

# **Stormwater Management Report**

for

## **John Carroll High School**

Fort Pierce, Florida

January, 2026

Prepared By:



### ***Velcon Engineering & Surveying LLC***

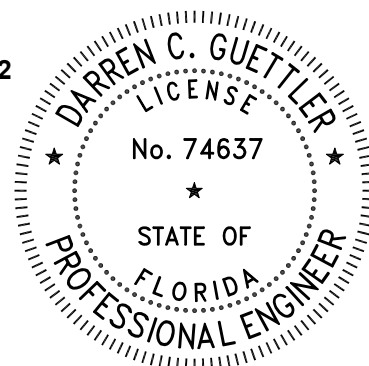
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Certificate of Authorization No. 32222

Engineer's Project No. 23-1002



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Florida Lic. No 74637

Date: 01-29-2026

## **1. Purpose**

The purpose of this report is to provide the City of Fort Pierce & SFWMD with calculations and documentation which demonstrate that the proposed surface water management system complies with state and local criteria.

## **2. Background**

The 8.746 acre site is located on the north side of the Delaware Ave. and west of 33rd Ave. The site is currently occupied with multiple buildings and modular classrooms. The purpose of the project is to provide a remodel for the existing John Carroll High School with new buildings and a new parking lot. The project is bordered to the north and west by an existing sports fields and some residential property. South of the proposed site is Delaware Ave. with more residential properties across the street. To the east is the Saint Anastasia Church and school which partnered with John Carroll. The existing site grading slopes towards the permitter and conveys stormwater out to the Delaware Ave. right-of-way.

## **3. Proposed System**

The proposed project entails the construction of a paved parking area, along with a stormwater management system consisting of a dry retention area to serve the site.

The stormwater management system will provide water quality treatment and attenuation for the 10-year, 24-hour 10-year, 72-hour and 25-year, 72-hour storm events, with a controlled discharge to Delaware Ave. road side swale. Attenuation is also provided for the 100-year, 72-hour storm event with no discharge.

The existing conveyance ditch onsite at a TOE elevation of 14.5' NAVD stays dry year round, this equates to an apparent water table elevation of 14.5' NAVD. Following a conservative approach, we estimated the wet season water table elevation at 14.5' NAVD.

# Drainage Calculations

## Site Data

Area	SF	AC	%
Project Area	380,975	8.75	
Undeveloped Area Not Included	0	0.00	
<b>Drainage Area</b>	<b>380,975</b>	<b>8.75</b>	<b>100.00</b>
<b>Impervious Areas:</b>			
Prop. Bldg.	16,735	0.38	4.39
Ex. Bldg.	34,166	0.78	8.97
Prop. Pavement & Walks	134,016	3.08	35.18
Ex. Pavement to Remain	14,372	0.33	3.77
<b>Total Impervious</b>	<b>199,289</b>	<b>4.58</b>	<b>52.31</b>
<b>Pervious Areas:</b>			
Dry Retention Area	55,170	1.27	14.48
Other Pervious	126,516	2.90	33.21
<b>Total Pervious</b>	<b>181,686</b>	<b>4.17</b>	<b>47.69</b>

## Soil Storage

Wet Season  
 Water Table Elevation = 14.5 NAVD  
 Avg. Grade Elevation = 18.5 NAVD  
 Depth to Wet Season W.T. = **4.0 FT**

<b>Soil Storage - Reference SFWMD Permit Manual Vol IV</b>						
Depth to W.T. (ft)	Coastal (1)		Flatwoods (2)		Depression (3)	
	Storage (in)	CN	Storage (in)	CN	Storage (in)	CN
1.0	0.6	94	0.6	94	0.6	94
1.5	1.6	87	1.6	87	1.4	88
2.0	2.5	80	2.5	80	2.1	83
2.5	4.6	70	4.0	72	3.3	76
3.0	6.6	60	5.4	65	4.4	69
3.5	8.8	54	7.2	59	5.6	65
4.0	10.9	48	<b>9.0</b>	53	6.8	60

Soil Storage = 9.0 inches  
 Soil Moisture Storage, S = (0.75)(% Pervious)(Soil Storage)  

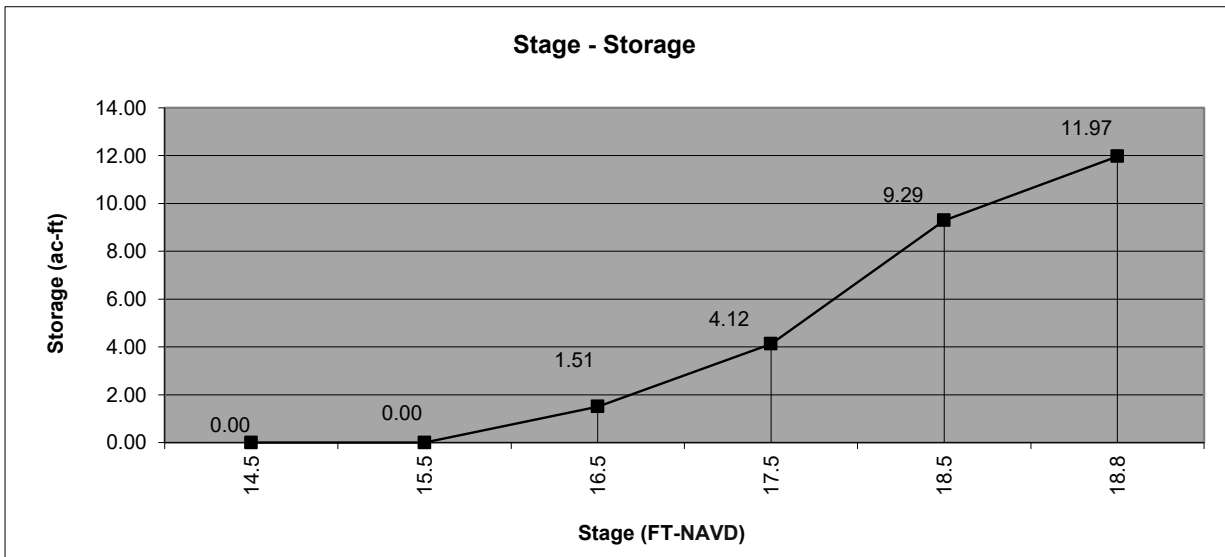
S =	2.24 inches
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**Stage - Storage**

Elevation (FT - NAVD)	Dry Detention		Other Areas			Total Volume (ac-ft)	Cumm. Volume (ac-ft)
	Area (SF)	Vol. (ac-ft)	Pavement <sup>1</sup> (ac-ft)	Pervious <sup>2</sup> (ac-ft)	Exfiltration (ac-ft)		
14.5	0	0.00	0.00	0.00	0.00	0.00	0.00
15.5	43,754	0.00	0.00	0.00	0.00	0.00	0.00
16.5	49,361	1.07	0.00	0.44	0.00	1.51	1.51
17.5	55,170	1.20	0.10	1.32	0.00	2.62	4.12
18.5	55,170	1.27	1.70	2.20	0.00	5.17	9.29
18.8	55,170	0.38	1.02	1.27	0.00	2.67	11.97

<sup>1</sup>Pavement Area Varies Linearly from EL. 17.20 to EL. 18.80 NAVD  
 Impervious Areas = 3.41 ac

<sup>2</sup>Pervious Area Varies Linearly from EL. 15.50 to EL. 18.80 NAVD  
 Pervious Areas = 2.90 ac



## Water Quality Calculations

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### 1.0 Inch Over the Project Area

$$1.0 \text{ inch} * 1\text{ft} / 12\text{in} * \frac{8.75}{\text{Drainage Area (AC)}} = \boxed{0.73} \text{ ac-ft Treated Volume}$$

OR

### 2.5 Inches Times the Percent Impervious

$$\text{(Site Area)} \quad \frac{8.75}{\text{Project Area (AC)}} - \left( \frac{0.00}{\text{Lakes (AC)*}} + \frac{0.00}{\text{Wetlands (AC)*}} + \frac{1.17}{\text{Roofs}} \right) = \frac{7.58}{\text{Site Area}}$$

$$\text{(Impervious Area)} \quad \frac{7.58}{\text{Site Area (AC)}} - \frac{4.17}{\text{Pervious Area (AC)}} = \frac{3.41}{\text{Impervious Area}}$$

$$\text{(% Impervious)} \quad \frac{\text{Impervious Area}}{\text{Site Area (AC)}} * 100 \% = \underline{45.0\%}$$

$$\text{(2.5 in. * \% Imp.)} \quad 2.50 \text{ inches} * \frac{45.0\%}{\text{Percent Impervious}} = \frac{1.12}{\text{Inches To Be Treated}}$$

$$\text{(Treated Volume)} \quad \frac{1.12}{\text{Treated Inches}} * \frac{1\text{ft}}{12 \text{ inches}} * \frac{8.75}{\text{Site Area (AC)}} = \boxed{0.82} \text{ ac-ft Treated Volume}$$

**Required Wet Detention = 0.82 ac-ft**

**Required Dry Detention = 0.61 ac-ft**

**Required DRY Retention = 0.41 ac-ft**

**Required DRY Retention Per BMPTrains Nutrient Loading = 1.02 ac-ft** ←

PLEASE SEE ATTACHED BMPTRAINS REPORT

**Water Quality is Achieved at:** Elev. 16.18 NAVD (dry retention area)  
(See Stage-Storage Section)

**Water Quality is Provided at:** Elev. 16.50 NAVD **1.51 ac-ft**

## Post-Development Discharge

(See Output From ICPR Software)

Event	Rainfall (inches)	Max Stage (FT-NAVD)		Q <sub>max</sub> (CFS) Pre Vs. Post	
		ICPR Model	Plan Grade		
10yr-1 day (Parking)	6.00	16.99	< 17.20 min. pavt.	24.84	> 1.55
10yr-3 day (NSLRWCD)	8.50	17.35	< 17.5 min. berm	28.66	> 3.72
25yr-3 day (Berm)	9.50	17.45	< 17.5 min. berm	32.24	> 4.34
100yr-3 day (FFE)	12.23	18.24	< 18.80 FFE min. FFE	Zero Discharge	

## Conclusion

As demonstrated in this drainage report, all the proposed improvements meet the development criteria for the City of Fort Pierce and SFWMD stormwater management and flood protection. All required water quality pretreatment will be provided in the proposed dry detention system, all minimum elevations are met for the proposed site improvements, and the discharge rate meets the minimum requirements for discharge rates established by SFWMD.

**"ONSITE" DRAINAGE BASIN CHARACTERISTICS**

**SITE DATA (CURVE NUMBER) POST-CONDITION BASIN**

GROUND COVER (CONDITION)	SOIL GROUP	AREA (ACRES)	%	CN	AREA × CN
DRAINAGE AREA		8.75			
BUILDINGS	B/D	1.04	11.9%	98	102
PAVEMENT	B/D	2.02	23.1%	98	198
PERVIOUS	B/D	5.69	65.1%	79	450
TOTAL		8.75	100.0%		86

**SITE DATA (AREAS BREAKDOWN)**

ONSITE AREA	8.75 AC-ft	
BASIN TOTAL	8.75 AC-ft	
TOTAL IMPERVIOUS	3.05 AC-ft	
TOTAL IMPERVIOUS AREA	3.05 AC-ft	
BUILDINGS =	1.04 AC-ft	
PAVEMENT =	2.02 AC-ft	
TOTAL PERVIOUS AREA	5.69 AC-ft	
GREEN SPACE =	5.69 AC-ft	
DIRECTLY CONNECTED IMPERVIOUS AREA =	3.05 AC-ft	34.91% % DCIA
IMPERVIOUS AREA LESS WET SWM AREAS =	3.05 AC-ft	

**"ONSITE" DRAINAGE BASIN CHARACTERISTICS**

**SITE DATA (CURVE NUMBER) POST-CONDITION BASIN**

GROUND COVER (CONDITION)	SOIL GROUP	AREA (ACRES)	%	CN	AREA × CN
DRAINAGE AREA		8.75			
DRY RETENTION	B/D	1.27	14.5%	69	87
BUILDINGS	B/D	1.17	13.4%	98	115
PAVEMENT	B/D	3.41	38.9%	98	334
PERVIOUS	B/D	2.90	33.2%	69	200
TOTAL		8.75	100.0%		84

**SITE DATA (AREAS BREAKDOWN)**

ONSITE AREA	8.75 AC-ft	
BASIN TOTAL	8.75 AC-ft	
TOTAL IMPERVIOUS	4.58 AC-ft	
TOTAL IMPERVIOUS AREA	4.58 AC-ft	
BUILDINGS =	1.17 AC-ft	
PAVEMENT =	3.41 AC-ft	
TOTAL PERVIOUS AREA	2.90 AC-ft	
GREEN SPACE =	2.90 AC-ft	
DIRECTLY CONNECTED IMPERVIOUS AREA =	4.58 AC-ft	52.31% % DCIA
IMPERVIOUS AREA LESS WET SWM AREAS =	4.58 AC-ft	

## Appendix A - BMPTrains Nutrient Loading

# Complete Report Ver 5.3.2

Project: John Carroll High School

Date: 11/12/2025 4:41:05 PM

## Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Onsite
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall	56.00

## Pre-Condition Landuse Information

Landuse	Low-Intensity Commercial: TN=1.13 TP=0.188
Area (acres)	8.75
Rational Coefficient (0-1)	0.35
Non DCIA Curve Number	79.00
DCIA Percent (0-100)	34.90
Nitrogen EMC (mg/l)	1.130
Phosphorus EMC (mg/l)	0.188
Runoff Volume (ac-ft/yr)	14.304
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	19.929
Phosphorus Loading (kg/yr)	3.316

## Post-Condition Landuse Information

Landuse	Low-Intensity Commercial: TN=1.13 TP=0.188
Area (acres)	8.75
Rational Coefficient (0-1)	0.45
Non DCIA Curve Number	69.00
DCIA Percent (0-100)	52.31
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.130

Phosphorus EMC (mg/l)	0.188
Runoff Volume (ac-ft/yr)	18.341
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	25.554
Phosphorus Loading (kg/yr)	4.251

## Catchment Number: 1 Name: Onsite

**Project:** John Carroll High School

**Date:** 11/12/2025

### Retention Design

Retention Depth (in) 1.400

Retention Volume (ac-ft) 1.021

### Watershed Characteristics

Catchment Area (acres) 8.75

Contributing Area (acres) 8.750

Non-DCIA Curve Number 69.00

DCIA Percent 52.31

Rainfall Zone Florida Zone 2

Rainfall (in) 56.00

### Surface Water Discharge

Required TN Treatment Efficiency (%) 60

Provided TN Treatment Efficiency (%) 90

Required TP Treatment Efficiency (%) 90

Provided TP Treatment Efficiency (%) 90

### Media Mix Information

Type of Media Mix Not Specified

Media N Reduction (%)

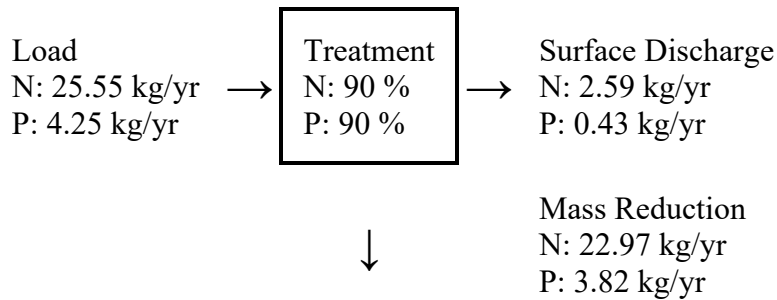
Media P Reduction (%)

### Groundwater Discharge (Stand-Alone)

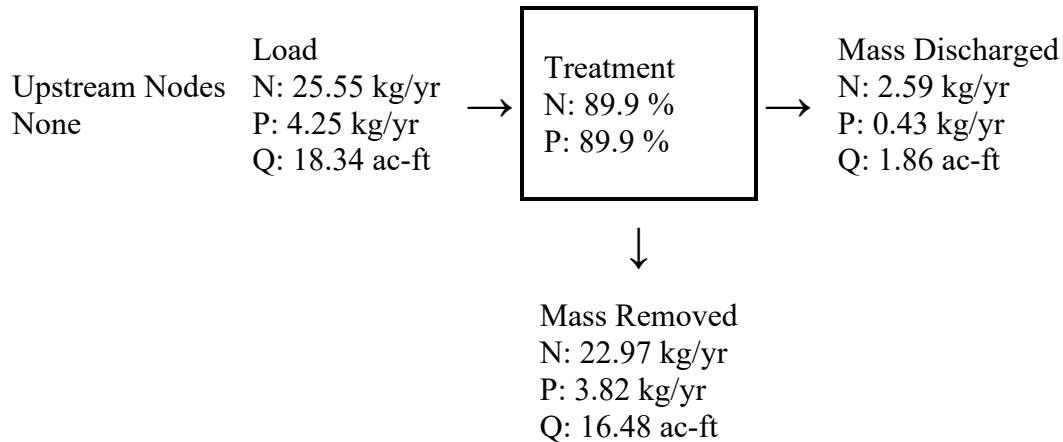
Treatment Rate (MG/yr) 0.000

TN Mass Load (kg/yr) 22.968  
 TN Concentration (mg/L) 0.000  
 TP Mass Load (kg/yr) 3.821  
 TP Concentration (mg/L) 0.000

## Load Diagram for Retention (stand-alone)



## Load Diagram for Retention ( As Used In Routing)



# Summary Treatment Report Version: 5.3.2

Date:11/12/2025

Project: John Carroll High  
 School

**Routing Summary**  
 Catchment 1 Routed to Outlet

**Analysis Type:** Specified

Removal Efficiency

**BMP Types:**

Catchment 1 - (Onsite )

Retention

Based on % removal values to  
the nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

## Summary Report

### Nitrogen

#### Surface Water Discharge

Total N pre load	19.93 kg/yr	
Total N post load	25.55 kg/yr	
Target N load reduction	60 %	
Target N discharge load	10.22 kg/yr	
Percent N load reduction	90 %	
Provided N discharge load	2.59 kg/yr	5.7 lb/yr
Provided N load removed	22.97 kg/yr	50.64 lb/yr

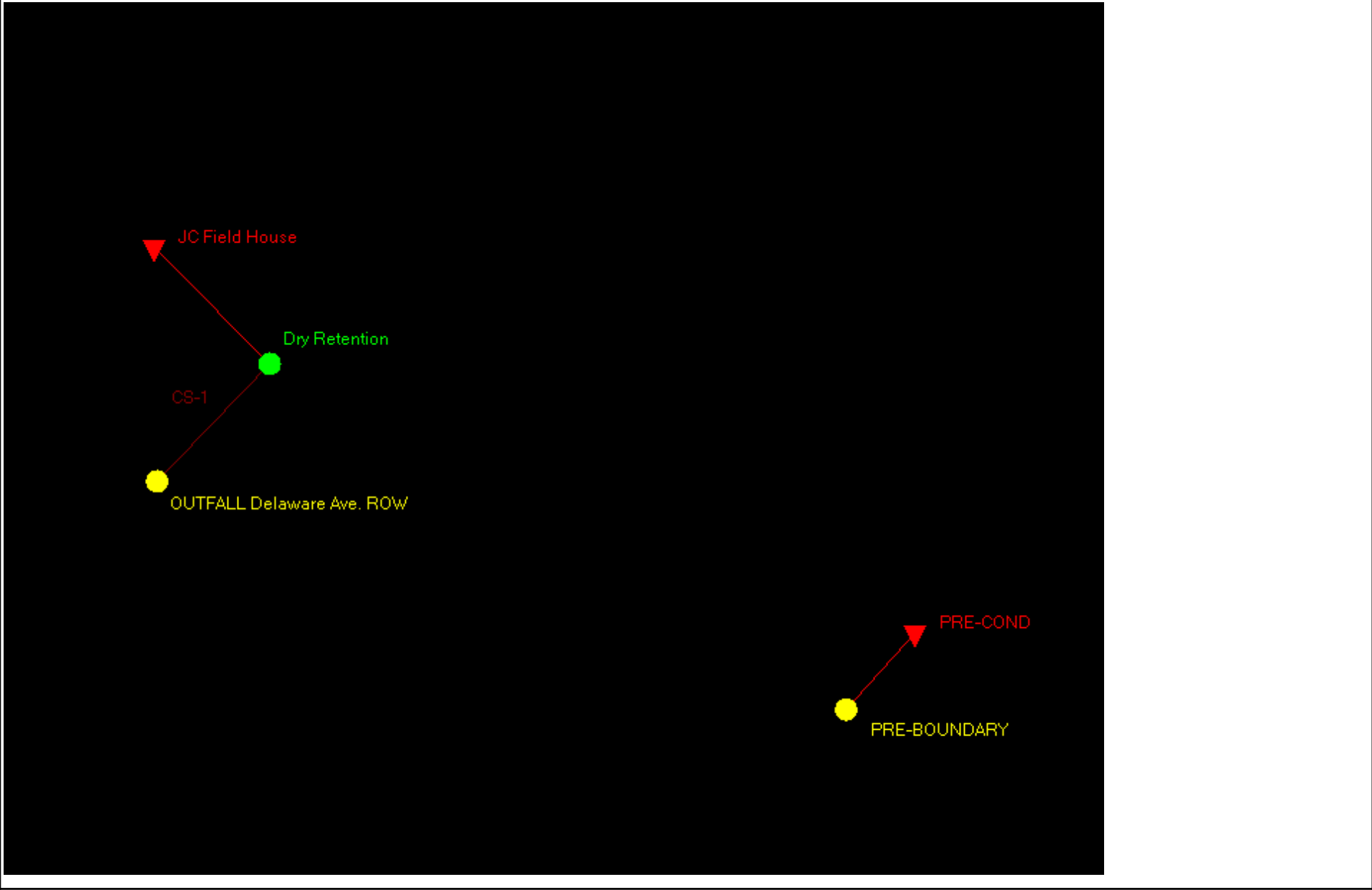
### Phosphorus

#### Surface Water Discharge

Total P pre load	3.316 kg/yr	
Total P post load	4.251 kg/yr	
Target P load reduction	90 %	
Target P discharge load	.425 kg/yr	
Percent P load reduction	90 %	
Provided P discharge load	.43 kg/yr	.95 lb/yr
Provided P load removed	3.821 kg/yr	8.426 lb/yr

## Appendix B - ICPR Flood Routing Model

Background Image: Capture



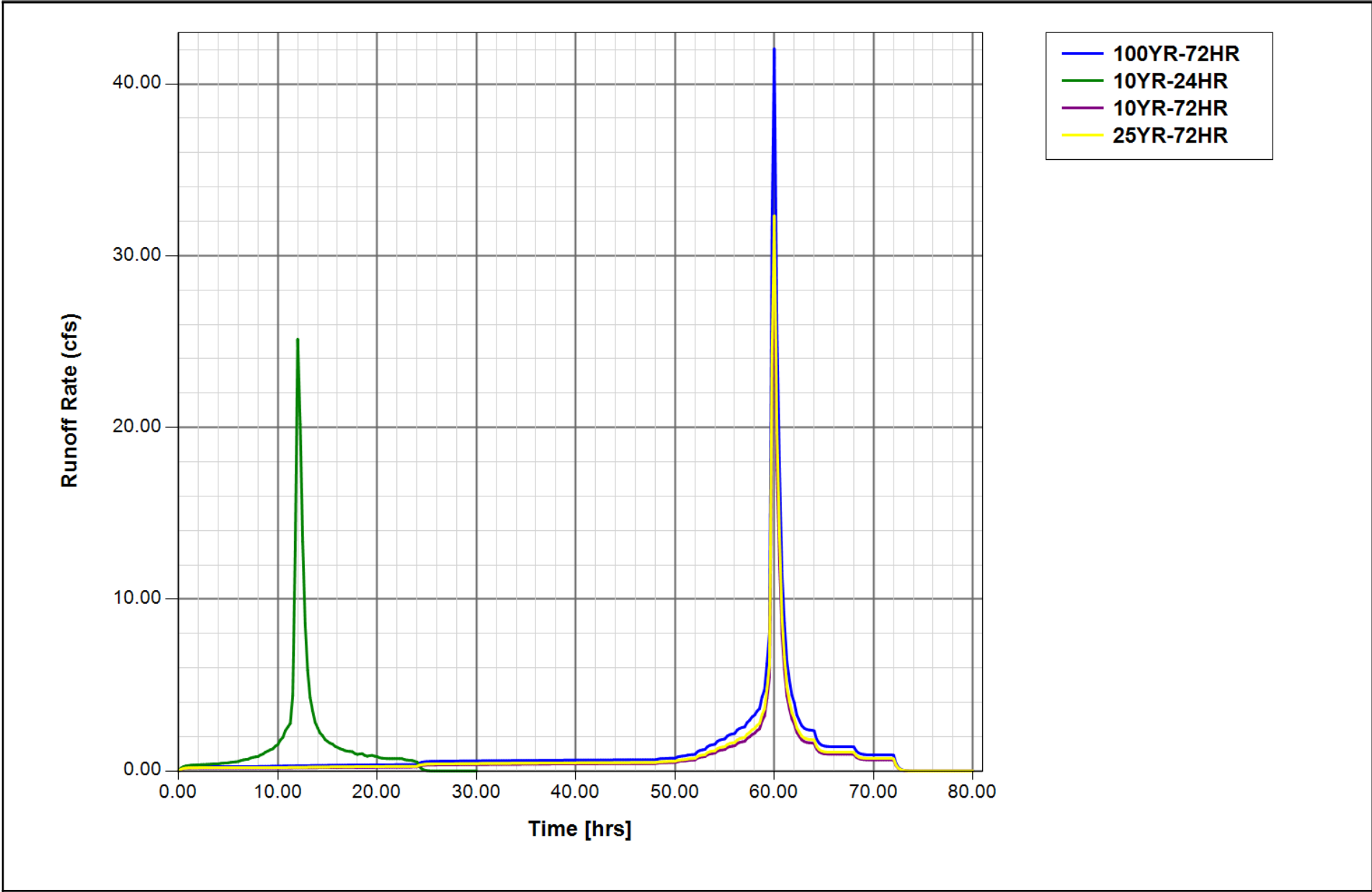
Simple Basin: JC High School

Scenario: w/ Discharge  
 Node: Dry Retention  
 Hydrograph Method: Santa Barbara Urban Hydrograph  
 Infiltration Method: Curve Number  
 Time of Concentration: 20.0000 min  
 Max Allowable Q: 999999.00 cfs  
 Time Shift: 0.0000 hr  
 Area: 8.7500 ac  
 Curve Number: 84.0  
 % Impervious: 52.31  
 % DCIA: 52.31  
 % Direct: 0.00  
 Rainfall Name:

Comment:

Simple Basin Runoff Summary [w/ Discharge]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
JC High School	100YR-72HR	42.05	60.0000	12.23	11.27	8.7500	92.2	52.31	52.31
JC High School	10YR-24HR	25.14	12.0167	6.00	5.14	8.7500	92.6	52.31	52.31
JC High School	10YR-72HR	28.74	60.0000	8.50	7.58	8.7500	92.4	52.31	52.31
JC High School	25YR-72HR	32.32	60.0000	9.50	8.57	8.7500	92.3	52.31	52.31



Simple Basin: PRE-COND

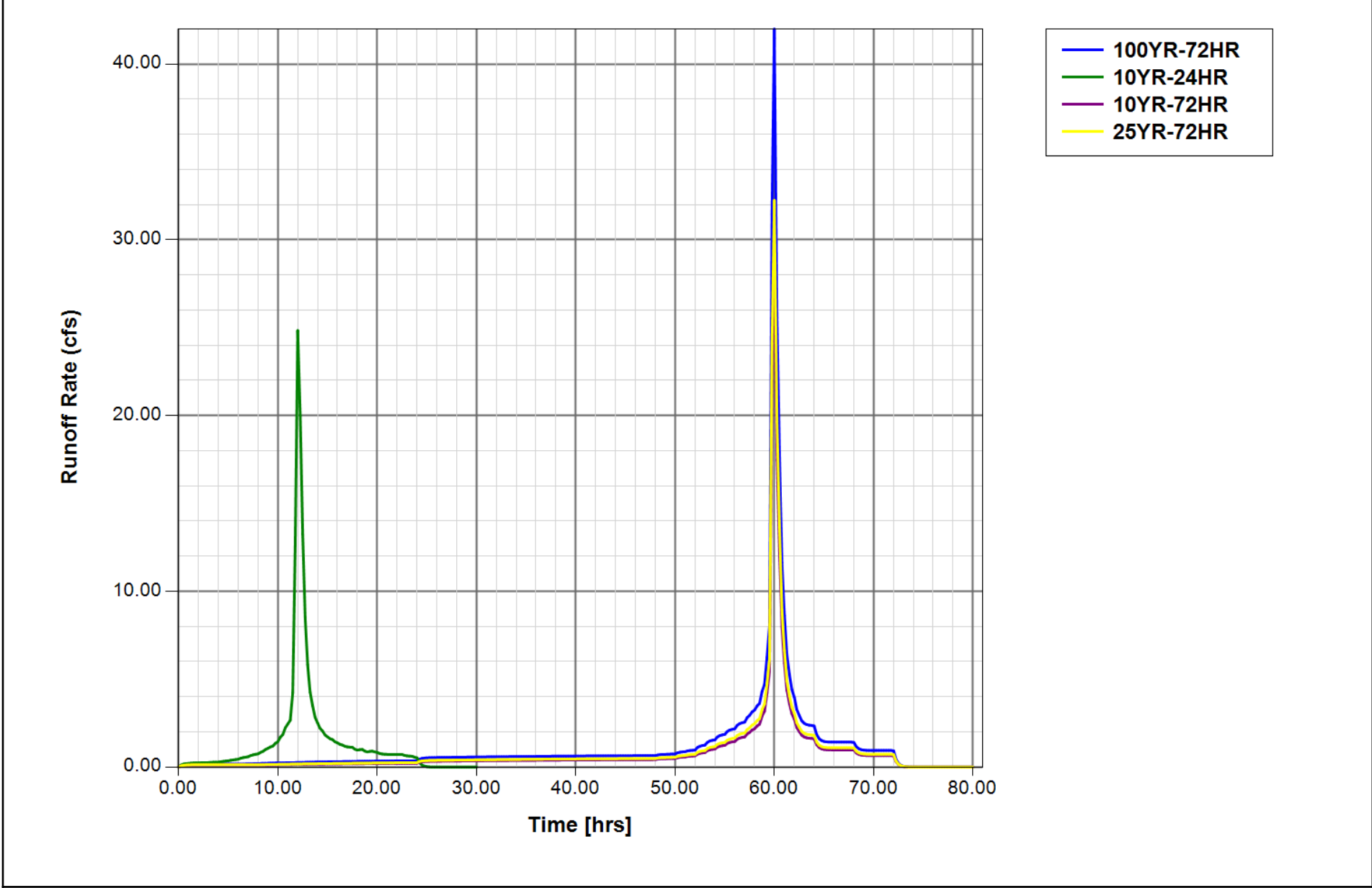
Scenario: w/ Discharge  
 Node: PRE-BOUNDARY  
 Hydrograph Method: Santa Barbara Urban Hydrograph  
 Infiltration Method: Curve Number  
 Time of Concentration: 20.0000 min  
 Max Allowable Q: 999999.00 cfs  
 Time Shift: 0.0000 hr  
 Area: 8.7460 ac  
 Curve Number: 86.0  
 % Impervious: 34.90  
 % DCIA: 34.90  
 % Direct: 0.00  
 Rainfall Name:

Comment:

Simple Basin Runoff Summary [w/ Discharge]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
PRE-COND	100YR-72HR	41.99	60.0000	12.23	11.09	8.7460	90.7	34.90	34.90
PRE-COND	10YR-24HR	24.84	12.0167	6.00	4.96	8.7460	91.1	34.90	34.90
PRE-COND	10YR-72HR	28.66	60.0000	8.50	7.40	8.7460	90.9	34.90	34.90
PRE-COND	25YR-72HR	32.24	60.0000	9.50	8.39	8.7460	90.8	34.90	34.90

Simple Basin Runoff Rate: PRE-COND [w/ Discharge]



Node: OUTFALL Delaware Ave. ROW

Scenario: w/ Discharge  
 Type: Time/Stage  
 Base Flow: 0.00 cfs  
 Initial Stage: 13.80 ft  
 Warning Stage: 17.90 ft  
 Boundary Stage:

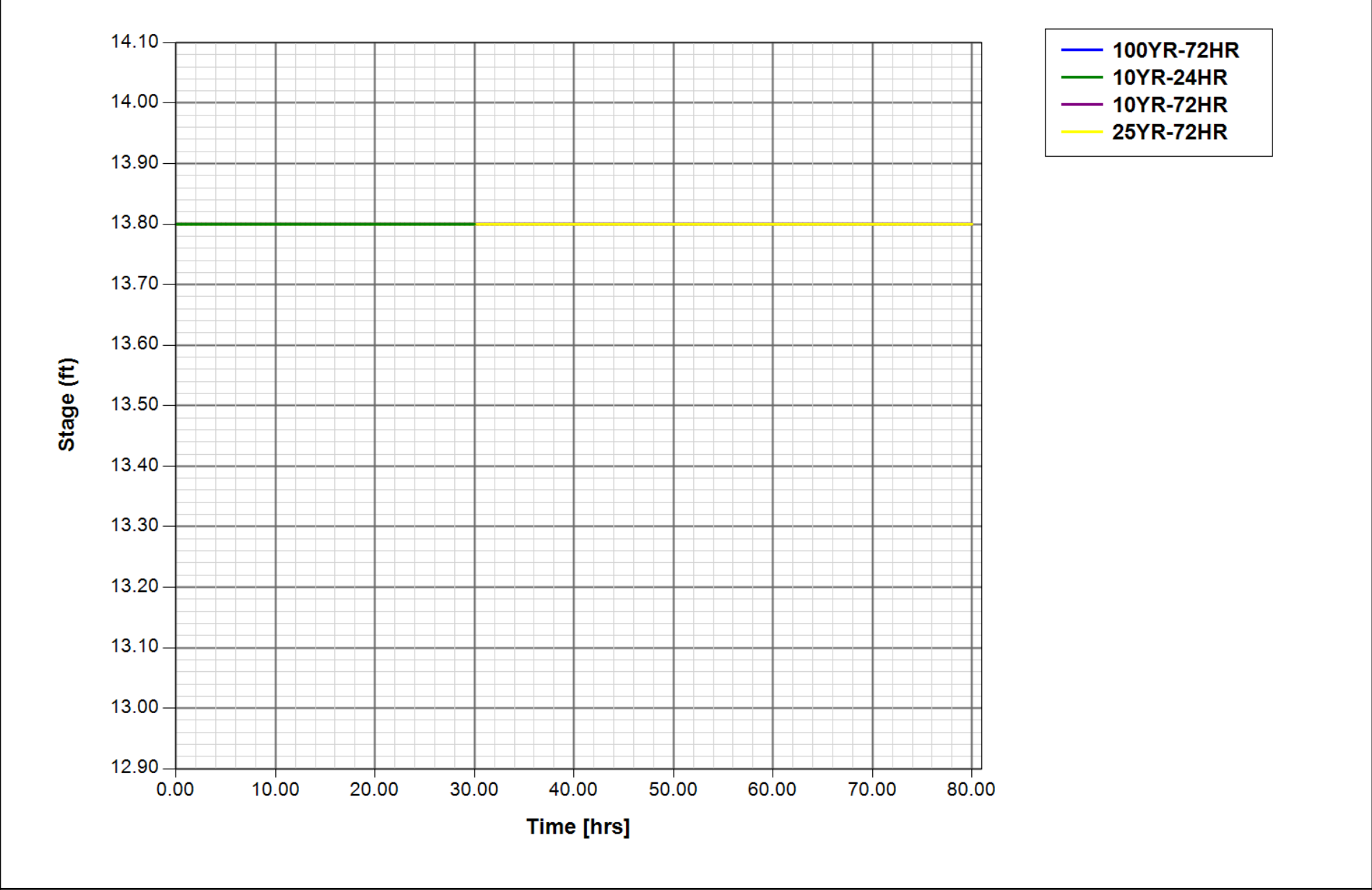
Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	13.80
0	0	0	72.0000	13.80

Comment:

Node Max Conditions [w/ Discharge]

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 [ft <sup>2</sup> ]
OUTFALL Delaware Ave. ROW	100YR-72HR	17.90	13.80	0.0000	0.00	0.00	0
OUTFALL Delaware Ave. ROW	10YR-24HR	17.90	13.80	0.0000	1.55	0.00	0
OUTFALL Delaware Ave. ROW	10YR-72HR	17.90	13.80	0.0000	3.72	0.00	0
OUTFALL Delaware Ave. ROW	25YR-72HR	17.90	13.80	0.0000	4.34	0.00	0

Stage [ Node: OUTFALL Delaware Ave. ROW ]



## Node Max Conditions [w/ Discharge]

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]
Dry Retention	100YR-72HR	18.80	18.24	0.0010	42.04	0.00	271059
OUTFALL Delaware Ave. ROW	100YR-72HR	17.90	13.80	0.0000	0.00	0.00	0
PRE-BOUNDARY	100YR-72HR	17.90	13.80	0.0032	41.98	0.00	0
Dry Retention	10YR-24HR	18.80	16.99	0.0010	25.13	1.55	128779
OUTFALL Delaware Ave. ROW	10YR-24HR	17.90	13.80	0.0000	1.55	0.00	0
PRE-BOUNDARY	10YR-24HR	17.90	5.75	0.0032	24.84	0.00	0
Dry Retention	10YR-72HR	18.80	17.35	0.0010	28.73	3.72	157102
OUTFALL Delaware Ave. ROW	10YR-72HR	17.90	13.80	0.0000	3.72	0.00	0
PRE-BOUNDARY	10YR-72HR	17.90	13.80	0.0032	28.65	0.00	0
Dry Retention	25YR-72HR	18.80	17.45	0.0010	32.31	4.34	165508
OUTFALL Delaware Ave. ROW	25YR-72HR	17.90	13.80	0.0000	4.34	0.00	0
PRE-BOUNDARY	25YR-72HR	17.90	13.80	0.0032	32.23	0.00	0

Drop Structure Link: CS-1			Upstream Pipe	Downstream Pipe
Scenario:	w/ Discharge		Invert: 15.70 ft	Invert: 15.70 ft
From Node:	Dry Retention		Manning's N: 0.0130	Manning's N: 0.0130
To Node:	OUTFALL Delaware Ave. ROW		Geometry: Circular	Geometry: Circular
Link Count:	1		Max Depth: 1.00 ft	Max Depth: 1.00 ft
Flow Direction:	None		Bottom Clip	
Solution:	Combine		Default: 0.00 ft	Default: 0.00 ft
Increments:	10		Op Table:	Op Table:
Pipe Count:	1		Ref Node:	Ref Node:
Damping:	0.0000 ft		Manning's N: 0.0130	Manning's N: 0.0130
Length:	16.00 ft		Top Clip	
FHWA Code:	1		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: 0.0130	Manning's N: 0.0130
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:	Sharp Crested Vertical	Top Clip
Geometry Type:	Rectangular	Default: 0.00 ft
Invert:	16.50 ft	Op Table:
Control Elevation:	13.00 ft	Ref Node:
Max Depth:	999.00 ft	Discharge Coefficients
Max Width:	1.50 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:	2	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: Rectangular  
 Invert: 17.00 ft  
 Control Elevation: 13.00 ft  
 Max Depth: 999.00 ft  
 Max Width: 2.50 ft  
 Fillet: 0.00 ft



Default: 0.00 ft

Op Table:

Ref Node:



Discharge Coefficients

Weir Default: 3.200

Weir Table:

Orifice Default: 0.600

Orifice Table:

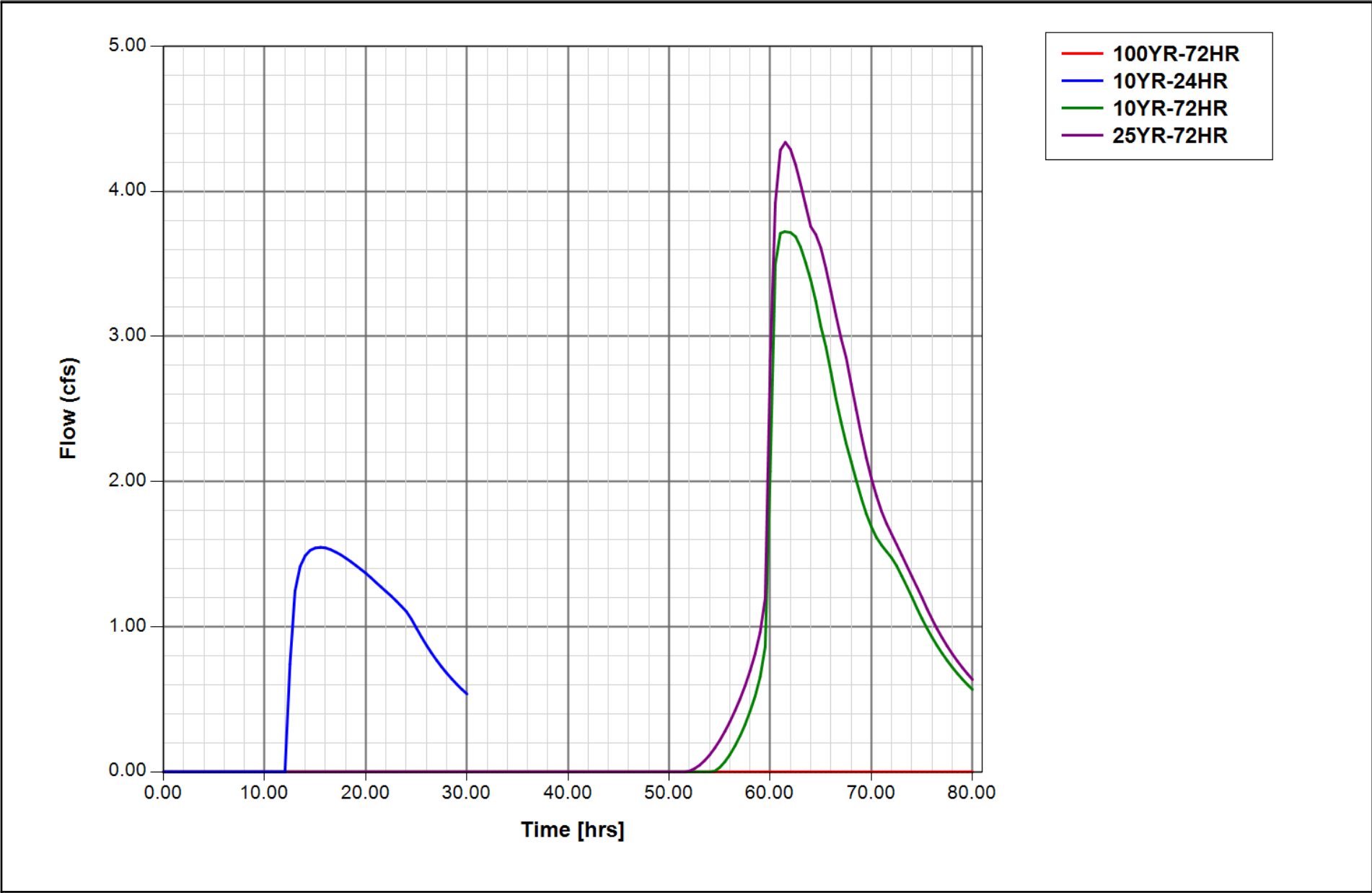
Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [w/ Discharge]

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-1 - Pipe	100YR-72HR	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 2	100YR-72HR	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 3	100YR-72HR	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Pipe	10YR-24HR	1.55	0.00	0.01	0.00	0.00	0.00
CS-1 - Weir: 2	10YR-24HR	1.55	0.00	0.00	2.11	2.11	2.11
CS-1 - Weir: 3	10YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Pipe	10YR-72HR	3.72	0.00	0.01	0.00	0.00	0.00
CS-1 - Weir: 2	10YR-72HR	1.76	0.00	0.00	2.11	2.11	2.11
CS-1 - Weir: 3	10YR-72HR	2.14	0.00	0.01	1.33	1.33	1.33
CS-1 - Pipe	25YR-72HR	4.34	0.00	0.01	0.00	0.00	0.00
CS-1 - Weir: 2	25YR-72HR	1.76	0.00	0.00	2.11	2.11	2.11
CS-1 - Weir: 3	25YR-72HR	2.72	0.00	0.01	1.33	1.33	1.33

Link Flow: CS-1 [w/ Discharge]

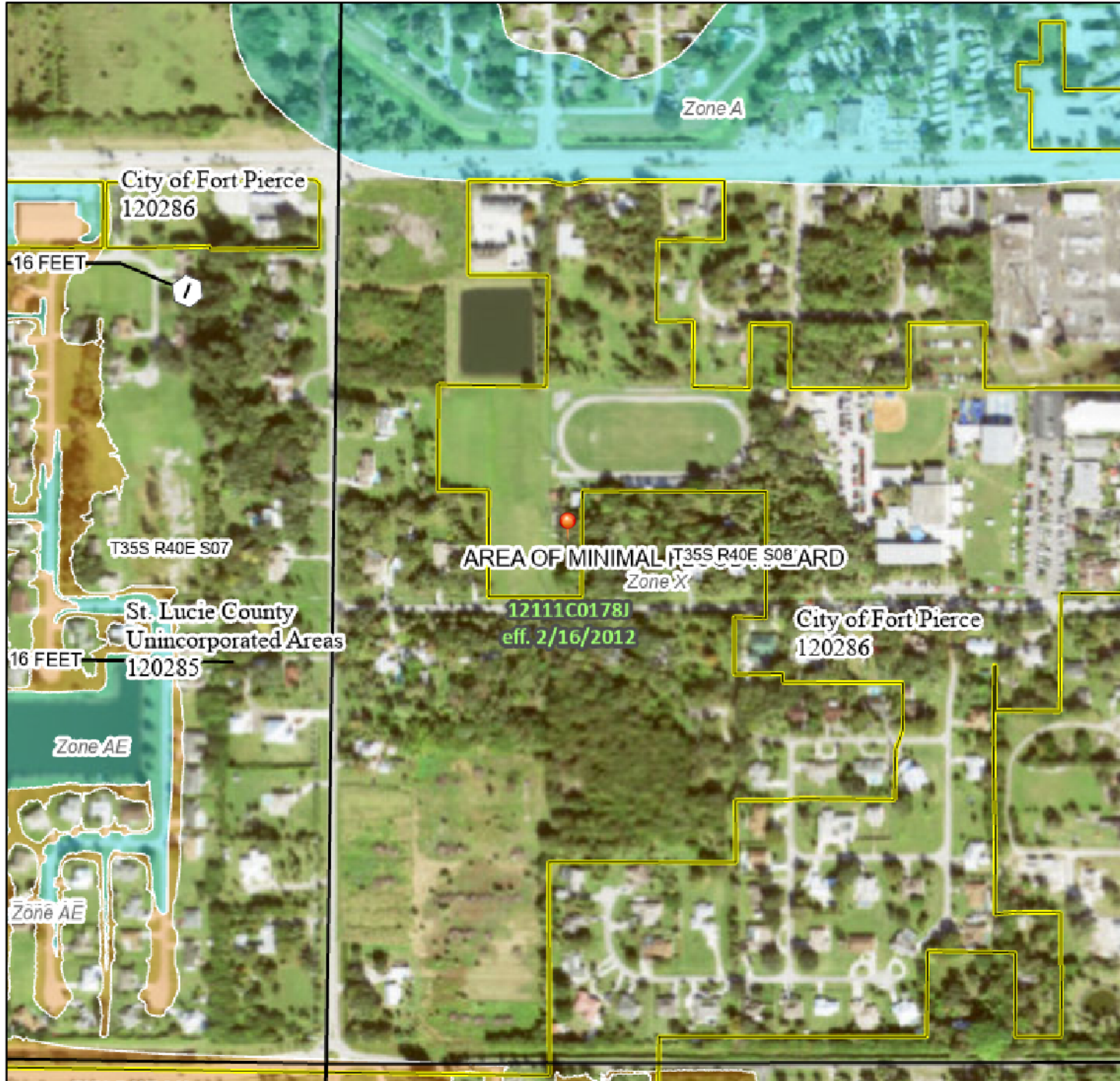


## Appendix C - FEMA Flood Map

# National Flood Hazard Layer FIRMMette



80°22'9"W 27°26'56"N



## Legend

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

- |                             |  |   |
|-----------------------------|--|---|
| SPECIAL FLOOD HAZARD AREAS  |  | Without Base Flood Elevation (BFE)<br>Zone A, V, A99  |
|                             |  | With BFE or Depth Zone AE, AO, AH, VE, AR   |
|                             |  | Regulatory Floodway   |
| OTHER AREAS OF FLOOD HAZARD |  | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
|                             |  | Future Conditions 1% Annual Chance Flood Hazard Zone X  |
|                             |  | Area with Reduced Flood Risk due to Levee. See Notes. Zone X  |
|                             |  | Area with Flood Risk due to Levee Zone D  |
| OTHER AREAS                 |  | NO SCREEN Area of Minimal Flood Hazard Zone X   |
|                             |  | Effective LOMRs   |
|                             |  | Area of Undetermined Flood Hazard Zone D  |
| GENERAL STRUCTURES          |  | Channel, Culvert, or Storm Sewer  |
|                             |  | Levee, Dike, or Floodwall   |
| OTHER FEATURES              |  | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation   |
|                             |  | 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation   |
|                             |  | Coastal Transect  |
|                             |  | Base Flood Elevation Line (BFE)   |
|                             |  | Limit of Study  |
|                             |  | Jurisdiction Boundary   |
| MAP PANELS                  |  | Digital Data Available  |
|                             |  | No Digital Data Available   |
|                             |  | Unmapped  |
- The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

80°21'32"W 27°26'24"N

Basemap Imagery Source: USGS National Map 2023

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/26/2024 at 3:17 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

## Appendix D - USDA Soil Survey



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 St. Lucie County, Florida



# Preface

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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](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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# Contents

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<b>Preface</b> .....	2
<b>How Soil Surveys Are Made</b> .....	5
<b>Soil Map</b> .....	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
St. Lucie County, Florida.....	13
2—Ankona and Farmton sands.....	13
16—Hilolo loamy sand, 0 to 2 percent slopes.....	15
38—Riviera fine sand, 0 to 2 percent slopes.....	18
<b>References</b> .....	21

# 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

## Custom Soil Resource Report

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

## Custom Soil Resource Report

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: 1:1,630 if printed on A landscape (11" x 8.5") sheet.


0 20 40 80 120 Meters

0 50 100 200 300 Feet


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 1:24,000.

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: St. Lucie County, Florida  
 Survey Area Data: Version 19, Aug 29, 2025

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

Date(s) aerial images were photographed: Jan 18, 2022—Jan 30, 2022

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

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Ankona and Farmton sands	2.3	20.5%
16	Hilolo loamy sand, 0 to 2 percent slopes	2.9	26.7%
38	Riviera fine sand, 0 to 2 percent slopes	5.8	52.9%
<b>Totals for Area of Interest</b>		<b>11.0</b>	<b>100.0%</b>

## 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

## Custom Soil Resource Report

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.

## St. Lucie County, Florida

### 2—Ankona and Farmton sands

#### Map Unit Setting

*National map unit symbol:* 1jptv  
*Landscape:* Coastal plains  
*Elevation:* 0 to 200 feet  
*Mean annual precipitation:* 49 to 58 inches  
*Mean annual air temperature:* 70 to 77 degrees F  
*Frost-free period:* 350 to 365 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Ankona and similar soils:* 50 percent  
*Farmton and similar soils:* 40 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Ankona

##### Setting

*Landscape:* Coastal plains  
*Landform:* Flatwoods on marine terraces  
*Landform position (three-dimensional):* Talf  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Parent material:* Sandy and loamy marine deposits

##### Typical profile

*A - 0 to 11 inches:* sand  
*E - 11 to 38 inches:* sand  
*Bh - 38 to 48 inches:* loamy sand  
*Btg - 48 to 57 inches:* sandy loam  
*Cg - 57 to 80 inches:* loamy fine sand

##### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* 31 to 50 inches to ortstein  
*Drainage class:* Poorly drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* About 6 to 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 4.0  
*Available water supply, 0 to 60 inches:* Very low (about 1.5 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4w  
*Hydrologic Soil Group:* C/D  
*Ecological site:* F155XY120FL - Sandy Flatwoods and Hammocks

## Custom Soil Resource Report

*Forage suitability group:* Sandy soils on flats of mesic or hydric lowlands  
(G156BC141FL)

*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands  
(G156BC141FL)

*Hydric soil rating:* No

### Description of Farnton

#### Setting

*Landscape:* Coastal plains

*Landform:* Flatwoods on marine terraces

*Landform position (three-dimensional):* Interfluve, talf

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Parent material:* Sandy and loamy marine deposits

#### Typical profile

*A - 0 to 7 inches:* sand

*E - 7 to 34 inches:* sand

*Bh - 34 to 50 inches:* sand

*Btg - 50 to 80 inches:* sandy loam

#### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Poorly drained

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)

*Depth to water table:* About 6 to 18 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Sodium adsorption ratio, maximum:* 4.0

*Available water supply, 0 to 60 inches:* Moderate (about 6.9 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4w

*Hydrologic Soil Group:* B/D

*Ecological site:* F155XY120FL - Sandy Flatwoods and Hammocks

*Forage suitability group:* Sandy soils on flats of mesic or hydric lowlands  
(G156BC141FL)

*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands  
(G156BC141FL)

*Hydric soil rating:* No

### Minor Components

#### Electra

*Percent of map unit:* 4 percent

*Landscape:* Coastal plains

*Landform:* Rises on marine terraces, Knolls on marine terraces

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Convex

*Across-slope shape:* Linear

## Custom Soil Resource Report

*Ecological site:* F155XY150FL - Sandy Flatwoods and Hammocks on Rises and Knolls of Mesic Uplands

*Other vegetative classification:* Sandy soils on rises and knolls of mesic uplands (G156BC131FL)

*Hydric soil rating:* No

### **Waveland**

*Percent of map unit:* 3 percent

*Landscape:* Coastal plains

*Landform:* Flatwoods on marine terraces

*Landform position (three-dimensional):* Talf

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Ecological site:* F155XY120FL - Sandy Flatwoods and Hammocks

*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

*Hydric soil rating:* No

### **Lawnwood**

*Percent of map unit:* 3 percent

*Landscape:* Coastal plains

*Landform:* Marine terraces on flatwoods

*Landform position (three-dimensional):* Talf

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Ecological site:* F155XY120FL - Sandy Flatwoods and Hammocks

*Other vegetative classification:* Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

*Hydric soil rating:* No

## **16—Hilolo loamy sand, 0 to 2 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2z1ft

*Landscape:* Coastal plains

*Elevation:* 0 to 100 feet

*Mean annual precipitation:* 42 to 63 inches

*Mean annual air temperature:* 68 to 77 degrees F

*Frost-free period:* 350 to 365 days

*Farmland classification:* Farmland of unique importance

### **Map Unit Composition**

*Hilolo and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

## Custom Soil Resource Report

### Description of Hilolo

#### Setting

*Landscape:* Coastal plains  
*Landform:* Flatwoods on marine terraces  
*Landform position (three-dimensional):* Tread, talf  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Calcareous sandy and loamy marine deposits

#### Typical profile

*A - 0 to 6 inches:* loamy sand  
*Btkg1 - 6 to 12 inches:* fine sandy loam  
*Btkg2 - 12 to 28 inches:* sandy clay loam  
*Btkg3 - 28 to 53 inches:* fine sandy loam  
*Cg - 53 to 80 inches:* loamy fine sand

#### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)  
*Depth to water table:* About 3 to 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 10 percent  
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 4.0  
*Available water supply, 0 to 60 inches:* Moderate (about 7.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3w  
*Hydrologic Soil Group:* B/D  
*Ecological site:* F155XY140FL - Loamy and Clayey Flats and Hammocks  
*Forage suitability group:* Loamy and clayey soils on flats of hydric or mesic lowlands (G156BC341FL)  
*Other vegetative classification:* Loamy and clayey soils on flats of hydric or mesic lowlands (G156BC341FL)  
*Hydric soil rating:* Yes

### Minor Components

#### Pineda

*Percent of map unit:* 4 percent  
*Landscape:* Coastal plains  
*Landform:* Drainageways on marine terraces, Flats on marine terraces  
*Landform position (three-dimensional):* Tread, dip, talf  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave, linear  
*Ecological site:* R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps  
*Other vegetative classification:* Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)

## Custom Soil Resource Report

*Hydric soil rating:* Yes

### **Riviera**

*Percent of map unit:* 4 percent

*Landscape:* Coastal plains

*Landform:* Drainageways on marine terraces, Flats on marine terraces

*Landform position (three-dimensional):* Tread, dip, talf

*Down-slope shape:* Linear

*Across-slope shape:* Concave, linear

*Ecological site:* R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps

*Other vegetative classification:* Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)

*Hydric soil rating:* Yes

### **Winder**

*Percent of map unit:* 4 percent

*Landscape:* Coastal plains

*Landform:* Flats on marine terraces, Drainageways on marine terraces, Depressions on marine terraces

*Landform position (three-dimensional):* Tread, talf, dip

*Down-slope shape:* Linear, convex, concave

*Across-slope shape:* Linear, concave

*Ecological site:* F155XY140FL - Loamy and Clayey Flats and Hammocks

*Other vegetative classification:* Wetland Hardwood Hammock (R156BY012FL), Loamy and clayey soils on flats of hydric or mesic lowlands (G156BC341FL)

*Hydric soil rating:* Yes

### **Pople**

*Percent of map unit:* 4 percent

*Landscape:* Coastal plains

*Landform:* Drainageways on marine terraces, Flats on marine terraces

*Landform position (three-dimensional):* Tread, talf

*Down-slope shape:* Convex, linear

*Across-slope shape:* Concave, linear

*Ecological site:* R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps

*Other vegetative classification:* Cabbage Palm Flatwoods (R155XY005FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)

*Hydric soil rating:* Yes

### **Brynwood**

*Percent of map unit:* 4 percent

*Landscape:* Coastal plains

*Landform:* Flatwoods on marine terraces

*Landform position (three-dimensional):* Tread, talf

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Ecological site:* F155XY120FL - Sandy Flatwoods and Hammocks

*Other vegetative classification:* South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

*Hydric soil rating:* No

### 38—Riviera fine sand, 0 to 2 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2tzw2  
*Landscape:* Coastal plains  
*Elevation:* 0 to 80 feet  
*Mean annual precipitation:* 44 to 59 inches  
*Mean annual air temperature:* 68 to 77 degrees F  
*Frost-free period:* 350 to 365 days  
*Farmland classification:* Farmland of unique importance

#### Map Unit Composition

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

#### Description of Riviera

##### Setting

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

##### Typical profile

*A - 0 to 6 inches:* fine sand  
*E - 6 to 28 inches:* fine sand  
*Bt/E - 28 to 32 inches:* fine sandy loam  
*Btg - 32 to 42 inches:* sandy clay loam  
*C - 42 to 80 inches:* fine sand

##### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)  
*Depth to water table:* About 3 to 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 4.0  
*Available water supply, 0 to 60 inches:* Moderate (about 6.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3w

## Custom Soil Resource Report

*Hydrologic Soil Group:* A/D

*Ecological site:* F155XY130FL - Sandy over Loamy Flatwoods and Hammocks

*Forage suitability group:* Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)

*Other vegetative classification:* Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)

*Hydric soil rating:* Yes

### Minor Components

#### Wabasso

*Percent of map unit:* 8 percent

*Landscape:* Coastal plains

*Landform:* Flatwoods on marine terraces

*Landform position (three-dimensional):* Tread, talf

*Down-slope shape:* Convex, linear

*Across-slope shape:* Linear

*Ecological site:* F155XY120FL - Sandy Flatwoods and Hammocks

*Other vegetative classification:* South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

*Hydric soil rating:* No

#### Pinellas

*Percent of map unit:* 4 percent

*Landscape:* Coastal plains

*Landform:* Flatwoods on marine terraces

*Landform position (three-dimensional):* Tread, talf

*Down-slope shape:* Convex, linear

*Across-slope shape:* Linear

*Ecological site:* F155XY130FL - Sandy over Loamy Flatwoods and Hammocks

*Other vegetative classification:* Cabbage Palm Flatwoods (R155XY005FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)

*Hydric soil rating:* No

#### Brynwood

*Percent of map unit:* 4 percent

*Landscape:* Coastal plains

*Landform:* Flatwoods on marine terraces

*Landform position (three-dimensional):* Tread, talf

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Ecological site:* F155XY120FL - Sandy Flatwoods and Hammocks

*Other vegetative classification:* South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

*Hydric soil rating:* Yes

#### Floridana

*Percent of map unit:* 2 percent

*Landscape:* Coastal plains

*Landform:* Depressions on marine terraces

*Landform position (three-dimensional):* Tread, dip

*Down-slope shape:* Concave, linear

*Across-slope shape:* Concave, linear

*Ecological site:* R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps

## Custom Soil Resource Report

*Other vegetative classification:* Freshwater Marshes and Ponds (R155XY010FL),  
Sandy over loamy soils on stream terraces, flood plains, or in depressions  
(G155XB245FL)

*Hydric soil rating:* Yes

### **Oldsmar**

*Percent of map unit:* 2 percent

*Landscape:* Coastal plains

*Landform:* Flatwoods on marine terraces

*Landform position (three-dimensional):* Talf

*Down-slope shape:* Convex, linear

*Across-slope shape:* Linear

*Ecological site:* F155XY120FL - Sandy Flatwoods and Hammocks

*Other vegetative classification:* South Florida Flatwoods (R155XY003FL), Sandy  
soils on flats of mesic or hydric lowlands (G155XB141FL)

*Hydric soil rating:* No

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