

Fellsmere North Regional Lake

Drainage Report and Calculations

Prepared For:
The City of Fellsmere & Mirzam Land Investment, LLC

For Review By:
St. Johns River Water Management District
Fellsmere Water Control District

February 2016

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February 15, 2016

Fellsmere North Regional Lake Drainage Report and Calculations

1 Existing Conditions:

1.1 Location

The Fellsmere North Regional Lake site encompasses 6.71 acres of vacant land located in Fellsmere, including portions of Tracts 1432 to 1436, Township 31S, Range 37E, along with a portion of the Railroad right of way, Indian River County, Latitude 27°46'27.93"N., Longitude, 80°36'18.43"W.

The property is bound by vacant land to the north, South Carolina Avenue to the south, 138th Avenue, 138th Avenue to the west, and vacant land that is proposed as the Fountains of Fellsmere to the east. Access to the proposed project is provided via South Carolina Avenue.

Ownership breakdown:	5.37 acres	Mirzam
	1.34 acres	City of Fellsmere

1.2 Site Condition

The site natural ground elevation ranges from a low of 21.1 feet NAVD 1988, to a high of 26.82 feet NAVD, and averages approximately 23.0 feet NAVD. The project site is vacant, with the exception of the Fellsmere Water Control District Railroad Ditch, which is approximately 15 feet wide. It is fairly heavily wooded with natural vegetation such as oaks and cabbage palms. Several of the existing trees shall be relocated either on-site or to the Fountains of Fellsmere project located immediately east of the Regional Lake parcel.

1.3 Soils & Wetlands

According to the USDA Soil Survey for Indian River County, Florida, the existing soils consist primarily of Malabar fine sand (39). These soils are typically sloped at 0 to 2 percent, and considered poorly drained. The depth to water table is typically 0 to 18 inches with low to moderate water storage capacity.

1.4 Existing Drainage Flow Pattern

The Fellsmere Water Control District Railroad Ditch collects water from FWCD Ditch 14 and 15 and diverts the flow around to the north, and has a peak tail-water stage of 22.57 NAVD, at 27 hours, and a normal canal water elevation of 17.25 ft NAVD per drainage reports / models provided by the City of Fellsmere's consultant.

1.5 FEMA Flood Zone

The site is located in within an "Other Area", either Zone X - other areas determined to be outside the 0.2% annual chance flood plain, or Zone D - areas in which flood hazards are undetermined, but possible. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.

2 Proposed Development:

2.1 Project Description:

The Fellsmere North Regional Lake project is intended to capture run-off from the City of Fellsmere Community Redevelopment Area and provide nutrient reduction such that any redevelopment activities can simply move forward with building permit and not require a Water Management District / Water Control District Permit.

The nutrient loading / reduction calculations are a pre-post comparison based on the City's allowable build-out impervious values. Refer to the Nutrient Loading Calculations. C-Category Soils condition has been utilized based on the fact that most of the soils are B-D and the Category C provides for an average of the two. Refer to the Soils Survey for the whole basin.

Based on the lake configuration, 8 days of residence time is anticipated, with a proposed nutrient reduction of 28.27% for Nitrogen and 57.94% for Phosphorus.

2.2 Permanent Pool Elevation

Based on data provided by the FWCD for the Railroad Ditch, the normal water elevation is 17.25 feet NAVD.

2.3 Proposed Drainage Flow Pattern

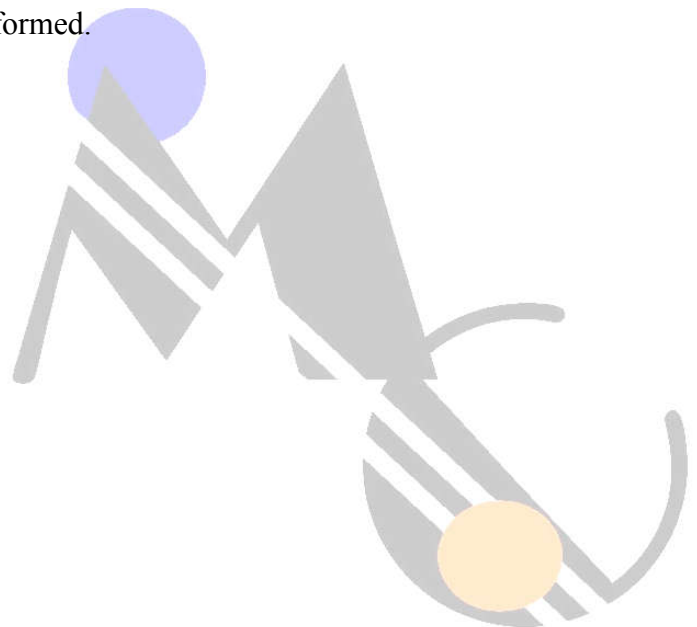
As stated previously, the Fellsmere Water Control District Railroad Ditch collects water from FWCD Ditch 14 and 15 and diverts the flow around to the north. The North Regional Lake project expands the contributing drainage basin to 372.40 acres due to the fact that additional downtown (CRA) areas will now be directed to the Railroad Ditch. The internal plumbing to address the revisions to the drainage basin are under design.

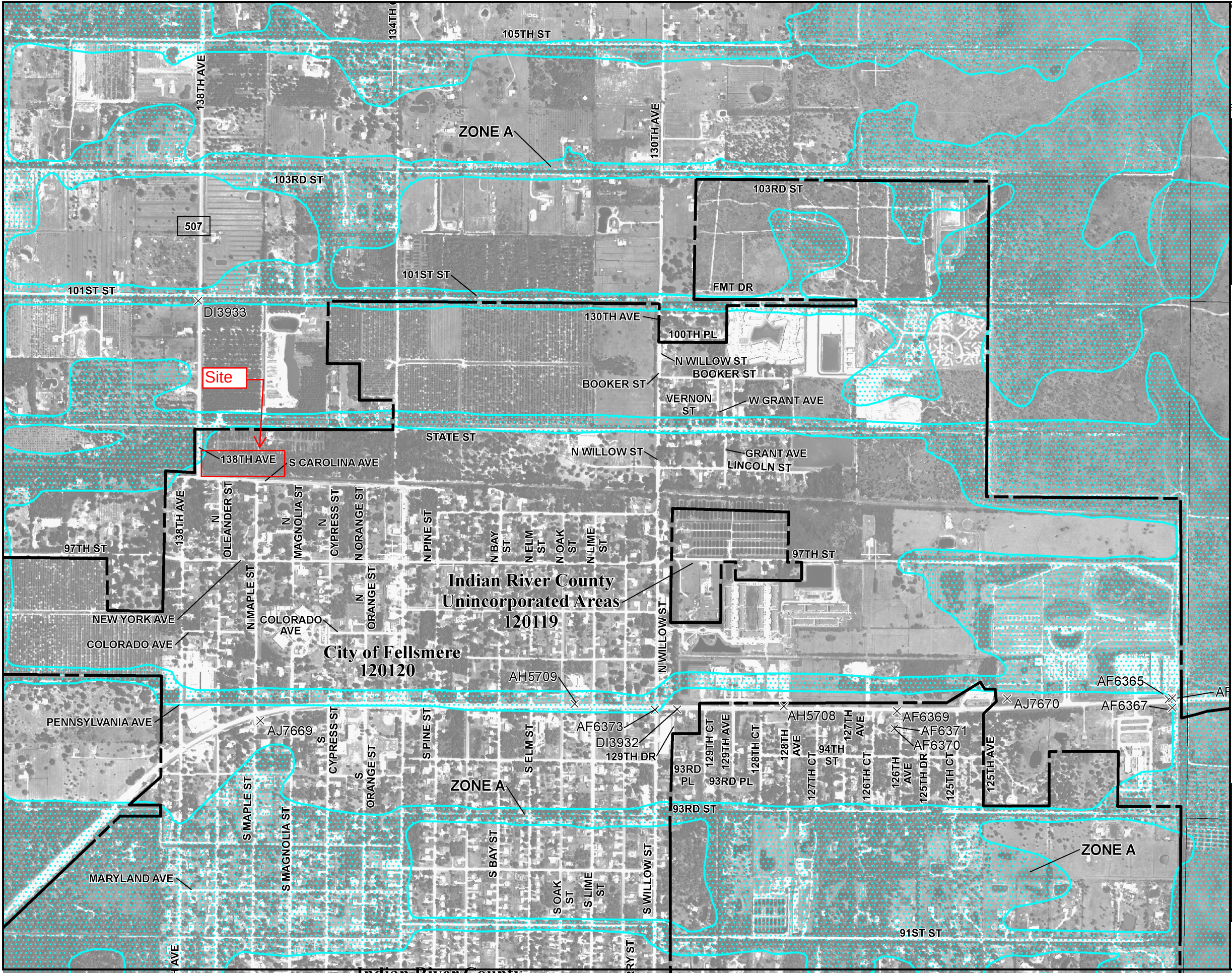
3 Modeling:

No computer-aided modeling has been performed.

4 Attachments

- 4.1 FEMA FIRM Map
- 4.2 Post Development Drainage Map
- 4.3 Nutrient Loading Calculations
- 4.4 USGS Soil Survey Map
- 4.5 Lake Residence Time Calculations
- 4.6 Excerpts from supporting reports
- 4.7 Stormwater Maintenance Memo





Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

0 500 1,000 1,500 2,000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0091H

FIRM

FLOOD INSURANCE RATE MAP

INDIAN RIVER COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 91 OF 390

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FELLSMERE, CITY OF	120120	0091	H
INDIAN RIVER COUNTY	120119	0091	H

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
12061C0091H

MAP REVISED
DECEMBER 4, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Lot Address	Area sf	Area acres	Exist Use	Approx % Imperv.	Exist Mean Annual Load Kg/ac.-yr	Total Exist Mean Annual Load Kg/yr	Prop. Use	Approx % Imperv.	Prop Mean Annual Load Kg/ac.-yr	Total Prop Mean Annual Load Kg/yr	Diff	Req % Red	C	CxA	
1 N. Broadway	3049	0.070	Vacant	0	0.035	0.002	Commercial	80/90	0.943	0.066	0.064	96.29%	0.80	2439.20	City of Fellsmere Sign
2 N. Broadway	37100	0.852	Commercial	40	0.446	0.380	Commercial	80/90	0.943	0.803	0.423	52.70%	0.80	29680.00	Front 1/2 Gas Conv., Back vacant - Use Single Family 40% total
3 N. Broadway	3125	0.072	Vacant	0	0.035	0.003	Commercial	80/90	0.943	0.068	0.065	96.29%	0.80	2500.00	
5 N. Broadway	9375	0.215	Vacant	0	0.035	0.008	Commercial	80/90	0.943	0.203	0.195	96.29%	0.80	7500.00	
11 N. Broadway	9375	0.215	Vacant	0	0.035	0.008	Commercial	80/90	0.943	0.203	0.195	96.29%	0.80	7500.00	
17 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	Two Parcels non-contiguous
19 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	
25 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	
29 N. Broadway	3125	0.072	Vacant	0	0.035	0.003	Commercial	80/90	0.943	0.068	0.065	96.29%	0.80	2500.00	
31 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	
32 N. Broadway	21000	0.482	Commercial/retail/office	65	1.257	0.606	Commercial	80/90	0.943	0.455	-0.151	-33.30%	0.80	16800.00	Use Multi-Family - 65%
39 N. Broadway	15625	0.359	Church	40	0.446	0.160	Commercial	80/90	0.943	0.338	0.178	52.70%	0.80	12500.00	Use Single Family - 40%
44 N. Broadway	17500	0.402	Commercial/Restaurant	80	0.943	0.379	Commercial	80/90	0.943	0.379	0.000	0.00%	0.80	14000.00	
45 N. Broadway	9375	0.215	Vacant	0	0.035	0.008	Commercial	80/90	0.943	0.203	0.195	96.29%	0.80	7500.00	
46 N. Broadway	7000	0.161	Commercial	40	0.446	0.072	Commercial	80/90	0.943	0.152	0.080	52.70%	0.80	5600.00	Use Single Family - 40%
51 N. Broadway	12500	0.287	Vacant	0	0.035	0.010	Commercial	80/90	0.943	0.271	0.261	96.29%	0.80	10000.00	Use Single Family - 25%
52 N. Broadway	7000	0.161	Vacant/Parking	25	0.383	0.062	Commercial	80/90	0.943	0.152	0.090	59.38%	0.80	5600.00	
56 N. Broadway	10500	0.241	Commercial/office	80	0.943	0.227	Commercial	80/90	0.943	0.227	0.000	0.00%	0.80	8400.00	City of Fellsmere
59 N. Broadway	9375	0.215	Vacant	0	0.035	0.008	Commercial	80/90	0.943	0.203	0.195	96.29%	0.80	7500.00	
62 N. Broadway	21000	0.482	Fire Station	80	0.943	0.455	Commercial	80/90	0.943	0.455	0.000	0.00%	0.80	16800.00	
65 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	
71 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	
72 N. Broadway	10500	0.241	Vacant	0	0.035	0.008	Commercial	80/90	0.943	0.227	0.219	96.29%	0.80	8400.00	
75 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	
79 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	
81 N. Broadway	3125	0.072	Commercial/Office	40	0.446	0.032	Commercial	80/90	0.943	0.068	0.036	52.70%	0.80	2500.00	Use Single Family - 40%
85 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	
86 N. Broadway	21000	0.482	Commercial	80	0.943	0.455	Commercial	80/90	0.943	0.455	0.000	0.00%	0.80	16800.00	
89 N. Broadway	3125	0.072	Vacant	0	0.035	0.003	Commercial	80/90	0.943	0.068	0.065	96.29%	0.80	2500.00	
94 N. Broadway	17500	0.402	Commercial	80	0.446	0.179	Commercial	80/90	0.943	0.379	0.200	52.70%	0.80	14000.00	Use Single Family - 40%
98 N. Pine St. (on Broadway)	21875	0.502	Vacant	0	0.035	0.018	Commercial	80/90	0.943	0.474	0.456	96.29%	0.80	17500.00	
102 N. Broadway	10500	0.241	Commercial	80	0.943	0.227	Commercial	80/90	0.943	0.227	0.000	0.00%	0.80	8400.00	
106 N. Broadway	7000	0.161	Commercial	80	0.943	0.152	Commercial	80/90	0.943	0.152	0.000	0.00%	0.80	5600.00	
107 N. Broadway	25000	0.574	Hotel	65	1.257	0.721	Commercial	80/90	0.943	0.541	-0.180	-33.30%	0.80	20000.00	Use Multi-Family - 65%
112 N. Broadway	7000	0.161	Vacant	0	0.035	0.006	Commercial	80/90	0.943	0.152	0.146	96.29%	0.80	5600.00	
114 N. Broadway	7000	0.161	Commercial	80	0.943	0.152	Commercial	80/90	0.943	0.152	0.000	0.00%	0.80	5600.00	
118 N. Broadway	10500	0.241	Vacant	0	0.035	0.008	Commercial	80/90	0.943	0.227	0.219	96.29%	0.80	8400.00	
119 N. Broadway	3125	0.072	Vacant	0	0.035	0.003	Commercial	80/90	0.943	0.068	0.065	96.29%	0.80	2500.00	
123 N. Broadway	3125	0.072	Vacant	0	0.035	0.003	Commercial	80/90	0.943	0.068	0.065	96.29%	0.80	2500.00	
125 N. Broadway	6250	0.143	Commercial	25	0.383	0.055	Commercial	80/90	0.943	0.135	0.080	59.38%	0.80	5000.00	Use Single Family - 25%
129 N. Broadway	6250	0.143	Vacant	0	0.035	0.005	Commercial	80/90	0.943	0.135	0.130	96.29%	0.80	5000.00	
130 N. Broadway	14000	0.321	Commercial	40	0.446	0.143	Commercial	80/90	0.943	0.303	0.160	52.70%	0.80	11200.00	Use Single Family - 40%
132 N. Broadway	7000	0.161	Vacant/Parking	25	0.383	0.062	Commercial	80/90	0.943	0.152	0.090	59.38%	0.80	5600.00	Use Single Family - 25%
133 N. Broadway	9500	0.218	Commercial/Office	40	0.446	0.097	Commercial	80/90	0.943	0.206	0.108	52.70%	0.80	7600.00	Use Single Family - 40%
138 N. Broadway	7000	0.161	Vacant	0	0.035	0.006	Commercial	80/90	0.943	0.152	0.146	96.29%	0.80	5600.00	
139 N. Broadway	15625	0.359	Vacant	0	0.035	0.013	Commercial	80/90	0.943	0.338	0.326	96.29%	0.80	12500.00	
140 N. Broadway	3500	0.080	Vacant	0	0.035	0.003	Commercial	80/90	0.943	0.076	0.073	96.29%	0.80	2800.00	
142 N. Broadway	14000	0.321	Vacant	0	0.035	0.011	Commercial	80/90	0.943	0.303	0.292	96.29%	0.80	11200.00	
149 N. Broadway	18280	0.420	Vacant	0	0.035	0.015	Commercial	80/90	0.943	0.396	0.381	96.29%	0.80	14624.00	
150 N. Broadway	7000	0.161	Vacant	0	0.035	0.006	Commercial	80/90	0.943	0.152	0.146	96.29%	0.80	5600.00	
154 N. Broadway	7000	0.161	Vacant	0	0.035	0.006	Commercial	80/90	0.943	0.152	0.146	96.29%	0.80	5600.00	
158 N. Broadway	8362	0.192	Vacant	0	0.035	0.007	Commercial	80/90	0.943	0.181	0.174	96.29%	0.80	6689.60	
Total for Broadway	526416	12.085				4.825				11.396	6.571	57.66%	0.80	421132.80	
Total All Sheets less East Basins	3985182	91.487				28.152				66.740	38.587	57.82%	0.73	2893173.35	
Total for Broadway	526416	12.085				4.825				11.396	6.571	57.66%	0.80	421132.80	
Total for Pine & Orange	543497	12.477				3.366				11.766	8.400	71.40%	0.80	434797.6	
Total for Others	2258998	51.859				16.364				33.685	17.321	51.42%	0.72	1621096.78	
Total for Others (2)	656271	15.066				3.598				9.893	6.295	63.63%	0.63	416146.17	
Total for East Basins	12236440	280.910				120.458				169.165	48.707	28.79%	0.69	8394833.00	
Total	16221621	372.397				148.610				235.905	87.294	37.00%	0.70	11288006.35	

2/10/2016

N. Pine St.			Approx.	Exist	Total Exist		Approx.	Prop	Total Prop		Req		
Lot Address	Area	Area	%	Mean	Mean	Prop. Use	%	Mean	Mean	Diff	%	C	CxA
	sf	acres	Imperv.	Annual Load Kg/ac.-yr	Annual Load Kg/yr		Imperv.	Annual Load Kg/ac.-yr	Annual Load Kg/yr		Red		
6 N. Pine	15680	0.360	65	1.257	0.452	Church	80	0.943	0.339	-0.113	-33.30%	0.80	12544
12 N. Pine	6250	0.143	0	0.035	0.005	Vacant	80	0.943	0.135	0.130	96.29%	0.80	5000
16 N. Pine	6250	0.143	0	0.035	0.005	Vacant	80	0.943	0.135	0.130	96.29%	0.80	5000
24 N. Pine	12500	0.287	40	0.446	0.128	Single-Family	80	0.943	0.271	0.143	52.70%	0.80	10000
30 N. Pine	12500	0.287	25	0.383	0.110	Single-Family	80	0.943	0.271	0.161	59.38%	0.80	10000
36 N. Pine	6250	0.143	65	1.257	0.180	Church	80	0.943	0.135	-0.045	-33.30%	0.80	5000
44 N. Pine	15625	0.359	65	0.446	0.160	Church/School/Parking	80	0.943	0.338	0.178	52.70%	0.80	12500
50 N. Pine	12500	0.287	0	0.035	0.010	Vacant	80	0.943	0.271	0.261	96.29%	0.80	10000
62 N. Pine	9375	0.215	0	0.035	0.008	Vacant	80	0.943	0.203	0.195	96.29%	0.80	7500
64 N. Pine	9375	0.215	0	0.035	0.008	Vacant	80	0.943	0.203	0.195	96.29%	0.80	7500
72 N. Pine	12500	0.287	25	0.383	0.110	Single-Family	80	0.943	0.271	0.161	59.38%	0.80	10000
82 N. Pine	12500	0.287	25	0.383	0.110	Single-Family	80	0.943	0.271	0.161	59.38%	0.80	10000
88 N. Pine	6250	0.143	25	0.383	0.055	Mobile Home	80	0.943	0.135	0.080	59.38%	0.80	5000
90 N. Pine	6250	0.143	0	0.035	0.005	Vacant	80	0.943	0.135	0.130	96.29%	0.80	5000
98 (on N. Pine St.)	15625	0.359	0	0.035	0.013	Vacant	80	0.943	0.338	0.326	96.29%	0.80	12500
104 N. Pine	25000	0.574	0	0.035	0.020	Vacant	80	0.943	0.541	0.521	96.29%	0.80	20000
122 N. Pine	12500	0.287	40	0.446	0.128	Single-Family	80	0.943	0.271	0.143	52.70%	0.80	10000
130 N. Pine	15625	0.359	15	0.215	0.077	Single-Family	80	0.943	0.338	0.261	77.20%	0.80	12500
138 N. Pine	18750	0.430	0	0.035	0.015	Vacant	80	0.943	0.406	0.391	96.29%	0.80	15000
150 N. Pine	4688	0.108	0	0.035	0.004	Vacant	80	0.943	0.101	0.098	96.29%	0.80	3750.4
154 N. Pine	4688	0.108	0	0.035	0.004	Vacant	80	0.943	0.101	0.098	96.29%	0.80	3750.4
156 N. Pine	5422	0.124	0	0.035	0.004	Vacant	80	0.943	0.117	0.113	96.29%	0.80	4337.6
Total Pine St.	246103	5.650			1.610				5.328	3.717	69.77%	0.80	196882.4
N. Orange St.													
1 N. Orange	12600	0.289	40	0.446	0.129	Office	80	0.943	0.273	0.144	52.70%	0.80	10080
9 N. Orange	14000	0.321	0	0.035	0.011	Vacant	80	0.943	0.303	0.292	96.29%	0.80	11200
21 N. Orange	21000	0.482	15	0.215	0.104	Single-Family	80	0.943	0.455	0.351	77.20%	0.80	16800
29 N. Orange	42000	0.964	0	0.035	0.034	Vacant	80	0.943	0.909	0.875	96.29%	0.80	33600
53 N. Orange	21000	0.482	0	0.035	0.017	Vacant	80	0.943	0.455	0.438	96.29%	0.80	16800
65-69 N. Orange	14000	0.321	65	1.257	0.404	Multi-Family	80	0.943	0.303	-0.101	-33.30%	0.80	11200
73-77 N. Orange	14000	0.321	65	1.257	0.404	Multi-Family	80	0.943	0.303	-0.101	-33.30%	0.80	11200
85 N. Orange	21000	0.482	25	0.383	0.185	Single-Family	80	0.943	0.455	0.270	59.38%	0.80	16800
93 N. Orange	7000	0.161	0	0.035	0.006	Vacant	80	0.943	0.152	0.146	96.29%	0.80	5600
99 N. Orange	14000	0.321	25	0.383	0.123	Single-Family	80	0.943	0.303	0.180	59.38%	0.80	11200
107 N. Orange	21000	0.482	0	0.035	0.017	Vacant	80	0.943	0.455	0.438	96.29%	0.80	16800
121 N. Orange	14000	0.321	0	0.035	0.011	Vacant	80	0.943	0.303	0.292	96.29%	0.80	11200
123 N. Orange	7000	0.161	40	0.446	0.072	Single-Family	80	0.943	0.152	0.080	52.70%	0.80	5600
125 N. Orange	14000	0.321	0	0.035	0.011	Vacant	80	0.943	0.303	0.292	96.29%	0.80	11200
133 N. Orange	21000	0.482	0	0.035	0.017	Vacant	80	0.943	0.455	0.438	96.29%	0.80	16800
149 N. Orange	14000	0.321	25	0.383	0.123	Single-Family	80	0.943	0.303	0.180	59.38%	0.80	11200
154 N. Orange	17328	0.398	0	0.035	0.014	Vacant	80	0.943	0.375	0.361	96.29%	0.80	13862.4
159 N. Orange	8466	0.194	25	0.383	0.074	Single-Family	80	0.943	0.183	0.109	59.38%	0.80	6772.8
Total Orange	297394	6.827			1.755				6.438	4.683	72.74%	0.80	237915.2
Total for Pine & Orange	543497	12.477			3.366				11.766	8.400	71.40%	0.80	434797.6

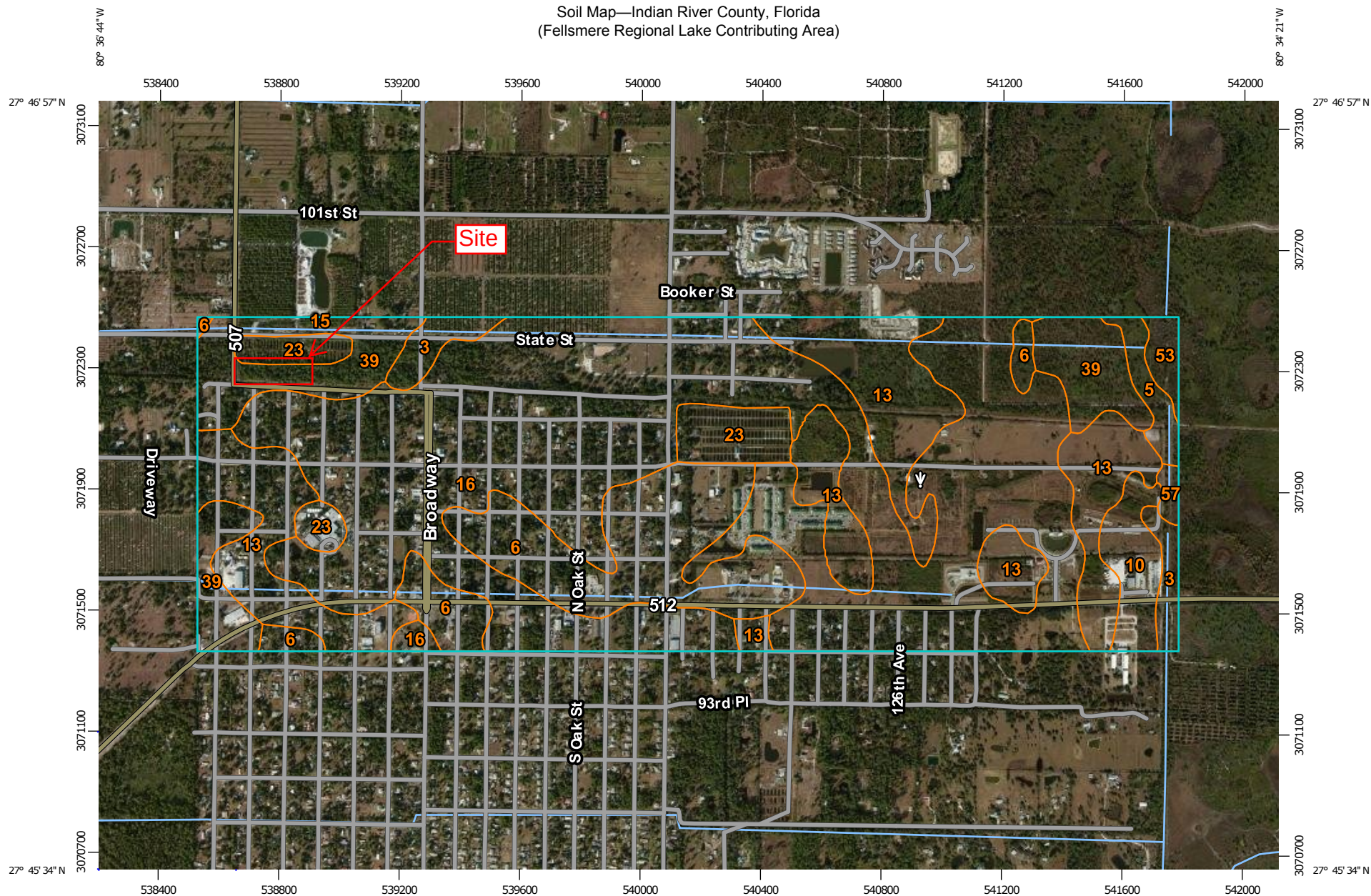
2/10/2016

Lot Address	Area sf	Area acres	Exist Use	Approx. % Imperv.	Exist Mean Annual Load Kg/ac.-yr	Total Exist Mean Annual Load Kg/yr	Prop. Use	Approx. % Imperv.	Prop Mean Annual Load Kg/ac.-yr	Total Prop Mean Annual Load Kg/yr	Diff	Req % Red	C	CxA			
N. Pine St (East)																	
143 N. Pine	31324	0.719	Single-Family	15	0.215	0.155	Single Family	50	0.446	0.321	0.166	51.79%	0.50	15662.00			
N. Hickory St.																	
140 N. Hickory	19875	0.456	Vacant	0	0.035	0.016	Single Family	50	0.446	0.203	0.188	92.15%	0.50	9937.50			
142 N. Hickory	10800	0.248	Vacant	0	0.035	0.009	Single Family	50	0.446	0.111	0.102	92.15%	0.50	5400.00			
151 N. Hickory	29732	0.683	Single-Family	15	0.215	0.147	Single Family	50	0.446	0.304	0.158	51.79%	0.50	14866.00			
N. Bay St.																	
146 N. Bay	9938	0.228	Single-Family	25	0.383	0.087	Single Family	50	0.446	0.102	0.014	14.13%	0.50	4969.00			
150 N. Bay	9938	0.228	Single-Family	40	0.446	0.102	Single Family	50	0.446	0.102	0.000	0.00%	0.50	4969.00			
158 N. Bay	9208	0.211	Single-Family	25	0.383	0.081	Single Family	50	0.446	0.094	0.013	14.13%	0.50	4604.00			
N. Elm St.																	
144 N. Elm	55633	1.277	Single-Family	15	0.215	0.275	Single Family	50	0.446	0.570	0.295	51.79%	0.50	27816.50			
N. Oak St.																	
141 N. Oak	13250	0.304	Single-Family	25	0.383	0.117	Single Family	50	0.446	0.136	0.019	14.13%	0.50	6625.00			
143 N. Oak	11706	0.269	Vacant	0	0.035	0.009	Single Family	50	0.446	0.120	0.110	92.15%	0.50	5853.00			
146 N. Oak	52450	1.204	Single-Family	15	0.215	0.259	Single Family	50	0.446	0.537	0.278	51.79%	0.50	26225.00			
N. Lime St.																	
140 N. Lime	24308	0.558	Vacant	0	0.035	0.020	Single Family	50	0.446	0.249	0.229	92.15%	0.50	12154.00			
N. Mulberry St.																	
140 N. Mulberry	46082	1.058	Vacant	0	0.035	0.037	Single Family	50	0.446	0.472	0.435	92.15%	0.50	23041.00			
145 N. Mulberry	9938	0.228	Single-Family	25	0.383	0.087	Single Family	50	0.446	0.102	0.014	14.13%	0.50	4969.00			
151 N. Mulberry	11836	0.272	Single-Family	25	0.383	0.104	Single Family	50	0.446	0.121	0.017	14.13%	0.50	5918.00			
N. Willow St.																	
140 N. Willow	9938	0.228	Single-Family	25	0.383	0.117	Single Family	80	0.943	0.215	0.098	45.62%	0.80	7950.40			
146 N. Willow	11188	0.257	Vacant	0	0.035	0.009	Single Family	80	0.943	0.242	0.233	96.29%	0.80	8950.40			
130 N. Willow	28125	0.646	Single-Family	40	0.446	0.288	Single Family	80	0.943	0.609	0.321	52.70%	0.80	22500.00			
104 N. Willow	28125	0.646	Vacant	0	0.035	0.023	Single Family	80	0.943	0.609	0.586	96.29%	0.80	22500.00			
100 N. Willow	28125	0.646	Single-Family	15	0.215	0.139	Single Family	80	0.943	0.609	0.470	77.20%	0.80	22500.00			
80 N. Willow	12500	0.287	Single-Family	40	0.446	0.128	Single Family	80	0.943	0.271	0.143	52.70%	0.80	10000.00			
74 N. Willow	12500	0.287	Single-Family	25	0.383	0.117	Single Family	80	0.943	0.271	0.154	56.76%	0.80	10000.00			
60 N. Willow	15625	0.359	Vacant	0	0.035	0.013	Single Family	80	0.943	0.338	0.326	96.29%	0.80	12500.00			
52 N. Willow	12500	0.287	Vacant	0	0.035	0.010	Single Family	80	0.943	0.271	0.261	96.29%	0.80	10000.00			
44 N. Willow	12500	0.287	Single-Family	50	0.446	0.128	Single Family	80	0.943	0.271	0.143	52.70%	0.80	10000.00			
36 N. Willow	12500	0.287	Vacant	0	0.035	0.010	Single Family	80	0.943	0.271	0.261	96.29%	0.80	10000.00			
Commercial (no permit)	107593.2	2.470	Office/Vacant	15	0.215	0.531	Commercial	80	0.943	2.329	1.798	77.20%	0.80	86074.56			
Commercial (no permit)	111949.2	2.570	Commercial/Vacant	15	0.215	0.553	Commercial	80	0.943	2.424	1.871	77.20%	0.80	89559.36			
Total Other (2) Lots						2.484				7.518	5.034	66.95%	0.60	319909.80			
						Approx. % Imperv.	Exist Mean Annual Load Kg/ac.-yr	Total Exist Mean Annual Load Kg/yr	Prop. Use	Approx. % Imperv.	Prop Mean Annual Load Kg/ac.-yr	Total Prop Mean Annual Load Kg/yr	Diff	Req. % Reduct	C	CxA	
Right-of-way				Width	Length	Area (sf)	Area (ac)										
N. Wyoming St.				25	2215	55375	1.271	25	0.383	0.487	50	0.817	1.039	0.552	53.12%	0.76	42085.00
N. Hickory St.				60	227.95	13677	0.314	25	0.383	0.120	50	0.817	0.257	0.136	53.12%	0.76	10394.52
N. Bay St.				60	215.94	12956	0.297	25	0.383	0.114	50	0.817	0.243	0.129	53.12%	0.76	9846.86
N. Elm St.				60	203.93	12236	0.281	25	0.383	0.108	50	0.817	0.229	0.122	53.12%	0.76	9299.21
N. Oak St.				60	191.92	11515	0.264	25	0.383	0.101	50	0.817	0.216	0.115	53.12%	0.76	8751.55
N. Lime St.				60	179.9	10794	0.248	25	0.383	0.095	50	0.817	0.202	0.108	53.12%	0.76	8203.44
N. Mulberry St.				60	167.89	10073	0.231	25	0.383	0.089	50	0.817	0.189	0.100	53.12%	0.76	7655.78
Total Right-of-ways						126627	2.907		1.113			2.375	1.262	53.12%	0.76	96236.37	
Total This Sheet Other (2)						656271	15.066		3.598			9.893	6.295	63.63%	0.63	416146.17	

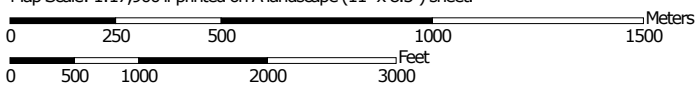
2/10/2016

Lot Address	Area sf	Area acres	Exist Use	Approx. % Imperv.	Exist Mean Annual Load Kg/ac.-yr	Total Exist Mean Annual Load Kg/yr	Prop. Use	Approx. % Imperv.	Prop Mean Annual Load Kg/ac.-yr	Total Prop Mean Annual Load Kg/yr	Diff	Req % Red	C	CxA			
N. Cypress St. 153 N. Cypress	24795	0.569	Single-Family	25	0.383	0.218	Commercial	80/90	0.943	0.537	0.319	59.38%	0.80	19836			
South Carolina Ave 160 S. Carolina (E) 160 S. Carolina (W)	12142 5254	0.279 0.121	Vacant Vacant	0 0	0.035 0.035	0.010 0.004	Commercial Commercial	80/90 80/90	0.943 0.943	0.263 0.114	0.253 0.110	96.29% 96.29%	0.80 0.80	9713.6 4203.2	City of Fellsmere City of Fellsmere		
N. Magnolia St. 147 N. Magnolia 148 N. Magnolia	28000 35116	0.643 0.806	Single-Family Single-Family	15 15	0.215 0.215	0.138 0.173	Commercial Commercial	80/90 80/90	0.943 0.943	0.606 0.760	0.468 0.587	77.20% 77.20%	0.80 0.80	22400 28092.8			
N. Maple St. 159 N. Maple 162 N. Maple	14446 9082	0.332 0.208	Single-Family Vacant	25 0	0.383 0.035	0.127 0.007	Commercial Commercial	80/90 80/90	0.943 0.943	0.313 0.197	0.186 0.189	59.38% 96.29%	0.80 0.80	11556.8 7265.6			
N. Oleander St. 150 N. Oleander 161 N. Oleander	17827 16698	0.409 0.383	Single-Family Single-Family	25 25	0.383 0.383	0.157 0.147	Commercial Commercial	80/90 80/90	0.943 0.943	0.386 0.361	0.229 0.215	59.38% 59.38%	0.80 0.80	14261.6 13358.4			
N. Myrtle St. 163 N. Myrtle	11660	0.268	Single-Family	25	0.383	0.103	Commercial	80/90	0.943	0.252	0.150	59.38%	0.80	9328			
Total other Lots	175020	4.018				1.084				3.789	2.705	71.39%	0.80	140016			
						Approx. % Imperv.	Exist Mean Annual Load Kg/ac.-yr	Total Exist Mean Annual Load Kg/yr	Prop. Use	Approx. % Imperv.	Prop Mean Annual Load Kg/ac.-yr	Total Prop Mean Annual Load Kg/yr	Diff	Req. % Reduct	C	CxA	
Right-of-way N. Broadway St. N. Pine St. N. Orange St. Oregon Ave. Colorado Ave. Idaho Ave. New York Ave South Carolina Ave. N. Cypress St. N. Magnolia St. N. Maple St. N. Oleander St. N. Myrtle St.	Width 100 60 80 60 100 60 80 50 80 80 80 80	Length 2175.35 2106 2183 265 300 265 565 2705 181.2 246.8 107.25 123.3 85	Area (sf) 217535 126360 174640 15900 30000 15900 45200 135250 14496 19744 8580 9864 6800	Area (ac) 4.994 2.901 4.009 0.365 0.689 0.365 1.038 3.105 0.333 0.453 0.197 0.226 0.156		75 0.383 0.383 0.817 0.817 0.817 0.817 50 25 25 25 25 50	1.106 0.383 0.383 0.817 0.817 0.817 0.817 2.537 0.383 0.383 0.383 0.383 0.817	5.523 1.111 1.536 0.298 0.563 0.298 0.848 2.537 0.127 0.174 0.075 0.087 0.128		75 50 50 75 75 75 75 75 50 50 50 50 75	1.106 0.817 0.817 1.106 1.106 1.106 1.106 3.434 0.817 0.817 0.817 0.817 1.106	5.523 2.370 3.276 0.404 0.762 0.404 1.148 0.897 0.272 0.370 0.161 0.185 0.173	0.000 1.259 1.740 0.105 0.199 0.105 0.300 0.897 0.144 0.197 0.085 0.098 0.045	0.00% 53.12% 53.12% 26.13% 26.13% 26.13% 26.13% 26.13% 53.12% 53.12% 53.12% 53.12% 26.13%	0.76 0.58 0.58 0.76 0.76 0.76 0.76 0.76 0.58 0.58 0.58 0.58 0.76	165326.60 73288.80 101291.20 12084.00 22800.00 12084.00 34352.00 102790.00 8407.68 11451.52 4976.40 5721.12 5168.00	Use single family @25%
Total Right-of-ways			820269	18.831				13.304				18.480	5.176	28.01%	0.68	559741.32	
Alleys N. Pine - N. Broadway N. Broadway - N. Orange N. Orange - N. Cypress N. Cypress - N. Magnolia N. Magnolia - N. Maple N. Maple - N. Oleander N. Oleander - N. Mrytle	15 20 20 20 20 20 20	1910.9 1997.46 174.15 239.75 253.8 116.3 130.3	28664 39949 3483 4795 5076 2326 2606	0.658 0.917 0.080 0.110 0.117 0.053 0.060	25 25 25 25 25 25 25	0.383 0.383 0.383 0.383 0.383 0.383 0.383	0.252 0.351 0.031 0.042 0.045 0.020 0.023		100 100 75 75 75 75 75	1.106 1.106 1.106 1.106 1.106 1.106 1.106	0.728 1.014 0.088 0.122 0.129 0.059 0.066	0.476 0.663 0.058 0.080 0.084 0.039 0.043	65.37% 65.37% 65.37% 65.37% 65.37% 65.37% 65.37%	1.00 1.00 0.76 0.76 0.76 0.76 0.76	28663.50 39949.20 2647.08 3644.20 3857.76 1767.76 1980.56		
Total Alleys			86899	1.995				0.764				2.206	1.442	65.37%	0.95	82510.06	
Other Remaining Canal Right-of-Way Total Lake Parcel FOF Phase 1 (Includes 3) FOF Phase 2 FOF Phase 4	100	2468		16180 292410 500256 265801 102163	0.371 6.713 11.484 6.102 2.345		0.035 0.045 0.045 0.045 0.045	0.013 0.302 0.517 0.275 0.106		50 50 65 65 65	0.035 0.045 1.257 1.257 1.257	0.013 0.302 5.125 2.723 1.047	0.000 0.000 4.608 2.448 0.941	0.00% 0.00% 89.92% 89.92% 89.92%	0.58 0.58 0.76 0.76 0.76	9384.40 169597.80 380194.56 202008.76 77643.88	Exist Open Land Exist Forests Multi Family - 65% Multi Family - 65% Multi Family - 65%
Total Other				1176810	27.016			1.212				9.209	7.997	86.84%	0.71	838829.40	
Total This Sheet				2258998	51.859			16.364				33.685	17.321	51.42%	0.72	1621096.78	

Soil Map—Indian River County, Florida
(Fellsmere Regional Lake Contributing Area)



Map Scale: 1:17,900 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

11/4/2015
Page 1 of 3

Soil Map—Indian River County, Florida
(Fellsmere Regional Lake Contributing Area)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>

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: Indian River County, Florida

Survey Area Data: Version 13, Sep 23, 2015

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

Date(s) aerial images were photographed: Dec 15, 2010—Mar 13, 2011

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

Indian River County, Florida (FL061)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	EauGallie fine sand	17.8	2.0%
5	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	10.1	1.1%
6	Oldsmar fine sand	108.0	12.1%
10	Riviera fine sand, 0 to 2 percent slopes	20.7	2.3%
13	Wabasso fine sand	159.8	17.9%
15	Manatee loamy fine sand	0.4	0.0%
16	Pineda fine sand	455.8	51.1%
23	Arents, 0 to 5 percent slopes	32.0	3.6%
39	Malabar fine sand	78.4	8.8%
53	Manatee mucky loamy fine sand, depressional	6.6	0.7%
57	Holopaw fine sand, depressional	3.0	0.3%
Totals for Area of Interest		892.5	100.0%

2/10/2016														
Assume HSG C														
Lot Address	Area sf	Area acres	Exist Use	Approx % Imperv.	Exist Mean Annual Load Kg/ac.-yr	Total Exist Mean Annual Load Kg/yr	Prop. Use	Approx % Imperv.	Prop Mean Annual Load Kg/ac.-yr	Total Prop Mean Annual Load Kg/yr	Diff	Req % Red	C	CxA
BPL14-D														
Single Family		17.500	Single Family	50	0.817	14.298	No Change	50	0.817	14.298	0.000	0.00%	0.58	10.15
Future Development		42.450	Vacant	65	1.257	53.360	Reduction On-Site	0	0	0.000	-53.360	0.00%	0.76	32.26
Exist Permit		19.800	Commercial / Multi Fam	65	1.257	24.889	No Change			24.889	0.000	0.00%	0.76	15.05
BPL14-E														
Future Development		43.160	Vacant	65	1.257	54.252	Reduction On-Site	0	0	54.252	0.000	0.00%	0.76	32.80
Existing Permit		29.290	Industrial	65	1.257	36.818	No Change	0	0	0.000	-36.818	0.00%	0.76	22.26
BPL15-E														
Future Development		29.820	Vacant	65	1.257	37.484	Reduction On-Site	0	0	0.000	-37.484	0.00%	0.76	22.66
Exist Permit		28.460	Commercial / Multi Fam	65	1.257	35.774	No Change			35.774	0.000	0.00%	0.76	21.63
No Increased Impervious		3.730	Industrial	50	0.817	3.047	No Change			3.047	0.000	0.00%	0.58	2.16
BPL15-D														
Future Development		11.230	Vacant	65	1.257	14.116	Reduction On-Site	0	0	0.000	-14.116	0.00%	0.76	8.53
Exist Permit		25.980	Commercial / Multi Fam	65	1.257	32.657	No Change			32.657	0.000	0.00%	0.76	19.74
BPL13b-C														
Road/Canal R/W		5.200	Road/Canal R/W	50	0.817	4.248	No Change			4.248	0.000	0.00%	0.58	3.02
Rodeo Site		5.840	Rodeo Site	15	0.215	1.256	Reduction On-Site			0.000	-1.256	0.00%	0.80	4.67
Total This Sheet		262.460				312.198				169.165	-143.033	-84.55%	0.74	194.95

Indian River County, Florida

57—Holopaw fine sand, depressional

Map Unit Setting

National map unit symbol: tdh5

Elevation: 10 to 200 feet

Mean annual precipitation: 52 to 60 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 350 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Holopaw, depressional, and similar soils: 85 percent

Minor components: 15 percent

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

Description of Holopaw, Depressional

Setting

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 8 inches: fine sand

Eg - 8 to 47 inches: fine sand

Btg - 47 to 65 inches: sandy loam

Cg - 65 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 1 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 (0.20 to 1.98 in/hr)

Depth to water table: About 0 to 6 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 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: A/D

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL), Freshwater Marshes and Ponds (R155XY010FL)

Minor Components

Malabar, hydric

Percent of map unit: 3 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), Cabbage Palm Flatwoods (R155XY005FL)

Floridana, depressional

Percent of map unit: 3 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G156BC245FL), Freshwater Marshes and Ponds (R155XY010FL)

Riviera, depressional

Percent of map unit: 3 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G156BC245FL), Freshwater Marshes and Ponds (R155XY010FL)

Pineda, depressional

Percent of map unit: 3 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G156BC245FL), Freshwater Marshes and Ponds (R155XY010FL)

Manatee

Percent of map unit: 3 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Loamy and clayey soils on stream
terraces, flood plains, or in depressions (G156BC345FL),
Freshwater Marshes and Ponds (R155XY010FL)

Data Source Information

Soil Survey Area: Indian River County, Florida
Survey Area Data: Version 13, Sep 23, 2015

Indian River County, Florida

53—Manatee mucky loamy fine sand, depressional

Map Unit Setting

National map unit symbol: tdh1

Elevation: 10 to 200 feet

Mean annual precipitation: 52 to 60 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 350 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Manatee and similar soils: 85 percent

Minor components: 15 percent

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

Description of Manatee

Setting

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 8 inches: mucky loamy fine sand

Btg - 8 to 24 inches: fine sandy loam

BCg - 24 to 42 inches: sandy loam

Cg - 42 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 1 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 1.98 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Calcium carbonate, maximum in profile: 15 percent

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: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: B/D

Other vegetative classification: Loamy and clayey soils on stream
terraces, flood plains, or in depressions (G156BC345FL),
Freshwater Marshes and Ponds (R155XY010FL)

Minor Components

Riviera, depressional

Percent of map unit: 3 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy over loamy soils on stream
terraces, flood plains, or in depressions (G156BC245FL),
Freshwater Marshes and Ponds (R155XY010FL)

Malabar, hydric

Percent of map unit: 2 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Other vegetative classification: Sandy soils on flats of mesic or hydric
lowlands (G156BC141FL), Cabbage Palm Flatwoods
(R155XY005FL)

Floridana, depressional

Percent of map unit: 2 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy over loamy soils on stream
terraces, flood plains, or in depressions (G156BC245FL),
Freshwater Marshes and Ponds (R155XY010FL)

Chobee, depressional

Percent of map unit: 2 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Loamy and clayey soils on stream
terraces, flood plains, or in depressions (G156BC345FL)

Pineda, depressional

Percent of map unit: 2 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G156BC245FL), Freshwater Marshes and Ponds (R155XY010FL)

Holopaw, depressional

Percent of map unit: 2 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL), Freshwater Marshes and Ponds (R155XY010FL)

Winder

Percent of map unit: 1 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave, linear

Across-slope shape: Linear, concave

Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156BC341FL), Wetland Hardwood Hammock (R155XY012FL)

Samsula

Percent of map unit: 1 percent

Landform: Marshes on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Organic soils in depressions and on flood plains (G156BC645FL)

Data Source Information

Soil Survey Area: Indian River County, Florida

Survey Area Data: Version 13, Sep 23, 2015

Indian River County, Florida

5—Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tw7

Elevation: 10 to 130 feet

Mean annual precipitation: 38 to 62 inches

Mean annual air temperature: 64 to 75 degrees F

Frost-free period: 280 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Myakka and similar soils: 75 percent

Myakka, wet, and similar soils: 15 percent

Minor components: 10 percent

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

Description of Myakka

Setting

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Tread, talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand

E - 6 to 20 inches: fine sand

Bh - 20 to 36 inches: fine sand

C - 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: High

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 6 to 18 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 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

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

Description of Myakka, Wet

Setting

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Tread, talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand

E - 6 to 20 inches: fine sand

Bh - 20 to 36 inches: fine sand

C - 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: High

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 to 6 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 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

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

Minor Components

Basinger

Percent of map unit: 5 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear, convex

Across-slope shape: Concave, linear

Other vegetative classification: Sandy soils on flats of mesic or hydric
lowlands (G155XB141FL)

Eaugallie, non-hydric

Percent of map unit: 4 percent

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

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

Placid, depressional

Percent of map unit: 1 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Convex, concave

Across-slope shape: Linear, concave

Other vegetative classification: Sandy soils on stream terraces, flood
plains, or in depressions (G155XB145FL)

Data Source Information

Soil Survey Area: Indian River County, Florida

Survey Area Data: Version 13, Sep 23, 2015

Indian River County, Florida

6—Oldsmar fine sand

Map Unit Setting

National map unit symbol: tdfp

Elevation: 20 to 200 feet

Mean annual precipitation: 52 to 60 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 350 to 365 days

Farmland classification: Farmland of unique importance

Map Unit Composition

Oldsmar, non-hydric, and similar soils: 80 percent

Oldsmar, hydric, and similar soils: 10 percent

Minor components: 10 percent

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

Description of Oldsmar, Non-hydric

Setting

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 5 inches: fine sand

E - 5 to 32 inches: fine sand

Bh - 32 to 50 inches: fine sand

Btg - 50 to 62 inches: sandy clay loam

Cg - 62 to 80 inches: loamy 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: 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

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): 4w

Hydrologic Soil Group: A/D

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R155XY003FL)

Description of Oldsmar, Hydric

Setting

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sand

E - 5 to 32 inches: fine sand

Bh - 32 to 50 inches: fine sand

Btg - 50 to 62 inches: sandy clay loam

Cg - 62 to 80 inches: loamy 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: 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 0 to 12 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 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R155XY003FL)

Minor Components

Holopaw

Percent of map unit: 3 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), Slough (R155XY011FL)

Eaugallie, non-hydric

Percent of map unit: 3 percent

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R155XY003FL)

Malabar, non-hydric

Percent of map unit: 2 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), Cabbage Palm Flatwoods (R155XY005FL)

Wabasso, non-hydric

Percent of map unit: 2 percent

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R155XY003FL)

Data Source Information

Soil Survey Area: Indian River County, Florida

Survey Area Data: Version 13, Sep 23, 2015

Indian River County, Florida

10—Riviera fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzw2

Elevation: 0 to 80 feet

Mean annual precipitation: 44 to 59 inches

Mean annual air temperature: 68 to 77 degrees F

Frost-free period: 300 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

Landform: Drainageways on marine terraces, flatwoods on marine terraces

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

Down-slope shape: Linear

Across-slope shape: Concave, linear

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: fine sand

E - 6 to 28 inches: fine sand

Bt/E - 28 to 36 inches: sandy loam

Btg - 36 to 42 inches: sandy clay loam

2C - 42 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: 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 0 to 12 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: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: A/D

Ecological site: Slough (R155XY011FL)

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

Minor Components

Wabasso

Percent of map unit: 8 percent

Landform: Drainageways on marine terraces, flatwoods on marine terraces

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

Down-slope shape: Linear, convex

Across-slope shape: Linear, concave

Ecological site: South Florida Flatwoods (R155XY003FL)

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)

Pinellas

Percent of map unit: 4 percent

Landform: Drainageways on marine terraces, flatwoods on marine terraces

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

Down-slope shape: Linear, convex

Across-slope shape: Concave, linear

Ecological site: Cabbage Palm Flatwoods (R155XY005FL)

Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156AC241FL)

Hallandale

Percent of map unit: 4 percent

Landform: Drainageways on marine terraces, flatwoods on marine terraces

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

Down-slope shape: Linear, convex

Across-slope shape: Concave, linear

Ecological site: Slough (R155XY011FL)

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)

Oldsmar

Percent of map unit: 2 percent

Landform: Drainageways on marine terraces, flatwoods on marine terraces

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

Down-slope shape: Linear, convex

Across-slope shape: Concave, linear

Ecological site: South Florida Flatwoods (R155XY003FL)

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)

Floridana

Percent of map unit: 2 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Tread, dip

Down-slope shape: Concave

Across-slope shape: Concave, linear

Ecological site: Freshwater Marshes and Ponds (R155XY010FL)

Other vegetative classification: Sandy over loamy soils on stream
terraces, flood plains, or in depressions (G156BC245FL)

Data Source Information

Soil Survey Area: Indian River County, Florida

Survey Area Data: Version 13, Sep 23, 2015

Indian River County, Florida

13—Wabasso fine sand

Map Unit Setting

National map unit symbol: tdfx

Elevation: 0 to 200 feet

Mean annual precipitation: 52 to 60 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 350 to 365 days

Farmland classification: Farmland of unique importance

Map Unit Composition

Wabasso, non-hydric, and similar soils: 70 percent

Wabasso, hydric, and similar soils: 20 percent

Minor components: 10 percent

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

Description of Wabasso, Non-hydric

Setting

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 7 inches: fine sand

E - 7 to 24 inches: fine sand

Bh - 24 to 35 inches: fine sand

Bt - 35 to 48 inches: sandy clay loam

Cg - 48 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural 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

Calcium carbonate, maximum in profile: 5 percent

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 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R155XY003FL)

Description of Wabasso, Hydric**Setting**

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 7 inches: fine sand

E - 7 to 24 inches: fine sand

Bh - 24 to 35 inches: fine sand

Bt - 35 to 48 inches: sandy clay loam

Cg - 48 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural 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 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

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 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R155XY003FL)

Minor Components**Eaugallie, non-hydric**

Percent of map unit: 3 percent

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R155XY003FL)

Boca, non-hydric

Percent of map unit: 3 percent

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL), South Florida Flatwoods (R155XY003FL)

Winder

Percent of map unit: 2 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave, linear

Across-slope shape: Linear, concave

Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156BC341FL), Wetland Hardwood Hammock (R155XY012FL)

Riviera

Percent of map unit: 2 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL), Cabbage Palm Flatwoods (R155XY005FL)

Data Source Information

Soil Survey Area: Indian River County, Florida

Survey Area Data: Version 13, Sep 23, 2015

Indian River County, Florida

15—Manatee loamy fine sand

Map Unit Setting

National map unit symbol: tdfz

Elevation: 10 to 200 feet

Mean annual precipitation: 52 to 60 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 350 to 365 days

Farmland classification: Farmland of unique importance

Map Unit Composition

Manatee and similar soils: 85 percent

Minor components: 15 percent

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

Description of Manatee

Setting

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 12 inches: loamy fine sand

Bt - 12 to 31 inches: fine sandy loam

BCg - 31 to 39 inches: loamy fine sand

Cg - 39 to 80 inches: loamy fine 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: Very high

Capacity of the most limiting layer to transmit water (Ksat):

Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

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: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: B/D

Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156BC341FL), Freshwater Marshes and Ponds (R155XY010FL)

Minor Components

Chobee

Percent of map unit: 5 percent

Landform: Drainageways on marine terraces, depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156BC341FL), Slough (R155XY011FL)

Winder

Percent of map unit: 5 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave, linear

Across-slope shape: Linear, concave

Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156BC341FL), Wetland Hardwood Hammock (R155XY012FL)

Floridana, depressional

Percent of map unit: 5 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G156BC245FL), Freshwater Marshes and Ponds (R155XY010FL)

Data Source Information

Soil Survey Area: Indian River County, Florida

Survey Area Data: Version 13, Sep 23, 2015

Indian River County, Florida

16—Pineda fine sand

Map Unit Setting

National map unit symbol: tdg0

Elevation: 20 to 200 feet

Mean annual precipitation: 52 to 60 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 350 to 365 days

Farmland classification: Farmland of unique importance

Map Unit Composition

Pineda and similar soils: 85 percent

Minor components: 15 percent

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

Description of Pineda

Setting

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand

E - 4 to 9 inches: fine sand

Bw - 9 to 23 inches: fine sand

Btg - 23 to 40 inches: sandy loam

Cg - 40 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

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 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL), Slough (R155XY011FL)

Minor Components

Eaugallie, non-hydric

Percent of map unit: 4 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R155XY003FL)

Riviera

Percent of map unit: 4 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G156BC241FL), Cabbage Palm Flatwoods (R155XY005FL)

Wabasso, hydric

Percent of map unit: 4 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), South Florida Flatwoods (R155XY003FL)

Winder

Percent of map unit: 3 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave, linear

Across-slope shape: Linear, concave

Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156BC341FL), Wetland Hardwood Hammock (R155XY012FL)

Data Source Information

Soil Survey Area: Indian River County, Florida

Survey Area Data: Version 13, Sep 23, 2015

Indian River County, Florida

23—Arents, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: tdg6

Elevation: 20 to 200 feet

Mean annual precipitation: 52 to 60 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 350 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Arents and similar soils: 90 percent

Minor components: 10 percent

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

Description of Arents

Setting

Landform: Rises on marine terraces

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Altered marine deposits

Typical profile

C1 - 0 to 10 inches: sand

C2 - 10 to 32 inches: sand

C3 - 32 to 60 inches: sand

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat poorly drained

Runoff class: Low

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 18 to 36 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 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Other vegetative classification: Forage suitability group not assigned
(G156BC999FL)

Minor Components

Quartzipsamments

Percent of map unit: 5 percent

Landform: Rises on marine terraces

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Forage suitability group not assigned
(G156BC999FL)

Urban land

Percent of map unit: 5 percent

Landform: Marine terraces

Landform position (three-dimensional): Interfluvial, talus

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Forage suitability group not assigned
(G156BC999FL)

Data Source Information

Soil Survey Area: Indian River County, Florida

Survey Area Data: Version 13, Sep 23, 2015

Indian River County, Florida

39—Malabar fine sand

Map Unit Setting

National map unit symbol: tdgm

Elevation: 10 to 200 feet

Mean annual precipitation: 52 to 60 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 350 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Malabar, hydric, and similar soils: 80 percent

Malabar, non-hydric, and similar soils: 10 percent

Minor components: 10 percent

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

Description of Malabar, Hydric

Setting

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 3 inches: fine sand

E - 3 to 17 inches: fine sand

Bw - 17 to 41 inches: fine sand

Btg - 41 to 65 inches: sandy loam

Cg - 65 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: Very high

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

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 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), Cabbage Palm Flatwoods (R155XY005FL)

Description of Malabar, Non-hydric**Setting**

Landform: Flats on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 3 inches: fine sand

E - 3 to 17 inches: fine sand

Bw - 17 to 41 inches: fine sand

Btg - 41 to 65 inches: sandy loam

Cg - 65 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: Very high

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 6 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

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 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156BC141FL), Cabbage Palm Flatwoods (R155XY005FL)

Minor Components**Pineda**

Percent of map unit: 2 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy over loamy soils on flats of
hydric or mesic lowlands (G156BC241FL), Slough
(R155XY011FL)

Holopaw

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy soils on flats of mesic or hydric
lowlands (G156BC141FL), Slough (R155XY011FL)

Oldsmar, hydric

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric
lowlands (G156BC141FL), South Florida Flatwoods
(R155XY003FL)

Riviera

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy over loamy soils on flats of
hydric or mesic lowlands (G156BC241FL), Cabbage Palm
Flatwoods (R155XY005FL)

Lokosee, hydric

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy soils on flats of mesic or hydric
lowlands (G156BC141FL), Cabbage Palm Flatwoods
(R155XY005FL)

Data Source Information

Soil Survey Area: Indian River County, Florida
Survey Area Data: Version 13, Sep 23, 2015

Fountains of Fellsmere

Total contributing basin including east areas

Permanent Pool Calculations:

$$PPV = \frac{DA \times C \times R \times RT}{WS \times CF}$$

PPV	Required Permanent Pool Volume		
DA	Drainage Area (ac.)	372.40	
C	Runoff Coefficient	0.70	
R	Wet Season Rainfall Depth (in.)	32	
RT	Residence Time (days)	14	Minimum
WS	Length of Wet Season (days)	153	June - October
CF	Conversion Factor	12	in./ft.

Minimum PPV (for 14 days Residence Time):

63.61 ac.-ft.

Required PPV for Outstanding Florida Waters = Minimum + Additional 50%

(Calculation based on 21 days Residence Time)

95.41 ac.-ft.

PPV of Project Lake:

	Elev.	Area (ac.)	Vol. (ac.-ft.)
Lake Control	23.25	2.884	
			18.630
Littoral Shelf	16.25	2.438	
			10.021
Grade Break	11.25	1.570	
			7.903
Bottom	5.25	1.064	
Total PPV			36.553

Residence Time for Project Lake PPV:

8.05 days

Mean Depth of Lake:

$$MD = \frac{PPV}{A-lake}$$

MD	Mean Depth of Lake		
PPV	Permanent Pool Volume of Project Lake	36.55	ac.-ft.
A-Lake	Area of Project Lake	2.88	ac.

Mean Depth of Lake 12.67 ft.

TABLE 13.7-3

MEAN ANNUAL LOADINGS OF TOTAL PHOSPHORUS FOR LAND USE TYPES IN
THE LAKE APOPKA HYDROLOGIC BASIN

LAND USE CATEGORY	MEAN ANNUAL TOTAL PHOSPHORUS LOAD (kg/ac-yr)			
	HSG A	HSG B	HSG C	HSG D
Low-Density Residential (max. 15% impervious)	0.069	0.135	0.215	0.284
Single-Family Residential (max. 25% impervious)	0.227	0.286	0.383	0.465
Single-Family Residential (max. 40% impervious)	0.250	0.333	0.446	0.536
Multi-Family Residential (max. 65% impervious)	1.082	1.156	1.257	1.336
Commercial (max. 80% impervious)	0.899	0.916	0.943	0.964
Highway – max. 50% impervious	0.710	0.756	0.817	0.871
Highway – max. 75% impervious	1.053	1.076	1.106	1.133
Agriculture – Pasture	0.026	0.118	0.239	0.347
Agriculture – Crops, Ornamentals, Nurseries	0.040	0.180	0.366	0.531
Agriculture – Groves	0.007	0.036	0.079	0.123
Open Land/Recreational/Fallow Groves and Cropland	0.004	0.017	0.035	0.051
Forests/Abandoned Tree Crops	0.004	0.021	0.045	0.070

HSG = Hydrologic Soil Group

CITY OF FELLSMERE
HISTORIC FELLSMERE MASTER DRAINAGE PLAN
ICPR DATA (ALL ELEVATIONS NAVD)
PEAK STAGE COMPARISON FOR SELECTED NODES IN A 25-YEAR / 24-HOUR STORM EVENT

Node Name	Reference Elevation Near Node	Location of Reference Elevation	Source of Ref. Elevation Data	2013 NAVD update 2004 Buildout Model #1	2013 NAVD buildout Full Buildout Model #2	2013 BO - 2 lakes Two Lakes Total Model #3	2013 BO - 4 lakes Four Lakes Total Model #4	2013 BO - 7 lakes Seven Lakes Total Model #5
NP-135	N/A	N/A	N/A	21.577	21.628	21.543	21.515	21.341
NP-150	N/A	N/A	N/A	21.774	21.825	21.732	21.701	21.517
NP-180	N/A	N/A	N/A	22.031	22.074	21.980	21.953	21.798
NP13bB13	23.00	Center of S.C. Ave. Between Pine and Broadway	Survey	22.421	22.612	22.689	22.668	22.542
NP14A23	24.00	Center of Myrtle St at Ditch 14 Crossing	Survey	22.507	22.635	22.499	22.474	22.342
NP14B23	22.50	Lowest Grate at the SW Corner of the NY-Broadway Intersection	Survey	22.898	23.063	22.801	22.781	22.675
NP14B25	22.70	Grate Elevation at the SE Corner of the NY-Broadway Intersection	Survey	22.915	23.065	22.859	22.836	22.723
NP14B35	22.70	NY Ave Edge of Pvm. Between Pine and Hickory	Survey	22.998	23.154	22.886	22.864	22.755
NP14C23	24.00	NY Ave Edge of Pvm. at the Mulberry Intersection	Lidar	23.522	23.627	23.184	23.168	23.087
NP14NBP	24.00	TOB Adjacent Bank Near FWCD Offices	Lidar	23.440	23.284	23.310	23.296	23.215
NP15A15	24.10	Center of Myrtle - Adjacent CDBG ASB	Survey	22.025	22.168	22.063	22.028	21.808
NP15B11	22.50	W EOP of Broadway at Driveway to Gas Station N of 512	Lidar	22.478	22.773	22.678	22.649	22.486
NP15C09	24.00	Center of Mulberry Street N. of 512	Lidar	22.826	23.258	23.200	23.174	23.094
NP15D05	25.20	Center of Adjacent Road on North Side of Ditch 15	Lidar	23.815	23.739	23.750	23.740	23.686
NP16B15	23.25	Center of Cypress-Virginia Intersection	Lidar	22.920	22.944	22.837	22.816	22.622
NP17A15	23.00	Center of Oleander-Alabama Intersection	Lidar	22.434	22.397	22.292	22.265	22.129
NP17D17	24.50	Center of 91st Street Adjacent to Ditch	Lidar	23.934	23.968	23.838	23.833	23.810
NP18A10	23.50	Baseball Field Elev	Lidar	22.108	22.153	22.031	22.033	21.888
NP18C09	24.00	Center of 89th Street Near Mulberry	Lidar	23.529	23.613	23.169	23.149	23.024
NPL17-E	26.00	Typical House Elevation From Several Locations	Lidar	24.045	24.053	24.015	24.015	24.012

Model Notes:

Model #1 - Update of the published 2002 model to match improvements present in 2004 Including the following changes:

- A) Topographic information was updated to include Lidar information rather than the Pickett Aerial Survey providing a higher degree of accuracy.
- B) Connections to two large sections of land were added at the south end of the Park Lateral and Lateral U representing property owned by Fellsmere Joint Venture
- C) Adjustments were made to various pipe connections and initialization stages as a result of discrepancies between the lidar data and the previous topographic data.
- D) Miscellaneous adjustments were made to calibrate the model to match a documented storm event.

Model #2 - The 2004 Model (Model #1) was updated to document changes made between 2004 and 2013. In addition, the model was adjusted for a fully built-out Historic Fellsmere:

- A) Details were included for large site plans which had submitted models to the F.W.C.D. for approval.
- B) Culverts that had been added or replaced in the sublaterals between 2004 and 2013 were included in the model. These modifications caused lower stages despite the buildout conditions.
- C) The lidar stage storage was modified in the downtown area to remove storage on future building sites. In general, buildings were assumed to be constructed to 18" above the road CL.
- D) The curve numbers were increased in order to account for additional impervious area for buildings and improved roads in both residential and commercial basins in Historical Fellsmere.

Model #3 - Revised the 2013 Buildout Model (Model #2) to add in two potential lakes and other improvements to address flooding issues.

- A) Added in design storage and routing for potential lake at south end of town and along the railroad ditch just west of Babcock street.
- B) Added 18" diameter header pipes to connect the New York ditch to the railroad ditch at each street between Willow and Pine streets.
This change caused a lowering of the stages in Ditch 14 while increasing stages in the N. Bypass Ditch (Railroad Ditch)
- C) Increased the diameter of pipe RP18B09 from 48" to 60" to ease constriction just south of the proposed south lake.

Model #4 - Revised the 2013 Buildout Model with Two Lakes Added (Model #3) to add in two additional potential lakes and other improvements to demonstrate impact on flooding issues.

- A) Added in design storage and routing for potential 5 Acre lakes at the west end of Ditches 14 and 18 adjacent to park lateral.
- B) Weirs to be added to lateral ditches to divert low flow storms to the lakes with overflows for larger events.

Model #5 - Revised the 2013 Buildout Model with Four Lakes Added (Model #4) to add in three additional potential lakes and other improvements to demonstrate impact on flooding issues.

- A) Added in design storage and routing for potential 10 acre lakes at the west end of Ditches 15, 16 and 17 adjacent to park lateral.
- B) Weirs to be added to lateral ditches to divert low flow storms to the lakes with overflows for larger events.
- C) Up-sized the lakes at the ends of Ditches 14 and 18 to 10 acres in size.

CITY OF FELLSMERE
HISTORIC FELLSMERE MASTER DRAINAGE PLAN
ICPR DATA (ALL ELEVATIONS NAVD)
PEAK STAGE COMPARISON FOR SELECTED NODES IN A 100-YEAR / 96-HOUR STORM EVENT

Node Name	Reference Elevation Near Node	Location of Reference Elevation	Source of Ref. Elevation Data	2013 NAVD update 2004 Buildout Model #1	2013 NAVD buildout Full Buildout Model #2	2013 BO - 2 lakes Two Lakes Total Model #3	2013 BO - 4 lakes Four Lakes Total Model #4	2013 BO - 7 lakes Seven Lakes Total Model #5
NP-135	N/A			21.914	21.973	21.968	21.962	21.928
NP-150	N/A			22.104	22.163	22.158	22.151	22.116
NP-180	N/A			22.362	22.412	22.414	22.407	22.376
NP13bB13	23.00	Center of S.C. Ave. Between Pine and Broadway	Survey	22.698	22.916	23.075	23.068	23.031
NP14A23	24.00	Center of Myrtle St at Ditch 14 Crossing	Survey	22.746	22.913	22.849	22.838	22.790
NP14B23	22.50	Lowest Grate at the SW Corner of the NY-Broadway Intersection	Survey	23.023	23.292	23.117	23.109	23.066
NP14B25	22.70	Grate Elevation at the SE Corner of the NY-Broadway Intersection	Survey	23.094	23.376	23.207	23.195	23.146
NP14B35	22.70	NY Ave Edge of Pvm. Between Pine and Hickory	Survey	23.131	23.414	23.230	23.218	23.170
NP14C23	24.00	NY Ave Edge of Pvm. at the Mulberry Intersection	Lidar	23.452	23.789	23.517	23.508	23.465
NP14NBP	24.00	TOB Adjacent Bank Near FWCD Offices	Lidar	23.799	23.602	23.682	23.676	23.649
NP15A15	24.10	Center of Myrtle - Adjacent CDBG ASB	Survey	22.329	22.483	22.459	22.447	22.411
NP15B11	22.50	W EOP of Broadway at Driveway to Gas Station N of 512	Lidar	22.769	23.086	23.053	23.039	22.980
NP15C09	24.00	Center of Mulberry Street N. of 512	Lidar	23.111	23.559	23.531	23.527	23.459
NP15D05	25.20	Center of Adjacent Road on North Side of Ditch 15	Lidar	24.184	24.074	24.119	24.115	24.092
NP16B15	23.25	Center of Cypress-Virginia Intersection	Lidar	23.224	23.280	23.230	23.221	23.102
NP17A15	23.00	Center of Oleander-Alabama Intersection	Lidar	22.657	22.657	22.631	22.622	22.588
NP17D17	24.50	Center of 91st Street Adjacent to Ditch	Lidar	24.270	24.294	24.230	24.230	24.216
NP18A10	23.50	Baseball Field Elev	Lidar	22.431	22.481	22.497	22.532	22.500
NP18C09	24.00	Center of 89th Street Near Mulberry	Lidar	23.847	23.904	23.689	23.690	23.650
NPL17-E	26.00	Typical House Elevation From Several Locations	Lidar	24.428	24.438	24.407	24.407	24.403

Model Notes:

Model #1 - Update of the published 2002 model to match improvements present in 2004 Including the following changes:

- A) Topographic information was updated to include Lidar information rather than the Pickett Aerial Survey providing a higher degree of accuracy.
- B) Connections to two large sections of land were added at the south end of the Park Lateral and Lateral U representing property owned by Fellsmere Joint Venture
- C) Adjustments were made to various pipe connections and initialization stages as a result of discrepancies between the lidar data and the previous topographic data.
- D) Miscellaneous adjustments were made to calibrate the model to match a documented storm event.

Model #2 - The 2004 Model (Model #1) was updated to document changes made between 2004 and 2013. In addition, the model was adjusted for a fully built-out Historic Fellsmere:

- A) Details were included for large site plans which had submitted models to the F.W.C.D. for approval.
- B) Culverts that had been added or replaced in the sublaterals between 2004 and 2013 were included in the model. These modifications caused lower stages despite the buildout conditions.
- C) The lidar stage storage was modified in the downtown area to remove storage on future building sites. In general, buildings were assumed to be constructed to 18" above the road CL.
- D) The curve numbers were increased in order to account for additional impervious area for buildings and improved roads in both residential and commercial basins in Historical Fellsmere.

Model #3 - Revised the 2013 Buildout Model (Model #2) to add in two potential lakes and other improvements to address flooding issues.

- A) Added in design storage and routing for potential lake at south end of town and along the railroad ditch just west of Babcock street.
- B) Added 18" diameter header pipes to connect the New York ditch to the railroad ditch at each street between Willow and Pine streets.
This change caused a lowering of the stages in Ditch 14 while increasing stages in the N. Bypass Ditch (Railroad Ditch)
- C) Increased the diameter of pipe RP18B09 from 48" to 60" to ease constriction just south of the proposed south lake.

Model #4 - Revised the 2013 Buildout Model with Two Lakes Added (Model #3) to add in two additional potential lakes and other improvements to demonstrate impact on flooding issues.

- A) Added in design storage and routing for potential 5 Acre lakes at the west end of Ditches 14 and 18 adjacent to park lateral.
- B) Weirs to be added to lateral ditches to divert low flow storms to the lakes with overflows for larger events.

Model #5 - Revised the 2013 Buildout Model with Four Lakes Added (Model #4) to add in three additional potential lakes and other improvements to demonstrate impact on flooding issues.

- A) Added in design storage and routing for potential 10 acre lakes at the west end of Ditches 15, 16 and 17 adjacent to park lateral.
- B) Weirs to be added to lateral ditches to divert low flow storms to the lakes with overflows for larger events.
- C) Up-sized the lakes at the ends of Ditches 14 and 18 to 10 acres in size.

Fellsmere North Regional Lake

Stormwater Maintenance and Operation Plan

The stormwater management system at the Fellsmere North Regional Lake has been designed to minimize the level of maintenance required to keep the system operational.

The following components are included as parts of the stormwater management system:

1. Drainage Piping
2. Control Structures
3. Mitered and Straight Concrete Endwalls
4. Wet Detention Lakes
5. Overall Site Stabilization

Maintenance of the various components of the stormwater management system must be inspected on a regular basis to insure that the system operates satisfactorily in accordance with the original design. The following are is a list of items to be inspected a recommended schedule of inspections:

1. Drainage Piping:
 - a. Remove accumulated debris and sediments at ends of pipes (annually or more often if needed as part of the Inlet and Endwall maintenance schedule).
 - b. Flush and remove debris and sediments in pipes (bi-annually or more often if operation of system does not appear to be functioning properly).
2. Control Structures:
 - a. Inspect structure, baffle and grates for damage (annually) and repair as needed.
 - b. Remove any vegetation or debris affecting flows (monthly or after storm events)
 - c. Remove accumulated debris and sediments in bottom of structure (annually or more often if needed).
3. Mitered and Straight Concrete Endwalls
 - a. Inspect structure for cracks and damage (annually) and repair as needed.
 - b. Inspect area around Endwall for evidence of erosion (annually) and repair as needed
 - c. Remove any vegetation or debris affecting flows (monthly or after storm events)
4. Wet Detention Lakes
 - a. Mow grass at side slopes as needed.
 - b. Irrigate and maintain perimeter landscaping as needed.

- c. Inspect the condition of any littoral plantings (annually) and supplement with new plantings if necessary.
- d. Remove any accumulated debris (bi-monthly or after major storm events) around perimeter of lake
- e. Inspect area for evidence of erosion (annually) and repair as needed

5. Overall Site Stabilization

- a. Inspect the entire project site (annually) for areas of erosion that could discharge sediments into the stormwater system and stabilize any areas that have been disturbed.

Maintenance and operation of the stormwater management system will be the responsibility of the City of Fellsmere.

