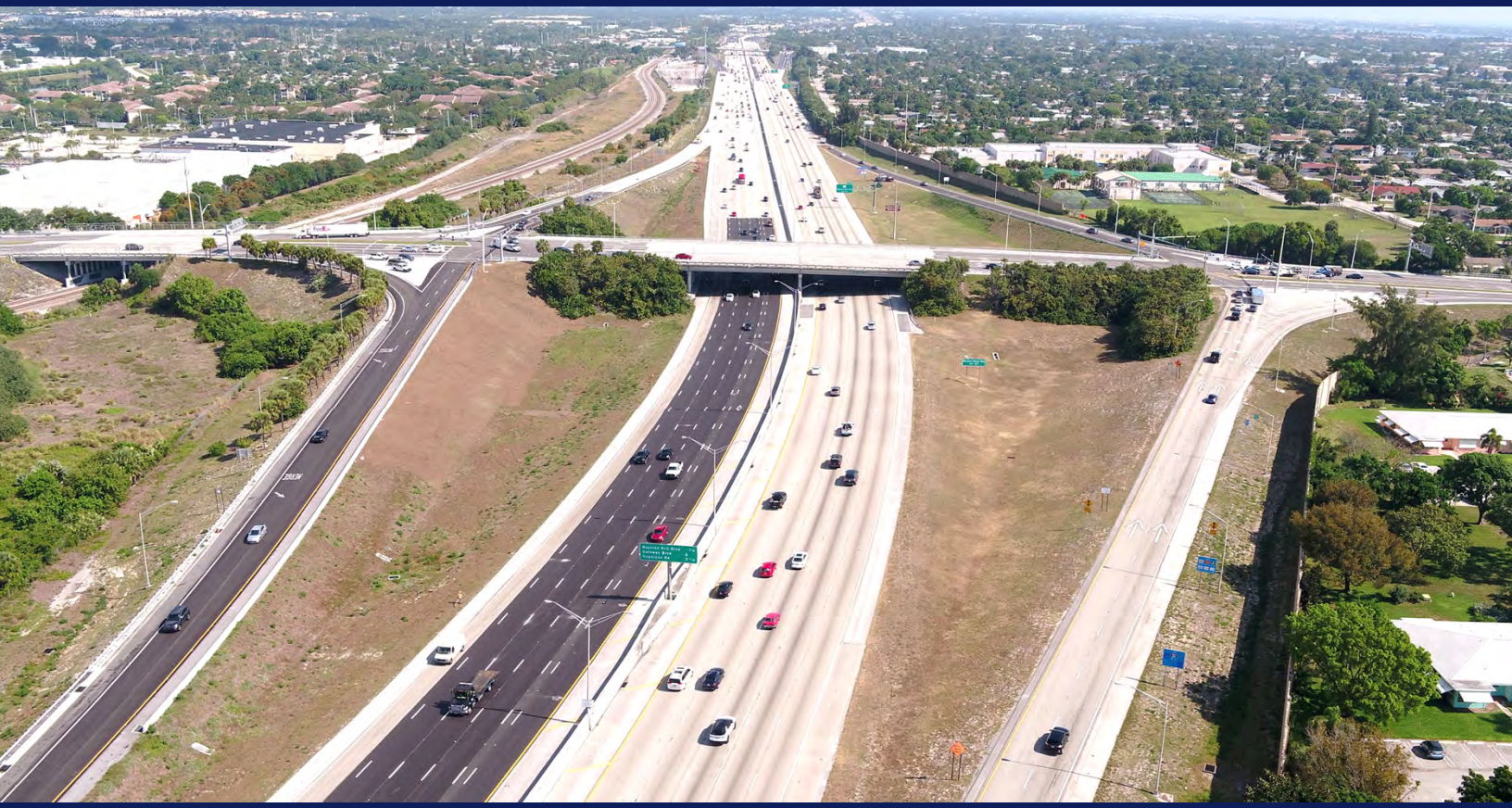
SR 9/I-95 Project Development and Environment (PD&E) Study from S. of Woolbright Road to N. of Woolbright Road Palm Beach County, Florida

FPID No.: 437279-1-22-02 | ETDM No.: 14341



CONCEPTUAL DRAINAGE REPORT

October 2020

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FHWA and FDOT.

Concept Drainage Report

SR 9/I-95 Project Development and Environment Study
From S. of Woolbright Road to N. of Woolbright Road
Boynton Beach, Palm Beach County, Florida
(From Mile Post 13.560 to Mile Post 13.995)

FPID: 437279-1-22-02
ETDM No.: 14341

Prepared for:

Florida Department of Transportation
District Four
3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

Prepared by:

Hanson Professional Services Inc.

October 2020

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1. SUMMARY OF PROJECT

1.1. Project Description

This report contains information regarding the SR 9/I-95 (I-95) from South of Woolbright Road to North of Woolbright Road Project Development and Environment (PD&E) Study (Mile Post 13.560 to Mile Post 13.995). This project has been developed in compliance with Title VI of the Civil Rights Act of 1964 and other related federal and state nondiscrimination authorities. Neither the Florida Department of Transportation (FDOT) nor this project will deny the benefits of, exclude from participation in, or subject to discrimination anyone on the basis of race, color, national origin, age, sex, disability, or family status.

The FDOT, District Four is conducting a PD&E Study to identify long-term needs of I-95 and develop design concepts to address traffic spillback onto I-95, reduce congestion at the I-95 and Woolbright Road interchange, improve interchange operations, and improve safety at the study interchange through the 2045 design year horizon. This study will also consider Strategic Intermodal System (SIS) connector improvements needed within the project area and is consistent with plans for the I-95 mainline, including the potential extension of I-95 Managed Lanes through Palm Beach County. This proposed study will investigate alternatives to improve the overall operating conditions and enhance safety within the interchange.

The improvements to the I-95 Interchange at Woolbright Road will provide additional capacity for vehicles travelling east-west as well as operational improvements north-south through the interchange. Local and network connectivity for the City of Boynton Beach will be improved.

The Interchange of I-95 at Woolbright Road is located in Palm Beach County in the City of Boynton Beach. The project limits along I-95 extend from just south of Woolbright Road at SW 23rd Avenue to just north of Woolbright Road about 2,000-ft north of the interchange. The project limits along Woolbright Road extend from the SW 18th Street on the west to just east of I-95 at SW 2nd Street. The project area includes the signalized intersections at SW 8th Street, and the I-95 southbound and northbound ramps. The South Florida Rail Corridor (SFRC)/CSX Railroad is adjacent to the project corridor and runs parallel along the west side of I-95. Tri-Rail operates along this rail corridor, with the nearest station; Boynton Beach Tri-Rail Station located 2.68 miles to the north of Woolbright Road, just north of the Gateway Boulevard interchange. (**Figure 1** – *Project Location Map*).

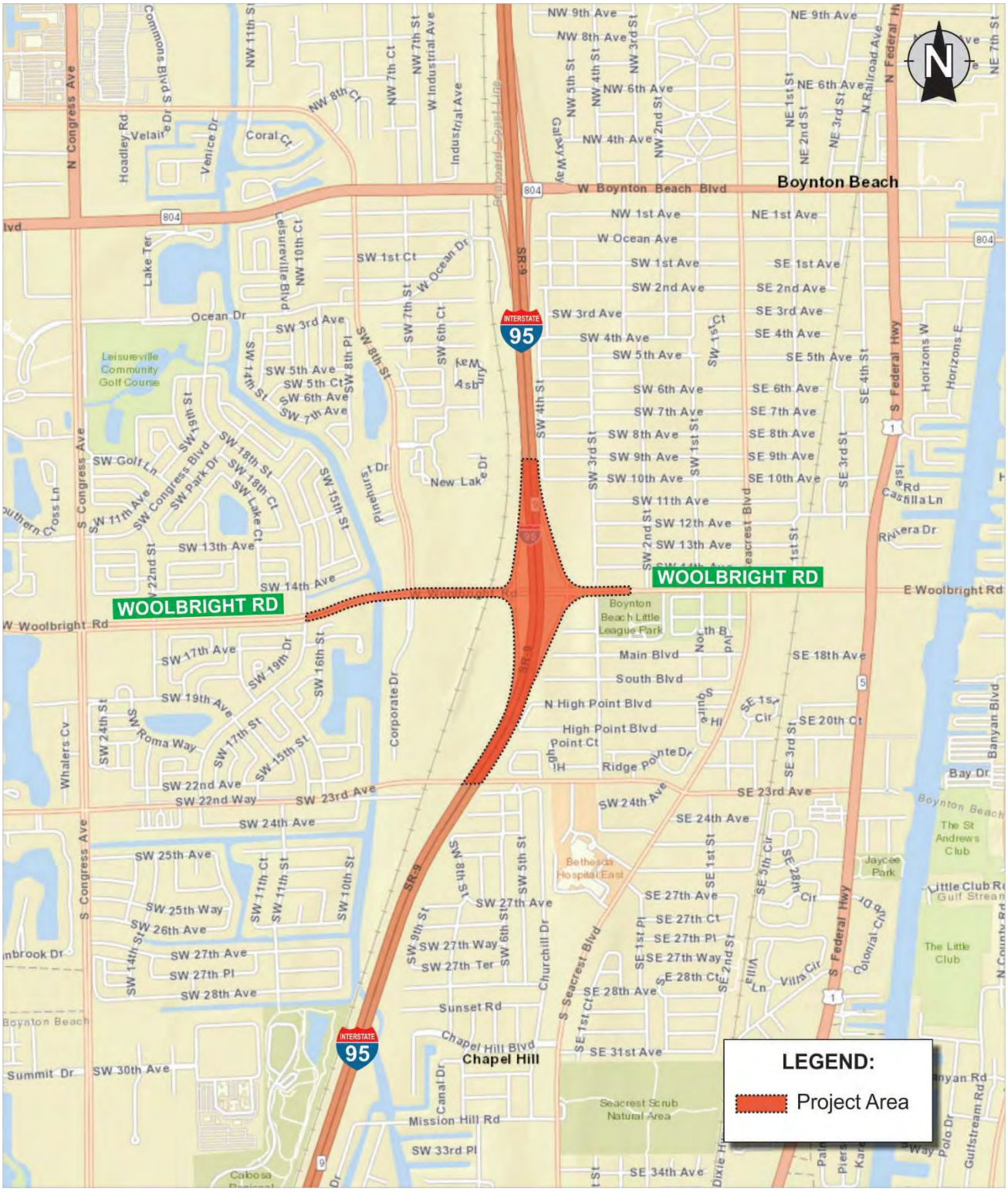


Figure 1 – Project Location Map

Within the project limits, I-95 is a ten-lane divided interstate freeway providing four general purpose lanes and one high occupancy vehicle (HOV) lane in each direction. The project will be designed to complement the I-95 interim interchange design-build project recently completed, which constructed one additional left-turn lane onto I-95 in both the eastbound and westbound directions; a free-flow right-turn lane from the southbound off-ramp; and designated bicycle lanes along Woolbright Road within the limits of the interchange.

Woolbright Road is currently a six-lane urban divided minor arterial to the west of I-95 and a four-lane urban divided minor arterial to the east of I-95. There is a raised median from SW 18th Street west of I-95 to just west of SW 2nd Street east of I-95. At SW 2nd Street, Woolbright Road transitions to a five-lane roadway section with a two-way left-turn lane in the middle. There are sidewalks on both sides of Woolbright Road throughout the project area and designated bicycle lanes within the limits of the interchange.

The land use adjacent to the interchange is zoned as Public Usage, Single Family, Duplex, Neighborhood Commercial, and Light Industrial. The area southeast of the interchange is zoned Recreation, Multi Family, Public Usage, and Planned Unit Development. Zoning northwest of the interchange consists of Planned Commercial Development, Planned Unit Development, Light Industrial, Office Professional, Neighborhood Commercial, and Single Family, and southwest of the interchange is zoned Community Commercial, Office Professional, Planned Industrial Development, and Single Family.

Improvement to the I-95 interchange at Woolbright Road is consistent with the Cost Feasible Plan of the Palm Beach County Transportation Planning Agency (TPA's) 2045 Long Range Transportation Plan (LRTP). "The purpose is to improve interchange operations and reduce congestion, reduce potential for traffic spillback onto I-95, and increase safety. The improvements are needed to ensure that the I-95 interchange will meet FDOT Level-of-Service standards through year 2045."

This project has been screened through the Efficient Transportation Decision Making (ETDM) process. The Advance Notification (AN) was distributed during the programing screening event, which occurred on October 23, 2017. The Program Screen Summary Report was re-published on May 3, 2018 and can be viewed under the ETDM # 14341.

1.2. Background

The FDOT made improvements to the I-95 mainline in Palm Beach County in the 1990s and 2000s, adding High Occupancy Vehicle (HOV) lanes and auxiliary lanes from south of Linton Boulevard to north of PGA Boulevard.

Minor interchange improvements were also made to eight of the existing 18 interchanges along this section of the corridor. At the time of the project, FDOT committed to re-examine the need for long-term improvements at those interchanges that were not improved during the I-95 mainline project. FDOT District Four also identified the need to re-examine the 2003 I-95 Master Plan Study for Palm Beach County to develop new improvements to interchanges based on changes in traffic volumes and updated design standards since the Master Plan was developed.

A Concept Development Report (CDR) was prepared by the FDOT District Four Office of Planning and Environmental Management in August of 2014. The following are the recommendations identified for short-term improvements that have been recently completed as part of the Design-Build project:

- One additional left-turn lane onto I-95 in both the eastbound and westbound directions;
- A free-flow right-turn lane from the southbound off-ramp; and
- Designated bicycle lanes along Woolbright Road within the limits of the interchange.

1.3. Purpose and Need

The purpose of this study is to identify long-term needs of I-95 and develop concepts to address traffic spillback onto I-95, reduce congestion on I-95 and Woolbright Road, improve interchange operations, and improve safety at the I-95 and Woolbright Road interchange through the 2045 design year horizon. This project will also consider SIS connector improvements needed within the project area and will be consistent with plans for the I-95 mainline, including the potential extension of I-95 managed lanes through Palm Beach County.

Additional considerations for the purpose and need for this project are further described in the following sections that include System Linkage, Capacity, Transportation Demand, Social Demands/Economic Development, Modal Interrelationships, and Safety.

System Linkage: I-95 is a part of the state's Strategic Intermodal System (SIS) and the National Highway System (NHS). A need exists to ensure that I-95 continues to meet the minimum requirements as a component of those two systems. The project is not proposing to change system linkage; however, the interchange modifications would improve movements within the existing systems. The proposed project at I-95 and Woolbright Road will help improve connectivity and capacity within the roadway network by addressing traffic spillback onto I-95 and improving interchange connections.

Capacity: Using field review data collected in 2018, A.M. and P.M. peak conditions were observed at all intersections in the study area. At the Corporate Drive/SW 8th Street intersection, during the P.M. peak hour, all approaches experienced minimal queues, except for the westbound and eastbound directions. The westbound left-turn queue experienced spillback into the through lanes and the eastbound direction experienced long queues. During the P.M. peak hour on the I-95 southbound ramp intersection, the eastbound approach experienced long queues, but all queues cleared the intersection during each signal cycle. The southbound approach experienced significant queues, with the queue not clearing during one signal cycle. During the P.M. peak hour at the I-95 northbound ramps intersection, the eastbound approach experienced minimal queue buildup and the northbound and westbound approaches experienced long queues; however, all queues cleared the intersection in one signal cycle for all approaches.

Transportation Demand: Interchange improvements to I-95 at Woolbright Road is included in the Palm Beach County TPA's 2045 LRTP under projects funded with SIS revenues, which includes federal funds. The project is consistent with the plans for the I-95 mainline, including the extension of express lanes into Palm Beach County.

Social Demands/Economic Development: Social and economic demands on the I-95 corridor will continue to increase as population and employment increase. The Palm Beach County TPA 2040 LRTP states that the population would grow 27 percent from 1.32 million in 2010 to 1.68 million in 2040. The employment was also forecasted to grow from 571,000 to 820,000 employees in the same 30-year period for an increase of nearly 44 percent. The predicted increase in population and employment will increase congestion in the study area.

Modal Interrelationships: Currently, sidewalks and crosswalks are provided on both sides of Woolbright Road. Palm Tran Route 70 services Seacrest Boulevard both north and south of Woolbright Road east of the interchange, as well as the Boynton Beach Tri-Rail station 2.68 miles north of Woolbright Road. The project proposes to provide undesignated bicycle lanes on both sides of Woolbright Road. Capacity improvements at the interchange will enhance the mobility of people and goods by alleviating current and future congestion at the interchange and the surrounding freight and transit networks. Reduced congestion will serve to maintain and improve viable access to the major transportation facilities and businesses in the area.

Safety: The crash data for the latest available five-year period (2012 to 2016) along Woolbright Road (93220000) from SW 8 Street to S. Seacrest Boulevard was retrieved from FDOT's Crash Analysis Reporting System (CARS) on-line database and from Signal 4 Analytics database. The study corridor encompasses the I-95 Interchange.

The crash data from both databases were summarized separately for the entire corridor and for the I-95 interchange.

Overall, there was a total of 680 crashes during the 5-year period. Based on crash severity, of the 680 crashes reported, 240 (35.5%) were injury type crashes, 437 (64.3%) were property damage only crashes, and three fatal crashes were reported. Two of the fatal crashes occurred in 2012 and were classified as overturn and collision with parked vehicle type and the third fatal crash occurred in 2016 and it was classified as angle collision. There were 150 wet pavement crashes (22.1%) reported. The frequency of wet pavement crashes was constant through the 5-year analysis period. This may indicate a crash pattern of wet pavement crashes. There were 171 nighttime/dusk/dawn/dark crashes (25.1%) reported. The leading crash type was rear-end with a total of 338 crashes (49.7%) followed by sideswipe with a total of 94 crashes (13.8%). Careless driving or negligent manner was the most predominate contributing causes of these crashes. Most of the crashes (178) occurred during the morning hours (6 AM to 9 AM), which correspond to the typical morning rush period.

2. PROPOSED ALTERNATIVES

The following describes the alternatives considered for this project.

2.1 No Build Alternative

- This alternative would keep the existing interchange roadway network into the future without improvements.
- The No Build Alternative has a number of positive aspects, since it would not require expenditure of public funds for design, right-of-way acquisition, construction, or utility relocation. Traffic would not be disrupted due to construction, therefore, avoiding inconveniences to local residents and businesses. Also, there would be no direct or secondary impacts to the environment, the socio-economic characteristics, or community cohesion of the area.
- The No Build Alternative fails to fulfill the purpose and need of the project. Operational and safety conditions within the interchange area will become progressively worse as traffic volumes continue to increase, thereby increasing the number of crashes and deteriorating access of this interchange.

2.2 Alternative 1 – Tight Diamond Interchange (TDI)– Recommended Alternative

- Modify the existing Diamond Interchange by widening the existing Woolbright Road bridge over I-95 and the bridge over the South Florida Rail Corridor to accommodate one additional through lane in each direction through the interchange
- Add one additional left-turn lane (triple lefts) at the northbound and southbound I-95 off-ramp intersections
- Add one additional westbound through lane at the Corporate Drive/SW 8th Street intersection
- Add one additional left-turn lane in the eastbound and westbound direction at the Corporate Drive/SW 8th Street intersection
- Widen the existing bridge over the E-4 Canal to accommodate the additional westbound through lane and bicycle lanes
- Extend the bicycle lanes from the interchange to SW 18th Street

2.3 Alternative 2 – Diverging Diamond Interchange (DDI)

- Reconstruct the existing Diamond Interchange to a Diverging Diamond Interchange (DDI) configuration, which provides three continuous through lanes through the interchange with two free flow left-turn lanes into the I-95 on-ramps
- Add one additional westbound through lane at the Corporate Drive/SW 8th Street intersection
- Add one additional left-turn lane in the eastbound and westbound direction at the Corporate Drive/SW 8th Street intersection

- Widen the existing bridge over the E-4 Canal to accommodate the additional westbound through lane and bicycle lanes
- Extend the bicycle lanes from the interchange to SW 18th Street

2.4 Alternative 3 – Single Point Urban Interchange (SPUI)

- Reconstruct the existing Diamond Interchange to a Single Point Urban Interchange (SPUI) configuration, which provides two continuous through lanes through the interchange
- Add one additional left-turn lane (triple lefts) at the southbound I-95 off-ramp intersection
- Add one additional westbound through lane at the Corporate Drive/SW 8th Street intersection
- Add one additional left-turn lane in the eastbound and westbound direction at the Corporate Drive/SW 8th Street intersection
- Widen the existing bridge over the E-4 Canal to accommodate the additional westbound through lane and bicycle lanes
- Extend the bicycle lanes from the interchange to SW 18th Street

3. Site Information

3.1 Topography

The existing terrain is relatively flat, as expected for coastal areas of South Florida. Runoff is collected in collection systems and piped to swales and dry detention ponds within the interchange right-of-way. There are four detention ponds that are interconnected and discharged through control structures into the Lake Worth Drainage District (LWDD) E-4 (Lake Ida) Canal via roadside ditches.

3.2 Vertical Datum

All drainage design and analysis completed for and reported within this report is based on the North American Vertical Datum, 1988 (NAVD 88). The conversion from National Geodetic Vertical Datum of 1929, which some older reference documents and permits utilize, is:

NGVD -1.545ft = NAVD

3.3 Hydrologic Data

According to current National Oceanic and Atmospheric Administration (NOAA) precipitation frequency estimates, the 25-year, 72-hour rainfall total for the project area is 13.2 inches. Current permit documentation indicates that the existing systems were designed using 14 inches of rainfall for the same event, based on Volume II of the Applicants Handbook. Copies of the NOAA data are included in **Appendix A**.

3.4 Land Use Description

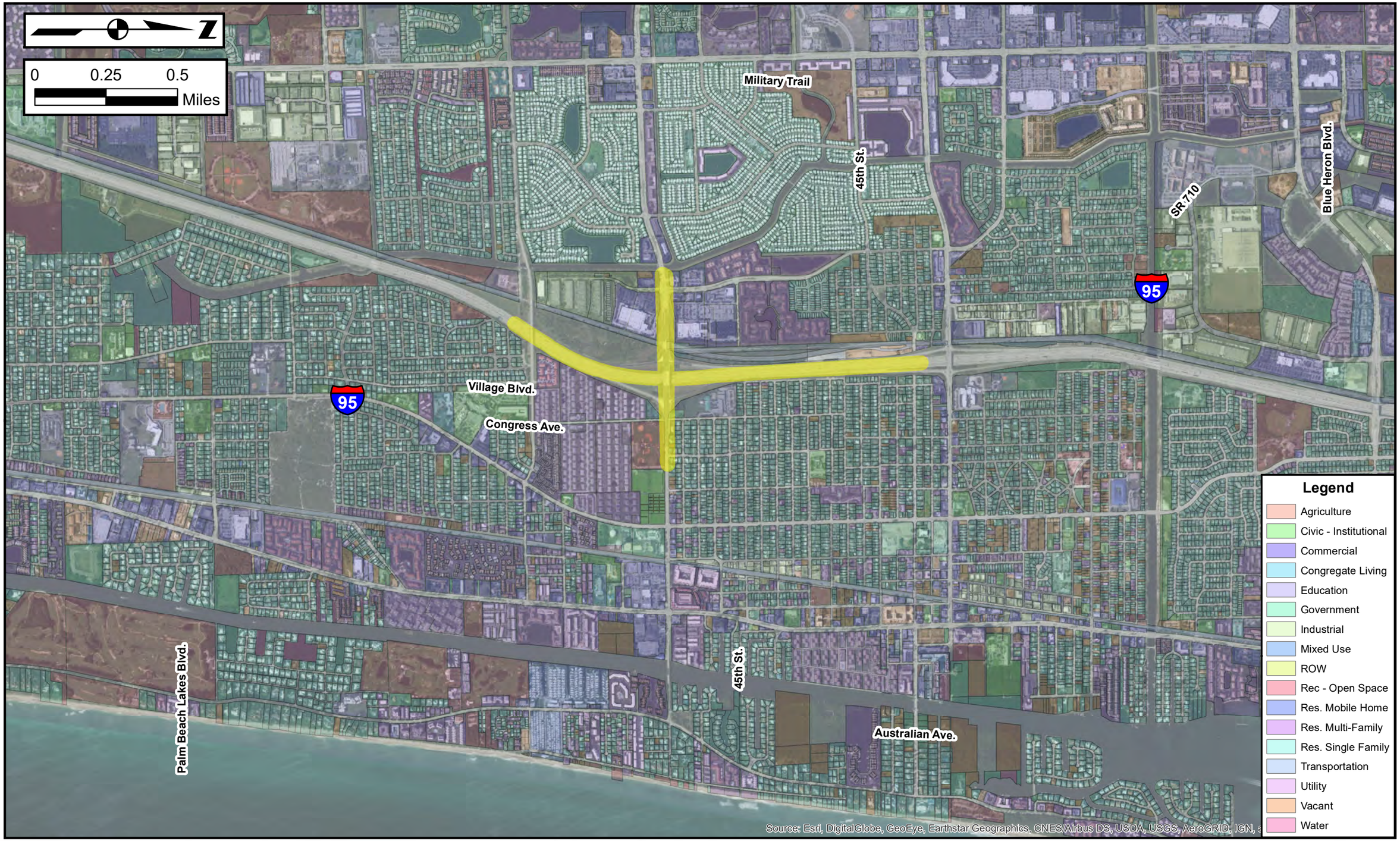
Land use adjacent to the project is highly urbanized. The surrounding area is comprised by light commercial facilities on the west, and dense residential areas to the east. An elementary school and little league park lie along the project corridor. Additionally, a dual track CSX rail line lies under the project right of way. See **Figure 2** - Current Land Use Map for a graphical representation of the land use surrounding the project.

3.5 Soils

According to the SSURGO database provided by United States Department of Agriculture's National Resource Conservation Service; soils within the project area are primarily classified as urban land complexes consisting largely of Basinger, Myakka, and Pomello type map units consisting of low slope fine sands, with some organics and muck. The majority of the soils within the project area are classified as hydrologic soil group A. A copy of the Web Soil Survey (WSS) report is included in **Appendix B,** and **Figure 3** - Soils Map presents the data graphically.

3.6 Wetland and Vegetative Cover

In compliance with the FDOT PD&E Manual, an environmental review of the project area has been completed. Based on the preliminary data, no jurisdictional wetland impacts are anticipated. Tape grass, a submerged aquatic grass, was found in some locations along the E-4 canal. If any modifications to the banks of the E-4 canal are proposed, a re-evaluation of the tape grass would be necessary.



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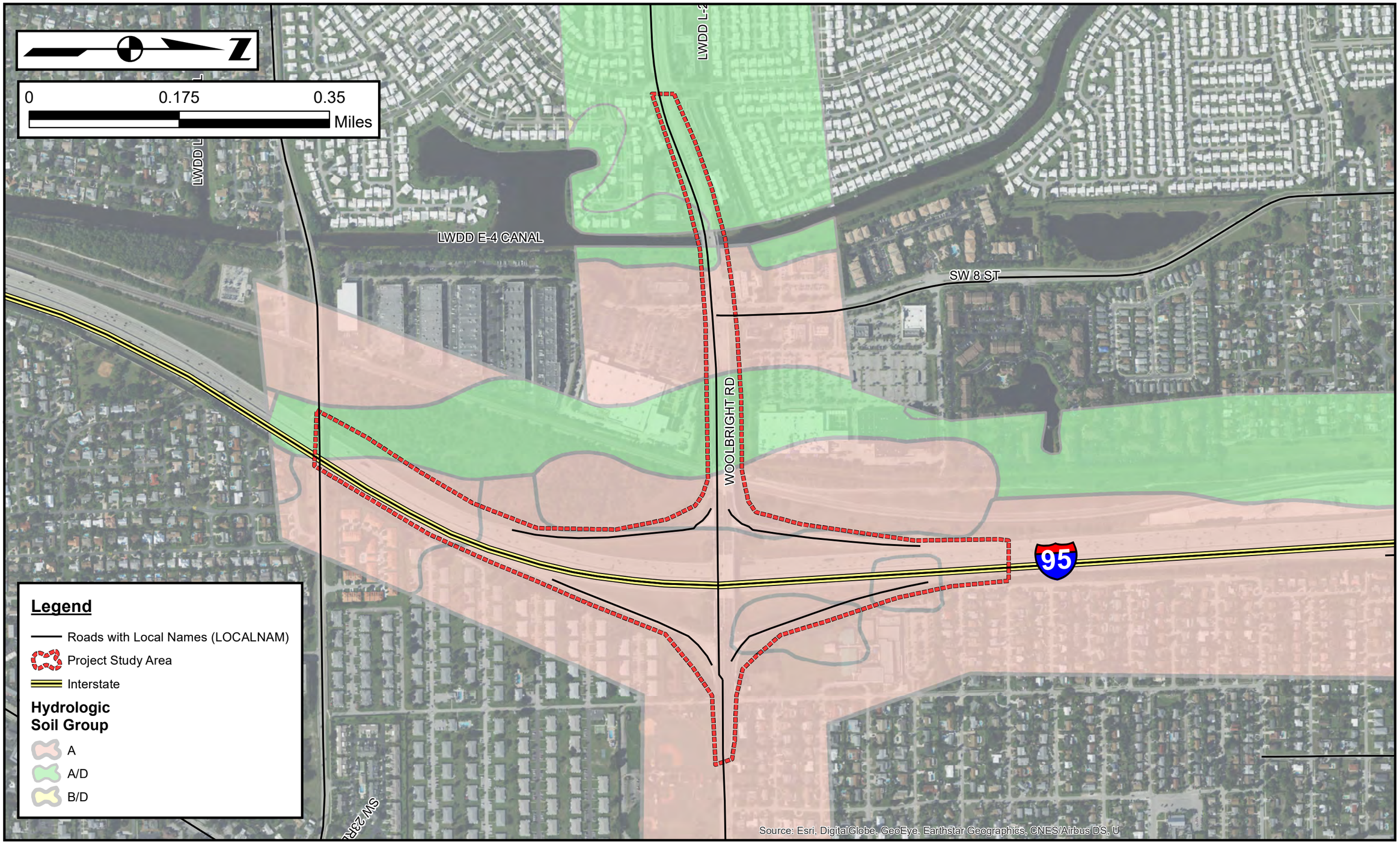
Title:

CURRENT LAND USE

Figure:

2



Florida Department of Transportation District Four 3400 West Commercial Boulevard Fort Lauderdale, FL 33309	**I-95/SR 9 Interchange at Woolbright Road** Project Development & Environment Study FPID No: 437279-1-22-02 ETDM No.: 14341	Title: **SOILS MAP**	Figure: **3**

3.7 100-yr Floodplain

Most of the modifications associated with the alternatives lie outside of Federal Emergency Management Agency (FEMA) Flood Zones. However, depending on the final design of the bridge crossing the E-4 Canal some encroachment is possible. Additional detail is provided in the Location Hydraulic Report. Encroachments into the floodplain will be transverse and confined within the existing right-of-way. In accordance with Executive Order 11988, FHWA TECHNICAL ADVISORY T 6640.8A, 23 CFR 771, and Chapter 24 of the PD&E Manual, the Department must take the appropriate measures to protect floodplains and minimize impacts. For this reason, compensating storage will be provided to offset any fill within the floodplain. As a result, the project will result in no increased risks associated with flooding. The project will also result in no adverse impacts to water quality, groundwater recharge, fish and wildlife habitat, plants, open spaces or natural beauty, recreation, agriculture and aquaculture, or forestry. Floodplain and land use development plans are not necessary since the project is a modification to an existing road. See **Figure 5** - FEMA Flood Hazard Map for a graphical representation of the flood zones. The effective FEMA FIRM panel (12099C0789F) dated October 5, 2017 is also included in **Appendix C** for reference.

3.8 Geology and Hydrogeology

The USGS Ground Water Atlas of the United States (Miller, 2000) describes the location, hydrologic characteristics, and geologic characteristics of the principal aquifers throughout the United States. The Atlas indicated that the underlying hydrogeological units in this geomorphic zone (Coastal Plain) of Palm Beach County include the surficial and the Floridan aquifer system. According to the Atlas the surficial aquifer is separated from the Floridan aquifer by a thick clayey confining unit.

Furthermore, a review of United States Environmental Protection Agency (USEPA) Sole Source Aquifer (SSA) Protection Program maps of sole source aquifers in the southeastern United States indicated that the study area is located within the Biscayne Aquifer Streamflow and Recharge Source Zone. Typically, the construction of any new, federally funded project that is located within these zones requires review by the USEPA to ensure that the project does not contaminate the SSA. Once a preferred alternative is selected, a letter will be sent to the EPA requesting concurrence that the project will have no effect on the SSA. The limits of the Biscayne Aquifer SSA are large and the project study area lies completely within its boundary. **Figure 6** - Biscayne SSA Map includes the Biscayne SSA recharge dataset for graphical reference. Seasonal high water table elevation 9.58 (NGVD29) was used for the project. This value was taken from the permit for the widening of Woolbright Road (ERP 50-04473-9). The data from the referenced permit is shown below.

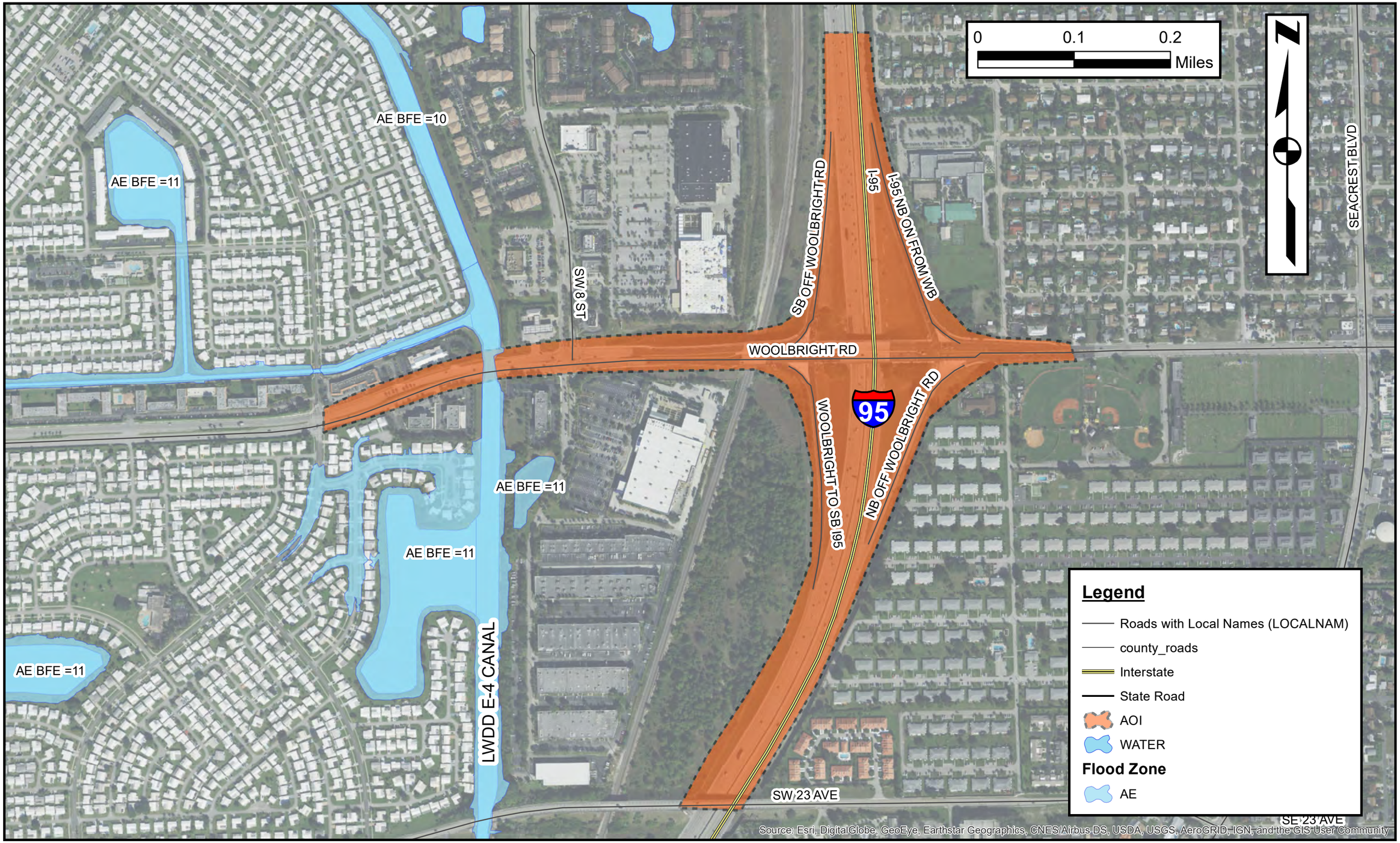
BASIN INFORMATION:

Basin	Area Acres	WSWT Elev (ft, NGVD)	Normal/Dry Ctrl Elev (ft, NGVD)	Method of Determination
BASIN 1	41.68	9.58	9.58/9.58	WET SEASON WTR TABLE CONTOUR MAP
BASIN 2	71.81	9.58	9.58/9.58	WET SEASON WTR TABLE CONTOUR MAP
BASIN 3	39.14	9.58	9.58/9.58	WET SEASON WTR TABLE CONTOUR MAP
BASIN 4	59.03	9.58	9.58/9.58	WET SEASON WTR TABLE CONTOUR MAP
BASIN 5	111.56	9.58	9.58/9.58	WET SEASON WTR TABLE CONTOUR MAP

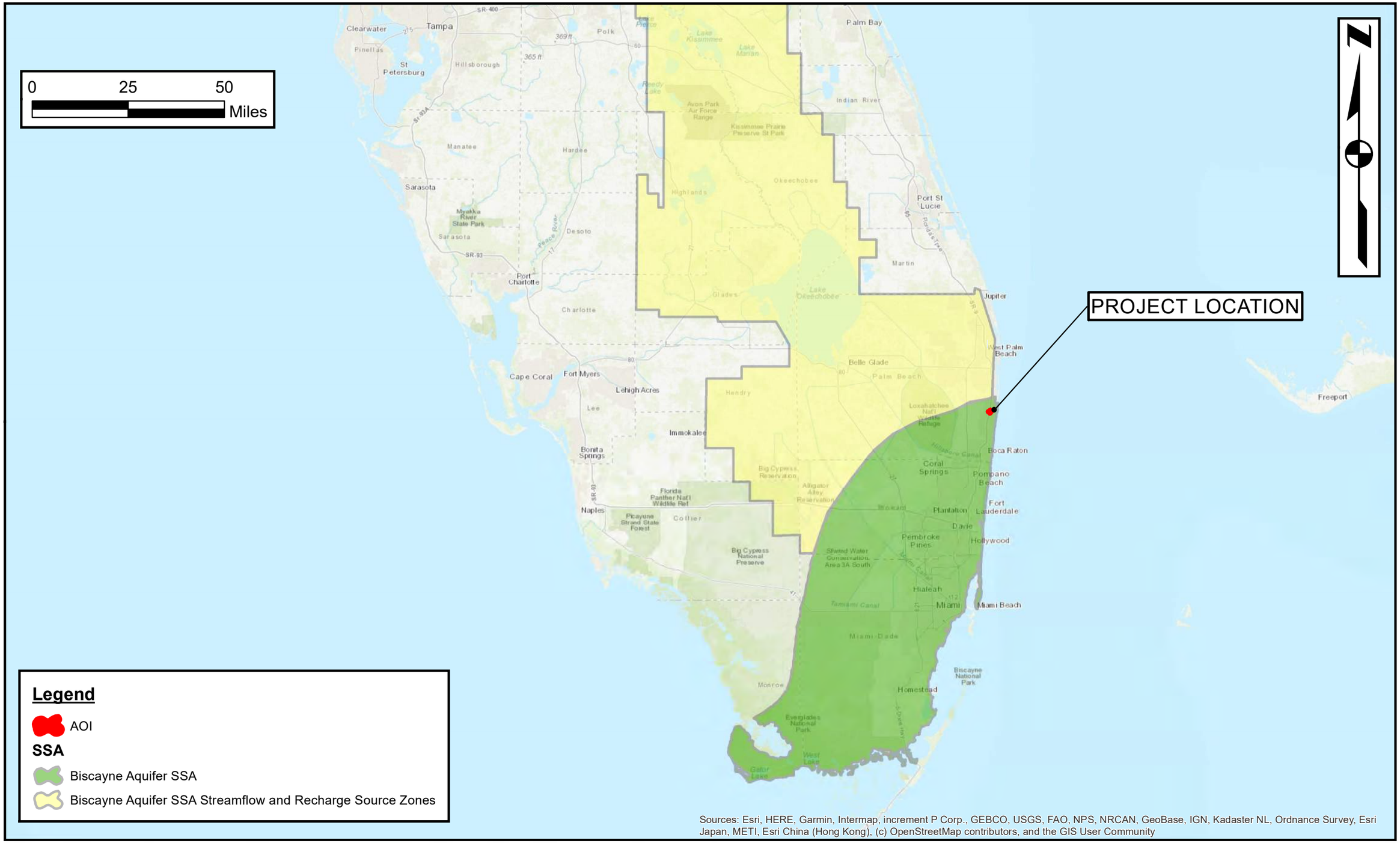
Figure 4 – Basin Seasonal High Watser Table Elevations

3.8.1 Wellfields

According to the Palm Beach County Office of Environmental Resources Management (ERM), “the majority of Palm Beach County's drinking water supply comes from underground freshwater aquifers. Contamination is a daily threat from pollutants seeping into the ground, especially in areas next to the wells that pump water out of the aquifer - known as wellfields.” As such the County and the South Florida Water Management District (SFWMD) have identified 4 specific, groundwater travel-time based zones around each well head where there are special regulations governing the use and handling of specific substances that could be harmful to the population if they were to be spilled and find their way into the drinking water supply. The ponds for this project lie partially within Zone 2 of the City of Boynton Beach Eastern Wellfield and two Zone 1 areas lie within the northeast onramp corridor. Wells 8-36E and 8-12E are near the project area. Within the County’s Unified Land Development Code there are two regulations regarding stormwater treatment within wellfield zones; those are that no new exfiltration systems are to be constructed in Zones 1 or 2, and any retention or detention ponds must comply with the SFWMD Permit Information Manual. The project does not propose any “new” facilities within Zones 1 and 2, however, Pond 5 will be modified and is located partially within a Zone 2 area. **Figure 7**, Wellfield Map depicts the wellfield protection zones in relation to the study area.

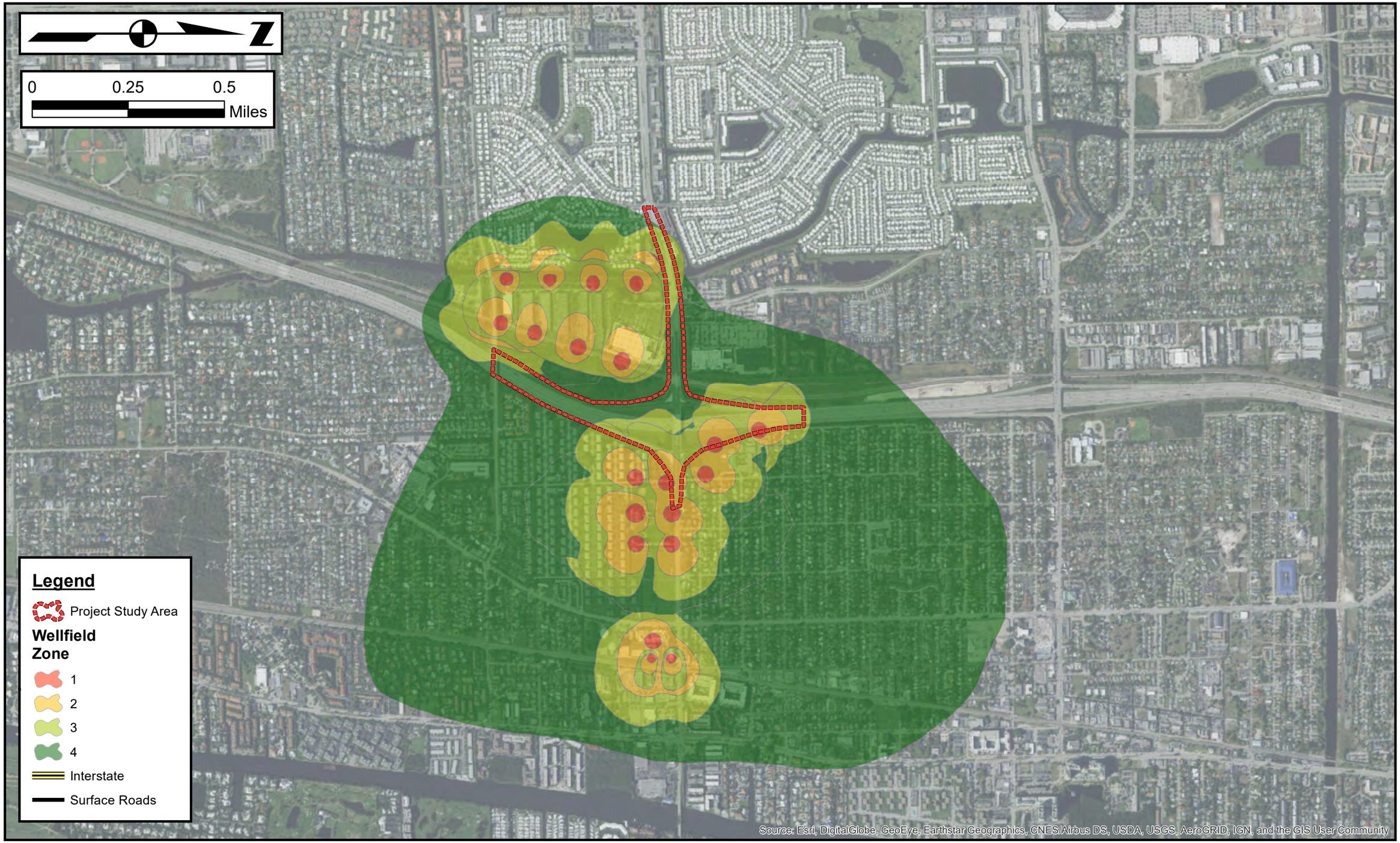


Florida Department of Transportation District Four 3400 West Commercial Boulevard Fort Lauderdale, FL 33309	**I-95/SR 9 Interchange at Woolbright Road** Project Development & Environment Study FPID No: 437279-1-22-02 ETDM No.: 14341	Title: **FEMA FLOOD HAZARD MAP**	Figure: **5**



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Florida Department of Transportation District Four 3400 West Commercial Boulevard Fort Lauderdale, FL 33309	**I-95/SR 9 Interchange at 45th Street** Project Development & Environment Study FPID No.: 436519-1-22-01 ETDM No.: 14225	Title: **BISCAYNE SSA MAP**	Figure: **6**



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3.9 Contamination

A Contamination Screening Evaluation Report (CSER) was been completed as part of the Preliminary Environmental Review Summary and found no contaminated sites within the project boundaries. The project area is in a wellfield protection area with numerous well sites in the project vicinity which provide drinking water to the nearby communities; protections are in place to keep potential contaminants from entering this area.

3.10 Habitat Assessment (EFH and Endangered Species Issues)

A preliminary habitat assessment was also completed by others with the Preliminary Environmental Review. According to the summary memo there is a small chance of encountering manatees and alligators during in-water construction in the E-4 Canal. The memo concludes that the project is not anticipated to adversely affect those or other aquatic species.

3.11 Historical and Archeological Assessment

In compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 and Chapter 12 of the FDOT PD&E manual, a Cultural Resource Assessment Survey was completed by others. Preliminary research identified several potential historic bridges and a potential linear resource in the E-4 Canal. Comprehensive field survey will be conducted during the CRAS to identify any unrecorded resources.

3.12 Regulatory Issues and Design Criteria

SFWMD is the primary permitting agency for the project. The interchange is covered by an existing Environmental Resource Permit most recently modified by ERP 50-04473-P. As such, runoff from the interchange will be required to meet SFWMD quantity and quality criteria. Additionally, the direct connection to the E-4 Canal will require permitting with the Lake Worth Drainage District.

The required water quality volume for the project is based on the total impervious area, existing plus proposed, for the project limits. The standard water quality criteria is the greater of: 1-inch of runoff over the contributing area or 2.5-inches times the impervious area, whichever is greater. This standard calculation is applicable to wet detention treatment requirements. For dry detention treatment the water quality criteria is to provide 75% of the standard criteria and 50% for retention/exfiltration systems. Existing treatment is provided by dry detention ponds located within existing right-of-way in a linear configuration. However, the project lies almost entirely within the E-4 Canal segment of the Lake Worth Lagoon, WBID# 3262. East of the interchange the project extends into the Intracoastal Waterway (ICWW) Waterbody Identification Number (WBID#) 3226F3. WBID#

3262 has been classified as impaired for Chlorophyll-a and WBID# 3226F3 is listed as impaired for Copper by the Florida Department of Environmental Protection (FDEP). A TMDL has NOT been established for the watershed.

In January 1997 FDEP and Palm Beach County formed the Lake Worth Lagoon Ecosystem Management Area team. A Surface Water Improvement and Management (SWIM) plan for the Lake Worth Lagoon was developed to identify goals and objectives for restoring the lagoon.

Based on early coordination with SFWMD, modifications to the stormwater management systems within this impaired waterbody will require an additional 50% water quality treatment volume as well as nutrient loading analysis demonstrating no increase in nutrient loading over the existing condition. It was stated by SFWMD that regardless of the listed impairment the project must meet net improvement criteria for total nitrogen and total phosphorus. Therefore, the pond siting has been based on providing 100% of the required treatment volume for the existing impervious area plus 150% of the required treatment volume for the added impervious area. Additionally, the project must provide a net nutrient load reduction. French drain was used to meet the additional nutrient removal requirements.

The discharge attenuation requirements for the project are to not exceed the predevelopment or permitted discharge for the SFWMD 25-year 72-hour design storm event. The design storm rainfall depth of 14 inches was taken from the existing SFWMD Environmental Resource Permit (ERP) for the Woolbright Road and I-95 Interchange Operational Improvements.

4. Drainage System Description

4.1 Predevelopment Conditions

Generally, all the drainage within the study area enters the E-4 Canal. East of the railroad bridge runoff is piped directly to the canal. the four interchange infield ponds are interconnected and discharged to an FDOT ditch where it ultimately enters the E-4 Canal south of Woolbright Road.

The existing drainage basins for the project area are the ‘Canal Basin’, ‘Interchange Basin’, and ‘East Basin’. Currently, drainage west of the SRFC rail bridge flows due west into the canal, untreated. The Interchange Basin contains the stormwater management facilities that are responsible for collection and treatment of stormwater before it is discharged. There are four sub-basins within the interchange basin.

4.2 Pond Sizing Analysis

All basins can be defined as "open" and exhibit a positive outfall. An analysis was performed to determine SMF sizes required to support the proposed improvements. This analysis assumed that all proposed impervious area will require treatment and attenuation. Total pond volume requirements were assessed to determine if existing right of way would be sufficient for the project needs.

Table 1 - Treatment Volume Summary – Alternative 1

BASIN No.	TOTAL AREA (Ac)	ADDED IMPERVIOUS AREA (Ac)	SYSTEM TYPE	150% TV REQUIRED FOR ADDED IMPERVIOUS (Ac-ft)	EXIST TV TO BE MAINTAINED (Ac-ft)	TOTAL TV REQUIRED (Ac-ft)	TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)
1	11.39	1.30	NA	0.41	0.07	0.48	1.31
2	11.94	0.51	DD	0.16	0.58	0.74	2.70
3	9.64	0.11	DD	0.04	0.59	0.62	1.00
4	6.31	0.10	DD	0.03	0.62	0.65	1.69
5	9.56	0.36	DD	0.11	2.06	2.17	1.86
TOTAL	**48.84**	**2.38**		**0.74**	**3.92**	**4.67**	**8.57**

Alternative 1 was modeled in ICPR version 4.03.07 to demonstrate that the project will meet SFWMD pre/post discharge requirements as well as FDOT District Four roadway flood protection criteria as established in the permitting and design for the recent widening project (ERP 150514-9). The modeling effort was based on the proposed conditions as permitted for that project. Below are ICPR result summary tables for Alternative 1. Model input and results are included in **Appendix D.**

Table 2-SFWMD 25YR-72HR Discharge Summary – Alternative 1

Node Name	Storm Event	Proposed Max Inflow (cfs)	Existing Max Inflow (cfs)	Inflow Change (cfs)
E-4 Canal	25YR72H	51.18	67.5	-16.32
FDOT DITCH	25YR72H	57.21	57.34	-0.13

Table 3-Pond DHW Summary – Alternative 1

Node Name	Warning Stage (ft)	Proposed Max Stage (ft)		
		010YR-01HR	010YR-08HR	010YR-24Hr
DD-Pond 2	23	17.63	19.17	18.66
DD-Pond 3	17	14.71	15.73	15.55
DD-Pond 4	19.7	17.26	17.65	17.29
DD-Pond 5	21	15.73	17.53	18.60

4.3 Post Development Conditions

4.3.1 Alternative 1 – Widening

This alternative will widen and add turn lanes. Total area of new impervious area is 3.1 Ac which will require 4.01 Ac-ft of pond volume in dry detention. The proposed widening will enlarge the existing ponds in the diamond infield areas. Based on depths and stages presented in the previous permitting effort and our current analysis, modifications to the pond grading and/or control structures will provide treatment and attenuation that meets SFWMD and FDOT requirements. This alternative is shown in **Figure 7**.

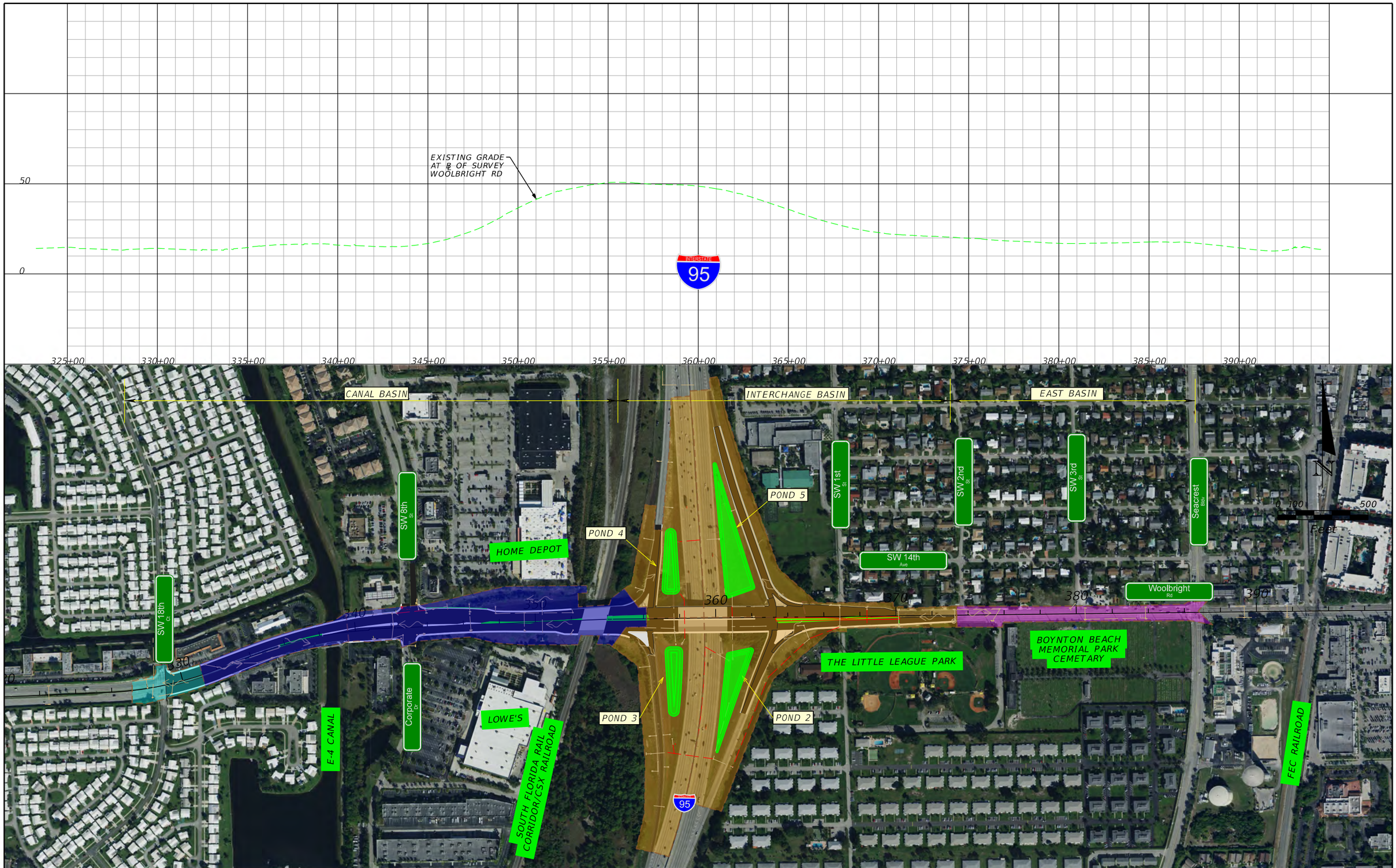
4.3.2 Alternative 2 – Diverging Diamond Interchange (DDI)

This alternative will reconfigure the interchange into a DDI with spacious median areas. It will also widen the southbound I-95 off ramp which will impact the existing pond in the northwest quadrant of the interchange (Pond 4). 3.31 Acs of new impervious will be added and 1.64 Ac removed, resulting in only 2.33 Ac-ft of required pond volume.

Like Alternative 1, treatment and attenuation will likely be satisfied using minor modifications to the remaining infield ponds. Additionally, this alternative will impact three residential and one commercial parcel on the northeast side of the interchange. If there are remainder portions of those parcels as a result of the right-of-way acquisition, those could also be used for stormwater management. This alternative is shown in **Figure 8.**

4.3.3 Alternative 3 – Single Point Urban Interchange (SPUI)

Reconfiguring the interchange into SPUI will impact all the existing infield ponds. Treatment and attenuation volume in the existing ponds will need to be added to account for the 2.40 Ac of added impervious area needing treatment. This will require relocation of the infield ponds. Since the existing ramps will be removed these areas provide some opportunity to provide ponds within the existing right-of-way. However, the Southbound I-95 on ramp is proposed to be on bridge for longer distance to allow for a pond underneath it. This alternative is shown in **Figure 9.** Pond sizing calculations are included in **Appendix D.**



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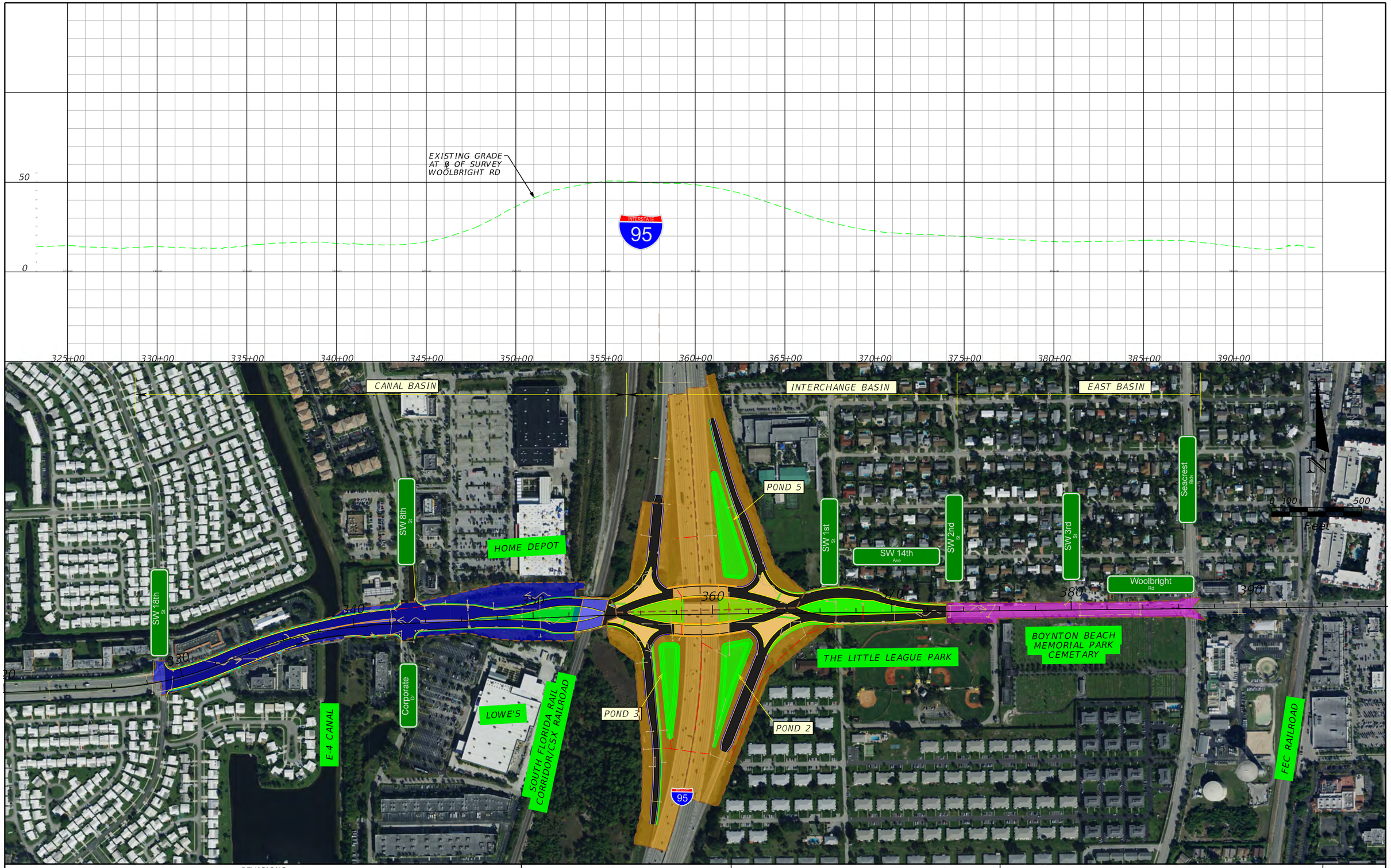
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	437279-1-22-02

DRAINAGE MAP ALTERNATIVE 1

SHEET NO.



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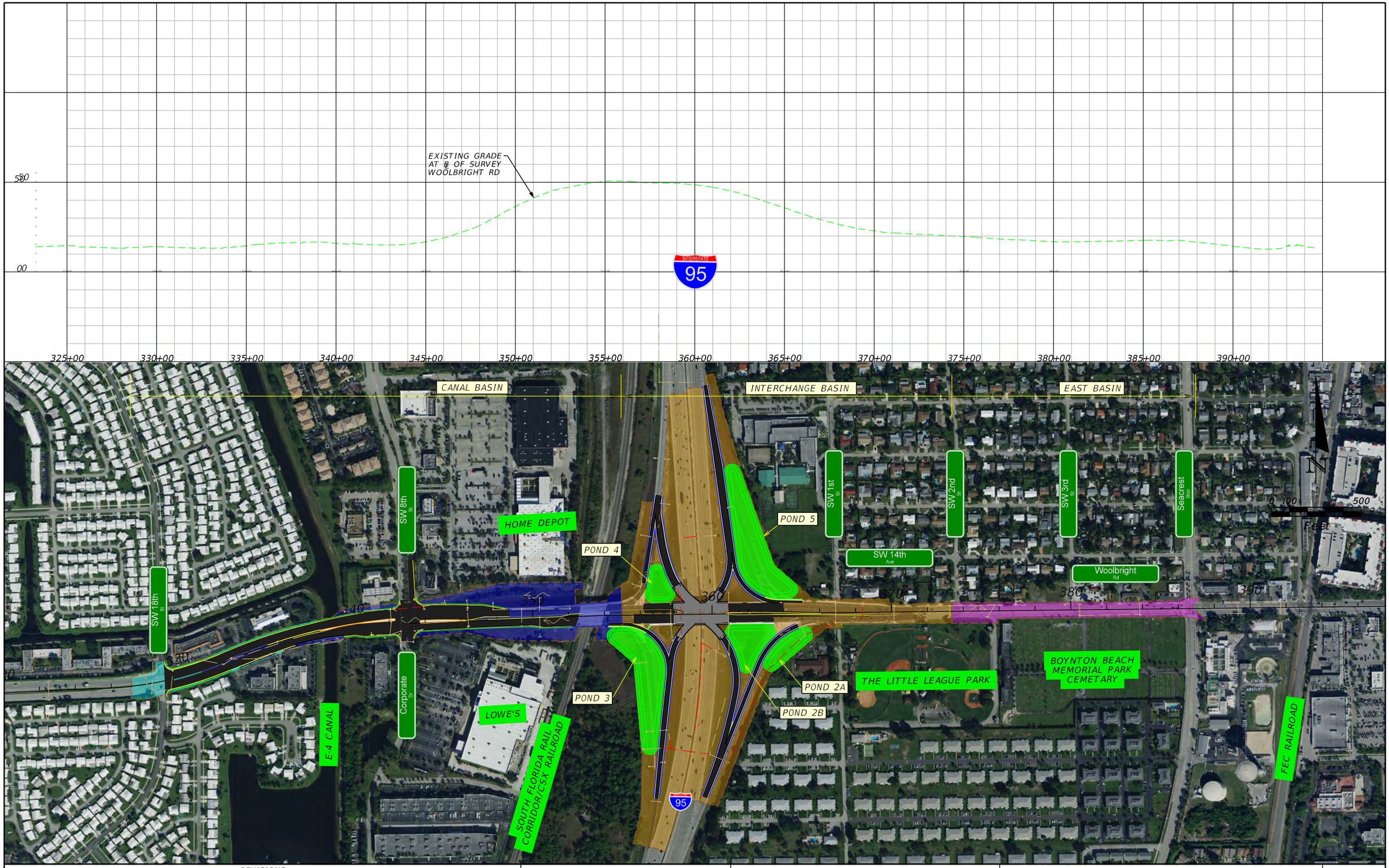
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	437279-1-22-02

DRAINAGE MAP ALTERNATIVE 2

SHEET NO.



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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	437279-1-22-02

DRAINAGE MAP ALTERNATIVE 3

SHEET NO.

5. Recommendations

Based on these preliminary findings, it is recommended that the project be advanced using Alternative 1: Widening. It can be implemented by modifying the existing stormwater management facilities and has the lowest cost and least impact to the existing stormwater management systems. It is recommended to modify the existing infield dry detention ponds in Basins B-2 and B-5 by re-grading the side slopes, increasing the depth and performing minor modification to the control structures. Dry detention systems, such as those currently being used to treat the runoff from I-95, will likely not meet these nutrient removal requirements on their own. There are several treatment approaches that can be used to retrofit the dry detention basins to provide additional nutrient removal. For example, providing retention in the bottom of the existing ponds, or adding a Biosorption Activated Media (BAM) filter, or nutrient separating baffle box could be added to create a “treatment train” that would be capable of meeting the additional nutrient removal goals. Based on nutrient removal calculations performed using version 4.1.0 of BMP Trains, using additional retention volume in Ponds 2 and 5 along with exfiltration trench in the canal basin, the project can meet net reduction goals for TN and TP.

Early in the design phase, it is recommended to meet with SFWMD to document and coordinate the design criteria and identify any other concerns of SFWMD that may need to be addressed during the final design.

Appendix A – NOAA Rainfall data

NOAA Atlas 14, Volume 9, Version 2
Location name: Boynton Beach, Florida, USA*
Latitude: 26.5145°, Longitude: -80.0722°
Elevation: 22.15 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.570** (0.448-0.723)	**0.659** (0.518-0.838)	**0.806** (0.632-1.03)	**0.928** (0.723-1.19)	**1.09** (0.825-1.45)	**1.22** (0.902-1.65)	**1.35** (0.966-1.87)	**1.48** (1.02-2.12)	**1.65** (1.09-2.44)	**1.78** (1.15-2.68)
10-min	**0.834** (0.656-1.06)	**0.966** (0.759-1.23)	**1.18** (0.925-1.51)	**1.36** (1.06-1.74)	**1.60** (1.21-2.12)	**1.79** (1.32-2.41)	**1.98** (1.41-2.74)	**2.17** (1.49-3.10)	**2.42** (1.60-3.57)	**2.61** (1.69-3.92)
15-min	**1.02** (0.800-1.29)	**1.18** (0.926-1.50)	**1.44** (1.13-1.84)	**1.66** (1.29-2.12)	**1.95** (1.47-2.59)	**2.18** (1.61-2.94)	**2.41** (1.72-3.34)	**2.64** (1.82-3.78)	**2.95** (1.95-4.35)	**3.18** (2.06-4.78)
30-min	**1.56** (1.23-1.98)	**1.81** (1.42-2.30)	**2.22** (1.74-2.84)	**2.57** (2.00-3.29)	**3.04** (2.29-4.02)	**3.40** (2.51-4.57)	**3.75** (2.68-5.20)	**4.12** (2.83-5.89)	**4.60** (3.05-6.79)	**4.96** (3.21-7.47)
60-min	**2.12** (1.66-2.68)	**2.46** (1.93-3.13)	**3.03** (2.37-3.86)	**3.50** (2.73-4.49)	**4.16** (3.14-5.53)	**4.68** (3.46-6.31)	**5.19** (3.72-7.21)	**5.72** (3.94-8.20)	**6.43** (4.27-9.50)	**6.97** (4.51-10.5)
2-hr	**2.67** (2.12-3.37)	**3.11** (2.46-3.92)	**3.83** (3.02-4.85)	**4.44** (3.48-5.65)	**5.29** (4.03-6.99)	**5.96** (4.44-8.00)	**6.63** (4.79-9.16)	**7.33** (5.09-10.4)	**8.26** (5.53-12.1)	**8.98** (5.86-13.4)
3-hr	**3.00** (2.38-3.76)	**3.49** (2.78-4.39)	**4.33** (3.43-5.47)	**5.05** (3.98-6.40)	**6.07** (4.65-8.01)	**6.88** (5.15-9.22)	**7.72** (5.60-10.6)	**8.59** (5.99-12.2)	**9.78** (6.58-14.3)	**10.7** (7.02-15.9)
6-hr	**3.51** (2.81-4.38)	**4.14** (3.31-5.17)	**5.24** (4.18-6.57)	**6.21** (4.93-7.82)	**7.64** (5.92-10.1)	**8.81** (6.66-11.8)	**10.0** (7.36-13.8)	**11.4** (8.01-16.1)	**13.2** (8.97-19.3)	**14.7** (9.70-21.7)
12-hr	**3.98** (3.21-4.93)	**4.78** (3.85-5.93)	**6.21** (4.99-7.73)	**7.52** (6.01-9.41)	**9.49** (7.44-12.6)	**11.2** (8.53-14.9)	**13.0** (9.59-17.8)	**14.9** (10.6-21.1)	**17.7** (12.1-25.7)	**19.9** (13.3-29.3)
24-hr	**4.54** (3.69-5.59)	**5.47** (4.44-6.75)	**7.18** (5.81-8.89)	**8.78** (7.07-10.9)	**11.2** (8.90-14.8)	**13.3** (10.3-17.8)	**15.6** (11.7-21.4)	**18.1** (13.0-25.6)	**21.7** (15.1-31.5)	**24.7** (16.6-36.0)
2-day	**5.37** (4.40-6.58)	**6.35** (5.19-7.78)	**8.16** (6.65-10.0)	**9.87** (8.00-12.2)	**12.5** (10.0-16.4)	**14.8** (11.5-19.7)	**17.3** (13.1-23.6)	**20.1** (14.6-28.2)	**24.1** (16.8-34.7)	**27.4** (18.6-39.7)
3-day	**6.05** (4.97-7.38)	**7.01** (5.76-8.56)	**8.81** (7.21-10.8)	**10.5** (8.56-12.9)	**13.2** (10.6-17.2)	**15.5** (12.1-20.5)	**18.0** (13.7-24.5)	**20.8** (15.2-29.1)	**24.9** (17.5-35.8)	**28.2** (19.3-40.8)
4-day	**6.63** (5.47-8.06)	**7.55** (6.22-9.19)	**9.30** (7.64-11.4)	**11.0** (8.97-13.5)	**13.6** (11.0-17.7)	**15.9** (12.5-20.9)	**18.5** (14.0-24.9)	**21.3** (15.6-29.6)	**25.3** (17.9-36.3)	**28.7** (19.6-41.4)
7-day	**7.99** (6.63-9.66)	**8.83** (7.32-10.7)	**10.5** (8.64-12.7)	**12.1** (9.91-14.7)	**14.6** (11.9-18.9)	**16.9** (13.3-22.1)	**19.4** (14.8-26.0)	**22.2** (16.3-30.7)	**26.3** (18.7-37.4)	**29.6** (20.4-42.5)
10-day	**9.06** (7.54-10.9)	**9.95** (8.27-12.0)	**11.6** (9.65-14.1)	**13.3** (11.0-16.1)	**15.9** (12.9-20.4)	**18.2** (14.4-23.6)	**20.7** (15.9-27.6)	**23.5** (17.4-32.3)	**27.6** (19.7-39.1)	**30.9** (21.4-44.2)
20-day	**11.9** (9.95-14.2)	**13.2** (11.1-15.9)	**15.6** (13.0-18.8)	**17.7** (14.7-21.4)	**20.8** (16.9-26.3)	**23.4** (18.6-29.9)	**26.1** (20.1-34.3)	**28.9** (21.5-39.3)	**32.9** (23.6-46.1)	**36.1** (25.3-51.3)
30-day	**14.3** (12.0-17.1)	**16.1** (13.5-19.2)	**19.1** (16.0-22.8)	**21.6** (18.0-26.0)	**25.1** (20.4-31.3)	**27.9** (22.2-35.4)	**30.7** (23.7-40.1)	**33.6** (25.0-45.2)	**37.5** (27.0-52.1)	**40.6** (28.5-57.3)
45-day	**17.6** (14.9-20.9)	**19.8** (16.8-23.6)	**23.4** (19.7-27.9)	**26.3** (22.1-31.6)	**30.3** (24.6-37.4)	**33.3** (26.5-41.8)	**36.2** (28.0-46.8)	**39.1** (29.2-52.2)	**42.9** (30.9-59.1)	**45.7** (32.2-64.3)
60-day	**20.6** (17.5-24.4)	**23.1** (19.6-27.4)	**27.1** (22.9-32.2)	**30.2** (25.4-36.1)	**34.4** (28.0-42.2)	**37.5** (29.9-46.9)	**40.4** (31.4-52.0)	**43.3** (32.4-57.5)	**47.0** (33.9-64.4)	**49.6** (35.1-69.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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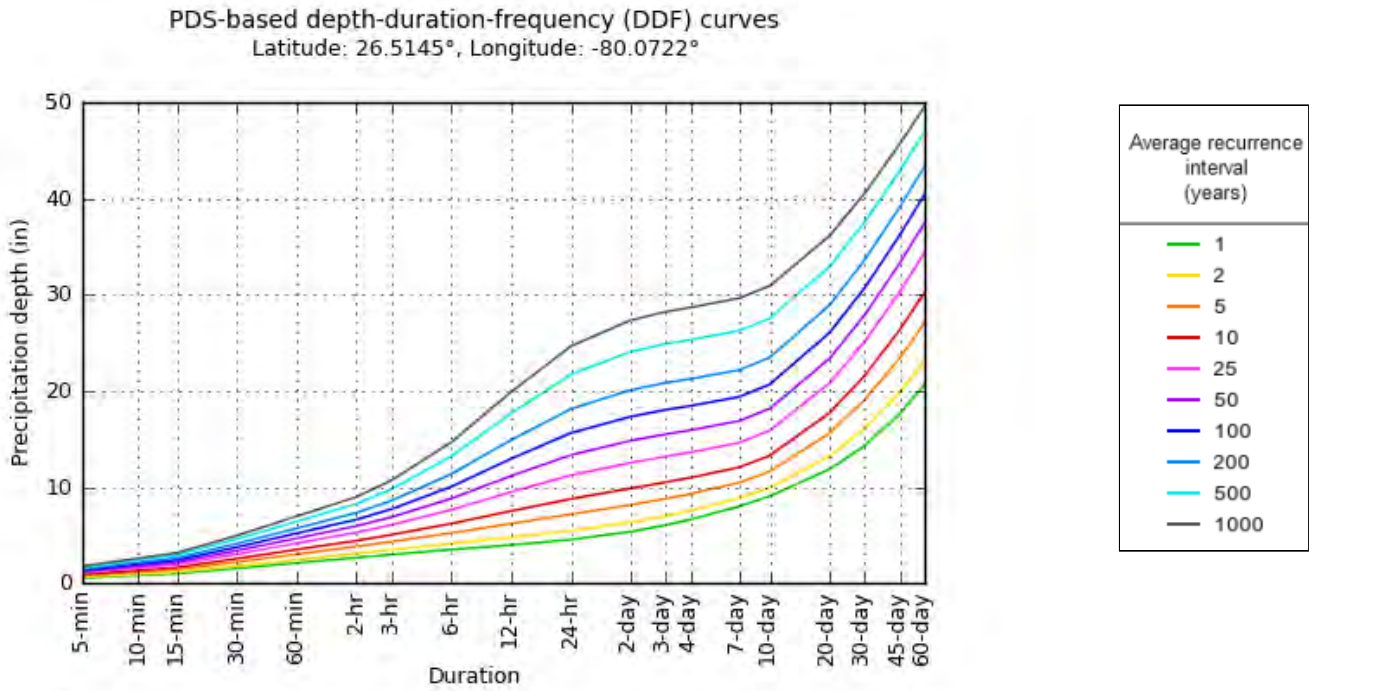
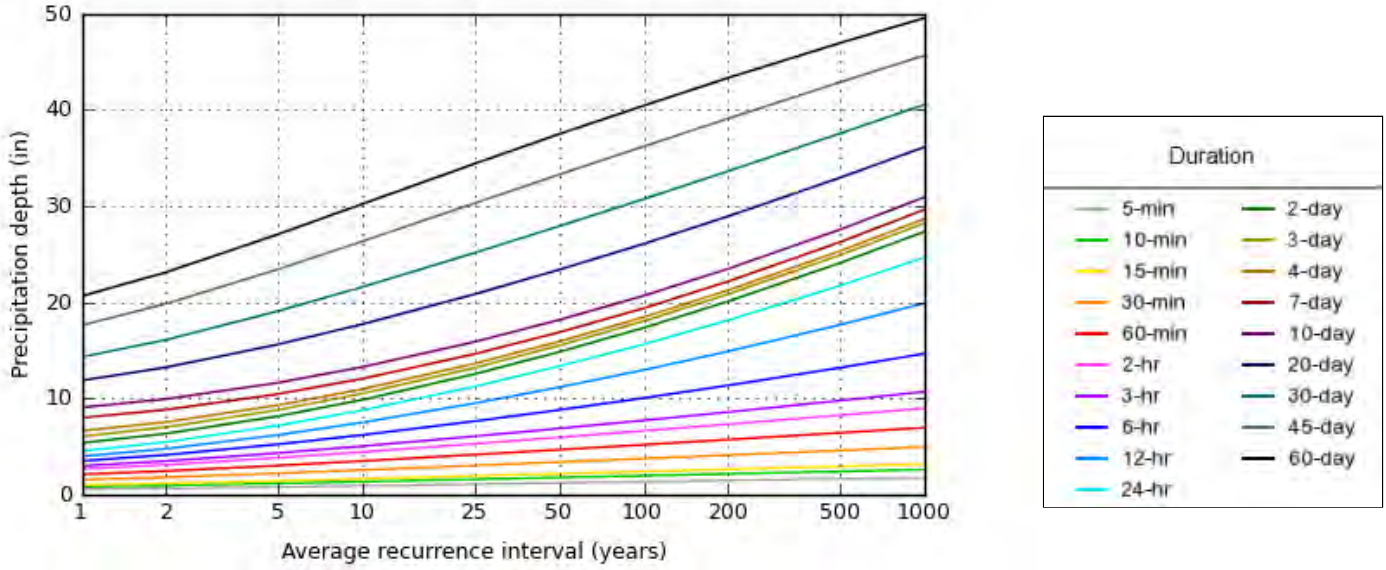
PF graphical





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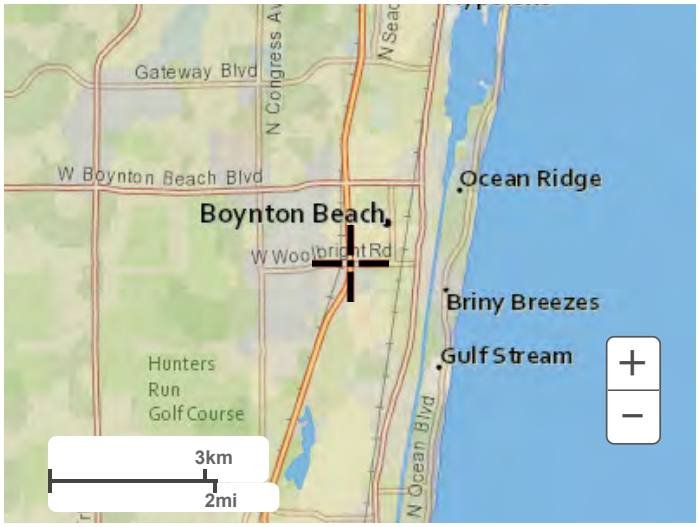
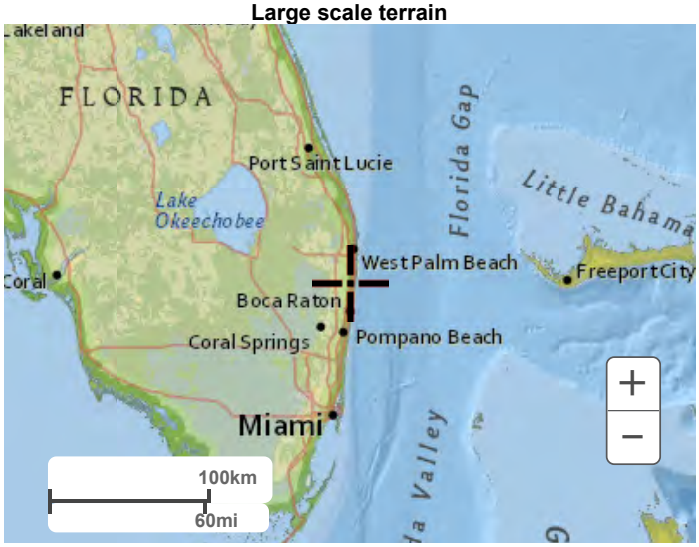
Maps & aerials

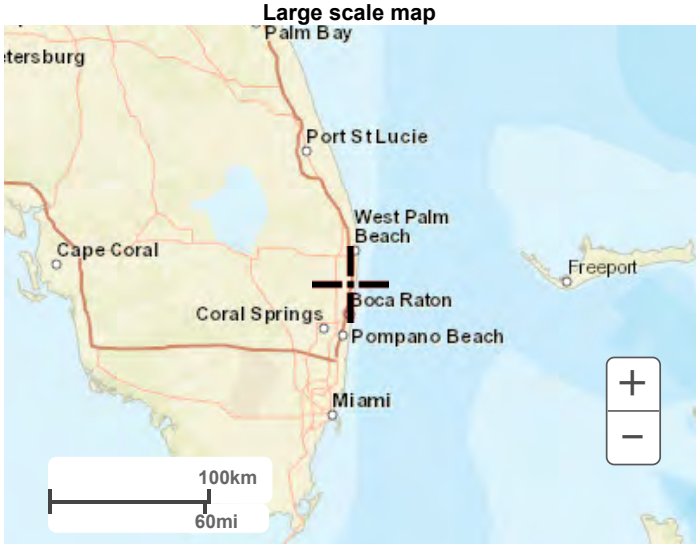
Small scale terrain



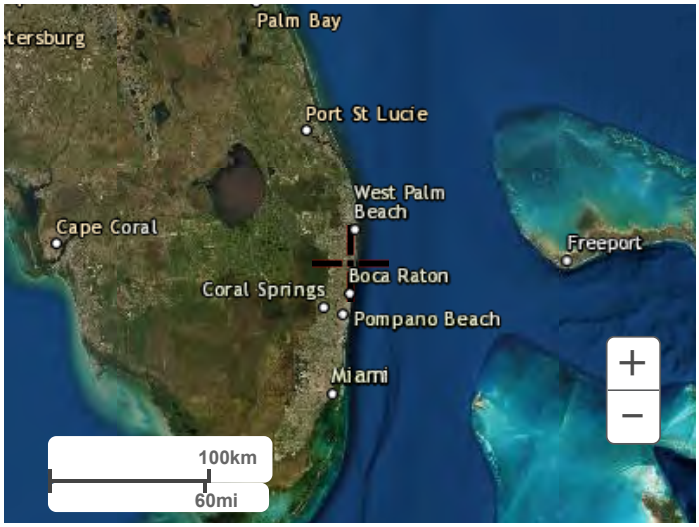
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix B – Soil Data

United States Department of Agriculture

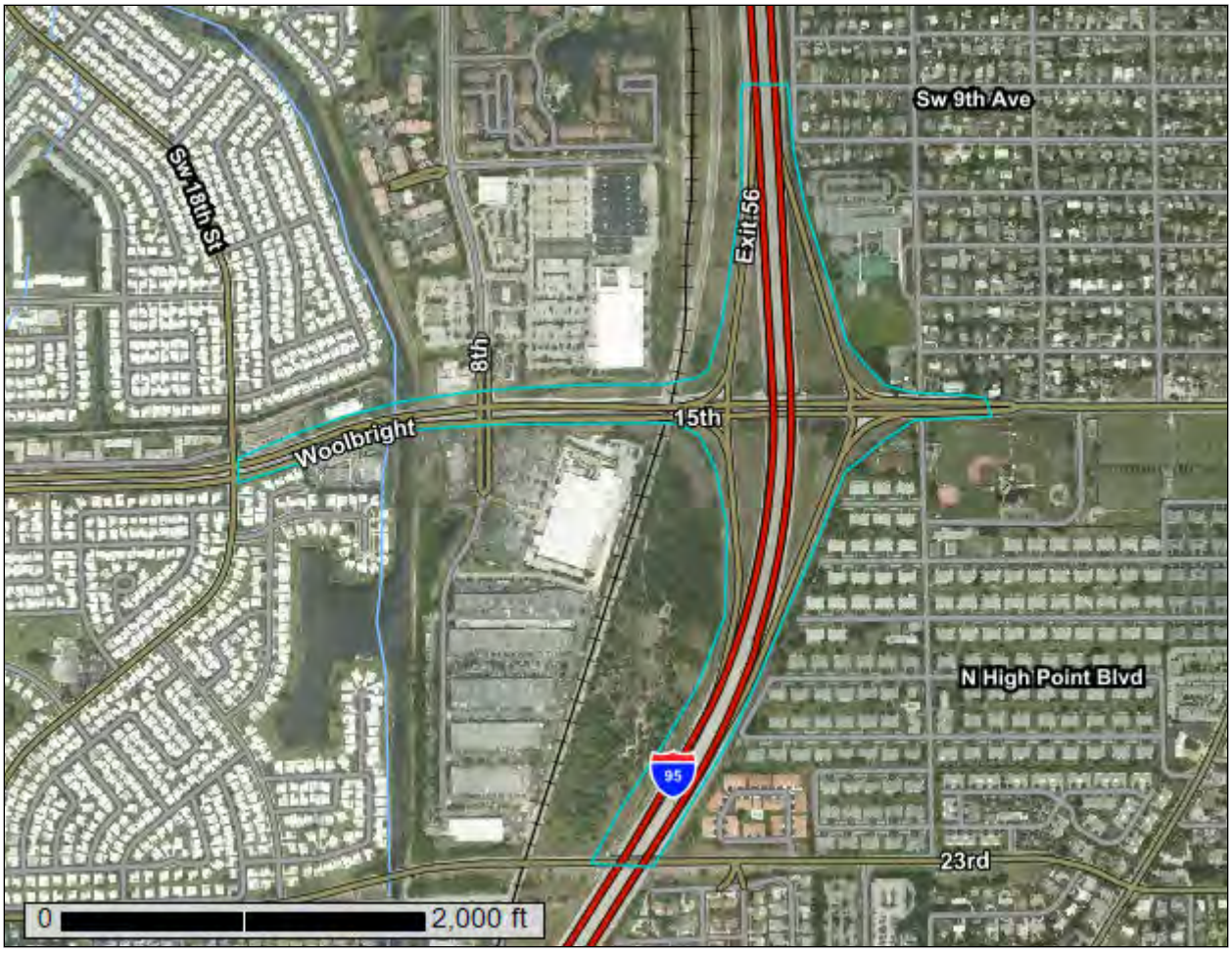
NRCS

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 Palm Beach County Area, Florida

I-95 and Woolbright Road Interchange



June 16, 2020

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.

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How Soil Surveys Are Made

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

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

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

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

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

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.

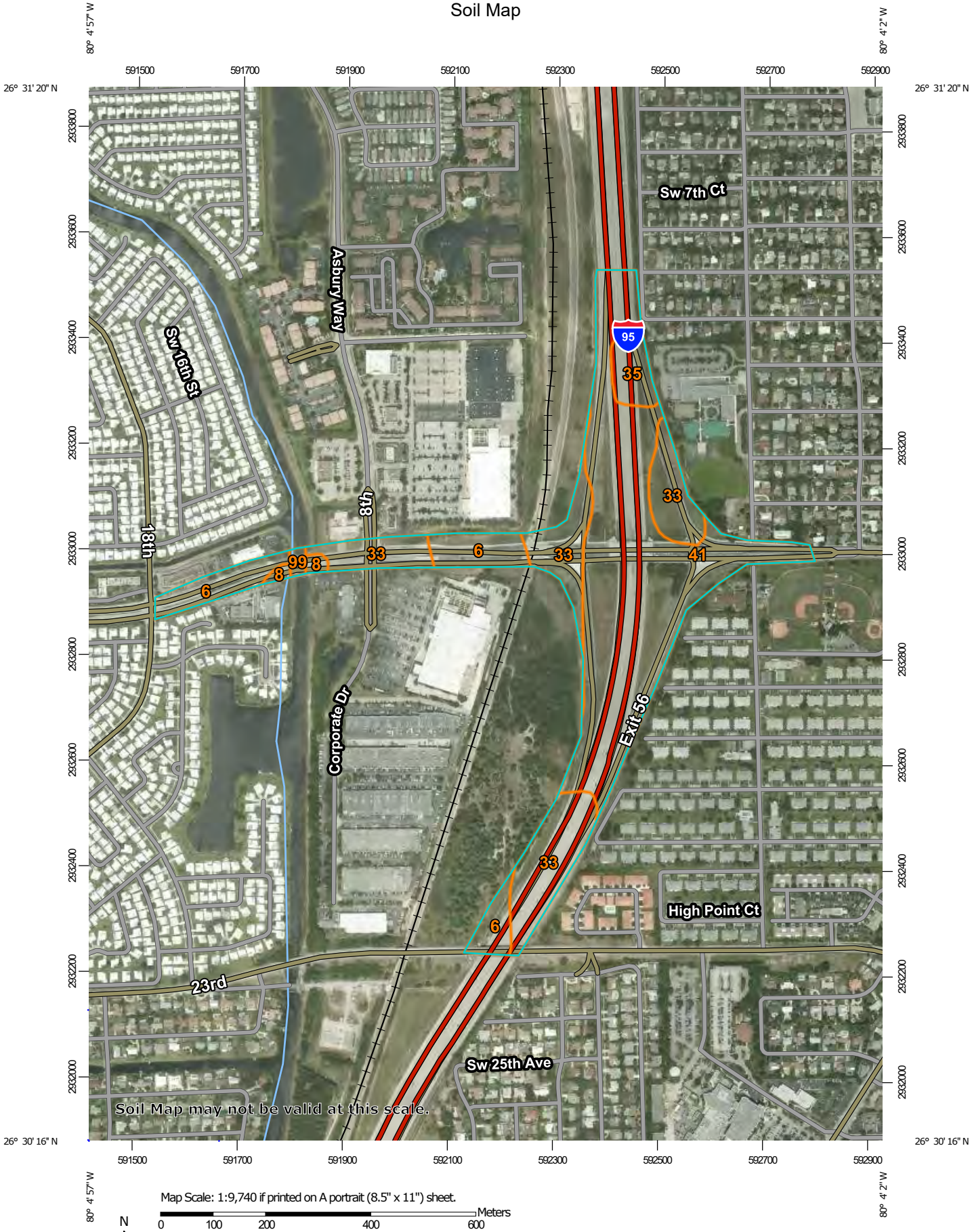
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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: 1:9,740 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

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.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Palm Beach County Area, Florida
Survey Area Data: Version 16, Feb 3, 2020

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

Date(s) aerial images were photographed: Mar 26, 2019—Apr 22, 2019

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
6	Basinger fine sand, 0 to 2 percent slopes	7.6	12.4%
8	Basinger and Myakka sands, depressional	0.6	1.0%
33	Pomello fine sand, 0 to 5 percent slopes	16.7	27.3%
35	Quartzipsamments, shaped, 0 to 5 percent slopes	2.3	3.7%
41	St. Lucie-Paola-Urban land complex, 0 to 8 percent slopes	33.7	55.0%
99	Water	0.4	0.6%
Totals for Area of Interest		**61.3**	**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.

Palm Beach County Area, Florida

6—Basinger fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svym
Elevation: 0 to 100 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Basinger

Setting

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

Typical profile

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

Properties and qualities

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

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Myakka

Percent of map unit: 6 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Immokalee

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

Pompano

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

Placid

Percent of map unit: 4 percent
Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 1 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: Slough (R155XY011FL)
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Anclote

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Hydric soil rating: Yes

8—Basinger and Myakka sands, depressional

Map Unit Setting

National map unit symbol: 1j7ct
Elevation: 10 to 100 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Basinger, depressional, and similar soils: 47 percent
Myakka, depressional, and similar soils: 47 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Basinger, Depressional

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 4 inches: sand
Eg - 4 to 29 inches: sand
Bh/Eg - 29 to 36 inches: sand
Cg - 36 to 72 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D

Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Hydric soil rating: Yes

Description of Myakka, Depressional

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: sand
E - 6 to 26 inches: sand
Bh - 26 to 47 inches: sand
C - 47 to 72 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Hydric soil rating: Yes

Minor Components

Anclote

Percent of map unit: 2 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Pompano

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear

Across-slope shape: Concave
Hydric soil rating: Yes

Sanibel

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

33—Pomello fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1j7dk
Elevation: 10 to 20 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Pomello

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 44 inches: fine sand
Bh - 44 to 60 inches: fine sand
Bw/C - 60 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well 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 24 to 42 inches
Frequency of flooding: None

Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G156AC131FL)
Hydric soil rating: No

Minor Components

Basinger

Percent of map unit: 3 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Immokalee

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Myakka

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Palm beach

Percent of map unit: 2 percent
Landform: Dunes on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Paola

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

St. lucie

Percent of map unit: 2 percent

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

35—Quartzipsamments, shaped, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1j7dm
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Quartzipsamments and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Quartzipsamments

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
C - 6 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

41—St. Lucie-Paola-Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1j7ds
Elevation: 10 to 20 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

St. lucie and similar soils: 35 percent
Paola and similar soils: 33 percent
Urban land: 30 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Lucie

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 5 inches: sand
C - 5 to 80 inches: sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Paola

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 3 inches: sand
E - 3 to 20 inches: sand
C - 20 to 80 inches: sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Minor Components

Palm beach

Percent of map unit: 1 percent
Landform: Dunes on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Pomello

Percent of map unit: 1 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

99—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Reports

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

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

Soil Physical Properties

This folder contains a collection of tabular reports that present soil physical properties. The reports (tables) include all selected map units and components for each map unit. Soil physical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission

rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

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.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group

index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Palm Beach County Area, Florida														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
6—Basinger fine sand, 0 to 2 percent slopes														
Basinger	80	A/D	0-2	Fine sand	SP-SM, SM	A-2-4, A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	87-94-100	7-10- 15	0-0 -0	NP
			2-18	Fine sand	SP-SM, SM	A-3, A-2-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	86-94-100	6- 9- 14	0-0 -0	NP
			18-36	Fine sand	SP-SM, SM	A-2-4, A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	87-94-100	7-11- 16	0-0 -0	NP
			36-80	Fine sand	SP-SM, SM	A-3, A-2-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	87-94-100	7-11- 16	0-0 -0	NP

Engineering Properties–Palm Beach County Area, Florida														
Map unit symbol and soil name	**Pct. of map unit**	**Hydrologic group**	**Depth**	**USDA texture**	**Classification**		**Pct Fragments**		**Percentage passing sieve number—**				**Liquid limit**	**Plasticity index**
					Unified	**AASHTO**	**>10 inches**	**3-10 inches**	**4**	**10**	**40**	**200**		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
8—Basinger and Myakka sands, depressional														
Basinger, depressional	47	A/D	0-4	Sand	SP	A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	85-93-1 00	1- 3- 4	0-7 -14	NP
			4-29	Fine sand, sand	SP, SP-SM	A-2-4, A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	85-93-1 00	2- 7- 12	0-7 -14	NP
			29-36	Fine sand, sand	SP, SP-SM	A-2-4, A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	85-93-1 00	2- 7- 12	0-7 -14	NP
			36-72	Fine sand, sand	SP, SP-SM	A-2-4, A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	85-93-1 00	2- 7- 12	0-7 -14	NP
Myakka, depressional	47	A/D	0-6	Sand	SP, SP-SM	A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	85-93-1 00	2- 6- 10	0-7 -14	NP
			6-26	Sand, fine sand	SP, SP-SM	A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	85-93-1 00	2- 6- 10	0-7 -14	NP
			26-47	Sand, fine sand, loamy fine sand	SM, SP-SM	A-2-4, A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	85-93-1 00	5-13- 20	0-7 -14	NP
			47-72	Sand, fine sand	SP, SP-SM	A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	85-93-1 00	2- 5- 8	0-7 -14	NP
33—Pomello fine sand, 0 to 5 percent slopes														
Pomello	85	A	0-4	Fine sand	SP, SP-SM	A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	60-80-1 00	1- 5- 8	0-7 -14	NP
			4-44	Fine sand	SP, SP-SM	A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	60-80-1 00	1- 5- 8	0-7 -14	NP
			44-60	Coarse sand, sand, fine sand	SM, SP-SM	A-2-4, A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	60-80-1 00	6-11- 15	0-7 -14	NP
			60-80	Coarse sand, sand, fine sand	SP, SP-SM	A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	60-80-1 00	4- 7- 10	0-7 -14	NP

Engineering Properties–Palm Beach County Area, Florida														
Map unit symbol and soil name	**Pct. of map unit**	**Hydrologic group**	**Depth**	**USDA texture**	**Classification**		**Pct Fragments**		**Percentage passing sieve number—**				**Liquid limit**	**Plasticity index**
					Unified	**AASHTO**	**>10 inches**	**3-10 inches**	**4**	**10**	**40**	**200**		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
35—Quartzipsamments, shaped, 0 to 5 percent slopes														
Quartzipsamments	100	A	0-6	Fine sand	SP, SP-SM	A-3	0- 0- 0	0- 0- 0	100-100-100	100-100-100	85-93-100	2- 6- 10	0-7 -14	NP
			6-80	Fine sand	SP, SP-SM	A-3	0- 0- 0	0- 0- 0	100-100-100	100-100-100	85-93-100	2- 6- 10	0-7 -14	NP
41—St. Lucie-Paola-Urban land complex, 0 to 8 percent slopes														
St. lucie	35	A	0-5	Sand	SP	A-3	0- 0- 0	0- 0- 0	100-100-100	90-95-100	80-90-99	1- 3- 4	0-7 -14	NP
			5-80	Sand, fine sand	SP	A-3	0- 0- 0	0- 0- 0	100-100-100	90-95-100	80-90-99	1- 3- 4	0-7 -14	NP
Paola	33	A	0-3	Sand	SP	A-3	0- 0- 0	0- 0- 0	100-100-100	100-100-100	85-93-100	1- 2- 2	0-7 -14	NP
			3-20	Sand, fine sand	SP	A-3	0- 0- 0	0- 0- 0	100-100-100	100-100-100	85-93-100	1- 2- 2	0-7 -14	NP
			20-80	Sand, fine sand	SP	A-3	0- 0- 0	0- 0- 0	100-100-100	100-100-100	80-90-100	1- 3- 4	0-7 -14	NP

Soil Qualities and Features

This folder contains tabular reports that present various soil qualities and features. The reports (tables) include all selected map units and components for each map unit. 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.

Soil Features

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

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to

corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Soil Features–Palm Beach County Area, Florida									
Map symbol and soil name	**Restrictive Layer**				**Subsidence**		**Potential for frost action**	**Risk of corrosion**	
	Kind	**Depth to top**	**Thickness**	**Hardness**	**Initial**	**Total**		**Uncoated steel**	**Concrete**
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
		In	*In*		*In*	*In*			
6—Basinger fine sand, 0 to 2 percent slopes									
Basinger		—	—		0	0	None	High	High
8—Basinger and Myakka sands, depressional									
Basinger, depressional		—	—		0	—	None	High	Moderate
Myakka, depressional		—	—		0	—	None	High	Moderate
33—Pomello fine sand, 0 to 5 percent slopes									
Pomello		—	—		0	—	None	Moderate	High
35—Quartzipsamments, shaped, 0 to 5 percent slopes									
Quartzipsamments		—	—		0	—	None	Low	Moderate
41—St. Lucie-Paola-Urban land complex, 0 to 8 percent slopes									
St. lucie		—	—		0	—	None	Low	Moderate
Paola		—	—		0	—	None	Low	Moderate
Urban land		—	—		0	—			

Soil Features–Palm Beach County Area, Florida									
Map symbol and soil name	**Restrictive Layer**				**Subsidence**		**Potential for frost action**	**Risk of corrosion**	
	Kind	**Depth to top**	**Thickness**	**Hardness**	**Initial**	**Total**		**Uncoated steel**	**Concrete**
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
99—Water									
Water		—	—		—	—			

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Appendix C – Floodplain Data

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded tenth-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Transverse Mercator State Plane Florida East FIPS Zone 0901 Feet. The **horizontal datum** was NAD83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

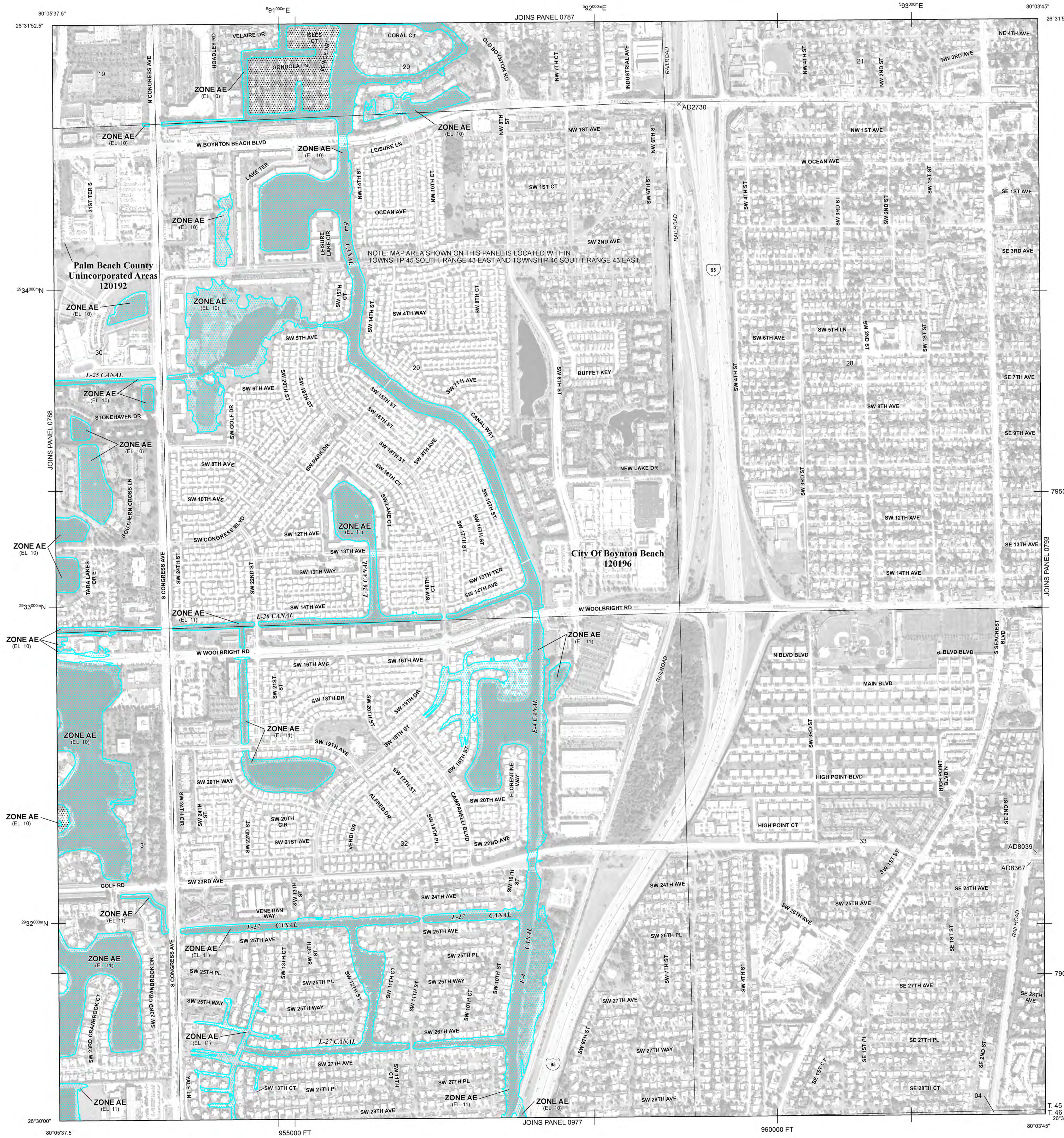
Base map information shown on this FIRM was provided in digital format by Palm Beach County. The original orthophotographic base imagery was provided in color with a one-foot pixel resolution at a scale of 1" = 200' from photography flown November 2010 - January 2011.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A———A	Cross section line
23- - - - -23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4275000mE	1000-meter Universal Transverse Mercator grid ticks, zone 17
6000000 FT	5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 901), Transverse Mercator projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
OCTOBER 5, 2017

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0789F

FIRM
FLOOD INSURANCE RATE MAP
PALM BEACH COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 789 OF 1200

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOYNTON BEACH, CITY OF	120196	0789	F
PALM BEACH COUNTY	120192	0789	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12099C0789F

EFFECTIVE DATE
OCTOBER 5, 2017

Federal Emergency Management Agency

sources of small size.
possible updated or ad

To obtain more detailed
and/or **floodways** have
Profiles and Floodwa
contained within the Fl
Users should be aware
elevations. These BFE
should not be used as

Appendix D – Pond Sizing Calculations

FDOT	I-95 and Woolbright Interchange PD&E Pond Siting Analysis		Comp. By: Date: Chk. By: Job No:

Pond Site Sizing - Summary

Alternative		Outfall	Limits	Limits	Length	Existing Impervious	Added Impervious	Removed Impervious	New Impervious to Treat	Total Impervious Area	Total Required Pond Volume	Provided Pond Volume	Remarks
	Basin		From	To	ft	Ac	Ac	Ac	Ac	Ac			
1 Widening	Canal 1	(Lake Ida Can	51+68	65+77	1408.88	6.57	1.30	0.00	1.30	7.87	1.72	0.00	Exfiltration Trench
	INT 1	FDOT Ditch	65+77	73+21	743.87	18.88	1.80	0.00	1.80	20.68	13.05	20.33	Use existing ponds in interchange
Alt Totals					2152.75		3.10	0.00	3.10	28.55	14.76	20.33	
2 DDI	Canal	(Lake Ida Can	51+68	65+77	1408.88	6.57	1.08	0.34	0.74	7.31	1.05	0.00	
	INT	FDOT Ditch	65+77	73+21	743.87	18.88	2.23	1.30	0.93	19.81	12.97	0.00	Fill in Pond 4, Excess TV in Ponds 3&5
	East	FDOT Ditch	73+21	89+73	1651.92		0.00	0.00	0.00	0.00			
Alt Totals					3804.7		3.31	1.64	1.67	27.12	14.02	17.00	
3 SPUI	Canal	Lake Ida Canal	51+68	65+77	1408.88	6.57	1.24	0.00	1.24	7.81	1.64	0.00	
	INT	FDOT Ditch	65+77	73+21	743.87	18.88	3.46	2.30	1.16	20.04	13.08	21.32	Fill in all existing ponds in interchange
Alt Totals					2152.8		4.70	2.30	2.40	27.85	14.73	21.32	

Notes

1

2

3

FDOT

I-95 & Woolbright

Comp. By:
Date:
Chk. By:
Job No:

POND SIZING CALCULATIONS

Basin: Canal
Added Impervious Area (ac): 1.30

Water Quantity Calculations

Description	Soil Group	C Value	Curve Number	Area ac	C*A	CN*A
Impervious		0.95	98	**1.30**	1.24	127.4
Open, Good	A	0.20	39	**0.00**	0.00	0
	Composites:	**0.95**	**98**	1.30	1.24	127.4

SCS Curve Number Method with antecedent moisture condition II:

$Q = (P - 0.2*S)^2 / (P + 0.8*S)$ Q = Runoff, inches

P_{SJRWMD} = Rainfall volume, inches, from the 24 hour/25 year = 8.62

S = Storage volume on and within soils after saturation = $(1000/CN_C) - 10$

Spost = 0.20 inches

Qpost = 8.38 inches

Runoff Volume, V = (Q)(A)

Vpost= 0.91 (ac-ft)

Water Quality Calculations

2.5 inch * Impervious Area in (ac-ft)	0.27	(ac-ft)
150% Treatment Volume	0.41	
50% Dry Retention Credit	0.20	
TOTAL	0.20	
EXISTING TV	0.07	
Total Water Quality Volume Required (ac-ft) :	0.28	

Pond Sizing

Attenuation Volume Required (ac-ft) : 0.91

Total Water Quality Volume Required (ac-ft) : 0.28

Depth to SHWT: -

Assume a rectangular box pond with length to width ratio = 2:1

V * 43560 = (L * 0.5 L * H)

where: V = Total Storage Volume required (ac-ft)
L = pond length (ft)
W = pond width (ft) = 0.5 L
H = Max.pond volume height (ft) = Maximum treatment Volume + Attenuation & Freeboard

H1 =	1	feet	H1 = Maximum treatment Volume
H2 =	1	feet	H2 = Maximum Attenuation
H3 =	1	feet	H3 = Maximum Freeboard
H_{tot} =	3	feet	H = Maximum pond height (ft)

Required Area at NWL to contain Water Quality Volume in 1 foot of depth: $A_{WQ} = \frac{V_{WQ}}{H1}$ **0.28 acres**

Required Area at NWL to contain Attenuation Volume in 2 feet of depth: $A_{att} = \frac{V_{ATT}}{H1 + H2}$ **0.45 acres** **REQ. AREA @ NWL**

A_{NWL}= 0.45 **34.92%** **of added impervious area** Provided in current pond sites

L=	199	feet	
W =	99	feet	
Area =	0.45	Ac.	**At Normal Water Level**

Account for treatment volume at 2 * H1 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	207	feet	
W =	107	feet	
Area =	0.51	Ac.	**At Treatment Volume Elevation**

Account for attenuation at 2 * H2 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	215	feet	
W =	115	feet	
Area =	0.57	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for freeboard at 2 * H3 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	223	feet	
W =	123	feet	
Area =	0.63	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for 15' maintenance berm by adding: 2 * width of berm = 30 feet

L=	245	feet	
and W =	145	feet	
and: Area =	0.82	Ac.	**At Outside Top of Maintenance Berm**

Stage-Area Summary Table:

Stage	Area (ac)	Volume (ac-ft)
Bottom	0.45	0.00
TV	0.51	0.48
Attenuation	0.57	1.02
TOB	0.82	1.72

FDOT

I-95 & Woolbright

Comp. By:
Date:
Chk. By:
Job No:

POND SIZING CALCULATIONS

Basin No: Interchange
Added Impervious Area (ac): 1.08

Water Quantity Calculations

Description	Soil Group	C Value	Curve Number	Area ac	C*A	CN*A
Impervious		0.95	98	**1.08**	1.03	105.84
Open, Good	A	0.20	39	**0.00**	0.00	0
	Composites:	**0.95**	**98**	1.08	1.03	105.84

SCS Curve Number Method with antecedent moisture condition II:

$Q = (P - 0.2*S)^2 / (P + 0.8*S)$ Q = Runoff, inches

P_{SJRWMD} = Rainfall volume, inches, from the 24 hour/25 year = 8.62

S = Storage volume on and within soils after saturation = $(1000/CN_C) - 10$

Spost = 0.20 inches

Qpost = 8.38 inches

SJRWMD 100-240 Attenuation Volume Reqd.:

Runoff Volume, V = (Q)(A)

Vpost= 0.75

0.75 (ac-ft)

Water Quality Calculations

2.5 inch * Impervious Area in (ac-ft)	0.23	(ac-ft)
150% Treatment Volume	0.34	
50% Dry Retention Credit	0.17	
TOTAL	0.17	
EXISTING TV	3.85	
Total Water Quality Volume Required (ac-ft) :	4.02	

Pond Sizing

Attenuation Volume Required (ac-ft) : 0.75

Total Water Quality Volume Required (ac-ft) : 4.02

Depth to SHWT: -

Assume a rectangular box pond with length to width ratio = 2:1

V * 43560 = (L * 0.5 L * H)

where: V = Total Storage Volume required (ac-ft)
L = pond length (ft)
W = pond width (ft) = 0.5 L
H = Max.pond volume height (ft) = Maximum treatment Volume + Attenuation & Freeboard

H1 =	1	feet	H1 = Maximum treatment Volume
H2 =	1	feet	H2 = Maximum Attenuation
H3 =	1	feet	H3 = Maximum Freeboard
H_{tot} =	3	feet	H = Maximum pond height (ft)

Required bottom area to contain Water Quality Volume in 1 foot of depth: $A_{WQ} = \frac{V_{WQ}}{H1}$ **4.02 acres** REQUIRED AREA @ NWL

Required Area at NWL to contain Attenuation Volume in 2 feet of depth: $A_{att} = \frac{V_{ATT}}{H1 + H2}$ **0.38 acres**

A_{NWL}= 4.02 **372.11%** **of added impervious area**

L=	592	feet	
W =	296	feet	
Area =	4.02	Ac.	**At Normal Water Level**

Account for treatment volume at 2 * H1 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	600	feet	
W =	304	feet	
Area =	4.18	Ac.	**At Treatment Volume Elevation**

Account for attenuation at 2 * H2 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	608	feet	
W =	312	feet	
Area =	4.35	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for freeboard at 2 * H3 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	616	feet	
W =	320	feet	
Area =	4.52	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for 15' maintenance berm by adding: 2 * width of berm = 30 feet

L=	638	feet	
and W =	342	feet	
and: Area =	5.00	Ac.	**At Outside Top of Maintenance Berm**

Stage-Area Summary Table:

Stage	Area (ac)	Volume (ac-ft)
Bottom	**4.02**	**0.00**
TV	**4.18**	**4.10**
Attenuation	**4.35**	**8.37**
TOB	**5.00**	**13.05**

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT IV
I-95 / WOOLBRIGHT ROAD INTERCHANGE OPERATIONAL IMPROVEMENTS

TREATMENT VOLUME SUMMARY -- Alternative 1

BASIN No.	TOTAL AREA (Ac)	ADDED IMPERVIOUS AREA (Ac)	% NEW IMPERVIOUS AREA	SYSTEM TYPE	TREATMENT VOLUME REQUIRED PER ADDITIONAL IMPERVIOUS AREA (Ac-ft)	150% IMPAIRED BASIN CRITERIA (Ac-ft)	PRE-DEVELOPMENT TREATMENT VOLUME TO BE MAINTAINED (Ac-ft)	TOTAL TREATMENT VOLUME REQUIRED (Ac-ft)	POST DEVELOPMENT TREATMENT VOLUME PROVIDED (Ac-ft)	TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)
1	11.39	1.3	11.41%	NA	0.27	0.41	0.07	0.48	0.63	131.46%
2	11.94	0.51	4.27%	DD	0.11	0.16	0.58	0.74	2.01	270.46%
3	9.64	0.11	1.19%	DD	0.02	0.04	0.59	0.62	0.62	99.62%
4	6.31	0.10	1.60%	DD	0.02	0.03	0.62	0.65	1.11	169.40%
5	9.56	0.36	3.75%	DD	0.07	0.11	2.06	2.17	4.03	185.64%
TOTAL	**48.84**	**2.38**	**4.88%**		**0.50**	**0.74**	**3.92**	**4.67**	**8.39**	**179.82%**

Treatment Value Provided in Exfiltration Trench
Values obtained from Woolbright Widening Permit

FDOT

I-95 & Woolbright

Comp. By:
Date:
Chk. By:
Job No:

POND SIZING CALCULATIONS

Basin: Canal
Added Impervious Area (ac): 0.74

Water Quantity Calculations

Description	Soil Group	C Value	Curve Number	Area ac	C*A	CN*A
Impervious		0.95	98	**0.74**	0.70	72.52
Open, Good	A	0.20	39	**0.00**	0.00	0
	Composites:	**0.95**	**98**	0.74	0.70	72.52

SCS Curve Number Method with antecedent moisture condition II:

$Q = (P - 0.2*S)^2 / (P + 0.8*S)$ Q = Runoff, inches

P_{SJRWMD} = Rainfall volume, inches, from the 24 hour/25 year = 8.62

S = Storage volume on and within soils after saturation = $(1000/CN_C) - 10$

Spost = 0.20 inches

Qpost = 8.38 inches

Runoff Volume, V = (Q)(A)

Vpost= 0.52 (ac-ft)

Water Quality Calculations

2.5 inch * Impervious Area in (ac-ft)	0.15	(ac-ft)
150% Treatment Volume	0.23	
50% Dry Retention Credit	0.12	
TOTAL	0.12	
EXISTING TV	0.07	
Total Water Quality Volume Required (ac-ft) :	0.19	

Pond Sizing

Attenuation Volume Required (ac-ft) : 0.52

Total Water Quality Volume Required (ac-ft) : 0.19

Depth to SHWT: -

Assume a rectangular box pond with length to width ratio = 2:1

$V * 43560 = (L * 0.5\ L * H)$

where: V = Total Storage Volume required (ac-ft)
L = pond length (ft)
W = pond width (ft) = 0.5 L
H = Max.pond volume height (ft) = Maximum treatment Volume + Attenuation & Freeboard

H1 =	1	feet	H1 = Maximum treatment Volume
H2 =	1	feet	H2 = Maximum Attenuation
H3 =	1	feet	H3 = Maximum Freeboard
H_{tot} =	3	feet	H = Maximum pond height (ft)

Required Area at NWL to contain Water Quality Volume in 1 foot of depth: $A_{WQ} = \frac{V_{WQ}}{H1}$ **0.19 acres**

Required Area at NWL to contain Attenuation Volume in 2 feet of depth: $A_{att} = \frac{V_{ATT}}{H1 + H2}$ **0.26 acres** **REQ. AREA @ NWL**

A_{NWL}= 0.26 **34.92% of added impervious area** Provided in current pond sites

L=	150	feet	
W =	75	feet	
Area =	0.26	Ac.	**At Normal Water Level**

Account for treatment volume at 2 * H1 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	158	feet	
W =	83	feet	
Area =	0.30	Ac.	**At Treatment Volume Elevation**

Account for attenuation at 2 * H2 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	166	feet	
W =	91	feet	
Area =	0.35	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for freeboard at 2 * H3 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	174	feet	
W =	99	feet	
Area =	0.40	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for 15' maintenance berm by adding: 2 * width of berm = 30 feet

L=	196	feet	
and W =	121	feet	
and: Area =	0.54	Ac.	**At Outside Top of Maintenance Berm**

Stage-Area Summary Table:

Stage	Area (ac)	Volume (ac-ft)
Bottom	**0.26**	**0.00**
TV	**0.30**	**0.28**
Attenuation	**0.35**	**0.60**
TOB	**0.54**	**1.05**

FDOT

I-95 & Woolbright

Comp. By:
Date:
Chk. By:
Job No:

POND SIZING CALCULATIONS

Basin No: Interchange
Added Impervious Area (ac): 0.93

Water Quantity Calculations

Description	Soil Group	C Value	Curve Number	Area ac	C*A	CN*A
Impervious		0.95	98	**0.93**	0.88	91.14
Open, Good	A	0.20	39	**0.00**	0.00	0
	Composites:	**0.95**	**98**	0.93	0.88	91.14

SCS Curve Number Method with antecedent moisture condition II:

$Q = (P - 0.2*S)^2 / (P + 0.8*S)$ Q = Runoff, inches

P_{SJRWMD} = Rainfall volume, inches, from the 24 hour/25 year = 8.62

S = Storage volume on and within soils after saturation = $(1000/CN_C) - 10$

Spost = 0.20 inches

Qpost = 8.38 inches

SJRWMD 100-240 Attenuation Volume Reqd.:

Runoff Volume, V = (Q)(A)

Vpost= 0.65

0.65 (ac-ft)

Water Quality Calculations

2.5 inch * Impervious Area in (ac-ft)	0.19	(ac-ft)
150% Treatment Volume	0.29	
50% Dry Retention Credit	0.15	
TOTAL	0.15	
EXISTING TV	3.85	
Total Water Quality Volume Required (ac-ft) :	4.00	

Pond Sizing

Attenuation Volume Required (ac-ft) : 0.65

Total Water Quality Volume Required (ac-ft) : 4.00

Depth to SHWT: -

Assume a rectangular box pond with length to width ratio = 2:1

V * 43560 = (L * 0.5 L * H)

where: V = Total Storage Volume required (ac-ft)

L = pond length (ft)

W = pond width (ft) = 0.5 L

H = Max.pond volume height (ft) = Maximum treatment Volume + Attenuation & Freeboard

H1 =	1	feet	H1 = Maximum treatment Volume
H2 =	1	feet	H2 = Maximum Attenuation
H3 =	1	feet	H3 = Maximum Freeboard
H_{tot} =	3	feet	H = Maximum pond height (ft)

Required bottom area to contain Water Quality Volume in 1 foot of depth: $A_{WQ} = \frac{V_{WQ}}{H1}$ **4.00 acres** REQUIRED AREA @ NWL

Required Area at NWL to contain Attenuation Volume in 2 feet of depth: $A_{att} = \frac{V_{ATT}}{H1 + H2}$ **0.32 acres**

A_{NWL}= 4.00 **429.60% of added impervious area** Provided in current pond sites

L=	590	feet	
W =	295	feet	
Area =	4.00	Ac.	**At Normal Water Level**

Account for treatment volume at 2 * H1 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	598	feet	
W =	303	feet	
Area =	4.16	Ac.	**At Treatment Volume Elevation**

Account for attenuation at 2 * H2 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	606	feet	
W =	311	feet	
Area =	4.33	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for freeboard at 2 * H3 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	614	feet	
W =	319	feet	
Area =	4.50	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for 15' maintenance berm by adding: 2 * width of berm = 30 feet

L=	636	feet	
and W =	341	feet	
and: Area =	4.98	Ac.	**At Outside Top of Maintenance Berm**

Stage-Area Summary Table:

Stage	Area (ac)	Volume (ac-ft)
Bottom	**4.00**	**0.00**
TV	**4.16**	**4.08**
Attenuation	**4.33**	**8.32**
TOB	**4.98**	**12.97**

FDOT

I-95 & Woolbright

Comp. By:
Date:
Chk. By:
Job No:

POND SIZING CALCULATIONS

Basin No: Interchange
Added Impervious Area (ac): 1.16
Existing iMP
Total IMP

Water Quantity Calculations

Description	Soil Group	C Value	Curve Number	Area ac	C*A	CN*A
Impervious		0.95	98	**1.16**	1.10	113.68
Open, Good	A	0.20	39	**0.00**	0.00	0
	Composites:	**0.95**	**98**	1.16	1.10	113.68

SCS Curve Number Method with antecedent moisture condition II:

$Q = (P - 0.2*S)^2 / (P + 0.8*S)$ Q = Runoff, inches

P_{SJRWMD} = Rainfall volume, inches, from the 24 hour/25 year = 8.62

S = Storage volume on and within soils after saturation = $(1000/CN_C) - 10$

Spost = 0.20 inches

Qpost = 8.38 inches

SJRWMD 100-240 Attenuation Volume Reqd.: ***BASE ON TOTAL IMPERVIOUS*

Runoff Volume, V = (Q)(A)

Vpost= 0.81

0.81 (ac-ft)

Water Quality Calculations

2.5 inch * Impervious Area in (ac-ft) 0.24 (ac-ft)
150% Treatment Volume 0.36
50% Dry Retention Credit 0.18

TOTAL **0.18**

EXISTING TV 3.85
Total Water Quality Volume Required (ac-ft) : **4.03**

Pond Sizing

Attenuation Volume Required (ac-ft) : 0.81

Total Water Quality Volume Required (ac-ft) : 4.03

Depth to SHWT: -

Assume a rectangular box pond with length to width ratio = 2:1

V * 43560 = (L * 0.5 L * H)

where: V = Total Storage Volume required (ac-ft)
L = pond length (ft)
W = pond width (ft) = 0.5 L
H = Max.pond volume height (ft) = Maximum treatment Volume + Attenuation & Freeboard

H1 =	1	feet	H1 = Maximum treatment Volume
H2 =	1	feet	H2 = Maximum Attenuation
H3 =	1	feet	H3 = Maximum Freeboard
H_{tot} =	3	feet	H = Maximum pond height (ft)

Required bottom area to contain Water Quality Volume in 1 foot of depth: $A_{WQ} = \frac{V_{WQ}}{H1}$ **4.03 acres** REQUIRED AREA @ NWL

Required Area at NWL to contain Attenuation Volume in 2 feet of depth: $A_{att} = \frac{V_{ATT}}{H1 + H2}$ **0.41 acres**

A_{NWL}= 4.03 **347.52%** **of added impervious area** Provided in current pond sites

L=	593	feet	
W =	296	feet	
Area =	4.03	Ac.	**At Normal Water Level**

Account for treatment volume at 2 * H1 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	601	feet	
W =	304	feet	
Area =	4.20	Ac.	**At Treatment Volume Elevation**

Account for attenuation at 2 * H2 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	609	feet	
W =	312	feet	
Area =	4.36	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for freeboard at 2 * H3 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	617	feet	
W =	320	feet	
Area =	4.53	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for 15' maintenance berm by adding: 2 * width of berm = 30 feet

L=	639	feet	
and W =	342	feet	
and: Area =	5.02	Ac.	**At Outside Top of Maintenance Berm**

Stage-Area Summary Table:

Stage	Area (ac)	Volume (ac-ft)
Bottom	**4.03**	**0.00**
TV	**4.20**	**4.11**
Attenuation	**4.36**	**8.39**
TOB	**5.02**	**13.08**

FDOT

I-95 & Woolbright

Comp. By:
Date:
Chk. By:
Job No:

POND SIZING CALCULATIONS

Basin: Canal
Added Impervious Area (ac): 1.24

Water Quantity Calculations

Description	Soil Group	C Value	Curve Number	Area ac	C*A	CN*A
Impervious		0.95	98	**1.24**	1.18	121.52
Open, Good	A	0.20	39	**0.00**	0.00	0
	Composites:	**0.95**	**98**	1.24	1.18	121.52

SCS Curve Number Method with antecedent moisture condition II:

$Q = (P - 0.2*S)^2 / (P + 0.8*S)$ Q = Runoff, inches

P_{SJRWMD} = Rainfall volume, inches, from the 24 hour/25 year = 8.62

S = Storage volume on and within soils after saturation = $(1000/CN_C) - 10$

Spost = 0.20 inches

Qpost = 8.38 inches

Runoff Volume, V = (Q)(A)

Vpost= 0.87 (ac-ft)

Water Quality Calculations

2.5 inch * Impervious Area in (ac-ft)	0.26	(ac-ft)
150% Treatment Volume	0.39	
50% Dry Retention Credit	0.19	
TOTAL	0.19	
EXISTING TV	0.07	
Total Water Quality Volume Required (ac-ft) :	0.27	

Pond Sizing

Attenuation Volume Required (ac-ft) : 0.87

Total Water Quality Volume Required (ac-ft) : 0.27

Depth to SHWT: -

Assume a rectangular box pond with length to width ratio = 2:1

$V * 43560 = (L * 0.5\ L * H)$

where: V = Total Storage Volume required (ac-ft)
L = pond length (ft)
W = pond width (ft) = 0.5 L
H = Max.pond volume height (ft) = Maximum treatment Volume + Attenuation & Freeboard

H1 =	1	feet	H1 = Maximum treatment Volume
H2 =	1	feet	H2 = Maximum Attenuation
H3 =	1	feet	H3 = Maximum Freeboard
H_{tot} =	3	feet	H = Maximum pond height (ft)

Required Area at NWL to contain Water Quality Volume in 1 foot of depth: $A_{WQ} = \frac{V_{WQ}}{H1}$ **0.27 acres**

Required Area at NWL to contain Attenuation Volume in 2 feet of depth: $A_{att} = \frac{V_{ATT}}{H1 + H2}$ **0.43 acres** **REQ. AREA @ NWL**

A_{NWL}= 0.43 **34.92%** **of added impervious area** Provided in current pond sites

L=	194	feet	
W =	97	feet	
Area =	0.43	Ac.	**At Normal Water Level**

Account for treatment volume at 2 * H1 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	202	feet	
W =	105	feet	
Area =	0.49	Ac.	**At Treatment Volume Elevation**

Account for attenuation at 2 * H2 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	210	feet	
W =	113	feet	
Area =	0.55	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for freeboard at 2 * H3 * Side Slope = 8 feet
(assume 4:1 side slopes)

L=	218	feet	
W =	121	feet	
Area =	0.61	Ac.	**At Rim of Maintenance Berm (Pond TOB)**

Account for 15' maintenance berm by adding: 2 * width of berm = 30 feet

L=	240	feet	
and W =	143	feet	
and: Area =	0.79	Ac.	**At Outside Top of Maintenance Berm**

Stage-Area Summary Table:

Stage	Area (ac)	Volume (ac-ft)
Bottom	**0.43**	**0.00**
TV	**0.49**	**0.46**
Attenuation	**0.55**	**0.98**
TOB	**0.79**	**1.64**

ALT1

Pond	Reference	Stage (ft)	Area (ac)	Volume (ac-ft)
Pond 02	1' deeper	13.76	0.34	0
	Bottom	16.4	0.5	1.1088
	TV	19.7	0.75	3.1713
	TOB	23	1.04	**6.1248**
Pond 03	6" deeper	12.3	0.63	0
	Bottom	12.8	0.68	0.3275
	TV	15.1	0.78	2.0065
	TOB	17	1.12	**3.8115**
Pond 04	Bottom	13.78	0.07	0
	TV	16.73	0.35	0.6195
	TOB	19.7	0.77	**2.2827**
Pond 05	2' deeper	14.4	0.9	0
	Bottom	16.4	1.03	1.93
	TV	18.2	1.3	4.027
	TOB	21	1.62	**8.115**
			TOTAL TV	9.82
			TOTAL VOLUME	20.33

ALT 2

Pond	Reference	Stage (ft)	Area (ac)	Volume (ac-ft)
Pond II	2' deeper	12.26	0.3364	0
	Bottom	14.76	0.4884	1.031
	TV	16.4	0.6014	1.924636
	TOB	23	1.17	**7.770256**
Pond III	2' deeper	10.8	0.3604	0
	Bottom	12.8	0.5381	0.8985
	TV	15.1	0.7717	2.40477
	TOB	17	0.9742	**4.063375**
Pond V	2' deeper	15.9	0.787	0
	Bottom	16.4	0.8304	0.40435
	TV	18.2	0.9894	2.04217
	TOB	21	1.2451	**5.17047**
			TOTAL TV	6.37
			TOTAL VOLUME	17.00

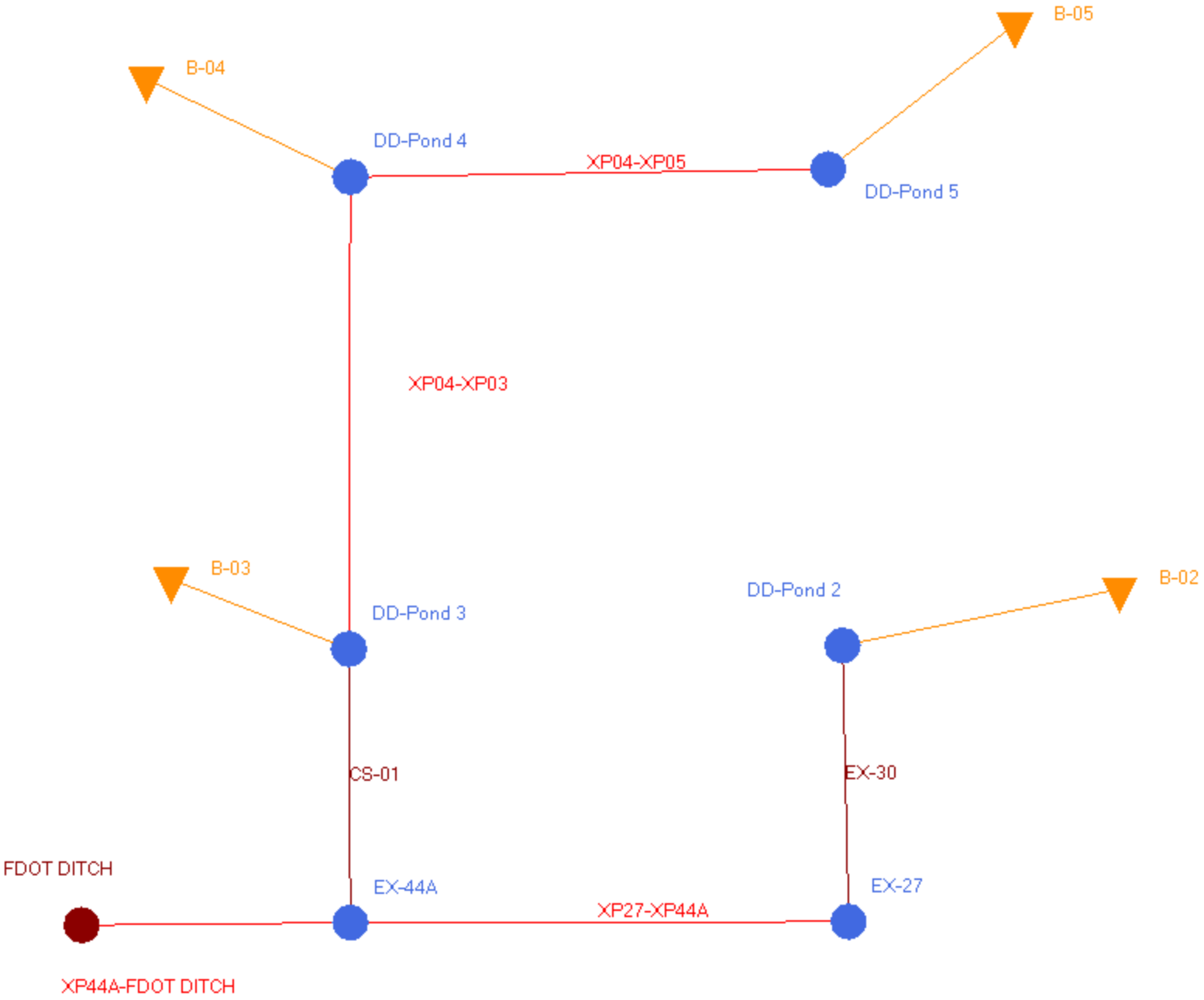
ALT3

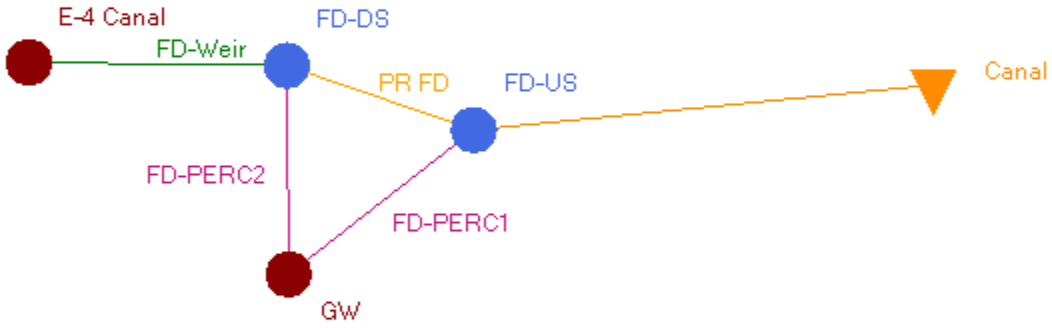
Pond	Reference	Stage (ft)	Area (ac)	Volume (ac-ft)
Pond IV	Bottom	13.78	0.26	0
	TOB	16.73	0.39	**0.95875**
Pond IIa	Bottom	14.76	0.47	0
	TOB	19.7	0.8	**3.1369**
Pond IIb	Bottom	14.76	0.22	0
	TOB	19.7	0.5	**1.7784**
Pond III	Bottom	12.8	1.33	0
	TOB	17	1.95	**6.888**
Pond V	Bottom	16.4	1.5	0
	TOB	21	2.22	**8.556**
			TOTAL TV	21.32
			TOTAL VOLUME	21.32

Woolbright Existing CN's							
Basin	**Total Area (Ac)**	**Impervious (Ac)**	**Pervious (Ac)**	**CN Impervious**	***CN Pervious**	**CN Composite**	**%IMP**
Canal	11.39	6.39	5	98	61	81.8	56.10%
2	11.94	6.49	5.45	98	61	81.1	54.36%
3	9.64	4.92	4.72	98	61	79.9	51.04%
4	6.31	3.26	3.06	98	61	80.2	51.66%
5	9.56	4.21	5.35	98	61	77.3	44.04%
Totals	48.84	25.27	23.58				

Woolbright Proposed CN's -- Alternative 1									
Basin	**Total Area (Ac)**	**Impervious (Ac)**	**Added Impervious (Ac)**	**total Impervious (Ac)**	**Pervious (Ac)**	**CN Impervious**	***CN Pervious**	**CN Composite**	**%IMP**
Canal	11.39	6.39	1.3	7.69	3.7	98	61	86.0	67.52%
2	11.94	6.49	0.51	7	4.94	98	61	82.7	58.63%
3	9.64	4.92	0.1145	5.0345	4.6055	98	61	80.3	52.23%
4	6.31	3.26	0.1009	3.3609	2.9491	98	61	80.7	53.26%
5	9.56	4.21	0.3585	4.5685	4.9915	98	61	78.7	47.79%
Totals	48.84	25.27	2.3839	27.6539					

*Pervious CN from permit.


B-05
B-04
DD-Pond 4
XP04-XP05
DD-Pond 5
XP04-XP03
B-03
DD-Pond 3
DD-Pond 2
B-02
CS-01
EX-30
FDOT DITCH
EX-44A
XP27-XP44A
EX-27
XP44A-FDOT DITCH


E-4 Canal
FD-DS
FD-Weir
PR FD
FD-US
Canal
FD-PERC2
FD-PERC1
GW

Simulation: 0101YR-01HR

Scenario: 1-Permitted
Run Date/Time: 7/22/2020 2:36:19 PM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	2.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

Dflt Damping (2D): 0.0050 ft
Min Node Srf Area (2D): 100 ft2
Energy Switch (2D): Energy

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False

Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ~FDOT-1
Rainfall Amount: 3.60 in
Storm Duration: 1.0000 hr

Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 010YR-08HR

Scenario: 1-Permitted
Run Date/Time: 7/22/2020 2:36:22 PM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]

Start Time:	0	0	0	0.0000
End Time:	0	0	0	12.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FDOT-8
		Rainfall Amount:	6.60 in
Edge Length Option:	Automatic	Storm Duration:	8.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 010YR-24Hr

Scenario: 1-Permitted
Run Date/Time: 7/22/2020 2:36:32 PM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

Dflt Damping (2D): 0.0050 ft
Min Node Srf Area (2D): 100 ft2
Energy Switch (2D): Energy

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False

Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ~FDOT-24
Rainfall Amount: 9.00 in
Storm Duration: 24.0000 hr

Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 025YR-72HR

Scenario: 1-Permitted
Run Date/Time: 7/22/2020 2:36:50 PM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	14.00 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 100YR-72HR

Scenario: 1-Permitted
Run Date/Time: 7/22/2020 2:37:44 PM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	17.50 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 010YR-01HR

Scenario: 3-PR ALT 1
Run Date/Time: 7/24/2020 8:28:09 AM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	2.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FDOT-1
		Rainfall Amount:	3.60 in
Edge Length Option:	Automatic	Storm Duration:	1.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 010YR-08HR

Scenario: 3-PR ALT 1
Run Date/Time: 7/24/2020 8:28:11 AM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	12.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr

Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FDOT-8
		Rainfall Amount:	6.60 in
Edge Length Option:	Automatic	Storm Duration:	8.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 010YR-24Hr

Scenario: 3-PR ALT 1
Run Date/Time: 7/24/2020 8:28:17 AM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FDOT-24
		Rainfall Amount:	9.00 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft

Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 025YR-72HR

Scenario: 3-PR ALT 1
Run Date/Time: 7/24/2020 8:28:30 AM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	14.00 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 100YR-72HR

Scenario: 3-PR ALT 1

Run Date/Time: 7/24/2020 8:29:10 AM
Program Version: ICPR4 4.07.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

Dflt Damping (2D): 0.0050 ft
Min Node Srf Area (2D): 100 ft2
Energy Switch (2D): Energy

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False

Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ~SFWMD-72
Rainfall Amount: 17.50 in
Storm Duration: 72.0000 hr

Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Node: DD-Pond 2

Scenario: 1-Permitted
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 14.76 ft
Warning Stage: 23.00 ft

Stage [ft]	Area [ac]	Area [ft2]
14.76	0.2530	11021
16.40	0.3550	15464
19.70	0.6580	28662

Stage [ft]	Area [ac]	Area [ft2]
23.00	1.0970	47785

Comment:

Node Max Conditions [1-Permitted]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
DD-Pond 2	0101YR-01HR	23.00	17.77	-0.0010	38.09	15.35	20931
DD-Pond 2	010YR-08HR	23.00	18.28	0.0010	27.69	17.83	22988
DD-Pond 2	010YR-24Hr	23.00	16.71	0.0009	9.42	9.35	16696
DD-Pond 2	025YR-72HR	23.00	20.65	0.0010	70.52	22.33	34170
DD-Pond 2	100YR-72HR	23.00	21.79	0.0010	89.48	24.15	40766

Node: DD-Pond 3

Scenario: 1-Permitted
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 12.80 ft
Warning Stage: 17.00 ft

Stage [ft]	Area [ac]	Area [ft2]
12.80	0.6400	27878
15.10	0.8690	37854
17.00	1.0600	46174

Comment:

Node Max Conditions [1-Permitted]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
DD-Pond 3	0101YR-01HR	17.00	14.97	0.0010	29.54	0.19	37599
DD-Pond 3	010YR-08HR	17.00	15.75	0.0010	30.35	17.91	40841
DD-Pond 3	010YR-24Hr	17.00	15.55	0.0010	12.03	11.20	40041
DD-Pond 3	025YR-72HR	17.00	18.15	0.0010	84.25	35.14	46181
DD-Pond 3	100YR-72HR	17.00	18.94	0.0010	97.90	38.66	46181

Node: DD-Pond 4

Scenario: 1-Permitted
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 13.78 ft
Warning Stage: 19.70 ft

Stage [ft]	Area [ac]	Area [ft2]
13.78	0.0700	3049
14.76	0.1250	5445
16.73	0.3520	15333
19.70	0.7700	33541

Comment:

Node Max Conditions [1-Permitted]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
DD-Pond 4	0101YR-01HR	19.70	17.23	0.0010	19.33	3.95	18851
DD-Pond 4	010YR-08HR	19.70	17.64	0.0010	14.36	10.02	21383
DD-Pond 4	010YR-24Hr	19.70	17.38	0.0010	5.96	5.85	19873
DD-Pond 4	025YR-72HR	19.70	19.38	0.0009	50.90	28.67	31562
DD-Pond 4	100YR-72HR	19.70	20.18	-0.0010	60.23	29.21	33553

Node: DD-Pond 5

Scenario: 1-Permitted
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 16.40 ft
Warning Stage: 21.00 ft

Stage [ft]	Area [ac]	Area [ft2]
16.40	1.2400	54014
18.20	1.6700	72745
21.00	1.5990	69652

Comment:

Node Max Conditions [1-Permitted]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
DD-Pond 5	0101YR-01HR	21.00	17.47	0.0005	26.20	0.00	51510
DD-Pond 5	010YR-08HR	21.00	18.71	0.0010	20.60	2.19	57513
DD-Pond 5	010YR-24Hr	21.00	18.84	0.0010	7.12	3.37	58218
DD-Pond 5	025YR-72HR	21.00	20.35	0.0006	55.21	14.69	66174
DD-Pond 5	100YR-72HR	21.00	21.08	0.0009	70.52	15.73	69657

Node: E-4 Canal

Scenario: 1-Permitted
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 9.26 ft
Warning Stage: 10.26 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	9.26
0	0	0	999.0000	9.26

Comment:

Node Max Conditions [1-Permitted]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
E-4 Canal	0101YR-01HR	10.26	9.26	0.0000	37.30	0.00	0
E-4 Canal	010YR-08HR	10.26	9.26	0.0000	26.73	0.00	0
E-4 Canal	010YR-24Hr	10.26	9.26	0.0000	9.07	0.00	0
E-4 Canal	025YR-72HR	10.26	9.26	0.0000	67.50	0.00	0
E-4 Canal	100YR-72HR	10.26	9.26	0.0000	85.57	0.00	0

Node: EX-27

Scenario: 1-Permitted
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 9.90 ft
Warning Stage: 16.36 ft

Stage [ft]	Area [ac]	Area [ft2]
9.90	0.0003	13
16.36	0.0003	13

Comment:

Node Max Conditions [1-Permitted]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
EX-27	0101YR-01HR	16.36	14.74	0.0024	15.35	15.35	342
EX-27	010YR-08HR	16.36	15.24	0.0024	17.83	17.80	342
EX-27	010YR-24Hr	16.36	14.65	0.0024	9.35	9.45	340
EX-27	025YR-72HR	16.36	16.59	0.0024	22.33	22.36	340
EX-27	100YR-72HR	16.36	17.03	0.0024	24.15	24.22	339

Node: EX-44A

Scenario: 1-Permitted
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 11.22 ft
Warning Stage: 16.44 ft

Stage [ft]	Area [ac]	Area [ft2]
11.22	0.0003	13
16.44	0.0003	13

Comment:

Node Max Conditions [1-Permitted]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
EX-44A	0101YR-01HR	16.44	14.45	0.0109	30.29	15.40	715
EX-44A	010YR-08HR	16.44	15.03	0.0109	35.46	35.45	715
EX-44A	010YR-24Hr	16.44	14.56	0.0109	30.29	20.43	715
EX-44A	025YR-72HR	16.44	16.18	0.0109	57.42	57.34	715
EX-44A	100YR-72HR	16.44	16.55	0.0109	62.87	62.79	715

Node: FDOT DITCH

Scenario: 1-Permitted
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 14.32 ft
Warning Stage: 15.75 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	14.32
0	0	0	999.0000	14.32

Comment:

Node Max Conditions [1-Permitted]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT DITCH	0101YR-01HR	15.75	14.32	0.0000	15.40	30.29	0
FDOT DITCH	010YR-08HR	15.75	14.32	0.0000	35.45	30.29	0
FDOT DITCH	010YR-24Hr	15.75	14.32	0.0000	20.43	30.29	0
FDOT DITCH	025YR-72HR	15.75	14.32	0.0000	57.34	30.29	0
FDOT DITCH	100YR-72HR	15.75	14.32	0.0000	62.79	30.29	0

Node: DD-Pond 2

Scenario: 3-PR ALT 1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 13.76 ft
Warning Stage: 23.00 ft

Stage [ft]	Area [ac]	Area [ft2]
13.76	0.3400	14810
16.40	0.5000	21780
19.70	0.7500	32670
23.00	1.0400	45302

Comment: lowered bottom 1' to add retention.
Revised areas based on topo, and 3:1 side slope

ESHW = 8.0

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
DD-Pond 2	010YR-01HR	23.00	17.63	0.0010	40.45	2.68	25835
DD-Pond 2	010YR-08HR	23.00	19.17	0.0010	28.45	10.76	30905
DD-Pond 2	010YR-24Hr	23.00	18.66	0.0010	9.62	5.99	29229
DD-Pond 2	025YR-72HR	23.00	21.37	-0.0010	71.08	24.15	39044
DD-Pond 2	100YR-72HR	23.00	22.53	-0.0010	89.98	25.88	43517

Node: DD-Pond 3

Scenario: 3-PR ALT 1

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 12.30 ft
Warning Stage: 17.00 ft

Stage [ft]	Area [ac]	Area [ft2]
12.30	0.6300	27443
15.10	0.7800	33977
17.00	1.1200	48787

Comment: lowered bottom 6" to add retention.
Revised areas based on topo

ESHW = 8.0

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
DD-Pond 3	010YR-01HR	17.00	14.71	0.0006	30.06	0.15	33403
DD-Pond 3	010YR-08HR	17.00	15.73	0.0010	30.90	17.62	39021
DD-Pond 3	010YR-24Hr	17.00	15.55	0.0010	12.13	11.20	37717
DD-Pond 3	025YR-72HR	17.00	17.94	-0.0010	82.35	33.25	48794
DD-Pond 3	100YR-72HR	17.00	18.77	-0.0010	98.39	37.13	48794

Node: DD-Pond 4

Scenario: 3-PR ALT 1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 13.78 ft
Warning Stage: 19.70 ft

Stage [ft]	Area [ac]	Area [ft2]
13.78	0.0700	3049
14.76	0.1250	5445
16.73	0.3520	15333
19.70	0.7700	33541

Comment: no retention in 4

ESHW = 8.0

Low edge of pavement = 17.7

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
DD-Pond 4	010YR-01HR	19.70	17.26	0.0009	19.81	4.29	19026
DD-Pond 4	010YR-08HR	19.70	17.65	0.0008	14.52	10.32	21487
DD-Pond 4	010YR-24Hr	19.70	17.29	0.0008	4.95	4.66	19213
DD-Pond 4	025YR-72HR	19.70	18.90	-0.0006	40.61	25.71	28644
DD-Pond 4	100YR-72HR	19.70	19.94	-0.0008	59.59	27.76	33553

Node: DD-Pond 5

Scenario: 3-PR ALT 1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 14.40 ft
Warning Stage: 21.00 ft

Stage [ft]	Area [ac]	Area [ft2]
14.40	0.9000	39204
18.20	1.3000	56628
21.00	1.6200	70567

Comment: lowered bottom 2' to add retention.
Revised areas based on topo

ESHW = 8.0

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
DD-Pond 5	010YR-01HR	21.00	15.73	0.0003	27.75	0.00	45308
DD-Pond 5	010YR-08HR	21.00	17.53	0.0010	21.19	0.00	53556
DD-Pond 5	010YR-24Hr	21.00	18.60	0.0010	7.28	1.37	58828
DD-Pond 5	025YR-72HR	21.00	19.60	0.0008	55.70	12.08	63753
DD-Pond 5	100YR-72HR	21.00	20.75	0.0009	70.97	15.07	69350

Node: E-4 Canal

Scenario: 3-PR ALT 1
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 9.26 ft
Warning Stage: 10.26 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	9.26
0	0	0	999.0000	9.26

Comment: design elevaiton for E-4 from LWDD = 10.8 NGVD = 9.26 NAVD88

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
E-4 Canal	010YR-01HR	10.26	9.26	0.0000	30.49	0.00	0
E-4 Canal	010YR-08HR	10.26	9.26	0.0000	23.45	0.00	0
E-4 Canal	010YR-24Hr	10.26	9.26	0.0000	8.17	0.00	0
E-4 Canal	025YR-72HR	10.26	9.26	0.0000	51.18	0.00	0
E-4 Canal	100YR-72HR	10.26	9.26	0.0000	62.23	0.00	0

Node: EX-27

Scenario: 3-PR ALT 1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 9.90 ft
Warning Stage: 16.36 ft

Stage [ft]	Area [ac]	Area [ft2]
9.90	0.0003	13
16.36	0.0003	13

Comment:

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
EX-27	010YR-01HR	16.36	14.35	0.0024	2.68	2.69	337
EX-27	010YR-08HR	16.36	14.83	0.0024	10.76	10.83	340
EX-27	010YR-24Hr	16.36	14.52	0.0024	5.99	6.11	340
EX-27	025YR-72HR	16.36	16.65	0.0024	24.15	24.14	339
EX-27	100YR-72HR	16.36	17.11	0.0024	25.88	25.88	339

Node: EX-44A

Scenario: 3-PR ALT 1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 11.22 ft
Warning Stage: 16.44 ft

Stage [ft]	Area [ac]	Area [ft2]
11.22	0.0003	13
16.44	0.0003	13

Comment:

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
EX-44A	010YR-01HR	16.44	14.33	0.0109	30.29	3.23	715
EX-44A	010YR-08HR	16.44	14.75	0.0109	30.29	27.52	715
EX-44A	010YR-24Hr	16.44	14.47	0.0109	30.29	16.49	715
EX-44A	025YR-72HR	16.44	16.17	0.0109	57.21	57.21	715
EX-44A	100YR-72HR	16.44	16.56	0.0109	62.90	62.90	715

Node: FD-DS

Scenario: 3-PR ALT 1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 9.26 ft
Warning Stage: 0.00 ft

Comment:

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FD-DS	010YR-01HR	0.00	13.95	0.0131	35.27	34.79	3766
FD-DS	010YR-08HR	0.00	13.64	0.0010	25.14	25.12	3764
FD-DS	010YR-24Hr	0.00	12.81	0.0010	8.76	8.72	3763
FD-DS	025YR-72HR	0.00	14.77	0.0011	52.92	52.91	3764
FD-DS	100YR-72HR	0.00	15.61	0.0011	64.58	64.57	3765

Node: FD-US

Scenario: 3-PR ALT 1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 9.26 ft
Warning Stage: 0.00 ft

Comment:

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FD-US	010YR-01HR	0.00	20.66	0.0188	43.48	44.20	3770
FD-US	010YR-08HR	0.00	17.28	0.0022	28.54	28.51	3768
FD-US	010YR-24Hr	0.00	13.71	0.0010	9.53	9.45	3768
FD-US	025YR-72HR	0.00	28.66	0.0147	68.75	68.61	3769
FD-US	100YR-72HR	0.00	36.31	0.0136	86.67	86.45	3769

Node: FDOT DITCH

Scenario: 3-PR ALT 1
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 14.32 ft
Warning Stage: 15.75 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	14.32
0	0	0	999.0000	14.32

Comment: From Permit

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT DITCH	010YR-01HR	15.75	14.32	0.0000	3.23	30.29	0
FDOT DITCH	010YR-08HR	15.75	14.32	0.0000	27.52	30.29	0
FDOT DITCH	010YR-24Hr	15.75	14.32	0.0000	16.49	30.29	0
FDOT DITCH	025YR-72HR	15.75	14.32	0.0000	57.21	30.29	0
FDOT DITCH	100YR-72HR	15.75	14.32	0.0000	62.90	30.29	0

Node: GW

Scenario: 3-PR ALT 1
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 9.26 ft
Warning Stage: 12.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	9.26
0	0	0	9999.0000	9.26

Comment:

Node Max Conditions [3-PR ALT 1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
GW	010YR-01HR	12.00	9.26	0.0000	13.51	0.14	0
GW	010YR-08HR	12.00	9.26	0.0000	6.31	0.03	0
GW	010YR-24Hr	12.00	9.26	0.0000	1.74	0.02	0
GW	025YR-72HR	12.00	9.26	0.0000	17.44	2.50	0
GW	100YR-72HR	12.00	9.26	0.0000	24.24	3.82	0

Simple Basin: B-02

Scenario: 1-Permitted
Node: DD-Pond 2
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 999999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 11.9400 ac
Curve Number: 81.1
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: B-03

Scenario: 1-Permitted
Node: DD-Pond 3
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 999999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 9.6400 ac
Curve Number: 79.9
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: B-04

Scenario: 1-Permitted
Node: DD-Pond 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 999999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0

Area:	6.3100 ac
Curve Number:	80.1
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B-05

Scenario:	1-Permitted
Node:	DD-Pond 5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	9.5600 ac
Curve Number:	77.3
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: Canal

Scenario:	1-Permitted
Node:	E-4 Canal
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	11.3900 ac
Curve Number:	81.8
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment: enlarged permit basin 1 to reflect expanded project limits and discharge to E-4 canal

Simple Basin: B-02

Scenario:	3-PR ALT 1
Node:	DD-Pond 2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	11.9400 ac
Curve Number:	82.7
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B-03

Scenario:	3-PR ALT 1
Node:	DD-Pond 3
Hydrograph Method:	NRCS Unit Hydrograph

Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	9.6400 ac
Curve Number:	80.3
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B-04

Scenario:	3-PR ALT 1
Node:	DD-Pond 4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	6.3100 ac
Curve Number:	80.7
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B-05

Scenario:	3-PR ALT 1
Node:	DD-Pond 5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	9.5600 ac
Curve Number:	78.7
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: Canal

Scenario:	3-PR ALT 1
Node:	FD-US
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	11.3900 ac
Curve Number:	86.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Drop Structure Link: CS-01		Upstream Pipe		Downstream Pipe	
Scenario:	1-Permitted	Invert:	11.32 ft	Invert:	11.22 ft
From Node:	DD-Pond 3	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	EX-44A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	77.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	15.07 ft	Ref Node:	
Control Elevation:	15.07 ft	Discharge Coefficients	
Max Depth:	3.08 ft	Weir Default:	3.200
Max Width:	2.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	12.80 ft	Ref Node:	
Control Elevation:	12.80 ft	Discharge Coefficients	
Max Depth:	0.25 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [1-Permitted]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-01 - Pipe	0101YR-01HR	0.19	-0.28	0.00	0.00	0.00	0.00
CS-01 - Weir: 1	0101YR-01HR	0.00	0.00	0.00	0.00	0.00	0.00
CS-01 - Weir: 2	0101YR-01HR	0.19	-0.28	0.00	0.00	0.00	0.00
CS-01 - Pipe	010YR-08HR	17.91	-0.28	0.04	0.00	0.00	0.00
CS-01 - Weir: 1	010YR-08HR	17.74	0.00	0.03	2.58	2.58	2.58
CS-01 - Weir: 2	010YR-08HR	0.24	-0.28	0.00	0.00	0.00	0.00
CS-01 - Pipe	010YR-24Hr	11.20	-0.28	0.04	0.00	0.00	0.00
CS-01 - Weir: 1	010YR-24Hr	10.97	0.00	0.03	2.23	2.23	2.23
CS-01 - Weir: 2	010YR-24Hr	0.24	-0.28	0.01	0.00	0.00	0.00
CS-01 - Pipe	025YR-72HR	35.14	-0.28	-0.05	0.00	0.00	0.00
CS-01 - Weir: 1	025YR-72HR	34.86	0.00	-0.03	5.66	5.66	5.66
CS-01 - Weir: 2	025YR-72HR	0.28	-0.28	0.01	0.00	0.00	0.00
CS-01 - Pipe	100YR-72HR	38.66	-0.28	-0.05	0.00	0.00	0.00
CS-01 - Weir: 1	100YR-72HR	38.36	0.00	-0.03	6.23	6.23	6.23
CS-01 - Weir: 2	100YR-72HR	0.31	-0.28	-0.01	0.00	0.00	0.00

Drop Structure Link: EX-30		Upstream Pipe		Downstream Pipe	
Scenario:	1-Permitted	Invert:	13.94 ft	Invert:	13.62 ft
From Node:	DD-Pond 2	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	EX-27	Geometry: Circular		Geometry: Circular	

Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	322.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Horizontal	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	16.36 ft	Op Table:	
Control Elevation:	16.36 ft	Ref Node:	
Max Depth:	4.00 ft	Discharge Coefficients	
Max Width:	3.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component			
Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Circular	Default:	0.00 ft
Invert:	14.76 ft	Op Table:	
Control Elevation:	14.76 ft	Ref Node:	
Max Depth:	0.25 ft	Discharge Coefficients	
		Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [1-Permitted]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
EX-30 - Pipe	0101YR-01HR	15.35	0.00	-0.05	0.00	0.00	0.00
EX-30 - Weir: 1	0101YR-01HR	15.29	0.00	-0.09	1.91	1.91	1.91
EX-30 - Weir: 2	0101YR-01HR	0.30	0.00	0.01	0.00	0.00	0.00
EX-30 - Pipe	010YR-08HR	17.83	0.00	0.05	0.00	0.00	0.00
EX-30 - Weir: 1	010YR-08HR	17.76	0.00	-0.10	1.91	1.91	1.91
EX-30 - Weir: 2	010YR-08HR	0.30	0.00	-0.01	0.00	0.00	0.00
EX-30 - Pipe	010YR-24Hr	9.35	0.00	-0.02	0.00	0.00	0.00
EX-30 - Weir: 1	010YR-24Hr	9.20	0.00	-0.01	1.89	1.89	1.89
EX-30 - Weir: 2	010YR-24Hr	0.30	0.00	-0.01	0.00	0.00	0.00
EX-30 - Pipe	025YR-72HR	22.33	0.00	-0.04	0.00	0.00	0.00
EX-30 - Weir: 1	025YR-72HR	22.24	0.00	0.04	1.99	1.99	1.99
EX-30 - Weir: 2	025YR-72HR	0.30	0.00	-0.01	0.00	0.00	0.00
EX-30 - Pipe	100YR-72HR	24.15	0.00	-0.03	0.00	0.00	0.00
EX-30 - Weir: 1	100YR-72HR	24.05	0.00	-0.03	2.00	2.00	2.00
EX-30 - Weir: 2	100YR-72HR	0.30	0.00	-0.01	0.00	0.00	0.00

Pipe Link: XP04-XP03		Upstream		Downstream	
Scenario:	1-Permitted	Invert:	16.58 ft	Invert:	12.99 ft
From Node:	DD-Pond 4	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	DD-Pond 3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	285.00 ft	Op Table:		Op Table:	

FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [1-Permitted]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
XP04-XP03	0101YR-01HR	3.95	0.00	0.01	3.87	1.14	2.50
XP04-XP03	010YR-08HR	10.02	0.00	0.01	5.07	2.04	3.56
XP04-XP03	010YR-24Hr	5.85	0.00	0.01	4.32	1.19	2.76
XP04-XP03	025YR-72HR	28.67	0.00	0.02	7.46	5.84	6.65
XP04-XP03	100YR-72HR	29.21	0.00	-0.03	7.53	5.95	6.74

Pipe Link: XP04-XP05		Upstream		Downstream	
Scenario:	1-Permitted	Invert:	18.20 ft	Invert:	16.45 ft
From Node:	DD-Pond 5	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	DD-Pond 4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	223.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [1-Permitted]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
XP04-XP05	0101YR-01HR	0.00	0.00	0.00	0.00	0.00	0.00
XP04-XP05	010YR-08HR	2.19	0.00	0.00	3.43	1.96	2.68
XP04-XP05	010YR-24Hr	3.37	0.00	0.00	3.87	2.39	3.13
XP04-XP05	025YR-72HR	14.69	0.00	-0.01	6.34	4.70	5.52
XP04-XP05	100YR-72HR	15.73	0.00	-0.01	6.48	5.05	5.76

Pipe Link: XP27-XP44A		Upstream		Downstream	
Scenario:	1-Permitted	Invert:	13.49 ft	Invert:	11.42 ft
From Node:	EX-27	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	EX-44A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	231.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [1-Permitted]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
XP27-XP44A	0101YR-01HR	15.35	-2.68	-0.23	5.51	-3.29	3.84
XP27-XP44A	010YR-08HR	17.80	-2.68	-0.81	5.68	-3.29	4.04
XP27-XP44A	010YR-24Hr	9.45	-2.68	0.89	3.77	-3.29	2.55
XP27-XP44A	025YR-72HR	22.36	-2.68	-1.15	3.71	-3.29	3.16
XP27-XP44A	100YR-72HR	24.22	-2.68	1.27	3.49	3.43	3.43

Pipe Link: XP44A-FDOT DITCH		Upstream		Downstream	
Scenario:	1-Permitted	Invert:	11.22 ft	Invert:	11.32 ft
From Node:	EX-44A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	FDOT DITCH	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	113.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [1-Permitted]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
XP44A-FDOT DITCH	0101YR-01HR	15.40	-30.29	1.76	-4.29	-6.66	-5.24
XP44A-FDOT DITCH	010YR-08HR	35.45	-30.29	-1.89	5.02	-6.66	-5.24
XP44A-FDOT DITCH	010YR-24Hr	20.43	-30.29	1.92	-4.29	-6.66	-5.24
XP44A-FDOT DITCH	025YR-72HR	57.34	-30.29	2.37	8.11	8.11	8.11
XP44A-FDOT DITCH	100YR-72HR	62.79	-30.29	-2.31	8.88	8.88	8.88

Drop Structure Link: CS-01		Upstream Pipe		Downstream Pipe	
Scenario:	3-PR ALT 1	Invert:	11.32 ft	Invert:	11.22 ft
From Node:	DD-Pond 3	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	EX-44A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	77.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	15.07 ft	Ref Node:	
Control Elevation:	15.07 ft	Discharge Coefficients	
Max Depth:	3.08 ft	Weir Default:	3.200
Max Width:	2.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	12.80 ft	Ref Node:	
Control Elevation:	12.80 ft	Discharge Coefficients	
Max Depth:	0.25 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-01 - Pipe	010YR-01HR	0.15	-0.28	0.00	0.00	0.00	0.00
CS-01 - Weir: 1	010YR-01HR	0.00	0.00	0.00	0.00	0.00	0.00
CS-01 - Weir: 2	010YR-01HR	0.15	-0.28	0.00	0.00	0.00	0.00
CS-01 - Pipe	010YR-08HR	17.62	-0.28	0.02	0.00	0.00	0.00
CS-01 - Weir: 1	010YR-08HR	17.40	0.00	0.02	2.60	2.60	2.60
CS-01 - Weir: 2	010YR-08HR	0.24	-0.28	0.00	0.00	0.00	0.00
CS-01 - Pipe	010YR-24Hr	11.20	-0.28	0.03	0.00	0.00	0.00
CS-01 - Weir: 1	010YR-24Hr	10.97	0.00	0.02	2.23	2.23	2.23
CS-01 - Weir: 2	010YR-24Hr	0.24	-0.28	0.01	0.00	0.00	0.00
CS-01 - Pipe	025YR-72HR	33.25	-0.28	-0.05	0.00	0.00	0.00
CS-01 - Weir: 1	025YR-72HR	32.99	0.00	-0.05	5.36	5.36	5.36
CS-01 - Weir: 2	025YR-72HR	0.26	-0.28	0.01	0.00	0.00	0.00
CS-01 - Pipe	100YR-72HR	37.13	-0.28	-0.05	0.00	0.00	0.00
CS-01 - Weir: 1	100YR-72HR	36.83	0.00	-0.04	5.98	5.98	5.98
CS-01 - Weir: 2	100YR-72HR	0.29	-0.28	0.01	0.00	0.00	0.00

Drop Structure Link: EX-30

Scenario:	3-PR ALT 1
From Node:	DD-Pond 2
To Node:	EX-27
Link Count:	1
Flow Direction:	Both
Solution:	Combine
Increments:	0
Pipe Count:	1
Damping:	0.0000 ft
Length:	322.00 ft
FHWA Code:	0
Entr Loss Coef:	0.00
Exit Loss Coef:	1.00
Bend Loss Coef:	0.00
Bend Location:	0.00 dec
Energy Switch:	Energy

Upstream Pipe

Invert:	13.94 ft
Manning's N:	0.0130

Geometry: Circular

Max Depth:	2.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Downstream Pipe

Invert:	13.62 ft
Manning's N:	0.0130

Geometry: Circular

Max Depth:	2.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	19.00 ft
Control Elevation:	19.00 ft
Max Depth:	4.00 ft
Max Width:	3.00 ft
Fillet:	0.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment: Raised from 16.36 to 19

Weir Component

Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Circular
Invert:	14.76 ft
Control Elevation:	14.76 ft
Max Depth:	0.25 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component

Weir:	3
Weir Count:	1

Bottom Clip

Default:	0.00 ft

Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	16.36 ft
Control Elevation:	16.36 ft
Max Depth:	2.64 ft
Max Width:	0.50 ft
Fillet:	0.00 ft

Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment: added attenuation notch

Drop Structure Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
EX-30 - Pipe	010YR-01HR	2.68	0.00	0.00	0.00	0.00	0.00
EX-30 - Weir: 1	010YR-01HR	0.00	0.00	0.00	0.00	0.00	0.00
EX-30 - Weir: 2	010YR-01HR	0.39	0.00	0.00	0.00	0.00	0.00
EX-30 - Weir: 3	010YR-01HR	2.29	0.00	0.00	3.60	3.60	3.60
EX-30 - Pipe	010YR-08HR	10.76	0.00	0.01	0.00	0.00	0.00
EX-30 - Weir: 1	010YR-08HR	3.00	0.00	0.01	1.30	1.30	1.30
EX-30 - Weir: 2	010YR-08HR	0.43	0.00	0.00	0.00	0.00	0.00
EX-30 - Weir: 3	010YR-08HR	7.37	0.00	0.00	5.59	5.59	5.59
EX-30 - Pipe	010YR-24Hr	5.99	0.00	0.00	0.00	0.00	0.00
EX-30 - Weir: 1	010YR-24Hr	0.00	0.00	0.00	0.00	0.00	0.00
EX-30 - Weir: 2	010YR-24Hr	0.42	0.00	0.00	0.00	0.00	0.00
EX-30 - Weir: 3	010YR-24Hr	5.57	0.00	0.00	4.85	4.85	4.85
EX-30 - Pipe	025YR-72HR	24.15	0.00	-0.05	0.00	0.00	0.00
EX-30 - Weir: 1	025YR-72HR	21.68	0.00	-0.03	2.27	2.27	2.27
EX-30 - Weir: 2	025YR-72HR	0.44	0.00	0.00	0.00	0.00	0.00
EX-30 - Weir: 3	025YR-72HR	7.61	0.00	-0.08	5.76	5.76	5.76
EX-30 - Pipe	100YR-72HR	25.88	0.00	-0.06	0.00	0.00	0.00
EX-30 - Weir: 1	100YR-72HR	23.23	0.00	-0.03	2.29	2.29	2.29
EX-30 - Weir: 2	100YR-72HR	0.43	0.00	0.00	0.00	0.00	0.00
EX-30 - Weir: 3	100YR-72HR	7.59	0.00	-0.09	5.75	5.75	5.75

Percolation Link: FD-PERC1

Scenario:	3-PR ALT 1
From Node:	FD-US
To Node:	GW
Link Count:	1
Flow Direction:	Both
Aquifer Base Elevation:	-5.00 ft
Water Table Elevation:	9.26 ft
Annual Recharge Rate:	0 ipy
Horizontal Conductivity:	7.000 fpd
Vertical Conductivity:	3.500 fpd
Fillable Porosity:	0.250
Layer Thickness:	0.00 ft

Surface Area Option:	User Specified
Bottom Elevation:	9.50 ft
Surface Area:	0.1100 ac
Vertical Flow Termination:	Horizontal Flow Algorithm
Perimeter 1:	1750.00 ft
Perimeter 2:	1750.00 ft
Perimeter 3:	1750.00 ft
Distance P1 to P2:	50.00 ft
Distance P2 to P3:	150.00 ft
# of Cells P1 to P2:	10
# of Cells P2 to P3:	15

Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
FD-PERC1	010YR-01HR	9.22	-0.14	0.10	0.00	0.00	0.00
FD-PERC1	010YR-08HR	3.99	-0.03	0.04	0.00	0.00	0.00
FD-PERC1	010YR-24Hr	0.97	-0.02	0.02	0.00	0.00	0.00
FD-PERC1	025YR-72HR	15.69	-2.50	0.02	0.00	0.00	0.00
FD-PERC1	100YR-72HR	21.88	-3.82	0.02	0.00	0.00	0.00

Percolation Link: FD-PERC2

Scenario:	3-PR ALT 1
From Node:	FD-DS
To Node:	GW
Link Count:	1
Flow Direction:	Both
Aquifer Base Elevation:	-5.00 ft
Water Table Elevation:	9.26 ft

Surface Area Option:	User Specified
Bottom Elevation:	9.40 ft
Surface Area:	0.1100 ac
Vertical Flow Termination:	Horizontal Flow Algorithm
Perimeter 1:	1750.00 ft
Perimeter 2:	1750.00 ft
Perimeter 3:	1750.00 ft

Annual Recharge Rate:	0 ipy		
Horizontal Conductivity:	7.000 fpd	Distance P1 to P2:	50.00 ft
Vertical Conductivity:	3.500 fpd	Distance P2 to P3:	150.00 ft
Fillable Porosity:	0.250	# of Cells P1 to P2:	10
Layer Thickness:	0.00 ft	# of Cells P2 to P3:	15

Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
FD-PERC2	010YR-01HR	4.66	0.00	0.01	0.00	0.00	0.00
FD-PERC2	010YR-08HR	2.37	0.00	0.00	0.00	0.00	0.00
FD-PERC2	010YR-24Hr	1.11	0.00	0.01	0.00	0.00	0.00
FD-PERC2	025YR-72HR	1.76	-0.01	0.01	0.00	0.00	0.00
FD-PERC2	100YR-72HR	2.39	-0.10	0.01	0.00	0.00	0.00

Weir Link: FD-Weir

Scenario:	3-PR ALT 1	Bottom Clip	
From Node:	FD-DS	Default:	0.00 ft
To Node:	E-4 Canal	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	12.00 ft	Discharge Coefficients	
Control Elevation:	12.00 ft	Weir Default:	2.800
Max Depth:	2.00 ft	Weir Table:	
Max Width:	4.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
FD-Weir	010YR-01HR	30.49	0.00	0.04	3.91	3.91	3.91
FD-Weir	010YR-08HR	23.45	0.00	0.02	3.58	3.58	3.58
FD-Weir	010YR-24Hr	8.17	0.00	-0.01	2.52	2.52	2.52
FD-Weir	025YR-72HR	51.18	0.00	0.02	6.40	6.40	6.40
FD-Weir	100YR-72HR	62.23	0.00	0.02	7.78	7.78	7.78

French Drain Link: PR FD

Scenario:	3-PR ALT 1	Pipe Data	
From Node:	FD-US	Damping:	0.0000 ft
To Node:	FD-DS	FHWA Code:	0
Link Count:	1	Entr Loss Coef:	0.50
Flow Direction:	Both	Exit Loss Coef:	1.00
OF Region:		Bend Loss Coef:	0.00
GW Region:		Bend Location:	0.00 dec
Mesh Scaling Factor:	1.0	Energy Switch:	Energy
Trench Length:	1750.00 ft	Pipe Length:	2000.00 ft
Trench Width:	5.00 ft	Pipe Invert:	11.50 ft
Trench Height:	5.50 ft	Pipe Invert:	11.40 ft
Trench Depth Below Invert:	2.00 ft	Manning's N:	0.0130
Trench Gravel Porosity:	0.387	Geometry Type:	Circular
		Pipe Max Depth:	3.00 ft

Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
PR FD	010YR-01HR	35.27	0.00	0.10	4.99	7.01	5.71
PR FD	010YR-08HR	25.14	0.00	-0.01	3.56	4.95	4.00
PR FD	010YR-24Hr	8.76	0.00	-0.01	1.57	3.25	2.13
PR FD	025YR-72HR	52.92	0.00	0.05	7.49	7.49	7.49
PR FD	100YR-72HR	64.58	0.00	0.05	9.14	9.14	9.14

Pipe Link: XP04-XP03		Upstream		Downstream	
Scenario:	3-PR ALT 1	Invert:	16.58 ft	Invert:	12.99 ft

From Node:	DD-Pond 4	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	DD-Pond 3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	285.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
XP04-XP03	010YR-01HR	4.29	0.00	0.00	3.96	1.69	2.79
XP04-XP03	010YR-08HR	10.32	0.00	0.01	5.12	2.15	3.62
XP04-XP03	010YR-24Hr	4.66	0.00	0.00	4.05	0.95	2.50
XP04-XP03	025YR-72HR	25.71	0.00	-0.02	7.10	5.24	6.17
XP04-XP03	100YR-72HR	27.76	0.00	-0.03	7.35	5.66	6.50

Pipe Link: XP04-XP05		Upstream		Downstream	
Scenario:	3-PR ALT 1	Invert:	18.20 ft	Invert:	16.45 ft
From Node:	DD-Pond 5	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	DD-Pond 4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	223.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
XP04-XP05	010YR-01HR	0.00	0.00	0.00	0.00	0.00	0.00
XP04-XP05	010YR-08HR	0.00	0.00	0.00	0.00	0.00	0.00
XP04-XP05	010YR-24Hr	1.37	0.00	0.00	3.02	1.60	2.30
XP04-XP05	025YR-72HR	12.08	0.00	0.01	5.85	3.85	4.85
XP04-XP05	100YR-72HR	15.07	0.00	-0.01	6.41	4.84	5.62

Pipe Link: XP27-XP44A		Upstream		Downstream	
Scenario:	3-PR ALT 1	Invert:	13.49 ft	Invert:	11.42 ft
From Node:	EX-27	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	EX-44A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	231.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
XP27-XP44A	010YR-01HR	2.69	-2.68	-0.19	1.61	-3.29	-1.82
XP27-XP44A	010YR-08HR	10.83	-2.68	0.48	3.54	-3.29	2.53
XP27-XP44A	010YR-24Hr	6.11	-2.68	0.82	2.95	-3.29	1.91
XP27-XP44A	025YR-72HR	24.14	-2.68	0.84	3.79	3.42	3.42
XP27-XP44A	100YR-72HR	25.88	-2.68	0.83	3.89	3.66	3.66

Pipe Link: XP44A-FDOT DITCH		Upstream		Downstream	
Scenario:	3-PR ALT 1	Invert:	11.22 ft	Invert:	11.32 ft
From Node:	EX-44A	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	FDOT DITCH	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	113.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [3-PR ALT 1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
XP44A-FDOT DITCH	010YR-01HR	3.23	-30.29	1.37	-4.29	-6.66	-5.24
XP44A-FDOT DITCH	010YR-08HR	27.52	-30.29	1.79	-4.29	-6.66	-5.24
XP44A-FDOT DITCH	010YR-24Hr	16.49	-30.29	2.31	-4.29	-6.66	-5.24
XP44A-FDOT DITCH	025YR-72HR	57.21	-30.29	1.91	8.09	8.09	8.09
XP44A-FDOT DITCH	100YR-72HR	62.90	-30.29	2.25	8.90	8.90	8.90

Drop Structure Link: CS-01		Upstream Pipe		Downstream Pipe	
Scenario:	1-Permitted	Invert:	11.32 ft	Invert:	11.22 ft
From Node:	DD-Pond 3	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	EX-44A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	77.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	15.07 ft	Ref Node:	
Control Elevation:	15.07 ft	Discharge Coefficients	
Max Depth:	3.08 ft	Weir Default:	3.200
Max Width:	2.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft		

Weir Type:	Sharp Crested Vertical
Geometry Type:	Circular
Invert:	12.80 ft
Control Elevation:	12.80 ft
Max Depth:	0.25 ft

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: EX-30		Upstream Pipe		Downstream Pipe	
Scenario:	1-Permitted	Invert:	13.94 ft	Invert:	13.62 ft
From Node:	DD-Pond 2	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	EX-27	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	322.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component	
Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	16.36 ft
Control Elevation:	16.36 ft
Max Depth:	4.00 ft
Max Width:	3.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component	
Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Circular
Invert:	14.76 ft
Control Elevation:	14.76 ft
Max Depth:	0.25 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: CS-01		Upstream Pipe		Downstream Pipe	
Scenario:	3-PR ALT 1	Invert:	11.32 ft	Invert:	11.22 ft
From Node:	DD-Pond 3	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	EX-44A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	

Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	77.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	15.07 ft	Ref Node:	
Control Elevation:	15.07 ft	Discharge Coefficients	
Max Depth:	3.08 ft	Weir Default:	3.200
Max Width:	2.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	12.80 ft	Ref Node:	
Control Elevation:	12.80 ft	Discharge Coefficients	
Max Depth:	0.25 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: EX-30		Upstream Pipe		Downstream Pipe	
Scenario:	3-PR ALT 1	Invert:	13.94 ft	Invert:	13.62 ft
From Node:	DD-Pond 2	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	EX-27	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	322.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	19.00 ft	Ref Node:	
Control Elevation:	19.00 ft	Discharge Coefficients	
Max Depth:	4.00 ft	Weir Default:	3.200
Max Width:	3.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600

Orifice Table:	

Weir Comment: Raised from 16.36 to 19

Weir Component	
Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Circular
Invert:	14.76 ft
Control Elevation:	14.76 ft
Max Depth:	0.25 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component	
Weir:	3
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	16.36 ft
Control Elevation:	16.36 ft
Max Depth:	2.64 ft
Max Width:	0.50 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment: added attenuation notch

Drop Structure Comment:

French Drain Link: PR FD		Pipe Data	
Scenario:	3-PR ALT 1	Damping:	0.0000 ft
From Node:	FD-US	FHWA Code:	0
To Node:	FD-DS	Entr Loss Coef:	0.50
Link Count:	1	Exit Loss Coef:	1.00
Flow Direction:	Both	Bend Loss Coef:	0.00
OF Region:		Bend Location:	0.00 dec
GW Region:		Energy Switch:	Energy
Mesh Scaling Factor:	1.0	Pipe Length:	2000.00 ft
Trench Length:	1750.00 ft	Pipe Invert:	11.50 ft
Trench Width:	5.00 ft	Pipe Invert:	11.40 ft
Trench Height:	5.50 ft	Manning's N:	0.0130
Trench Depth Below Invert:	2.00 ft	Geometry Type:	Circular
Trench Gravel Porosity:	0.387	Pipe Max Depth:	3.00 ft

Comment:

Percolation Link: FD-PERC1			
Scenario:	3-PR ALT 1	Surface Area Option:	User Specified
From Node:	FD-US	Bottom Elevation:	9.50 ft
To Node:	GW	Surface Area:	0.1100 ac
Link Count:	1	Vertical Flow Termination:	Horizontal Flow Algorithm
Flow Direction:	Both	Perimeter 1:	1750.00 ft
Aquifer Base Elevation:	-5.00 ft	Perimeter 2:	1750.00 ft
Water Table Elevation:	9.26 ft	Perimeter 3:	1750.00 ft
Annual Recharge Rate:	0 ipy	Distance P1 to P2:	50.00 ft
Horizontal Conductivity:	7.000 fpd	Distance P2 to P3:	150.00 ft
Vertical Conductivity:	3.500 fpd	# of Cells P1 to P2:	10
Fillable Porosity:	0.250	# of Cells P2 to P3:	15
Layer Thickness:	0.00 ft		

Comment:

Percolation Link: FD-PERC2			
Scenario:	3-PR ALT 1	Surface Area Option:	User Specified
From Node:	FD-DS	Bottom Elevation:	9.40 ft

To Node:	GW		
Link Count:	1	Surface Area:	0.1100 ac
Flow Direction:	Both	Vertical Flow Termination:	Horizontal Flow Algorithm
Aquifer Base Elevation:	-5.00 ft	Perimeter 1:	1750.00 ft
Water Table Elevation:	9.26 ft	Perimeter 2:	1750.00 ft
Annual Recharge Rate:	0 ipy	Perimeter 3:	1750.00 ft
Horizontal Conductivity:	7.000 fpd	Distance P1 to P2:	50.00 ft
Vertical Conductivity:	3.500 fpd	Distance P2 to P3:	150.00 ft
Fillable Porosity:	0.250	# of Cells P1 to P2:	10
Layer Thickness:	0.00 ft	# of Cells P2 to P3:	15

Comment:

Complete Report (not including cost) Ver 4.1.0

Project: Woolbright-Alt 1
Date: 8/6/2020 8:08:20 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Interchange	Canal
Rainfall Zone	Florida Zone 5	Florida Zone 5
Annual Mean Rainfall	61.00	61.00

Pre-Condition Landuse Information

Landuse	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200
Area (acres)	37.60	11.39
Rational Coefficient (0-1)	0.44	0.48
Non DCIA Curve Number	61.00	61.00
DCIA Percent (0-100)	50.30	56.10
Nitrogen EMC (mg/l)	1.520	1.520
Phosphorus EMC (mg/l)	0.200	0.200
Runoff Volume (ac-ft/yr)	83.489	27.775
Nitrogen Loading (kg/yr)	156.471	52.055
Phosphorus Loading (kg/yr)	20.588	6.849

Post-Condition Landuse Information

Landuse	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200
Area (acres)	37.60	11.39
Rational Coefficient (0-1)	0.47	0.57
Non DCIA Curve Number	61.00	61.00
DCIA Percent (0-100)	55.20	67.50
Wet Pond Area (ac)	0.00	0.00
Nitrogen EMC (mg/l)	1.520	1.520
Phosphorus EMC (mg/l)	0.200	0.200
Runoff Volume (ac-ft/yr)	90.389	32.719
Nitrogen Loading (kg/yr)	169.404	61.320
Phosphorus Loading (kg/yr)	22.290	8.068

Catchment Number: 1 Name: Interchange

Project: Woolbright-Alt 1
Date: 8/6/2020

Retention Design

Retention Depth (in)	0.100
Retention Volume (ac-ft)	0.313

Watershed Characteristics

Catchment Area (acres)	37.60
Contributing Area (acres)	37.600
Non-DCIA Curve Number	61.00
DCIA Percent	55.20
Rainfall Zone	Florida Zone 5
Rainfall (in)	61.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	8
Provided TN Treatment Efficiency (%)	14
Required TP Treatment Efficiency (%)	8
Provided TP Treatment Efficiency (%)	14

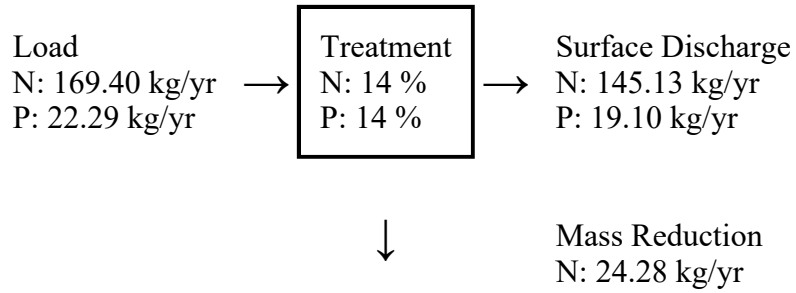
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

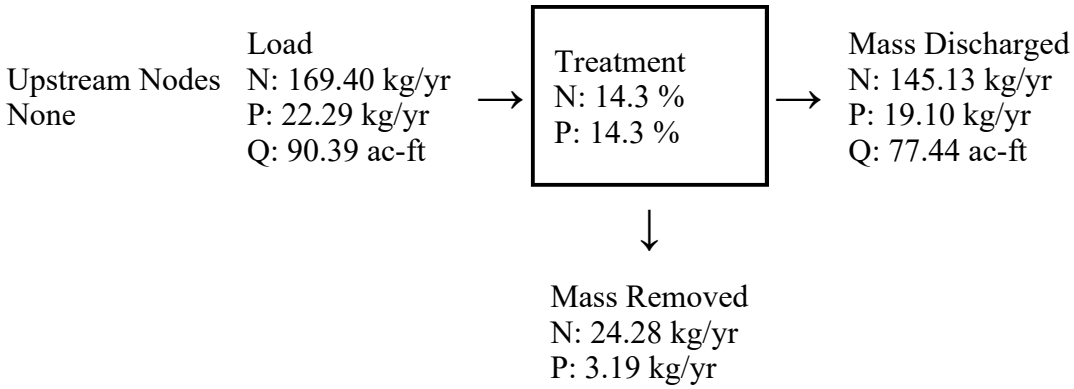
Treatment Rate (MG/yr)	4.221
TN Mass Load (kg/yr)	24.275
TN Concentration (mg/L)	1.520
TP Mass Load (kg/yr)	3.194
TP Concentration (mg/L)	0.200

Load Diagram for Retention (stand-alone)



P: 3.19 kg/yr

Load Diagram for Retention (As Used In Routing)



Catchment Number: 2 Name: Canal

Project: Woolbright-Alt 1
Date: 8/6/2020

Exfiltration Trench Design

Pipe Span (in)	36.0
Pipe Rise (in)	36.0
Pipe Length (ft)	2,000.0
Trench Width (ft)	5.0
Trench Depth (ft)	5.5
Trench Length (ft)	1,750.0
Aggregate Void %	0.39
Storage Volume (Ac-ft)	0.63
Retention Depth (in over CA)	0.663

Watershed Characteristics

Catchment Area (acres)	11.39
Contributing Area (acres)	11.390
Non-DCIA Curve Number	61.00
DCIA Percent	67.50
Rainfall Zone	Florida Zone 5
Rainfall (in)	61.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	15

Provided TN Treatment Efficiency (%)	59
Required TP Treatment Efficiency (%)	15
Provided TP Treatment Efficiency (%)	59

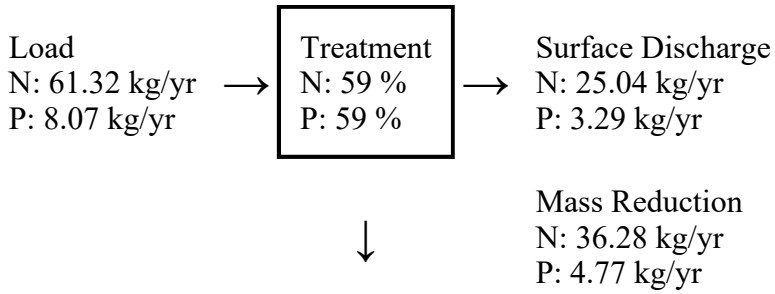
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

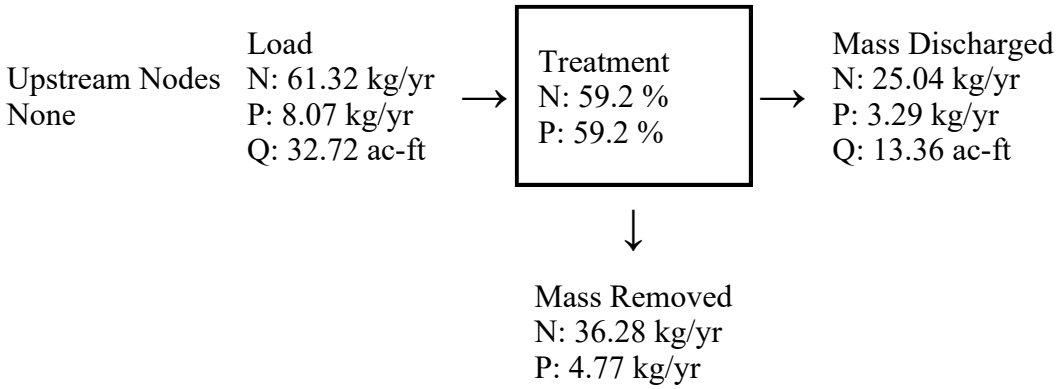
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	36.284
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	4.774
TP Concentration (mg/L)	0.000

Load Diagram for Exfiltration Trench (stand-alone)



Load Diagram for Exfiltration (As Used In Routing)



Summary Treatment Report Version: 4.1.0

Project: Woolbright-Alt 1

Analysis Type: Net Improvement
BMP Types:
Catchment 1 - (Interchange) Retention
Catchment 2 - (Canal) Exfiltration Trench
Based on % removal values to the nearest percent

Date:8/6/2020

Routing Summary
Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet

Total nitrogen target removal met? **Yes**
Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge		
Total N pre load	208.53 kg/yr	
Total N post load	230.72 kg/yr	
Target N load reduction	10 %	
Target N discharge load	208.53 kg/yr	
Percent N load reduction	26 %	
Provided N discharge load	170.17 kg/yr	375.21 lb/yr
Provided N load removed	60.56 kg/yr	133.53 lb/yr

Phosphorus

Surface Water Discharge		
Total P pre load	27.438 kg/yr	
Total P post load	30.358 kg/yr	
Target P load reduction	10 %	
Target P discharge load	27.438 kg/yr	
Percent P load reduction	26 %	
Provided P discharge load	22.39 kg/yr	49.37 lb/yr
Provided P load removed	7.968 kg/yr	17.57 lb/yr

From Pre-Condition Loads	
Existing N Discharge	208.53 (kg/yr)
Existing P Discharge	27.438 (kg/yr)