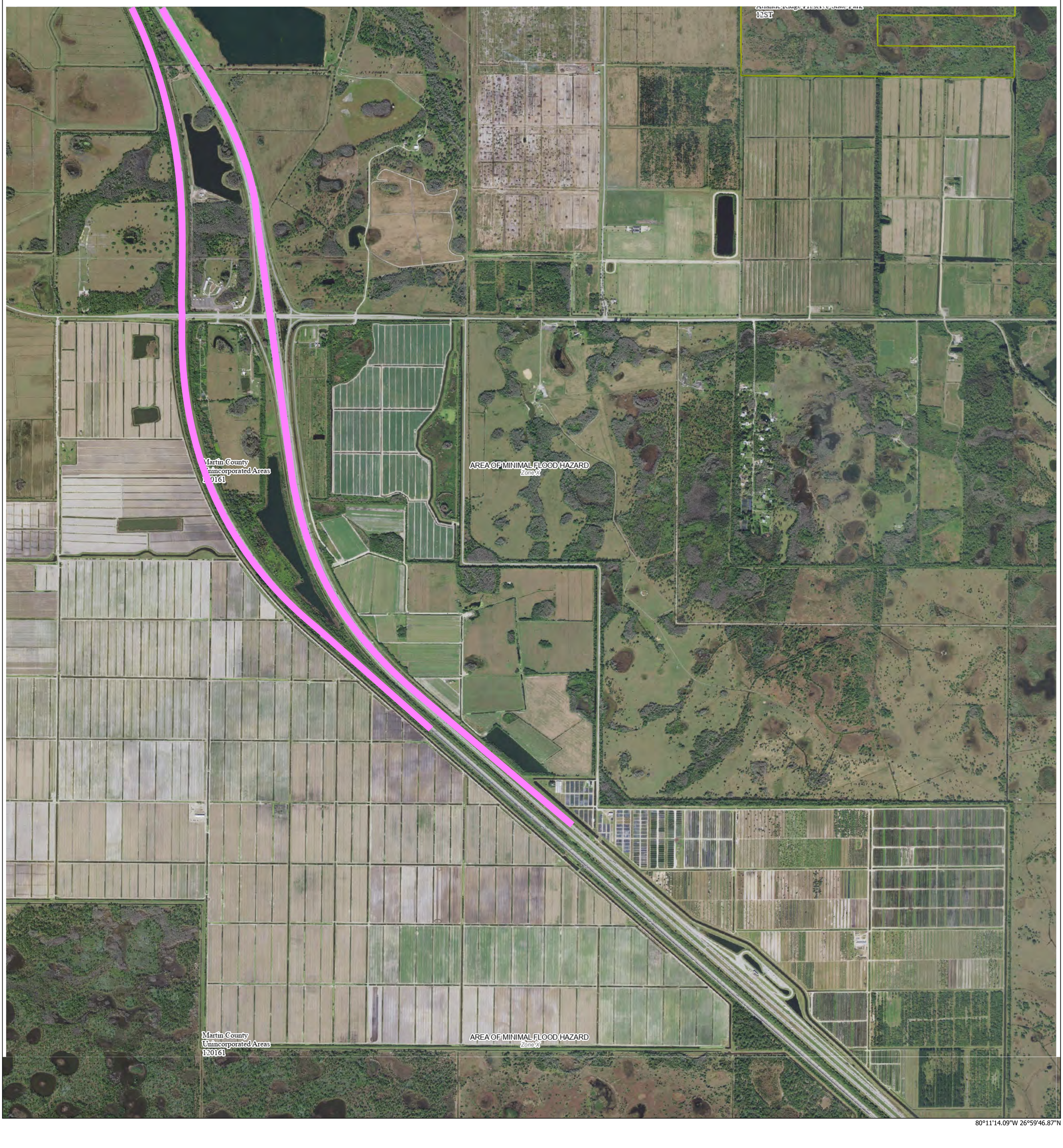
Vertical Uncertainty: 1 sigma / 95% Confidence — Vertical Uncertainty (+/-): 0.079 ft

Add Observation Vertical Uncertainty

Vertical_Area: null

Valid Tidal area, Non-Tidal area, Non-Valid area, CRD, IGLD85, SVU area

80°15'W 27°3'58.22"N



80°11'14.09"W 26°59'46.87"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

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To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

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This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **1/29/2025 8:23 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: No elevation features on this FIRM
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

N

1 inch = 1,000 feet 1:12,000

0 500 1,000 2,000 3,000 4,000 Feet

0 105 210 420 630 840 Meters

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

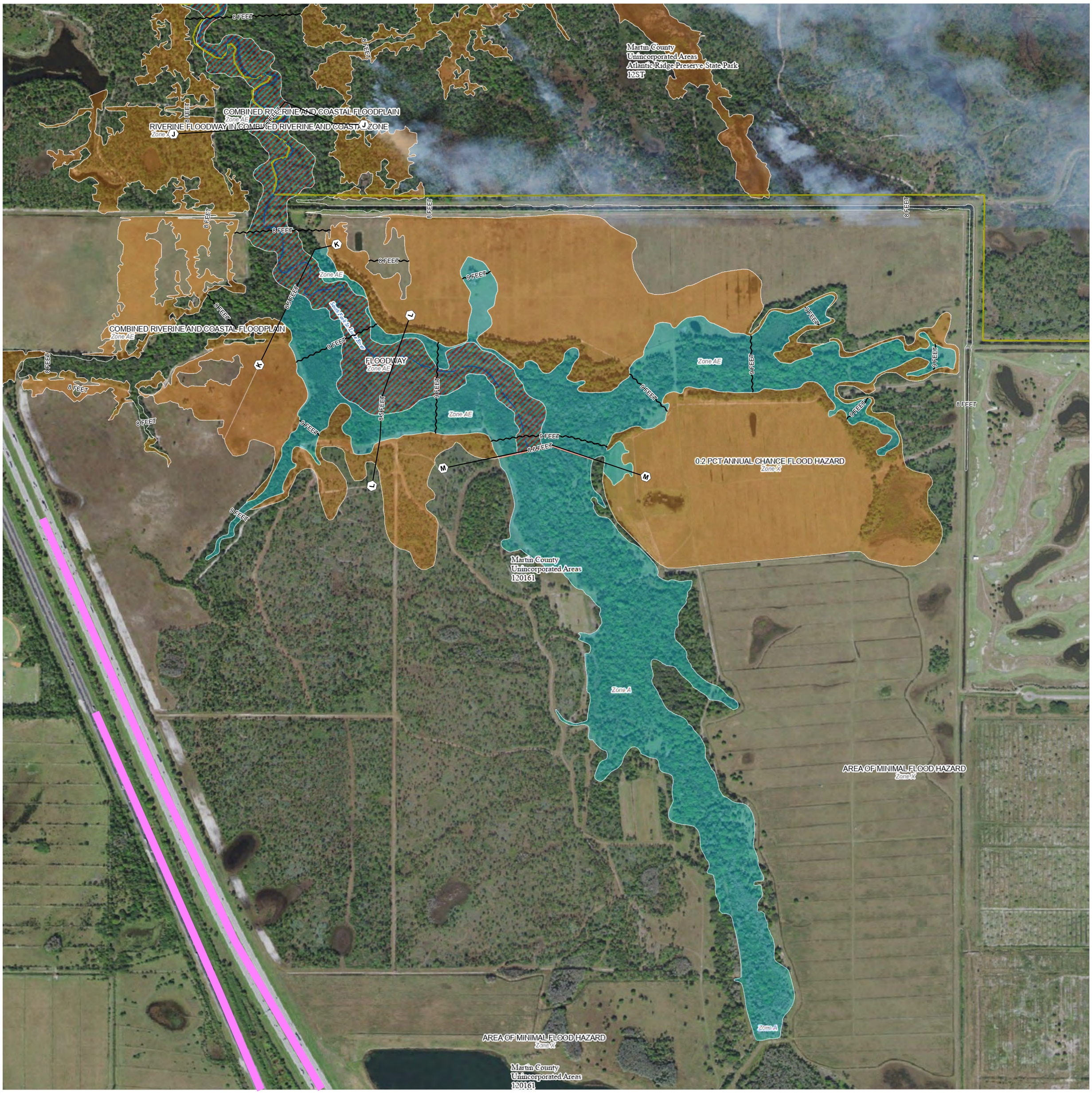
PANEL 315 OF 527

Panel Contains:

COMMUNITY	NUMBER	PANEL
MARTIN COUNTY	120161	0315

MAP NUMBER
12085C0315G
EFFECTIVE DATE
March 16, 2015

80°15'W 27°5'44.13"N



80°13'7.04"W 27°3'38.45"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

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SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

N

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 Feet

0 50 100 200 300 400 Meters

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

PANEL **303** OF **527**

Panel Contains:

COMMUNITY	NUMBER	PANEL
MARTIN COUNTY	120161	0303

MAP NUMBER
12085C0303H
EFFECTIVE DATE
February 19, 2020

80°16'52.92"W 27°5'44.13"N

80°14'59.57"W 27°3'38.45"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

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Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **1/29/2025 8:09 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

N

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 Feet

0 50 100 200 300 400 Meters

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

PANEL **284** OF **527**

Panel Contains:

COMMUNITY	NUMBER	PANEL
MARTIN COUNTY	120161	0284

MAP NUMBER
12085C0284H
EFFECTIVE DATE
February 19, 2020

APPENDIX D

POND SITE EVALUATION MATRICES

Basin 1			
Alternative	Pond 1 – Alt 1	Pond 1 – Alt 2	Pond 1 - ALT 3
Location/Address	Unassigned address, Martin County - Lat/Long 27°02'18.4"N 80°14'25.5"W	Unassigned address, Martin County - Lat/Long 27°02'10.4"N 80°14'10.9"W	Unassigned address, Martin County - Lat/Long 27°01'51.9"N 80°14'00.9"W
Parcel size (ac)	330.60	66.83	63.10
Pond size with tie downs (ac)	9.57	8.80	6.82
Parcel number	33-39-41-000-001-00000-1	34-39-41-000-004-00000-3	34-39-41-000-008-00000-4
Current parcel owner	MIDBROOK 1ST REALTY CORP	CURTIS RONALD J TTEE PERRY F MARTIN TTEE	SOUTH FLORIDA GRASSING INC
Estimated Parcel Value (per ac)			
Estimated Right-of-Way Cost			
Estimated Construction Cost	$647,051	$1,189,978	$172,361
Estimated TOTAL Cost			
Other Non-Quantified Costs	Possible Business Losses	Possible Business Losses	Possible Business Losses
Current Land-Use	Cropland Soil	Grazing Land Soil	Cropland Soil
Future Land-Use	Agricultural Ranchette	Agricultural Ranchette	Agricultural Ranchette
Soil Type	Wabasso, Pineda-Riviera, Riviera - Type D	Wabasso, Pineda-Riviera, Riviera - Type D	Wabasso, Pineda-Riviera, Riviera - Type D
Approximate Ground Elevation (ft)	16.20	16.40	15.20
Approximate SHWTE (ft)	15.20	15.40	14.20
Proposed Outfall	Kitching Creek	Kitching Creek	Kitching Creek
Wetland/Surface Water Impacts (ac)	8.15, Row crops 0.55, Streams & Waterways	None	1.11, Brazilian Pepper 21.38 – Reservoir
FEMA Flood Zone impacts (ac)	None	None	None
Listed Species Impacts	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther
Site Contamination Probability	Medium	Low	Low
Archaeological impacts probability	Low	Low	Low
Construction/Maintenance Concerns	Requires a permanent easement for access to pond.	Requires a permanent easement for pond outfall.	None
Environmental Look Around Opportunities	None	None	None

Basin 1			
Alternative	Pond 1 – Alt 1	Pond 1 – Alt 2	Pond 1 - ALT 3
Utility Conflicts	None	None	None
Public Opinion	-	-	-
Aesthetics	-	-	-
Notes	-		
Rankings	Ranking: #2	Ranking: #1	Ranking: #3

Basin 2			
Alternative	Pond 2 – Alt 1	Pond 2 – Alt 2	Pond 2 – Alt 3
Location/Address	Unassigned address, Martin County - Lat/Long 27°01'51.9"N 80°14'00.9"W	Unassigned address, Martin County - Lat/Long 27°02'10.4"N 80°14'10.9"W	SE BRIDGE RD HOBE SOUND FL, Lat/Long 27°02'06.1"N 80°13'53.6"W
Parcel size (ac)	63.10	66.83	48.50
Pond size with tie downs (ac)	2.20	2.09	2.31
Parcel number	34-39-41-000-008-00000-4	34-39-41-000-004-00000-3	34-39-41-000-002-00010-5
Current parcel owner	SOUTH FLORIDA GRASSING INC	CURTIS RONALD J TTEE PERRY F MARTIN TTEE	PAGODA GROVES INC
Estimated Parcel Value (per ac)			
Estimated Right-of-Way Cost			
Estimated Construction Cost For Alternative	$297,495	$282,620	$312,369
Estimated TOTAL Cost for Alternative			
Other Non-Quantified Costs	Possible Business Losses	Possible Business Losses	Possible Business Losses
Current Land-Use	Cropland Soil	Grazing Land Soil	Orchard Groves, Citrus
Future Land-Use	Agricultural Ranchette	Agricultural Ranchette	Agricultural Ranchette
Soil Type	Wabasso, Pineda-Riviera, Riviera - Type D	Wabasso, Pineda-Riviera, Riviera - Type D	Wabasso, Pineda-Riviera, Riviera - Type D
Approximate Ground Elevation (ft)	15.90	15.70	15.00
Approximate SHWTE (ft)	14.90	14.70	14.00
Proposed Outfall	Kitching Creek	Kitching Creek	Kitching Creek
Wetland/Surface Water Impacts (ac)	5.32, Improved Pastures 3.56, Wetland Scrub	None	10.84, Abandoned Groves 0.02, Streams & Waterways
FEMA Flood Zone impacts (ac)	None	None	None
Listed Species Impacts	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther
Site Contamination Probability	Low	Low	Medium

Basin 2			
Alternative	Pond 2 – Alt 1	Pond 2 – Alt 2	Pond 2 – Alt 3
Archaeological impacts probability	Low	Low	Low
Construction/Maintenance Concerns	None	None	Requires a permanent easement for access to pond.
Environmental Look Around Opportunities	None	None	None
Utility Conflicts	None	None	None
Public Opinion	-	- -	-
Aesthetics	-	- -	-
Notes	-		
Rankings	Ranking: #2	Ranking: #1	Ranking: #3

Basin 3				
Alternative	Pond 3A & 3B – Alt 1		Pond 3 – Alt 2	Pond 3 – Alt 3
	Pond 3A – Alt 1	Pond 3B – Alt 1		
Location/Address	1425 SE BRIDGE RD HOBE SOUND FL	UNASSIGNED, HOBE SOUND - LAT/LONG 27°03'27.8"N 80°14'21.4"W	UNASSIGNED, HOBE SOUND - LAT/LONG 27°02'54.6"N 80°14'25.1"W	UNASSIGNED, HOBE SOUND - LAT/LONG 27°03'27.8"N 80°14'21.4"W
Parcel size (ac)	64.55	16.44 & 31.70	167.00	16.44 & 31.70
Pond size with tie downs (ac)	8.25	7.73	17.38	17.38
Parcel number	27-39-41-000-012-00000-0	28-39-41-000-001-00010-9 & 27-39-41-000-004-00000-7	28-39-41-000-001-00030-5	28-39-41-000-001-00010-9 & 27-39-41-000-004-00000-7
Current parcel owner	BE A MAN BUY LAND LLC	BE A MAN BUY LAND LLC	MED REALTY CORP	BE A MAN BUY LAND LLC
Estimated Parcel Value (per ac)				
Estimated Right-of-Way Cost				
Estimated Construction Cost	$2,265,015		$2,350,207	$129,271
Estimated TOTAL Cost				
Other Non-Quantified Costs	None	Possible Business Damages	None	Possible Business Damages
Current Land-Use	Grazing Land Soil	Grazing Land Soil	Grazing Land Soil	Grazing Land Soil
Future Land-Use	Agricultural Ranchette	Agricultural Ranchette	Agricultural Ranchette	Agricultural Ranchette
Soil Type	Wabasso, Pineda-Riviera, Riviera - Type D	Wabasso, Pineda-Riviera, Riviera - Type D	Wabasso, Pineda-Riviera, Riviera - Type D	Wabasso, Pineda-Riviera, Riviera - Type D
Approximate Ground Elevation (ft)	15.80	15.80	15.80	15.60
Approximate SHWTE (ft)	14.80	14.80	14.80	14.60
Proposed Outfall	South Fork of the St. Lucie River	South Fork of the St. Lucie River	South Fork of the St. Lucie River	South Fork of the St. Lucie River

Basin 3				
Alternative	Pond 3A & 3B – Alt 1		Pond 3 – Alt 2	Pond 3 – Alt 3
	Pond 3A – Alt 1	Pond 3B – Alt 1		
Wetland/Surface Water Impacts (ac)	1.61, Specialty Farms 4.46, Upland Mixed Coniferous / Hardwood 0.30, Hardwood 0.005, Wetland	None	None	2.28, Improved Pastures 0.16, Ornamentals 23.37, Reservoirs 0.21, Cypress
FEMA Flood Zone impacts (ac)	None	None	None	None
Listed Species Impacts	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther
Site Contamination Probability	Low	Low	Low	Low
Archaeological impacts probability	Low	Low	Low	Low
Construction/Maintenance Concerns	Requires a permanent easement for access to pond. Requires long piping to get runoff from the mainline to the pond.	None	Requires a permanent easement for access to pond.	None

Basin 3				
Alternative	Pond 3A & 3B – Alt 1		Pond 3 – Alt 2	Pond 3 – Alt 3
	Pond 3A – Alt 1	Pond 3B – Alt 1		
Environmental Look Around Opportunities	None	None	None	None
Utility Conflicts	None	None	None	None
Public Opinion	-	-	-	-
Aesthetics	-	-	-	-
Notes	Pond has been located to avoid FPL easement.	-	-	-
Rankings	Ranking: #3		Ranking: #1	Ranking: #2

Basin 4			
Alternative	Pond 4 – Alt 1	Pond 4 – Alt 2	Pond 4 – Alt 3
Location/Address	UNASSIGNED, HOBE SOUND - LAT/LONG 27°03'42.6"N 80°14'28.9"W	UNASSIGNED, HOBE SOUND - LAT/LONG 27°03'40.6"N 80°14'36.6"W	UNASSIGNED, HOBE SOUND - LAT/LONG 27°03'40.1"N 80°14'08.6"W
Parcel size (ac)	12.77	227.34	116.05
Pond size with tie downs (ac)	11.99	11.99	7.26
Parcel number	21-39-41-000-009-00030-3	21-39-41-000-009-00100-8	22-39-41-000-011-00020-9
Current parcel owner	BE A MAN BUY LAND LLC	HOBE SOUND RANCH LTD	WHITWORTH FARMS LTD
Estimated Parcel Value (per ac)			
Estimated Right-of-Way Cost			
Estimated Construction Cost	$1,621,345.35	$1,621,345.35	$215,451.20
Estimated TOTAL Cost			
Other Non-Quantified Costs	Potential business damages	None	None
Current Land-Use	Grazing Land Soil	Grazing Land Soil	Grazing Land Soil
Future Land-Use	Agricultural Ranchette	Agricultural Ranchette	Agricultural Ranchette
Soil Type	Wabasso, Pineda-Riviera, Riviera - Type D	Wabasso, Pineda-Riviera, Riviera - Type D	Wabasso, Pineda-Riviera, Riviera - Type D
Approximate Ground Elevation (ft)	15.60	15.60	14.00
Approximate SHWTE (ft)	14.60	14.60	13.00
Proposed Outfall	South Fork of the St. Lucie River	South Fork of the St. Lucie River	South Fork of the St. Lucie River
Wetland/Surface Water Impacts (ac)	4.69, Other Open Lands "Rural" 0.22, Streams & Waterways 1.3, Cypress 1.37, Wetland Scrub	None	3.89, Improved Pastures 76.38, Reservoirs
FEMA Flood Zone impacts (ac)	None	None	None
Listed Species Impacts	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther	Florida Grasshopper Sparrow, Florida Scrub-jay, Audubon's Crested Caracara, Everglade Snail Kite, Florida Bonneted Bat, Wood Stork, Eastern Indigo Snake, Eastern Black Rail, Florida Panther, Red-cockaded Woodpecker
Site Contamination Probability	Low	Medium	Low
Archaeological impacts probability	Low	Low	Low

Basin 4			
Alternative	Pond 4 – Alt 1	Pond 4 – Alt 2	Pond 4 – Alt 3
Construction/Maintenance Concerns	None	Requires a permanent easement for access to pond.	Requires a permanent easement for access to pond. Requires long piping to get runoff from the mainline to the pond.
Environmental Look Around Opportunities	None	None	None
Utility Conflicts	None	None	None
Public Opinion	-	-	- - -
Aesthetics	-	-	- - -
Notes	-		
Rankings	Ranking: #1	Ranking: #2	Ranking: #3

APPENDIX E

CORRESPONDENCE, MEETING MINUTES, EXCERPTS FROM PREVIOUS PERMITS, AS-BUILTS

CORRESPONDENCE

Jen Rehrl

From: Gaines, Fred <Fred.Gaines@dot.state.fl.us>
Sent: Tuesday, October 8, 2019 11:48 AM
To: ppimentel@sdsinc.org
Cc: Yao, Erin; Hammond, Annemarie; Ribaric, Brian; Kirwan, Adriana; Stein, Philip
Subject: 423374-1 Widen Turnpike Mainline from Jupiter to Ft. Pierce - Hobe - St. Lucie Conservancy District Coordination
Attachments: 423374-1_ELA_Emails_Location_Map.pdf

Hello Mr. Pimentel,

Florida's Turnpike Enterprise (FTE) is conducting a Project Development and Environment (PD&E) study to evaluate capacity improvements to the existing Florida's Turnpike (SR 91) corridor in Palm Beach, Martin, and St. Lucie Counties. The project limits extend from north of Jupiter/Indiantown Road at Milepost (MP) 117 to north of Okeechobee Road (SR 70) at MP 153.7, approximately 36.7 miles. Please refer to the attached Project Location Map. The project consists of the widening of Florida's Turnpike from four to eight lanes by adding two general toll lanes in each direction.

As part of the study, FTE is evaluating the stormwater needs for the potential improvements and contacting the local agencies to explore watershed-wide stormwater needs and alternative permitting approaches.

Please let FTE know if the Hobe - St. Lucie Conservancy District is aware of any regional stormwater needs or opportunities adjacent to the proposed improvements. If you prefer to discuss this via teleconference or in person with FTE and the design consultants, FTE would be happy to set up a meeting.

Thanks,

Fred Gaines **PWS**

Permit Coordinator
Tel: 407.264.3689 Mob: 321.436.1126

Atkins, member of the SNC-Lavalin Group
Florida's Turnpike Milepost 263, Building 5315 | Ocoee, FL 34761-3069

Jen Rehrl

From: Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>
Sent: Wednesday, October 16, 2019 8:09 AM
To: Howell, William G.; Liz Bartell; aneemeh@hwlochner.com
Subject: FW: 423374-1 Widen Turnpike Mainline from Jupiter to Ft. Pierce - Hobe - St. Lucie Conservancy District Coordination

FYI…

From: Gaines, Fred <Fred.Gaines@dot.state.fl.us>
Sent: Tuesday, October 15, 2019 16:45
To: bhiggins@higgins-eng.com
Cc: 'Michael McElligott' <MMcElligott@sdsinc.org>; 'Jason Pierman' <JPierman@sdsinc.org>; Pete Pimentel <ppimentel@sdsinc.org>; Hammond, Annemarie <Annemarie.Hammond@dot.state.fl.us>; Yao, Erin <Erin.Yao@dot.state.fl.us>; Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>; Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>
Subject: RE: 423374-1 Widen Turnpike Mainline from Jupiter to Ft. Pierce - Hobe - St. Lucie Conservancy District Coordination

Thank you Mr. Higgins. Please let me know if any stormwater needs or opportunities arise in the future.

Have a great day!

Fred Gaines **PWS**

Permit Coordinator
Tel: 407.264.3689 Mob: 321.436.1126

Atkins, member of the SNC-Lavalin Group
Florida's Turnpike Milepost 263, Building 5315 | Ocoee, FL 34761-3069

From: Bob Higgins <bhiggins@higgins-eng.com>
Sent: Tuesday, October 15, 2019 1:49 PM
To: Gaines, Fred <Fred.Gaines@dot.state.fl.us>
Cc: 'Michael McElligott' <MMcElligott@sdsinc.org>; 'Jason Pierman' <JPierman@sdsinc.org>; Pete Pimentel <ppimentel@sdsinc.org>
Subject: RE: 423374-1 Widen Turnpike Mainline from Jupiter to Ft. Pierce - Hobe - St. Lucie Conservancy District Coordination

Mr Gaines
We are not aware of any "regional stormwater needs or opportunities" in the vicinity of HSLCD

Bob (District Engineer)

Robert W. Higgins, P.E.
President
Higgins Engineering, Inc.
4623 Forest Hill Blvd., Su. 113
West Palm Beach, FL 33415
561-439-7807 Office
561-439-0026 Fax
561-346-7721 Cell

From: Pete Pimentel
Sent: Tuesday, October 08, 2019 3:18 PM
To: Robert Higgins (bhiggins@higgins-eng.com) <bhiggins@higgins-eng.com>
Cc: Michael McElligott <MMcElligott@sdsinc.org>; Jason Pierman <JPierman@sdsinc.org>
Subject: FW: 423374-1 Widen Turnpike Mainline from Jupiter to Ft. Pierce - Hobe - St. Lucie Conservancy District Coordination

Bob: please check into this.

Thanks

From: Gaines, Fred [mailto:Fred.Gaines@dot.state.fl.us]
Sent: Tuesday, October 8, 2019 11:48 AM
To: Pete Pimentel
Cc: Yao, Erin; Hammond, Annemarie; Ribaric, Brian; Kirwan, Adriana; Stein, Philip
Subject: 423374-1 Widen Turnpike Mainline from Jupiter to Ft. Pierce - Hobe - St. Lucie Conservancy District Coordination

Hello Mr. Pimentel,

Florida's Turnpike Enterprise (FTE) is conducting a Project Development and Environment (PD&E) study to evaluate capacity improvements to the existing Florida's Turnpike (SR 91) corridor in Palm Beach, Martin, and St. Lucie Counties. The project limits extend from north of Jupiter/Indiantown Road at Milepost (MP) 117 to north of Okeechobee Road (SR 70) at MP 153.7, approximately 36.7 miles. Please refer to the attached Project Location Map. The project consists of the widening of Florida's Turnpike from four to eight lanes by adding two general toll lanes in each direction.

As part of the study, FTE is evaluating the stormwater needs for the potential improvements and contacting the local agencies to explore watershed-wide stormwater needs and alternative permitting approaches.

Please let FTE know if the Hobe - St. Lucie Conservancy District is aware of any regional stormwater needs or opportunities adjacent to the proposed improvements. If you prefer to discuss this via teleconference or in person with FTE and the design consultants, FTE would be happy to set up a meeting.

Thanks,

Fred Gaines **PWS**

Permit Coordinator
Tel: 407.264.3689 Mob: 321.436.1126

Atkins, member of the SNC-Lavalin Group
Florida's Turnpike Milepost 263, Building 5315 | Ocoee, FL 34761-3069

Jen Rehrl

From: Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>
Sent: Thursday, May 14, 2020 9:08 AM
To: Howell, William G.; Liz Bartell
Subject: FW: 423374-1_ML(Jup-FtP) - Loxahatchee River Environmental Control District Coordination

From: Albrey Arrington <albrey@lrecd.org>
Sent: Tuesday, October 08, 2019 17:00
To: Gaines, Fred <Fred.Gaines@dot.state.fl.us>
Cc: Yao, Erin <Erin.Yao@dot.state.fl.us>; Hammond, Annemarie <Annemarie.Hammond@dot.state.fl.us>; Patricia Gertenbach <pgertenbach@esciencesinc.com>; Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>; Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>; Stein, Philip <Philip.Stein@dot.state.fl.us>; Leiva, Ivette <Ivette.Leiva@dot.state.fl.us>; Bonilla, Olivia <Olivia.Bonilla@dot.state.fl.us>
Subject: RE: 423374-1_ML(Jup-FtP) - Loxahatchee River Environmental Control District Coordination

Fred,
The timing of your email today was impeccable. This afternoon I met with DOT staff to discuss the potential of the Loxahatchee River District harvesting excess stormwater from the ponds associated with the Turnpike, I-95, and Indiantown Rd interchange in Jupiter, FL. The Loxahatchee River District would like to use stormwater, when feasible, to augment our reclaimed water supplies.

This project idea came to light as DEP has been collaborating with local and regional agencies to draft a Reasonable Assurance Plan to improve water quality in impaired segments of the Loxahatchee River.

I would like to request a meeting between FTE, DOT, and the Loxahatchee River District to discuss your proposed work, how it might impact stormwater and nutrient loads to the Loxahatchee River, and if there is any opportunity for your proposed project to improve the feasibility of capturing excess stormwater and use it to increase reclaimed water supplies in the Loxahatchee River watershed.

Thank you,
Albrey

D. Albrey Arrington, Ph.D.

Executive Director
Loxahatchee River District
Cell: 561-222-9992
Email: albrey@lrecd.org

From: Gaines, Fred <Fred.Gaines@dot.state.fl.us>
Sent: Tuesday, October 8, 2019 10:24 AM
To: Albrey Arrington <albrey@lrecd.org>; EBilling <ebilling@lrecd.org>
Cc: Yao, Erin <Erin.Yao@dot.state.fl.us>; Hammond, Annemarie <Annemarie.Hammond@dot.state.fl.us>; Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>; Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>; Stein, Philip <Philip.Stein@dot.state.fl.us>
Subject: 423374-1_ML(Jup-FtP) - Loxahatchee River Environmental Control District Coordination

Hello Dr. Arrington,

Florida's Turnpike Enterprise (FTE) is conducting a Project Development and Environment (PD&E) study to evaluate capacity improvements to the existing Florida's Turnpike (SR 91) corridor in Palm Beach, Martin, and St. Lucie Counties. The project limits extend from north of Jupiter/Indiantown Road at Milepost (MP) 117 to north of Okeechobee Road (SR 70) at MP 153.7, approximately 36.7 miles. Please refer to the attached Project Location Map. The project consists of the widening of Florida's Turnpike from four to eight lanes by adding two general toll lanes in each direction.

As part of the study, FTE is evaluating the stormwater needs for the potential improvements and contacting the local agencies to explore watershed-wide stormwater needs and alternative permitting approaches.

Please let me know if the Loxahatchee River Environmental Control District is aware of any regional stormwater needs or opportunities adjacent to the proposed improvements. If you prefer to discuss this via teleconference or in person with FTE and the design consultants, FTE would be happy to set up a meeting.

Thanks,

Fred Gaines **PWS**

Permit Coordinator
Tel: 407.264.3689 Mob: 321.436.1126

Atkins, member of the SNC-Lavalin Group
Florida's Turnpike Milepost 263, Building 5315 | Ocoee, FL 34761-3069

Jen Rehrl

From: Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>
Sent: Thursday, May 14, 2020 9:10 AM
To: Howell, William G.; Liz Bartell
Subject: FW: 423374-1 Widen Turnpike Mainline from Jupiter to Ft Pierce - North St. Lucie River Water Control District Coordination

Brian P Ribaric P.E

Senior Project Manager
North America
Engineering, Design and Project Management
Tel: +1.407.264.3095 Mob: +1.407.619.9256

Atkins, member of the SNC-Lavalin Group
Florida's Turnpike Milepost 263, Building 5315
P.O. Box 613069, Ocoee, Florida 34761

From: Helms, Patrick <Patrick.Helms@aecom.com>
Sent: Monday, October 14, 2019 11:56
To: Gaines, Fred <Fred.Gaines@dot.state.fl.us>
Cc: Yao, Erin <Erin.Yao@dot.state.fl.us>; Hammond, Annemarie <Annemarie.Hammond@dot.state.fl.us>; Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>; Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>; Stein, Philip <Philip.Stein@dot.state.fl.us>
Subject: RE: 423374-1 Widen Turnpike Mainline from Jupiter to Ft Pierce - North St. Lucie River Water Control District Coordination

Good morning Mr. Gaines,

Thank you for your email regarding the PD&E study. General information regarding the North St. Lucie River Water Control District (NSLRWCD), including our permit manual, permit applications and maps can be found on the District's website at http://nslrwcd.org/. Based on the limits of construction identified in the location map, it appears this project might impact NSLRWCD Canals 101, 102 and Ten Mile Creek. Please note that the canal running parallel along the south side of Midway Rd. (f.k.a. NSLRWCD Canal 103) is owned/ maintained by St. Lucie County.

I think it is also worth noting at this time that the Florida Turnpike crosses over Ten Mile Creek just east of the Gordy Rd. Control Structure (STR 71-1-4) which serves as one of the main water control structures within NSLRWCD. Over the past many years significant erosion and shoaling has been observed within Ten Mile Creek east of the Gordy Rd. Control Structure and we would appreciate the opportunity to discuss improvements in this area.

We look forward to working with you and the PD&E team moving forward and please do not hesitate to contact me if you have any questions or need additional information.

Regards,

Patrick D. Helms, P.E.
Project Manager
C 561.718.0899
patrick.helms@aecom.com

From: Gaines, Fred <Fred.Gaines@dot.state.fl.us>
Sent: Tuesday, October 08, 2019 10:29 AM
To: nslrwcd@bellsouth.org; Helms, Patrick <Patrick.Helms@aecom.com>; McGowan, Tom <Tom.McGowan@aecom.com>
Cc: Yao, Erin <Erin.Yao@dot.state.fl.us>; Hammond, Annemarie <Annemarie.Hammond@dot.state.fl.us>; Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>; Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>; Stein, Philip <Philip.Stein@dot.state.fl.us>
Subject: 423374-1 Widen Turnpike Mainline from Jupiter to Ft Pierce - North St. Lucie River Water Control District Coordination

Good Morning,

Florida's Turnpike Enterprise (FTE) is conducting a Project Development and Environment (PD&E) study to evaluate capacity improvements to the existing Florida's Turnpike (SR 91) corridor in Palm Beach, Martin, and St. Lucie Counties. The project limits extend from north of Jupiter/Indiantown Road at Milepost (MP) 117 to north of Okeechobee Road (SR 70) at MP 153.7, approximately 36.7 miles. Please refer to the attached Project Location Map. The project consists of the widening of Florida's Turnpike from four to eight lanes by adding two general toll lanes in each direction.

As part of the study, FTE is evaluating the stormwater needs for the potential improvements and contacting the local agencies to explore watershed-wide stormwater needs and alternative permitting approaches.

Please let FTE know if the North St. Lucie River Water Control District is aware of any regional stormwater needs or opportunities adjacent to the proposed improvements. If you prefer to discuss this via teleconference or in person with FTE and the design consultants, FTE would be happy to set up a meeting.

Thanks,

Fred Gaines **PWS**

Permit Coordinator
Tel: 407.264.3689 Mob: 321.436.1126

Atkins, member of the SNC-Lavalin Group
Florida's Turnpike Milepost 263, Building 5315 | Ocoee, FL 34761-3069

Jen Rehrl

From: Howell, Bill <bhowell@hwlochner.com>
Sent: Friday, June 28, 2019 4:26 PM
To: Liz Bartell; Ellison, Tracy
Subject: FW: Follow up/Lox Meeting on June 24th/Plan Items

Liz / Tracy,

FYI – see below.

Bill Howell, PE
Senior Transportation Engineer
LOCHNER
4350 W. Cypress Street, Suite 800
Tampa, FL 33607
Office: 813.357.3750 (Main)
Direct: 813.357.3734
Mobile: 407.376.0459
bhowell@hwlochner.com
www.hwlochner.com

From: Mark Easley [mailto:Mark.Easley@kisingercampo.com]
Sent: Friday, June 28, 2019 2:44 PM
To: Howell, Bill <bhowell@hwlochner.com>
Subject: FW: Follow up/Lox Meeting on June 24th/Plan Items

Bill,

FYI,

ME

KCA KISINGER CAMPO & ASSOCIATES

Mark Easley
Senior Project Manager - Environmental Services
Email: Mark.Easley@kisingercampo.com
Work: 813.871.5331 ext 4111
Cell: 813.504.6512
201 N. Franklin St., Suite 400, Tampa, FL 33602

From: Tiffany Busby <tlbusby@wildwoodconsulting.net>
Sent: Friday, June 28, 2019 2:30 PM

To: Tiffany Busby <tlbusby@wildwoodconsulting.net>
Cc: Espy, Julie <Julie.Espy@dep.state.fl.us>
Subject: Follow up/Lox Meeting on June 24th/Plan Items

Greetings,

In follow up to the Loxahatchee RAP presentation at the Loxahatchee River Coordinating Council meeting on Monday, June 24th, please see the links below to some materials presented and discussed at the meeting. Posted at the links are the following items:

1. Monday's PowerPoint presentation;
2. The latest version of the Lox Pollutant Loading Screening Model (PLSM);
3. GIS version of the land use/treated areas used in the PLSM (LOX_RA_LandUse.zip); and
4. The entire project list—including nitrogen and phosphorus reduction amounts or "TBD"—in an Excel spreadsheet.

Separately, in individual emails, we will be sending each entity's project list to them for their specific review and feedback, so we make sure we have their information entered correctly and we will be asking them about their approval process.
Based on the project list, we would appreciate feedback from you on the following items:

1. Are there any projects with TBD reductions (especially nitrogen credits) for which there is additional information available so we can quantify them in the table? We are short about 10,000 lbs/yr of nitrogen credits and would love to add some additional reductions on the TBD projects.

2. Are there any projects that *your entity* could add to the list, such as future projects?

3. Are there any projects that seem to be *missing from other entities* that we could suggest that they add (reminder: we are looking for projects completed from 2008 forward or future projects)? Note: We will only add projects with permission and information from the lead organization, but we can suggest projects that are not currently included for the lead entity and we will follow up with them.

4. Do you have any corrections to your own project list, if applicable?

We would appreciate your feedback by July 17.

Many thanks,

Julie & Tiffany

Tiffany Lutterman Busby
Wildwood Consulting Inc.
69 S. Dixie Highway, Suite B
St. Augustine, FL 32084
Phone: 904-797-2721
Email: TLBusby@wildwoodconsulting.net

www.wildwoodconsulting.net

WILDWOOD CONSULTING INC.

Jen Rehrl

From: Howell, Bill <bhowell@hwlochner.com>
Sent: Friday, May 4, 2018 4:42 PM
To: Liz Bartell; Gordon Greene; Ellison, Tracy; Miller, Jack
Subject: FW: RE: 423374-1_ML (Jup to FtP) - Stormwater Discussion for Loxahatchee River District

fyi

Bill Howell, PE
Senior Transportation Engineer
LOCHNER
4350 W. Cypress Street, Suite 800
Tampa, FL 33607
Office: 813.357.3750 (Main)
Direct: 813.357.3734
Mobile: 407.376.0459
bhowell@hwlochner.com
www.hwlochner.com

From: Horwitz, Martin [mailto:Martin.Horwitz@dot.state.fl.us]
Sent: Friday, May 04, 2018 11:12 AM
To: mark.easley@kisingercampo.com; Howell, Bill <bhowell@hwlochner.com>
Cc: Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>
Subject: RE: RE: 423374-1_ML (Jup to FtP) - Stormwater Discussion for Loxahatchee River District

Just to follow up. Loxahatchee River District requested to use water from FDOT ponds. We did some research and found out the ponds are owned by FDOT District 4 so you don't need to consider it.

I wanted to provide the documents sent below since I wasn't sure if you had them.

Martin Horwitz
Environmental Administrator & Permit Coordinator
Florida's Turnpike Enterprise

Turkey Lake Headquarters | Mile Post 263, Bldg. #5315
P.O. Box 613069
Ocoee, Florida 34761
Office: (407) 264-3022
Cell: (321) 229-3846
martin.horwitz@dot.state.fl.us

From: Horwitz, Martin
Sent: Friday, May 04, 2018 8:52 AM
To: Mark Easley <Mark.Easley@kisingercampo.com>; Bill Howell <bhowell@hwlochner.com>
Cc: Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>
Subject: FW: RE: 423374-1_ML (Jup to FtP) - Stormwater Discussion for Loxahatchee River District

FYI

Martin Horwitz
Environmental Administrator & Permit Coordinator
Florida's Turnpike Enterprise

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Ocoee, Florida 34761
Office: (407) 264-3022
Cell: (321) 229-3846
martin.horwitz@dot.state.fl.us

From: Gaines, Fred
Sent: Thursday, May 03, 2018 6:50 PM
To: Horwitz, Martin <Martin.Horwitz@dot.state.fl.us>
Cc: Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>; Yao, Erin <Erin.Yao@dot.state.fl.us>
Subject: RE: 423374-1_ML (Jup to FtP) - Stormwater Discussion for Loxahatchee River District

Hello Martin – I was looking for a time to meet with you tomorrow and noticed the above-referenced meeting on your calendar. I recollect that I have mentioned the Turnpike's agreements with the South Indian River Water Control District (SIRWCD) in the vicinity of the above-referenced project, but I don't recollect sending them to the project team. Attached are the SIRWCD agreements for the Turnpike ROW adjacent to the LRD's Reclaimed Water Storage Lakes as depicted on the attached "DOT-stormwater-lakes.pdf". The "SIRWCD + Town of Jupiter resolution.pdf" further elaborates on the agreements for utilizing Turnpikes canal south of the C-18, while the "Jupiter recharge system.pdf" provides some of the history on why this borrow canal is important to them. The "SIRWCD meeting minutes.pdf" provides some recent coordination with both SIRWCD and Lox. River District (LRD). These agreements do not appear to be directly involved with the borrow lake areas that LRD wishes to discuss with TPK and D4, but may be pertinent to the discussion.

Thanks,

Fred Gaines **PWS**

Permit Coordinator
Tel: 407.264.3689 Mob: 321.436.1126

Atkins, member of the SNC-Lavalin Group
Florida's Turnpike Milepost 263, Building 5315 | Ocoee, FL 34761-3069

Jen Rehrl

From: Howell, Bill <bhowell@hwlochner.com>
Sent: Friday, May 4, 2018 4:41 PM
To: Liz Bartell; Gordon Greene; Ellison, Tracy; Miller, Jack
Subject: FW: RE: 423374-1_ML (Jup to FtP) - Stormwater Discussion for Loxahatchee River District
Attachments: SIRWCD C-18 agreement.pdf; SIRWCD C-18 Agreement Addendum #1.pdf; DOT-stormwater-lakes.pdf; SIRWCD + Town of Jupiter resolution.pdf; Jupiter recharge system.pdf; SIRWCD meeting minutes.pdf

fyi

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Tampa, FL 33607
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Direct: 813.357.3734
Mobile: 407.376.0459
bhowell@hwlochner.com
www.hwlochner.com

From: Horwitz, Martin [mailto:Martin.Horwitz@dot.state.fl.us]
Sent: Friday, May 04, 2018 8:53 AM
To: mark.easley@kisingercampo.com; Howell, Bill <bhowell@hwlochner.com>
Cc: Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>
Subject: FW: RE: 423374-1_ML (Jup to FtP) - Stormwater Discussion for Loxahatchee River District

FYI

Martin Horwitz
Environmental Administrator & Permit Coordinator
Florida's Turnpike Enterprise

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martin.horwitz@dot.state.fl.us

From: Gaines, Fred
Sent: Thursday, May 03, 2018 6:50 PM
To: Horwitz, Martin <Martin.Horwitz@dot.state.fl.us>
Cc: Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>; Yao, Erin <Erin.Yao@dot.state.fl.us>
Subject: RE: 423374-1_ML (Jup to FtP) - Stormwater Discussion for Loxahatchee River District

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Thanks,

Fred Gaines **PWS**

Permit Coordinator
Tel: 407.264.3689 Mob: 321.436.1126

Atkins, member of the SNC-Lavalin Group
Florida's Turnpike Milepost 263, Building 5315 | Ocoee, FL 34761-3069

Jen Rehrl

From: Gaines, Fred <Fred.Gaines@dot.state.fl.us>
Sent: Wednesday, May 13, 2020 10:55 AM
To: Ribaric, Brian; Liz Bartell
Cc: Stein, Philip; Zang, Douglas; Hammond, Annemarie; Kirwan, Adriana; Yao, Erin
Subject: RE: 423374-1_ML (Jupiter to Ft Pierce) - PD&E Progress Meeting

Hello Brian and Liz – here is the COE approval letter for the Loxahatchee River Watershed Restoration Project - https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/14061 . Turns out it wasn't an email as I recollected, and Liz you were correct it was about a month ago.

Thanks,

Fred Gaines, PWS
Atkins
321-436-1126

-----Original Appointment-----
From: Ribaric, Brian <Brian.Ribaric@dot.state.fl.us>
Sent: Tuesday, October 8, 2019 8:35 AM
To: Ribaric, Brian; Howell, William G.; Acosta, Mario; Benoit, Ellis; Beverly, James; Campbell, Deanna H.; Emam, Emam B.; Gaines, Fred; Heung, Wing; John, Alfred; Jujare, Anand; Jung, Rax; Kastelic, Daniel; Knutsen, Lance; Muench, Patrick; Pedersen, Josh; Pinzon, Henry; Sanchez, Geraldo; Schaefer, Abby; Snyder, Russ; Velasquez, Andrew; Yao, Erin; Samson, Kim C.; Hustad, Marc; Estrella, Carlos; Hudson, Derek; Sanchez, Bo; Wolczynski, Matt; Swann, Rob; Kirwan, Brian; Gordon Greene; Chao, Alfonso; Keller, Christopher; buchwaldp@stlucieco.org; Eileen LaSeur; Sarah Futral; Liz Bartell; Sharp, Stephanie; Timothy Polk; Bobo, Brandon; grahamk@stlucieco.org; base@stlucieco.org; DeLaRosa, Francis; Kareiva, Ronald; Neyer, Thomas; Bitar, Joe; Scott, Carol; Hammond, Annemarie; Kirwan, Adriana; Burke, Allyson; Tosspon, Jason; Hughes, James; Mtoi, Enock; Echevarria, Even; Brown, Ryan; Stein, Philip; Zang, Douglas; Jeremiah Slaymaker; Matt Floyd; Roche, Gary
Cc: Sarah Wilson; Liz Bartell; Kilgore,John; Gordon Greene; Guillermo Madriz; Timothy Polk
Subject: 423374-1_ML (Jupiter to Ft Pierce) - PD&E Progress Meeting
When: Wednesday, May 13, 2020 9:00 AM-11:00 AM (UTC-05:00) Eastern Time (US & Canada).
Where: GoTo Meeting

05-11-20: Please review the attendee request and agenda.

03-11-20: Room Added.

10-08-19: New Meeting Notice for November 2019-2021.

We will be conducting monthly progress meetings for the PD&E project efforts on the third Friday of each month.

Please add this to your calendars as a place holder. We will establish a meeting agenda identifying key discussion topics and staff participation prior to each meeting. I have reserved a conference room at Turkey Lake. "Goto Meeting" information is noted below.

Please join my meeting from your computer, tablet or smartphone.

https://global.gotomeeting.com/join/917252213

You can also dial in using your phone.
(For supported devices, tap a one-touch number below to join instantly.)

United States: +1 (312) 757-3121
- One-touch: tel:+13127573121,,917252213#

Access Code: 917-252-213

Join from a video-conferencing room or system.
Dial in or type: 67.217.95.2 or inroomlink.goto.com
Meeting ID: 917 252 213
Or dial directly: 917252213@67.217.95.2 or 67.217.95.2##917252213

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https://global.gotomeeting.com/install/917252213

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MEETING MINUTES

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
INTERAGENCY ENVIRONMENTAL LOOK AROUND (ELA) MEETING NOTES

FPID 446975-1
TURNPIKE AT I-95 DIRECT CONNECTION INTERCHANGE PD&E STUDY

MARTIN COUNTY

Date: August 21, 2025
Time: 9:35-10:05 AM
Venue: Microsoft Teams Meeting

I. Introductions

Attendees:

SFWMD	*Barbara Conmy and Jeff Sloman*
USACOE	*Heather Mason and Lucy Brandenburg*
FWC	*Kristee Booth*
FTE	*Fred Gaines, Carlos Bedoya, Jennifer Shipley, and Erin Yao*
Lochner	*Kevin Connor and Bill Howell*
PGA	*Erik Scott*

II. Scope of Work

- Evaluate a system-to-system interchange between Florida's Turnpike (SR 91) and Interstate 95 at SE Bridge Road (SR 708) in Martin County.
- Project limits are from mile post 123.44 to 127.53, approximately 2-miles south to 2-miles north of SE Bridge Road.
- Project is within the Grove and South Fork watersheds.

FTE provided an overview of the project which proposes a system-to-system interchange connecting Florida's Turnpike (State Road (SR) 91) and Interstate 95 (I-95) at SE Bridge Road (County Road (CR) 708) in Martin County, Florida. The study area begins approximately two miles south of SE Bridge Road at Mile Post (MP) 123.44 and extends to approximately two miles north of SE Bridge Road to MP 127.53. The Preferred Alternative proposes construction of four directional system-to-system ramps to provide full connectivity between SR 91 and I-95. South of SE Bridge Road, the ramps will accommodate traffic movements from northbound I-95 to northbound SR 91 and from southbound SR 91 to southbound I-95. North of SE Bridge Road, ramps will accommodate movements from northbound SR 91 to northbound I-95 and from southbound I-95 to southbound SR 91. In conjunction with the interchange improvements, SR 91 will be widened from four to eight lanes. Widening will occur exclusively to the west side of the existing alignment to avoid conflicts with the FGT infrastructure located along the east side. No modifications are proposed to the existing I-95 mainline. Additional project elements include emergency vehicle access connections between SR 91 and SE Bridge Road, as requested by Martin County Fire Rescue.

III. Environmental Look Around (ELA) / WATERSS

- ELA was held on 11/16/17 for the widening of Florida's Turnpike (SR 91).
- Are there any opportunities associated with the Palmar Complex associated with the Comprehensive Everglades Restoration Plan (CERP)?
    1. Indian River Lagoon - South
    2. Loxahatchee River Watershed Restoration Project

FTE asked SFWMD if there was a need within the Indian River Lagoon – South or Loxahatchee River Watershed Restoration CERP for FTE to discharge stormwater. SFWMD staff responded that Mindy Parrott (SFWMD) would be more familiar with the CERP opportunities. FTE responded that coordination with her has taken place, and coordination will continue as the project progresses. SFWMD stated no additional opportunities were known.

IV. USACOE Section 404 / Wetlands Involvement

- 157.26 acres (25.59%) of wetlands/surface waters in project area
- 90.55 acres of wetland/surface water impacts proposed
- Located within the Florida Southeast Coast (03090206) HUC Basin

As USACOE is a participating Agency on the PD&E Study, FTE provided an update on the status of the project since the ETDM review. The project will include wetland impacts and will require a Section 404 permit from the USACOE. A Natural Resources Evaluation (NRE) is being prepared that will document the wetland resources and proposed impacts and mitigation. The NRE will also document determinations of effect for protected species. Preliminary coordination has been conducted with USFWS. However, Section 7 consultation will not be completed until the design and permitting of the project when additional species surveys and final design details and known.

The NRE will be submitted to USFWS, FWC, FDACS, USACOE, FDEP, and SFWMD for review.

V. Additional Discussion

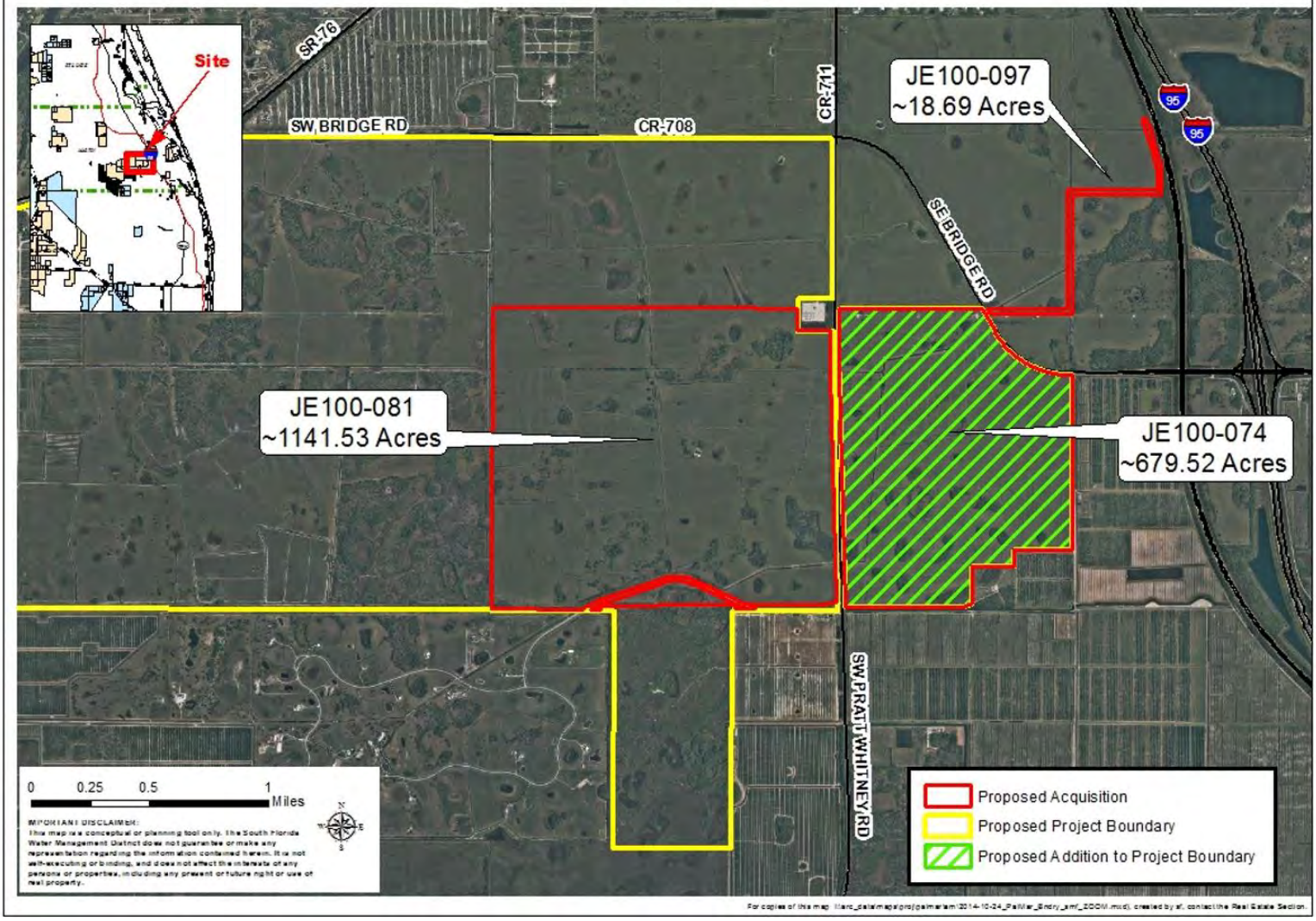
FTE identified that the project will impact a SFWMD canal that runs parallel to the Turnpike. The Canal will be relocated as part of the project and ROW transferred back to SFWMD. The canal is associated with the Hobe Sound Ranch/Palmar Complex, a component of the Indian River Lagoon South Comprehensive Everglades Restoration Plan (CERP) project. FTE has already coordinated this impact with SFWMD Land Management and Real Estate.

USACOE stated that since the project proposed new alignment that documentation of an alternatives analysis and documentation of the Least Environmentally Damaging Practicable Alternative (LEDPA) is required. FTE asked if this is needed during the PD&E or for the Section 404 permit. USACOE stated that the COE conducts the analysis pursuant to the 404(b)(1) Guidelines (Guidelines) and the National Environmental Policy Act (NEPA). So the earlier, the better.

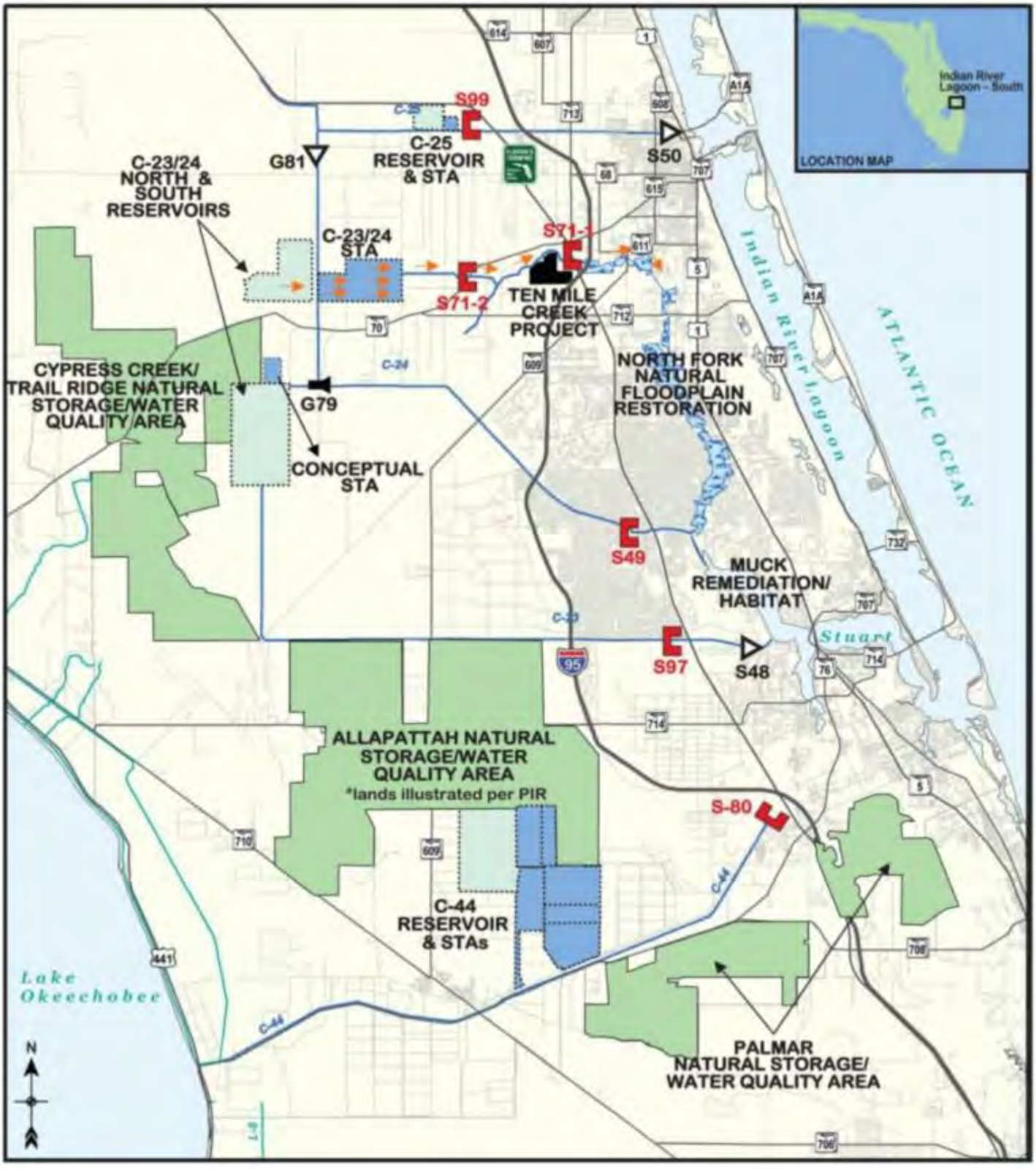
Barbara Conmy stated that she will be the reviewer of the NRE for SFWMD.
FWC stated they had no questions at this time and will provide any questions/comments after reviewing the NRE.

FTE identified that the PD&E will be completed before July 2026, allowing the project to be grandfathered/exempt from the new stormwater regulations.

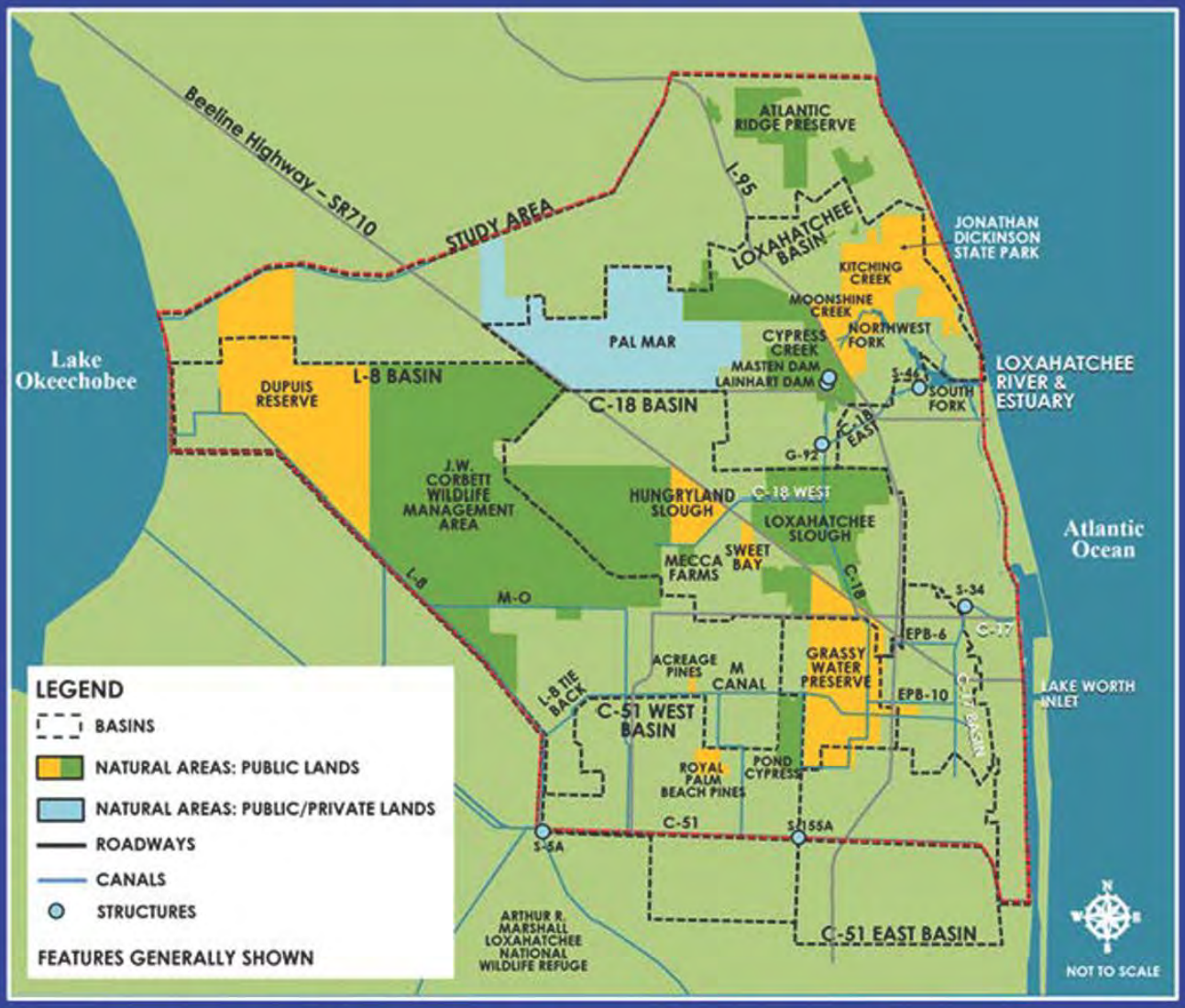
Palmar Complex - C-44 Basin
Martin County



Indian River Lagoon – South



COMPREHENSIVE EVERGLADES RESTORATION PLAN



Loxahatchee River Watershed Restoration Project

(formerly NORTH PALM BEACH COUNTY – PART 1)

FLORIDA'S TURNPIKE ENTERPRISE, FDOT DISTRICT FOUR, HOBE-ST. LUCIE CONSERVANCY DISTRICT (HSLCD) AND MARTIN COUNTY MEETING

FPID # 446975-1; TURNPIKE AT I-95 DIRECT CONNECTION INTERCHANGE PD&E STUDY

MARTIN COUNTY

Date: September 12, 2025; 10:00 AM to 10:30 AM
Where: Microsoft Teams Meeting

I. Introductions

Attendees:

Martin County	*Jim Gorton and Michael Grzelka*
HSLCD	*Michael McElligott and Patrick Helms (Higgins Engineering)*
FDOT D4	*Ann Broadwell*
FTE	*Jazlyn Georges, Annemarie Hammond, Ronald Kareiva, Erin Yao, Fred Gaines, and Adriana Kirwan*
Lochner	*Kevin Connor and Bill Howell*
PGA	*Erik Scott*

II. Scope of Work

- Evaluate a system-to-system interchange between Florida's Turnpike (SR 91) and Interstate 95 at SE Bridge Road (SR 708) in Martin County
- Project limits are from mile post 123.44 to 127.53, approximately 2-miles south to 2-miles north of SE Bridge Road

FTE provided an overview of the project which proposes a system-to-system interchange connecting Florida's Turnpike (State Road (SR) 91) and Interstate 95 (I-95) at SE Bridge Road (County Road (CR) 708) in Martin County, Florida. The study area begins approximately two miles south of SE Bridge Road at Mile Post (MP) 123.44 and extends to approximately two miles north of SE Bridge Road to MP 127.53. The Preferred Alternative proposes construction of four directional system-to-system ramps to provide full connectivity between SR 91 and I-95. South of SE Bridge Road, the ramps will accommodate traffic movements from northbound I-95 to northbound SR 91 and from southbound SR 91 to southbound I-95. North of SE Bridge Road, ramps will accommodate movements from northbound SR 91 to northbound I-95 and from southbound I-95 to southbound SR 91. In conjunction with the interchange improvements, SR 91 will be widened from four to eight lanes. Widening will occur exclusively to the west side of the existing alignment to avoid conflicts with the FGT infrastructure located along the east side. No modifications are proposed to the existing I-95 mainline. Additional project elements include emergency vehicle access connections between SR 91 and SE Bridge Road, as requested by Martin County Fire Rescue.

III. Relocation of Turnpike Canal South of Bridge Road

- Canal under jurisdiction of HSLCD

FTE previously coordinated with HSLCD to identify HSLCD facilities within the project area. The only feature is the canal located south of SE Bridge Road on the west side of the Turnpike. The canal is located on property owned by the adjacent landowner, but HSLCD manages the facility through easements and/or agreements.

FTE identified an impact to the canal because of the project and its intent to relocate the canal outside of its right-of-way and return it to the landowner/HSLCD, similar to the current arrangement. The current PD&E concept plan identifies a 100-ft assumed width for the relocation. FTE asked for any information about the canal that could be provided (i.e. design plans. as-builts, survey, etc.).

HSLCD stated that a 1:1 replacement of capacity and geometry would be required. The person with the most knowledge (Bob Higgins) could not attend the meeting, but they would discuss the project with him and provide the requested information, if available. But the assumption of a 100-ft width seems appropriate.

HSLCD asked about the project schedule. FTE responded that the project Design is funded in FY 2030 with Right-of-way funding in FY 2031.

IV. Environmental Look Around (ELA)

- Are there any regional drainage opportunities associated with the HSLCD in the vicinity of the project?

- Are there any regional drainage opportunities associated with Martin County in the vicinity of the project?

FTE described the proposed drainage aspects of the project. FTE inquired if there was a need for additional water by any adjacent landowners who would be willing to accept water from the project or if they are aware of any regional drainage opportunities.

HSLCD responded that they will need to coordinate with local landowners to see if they require additional water. HSLCD noted they do not have authority to give permission for discharge onto private property. HSLCD uses easements to maintain canals.

Martin County stated they only own the roadside swales located adjacent to SE Bridge Road. They currently do not have any opportunities for taking additional water, nor do they have any future plans in the area that could result in a partnership.

V. Additional Discussion

HSLCD stated that they would discuss internally with Bob Higgins (District Engineer) and Rick Melchiori (Board Member) and provide the requested and any pertinent additional information.

Florida Department of Transportation

RON DESANTIS
GOVERNOR

Florida's Turnpike Enterprise
P.O. Box 613069, Ocoee, FL 34761
407-532-3999

JARED W. PERDUE, P.E.
SECRETARY

Florida's Turnpike (SR 91) at I-95 (SR 9) Interchange (MP 125)
Project Development and Environment (PD&E) Study
in Martin County
FPID #446975-1-22-01

Meeting with SFWMD CERP Staff
Monday, July 14, 2025, 3:00 PM

I. Introductions

SFWMD: Patrick Murphy, Patrick Connelly, Leslye Waugh
FTE: Henry Pinzon, Annemarie Hammond, Jazlyn Georges, Narasimha Arza, Fred Gaines
Lochner: Bill Howell, Kevin Connor

II. Project Involvement with SFWMD Property

- Canal Relocation

  FTE described the project to SFWMD staff. Potential involvement includes an impact and relocation of a SFWMD canal.

- Is canal considered part of CERP property?

  SFWMD stated that while the canal was purchased as part of the Hobe Sound Ranch acquisition., the canal facilitates the Indian River Lagoon South CERP activities but is not an essential part of the project.

- Management objectives of CERP property

  SFWMD stated that the primary objective of the Indian River Lagoon South CERP and the Hobe Sound Ranch is for natural water retention and hydrologic restoration. The CERP activities on the Hobe Sound Ranch were near completion. The overall management plan for the project is being updated.

  Recreational activities on the site were discussed. While recreation may be included in the updated plan, currently it is not specified. The canal being proposed for impact is not one of

the major canals of the District. While public access and recreation may occur, it is secondary or ancillary to its primary hydraulic functions.

FTE asked if there is a more up to date land management plan than the 2017 Hobe Sound Ranch Interim Land Management plan. SFWMD stated that they was not sure but would find out for us.

NOTE: On July 15, 2025, SFWMD emailed that they checked with the SFWMD Land Management staff and it was indicated that there is no updated Land Management Plan for the Hobe Sound Ranch.

Florida Department of Transportation

RON DESANTIS
GOVERNOR

Florida's Turnpike Enterprise
P.O. Box 613069, Ocoee, FL 34761
407-532-3999

JARED W. PERDUE, P.E.
SECRETARY

Florida's Turnpike (SR 91) at I-95 (SR 9) Interchange (MP 125)
Project Development and Environment (PD&E) Study
in Martin County
FPID #446975-1-22-01

Meeting with SFWMD Real Estate Staff
Wednesday, July 23, 2025, 8:30 AM

I. Introductions

SFWMD: Ray Palmer, Bob Schaeffer, Joan Finley
FTE: Henry Pinzon, Annemarie Hammond, Jazlyn Georges, Doug Zang, Fred Gaines, Mark Mendez
Lochner: Bill Howell, Kevin Connor

II. Project Involvement with SFWMD Property

- Canal Relocation

  FTE described the project to SFWMD staff. Potential involvement includes an impact and relocation of a SFWMD canal.

- Meeting with SFWMD CERP Staff

  FTE summarized the meeting with SFWMD CERP staff including that the primary objective of the Indian River Lagoon South CERP and the Hobe Sound Ranch is for natural water retention and hydrologic restoration.

- Land Purchase Funding

  FTE identified that in their research, it appears that in 2018, SFWMD transferred Land and Water Conservation Fund Grant encumbrances onto Parcels JE100-081 and JE100-074: 1,533 acres of the Harmany Ranch Property. However, the encumbrances were not transferred onto Parcel JE100-097, the canal parcel.

  SFWMD confirmed that no Federal funds were utilized for Parcel JE100-097, the canal parcel.

SFWMD stated that the canal has easements with the adjacent properties to take water for conveyance to the St. Lucie River to the northeast and that flow in the canal must be maintained at all times during its relocation. Also, the proposed SMF Pond 4, located between I-95 and the Turnpike adjacent to the canal, would need to meet water quality standards prior to discharge to the canal.

- Other Discussion

  SFWMD asked if there would be an interchange on the Turnpike at Bridge Road. FTE explained that the project is only a system-to-system connection between the Turnpike and I-95. The only connection between the Turnpike and Bridge Road will be emergency vehicles access connections requested by Martin County Fire Rescue.

  SFWMD asked about the timing of the project and future coordination. FTE explained that design is programmed for Fiscal Year 2031 and should take approximately 2 years. Coordination from SFWMD real estate and ERP permitting would occur in this same timeframe.

  FTE asked for confirmation that a SFWMD ROW Occupancy Permit would not be necessary for the canal relocation. SFWMD agreed that a ROW Occupancy Permit should not be required.

ATKINS

Florida's Turnpike Headquarters
P.O. Box 613069
Florida's Turnpike Milepost 263, Building 5315
Ocoee, Florida 34761-3069
Telephone: +1.407.532.3999

MEETING NOTES

North St. Lucie River Water Control District Coordination Meeting

Turnpike Mainline (SR 91)
Widening PD&E Study from
Jupiter to Fort Pierce

Florida's Turnpike (SR 91) Widening PD&E Study from Jupiter (Indiantown Road) to Okeechobee Road (SR 70) (FPID#: 423374-1-22-01)

Palm Beach, Martin and St. Lucie Counties

July 2, 2020

Brian Ribaric BR

1. Introductions
   a. North St. Lucie River Water Control District (NSLRWCD)
      Patrick Helms, PE – AECOM
      Katherine Caricchio, PE – AECOM
   b. Florida's Turnpike Enterprise (FTE) and GEC
      Henry Pinzon, PE - FTE
      Rax Jung, PhD, PE - FTE
      Philip Stein – FTE
      Annemarie Hammond – FTE
      Brian Ribaric, PE – Atkins
      Doug Zang, AICP – Atkins
      Adriana Kirwan, PE – HNTB
      Fred Gaines, PWS - Atkins
   c. Lochner and PGA
      Bill Howell, PE – Lochner
      Liz Bartell, PE - PG

Note: Items in Green are Notes in addition to the agenda topics.

2. Project Overview provided by FTE
   a. Evaluating the potential widening of the Turnpike Mainline (SR 91) from four to eight lanes from Indiantown Rd (SR 706) to Okeechobee Rd (SR 70)
   b. Evaluating potential interchange reconfigurations
   c. Identifying stormwater management and ROW needs to meet FDOT and permitting agency requirements
   d. Conducting Environmental Look Around efforts to identify joint-use and nonconventional stormwater opportunities
      i. Florida Forever Lands
         1. Pepper Farms and Flow-Through Marsh
      ii. Martin County Septic-to-Sewer Conversions
   e. Project is not currently funded for design, ROW, or construction.

3. Proposed Design at Ten Mile Creek
   a. Proposed widening of bridge over Ten Mile Creek
      i. Ten Mile Creek is a FEMA regulatory floodway and will require a FEMA No-Rise Certification
      ii. Anticipate 6.8 acres of encroachment into the Ten Mile Creek FEMA floodplain
         1. FTE proposed floodplain compensation provided within NSLRWCD canal system/Ten Mile Creek. NSLRWCD stated this approach has been done before. The example provided was the Okeechobee Portofino Landings, in which the top of berm or littoral shelf of the channel was expanded to provide floodplain compensation.
         2. FTE will address FEMA no-rise and CLOMR as required.
         3. Ten Mile Creek is a sovereign submerged land (SSL).

iii. NSLRWCD stated that there is a volumetric discharge requirement (2 inches per acre per day for the 10-year, 3-day storm event) and a head loss requirement (0.3 foot) that is provided in the Permit Information and Criteria Manual.
    1. FTE clarified that FDOT projects are exempt from local requirements under Florida Statutes. FTE will permit through SFWMD utilizing SFWMD and FDOT stormwater design criteria.

4. History of Erosion and Shoaling
    a. FTE Bridge Embankment Protection (FPID 409327-1) in 2003
    b. NSLRWCD does not know of any current issues but requested inspection of the gabions and condition of the channel at Ten Mile Creek during design.

5. Additional Discussion/Questions
    a. NSLRWCD stated there is a DBHydro monitoring site at Gordy Road (East) that shows the flow is tidal.
    b. The control structures are not managed or dictated by SFWMD permit.
    c. NSLRWCD provided right of way (ROW) history on the west side of the Turnpike at Ten Mile Creek vicinity. NSLRWCD indicated that Midway Road/Canal 103 ROW has been conveyed to St. Lucie County. NSLRWCD Canal 102 culvert crossing flows west to east to NSLRWCD Canal 101 remnant at the FTE ROW line. NSLRWCD's Canal 96 at Ten Mile Creek/Gordy Road Structure stops at FTE ROW line and flows across FTE ROW to Ten Mile Creek. SFWMD is relying on the NSLRWCD Canal 96 outfall for the Ten Mile Creek Reservoir. NSLRWCD suggested a meeting with FTE ROW to clear up confusion over ROW limits.
    d. NSLRWCD asked if the widening south of SR 70 Interchange will impact the NSLRWCD's Canal 40 access berm to Ten Mile Creek. FTE responded that widening is proposed to the west in this location and that no impact to the NSLRWCD's Canal 40 or maintenance berm is anticipated.
    e. NSLRWCD inquired about widening at the Canal 49 bridge culvert. FTE responded that the culvert will either be extended or replaced.
    f. NSLRWCD referenced the canal crossing head loss criteria. FTE responded that reference will be added to the PD&E documentation.
    g. NSLRWCD indicated that approx.. 60% of NSLRWCD's 6500 sq. mi. district drains to Ten Mile Creek. Ten Mile Creek maintenance dredging is a challenge since it is Sovereign Submerged Lands. NSLRWCD is coordinating future Ten Mile Creek dredging with FDEP, SFWMD and COE. New bridges and bridge replacements will have to meet current criteria. NSLRWCD has been fined previously for doing unauthorized work within Ten Mile Creek. FTE indicated that the current concept indicates the mainline bridge over Ten Mile Creek will be widened and not replaced.
    h. FTE mentioned that a future PD&E project from SR 70 north will also potentially involve some NSLRWCD crossings. FTE will coordinate with NSLRCWD during that PD&E and future design projects as required.
    i. NSLRWCD indicated that there are maintenance challenges of NSLRWCD canals and culverts within FTE ROW. NSLRWCD has met with Turnpike's maintenance contractor in the past to discuss but challenges remain. FTE indicated that it would pass along the information directly to FTE Maintenance.
    j. NSLRWCD indicated that they don't have any water needs that could be provided by the project as part of the Environmental Look Around aspect.

ACTION ITEMS:
    a. Inform FTE ROW of NSLRWCD's request for a meeting regarding NSLRCWD canal flow across FTE ROW.
    b. Inform FTE Maintenance of NSLRWCD's request for a meeting regarding NSLRWCD maintenance challenges within FTE ROW.
    c. Meeting Notes

ATKINS

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Meeting Minutes

Project: FPID 423374-1-22-01
Description: Turnpike Mainline (SR 91) Widening PD&E from Jupiter (Indiantown Road) to Okeechobee Road (SR 70) – Palm Beach, Martin, and St. Lucie Counties
Meeting: SFWMD/USACE/NMFS/FDOT Pre-Application Meeting
Date/Time: 11/16/17 @ 11:10 am
Location: SFWMD HQ, West Palm Beach

Attendees:
Beverly Miller (SFWMD)
Jason Debish (SFWMD)
Beth Kacvinsky (SFWMD)
Carlos de Rojas, PE (SFWMD)
Trisha Stone (SFWMD)
Barbara Conmy (SFWMD)
Tarrie Ostrofsky (USACE)
Jennifer Schull (NMFS)
Erin Yao, PE (FTE) – by phone
Martin Horwitz (FTE) – by phone
Fred Gaines, PWS (Atkins/FTE)
Liz Bartell, PE (PGA)
Tim Polk, PE (PGA)
Sarah Johnson (KCA)
Bill Howell, PE (Lochner) – by phone
Tracy Ellison, PE (Lochner) – by phone
Jack Miller, PE (Lochner) – by phone

1. **Background**
    a. FTE introduced the project and stated that the PD&E Study limits are Turnpike Mainline (SR 91) from Indiantown Road (SR 706) to Okeechobee Road (SR 70), MP 117 to MP 153.7.
    b. PGA stated that the project will be permitted for the future (8-lane) condition.
    c. PGA stated that the proposed future improvements include widening the mainline from two to four lanes in each direction. The two alternatives being evaluated during the PD&E Study consist of four general toll lanes in each direction or two general toll lanes and two express toll lanes in each direction. FTE plans to account for the added impervious necessary for express lanes when permitting the project, even though the express lanes may not be constructed at this time.
    d. PGA stated that the project will also include improvements to the following interchanges: Stuart (SW Martin Highway/SR 714), Becker Road, Port St. Lucie Boulevard (SR 716), and Okeechobee Road (SR 70). The PD&E will also evaluate the potential for new interchanges. The major bridges within the project limits are the Loxahatchee River and Thomas B. Manuel Bridge over the St. Lucie

Canal. The project will also include bridge improvements over several other creeks and canals.

2. **Existing Permits**
    a. Turnpike mainline is permitted from MP 137.676 to 152.610 (Permit No. 56-00912-S). SFWMD confirmed that this permit should be modified for the proposed improvements. Several other permits exist within the 37-mile project for interchanges, the service plaza, bridges, and canal protection.

3. **Water Quality**
    a. SFWMD confirmed that the required water quality volume is 2.5" over the new impervious area in areas of reconstruction and widening but clarified that full treatment of new and existing impervious should be provided, if feasible. SFWMD stated that the required water quality volume shall also include the treatment volume provided in the existing condition, whether permitted or not. PGA confirmed that the new impervious area will be calculated for the future condition.
    b. SFWMD confirmed that an additional 50% of treatment shall be provided for any direct discharge to Outstanding Florida Waters (OFWs).
    c. SFWMD confirmed that nutrient loading is required for any direct discharge to water bodies that are impaired for nitrogen (TN) or phosphorus (TP). SFWMD clarified that although Dissolved Oxygen impairment is not typically a roadway impairment, there are times that it is related to high nutrient levels.
    d. PGA stated that there is a BMAP for St. Lucie River and Estuary Basin, but FTE is a de minimus stakeholder and has not been assigned an allocation for TN nor TP.
    e. PGA stated that the Loxahatchee TMDL Planning Unit (from Indiantown Road to SE Bridge Road) will be reviewed during the PD&E phase but stated that there are no current TMDLs within the project limits.

4. **Water Quantity**
    a. SFWMD confirmed that the proposed peak discharge for the 25-year, 3-day design shall not exceed that of the existing condition.
    b. PGA stated that she was aware of the following allowable discharge rates: C-23 Canal (31.5 csm for the 10-year design frequency) and C-24 Canal (30.25 csm for the 10-year design frequency). SFWMD stated that any widening of the bridges over these canals, or the C-18 and C-25 canals, will require a right-of-way permit.
    c. C-18, C-23 and C-24 will be handled by SFWMD WPB staff, while the C-25 will be handled by SFWMD Okeechobee staff.

5. **Environmental Look Around (ELA)**
    a. PGA stated that the ELA will be started during the PD&E phase. The PD&E Team plans to coordinate with the following Special WMDs: Northern Palm Beach County Improvement District, Loxahatchee River Environmental Control District, Hobe-St. Lucie Conservancy District, and North St. Lucie River Water Control District.
    b. PGA asked whether SFWMD was aware of any regional opportunities within the project limits, such as funding a SFWMD project for nutrient removal credit, and

discussed some alternative permitting approaches that may be necessary where the project is adjacent to sensitive lands to avoid off-site ponds?

i. The project corridor is adjacent to two miles of SFWMD-owned property and two miles of Florida Forever lands. One alternative is to make use of SFWMD-owned lands and Florida Forever acquisitions. SFWMD stated that there may be an opportunity for funding of the pepper farm restoration located on the SFWMD-owned lands (Martin County is part owner). SFWMD added that the pepper farm could also provide a potential for floodplain compensation by reconnecting Cypress Creek. SFWMD stated that there is also a plan to construct a flow through marsh on the Florida Forever land to capture agricultural discharge and provide attenuation. PGA stated that this project would also be suitable for floodplain compensation and pollutant loading reductions, and SFWMD agreed. The Florida Forever property was purchased with Comprehensive Everglades Restoration Plan (CERP) funds. SFWMD stated that there are no current opportunities for funding the flow through marsh, but there may be an opportunity for funding in the future. SFWMD indicated that there is bridge culvert system connecting the east and west sides of the Florida Forever property that is important for access and requested that the connection not be removed in the future.

ii. Another alternative PGA presented was to provide attenuation in the State-owned lands. PGA stated that this approach was used for the SR 710 from Martin/Palm Beach County Line to Pratt and Whitney Entrance (SFWMD Permit No. 50-04716-P), which was successfully permitted through SFWMD. The SR 710 project provided full treatment on-site, but attenuation was provided off-site in adjacent wetlands to avoid the need for off-site ponds within sensitive lands. Modeling was used to demonstrate a negligible stage increase in the wetlands and no adverse impacts to adjacent properties. SFWMD concurred.

iii. PGA said that another alternative that may be reviewed is the use of Bio-Sorption Activated Media (BAM) filters. SFWMD said they were not familiar with this new technology and would need more information before granting approval to use for TN reduction. PGA stated that BAM has been permitted in other water management districts and additional information would be provided if the PD&E study identifies this alternative as a recommended approach.

iv. PGA stated that Martin County has been implementing septic-to-sewer conversions and asked whether nutrient removal credit could be obtained by funding a similar project. SFWMD said it would need to be discussed further if the PD&E study identifies this alternative as a recommended approach.

v. SFWMD does not know of any additional opportunities and reminded FTE that water quality and quantity aspects will need to stay within the basins impacted.

c. PGA stated that the PD&E will look at potential joint-use opportunities with the adjacent golf course and the City of Port St. Lucie.

6. <u>Floodplain</u>

a. PGA stated that there are several floodways within the project limits: Roebuck Creek, Danforth Creek, Bessy Creek, North Fork St. Lucie, and Tenmile Creek.
b. PGA stated that the FEMA floodplains within the project limits are riverine and compensation would be provided for any impacts to these floodplains; however, a portion of the project is downstream of a SFWMD weir control structure. Floodplain impacts at this location would not require compensation, as they are considered tidal.
c. SFWMD added that the proposed improvements shall not create a backwater increase nor reduce the cross-sectional area at the bridges.

7. <u>Wetlands/Surface Waters</u>

a. KCA presented the types of wetlands anticipated within the project limits: freshwater marsh, forested wetlands, shrub wetlands, reservoirs, natural rivers, and drainage ditches and canals.
b. SFWMD indicated that impacts to wetlands associated with OFWs need to show Avoidance and Minimization. Potential mitigation options exist with restoration/enhancement of OFWs and associated wetlands.
c. KCA stated that the following mitigation options will be reviewed: Loxahatchee Mitigation Bank, Bluefield Ranch Mitigation Bank, R.G. Reserve Mitigation Bank, and DuPuis Reserve (Martin County). A cumulative impact analysis may be necessary based on the location of impacts and mitigation bank service area. SFWMD added that credits may be low or out at the R.G. Reserve Mitigation Bank.
d. COE agreed with approach.

8. <u>Protected Species</u>

a. KCA stated that no species-specific surveys have been conducted.
b. KCA stated that there is a potential for the following protected species:
    i. Federal
        1. Eastern indigo snake
        2. Wood stork
        3. Crested caracara*
        4. Snail kite*
        5. Manatee*
        6. Wood stork (5 CFAs)
        7. Red-cockaded woodpecker*
        8. Florida scrub-jay*
        9. Florida grasshopper sparrow*

        (* project in species consultation area)
    ii. State
        1. Wading birds
        2. Rookery at Okeechobee Road (SR 70) Toll Plaza
        3. Florida sandhill crane
        4. Gopher tortoise
        5. Southeastern American kestrel
        6. Sherman's fox squirrel
    iii. Other
        1. Osprey
        2. Bald eagle

c. FTE stated that the Florida Bonneted Bat Consultation Area (CA) may have recently changed, and the USFWS is in the process of expanding the CA and removing the focal areas, but it is currently still in a draft form.
d. NMFS inquired about tidal systems and Essential Fish Habitat. Assumed to be minimal. FTE will research further and address in detail during design.

9. <u>Loxahatchee Wild and Scenic River</u>

a. KCA discussed the project's Loxahatchee River involvement.
b. Implemented under the Wild and Scenic River Act
    i. SFWMD confirmed that Section 7a approval is needed.
c. National Park Service is lead federal agency.
d. SFWMD/FDEP develop and administer management plan – coordinate with Beth Kacvinsky
e. Supported by Loxahatchee River Management Coordinating Council (25 members)
    i. Three Federal Agencies
    ii. Eight State Agencies
    iii. Nine Local Agencies
    iv. Five Non-Governmental Organizations
f. Extends from southern end of Jonathan Dickinson State Park to southern end of Riverbend Park (Martin and Palm Beach Counties)
g. Road crosses scenic segment of river.
h. Addresses Impacts:
    i. Free Flow Nature
    ii. Water Quality
    iii. Remarkable Values – (scenic, recreational, geological, fish & wildlife, historical, cultural)
i. SFWMD added that Cypress Creek connects to the Loxahatchee River, but it is not considered part of wild and scenic river. KCA stated that the location of the Loxahatchee River within this PD&E project is considered scenic only (not wild).

10. <u>Cultural Resources</u>

a. KCA stated that a CRAS will be completed as part of this PD&E.

11. <u>Permits and Approvals</u>

a. KCA stated that the following permits and approvals are anticipated:
    i. USACE – Section 404 Dredge and Fill Permit
    ii. USACE – Section 408 Alteration of a USACE Civil Works Project
        1. SFWMD said that a Section 408 will be needed for the C-23 canal.
    iii. US Coast Guard - General Bridge Act of 1946 (33 USC 525)
    iv. NPS – Section 7a Wild and Scenic Rivers Act Approval
    v. SFWMD – Environmental Resource Permit
    vi. SFWMD - Right-of-Way Occupancy Permit
        1. SFWMD said that a Right-of-Way Occupancy permit will be necessary for the following canals: C-18 (if within the project limits), C-23 upstream of weir, C-24 downstream of weir, and C-25 downstream of weir.
    vii. FDEP - Sovereign Submerged Lands Easements

1. This will be submitted with the ERP, and SFWMD will process.

viii. FDEP – NPDES – Obtained by Construction Contractor
ix. FWC - Gopher Tortoise Relocation Permit
x. FWC - Incidental Take Permit (Permitting requirements to be coordinated w/ FWC)

b. FTE added that the ETDM number for this project is #14295.

EXCERPTS AND AS-BUILTS

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Form 0645-001
01/90

P.O. Box 24680
3301 Gun Club Road
West Palm Beach, FL 33416-4680
Telephone (407) 686-8800
Florida WATS 1-800-432-2045

SURFACE WATER MANAGEMENT PERMIT APPLICATIONS AND/OR WATER USE PERMIT APPLICATIONS

GENERAL INSTRUCTIONS

RELEVANT SECTIONS AND FORMS
In order to ensure efficient processing of your application, please provide the administrative information requested in RC-1A Applicants for a surface water management permit must complete sections I, II and IV of RC-1A and all of RC-1S. Applicants for a water use permit must complete sections I, III and IV of RC-1A and all of RC-1W. If any of the proposed project is agricultural in nature, or if the project is in a Reduced Threshold Area (see Rule 40E-20.302 Florida Administrative Code), surface water management and water use permit applications must be processed concurrently.

SIGNATURE AND FEE
All applicants (or their authorized agents) must sign the application form in Section IV "Certification." No application for which a fee is required shall be considered filed until the appropriate application fee is submitted.

NUMBER OF COPIES
If you are applying for a conceptual approval concurrent with a Development of Regional Impact Application for Development Approval, please submit one completed copy of RC-1A, and eight copies of all other completed forms and items. For all other applications, please submit one completed copy of RC-1A and six copies of all other completed forms and items.

GUIDANCE
Please utilize the booklets titled "Guidance for Preparing an Application for a Surface Water Management Permit" and "Guidance for Preparing an Application for a Water Use Permit" to fill in all material which relates to the proposed project. Please refer to the item numbers to identify supporting material that is attached to the Form. If you have questions, please discuss your application with District staff prior to submittal.

AUTHORITY TO REQUIRE INFORMATION
Rules 40E-2.101; 40E-20.112, 40E-4.101 and 40E-40.112, Florida Administrative Code, specify information requirements to constitute a complete permit application.

GOVERNING BOARD ACTIONS
Applications for individual surface water management and/or water use permits will require District Governing Board action. Requests for modification of surface water management permits issued before December 1, 1982, may require District Governing Board action. If you have questions, please discuss your application with District staff prior to submittal.

OTHER PERMITS FROM THIS DISTRICT
Applicants who propose projects which involve utilization of District works or land must also submit Form 0122 "Application to the South Florida Water Management District for Authority to Utilize Works or Land of the District."

APPROVALS BY OTHER AGENCIES
The proposed projects may also require approval by other state and federal agencies. SFWMD informs other agencies of permit applications received, but the responsibility for requesting approval from other agencies rests with the owner.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
RC-1A ADMINISTRATIVE INFORMATION FOR SURFACE WATER MANAGEMENT PERMIT APPLICATIONS AND/OR WATER USE PERMIT APPLICATIONS

Form 0645-A01
01/90

900108-2

I. GENERAL INFORMATION

THIS IS AN APPLICATION FOR (PLEASE CHECK APPROPRIATE BOXES):

[X] A SURFACE WATER MANAGEMENT PERMIT [ ] A WATER USE PERMIT

OWNER	APPLICANT (IF DIFFERENT FROM OWNER
NAME: Florida Department of Transportation	NAME: Post, Buckley, Schuh & Jernigan, Inc.
ADDRESS: 605 Suwannee Street	ADDRESS: Olympia Place 800 N. Magnolia Ave., Suite 600
CITY, STATE, ZIP: Tallahassee, FL 32301-8064	CITY, STATE, ZIP: Orlando, FL 32803
TELEPHONE ( )	TELEPHONE (407) 423-7275
PROJECT ENGINEER, CONSULTANT OR AGENT	**PRE-APPLICATION MEETING**
NAME OF FIRM: Adair & Brady, Inc.	HAVE ANY PRE-APPLICATION MEETINGS BEEN HELD WITH DISTRICT STAFF? [X] YES [ ] NO
NAME OF CONTACT PERSON: Patrick Lear	DATE(S): 10/31/89 & 12/12/89
ADDRESS: 1958 S. Congress Ave.	LOCATION(S): SFWMD offices, West Palm Beach, FL
CITY, STATE, ZIP: West Palm Beach, FL 33406	NAME(S) OF KEY DISTRICT STAFF: Eduardo Lopez Jay Marshall, Mark Daron
TELEPHONE (407) 964-1221	NAME(S) OF PROJECT REPRESENTATIVE(S): Douglas O'Laughlin, Dennis Thomas

PROJECT INFORMATION

NAME (INCLUDING THE PHASES COVERED BY THIS APPLICATION): Florida's Turnpike Median Barrier & Paving (Martin County)

TOTAL PROJECT ACREAGE, INCLUDING ALL PHASES: 81.45 Ac. PHASE AREAS (IF APPLICABLE): _____

CITY, TOWN OR VILLAGE (IF APPLICABLE): Mile Post 114 - Mile Post 137 COUNTY: (Martin County)

SECTION(S) OR GOVERNMENT LOT(S): Varies TOWNSHIP: 40-39 S RANGE: 42-41 E

SECTION(S) OR GOVERNMENT LOT(S): _____ TOWNSHIP: _____ S RANGE: _____ E

SECTION(S) OR GOVERNMENT LOT(S): _____ TOWNSHIP: _____ S RANGE: _____ E

II. SURFACE WATER MANAGEMENT

FORM OF PERMIT (PLEASE CHECK ONLY ONE BOX)

[ ] A NEW INDIVIDUAL PERMIT, PURSUANT TO RULE 40E-4, FLORIDA ADMINISTRATIVE CODE (F.A.C.)	[X] A NEW GENERAL PERMIT, PURSUANT TO RULE 40E-40, F.A.C.
[ ] A MODIFICATION OF EXISTING INDIVIDUAL PERMIT NO. _____	[ ] A MODIFICATION OF EXISTING GENERAL PERMIT NO. _____

DESCRIBE IN GENERAL TERMS THE REQUESTED CHANGE(S) OR NEW WORK(S)

SURFACE WATER MANAGEMENT (CONTINUED)

Form 0645-A02

TYPE OF PERMIT (PLEASE CHECK AT LEAST ONE BOX)

☐ CONCEPTUAL APPROVAL OF A SURFACE WATER MANAGEMENT SYSTEM WHICH WILL SERVE THE ENTIRE _____ - ACRE SITE. (PLEASE FILL IN THE ACREAGE OF YOUR ENTIRE PROJECT.)

☒ CONSTRUCTION AND OPERATION OF A SURFACE WATER MANAGEMENT SYSTEM WHICH WILL SERVE THE ENTIRE 81.45 - ACRE SITE. (PLEASE FILL IN THE ACREAGE OF YOUR ENTIRE PROJECT.)

☐ *PHASES OF THE SITE: CONSTRUCTION AND OPERATION OF A SURFACE WATER MANAGEMENT SYSTEM WHICH WILL SERVE _____ ACRES (PLEASE FILL IN THE ACREAGE OF THE PART OF YOUR PROJECT FOR WHICH A CONSTRUCTION AND OPERATION PERMIT IS SOUGHT) OF THE ENTIRE _____ - ACRE SITE. (PLEASE FILL IN THE ACREAGE OF YOUR ENTIRE PROJECT.)

☐ OPERATION OF AN EXISTING SURFACE WATER MANAGEMENT SYSTEM WHICH SERVES THE ENTIRE _____ - ACRE SITE. (PLEASE FILL IN THE ACREAGE OF YOUR ENTIRE PROJECT.)

☐ *PHASES OF THE SITE: OPERATION OF AN EXISTING SURFACE WATER MANAGEMENT SYSTEM WHICH SERVES _____ ACRES (PLEASE FILL IN THE ACREAGE OF THE PART OF YOUR PROJECT FOR WHICH AN OPERATION PERMIT IS SOUGHT.) OF THE ENTIRE _____ - ACRE SITE. (PLEASE FILL IN THE ACREAGE OF YOUR ENTIRE PROJECT.)

*IF THIS IS THE CASE, YOU MUST ALSO USE THIS FORM TO APPLY FOR OTHER TYPES OF PERMITS FOR THE REST OF THE SITE, TO ASSURE THAT THE ENTIRE SITE IS COVERED BY THIS APPLICATION.

III. WATER USE N/A

FORM OF PERMIT (PLEASE CHECK ONLY ONE BOX):

☐ A NEW INDIVIDUAL PERMIT PURSUANT TO RULE 40E-2.101, FLORIDA ADMINISTRATIVE CODE (F.A.C.)

☐ A NEW GENERAL PERMIT, PURSUANT TO RULE 40E-20, F.A.C.

☐ A MODIFICATION OF EXISTING PERMIT NO. _____

☐ RENEWAL OF EXISTING PERMIT NO. _____

THE PURPOSE OF THIS REQUEST:

TYPE OF PERMIT (PLEASE CHECK AT LEAST ONE BOX):

☐ AGRICULTURAL IRRIGATION ☐ LANDSCAPING IRRIGATION ☐ GOLF COURSE IRRIGATION

☐ PUBLIC WATER SUPPLY ☐ MINING/DEWATERING ☐ INDUSTRIAL/COMMERCIAL

☐ RECREATIONAL ☐ AQUACULTURE ☐ OTHER (PLEASE DESCRIBE) _____

SOURCE OF WATER (PLEASE CHECK AT LEAST ONE BOX):

SURFACE WATER FROM THE FOLLOWING WATER BODY(IES):

☐ ON-SITE RETENTION POND(S) OR LAKE(S) ☐ ADJACENT LAKE, CANAL, RIVER, OR CREEK: _____ (NAME)

GROUND WATER FROM THE FOLLOWING NAMED AQUIFER(S) (PLEASE INDICATE, FOR EACH AQUIFER, WHETHER IT IS SHALLOW OR DEEP):

IV. CERTIFICATION

I hereby certify that, to the best of my knowledge, the total project acreage listed above is owned or controlled by me and encompasses the project referenced in this permit application. In addition, I agree to provide entry to the project site for South Florida Water Management District inspectors with proper identification or documents as required by law for the purpose of making preliminary analyses of the site. Further, I agree to provide entry to the project site for such inspectors to monitor permitted work if a permit is granted.

Robert E. Ford — Signature (if not the owner, certify below) — Date: 1/2/90

I hereby certify that I am an authorized agent of the owner:

Adm. of R/W Operations — (Title) — Date: 1/2/90

FOR DISTRICT USE ONLY

APPLICATION NUMBER 900108-2

FEE REQUIRED _____

FEE PAID _____

RECEIPT NUMBER _____

Form 0645 - S01
01/90

RC-1S APPLICATION FOR A SURFACE WATER MANAGEMENT PERMIT

FOR SFWMD USE ONLY

Application No. _____

RECEIVED
JAN 08 1990
REGULATION DEPT

SFWMD ONLY
N A I M

SECTION I - SITE INFORMATION

✓	A	LOCATION SKETCH IS SUBMITTED AS ITEM I-1. ON PLANS	☐☐☐☐
✓	B	AERIAL PHOTOGRAPH IS SUBMITTED AS ITEM I-2. N/A	☐☐☐☐
	C	WETLANDS N/A	
✓		EXISTING COVER IS SUBMITTED AS ITEM I-3.	☐☐☐☐
✓		PROPOSED PRESERVATION TECHNIQUES ARE SUBMITTED AS ITEM I-4.	☐☐☐☐
✓		WETLANDS CONTROL ELEVATION TABLE IS SUBMITTED AS ITEM I-5.	☐☐☐☐

SECTION II - PROJECT INFORMATION

✓	A	PROJECT DESCRIPTION IS SUBMITTED AS ITEM II-1A.	☐☐☐☐
		STAFF GUIDANCE DOCUMENTS ARE SUBMITTED AS ITEM II-1B.	☐☐☐☐
✓	B	TOPOGRAPHIC MAP IS SUBMITTED AS ITEM II-2. N/A → CROSS SECTIONS	☐☐☐☐
✓	C	DRAINAGE MAP IS SUBMITTED AS ITEM II-3. ATTACHED	☐☐☐☐
	D	WATER ELEVATION	
		BASIN WATER TABLE ELEVATION TABLE IS SUBMITTED AS ITEM II-4A.	☐☐☐☐
		SUPPORTING INFORMATION IS SUBMITTED AS ITEM II-4B. NONE N/A	☐☐☐☐
✓		DESCRIPTION OF AFFECTED SYSTEMS IS SUBMITTED AS ITEM II-5.	☐☐☐☐
✓		FLOODPLAIN INFORMATION IS SUBMITTED AS ITEM II-6. N/A	☐☐☐☐
✓	E	PERCOLATION DATA ARE SUBMITTED AS ITEM II-7. N/A	☐☐☐☐
✓	F	WATER WITHDRAWAL IS SUBMITTED AS ITEM II-8. N/A	☐☐☐☐

SECTION III - MASTER PLAN

	A	MASTER PAVING, GRADING, AND DRAINAGE PLANS	
		CONCEPTUAL APPROVAL, PLANS NOT SUBMITTED. ☐ YES ☒ NO	☐☐☐☐
✓		MASTER PAVING, GRADING, AND DRAINAGE PLANS ARE SUBMITTED AS ITEM III-1.	☐☐☐☐
✓	B	DRAINAGE PLAN DETAILS ARE SUBMITTED AS ITEM III-2.	☐☐☐☐
✓	C	RECEIVING BODY LIST IS SUBMITTED AS ITEM III-3. N/A	☐☐☐☐
	D	CONSTRUCTION TECHNIQUES DESCRIPTION	
		CONCEPTUAL APPROVAL, STATEMENT NOT REQUIRED. ☐ YES ☒ NO	☐☐☐☐
✓		CONSTRUCTION TECHNIQUES DESCRIPTION IS SUBMITTED AS ITEM III-4. N/A	☐☐☐☐

Form 0645 - 502

SECTION III - MASTER PLAN (CONTINUED)

SFWMD ONLY

N A I M

	E	LEGAL RESERVATIONS	
		CONCEPTUAL APPROVAL, RESERVATIONS NOT REQUIRED. ☐ YES ☐ NO	☐☐☐☐
✓		LEGAL RESERVATIONS ARE SUBMITTED AS ITEM III-5. N/A	☐☐☐☐
✓	F	AFFECTED FACILITIES ANALYSIS IS SUBMITTED AS ITEM III-6 N/A	☐☐☐☐

SECTION IV - SURFACE WATER MANAGEMENT ANALYSIS

	A	FACILITIES	
✓		DESCRIPTION OF EXISTING FACILITIES IS SUBMITTED AS ITEM IV-1.	☐☐☐☐
✓		DESCRIPTION OF PREVIOUSLY APPROVED/PERMITTED FACILITIES IS SUBMITTED AS ITEM IV-2. N/A	☐☐☐☐
✓		DESCRIPTION OF PROPOSED FACILITIES FOR THE ENTIRE PROJECT IS SUBMITTED AS ITEM IV-3.	☐☐☐☐
✓		DESCRIPTION OF PROPOSED FACILITIES FOR THIS PHASE IS SUBMITTED AS ITEM IV-4.	☐☐☐☐
✓		FACILITY DETAILS FOR EXFILTRATION TRENCH ARE SUBMITTED AS ITEM IV-5. N/A	☐☐☐☐
✓		PERCOLATION TESTS AND CALCULATIONS ARE SUBMITTED AS ITEM IV-6. ATTACHED	☐☐☐☐
✓		EXFILTRATION TRENCH COMPUTATIONS ARE SUBMITTED AS ITEM IV-7. N/A	☐☐☐☐
✓		FACILITY DETAILS FOR GRAVITY DISCHARGE STRUCTURE(S) ARE SUBMITTED AS ITEM IV-8. SEE CALCS.	☐☐☐☐
✓		STAGE-DISCHARGE CALCULATION IS SUBMITTED AS ITEM IV-9. N/A	☐☐☐☐
✓		SPREADER SWALE VELOCITY CALCULATION IS SUBMITTED AS ITEM IV-10. ATTACHED	☐☐☐☐
✓	B	A STAGE-DISCHARGE, A STAGE-STORAGE, AND A LAND COVERAGE TABLE FOR EACH BASIN ARE SUBMITTED AS ITEM IV-11. N/A	☐☐☐☐
✓	C	DRAINAGE BASIN(S) AND/OR PHASE(S) TABLES ARE SUBMITTED AS ITEM IV-12. SEE ATTACHED	☐☐☐☐
✓	D	WATER QUALITY BEST MANAGEMENT PRACTICES DESCRIPTION IS SUBMITTED AS ITEM IV-13A.	☐☐☐☐
		RETENTION/DETENTION VOLUME CALCULATIONS FOR EACH BASIN OR PHASE ARE SUBMITTED AS ITEM IV-13B. SEE CALCS.	☐☐☐☐
✓	E	WET SEASON WATER TABLE AND SOIL STORAGE CALCULATIONS ARE SUBMITTED AS ITEM IV-13C. N/A	☐☐☐☐
✓	F	ALLOWABLE DISCHARGE SUPPORTING CALCULATIONS ARE SUBMITTED AS ITEM IV-14. N/A	☐☐☐☐
✓	G	FLOOD ROUTINGS ARE SUBMITTED AS ITEM IV-15. N/A	☐☐☐☐
	H	FLOODPLAIN ENCROACHMENT N/A	
		CONVEYANCE PREDEVELOPMENT CONDITIONS ARE SUBMITTED AS ITEM IV-16.	☐☐☐☐
		CONVEYANCE POST-DEVELOPMENT CONDITIONS ARE SUBMITTED AS ITEM IV-17.	☐☐☐☐
		STORAGE PREDEVELOPMENT SITE RUNOFF CONDITIONS ARE SUBMITTED AS ITEM IV-18.	☐☐☐☐
		STORAGE PREDEVELOPMENT BASIN STORAGE CONDITIONS ARE SUBMITTED AS ITEM IV-19.	☐☐☐☐
		FLOODPLAIN ☐ IMPORTER ☐ EXPORTER SUPPORTING INFORMATION IS SUBMITTED AS ITEM IV-20	☐☐☐☐

Form 0645 - 503

SECTION V - LEGAL AND INSTITUTIONAL

SFWMD ONLY
N A I M

✓			
	A	PROOF OF OWNERSHIP SUPPORTING INFORMATION IS SUBMITTED AS ITEM V-1	☐☐☐☐
	B	RESPONSIBLE ENTITY(IES) SUPPORTING INFORMATION IS SUBMITTED AS ITEM V-2.	☐☐☐☐
	C	UTILITIES N/A	
		WATER UTILITIES SUPPORTING INFORMATION IS SUBMITTED AS ITEM V-3.	☐☐☐☐
		SEWERAGE SUPPORTING INFORMATION IS SUBMITTED AS ITEM V-4.	☐☐☐☐
	D	RECEIVING BODY(IES) N/A	
		LEGAL AVAILABILITY DOCUMENTATION IS SUBMITTED AS ITEM V-5.	☐☐☐☐
		PHYSICAL CAPACITY DOCUMENTATION IS SUBMITTED AS ITEM V-6.	☐☐☐☐
		RIGHT OF WAY PERMIT APPLICATION IS SUBMITTED NOW. ☐	☐☐☐☐
		RIGHT OF WAY PERMIT IS APPLIED FOR, APPLICATION NO. _____	☐☐☐☐
		PROJECT IS PERMITTED FOR RIGHT OF WAY, PERMIT NO. _____	☐☐☐☐
	E	LAND USE TABLE IS SUBMITTED AS ITEM V-7	☐☐☐☐
	F	DEVELOPMENT OF REGIONAL IMPACT STATUS INFORMATION IS SUBMITTED AS ITEM V-8. N/A	☐☐☐☐
	G	BOUNDARY SURVEY IS SUBMITTED AS ITEM V-9. N/A	☐☐☐☐

SECTION VI - PUBLIC NOTICING INFORMATION

	A	DEPICTION OF WORKS AND FACILITIES IS SUBMITTED AS ITEM VI-1.	☐☐☐☐
	B	PROJECT MAP IS SUBMITTED AS ITEM VI-2	☐☐☐☐
	C	WETLANDS STATEMENT IS SUBMITTED AS ITEM VI-3. N/A	☐☐☐☐
	D	MITIGATION STATEMENT IS SUBMITTED AS ITEM VI-4. N/A	☐☐☐☐

SECTION VII - WORKS OF THE DISTRICT SURFACE WATER IMPROVEMENT AND MANAGEMENT (SWIM) N/A

	A	PROJECT IS PERMITTED FOR WORKS OF THE DISTRICT (SWIM). PERMIT NO: _____	☐☐☐☐
	B	WORKS OF THE DISTRICT (SWIM) PERMIT IS APPLIED FOR, APPLICATION NUMBER: _____	☐☐☐☐
	C	WORKS OF THE DISTRICT (SWIM) PERMIT IS NOT REQUIRED. ☐	☐☐☐☐

PBS&J

POST, BUCK[illegible], SCHUH & JERNIGAN, INC.

OLYMPIA PLACE
800 NORTH MAGNOLIA AVE.
SUITE 600
ORLANDO, FLORIDA 32803
(407) 423-7275

December 28, 1989

Mr. Carlos DeRojas
DIRECTOR of SURFACE WATER MANAGEMENT
P.O. Box V
3301 Gun Club Road
W. Palm Beach, FL 33416

RE: **Florida's Turnpike**
S. R. 91
Median Barrier Wall and Paved Shoulder Projects
M. P. 117.0 to M.P. 137
W.P.I. 4156428 & 4156429
State Project No. 97890-3327 & 97890-3328
Martin County

Dear Mr. DeRojas:

On behalf of Florida's Turnpike we are submitting the enclosed application for a General Surface Water Permit for the proposed median barrier wall and paved shoulder projects.

In addition to the RC-1A application, six (6) copies each of the RC-1S application, drainage calculations, permeability test results and construction plans are provided.

Thank you for your consideration of this application.

Correspondence regarding this project should be directed to myself or Pete Manz of this office.

Sincerely,

Beth Baxter

Beth Baxter, P.G.

BB:mw:bls
bb2/27

Enclosures.

cc:
Raymond Ashe
Pete Manz
Ken Holladay
File 07-560.D.4156428.6.4.3

Attached — Item I-1

N/A — Item I-2

N/A — Item I-3

N/A — Item I-4

N/A — Item I-5

Project Description — Item II-IA
Two meeting with the District staff have occurred. The key people at the District are Mr. Jay Marshall, Eduardo Lopez and Mark Daron. The project representative is Mr. Douglas O'Laughlin, P.E. - See attached memos.

The project will involve the replacement of the existing guardrail with a concrete barrier wall and paved median from mile post 117 to mile post 137 (See plans for omitted areas).

N/A (no wetlands) — Item II-1B

Attached — Item II-2

N/A (Drainage Map) — Item II-3
(No inflow from surrounding areas)

Basin Water Table Elevation — Item II-4A
Varies

Supporting Information — Item II-4B
The wet season water table elevation is based on the elevation of the existing Drainage Canal.

Description of Affected System — Item II-5

Flood Plain — Item II-6
N/A

Percolation Data — Item II-7
See attached

Water Withdrawal — *Item II-8*
N/A

Master Paving & Drainage Plan — *Item III-1*
Attached

Drainage Plan Details — *Item III-2*
Attached

Receiving Body — *Item III-3*
Existing Drainage Canal

Construction Techniques — *Item III-4*
N/A

Legal Reservations — *Item III-5*
N/A

Affected Facilities Analysis — *Item III-6*
The Existing Drainage Canal will be used to receive the additional runoff caused by paving the median. A pretreatment of 2.5" x the new pavement width will be achieved by a pretreatment swale. The drainage structures will be elevated above the swale bottom to allow water to percolate into the soil. When the water level reaches the inlet elevation the inlet acts as a weir. The water flows through 18" pipes to the existing drainage canal on the west side of the highway (See detail in plans).

Description of Existing Facilities — *Item IV-1*
Florida's Turnpike (Martin County), a guardrail and grassed median exist along with drainage canals on each side of the highway.

Previously Approved Facilities — *Item IV-2*
N/A

Proposed Facilities — *Item IV-3*
A pretreatment swale will be located on the west side of the Turnpike. The drainage structures will be elevated 6" above the bottom of the swale. When the water surface reaches this elevation, a corrugated metal pipe will convey the water to the existing canal. A concrete barrier wall and paved shoulder will occupy the median.

Facilities for Phases — *Item IV-4*
N/A

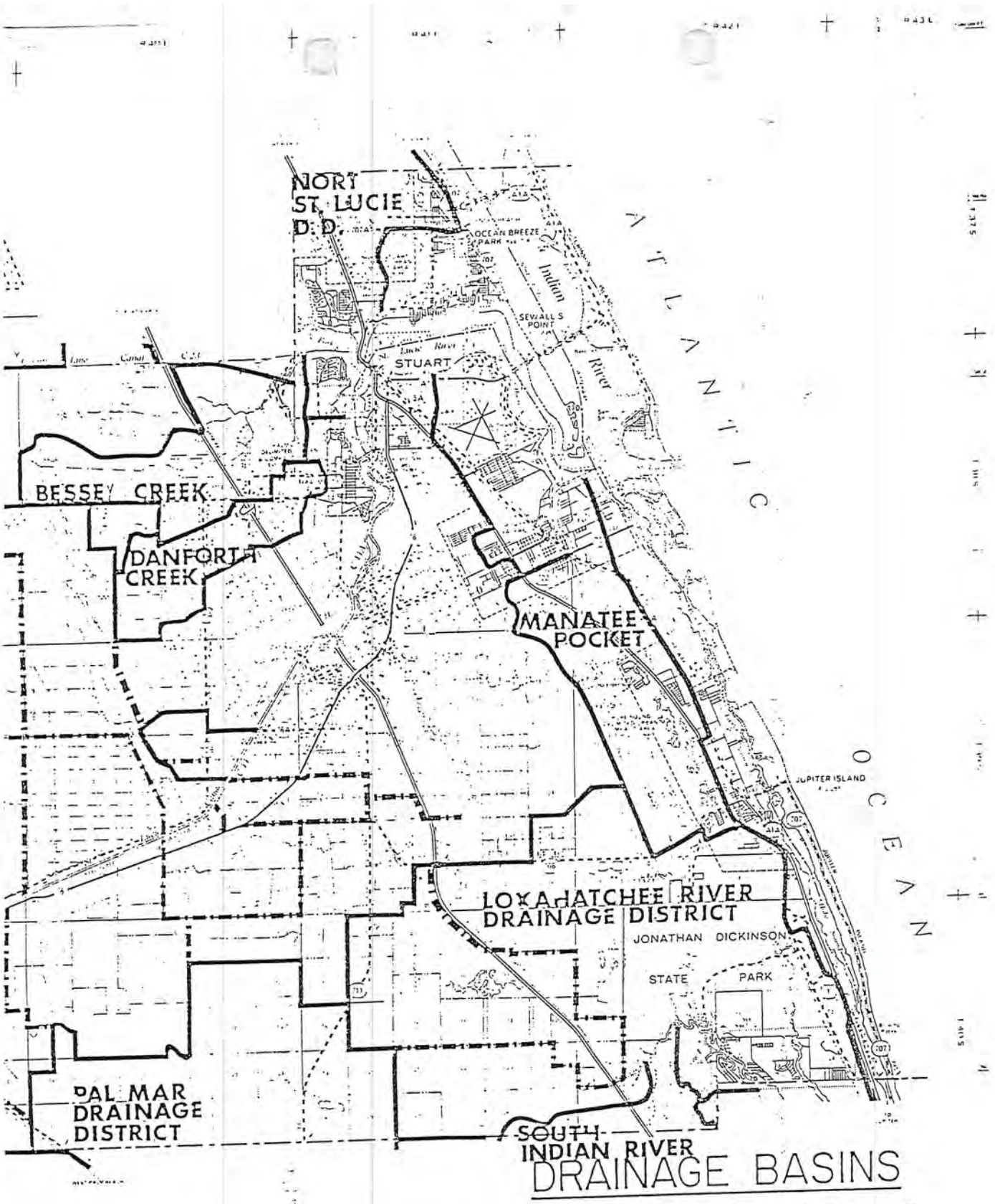
Exfiltration Trench — *Item IV-5*
N/A

Percolation Test — *Item IV-6*
See Attached

Exfiltration Trench Computations — *Item IV-7*
N/A

Discharge Structure — *Item IV-8*
See Attached

Stage Discharge Calculations N/A	Item IV-9
Spreader Swale See Details in Plans	Item IV-10
See Calculations	Items IV-11 to IV-15
N/A	Items IV-16 to IV-20



DRAINAGE BASINS

MARTIN COUNTY
FLORIDA

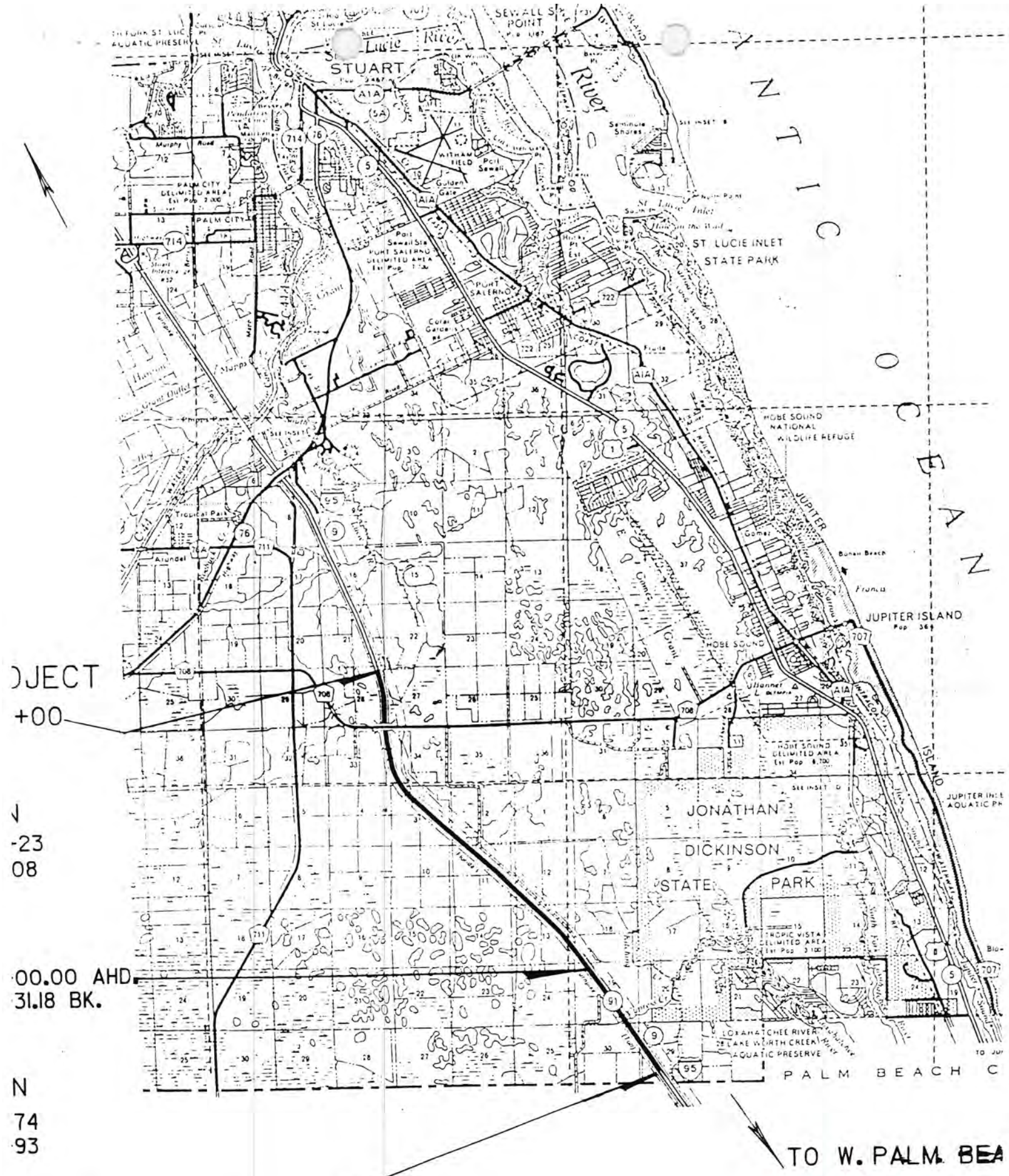
PREPARED BY THE
PHOTOGRAMMETRIC DIVISION
FOR THE
TRAFFIC AND PLANNING DIVISION
FLORIDA STATE ROAD DEPARTMENT
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS

SCALE

SCALE FOR PLOTS
JANUARY 1968

GRID NORTH AT TRIANGULATION STATION ALLEN IS 0°15'W EAST OF TRUE NORTH
MAGNETIC NORTH IN JUNE 1968 IS APPROXIMATELY 4°W WEST OF TRUE NORTH
ANNUAL MAGNETIC CHANGE IS APPROXIMATELY 7.0' WESTWARD

REVISIONS	
FEATURE	DATE



900108-2

MICROFILMED

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

November 20, 1989

Adair & Brady, Inc.
1958 South Congress Avenue
West Palm Beach, Florida 33406

Attention: Mr. John Adair, P.E.

Re: Permeability Test Data
Martin County Turnpike
Mile Post No. 127.4 to No. 137.4
WPI No. 4156429

Gentlemen:

Transmitted herewith, as per your request, are the results of our additional field testing from the above referenced project site. This testing was perfomed on the west side of the existing Turnpike in the proposed drainage areas from Mile Post No. 127.4 to No. 137.4.

The scope of work performed was in general accordance with and as detailed on the "Geotechnical Price Proposal - WPI No. 4156429" sheet from TLPB made part of the "Standard Consultant Agreement" between the State of Florida Department of Transportation and Adair & Brady, Inc. This schedule detailed the type and approximate frequency of this testing to be performed. The specific field test locations were selected by TLPB in consultation with Adair & Brady, Inc.

Data sheets detailing the results of our field testing have been included in this report. It can be noted that this completes the scheduled work tasks for TLPB on this project.

Testing Lab of the Palm Beaches, Inc. appreciates this opportunity to have been of further service to you on this project. If you have any questions concerning this data, please feel free to contact us at your earliest convenience.

Respectfully submitted,

TESTING LAB OF THE PALM BEACHES, INC.

E. Victor Brynteson
Project Manager

11-20-89
John J. Roberts, II, P.E.
Senior Project Engineer

JJR/EVB/mas

Enclosures

PERMEABILITY TESTS INFORMATION

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 127.4 to No. 137.4
WPI No. 4156429

Project No.: 89/1-11

Date Test Performed: November 17, 1989

LOCATION	DEPTH	DESCRIPTION -
Mile Post No. 128.7 45 feet West of the West edge of the South Bound Drive Lane.	0'-1'	Brown medium fine sand with some silt
	1'-2'	Dark brown fine sand with traces of silt
	2'-4'	Gray fine sand with traces of silt
	4'-5'6"	Dark brown fine silty sand
	5'6"-10'	Brown medium fine sand with clayey silt

Water table = 2'3"

Average Q = 0.3 gpm or K_{IV} = 2.7 X 10^{-5} cfs/ft^2- ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diamater
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 127.4 to 137.4
WPI No. 4156429

Project No.: 89/1-11

Date Test Performed: November 17, 1989

LOCATION	DEPTH	DESCRIPTION
Mile Post 131.8 45 feet West of the West edge of the South Bound Drive Lane.	0'-2'	Brown medium fine sand
	2'-3'6"	Dark brown medium fine sand with some silt
	3'6"-5'	Brown fine sand with clayey silt
	5'-8'	Brown fine silty sand with some clayey silt
	8'-10'	Brown fine sand with some silt

Water table = 2'4"

Average Q = 0.1 gpm or $K_{IV} = 7.8 \times 10^{-6}$ cfs/ft^2 - ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 127.4 to No. 137.4
WPI No. 4156429

Project No.: 89/1-11

Date Test Performed: November 17, 1989

LOCATION	DEPTH	DESCRIPTION
Mile Post 132.5	0"-2"	Dark brown organic silt with roots
45 feet West of the	2"-2'	Dark brown medium fine sand
West edge of the South	2'-5'	Brown fine sand with clayey silt
Bound Drive Lane.	5'-8'	Brown fine silty sand
	8'-10'	Light brown medium fine sand with traces of silt

Water table = 0'11"

Average Q = 0.04 gpm or K_{IV} = 1.3 X 10^{-5} cfs/ft^2 - ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 127.4 to No. 137.4
WPI No. 4156429

Project No.: 89/1-11

Date Test Performed: November 17, 1989

LOCATION	DEPTH	DESCRIPTION
Mile Post No. 134.0 45 feet West of the West edge of the South Bound Drive Lane.	0"-2"	Dark brown organic silt and sand
	2"-2'	Light brown medium fine sand
	2'-3'	Dark brown medium fine to fine sand with traces of silt
	3'-6'	Brown medium fine to fine sand with clayey silt
	6'-10'	Brown medium fine silty sand

Water table = 1'1"

Average Q = 0.1 gpm or K_{IV} = 9.7 X 10^{-6} cfs/ft^2 - ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 127.4 to No. 137.4
WPI No. 4156429

Project No.: 89/1-11

Date Test Performed: November 16, 1989

LOCATION	DEPTH	DESCRIPTION
Mile Post No. 135.5 45 feet West of the West edge of the South Bound Drive Lane.	0'-2'6"	Brown medium fine sand with traces of roots
	2'6"-6'	Brown medium fine to fine sand with clayey silt
	6'-10'	Brown medium fine to fine silty sand

Water table = 1'10"

Average Q = 0.5 gpm or $K_{IV} = 5.7 \times 10^{-5}$ cfs/ft^2 - ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 127.4 to No. 137.4
WPI No. 4156429

Project No.: 89/1-11

Date Test Performed: November 16, 1989

LOCATION	DEPTH	DESCRIPTION
Mile Post No. 137.0 40 feet West of the West edge of the South Bound Drive Lane.	0"-6"	Gray medium fine sand with traces of roots
	6"-2'	Dark brown medium fine sand with clayey silt
	2'-4'	Brown fine sand with clayey silt and clay layer
	4'-5'	Gray medium fine to fine sand with clayey silt
	5'-10'	Gray medium fine to fine silty sand

Water table = 1'0"

Average Q = 0.5 gpm or $K_{IV} = 1.4\ 10^{-4}$ cfs/ft^2 - ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

November 17, 1989

Adair & Brady, Inc.
1958 South Congress Avenue
West Palm Beach, Florida 33406

Attention: Mr. John Adair, P.E.

Re: Permeability Test Data
Martin County Turnpike
Mile Post No. 117.4 to No. 127.4
WPI No. 4156428

Gentlemen:

Transmitted herewith, as per your request, are the results of our additional field testing from the above referenced project site. This testing was perfomed on the west side of the existing Turnpike in the proposed drainage areas from Mile Post No. 117.4 to No. 127.4.

The scope of work performed was in general accordance with and as detailed on the "Geotechnical Price Proposal - WPI No. 4156428" sheet from TLPB made part of the "Standard Consultant Agreement" between the State of Florida Department of Transportation and Adair & Brady, Inc. This schedule detailed the type and approximate frequency of this testing to be performed. The specific field test locations were selected by TLPB in consultation with Adair & Brady, Inc.

Data sheets detailing the results of our field testing have been included in this report. It can be noted that this completes the scheduled work tasks for TLPB on this project.

Testing Lab of the Palm Beaches, Inc. appreciates this opportunity to have been of further service to you on this project. If you have any questions concerning this data, please feel free to contact us at your earliest convenience.

Respectfully submitted,

TESTING LAB OF THE PALM BEACHES, INC.

E. Victor Brynteson
Project Manager

11-17-89

John J. Roberts, II, P.E.
Senior Project Engineer

JJR/EVB/mas

Enclosures

RECEIVED
NOV 20 1989
ADAIR & BRADY, INC.

PERMEABILITY TESTS INFORMATION

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 117.4 to No. 127.4
WPI No. 4156428

Project No.: 89/1-10

Date Test Performed: November 16, 1989

LOCATION	DEPTH	DESCRIPTION
Mile Post No. 118.7 45 feet West of the West edge of the South Bound Drive Lane.	0'-½'	Gray medium fine sand with traces of roots
	½'-3'	Light brown medium fine sand with traces of roots
	3'-9'	Dark brown medium fine sand with traces of roots
	9'-10'	Brown medium fine silty sand

Water table = 8'8"

Average Q = 6.3 gpm or K_{IV} = 2.0 X 10^{-4} cfs/ft^2-ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 117.4 to No. 127.4
WPI No. 4156428

Project No.: 89/1-10

Date Test Performed: November 15, 1989

LOCATION	DEPTH	DESCRIPTION
Mile Post No. 120.3 45' West of the West edge of the South Bound Drive Lane.	0'-½'	Dark brown medium fine sand with traces of roots
	½'-3'	Brown medium fine silty sand with some shell and traces of cemented sand
	3'-5'	Gray medium fine silty sand with traces of shell
	5'-10'	Gray medium fine silty sand

Water table = 5'4"

Average Q = 1.1 gpm or K_{IV} = 4.5 X 10^{-5} cfs/ft^2-ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 117.4 to No. 127.4
WPI No. 4156428

Project No.: 89/1-10

Date Test Performed: November 15, 1989

LOCATION	DEPTH	DESCRIPTION
Mile Post No. 121.9 45' West of the West edge of the South Bound Drive Lane.	0'-2'	Brown medium fine sand with traces of shell
	2'-4'	Brown medium fine sand with clayey silt
	4'-6'	Brown medium fine silty sand
	6'-10'	Gray medium fine silty sand

Water table = 6'6"

Average Q = 0.6 gpm or K_{IV} = 2.1 X 10^{-5} cfs/ft^2-ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 117.4 to No. 127.4
WPI No. 4156428

Project No.: 89/1-10

Date Test Performed: November 15, 1989

LOCATION	DEPTH	DESCRIPTION
Mile Post No. 123.5 45 feet West of the West edge of the South Bound Drive Lane.	0'-2'6"	Dark brown medium fine sand with traces of roots
	2'6"-3'6"	Dark brown medium fine sand with clayey silt
	3'6"-4'6"	Dark brown medium fine sand with clayey silt and traces of cemented sand and shell
	4'6"-5'6"	Gray medium fine silty sand with cemented sand
	5'6"-10'	Gray medium fine sand, some silt and traces of shell

Water table = 6'1"

Average Q = 1.5 gpm or K_{IV} = 5.5 X 10^{-5} cfs/ft^2- ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the groun surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 117.4 to No. 127.4
WPI No. 4156428

Project No.: 89/1-10

Date Test Performed: November 15, 1989

LOCATION	DEPTH	DESCRIPTION -
Mile Post No. 125.9 45 feet West of the West edge of the South Bound Drive Lane.	0'-2'6"	Brown medium fine sand with traces of roots
	2'6"-4'	Dark brown medium fine sand with clayey silt
	4'-6'	Gray medium fine sand with clayey silt, and traces of shell and cemented sand
	6'-10'	Gray medium fine silty sand with some shell

Water table = 4'2"

Average Q = 0.6 gpm or $K_{IV} = 2.9 \times 10^{-5}$ cfs/ft^2-ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

TESTING LAB OF THE PALM BEACHES, INC.

P.O. BOX 211
LAKE WORTH, FLORIDA 33460

585-7515

ASPHALT . . . CONCRETE . . . MATERIALS

D.O.T. Percolation (exfiltration) Test Procedures

Client: Adair and Brady, Inc.

Project Location: Martin County Turnpike
Mile Post No. 117.4 to No. 127.4
WPI No. 4156428

Project No.: 89/1-10

Date Test Performed: November 15, 1989

LOCATION	DEPTH	DESCRIPTION -
Mile Post No. 127.0 45 feet West of the West edge of the South Bound Drive Lane.	0'-4'	Brown medium fine sand
	4'-5'	Dark brown medium fine sand with clayey silt and traces of roots
	5'-6'	Brown medium fine sand with clayey silt
	6'-10'	Brown medium fine sand with some silt

Water table = 5½'

Average Q = 0.6 gpm or K_{IV} = 2.3 X 10^{-5} cfs/ft^2-ft head

NOTES:
The test procedures were conducted in general accordance with the latest D.O.T. percolation (exfiltration) test procedures.

The water table depth is the distance from the ground surface to the water table before the addition of water.

Hole Diameter: 7 inches
Casing: 6 inches diameter
Depth of hole: 10'

file QUAD 3 & 1, ITEM 4 & 5 POSTED

South Florida Water Management District

P.O. Box 24680 • 3301 Gun Club Road • West Palm Beach, FL 33416-4680 • (407) 686-8800 • FL WATS 1-800-432-2045

Regulation Department
Application No.: 900108-2

January 19, 1990

Florida Dept. of Transportation
605 Suwannee Street
Tallahassee, Florida 32301-9064

Dear Sir or Madam:

Subject: Notice of Intent to Construct Works
General Highway Permit and
Stormwater Discharge Certification No: 43-00568-S
Permittee: Florida Dept. of Transportation
Project : Florida's Turnpike Median Barrier and Paving
Location : Mile Post 114 to Mile Post 137
Martin County, S--/T40-39S/R42-41E

This letter is to notify you of the District's agency action concerning your Notice of Intent to Construct Works. This action is taken pursuant to Rule 40E-1.606 and Chapter 40E-40, Florida Administrative Code.

Based on the information submitted which includes surface water management system design plans signed and sealed by a Florida registered Professional Engineer, a General Highway Permit and Stormwater Discharge Certification is in effect for this project subject to:

1. Not receiving a filed request for a Chapter 120 Florida Statutes, administrative hearing,

2. the attached 12 Standard Limiting Conditions and

3. 2 Exhibits.

Should you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you prior to the date specified in the "Notice of Rights", we will assume that you concur with the District's action.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a "Notice of Rights" has been mailed to the addressee (and the persons listed in the attached distribution list) no later than 5:00 p.m. this 19, day of January, 1990, in accordance with Section 120.60(3), Florida Statutes.

Sincerely,

Anthony M. Waterhouse, P.E.
Assistant Director
South Florida Water Management District

AMW/kw
CERTIFIED MAIL NO. P 390 643 275
Enclosures

FORM 0537
10 87

South Florida Water Management District
GENERAL PERMIT
NOTICE OF RIGHTS

This Notice of Rights is intended to inform the recipient of the administrative and judicial review which may be available as mandated by section 120.60(3), Florida Statutes. Be advised that although this notice is intended to be comprehensive, the review procedures set forth herein have been the subject of judicial construction and interpretation which may affect the administrative of judicial review available. Recipients are therefore advised to become familiar with Chapters 120 and 373, Florida Statutes, and the judicial interpretation of the provisions of these chapters.

1. If a substantially affected person objects to the staff's recommendation, that person has the right to request an administrative hearing on the proposed agency action. The substantially affected person may request either a formal or an informal hearing, as set forth below. Failure to comply with the prescribed time periods shall constitute a waiver of the right to a hearing.

2. If a substantially affected person believes a genuine issue of material fact is in dispute, that person may request a formal hearing pursuant to section 120.57(1), Florida Statutes, by filing a petition not later than:
   a. IF NOTICE OF THE APPLICATION WAS PUBLISHED BY THE APPLICANT, within fourteen (14) days after mailing of the proposed agency action or
   b. IF NOTICE OF THE APPLICATION WAS NOT PUBLISHED, within fourteen days after receipt of actual notice.

   The request for a section 120.57(1), F.S., formal hearing must comply with the requirements of Rule 40E-1.521, Florida Administrative Code, a copy of which is attached. Petitions are deemed filed upon receipt by the District. Failure to substantially comply with the provisions of Rule 40E-1.521, Florida Administrative Code, shall constitute a waiver of the right to a 120.57(1) hearing. If a petition for administrative hearing is not timely filed, the staff's proposed agency will automatically mature into final agency action.

3. If a substantially affected person believes that no issues of material fact are in dispute, that person may request an informal hearing pursuant to section 120.57(2), F.S., by filing a petition for hearing not later than:
   a. IF NOTICE OF THE APPLICATION WAS PUBLISHED BY THE APPLICANT, within fourteen (14) days after mailing of the proposed agency action or
   b. IF NOTICE OF THE APPLICATION WAS NOT PUBLISHED, within fourteen days after receipt of actual notice.

   A request for informal hearing shall be considered as a waiver of the right to request a formal section 120.57(1), F.S., hearing. A request for a section 120.57(1), F.S., formal hearing not in substantial compliance with the provisions of rule 40E-1.521, F.A.C., may be considered by the District as a request for informal hearing. If a petition for administrative hearing is not timely filed, the staff's proposed agency action will automatically mature into final agency action.

4. Pursuant to section 373.114, Florida Statutes, a party to the proceeding below may seek review of a Final Order rendered on the permit application before the Land and Water Adjudicatory Commission, as provided therein. Review under this section is initiated by filing a request for review with the Land and Water Adjudicatory Commission and serving a copy on the Department of Environmental Regulation and any person named in the Order within 20 days after rendering of the District's Order. However, when the order to be reviewed has statewide or regional significance, as determined by the Land and Water Adjudicatory Commission within 60 days after receipt of a request for review, the commission may accept a request for review from any affected person within 30 days after the rendering of the order. Review under section 373.114, Florida Statutes, is limited solely to a determination of consistency with the provisions and purposes of Chapter 373, Florida Statutes. This review is appellate in nature and limited to the record below.

5. A party who is adversely affected by final agency action on the permit application is entitled to judicial review in the District Court of Appeal pursuant to section 120.68, Florida Statutes, as provided therein. Review under section 120.68, Florida Statutes in the District Court of Appeal is initiated by filing a petition in the appropriate District Court of Appeal in accordance with Florida rule of appellate Procedure 9.110. The Notice of Appeal must be filed within 30 days of the final agency action.

6. Section 373.617(2), Florida Statutes, provides:

   > Any person substantially affected by a final action of any agency with respect to a permit may seek review within 90 days of the rendering of such decision and request monetary damages and other relief in the circuit court in the judicial circuit in which the affected property is located; however, circuit court review shall be confined solely to determining whether final agency action is an unreasonable exercise of the state's police power constituting a taking without just compensation. Review of final agency action for the purpose of determining whether the action is in accordance with existing statutes or rules and based on component substantial evidence shall proceed in accordance with Chapter 120.

7. Please be advised that exhaustion of administrative remedies is generally a prerequisite to appeal to the District Court of Appeal or the seeking of Circuit Court review of final agency action by the District on the permit application. There are, however, exceptions to the exhaustion requirement. The applicant is advised to consult the case law as to the requirements of exhaustion exceptions.

LIMITING CONDITIONS

1. THE PERMITTEE SHALL PROSECUTE THE WORK AUTHORIZED IN A MANNER SO AS TO MINIMIZE ANY ADVERSE IMPACT OF THE WORKS ON FISH, WILDLIFE, NATURAL ENVIRONMENTAL VALUES, AND WATER QUALITY. THE PERMITTEE SHALL INSTITUTE NECESSARY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING FULL COMPACTION OF ANY FILL MATERIAL PLACED AROUND NEWLY INSTALLED STRUCTURES, TO REDUCE EROSION, TURBIDITY, NUTRIENT LOADING AND SEDIMENTATION IN THE RECEIVING WATERS.

2. WATER QUALITY DATA FOR THE WATER DISCHARGED FROM THE PERMITTEE'S PROPERTY OR INTO SURFACE WATERS OF THE STATE SHALL BE SUBMITTED TO THE DISTRICT AS REQUIRED. PARAMETERS TO BE MONITORED MAY INCLUDE THOSE LISTED IN CHAPTER 17-3. IF WATER QUALITY DATA IS REQUIRED, THE PERMITTEE SHALL PROVIDE DATA AS REQUIRED, ON VOLUMES OF WATER DISCHARGED, INCLUDING TOTAL VOLUME DISCHARGED DURING THE DAYS OF SAMPLING AND TOTAL MONTHLY DISCHARGES FROM THE PROPERTY OR INTO SURFACE WATERS OF THE STATE.

3. THE PERMITTEE SHALL COMPLY WITH ALL APPLICABLE LOCAL SUBDIVISION REGULATIONS AND OTHER LOCAL REQUIREMENTS. IN ADDITION THE PERMITTEE SHALL OBTAIN ALL NECESSARY FEDERAL, STATE, LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE START OF ANY CONSTRUCTION OR ALTERATION OF WORKS AUTHORIZED BY THIS PERMIT.

4. THE OPERATION PHASE OF THIS PERMIT SHALL NOT BECOME EFFECTIVE UNTIL A FLORIDA REGISTERED PROFESSIONAL ENGINEER CERTIFIES THAT ALL FACILITIES HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE DESIGN APPROVED BY THE DISTRICT. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL SUBMIT THE CERTIFICATION AND NOTIFY THE DISTRICT THAT THE FACILITIES ARE READY FOR INSPECTION AND APPROVAL. UPON APPROVAL OF THE COMPLETED SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL REQUEST TRANSFER OF THE PERMIT TO THE RESPONSIBLE ENTITY APPROVED BY THE DISTRICT.

5. ALL ROADS SHALL BE SET AT OR ABOVE ELEVATIONS REQUIRED BY THE APPLICABLE LOCAL GOVERNMENT FLOOD CRITERIA.

6. ALL BUILDING FLOORS SHALL BE SET AT OR ABOVE ELEVATIONS ACCEPTABLE TO THE APPLICABLE LOCAL GOVERNMENT.

7. OFF-SITE DISCHARGES DURING CONSTRUCTION AND DEVELOPMENT SHALL BE MADE ONLY THROUGH THE FACILITIES AUTHORIZED BY THIS PERMIT. NO ROADWAY OR BUILDING CONSTRUCTION SHALL COMMENCE ON-SITE UNTIL COMPLETION OF THE PERMITTED DISCHARGE STRUCTURE AND DETENTION AREAS. WATER DISCHARGED FROM THE PROJECT SHALL BE THROUGH STRUCTURES HAVING A MECHANISM SUITABLE FOR REGULATING UPSTREAM WATER STAGES. STAGES MAY BE SUBJECT TO OPERATING SCHEDULES SATISFACTORY TO THE DISTRICT.

8. NO CONSTRUCTION AUTHORIZED HEREIN SHALL COMMENCE UNTIL A RESPONSIBLE ENTITY ACCEPTABLE TO THE DISTRICT HAS BEEN ESTABLISHED AND HAS AGREED TO OPERATE AND MAINTAIN THE SYSTEM. THE ENTITY MUST BE PROVIDED WITH SUFFICIENT OWNERSHIP SO THAT IT HAS CONTROL OVER ALL WATER MANAGEMENT FACILITIES AUTHORIZED HEREIN. UPON RECEIPT OF WRITTEN EVIDENCE OF THE SATISFACTION OF THIS CONDITION, THE DISTRICT WILL ISSUE AN AUTHORIZATION TO COMMENCE CONSTRUCTION.

9. THE PERMIT DOES NOT CONVEY TO THE PERMITTEE ANY PROPERTY RIGHT NOR ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4, FAC.

10. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, OPERATION, MAINTENANCE OR USE OF ANY FACILITY AUTHORIZED BY THE PERMIT.

11. THIS PERMIT IS ISSUED BASED ON THE APPLICANT'S SUBMITTED INFORMATION WHICH REASONABLY DEMONSTRATES THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS WILL NOT BE CAUSED BY THE COMPLETED PERMIT ACTIVITY. IT IS ALSO THE RESPONSIBILITY OF THE PERMITTEE TO INSURE THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS DO NOT OCCUR DURING CONSTRUCTION.

12. PRIOR TO DEWATERING, PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR APPROVAL. INFORMATION SHALL INCLUDE AS A MINIMUM: PUMP SIZES, LOCATIONS AND HOURS OF OPERATION FOR EACH PUMP. IF OFF-SITE DISCHARGE IS PROPOSED, OR OFF-SITE ADVERSE IMPACTS ARE EVIDENT, AN INDIVIDUAL WATER USE PERMIT MAY BE REQUIRED. THE PERMITTEE IS CAUTIONED THAT SEVERAL MONTHS MAY BE REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION.

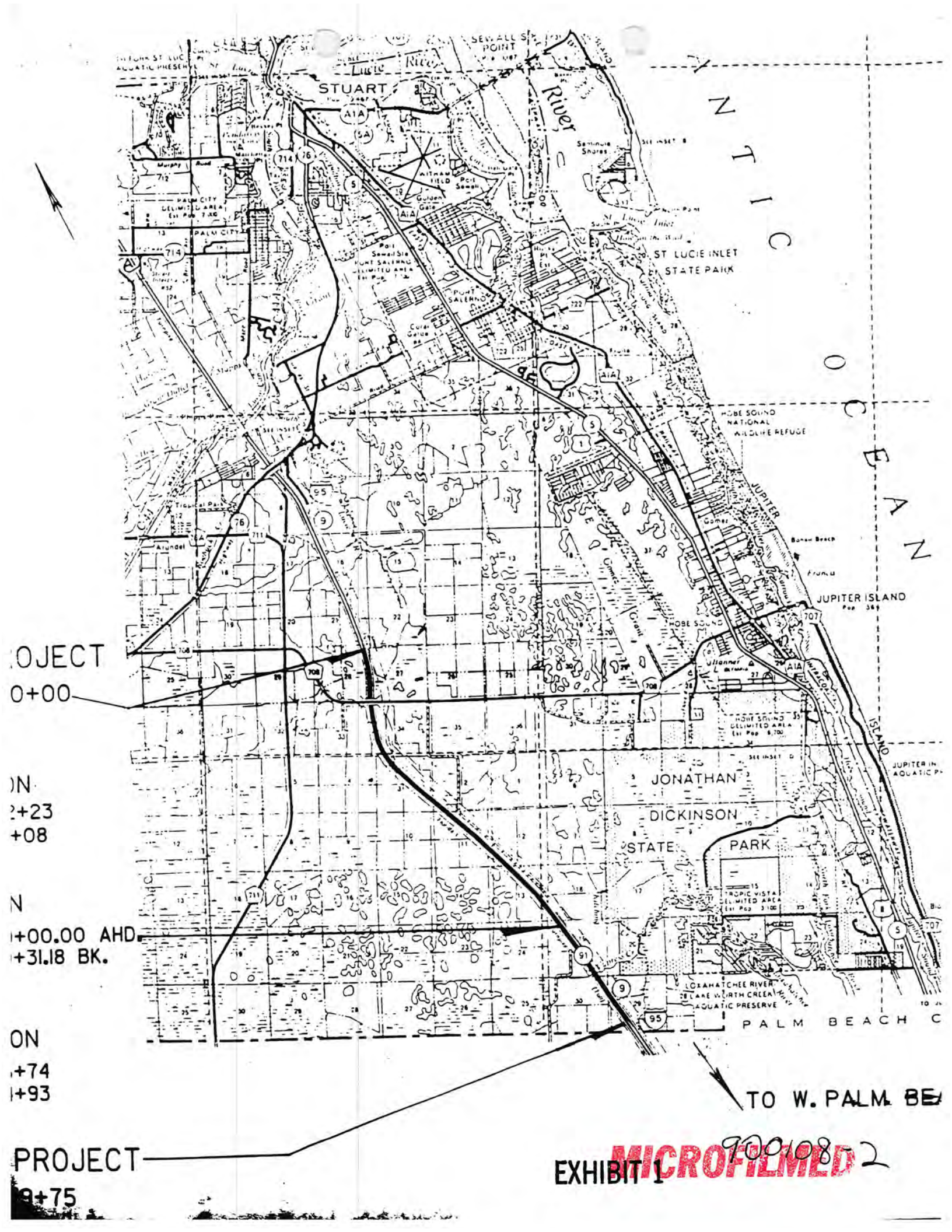


EXHIBIT 1

GENERAL PERMIT DISTRIBUTION LIST

PROJECT: FL Turnpike Median Barrier & Paving **APPLICATION NUMBER:** 900108-2

INTERNAL DISTRIBUTION

X Reviewer: JM Hiscock

X S. Anderson
W. Arnold
X S. Bradow
D. Breckenbridge/Miami
X B. Colavecchio
X M. Cruz
K. Dickson
A. Deister
JM Hiscock
J. Jackson
X P. Millar
J. Morgan
C. Pemble
X P. Rhoads
M. Slayton
X D. Slyfield
J. Show
W. Stimmel
J. Strutzel
D. Thatcher
P. Walker
X K. Wallace
E. Yaun
X Area Engineer
X Day File
X Enforcement
X Field Representative
X Permit File

GOVERNING BOARD MEMBERS

Ms. Valerie Boyd
Mr. Arsenio Milian

EXTERNAL DISTRIBUTION

X Applicant:
FL Dept of Transportation

X Applicant's Consultant:
Adair and Brady, Inc.

X Engineer, County of:
Martin

Engineer, City of:

Local Drainage District:

EXTERNAL DISTRIBUTION CONT'D

DEPT. OF ENVIRONMENTAL REGULATION:

Ft. Myers
Orlando
Port St. Lucie
Tallahassee
X West Palm Beach

BUILDING AND ZONING

Boca Raton
Boynton Beach
Royal Palm Beach
Tequesta
West Palm Beach

COUNTY

Broward	-BCEQCB
	-Dir., Water Mgmt. Div.
Dade	-DERM
Lee	-D.O.T.
	-Long Range Planning
	-Mosquito Control
X Martin	-Community Development Dir
Orange	-Env Protection Agency
	-Public Utilities
Palm Beach	-Building Dept.
	-Environmental Res. Mgmt.
	-Land Development Division
	-School Brd., Growth Mgt.
	-LWDD
Polk	-Water Resources Dept.
St. Lucie	-Planning Division

OTHER

Sierra Club
Central Florida Group
X Post, Buckley, Schuh & Jernigan, Inc.

EXHIBIT 2

ADAIR & BRADY, INC.
Consulting Engineers
Land Surveyors Land Planners

1958 South Congress Avenue
West Palm Beach, FL. 33406
407/964-1221

900 South Federal Hwy., Suite 310
Stuart, Florida 34994
407/287-1560 & 746-2874

SUBJECT TURNPIKE (MARTIN CO.) DRAINAGE CALCULATIONS

BY P.L. DATE 12/14/89 CK.

W.O. SHEET 1 OF

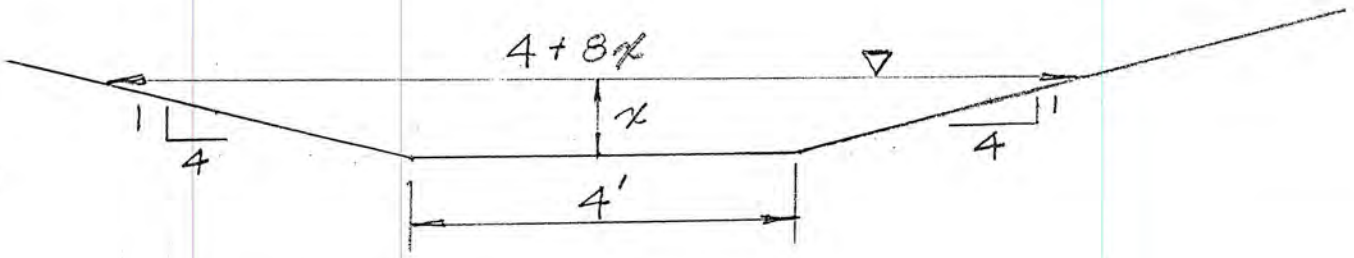
WATER QUALITY:

SOUTH FLORIDA WATER MANAGEMENT DISTRICT WILL ACCEPT 2½" TIMES THE NEW PAVEMENT WIDTH. ALSO, ALL TREATMENT WILL BE PROVIDED ON ONE SIDE.

$$\left\{\begin{matrix}\text{CROSS SECTIONAL AREA} \\ \text{FOR PRETREATMENT}\end{matrix}\right\} = \frac{2.5''}{12''} \times 20' \quad \text{(NEW PAVEMENT)}$$

$$= \underline{4.17 \text{ sq. ft.}}$$

PROPOSED SWALE IS 4' AT THE BOTTOM WITH 4:1 SIDE SLOPES.



$$\text{AREA} = \left[\frac{\text{Bottom} + \text{Top}}{2}\right] * x$$

$$4.17 = \left[\frac{4 + (4 + 8x)}{2}\right] x$$

$$4.17 = 4x + 4x^2$$

$$4x^2 + 4x - 4.17 = 0$$

MICROFILMED 12/15/89

ADAIR & BRADY, INC.
Consulting Engineers
Land Surveyors Land Planners

1958 South Congress Avenue
West Palm Beach, FL. 33406
407/964-1221

900 South Federal Hwy., Suite 310
Stuart, Florida 34994
407/287-1560 & 746-2874

SUBJECT Turnpike (Martin Co.)
Drainage Calculations

BY P.L. DATE 12/14/89 CK.
W.O. SHEET 2 OF

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-4 \pm \sqrt{16 + 66.72}}{8}$$

$$= \frac{-4 \pm 9.09}{8}$$

$$X = 0.64'$$

TO PREVENT EROSION OVER THE BERM TO THE CANAL, PROVIDE INLETS FOR DISCHARGING TO THE CANAL.

MAXIMUM SPACING OF INLETS:
ASSUME 2500 FT. MAX.

AVERAGE WIDTH 80', 42' IMPERVIOUS

$Q = CIA$; 20 MIN., 10 YEAR STORM EVENT

WHERE $C = 0.5$
$A = 80 \times 2500 / 43560 = 4.59$ AC
$I = 6''$
$Q = (0.5)(4.59)(6) = 13.77$ CFS

CHECK FREEBOARD AT INLET:
ASSUME TYPE "C" INLET
FLOW INTO INLET IS THE SAME AS A 10.67' WEIR
$(3' + 3' + (2'-4'') + (2'-4'')) = 10'-8'' = 10.67'$

$Q = CLH^{1.5}$
$13.77 = (3.13)(10.67) H^{1.5}$
$H^{1.5} = 0.41$
$H = \sqrt[3]{0.41^2} = 0.55$ FT + 0.64 = 1.19'

DEPTH OF SWALE 2.0' > 1.19'

ADAIR & BRADY, INC.
Consulting Engineers
Land Surveyors Land Planners

1958 South Congress Avenue
West Palm Beach, FL. 33406
407/964-1221

900 South Federal Hwy., Suite 310
Stuart, Florida 34994
407/287-1560 & 746-2874

SUBJECT TURNPIKE (MARTIN CO.) DRAINAGE CALCULATIONS

BY P.L. DATE 12/14/89 CK.

W.O. SHEET 3 OF

CHECK VELOCITY:

MAXIMUM VELOCITY = 1/2 VELOCITY AT INLET

$Q = VA$

$Q = 13.77 \text{ CFS}/2 = 6.88 \text{ C.F.S.}$

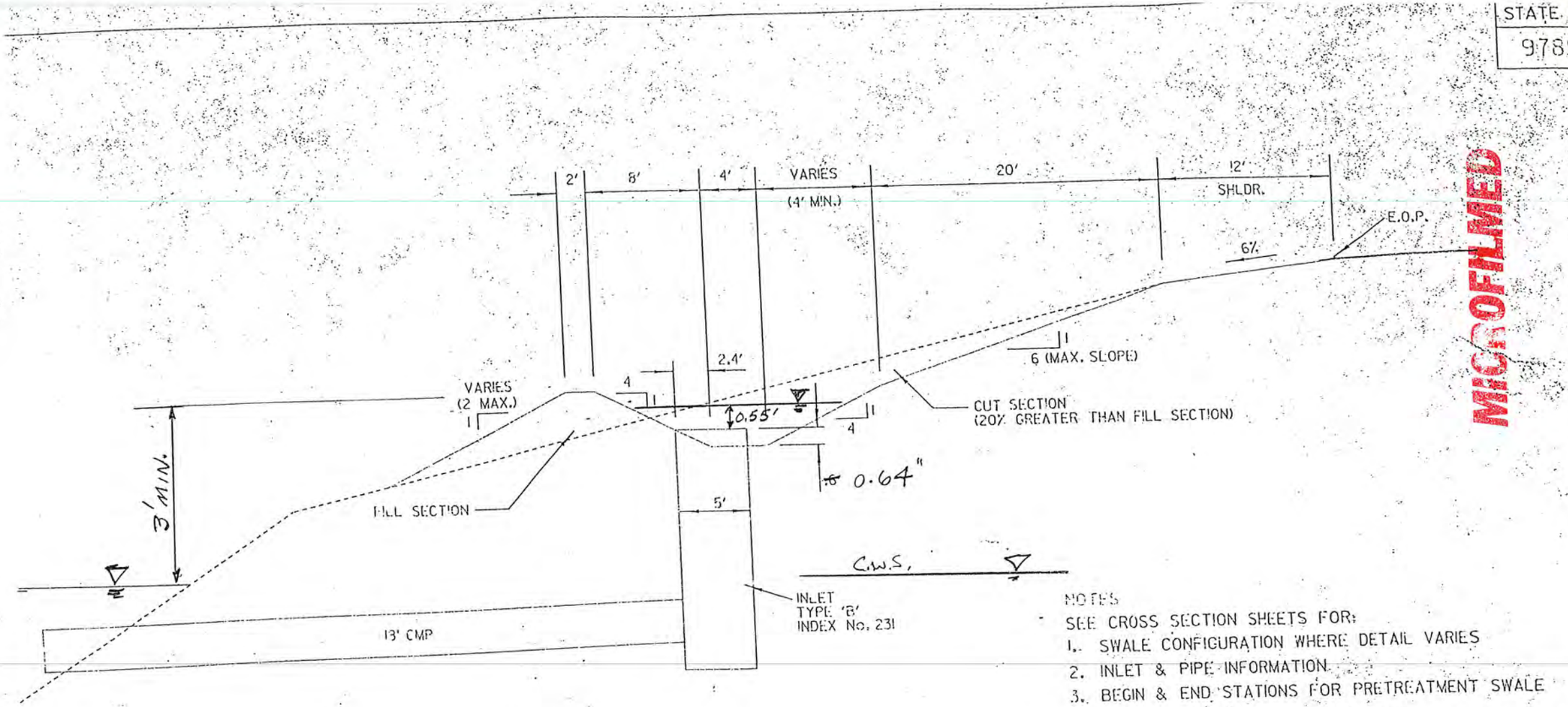
$$\text{AREA} = 0.55' \left[\frac{(9.12') + (13.52')}{2}\right] = 6.23 \text{ ft}^2$$

$$\frac{Q}{A} = V$$

$$V = \frac{6.88 \text{ ft}^3/\text{sec}}{6.23 \text{ ft}^2} = 1.10 \text{ ft/sec.} < 2.0 \text{ ft/sec ok}$$

12/15/89

STATE I
97890



NOTES
SEE CROSS SECTION SHEETS FOR:
1. SWALE CONFIGURATION WHERE DETAIL VARIES
2. INLET & PIPE INFORMATION
3. BEGIN & END STATIONS FOR PRETREATMENT SWALE

PRETREATMENT SWALE DETAIL

N.T.S.

1"-0"

FLORIDA'S TURNPIKE MEDIAN PAVEMENT AND BARRIER WALL

Project Description

The project will involve the replacement of the existing guardrail with a concrete barrier wall and paved median from mile post 117 to mile post 137 (See plans for omitted areas).

Affected Facilities Analysis
The Existing Drainage Canal will be used to receive the additional runoff caused by paving the median. A pretreatment of 2.5" x the new pavement width will be achieved by a pretreatment swale. The drainage structures will be elevated above the swale bottom to allow water to percolate into the soil. When the water level reaches the inlet elevation the inlet acts as a weir. The water flows through 18" pipes to the existing drainage canal on the west side of the highway (See detail in plans).

NO WETLANDS WILL BE DISTURBED, FILLED, EXCAVATED, OR OTHERWISE AFFECTED.

NO MITIGATION IS PROPOSED FOR THIS PROJECT.

DRAINAGE BASINS

MARTIN COUNTY
FLORIDA

PREPARED BY THE
PHOTOGRAMMETRIC DIVISION
FOR THE
TRAFFIC AND PLANNING DIVISION
FLORIDA STATE ROAD DEPARTMENT
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS

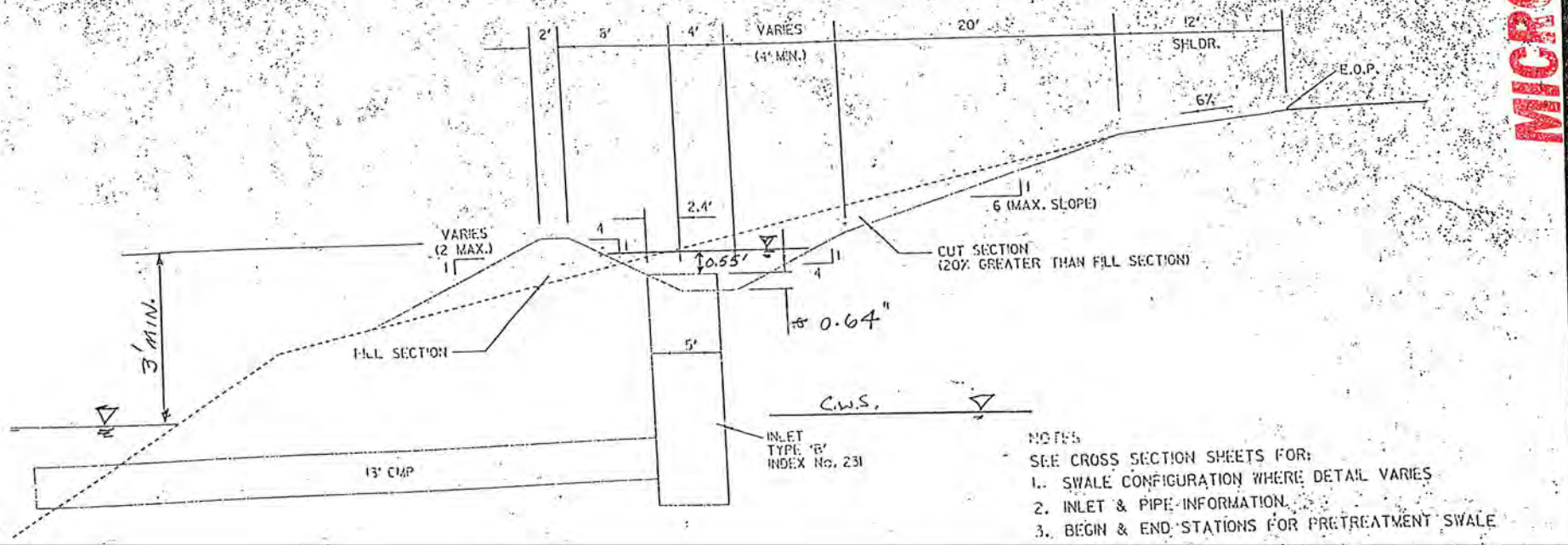
SCALE

SCALE FOR INSETS

JANUARY, 1968

GRID NORTH AT TRIANGULATION STATION ALLEN IS 0°30'W EAST OF TRUE NORTH
MAGNETIC NORTH IN JUNE 1968 IS APPROXIMATELY 4°30'W WEST OF TRUE NORTH

STATE PRO
97890



NOTES
SEE CROSS SECTION SHEETS FOR:
1. SWALE CONFIGURATION WHERE DETAIL VARIES
2. INLET & PIPE INFORMATION.
3. BEGIN & END STATIONS FOR PRETREATMENT SWALE

PRETREATMENT SWALE DETAIL

N.T.S.

1"-0"

ADAM & BRADY, INC.

Consulting Engineers
Land Surveyors *Land Planners*

1958 South Congress Avenue
West Palm Beach, FL. 33406
407/964-1221

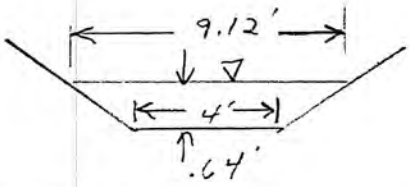
900 South Federal Hwy., Suite 310
Stuart, Florida 34994
407/287-1560 & 746-2874

SUBJECT FLORIDA TURNPIKE - Martin County
Permit No. 900 108-2

BY DRO DATE 9/17/90 CK. ____
W.O. ____ SHEET 1 OF ____

ENRON GAS PIPELINE OPERATING CO. REQUESTED DELETEING 275' OF PRETREATMENT SWALE TO PREVENT THE REQUIREMENT OF LOWERING THE MAIN AT THE CROSSOVER OF THE TURNPIKE.

REMOVE SWALE BETWEEN STA 3810+50 TO 3813+25 = 275'



VOLUME DELETED = $\frac{9.12+4}{2} \times .64 \times 275 = 1,155$ C.F.

S.F.W.M.D. HAS REQUESTED THE VOLUME BE ADDED TO THE REMAINING SWALE AREA

ORIGINAL TRENCH LENGTH 2,000

REMAINING TRENCH FROM 3813+25 TO 3824+00 = 1075 FT

VOLUME ADDED PER FOOT OF TRENCH $\frac{1,155 \text{ C.F.}}{1,075 \text{ FT}}$

$= 1.07$ C.F./FT

RAISE INLET TO ACCOMMODATE ADDITIONAL VOLUME

$\frac{1.07 \text{ SQ.FT}}{9.12 \text{ FT}} = .12$ FT.

Steve B Carrier 12-12-90

INLET S-3
STA 3818+00

FLORIDA DEPARTMENT OF TRANSPORTATION
BOB MARTINEZ
GOVERNOR
605 Suwannee Street, Tallahassee, Florida 32399-0450, Telephone (904) 488-8541
KAYE N. HENDERSON
SECRETARY

December 27, 1989

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. Box V
3301 Gun Club Road
W. Palm Beach, FL 33416

RE: FLORIDA'S TURNPIKE
SR 91
MEDIAN BARRIER WALL & PAVED SHOULDER PROJECTS
M.P. 117 to M.P. 137
W.P.I. No. 4156428 & 4156429
STATE PROJECT No. 97890-3327 & 97890-3328
MARTIN COUNTY

Dear Sir:

The Florida Turnpike is utilizing the firm of Post Buckley, Schuh and Jernigan as our General Consultant and for Project Management. This letter is to authorize them to act as our agent in securing the permits necessary to construct the referenced Turnpike Project.

If you have any questions, please call me at 904/488-4671 or Suncom 278-4671.

Sincerely,

Raymond A. Ashe Jr.
Turnpike Environmental Administrator

cc: Phenix Palmer
Ed Schureck
Beth Baxter

MEETINGS W/ SFWMD STAFF

MEMORANDUM

TO: File, Steve Carrier, John Adair

FROM: Douglas D. O'Laughlin DDO

DATE: December 12, 1989

RE: SP #97890-3327 & 97890-3328
BI NUMBERS 4156428 & 4156429
FLORIDA'S TURNPIKE - RESURFACING AND
PLACEMENT OF MEDIAN BARRIER
MEETING WITH SFWMD, EDUARDO LOPEZ, MARK DARON
M.P. 117 TO M.P. 137, MARTIN COUNTY
ADAIR & BRADY PROJECT NO. 89-073A&B

- -

Met with above to discuss the proposed pretreatment swale. I indicated that the swale would be on the west side on tangent sections only, that there was not enough area available in the curves. Also indicated from the aerials that existing vegetation would be removed to construct the berm. Mr. Daron ask the approximate cost to construct. Our best guess is in access of one million dollars.

Mr. Daron and Mr. Lopez stated that the proposed plan would be acceptable, but that maybe a more economical mitigation plan could be worked out. They will meet with their supervisors and respond back before the end of the week.

I informed Ken Holladay, he instructed us to submit application package immediately.

DDO/jw

ADAIR & BRADY, INC.

MEMORANDUM

TO: File

FROM: Dennis J. Thomas, Adair & Brady, Inc.

DATE: October 31, 1989

RE: SP #97890-3327 & 97890-3328
BI NUMBERS 4156428 & 4156429
FLORIDA'S TURNPIKE MEDIAN BARRIER, SHOULDER PAVING AND RESURFACING, MARTIN COUNTY
M.P. 117 TO M.P. 137
ADAIR & BRADY PROJECT NO. 89-073A&B

A meeting was held on October 31, 1989 at South Florida Water Management District offices to address permit requirements for the subject project. The following were in attendance:

Jay Marshall, SFWMD Water Quality
Doug O'Laughlin, A&B
Dennis Thomas, A&B

During the meeting Mr. Marshall consulted with Ms. Jenny Hiscock to seek direction/concurrence on certain issues.

Mr. Marshall informed A&B that this project could be permitted under an "Engineer-Certified General Permit" which requires a letter, signed and sealed plans and calculations demonstrating that water quality requirements have been met. The following requirements will apply to the project:

- Detaining 2.5" of rainfall over the newly constructed impervious area (20 foot wide median)
- All the water quality may be applied to one side of the roadway
- Existing median inlets with side drains do not have to be adjusted
- Percolation rates of proposed swale access to be obtained
- Use of existing canals for detention is not permissible, since they do not meet the minimum 100 foot width requirement.

Achieving the water quality may be accomplished by excavating a shallow swale on the roadside grassed areas, or constructing a short berm at the existing top of bank. Hopefully, the percolation rates will be adequate to provide for bleed down of detained volumes. Design storm volumes will drain to the existing canals over the existing berm with or without control devices, as necessary to prevent erosion. To determine the control water surface elevation of adjacent canals (if available) we should contact Debbie Thompson at SFWMD Right-of-Way Section.

It was suggested that to expedite the permitting process we should prepare the typical section, cross sections and supporting calculations and submit as soon as possible. Mr. Marshall stated that if we submit a package conforming to the discussions held and documented here, he would expedite processing of the permit.

DJT/jw

cc: Jay Marshall
Doug O'Laughlin
John Adair
Ken Holladay
Beth Baxter

APPENDIX F

GEOTECHNICAL DOCUMENTATION

GEOTECHNICAL TECHNICAL MEMORANDUM

September 5, 2024

Lochner, Inc.
4300 West Cypress Street, Suite 500
Tampa, FL 33607

Attn: Mr. Bill Howell, P.E.

RE: Geotechnical Technical Memorandum – CRAVE Submittal
PD&E I-95 Direct Connect
Martin County Florida
FPID: 446975-1-22-01
Tierra Project No. 6511-22-149

Mr. Howell:

Tierra, Inc. (Tierra) has reviewed published soil information from the USDA Soil Survey of Martin County, as-built information at the subject site, and borings we have completed in the general project vicinity. Below are our general geotechnical considerations for the soil conditions at the interchange site. It is important to note, Tierra has not performed any site-specific soil borings at the interchange site.

Roadway

Based on a review of the USDA Soils Survey, the near-surface subsurface conditions are anticipated to consist predominantly of sandy soils within the top 7 feet with occasional plastic soils at depths of 3 to 4 feet below natural grades. Organic soils are not indicated in the USDA Soil Survey but low-lying areas that are ponded have the potential to contain surficial organics.

The pre-development (natural) seasonal high groundwater table (SHGWT) levels are reported to be within 1.5 feet of the natural ground surface and some soil units with natural above grade SHGWT.

Bridge Structures

Based on our knowledge of the area and borings in the vicinity, the subsurface conditions will likely consist of sandy soils with varying amounts of shell and silt and varying density to depths of approximately 100 feet below existing grade. The foundation systems for new bridge structures are anticipated to consist of pre-stressed concrete piles. The piles will be driven to achieve the required nominal bearing resistances and likely pile tip levels are estimated at depths of approximately 80 feet below existing grade.

Tierra appreciates the opportunity to provide our services to H.W. Lochner, Inc (Lochner) and the Florida's Turnpike Enterprise (FTE) on this project.

Respectfully Submitted,

TIERRA, INC.

Marc E. Novak, P.E.
Senior Geotechnical Engineer
Florida License No. 67431

TIERRA, Inc.
7351 Temple Terrace Highway • Tampa, Florida 33637
Phone (813) 989-1354 • Fax (813) 989-1355

CUSTOM NRCS SOIL REPORT FOR MARTIN COUNTY

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Martin County, Florida

May 29, 2025

Preface

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

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

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

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

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

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

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

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

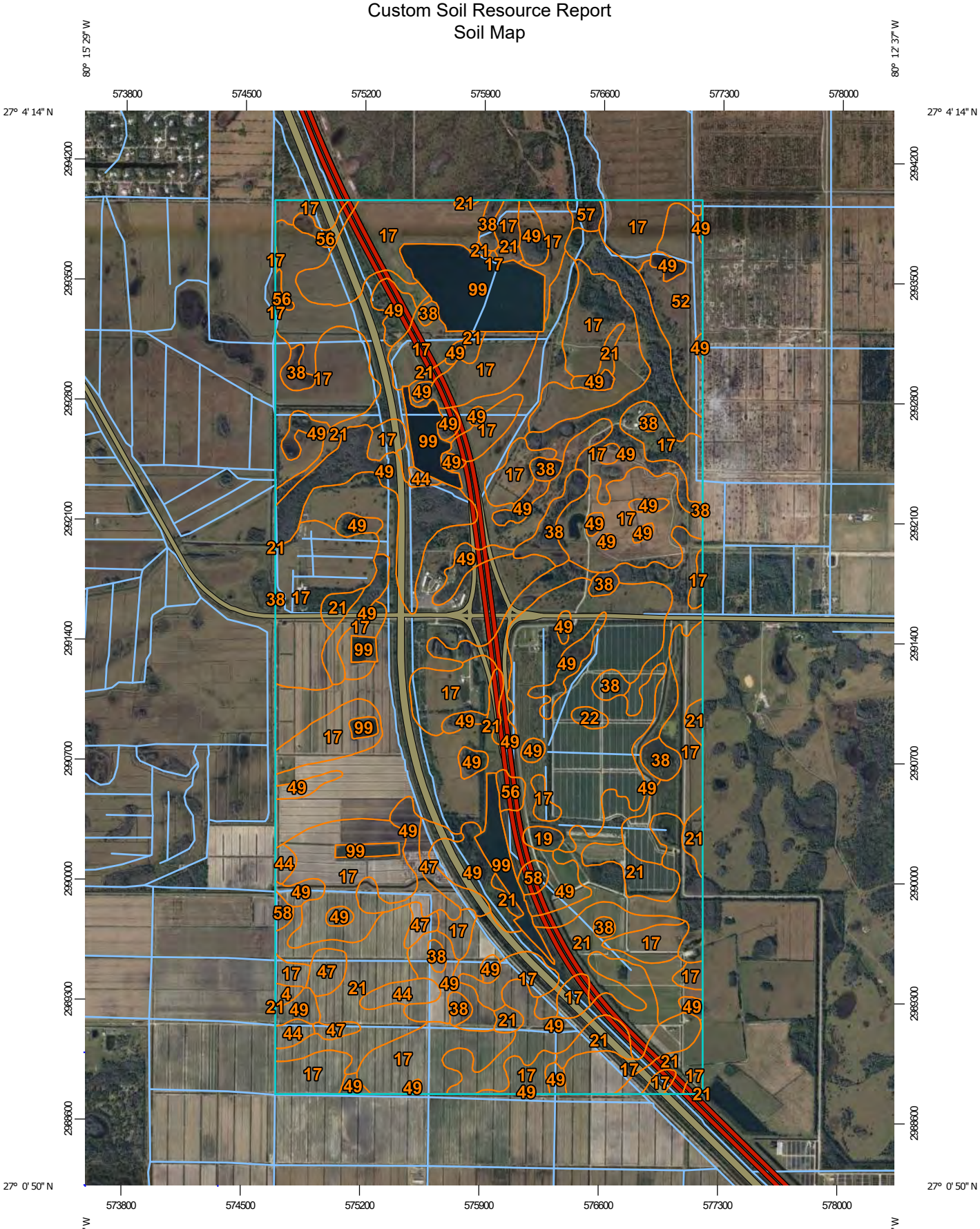
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:30,600 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 450 900 1800 2700

Feet
0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

Soil Survey Area: Martin County, Florida
Survey Area Data: Version 23, Aug 21, 2024

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

Date(s) aerial images were photographed: Mar 7, 2019—Jan 30, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Waveland and Immokalee fine sands	3.6	0.1%
17	Wabasso sand, 0 to 2 percent slopes	1,069.7	33.0%
19	Winder sand, frequently ponded, 0 to 1 percent slopes	6.7	0.2%
21	Pineda-Riviera fine sands association, 0 to 2 percent slopes	1,057.3	32.6%
22	Okeelanta muck, frequently ponded, 0 to 1 percent slopes	4.9	0.2%
38	Floridana fine sand, frequently ponded, 0 to 1 percent slopes	76.9	2.4%
44	Cypress Lake fine sand, 0 to 2 percent slopes	29.2	0.9%
47	Pinellas fine sand, 0 to 2 percent slopes	42.7	1.3%
49	Riviera fine sand, frequently ponded, 0 to 1 percent slopes	708.7	21.9%
52	Malabar fine sand, high, 0 to 2 percent slopes	62.2	1.9%
56	Wabasso and Oldsmar fine sands, depressional	19.4	0.6%
57	Chobee muck, frequently ponded, 0 to 1 percent slopes	7.7	0.2%
58	Gator and Tequesta mucks	10.7	0.3%
99	Water	142.3	4.4%
Totals for Area of Interest		**3,242.1**	**100.0%**

Map Unit Descriptions

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

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

including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

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

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

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

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

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

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

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

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

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

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

Martin County, Florida

4—Waveland and Immokalee fine sands

Map Unit Setting

National map unit symbol: 1jq7n
Elevation: 0 to 80 feet
Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Waveland and similar soils: 41 percent
Immokalee and similar soils: 39 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Waveland

Setting

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

Typical profile

A - 0 to 4 inches: fine sand
Eg - 4 to 43 inches: fine sand
Bh1 - 43 to 47 inches: fine sand
Bh2 - 47 to 77 inches: loamy fine sand
Cg1 - 77 to 91 inches: fine sand
Cg2 - 91 to 99 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 30 to 50 inches to ortstein
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R156BY003FL)
Hydric soil rating: No

Description of Immokalee

Setting

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

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 35 inches: fine sand
Bh - 35 to 54 inches: fine sand
BC - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R156BY003FL)
Hydric soil rating: No

Minor Components

Lawnwood

Percent of map unit: 4 percent
Landform: Marine terraces on flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R156BY003FL)

Hydric soil rating: No

Basinger

Percent of map unit: 4 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), Slough (R156BY011FL)
Hydric soil rating: Yes

Nettles

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R156BY003FL)
Hydric soil rating: No

Salerno

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R156BY003FL)
Hydric soil rating: No

Jonathan

Percent of map unit: 3 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G156BC121FL), South Florida Flatwoods (R156BY003FL)
Hydric soil rating: No

Placid

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL)

Hydric soil rating: Yes

17—Wabasso sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svyr
Elevation: 0 to 70 feet
Mean annual precipitation: 46 to 55 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 355 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Wabasso

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: sand
E - 6 to 25 inches: sand
Bh - 25 to 30 inches: sand
Btg - 30 to 58 inches: sandy clay loam
Cg - 58 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 50 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Minor Components

Brynwood

Percent of map unit: 6 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Cypress lake

Percent of map unit: 5 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Pineda

Percent of map unit: 4 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

19—Winder sand, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2x9f9

Elevation: 0 to 80 feet
Mean annual precipitation: 45 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 355 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Winder

Setting

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

Typical profile

A - 0 to 3 inches: sand
E - 3 to 13 inches: sand
Btg/E - 13 to 35 inches: sandy clay loam
Btg - 35 to 71 inches: sandy loam
Ckg - 71 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Forage suitability group: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G155XB345FL)
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G155XB345FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Felda

Percent of map unit: 5 percent
Landform: Depressions on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Pineda

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Hydric soil rating: Yes

Copeland

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G155XB345FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Wabasso

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Brynwood

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Gator

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

21—Pineda-Riviera fine sands association, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2x9fy
Elevation: 0 to 40 feet
Mean annual precipitation: 46 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 360 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Pineda and similar soils: 45 percent
Riviera and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pineda

Setting

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

Typical profile

A - 0 to 1 inches: fine sand
E - 1 to 5 inches: fine sand
Bw - 5 to 36 inches: fine sand
Btg/E - 36 to 54 inches: fine sandy loam
Cg - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Description of Riviera

Setting

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

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 28 inches: fine sand
Bt/E - 28 to 36 inches: fine sandy loam
Btg - 36 to 42 inches: sandy clay loam
C - 42 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Malabar

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Oldsmar

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pinellas

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Cabbage Palm Flatwoods (R155XY005FL)
Hydric soil rating: No

Cypress lake

Percent of map unit: 3 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps

Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Basinger
Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

22—Okeelanta muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting
National map unit symbol: 2tzw8
Elevation: 0 to 160 feet
Mean annual precipitation: 41 to 63 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition
Okeelanta and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Okeelanta

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

Typical profile
Oa - 0 to 31 inches: muck
Cg - 31 to 80 inches: fine sand

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very high (about 14.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Minor Components

Lauderhill

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Terra ceia

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Placid

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Floridana

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Pompano

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Tequesta

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL), Freshwater Marshes and Ponds (R156BY010FL)
Hydric soil rating: Yes

38—Floridana fine sand, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2sm53
Elevation: 0 to 90 feet
Mean annual precipitation: 42 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Floridana and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Floridana

Setting

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

Typical profile

A - 0 to 19 inches: fine sand
Eg - 19 to 25 inches: fine sand
Btg - 25 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Tequesta

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL), Freshwater Marshes and Ponds (R156BY010FL)
Hydric soil rating: Yes

Anclote

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Riviera

Percent of map unit: 3 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Gator

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

44—Cypress Lake fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zldq
Elevation: 0 to 40 feet

Mean annual precipitation: 55 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 355 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Cypress lake, nonhydric, and similar soils: 70 percent
Cypress lake, hydric, and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cypress Lake, Nonhydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits over limestone over sandy marine deposits

Typical profile

A - 0 to 7 inches: fine sand
E - 7 to 25 inches: fine sand
Btg - 25 to 32 inches: fine sandy loam
2R - 32 to 40 inches: bedrock
3C1 - 40 to 50 inches: fine sand
3C2 - 50 to 81 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 58 inches to lithic bedrock
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 6.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL), South Florida Flatwoods (R156BY003FL)
Hydric soil rating: No

Description of Cypress Lake, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Sandy and loamy marine deposits over limestone over sandy marine deposits

Typical profile

A - 0 to 7 inches: fine sand
E - 7 to 25 inches: fine sand
Btg - 25 to 32 inches: fine sandy loam
2R - 32 to 40 inches: bedrock
3C1 - 40 to 50 inches: fine sand
3C2 - 50 to 81 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 58 inches to lithic bedrock
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 6.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL), South Florida Flatwoods (R156BY003FL)
Hydric soil rating: Yes

Minor Components

Brynwood

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Pineda

Percent of map unit: 3 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Pinellas

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Cabbage Palm Flatwoods (R155XY005FL)
Hydric soil rating: No

Riviera

Percent of map unit: 3 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Wabasso

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

47—Pinellas fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzw0
Elevation: 0 to 80 feet

Mean annual precipitation: 45 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Pinellas

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 18 inches: fine sand
Bk - 18 to 34 inches: fine sand
Btkg - 34 to 46 inches: fine sandy loam
2Ckg - 46 to 80 inches: paragravelly fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Cabbage Palm Flatwoods (R155XY005FL)
Hydric soil rating: No

Minor Components

Riviera

Percent of map unit: 6 percent
Landform: Flats on marine terraces, drainageways on marine terraces

Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Cypress lake

Percent of map unit: 3 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Brynwood

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Holopaw

Percent of map unit: 2 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Wabasso

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

49—Riviera fine sand, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzwl
Elevation: 0 to 80 feet
Mean annual precipitation: 44 to 64 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Riviera

Setting

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

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 36 inches: fine sand
Bt/E - 36 to 42 inches: fine sandy loam
Cg1 - 42 to 56 inches: fine sand
Cg2 - 56 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D

Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Hydric soil rating: Yes

Minor Components

Chobee

Percent of map unit: 7 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Loamy and clayey soils on stream terraces, flood plains, or in depressions (G156BC345FL)
Hydric soil rating: Yes

Tequesta

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL), Freshwater Marshes and Ponds (R156BY010FL)
Hydric soil rating: Yes

Wabasso

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

52—Malabar fine sand, high, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svz4
Elevation: 0 to 80 feet
Mean annual precipitation: 42 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 355 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Malabar, High

Setting

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

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 17 inches: fine sand
Bw - 17 to 42 inches: fine sand
Bt - 42 to 59 inches: fine sandy loam
Cg - 59 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Minor Components

Oldsmar
Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pineda
Percent of map unit: 4 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Felda
Percent of map unit: 4 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

Basinger
Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

56—Wabasso and Oldsmar fine sands, depressional

Map Unit Setting

National map unit symbol: 1jq96
Elevation: 0 to 60 feet
Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Wabasso and similar soils: 45 percent
Oldsmar and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wabasso

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 31 inches: fine sand
Bh - 31 to 35 inches: fine sand
Bt - 35 to 43 inches: sandy clay loam
Cg - 43 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: C/D
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL)
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL)
Hydric soil rating: Yes

Description of Oldsmar

Setting
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy and loamy marine deposits

Typical profile
A - 0 to 12 inches: fine sand
E - 12 to 34 inches: fine sand
Bh - 34 to 52 inches: fine sand
Bt - 52 to 68 inches: fine sandy loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL)
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL)
Hydric soil rating: Yes

Minor Components

Floridana
Percent of map unit: 4 percent
Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Sandy over loamy soils on stream terraces, flood plains, or in depressions (G156BC245FL)
Hydric soil rating: Yes

Riviera

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Sandy over loamy soils on stream terraces, flood plains, or in depressions (G156BC245FL)
Hydric soil rating: Yes

Tequesta

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Organic soils in depressions and on flood plains (G156BC645FL)
Hydric soil rating: Yes

Winder

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Loamy and clayey soils on stream terraces, flood plains, or in depressions (G156BC345FL)
Hydric soil rating: Yes

57—Chobee muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzwg
Elevation: 0 to 130 feet
Mean annual precipitation: 43 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Chobee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chobee

Setting

Landform: Depressions on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loamy alluvium

Typical profile

Oa - 0 to 4 inches: muck
A - 4 to 16 inches: loamy sand
Btg1 - 16 to 28 inches: fine sandy loam
Btg2 - 28 to 42 inches: sandy clay loam
Btg3 - 42 to 53 inches: fine sandy loam
Cg - 53 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R156BY021FL - Mineral Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Minor Components

Riviera
Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R156BY021FL - Mineral Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Hydric soil rating: Yes

Gator
Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R156BY020FL - Histisol Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Tequesta
Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R156BY021FL - Mineral Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL), Freshwater Marshes and Ponds (R156BY010FL)
Hydric soil rating: Yes

58—Gator and Tequesta mucks

Map Unit Setting
National map unit symbol: 1jq98
Elevation: 0 to 60 feet

Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Gator and similar soils: 50 percent
Tequesta and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gator

Setting

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

Typical profile

Oa - 0 to 24 inches: muck
Cg1 - 24 to 48 inches: fine sandy loam
Cg2 - 48 to 56 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 11.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G156BC645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Organic soils in depressions and on flood plains (G156BC645FL)
Hydric soil rating: Yes

Description of Tequesta

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip

Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Stratified sandy and loamy marine deposits

Typical profile

Oa - 0 to 14 inches: muck
A - 14 to 26 inches: sand
Eg - 26 to 30 inches: sand
Btg - 30 to 40 inches: sandy clay loam
B/C - 40 to 48 inches: loamy sand
Cg - 48 to 64 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G156BC645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Organic soils in depressions and on flood plains (G156BC645FL)
Hydric soil rating: Yes

Minor Components

Chobee

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Loamy and clayey soils on stream terraces, flood plains, or in depressions (G156BC345FL)
Hydric soil rating: Yes

Floridana

Percent of map unit: 5 percent
Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Sandy over loamy soils on stream terraces, flood plains, or in depressions (G156BC245FL)
Hydric soil rating: Yes

99—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G156BC999FL)
Other vegetative classification: Forage suitability group not assigned (G156BC999FL)
Hydric soil rating: Unranked

Soil Information for All Uses

Soil Properties and Qualities

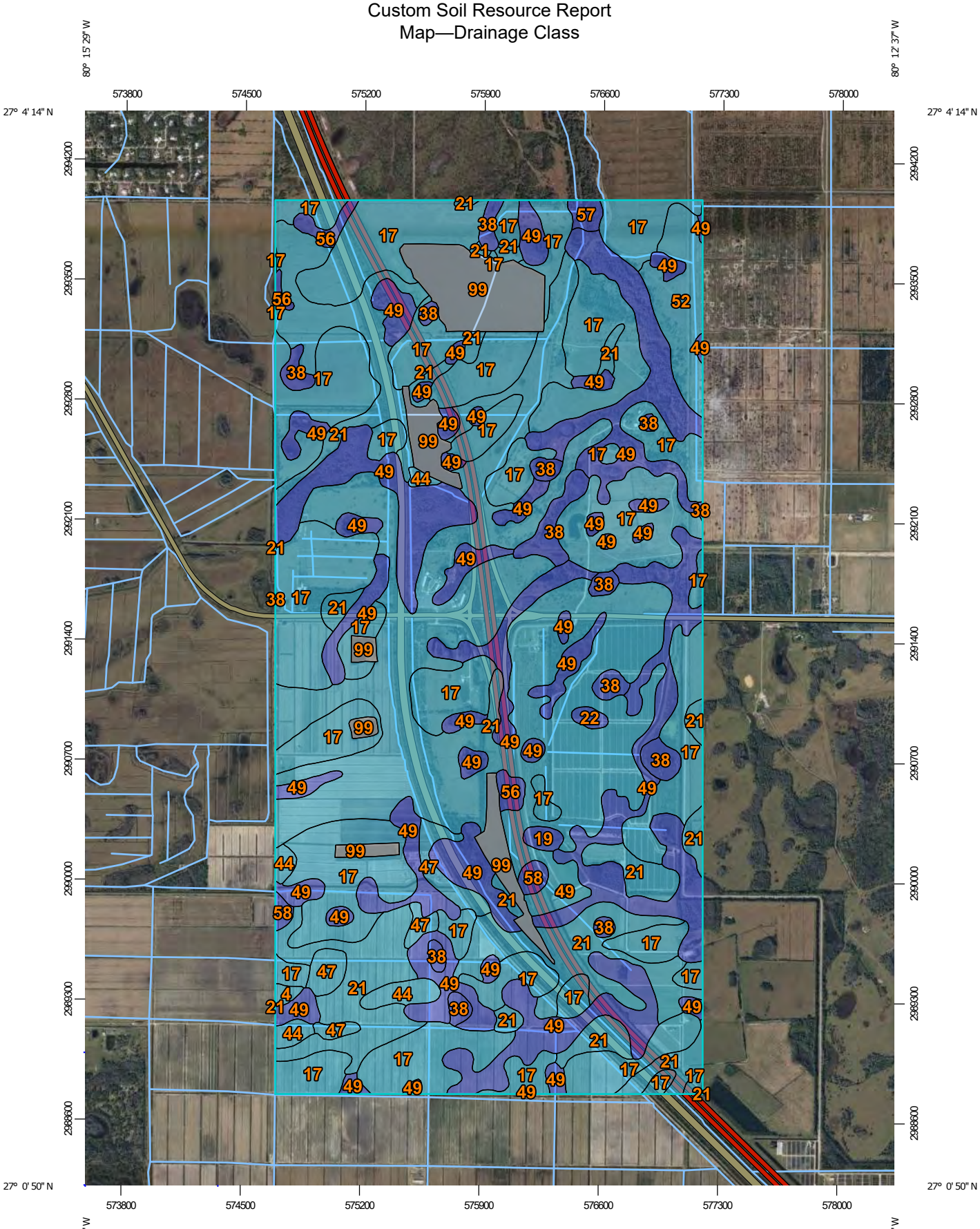
The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Drainage Class

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."



Map Scale: 1:30,600 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 450 900 1800 2700

Feet
0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Lines

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Points

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

Soil Survey Area: Martin County, Florida
Survey Area Data: Version 23, Aug 21, 2024

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

Date(s) aerial images were photographed: Mar 7, 2019—Jan 30, 2022

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

Table—Drainage Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
4	Waveland and Immokalee fine sands	Poorly drained	3.6	0.1%
17	Wabasso sand, 0 to 2 percent slopes	Poorly drained	1,069.7	33.0%
19	Winder sand, frequently ponded, 0 to 1 percent slopes	Very poorly drained	6.7	0.2%
21	Pineda-Riviera fine sands association, 0 to 2 percent slopes	Poorly drained	1,057.3	32.6%
22	Okeelanta muck, frequently ponded, 0 to 1 percent slopes	Very poorly drained	4.9	0.2%
38	Floridana fine sand, frequently ponded, 0 to 1 percent slopes	Very poorly drained	76.9	2.4%
44	Cypress Lake fine sand, 0 to 2 percent slopes	Poorly drained	29.2	0.9%
47	Pinellas fine sand, 0 to 2 percent slopes	Poorly drained	42.7	1.3%
49	Riviera fine sand, frequently ponded, 0 to 1 percent slopes	Very poorly drained	708.7	21.9%
52	Malabar fine sand, high, 0 to 2 percent slopes	Poorly drained	62.2	1.9%
56	Wabasso and Oldsmar fine sands, depressional	Very poorly drained	19.4	0.6%
57	Chobee muck, frequently ponded, 0 to 1 percent slopes	Very poorly drained	7.7	0.2%
58	Gator and Tequesta mucks	Very poorly drained	10.7	0.3%
99	Water		142.3	4.4%
Totals for Area of Interest			**3,242.1**	**100.0%**

Rating Options—Drainage Class

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group

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

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

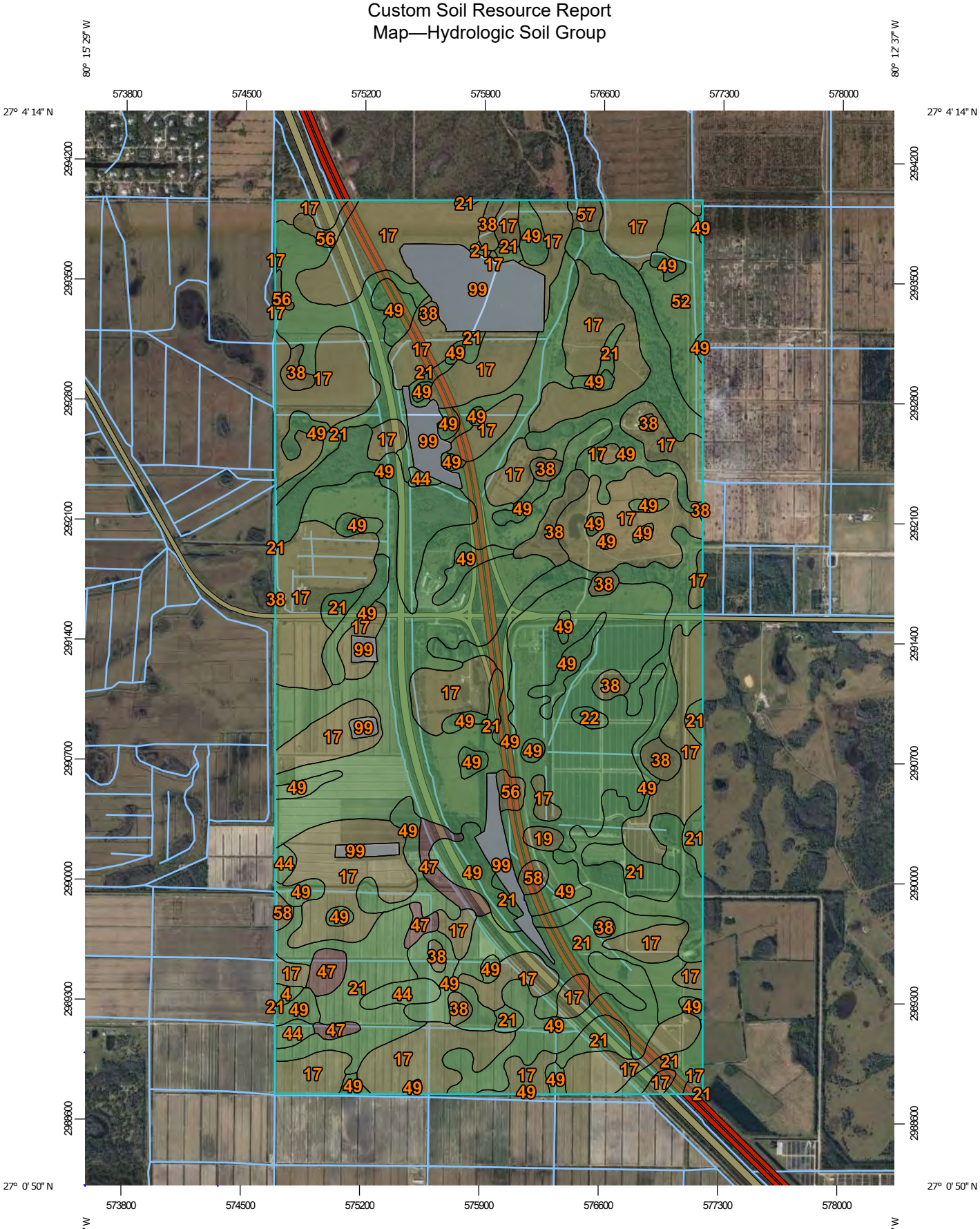
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.



Map Scale: 1:30,600 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 450 900 1800 2700

Feet
0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

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

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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Date(s) aerial images were photographed: Mar 7, 2019—Jan 30, 2022

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Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
4	Waveland and Immokalee fine sands	A/D	3.6	0.1%
17	Wabasso sand, 0 to 2 percent slopes	C/D	1,069.7	33.0%
19	Winder sand, frequently ponded, 0 to 1 percent slopes	C/D	6.7	0.2%
21	Pineda-Riviera fine sands association, 0 to 2 percent slopes	A/D	1,057.3	32.6%
22	Okeelanta muck, frequently ponded, 0 to 1 percent slopes	A/D	4.9	0.2%
38	Floridana fine sand, frequently ponded, 0 to 1 percent slopes	C/D	76.9	2.4%
44	Cypress Lake fine sand, 0 to 2 percent slopes	A/D	29.2	0.9%
47	Pinellas fine sand, 0 to 2 percent slopes	B/D	42.7	1.3%
49	Riviera fine sand, frequently ponded, 0 to 1 percent slopes	A/D	708.7	21.9%
52	Malabar fine sand, high, 0 to 2 percent slopes	A/D	62.2	1.9%
56	Wabasso and Oldsmar fine sands, depressional	C/D	19.4	0.6%
57	Chobee muck, frequently ponded, 0 to 1 percent slopes	C/D	7.7	0.2%
58	Gator and Tequesta mucks	C/D	10.7	0.3%
99	Water		142.3	4.4%
Totals for Area of Interest			**3,242.1**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Features

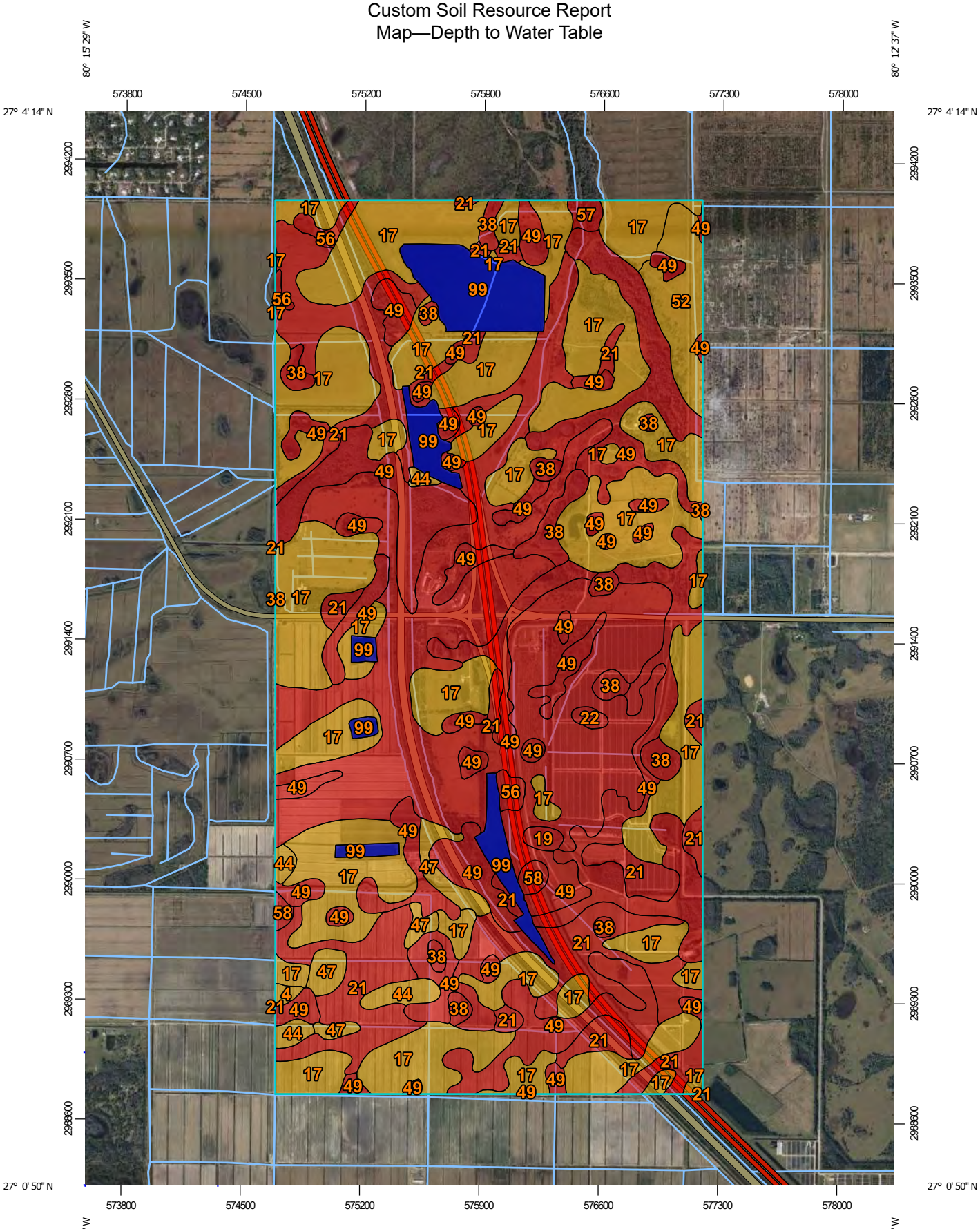
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Map—Depth to Water Table



Map Scale: 1:30,600 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 450 900 1800 2700

Feet
0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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Table—Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
4	Waveland and Immokalee fine sands	31	3.6	0.1%
17	Wabasso sand, 0 to 2 percent slopes	31	1,069.7	33.0%
19	Winder sand, frequently ponded, 0 to 1 percent slopes	0	6.7	0.2%
21	Pineda-Riviera fine sands association, 0 to 2 percent slopes	0	1,057.3	32.6%
22	Okeelanta muck, frequently ponded, 0 to 1 percent slopes	0	4.9	0.2%
38	Floridana fine sand, frequently ponded, 0 to 1 percent slopes	0	76.9	2.4%
44	Cypress Lake fine sand, 0 to 2 percent slopes	30	29.2	0.9%
47	Pinellas fine sand, 0 to 2 percent slopes	30	42.7	1.3%
49	Riviera fine sand, frequently ponded, 0 to 1 percent slopes	0	708.7	21.9%
52	Malabar fine sand, high, 0 to 2 percent slopes	30	62.2	1.9%
56	Wabasso and Oldsmar fine sands, depressional	0	19.4	0.6%
57	Chobee muck, frequently ponded, 0 to 1 percent slopes	0	7.7	0.2%
58	Gator and Tequesta mucks	0	10.7	0.3%
99	Water	>200	142.3	4.4%
Totals for Area of Interest			**3,242.1**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

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