MEMORANDUM

To:	Jennifer Marshall, PE FDOT Chief Engineer of Production
From:	Victor Gallo, PE – Project Manager Armando Orozco, PE – Deputy Project Manager Kimley-Horn & Associates, Inc.
Date:	October 3rd, 2025
Subject:	New Stormwater Rule Evaluation for State Road 20 Project Development and Environment (PD&E) Study

Introduction & Objective

The Florida Department of Transportation (FDOT) District Three has conducted a Project Development & Environment (PD&E) study to evaluate the potential for addressing safety issues, improving the capacity, and providing continuous bicycle and pedestrian facilities to State Road (S.R.) 20 (Blountstown Highway)/S.R. 366 (Pensacola Street) in Tallahassee, Leon County. The project limits extend 1.02 miles from S.R. 263 (Capital Circle SW) to Appleyard Drive.

Blountstown Highway (SR 20) is situated at the western end of the project corridor, beginning at Capital Circle SW and extending eastward to Pensacola Street. Beyond the project limits, it continues as Blountstown Highway toward U.S. 90. Within the defined project area, Blountstown Highway consists of four to six travel lanes and is divided by a raised median. Pensacola Street originates at Blountstown Highway and extends east to Appleyard Drive as a two-lane, two-way facility with a bi-directional left-turn lane near its eastern terminus. A 288-foot-long bridge (Bridge No. 550001) is located on Pensacola Street, spanning two railroad tracks and Munson Slough. Both Blountstown Highway and Pensacola Street are classified as Urban Minor Arterials and generally follow an east-west alignment. Bicycle lanes currently exist at the intersection of Blountstown Highway and Capital Circle SW, extending eastward and terminating just before the Pensacola Street bridge. Bicycle facilities resume approximately 900 feet west of Appleyard Drive in both directions. Sidewalks are present on both sides of Blountstown Highway from Capital Circle SW to Blountstown Street/Nina Road, and on the north side of Pensacola Street from Progress Drive to Appleyard Drive.

The Preferred Alternative includes widening Pensacola Street from Blountstown Highway to Appleyard Drive to a four-lane, curb-and-gutter typical section with bicycle and shared-use path facilities in both directions. The Preferred Alternative would also replace the existing two-lane bridge (Bridge No. 550001) on Pensacola Street with a four-lane divided bridge.

The objective of this task is to review the pond site alternatives developed in the original Pond Siting Report, that utilized traditional first flush treatment volume design and performance standards, and to assess the modifications required to meet the new nutrient reduction criteria established by the updated stormwater rule. The original Pond Siting report can be found in **Appendix C.**

New Stormwater Rule

The new nutrient reduction criteria is quantified differently, focusing on the removal of total nitrogen (TN) and total phosphorus (TP) in surface water discharges, as determined by Best Management Practice (BMP) nutrient reduction based on the existing ambient water quality conditions of the downstream Water of the State, as outlined in Sections 8.3.2 through 8.3.5 of the Applicant's Handbook Volume I (A.H. Vol I). This technical memorandum presents the findings and verification calculations for the proposed stormwater management facilities to confirm reasonable assurance with the nutrient reduction performance standards established under the new stormwater rule, set forth in Chapter 62-330, F.A.C. No changes in volumetric attenuation are expected, so attenuation volumes were not evaluated.

Assessment Categories 4a, 4b and 5 from FDEP's adopted 2022-2024 Biannual Assessment were the only ones evaluated for ambient water quality for the classification of impaired as set forth under section 8.3 of the 2024 A.H. Vol. I., and in reasonable assurance with Section 5.2.5 of the 2025 FDOT Drainage Manual. Two ambient water quality scenarios were considered: the first addresses nutrient response water quality impairments like TN and TP, while the second includes the potential added risk from any water quality impairment (e.g. bacteria, nutrients, mercury, metals) being used as basis for impairments. It should be noted that impairment assessment categories not meeting their designated use (WNAS) at the time of application must follow the impaired performance standards. Accordingly, a WBID with a TMDL under Chapter 62-304, F.A.C., but classified as meeting its designated use at the time of application (assessment category 2t), is not required to use impairment performance standards. Which means, during the PD&E phase, a WBID may be listed as assessment category 4a (impaired with a TMDL). However, by the time the project advances to design and the ERP application is submitted, the WBID could be reclassified as assessment category 2t (meeting its designated use with a TMDL). In that case, the WBID would no longer be considered impaired, and the impaired performance standards would not apply. See **Appendix A** for summary of waterbody impairments.

This memorandum presents the results of applying the new stormwater rule, as outlined in Part II of A.H. Vol. I. While the new nutrient reduction standards are not yet in effect for current ERP applications, this assessment assumes full implementation without grandfathering to evaluate future impacts on the Department's Work Program. **Table 1** summarizes the applicable performance standards from Section 8.3, limited to those relevant to the SR 20 project. The January 2024 Pond Siting Report (revised April 2024) was modeled for nutrient reductions. Nutrient loading analyses for pre- and post-development conditions confirmed that all increases remained below the minimum nutrient reduction rate standards, and thus, those minimum standards govern.

Table 1: New Nutrient reduction Performance Standard Requirements

Project Scenario	Post- Dev. TP Minimum Reduction Rates (%)	Post- Dev. TN Minimum Reduction Rates (%)	Nutrient Loading Analysis	Presumptive TSS Removal Efficiencies %	A.H. Section
All Sites	80	55	Post ≤ Pre	80	8.3.2
Impaired Waters	80	80	Post ≤ Pre	80	8.3.4
OFW	90	80	Post ≤ Pre	95	8.3.3
Impaired + OFW	95	95	Post ≤ Pre	95	8.3.4

Methodology

BMPTrains 2020 Version 4.3.5 was employed to evaluate the nutrient reduction rates provided by the stormwater alternatives originally sized and sited in the Pond Siting Report. Existing pond Nina on the western portion of the project is a dry retention stormwater management facility, while the western portion will drain to a new pond (Pond 1) sized in the original Pond Siting Report. Pond 1 was initially sized as a wet pond; however, geotechnical investigations conducted for this project, as referenced in the Pond Siting Report, identified 5 feet of available depth between the existing ground surface and the seasonal high groundwater table. Following the removal of the traditional treatment volume requirement in the new Rule, the pond was re-evaluated and resized as a dry retention pond, maintaining a 1.5-foot separation between the pond bottom and the seasonal high groundwater table to allow for infiltration. The revised calculations accounted for potential attenuation impacts by developing a new stage-storage table that ensures total storage exceeds the required attenuation volume while maintaining at least 1 foot of freeboard between the peak stage and the inside of the berm elevation. Pond 1 was not modeled for attenuation, as the stage-storage method was determined to be sufficient and provides a more conservative design. The pond footprint remained unchanged from the area specified in the original Pond Siting Report. Refer to **Appendix A** for the updated stage-storage table.

These were modeled to determine the nutrient reduction for each basin. Pond Nina and Pond 1 achieved the minimum nutrient reduction for their respective roadway sub-basins without necessitating design modifications. This performance is primarily attributable to their configuration as dry retention BMPs, which are highly efficient due to their extended retention and infiltration mechanisms. BMPTrain model outputs for nutrient reduction were cross-referenced with the corresponding tabulated values in Appendix O to verify consistency and confirm alignment within acceptable tolerances and limitations.

The BMPTrains model's primary focus was on the nutrient reduction of TN and TP, providing reasonable assurance with the new minimum nutrient reduction rate standards as set forth in Chapter 62-330 F.A.C. and the A.H. Vol. I. Within the pond's BMPTrains, separate catchments were created for each pond alternative (as set forth in the original Pond Siting Report). The pre/post Event Mean Concentration (EMC) values were sourced from the A.H. Vol. I, Section 9.2.2, Table 9.2 for Highways.

For dry retention systems, the average annual effectiveness was calculated using an event maximum runoff volume that can be captured in the retention system. The maximum volume is expressed as inches over the catchment area. BMPTrains and tables in Appendix O of the A.H Vol I. were used to determine the nutrient reduction of dry retention systems.

Analysis & Results

The project limits fall within the Black Swamp–Lake Munson HUC 12 watershed, which discharges to Lake Munson—a waterbody not designated as an Outstanding Florida Water (OFW). The project is located within the Munson Slough Waterbody ID (WBID) 807D, associated with the Ochlockonee St. Marks basin. This basin is classified as Assessment Category 2t for both TN and TP, as well as Assessment Category 5 impaired for metals. Pursuant to Section 8.3 of the Florida Department of Environmental Protection (FDEP) AH.Vol.I., this basin is subject to a minimum BMP nutrient reduction efficiency rate requirement of 55% TN and 80% TP for Scenario 1. While Scenario 2 will require a minimum BMP nutrient reduction efficiency rate of 80% for both TN and TP.

This project encompasses two roadway basins, each associated with a proposed stormwater dry pond alternative. Basin 1, located at the western project limits, discharges to Pond Nina—an existing 5-foot-deep dry pond constructed as part of the original SR 20 construction. According to the original Pond Siting Report, Pond Nina possesses adequate hydraulic capacity to accommodate the additional runoff from the proposed widening, with only a sump addition recommended to support the planned trunk line. Nutrient reduction performance for Pond Nina was evaluated using BMPTrains and validated against retention BMP data in Appendix O. Results indicate a nutrient reduction efficiency of 85% for both TN and TP for Basin 1. For the eastern segment of the project, a new pond (Pond 1) was sited and sized in the original Pond Siting Report to provide conventional first flush treatment and attenuation. This pond was referred to as a wet detention pond in the original pond siting report; however, the seasonal highwater elevation in the geotechnical data along with the control elevation of the proposed pond is indicative of a dry retention pond, for the purpose of this analysis it was evaluated as such. Runoff from the eastern portion of the project drains to Pond 1, which was likewise evaluated for nutrient reduction performance. Modeling results indicate Pond 1 achieves a 84% removal efficiency for both TN and TP. Refer to **Table 2** for a Nutrient Reduction Summary of Findings.

Table 2: Nutrient Reduction Summary of Findings

Total Roadway Basins	Basins Not Meeting Nutrient Reduction Rate Requirements	Basins Impaired for Nutrients (TN/TP)	Basins Impaired for Other (Metals)	Basins Upstream of an OFW
2	0	0	2	0

Conclusion

Based on the comprehensive evaluation of stormwater management alternatives and the application of the updated nutrient reduction design criteria established by the new Rule, the proposed stormwater facilities for the SR 20 PD&E project provide reasonable assurance with the anticipated nutrient reduction efficiency requirements. Both Pond Nina and Pond 1 meet or exceed the minimum nutrient reduction rates for TN and TP under both interpretation scenarios. This high level of performance is largely attributed to the use of dry retention BMPs, which continue to prove effective in nutrient removal through infiltration. While the updated rule has not yet been formally adopted for permitting, the modeling conducted herein – absent grandfathering provisions – confirms that the project is well-positioned to meet future regulatory standards without requiring design modifications. Overall, the findings support the viability of the proposed stormwater strategy for the SR 20 corridor.

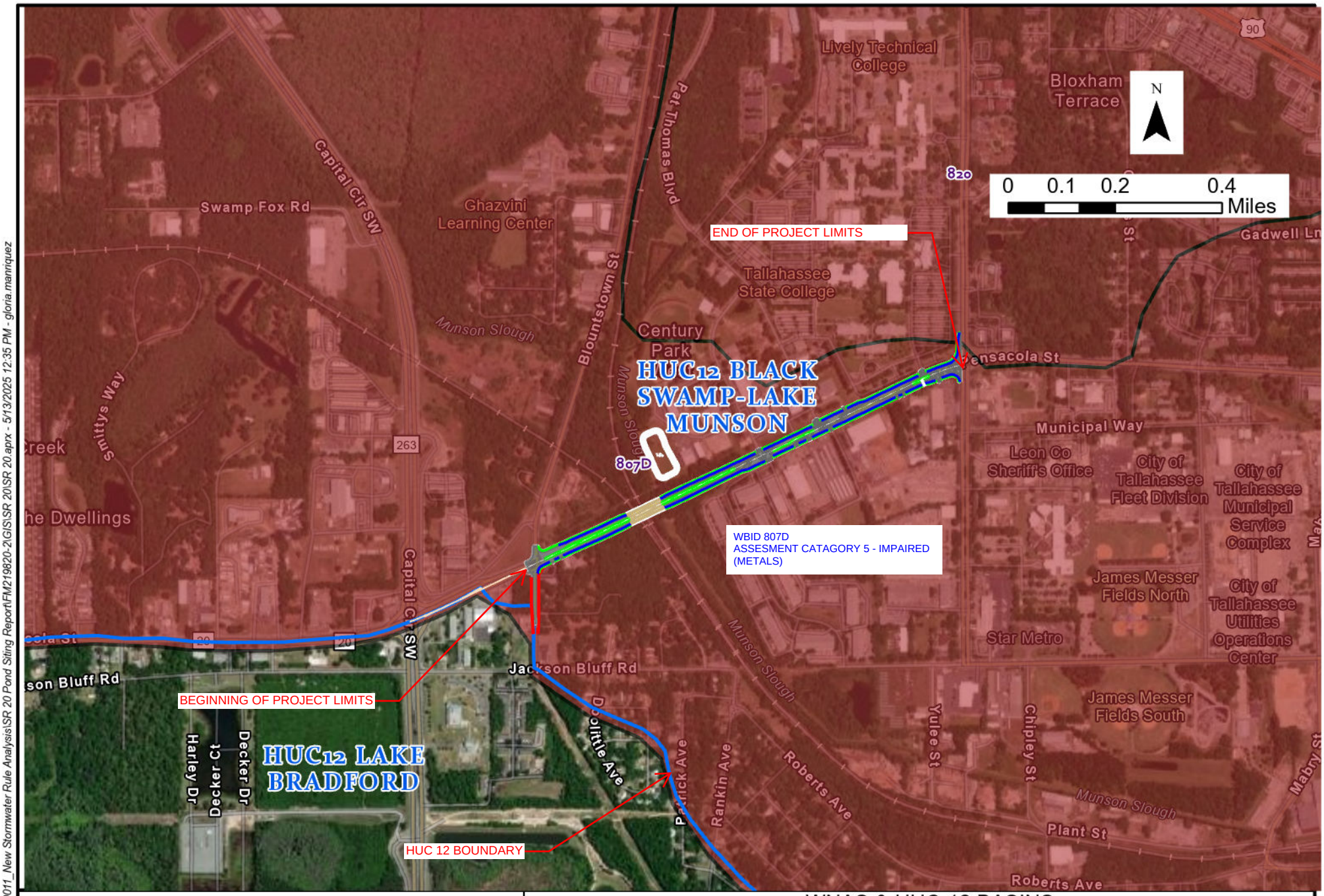
APPENDIX A

Nutrient Loading Analysis

Performance Efficiency Rate Matrix

Stage Storage Table (Pond 1)

Exhibits: WNAs and HUC-12 Basins, Pond Sites (BMPs)



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WNAS & HUC-12 BASINS

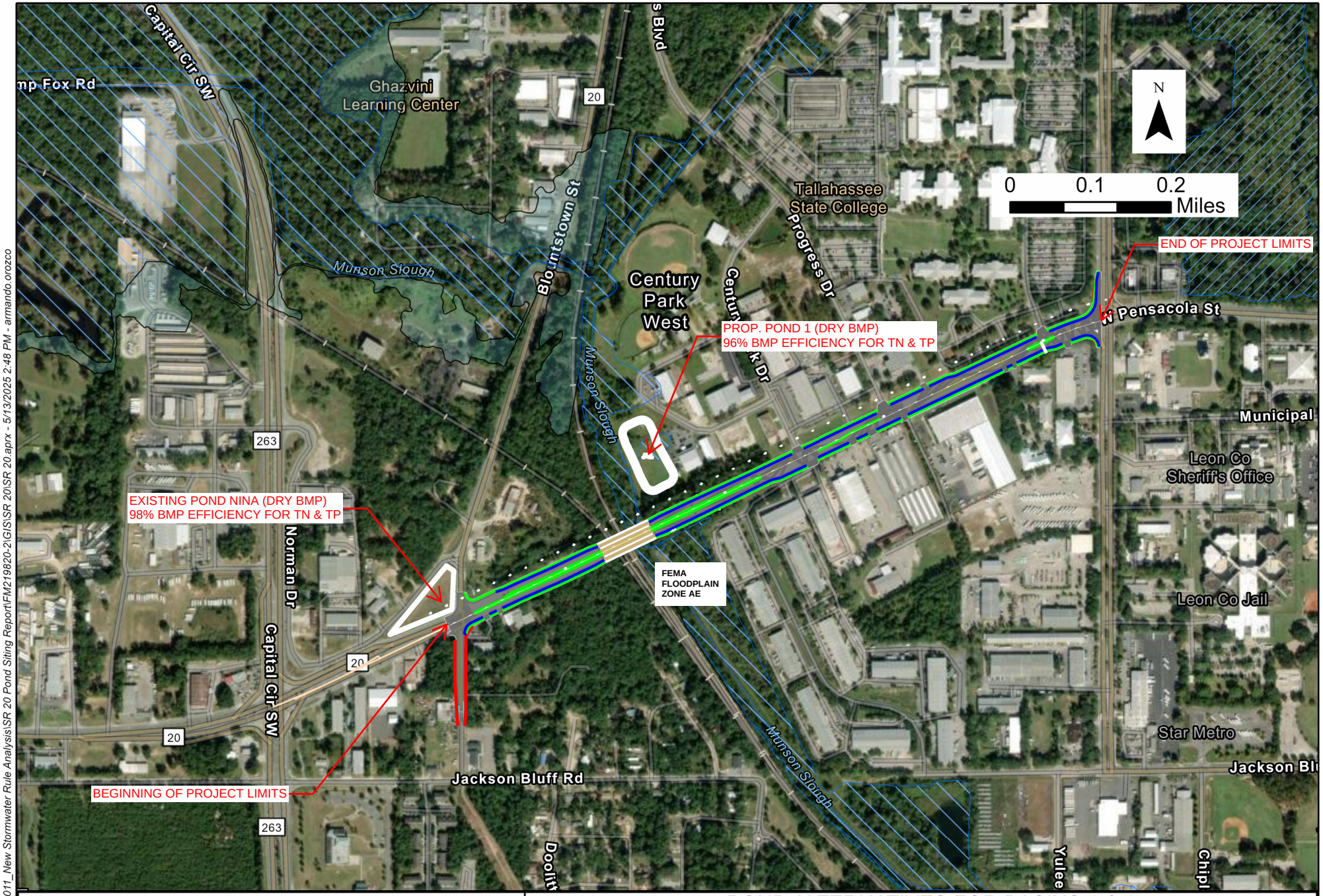
SR-20 NEW RULES POND SITING ANALYSIS
LEON COUNTY, FLORIDA

Scale: As Noted	Project No: 240000011	May 2025	Figure

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State Road 20 - Waters Not Attaining Standards Assessment Status												
	WBID	ASSESSMENT CATEGORY	GROUP NAME	COUNTY	WATERBODY NAME	WATER BODY TYPE	PARAMETER IWR	PARAMETER GROUP	ASSESSMENT STATUS	COMMENT	Post- Dev. TN Minimum Reduction Rates (%)	Post- Dev. TP Minimum Reduction Rates (%)
Scenario 1	807D	2t	Ochlockonee - St. Marks	Leon	Munson Slough (above Lake Munson)	Stream	Nutrients (Total Nitrogen)	Nutrient	Not Impaired (TMDL Complete)	This waterbody is not impaired for this parameter and is being placed in category 2t because there is a DEP Adopted Hierarchy 1 Nutrient TMDL. Analysis by FDEP Watershed Assessment Section has confirmed that data in the verified period meet the site-speci	55%	80%
	807D	2t	Ochlockonee - St. Marks	Leon	Munson Slough (above Lake Munson)	Stream	Nutrients (Total Phosphorus)	Nutrient	Not Impaired (TMDL Complete)	This waterbody is not impaired for this parameter and is being placed in category 2t because there is a DEP Adopted Hierarchy 1 Nutrient TMDL. Analysis by FDEP Watershed Assessment Section has confirmed that data in the verified period meet the site-speci	55%	80%
Scenario 2	807D	5	Ochlockonee - St. Marks	Leon	Munson Slough (above Lake Munson)	Stream	Lead	Metal	Impaired	This waterbody is not impaired for this parameter based on the number of exceedances for the sample size but cannot be delisted because the exceedance rate does not meet the delisting requirements of Table 4 as described in 62-303.720, F.A.C. This parameter will remain on the Verified List and the 303(d) List.	80%	80%

Pollutant Nutrient Loading Analysis							
Basin ID	**WBID**	**Total Nitrogen**			**Total Phosphorus**		
		Pre Loading (kg/y)	**Post Loading (kg/y)**	**Loading Change (%)**	**Pre Loading (kg/y)**	**Post Loading (kg/y)**	**Loading Change (%)**
Western	WBID 807D	25.278	28.751	12.1%	3.499	3.979	12.1%
Eastern	Ochlockonee St. Marks	23.447	38.609	39.3%	3.245	5.343	39.3%



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POND ALTERNATIVES FOR BASINS 1 & 2

SR-20 NEW RULES POND SITING ANALYSIS
LEON COUNTY, FLORIDA

Scale: As Noted	Project No: 240000011	May 2025	Figure

Performance Efficiency Rates Matrix

HUC-12		PSR Data						BMP Series Train	Nitrogen			Phosphorus	
HUC-12 ID	**HUC-12 Name**	**Basin ID**	**Pond ID**	**Facility Type**	**WBID**	**Basin Impairments**	**Impairments**	**BMP Element 1**	**BMP Element 1**	**Scenario 1: Req. Nitrogen Treatment (New Rule)**	**Scenario 2: Req. Nitrogen Treatment (New Rule)**	**BMP Element 1**	**Scenarios 1 & 2: Req. Phosphorus Treatment (New Rule)**
31200010602	Black Swamp - Lake Munson	Western	Nina	dry	WBID 807D Ochlockonee St. Marks	Impaired Waters	Assesment Category 5 (Metals)	Dry Pond	85%	55%	80%	85%	80%
		Eastern	Pond 1	dry		Impaired Waters	Assesment Category 5 (Metals)	Dry Pond	84%	55%	80%	84%	80%

Note: Only one Ambient Water Quality Assessment scenario was conducted, as both scenarios minimum nutrient reduction requirements are met under the new Rule.

PROJECT NAME:	SR 20	Kimley-Horn & Associates
BASIN DESIGNATION:	Pond 1 (Eastern Basin)	

STAGE STORAGE CALCULATIONS

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
Back of Berm	56.00	1.88				6.41
			1.69	1.00	1.69	
Berm	55.00	1.50				4.72
			1.46	1.00	1.46	
DHW (100yr-24hr)	54.00	1.41				3.26
			1.35	1.50	2.03	
Weir	52.50	1.28				1.23
			1.23	1.00	1.23	
Bottom	51.50	1.18				-

Storage volume provided>needed per PSR (2.9ac-ft)

Existing ground low =	56.0	SHW =	50.0	(From Geotech)
Existing ground high =	55.0	Tailwater=	NA	
SR 20 Roadway LEOP =	64.0			

APPENDIX B

BMPTrains Reports

Complete Report (not including cost) Ver 4.3.5

Project: SR 20
Date: 10/3/2025 1:08:02 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Pond Nina	Pond 1
Rainfall Zone	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	56.00	56.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values
Area (acres)	6.70	13.00
Rational Coefficient (0-1)	0.52	0.25
Non DCIA Curve Number	45.00	39.00
DCIA Percent (0-100)	60.80	28.40
Nitrogen EMC (mg/l)	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173
Runoff Volume (ac-ft/yr)	16.401	15.213
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	25.278	23.447
Phosphorus Loading (kg/yr)	3.499	3.245

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values

Area (acres)	7.48	13.00
Rational Coefficient (0-1)	0.53	0.41
Non DCIA Curve Number	45.00	39.00
DCIA Percent (0-100)	62.00	47.80
Wet Pond Area (ac)	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173
Runoff Volume (ac-ft/yr)	18.654	25.050
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	28.751	38.609
Phosphorus Loading (kg/yr)	3.979	5.343

Catchment Number: 1 Name: Pond Nina

Project: SR 20
Date: 10/3/2025

Retention Design

Retention Depth (in)	1.540
Retention Volume (ac-ft)	0.960

Watershed Characteristics

Catchment Area (acres)	7.48
Contributing Area (acres)	7.480
Non-DCIA Curve Number	45.00

DCIA Percent	62.00
Rainfall Zone	Florida Zone 1
Rainfall (in)	56.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	85
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	85

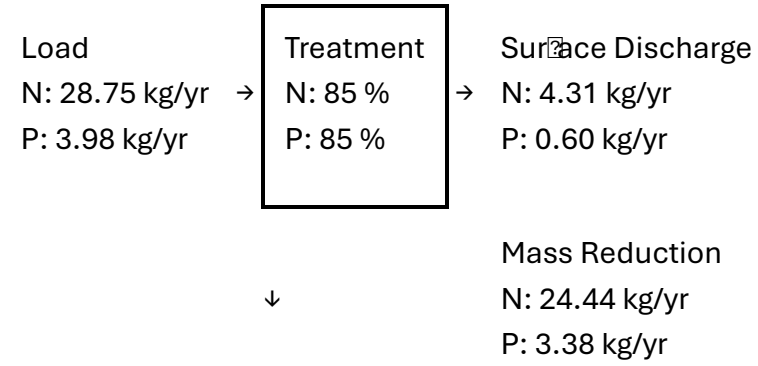
Media Mix Information

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

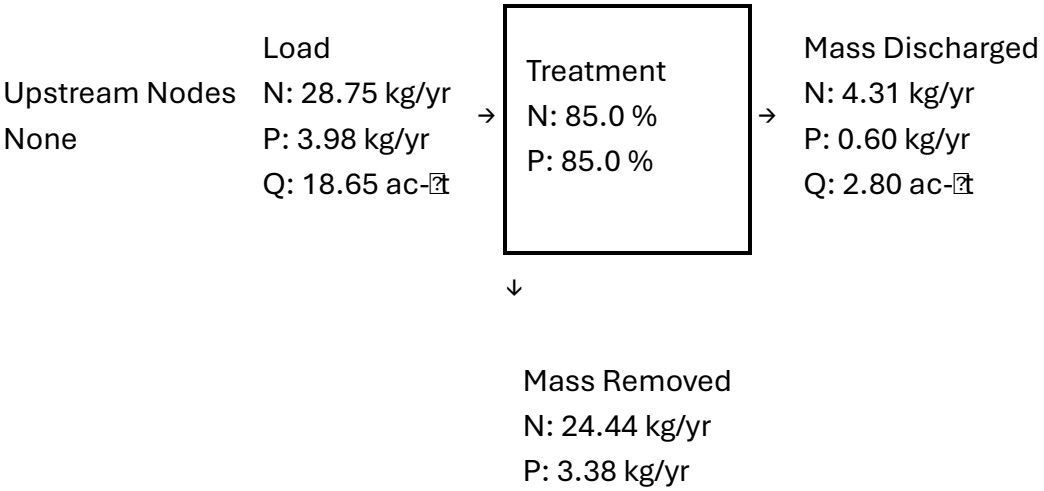
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	24.441
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	3.383
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Catchment Number: 2 Name: Pond 1

Project: SR 20
Date: 10/3/2025

Retention Design

Retention Depth (in)	1.135
Retention Volume (ac-ft)	1.230

Watershed Characteristics

Catchment Area (acres)	13.00
Contributing Area (acres)	13.000
Non-DCIA Curve Number	39.00
DCIA Percent	47.80
Rainfall Zone	Florida Zone 1
Rainfall (in)	56.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	84
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	84

Media Mix Information

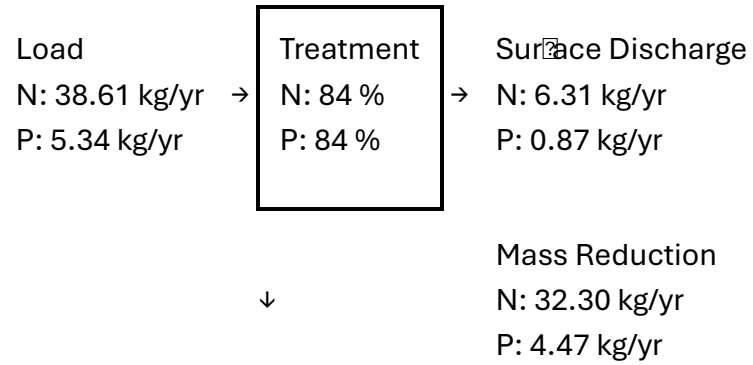
Type of Media Mix	Not Specified
Media N Reduction (%)	

Media P Reduction (%)

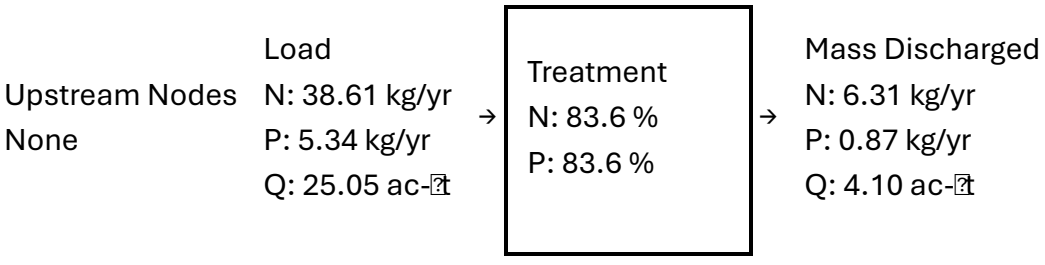
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	32.296
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	4.470
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



↓

Mass Removed
N: 32.30 kg/yr
P: 4.47 kg/yr

Summary Treatment Report Version: 4.3.5

Project: SR 20

Analysis Type: Specified Removal Efficiency

Date:10/3/2025

BMP Types:

Catchment 1 - (Pond Nina) Retention

Catchment 2 - (Pond 1) Retention

Based on % removal values to the nearest percent

Routing Summary

Catchment 1 Routed to Outlet

Catchment 2 Routed to Outlet

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	48.73 kg/yr	
Total N post load	67.36 kg/yr	
Target N load reduction	80 %	
Target N discharge load	13.47 kg/yr	
Percent N load reduction	84 %	
Provided N discharge load	10.62 kg/yr	23.42 lb/yr

APPENDIX C

Original Pond Siting Report

Preliminary Drainage Concept Report

Florida Department of Transportation

District 3

State Road (S.R.) 20 (Blountstown Highway) /

S.R. 366 (Pensacola Street)

Project Development and Environment (PD&E) Study

From S.R. 263 (Capital Circle SW) to Appleyard Drive

Leon County, Florida

Financial Project ID: 219820-2-22-01

Federal Aid Project ID: D322-010-B

ETDM Number: 14434

Prepared For:

Florida Department of Transportation
District 3
1074 Highway 90
Chipley, Florida 32428

Prepared By:

Kimley-Horn
2619 Centennial Boulevard, Suite 200
Tallahassee, Florida 32308

January 2024
Revised April 2024

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

Florida Department of Transportation
District Three

Preliminary Drainage Concept Report

Project Development & Environment (PD&E) Study for S.R. 20 (Blountstown Highway)/S.R. 366 (Pensacola Street)

From S.R. 263 (Capital Circle SW) to Appleyard Drive

Financial Project ID: 219820-2-22-01
Federal Aid Project ID: D322-010-B
Efficient Transportation Decision Making (ETDM) Number: 14434
Leon County, Florida



January 2024

Revised April 2024

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1.0 PROJECT SUMMARY

1.1 Project Description

The Florida Department of Transportation (FDOT) District Three is conducting a Project Development & Environment (PD&E) study to evaluate the potential for addressing safety issues, improving the capacity, and providing continuous bicycle and pedestrian facilities to State Road (S.R.) 20/S.R. 366 (Pensacola Street) in Leon County. The project limits extend one mile from S.R. 263 (Capital Circle SW) to Appleyard Drive **(see Figure 1-1)**. This PD&E Study builds upon a Feasibility Study completed by FDOT District Three in June 2020, which helped establish the purpose and need for the project advancing to the PD&E phase.

S.R. 20 is located at the western end of the project limits from S.R. 263 (Capital Circle SW) and continues eastward to S.R. 366 (Pensacola Street), where it continues eastward as Blountstown Highway to U.S. 90, outside the PD&E project limits. Within the project limits, S.R. 20 varies from four-to-six travel lanes and is divided by a raised median. S.R. 366 (Pensacola Street) begins at S.R. 20 (Blountstown Highway) and continues eastward to Appleyard Drive. S.R. 366 (Pensacola Street) is a two-way, two-lane roadway with a bi-directional left turn-lane near the eastern end of the project limits. A 285-foot bridge (Bridge No. 550001) is located on S.R. 366 (Pensacola Street) and spans two railroad tracks and Munson Slough.

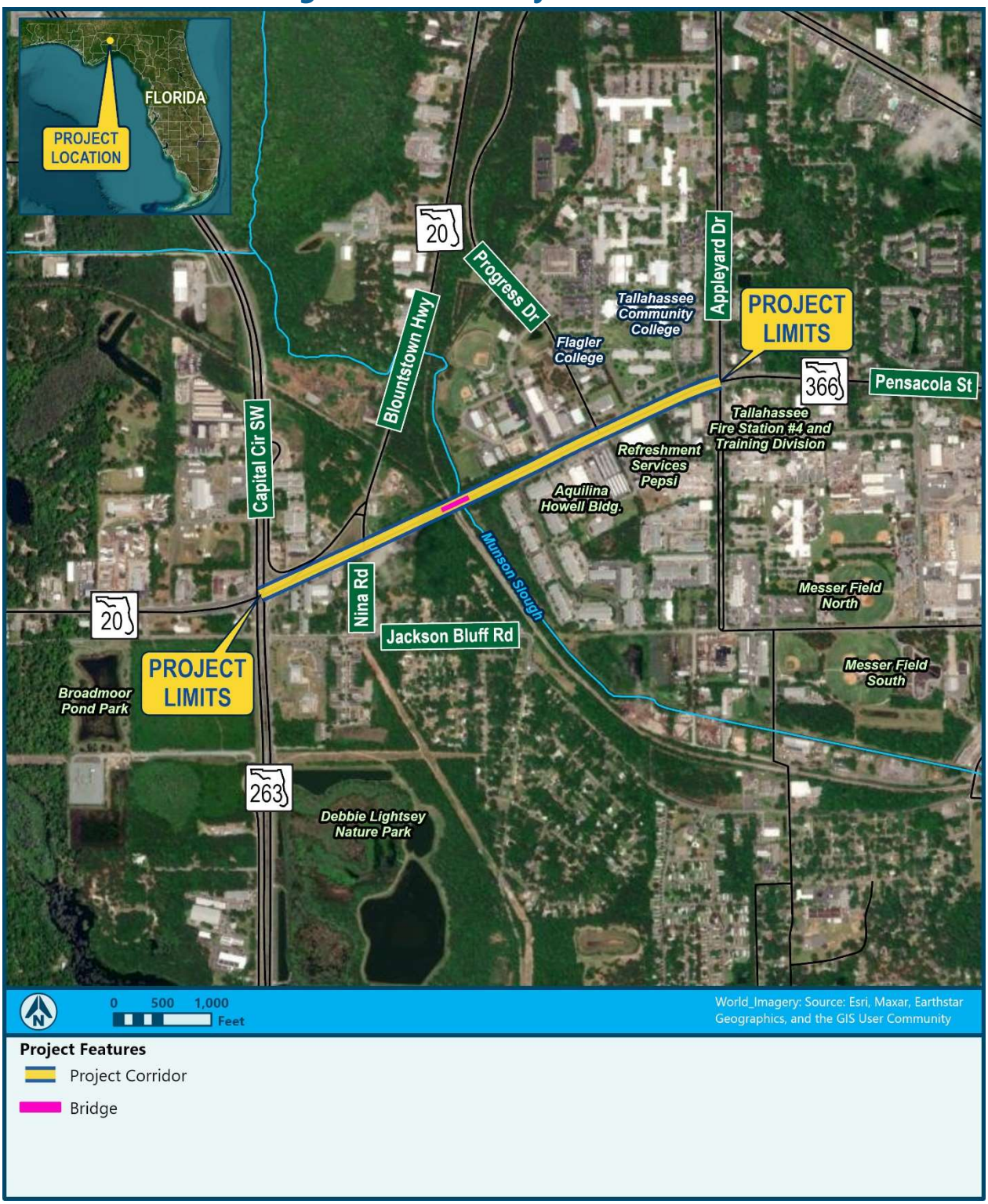
S.R. 20/S.R. 366 (Pensacola Street) are both classified as Urban Minor Arterials and run primarily in an east-west direction. The existing roadway includes bicycle lanes at the intersection of S.R. 20 and S.R. 263 (Capital Circle SW), extending east and terminating at the approach to the S.R. 366 (Pensacola Street) bridge. As S.R. 366 (Pensacola Street) continues east, bicycle lanes resume 900-feet west of Appleyard Drive, in each direction. The existing roadway includes sidewalks on both sides of S.R. 20 from S.R. 263 (Capital Circle SW) to S.R. 366 (Pensacola Street), and on the northside of S.R. 366 (Pensacola Street) from Progress Drive to Appleyard Drive. The current inconsistent nature of bicycle and pedestrian accommodations along the project corridor results in over 40% of the corridor lacking dedicated bicycle facilities, while over 50% of the corridor does not include sidewalks.

On the western end of the project limits, stormwater is currently handled through curb and gutter from S.R. 263 (Capital Circle SW) to S.R. 366 (Pensacola Street), with discharge to a stormwater pond located at the northwest corner of the S.R. 20 (Blountstown Highway) intersection. Swales and ditches are located alongside S.R. 366 (Pensacola Street), west of Progress Drive to Appleyard Drive.

The Build Alternative includes widening S.R. 366 (Pensacola Street) from S.R. 20 (Blountstown Highway) to Appleyard Drive to a four-lane, urban typical section with bicycle and shared use path facilities in both directions. The Build Alternative would also replace the existing two-lane bridge (Bridge No. 550001) on S.R. 366 (Pensacola Street) with a four-lane divided bridge.

Further descriptions of the typical sections for the Build Alternative are provided later in this report. An additional left turn lane is proposed for traffic turning from both southbound and northbound S.R. 263 (Capital Circle SW) onto S.R. 20, but no additional improvements to S.R. 20 would be needed since the existing roadway configuration has bicycle and pedestrian facilities, as well as the necessary travel lanes to handle projected traffic. Turning lanes are also proposed on Nina Road and Appleyard Drive to facilitate more efficient traffic flow. Nearly all the improvements proposed with the Build Alternative will fit within the existing right-of-way (ROW), resulting in minimal need for additional ROW.

Figure 1-1 Project Location



1.2 Purpose and Need

Purpose

The purpose of this project is to accommodate future vehicular capacity and address safety issues on S.R. 20/S.R. 366 (Pensacola Street) from S.R. 263 (Capital Circle SW) to Appleyard Drive.

Need

This project is needed to evaluate traffic congestion, safety concerns, and continuous bicycle and pedestrian facilities. The intersections of Capital Circle SW, Pepsi Driveway, and Century Park Drive along with the segment from Capital Circle SW to S.R. 20 (Blountstown Highway) are projected to operate at a failing Level of Service (LOS) in the year 2050 if no capacity improvements are constructed. From a safety perspective, the segment between Blountstown Highway and Progress Drive and all signalized intersections within the study area have a crash rate higher than the statewide averages for similar facilities. Although pedestrian and bicycle facilities exist today along the corridor, there are gaps along the full length of the corridor.

2.0 ALTERNATIVES

2.1 No Build Alternative

The No Build Alternative would maintain the existing four-lane roadway from S.R. 263 (Capital Circle SW) to S.R. 20 (Blountstown Highway) and the two-lane configuration from S.R. 20 (Blountstown Highway) to Appleyard Drive. **Figures 2-1** through **2-3** depict the existing typical sections which would remain under the No Build Alternative.

Figure 2-1 illustrates the existing typical section of S.R. 20 between S.R. 263 (Capital Circle SW) and S.R. 20 (Blountstown Highway). This section consists of a four-lane divided urban roadway and includes two 11-foot lanes in each direction divided by a 21.5-foot grassed median. This section also includes a curb and gutter drainage system, a 7-foot buffered bike lane, and 5-foot sidewalks in both directions.

Figure 2-1 S.R. 20 Existing Typical Section – S.R. 263 (Capital Circle SW) to S.R. 20 (Blountstown Highway)

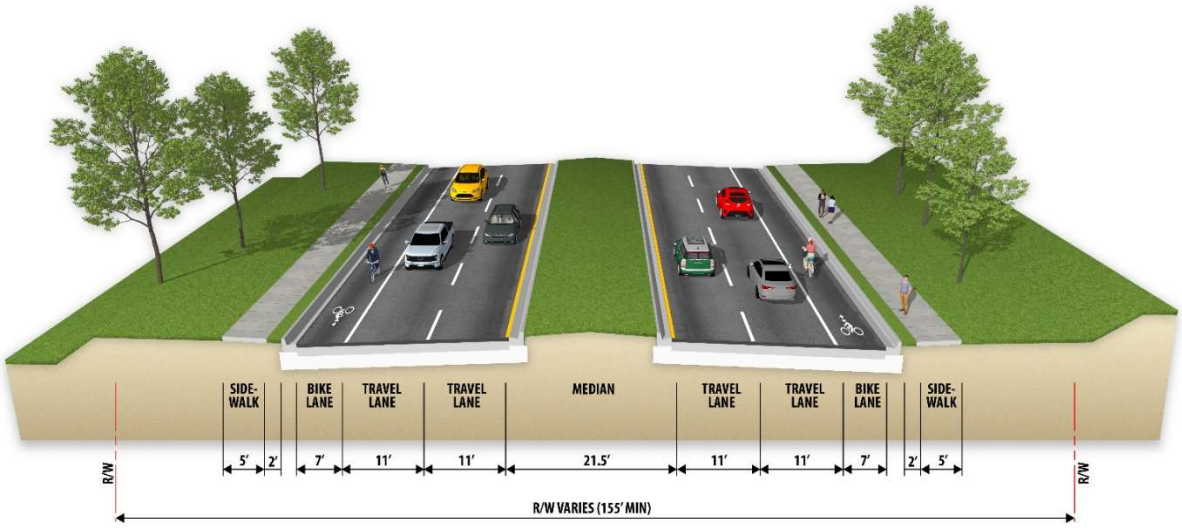


Figure 2-2 illustrates the existing typical section of S.R. 366 (Pensacola Street) between S.R. 20 (Blountstown Highway) and Appleyard Drive (excluding Bridge No. 550001). This section consists of a two-lane urban roadway which includes two 13-foot lanes in each direction divided by a 15-foot bi-directional turn lane, with 5-foot shoulders. This section also includes an 8-foot sidewalk along the eastbound lane, which is separated from the roadway shoulder by a 10-foot grassed, or sodded, area.

Figure 2-2 S.R. 366 (Pensacola Street) Existing Typical Section – S.R. 20 (Blountstown Highway) to Appleyard Drive (Excluding Bridge No. 550001)

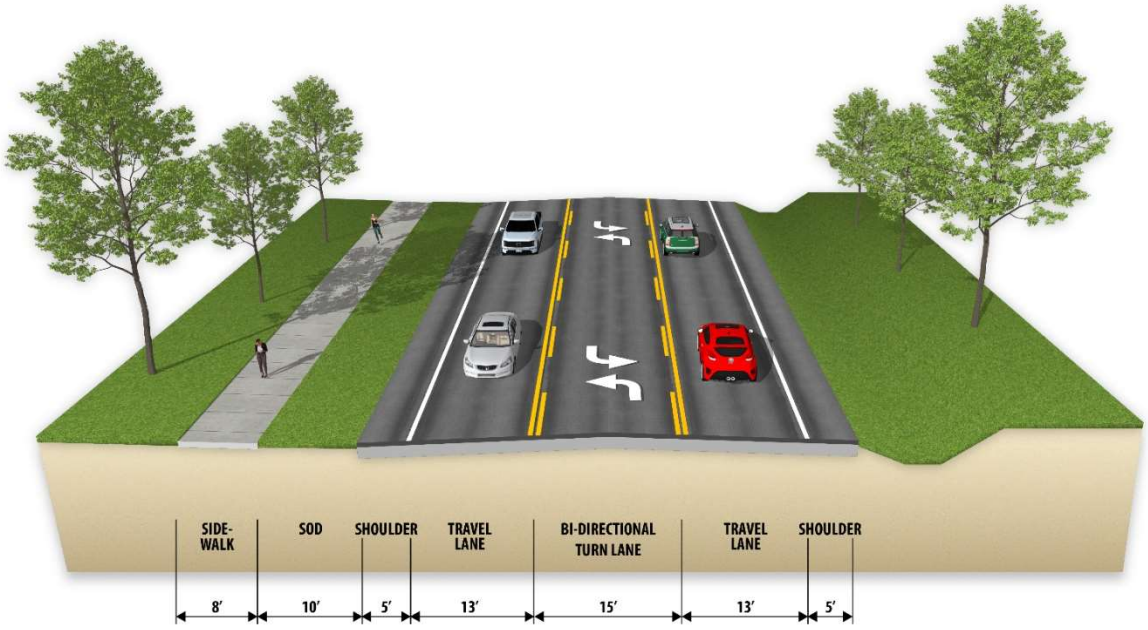
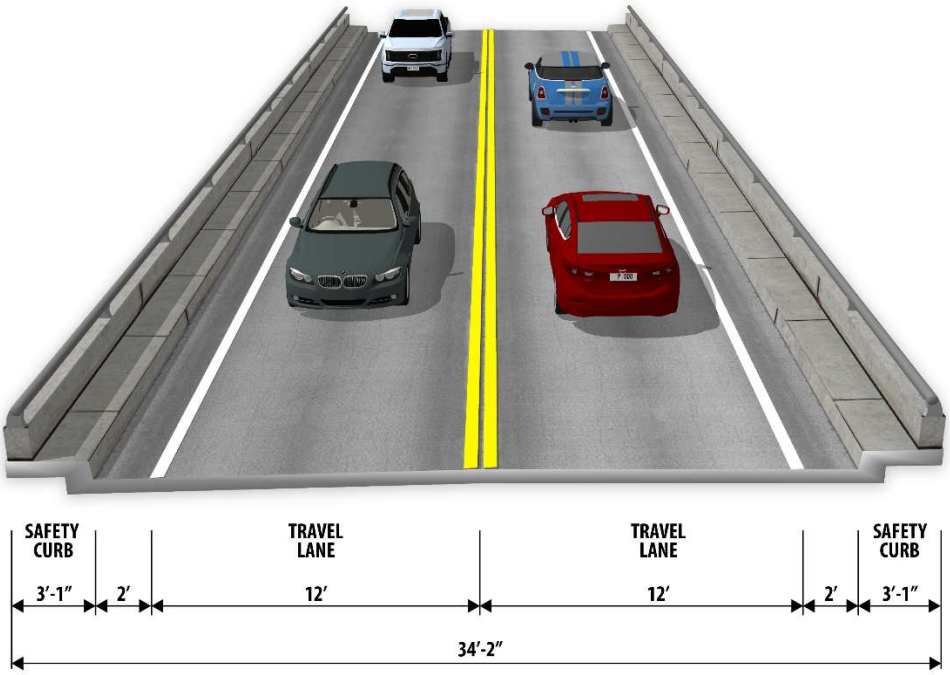


Figure 2-3 illustrates the existing typical section of Bridge No. 550001, which spans two railroad tracks and Munson Slough. This section consists of a two-lane urban roadway which includes two 12-foot lanes in each direction, 2-foot shoulders, and a 3-foot, 1-inch safety curb. Originally built in 1963, Bridge No. 550001 is 285-foot in length and 34-foot, 2-inches in width.

Figure 2-3 Existing Bridge Typical Section (Bridge No. 550001)



2.2 Build Alternative

The Build Alternative proposes to widen S.R. 366 (Pensacola Street) from S.R. 20 (Blountstown Highway) to Appleyard Drive to a four-lane roadway with dedicated bicycle and pedestrian facilities. Detailed descriptions of the proposed typical sections are provided below and depicted in **Figure 2-4** through **2-6**. The Build Alternative also proposes to add turn lanes to S.R. 263 (Capital Circle SW), Nina Road, and Appleyard Drive. Minimal ROW is required for the turn lanes at Nina Road and Appleyard Drive. No improvements are proposed for S.R. 20 from S.R. 263 (Capital Circle SW) to S.R. 366 (Pensacola Street).

Figure 2-4 illustrates the proposed typical section for S.R. 366 (Pensacola Street) from S.R. 20 (Blountstown Highway) to Century Park Drive (excluding Bridge No. 550001) which consists of a four-lane divided urban roadway, including two 11-foot lanes in each direction divided by a 22-foot raised median. This section has curb and gutter, and drainage will be handled with a closed drainage system utilizing inlets and stormwater pipes. There is a 7-foot buffered bike lane and 12-foot shared use path in both directions. The proposed typical section will fit within the existing ROW.

Figure 2-4 S.R. 366 (Pensacola Street) Proposed Typical Section 1 – S.R. 20 (Blountstown Highway) to Century Park Drive (excluding Bridge No. 550001)

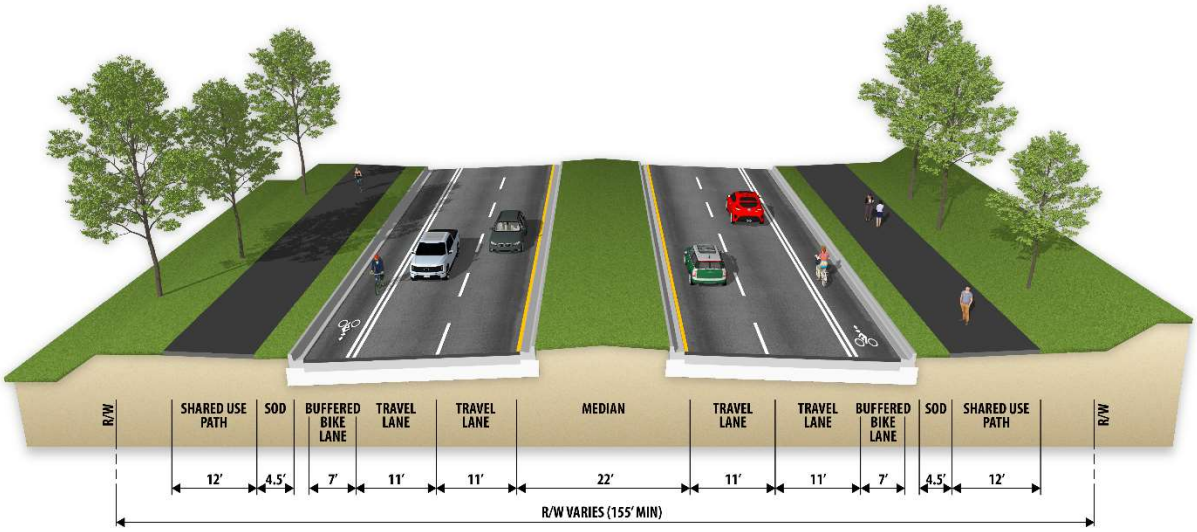


Figure 2-5 illustrates the proposed typical section for S.R. 366 (Pensacola Street) from Century Park Drive to Appleyard Drive consists of a four-lane urban section, with a striped median. The typical section consists of two 11-foot lanes in each direction, with curb and gutter. Drainage will be handled with a closed drainage system utilizing inlets and stormwater pipes. There is a 7-foot buffered bike lane and 12-foot shared use path in both directions. The proposed typical section will fit within the existing ROW.

Figure 2-5 S.R. 366 (Pensacola Street) Proposed Typical Section 2 – Century Park Drive to Appleyard Drive

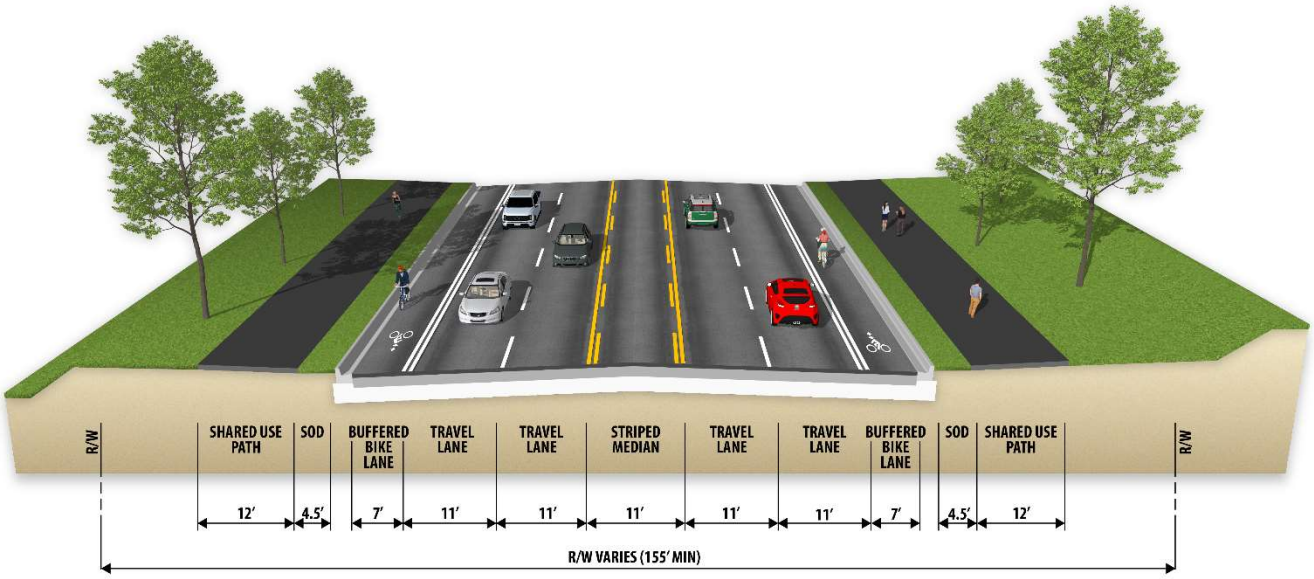
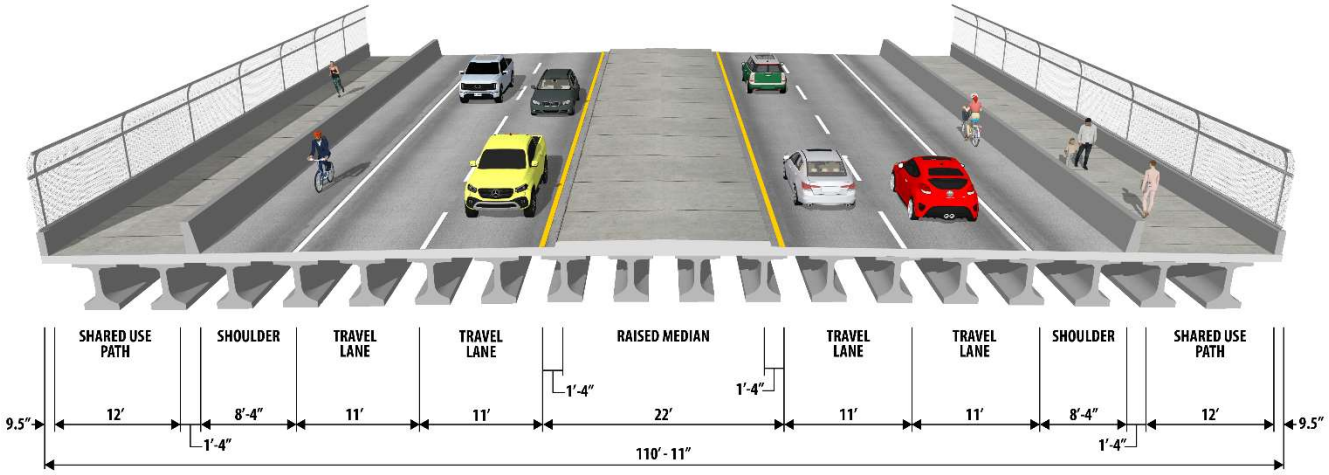


Figure 2-6 illustrates the proposed typical section for Bridge No. 550001 consists of two 11-foot lanes in each direction divided by a 22-foot raised concrete median. In both directions, an 8-foot, 4-inch shoulder would accommodate bicyclists, while a 12-foot shared use path is provided (with concrete wall on both sides). Since the bridge crosses over the Florida Gulf & Atlantic Railroad (FG&A), fencing will be provided on the outside wall of the shared use path. The proposed typical section will fit within the existing ROW.

Figure 2-6 Proposed Bridge Typical Section (Bridge No. 550001)



3.0 EXISTING CONDITIONS

3.1 Drainage

A review of Geographic Information Mapping System (GIS) topographic maps for the S.R.20/S.R. 366 corridor was conducted to document the direction of surface water flow. The topographic maps reviewed for this area are included in ***Appendix A***. The entire project corridor falls within the Lake Munson Drainage Basin.

Lake Munson Drainage Basin receives surface water from approximately 60.6 square miles of Leon County. Approximately 54% of land use in the 38,790-acre Lake Munson basin is rangeland, transportation, utilities, urban or residential. Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses. Leon County is currently monitoring 6 water resources within this drainage basin.

3.1.1 Western Project

The western limits of the project corridor (approximately 600 ft) are collected in curb and gutter and fall within the Lightsey Park Watershed. The runoff is conveyed towards the south to Delta Pond 1 which is located adjacent to Capital Circle SW. Delta Pond 1 was constructed as part of a Blueprint Intergovernmental Agency (BPIA) project that widened Capital Circle.

The project then crosses the Nina Pond Catchment which drains to an existing FDOT pond. This catchment includes approximately 550 LF of roadway and terminates at the western end of Bridge No. 550001. Nina Pond is a retention pond that was constructed with the BPIA Capital Circle project and is owned and maintained by FDOT.

The corridor continues to drain towards the east in an open drainage system as part of the West Ditch #2 Watershed where it discharges into Munson Slough. The heavily urbanized Munson Slough and its tributaries is located in central Leon County and drain a portion of the City of Tallahassee. The Slough flows south into and out of Lake Munson, then continues to Eight Mile Pond. After exiting Eight Mile Pond, the Slough flows under Oak Ridge Road and enters Ames Sink, which is known to be connected to Wakulla Springs.

3.1.2 Eastern Project

Drainage along the majority of the existing eastern portion of S.R. 366 is accomplished through collection and conveyance by open roadside ditches and side drains. Roadside ditches are present for the length of the project from Munson Slough to Appleyard Drive. These ditches convey and outfall the existing runoff directly to Munson Slough without treatment or attenuation. The intersection at Appleyard Drive is collected in curb and gutter and conveyed back to the roadside ditches. Offsite runoff, including private pond outfalls, is comingled with the project runoff and ultimately conveyed to the outfall.

3.2 US Department of Agriculture (USDA) Soil Survey

The Natural Resources Conservation Service (NRCS) Web Soils survey was used to identify the soils along the S.R. 20/S.R. 366 corridor. The eastern portion of the project falls within the Urban Land designation and soil assumptions based on soil group could not be determined. Geotechnical reports from adjacent projects were obtained to determine soil assumptions for SHW elevations used in the calculations for the Urban Land soil type designation.

The predominant soil types were found to be:

Table 3-1 NRCS Soil Types

Soil No.	Name	% of Area	Depth to SHWT (ft)
3	Alpine Sand	30.5	6
45	Sapelo Find Sand	8.8	1.5
49	Urban Land	60.7	Undetermined

Since the Depth to Seasonal High-Water Table (SHWT) is undetermined for the Urban Land soil group, a geotechnical investigation was performed to provide more accurate information. Soils information can be found in ***Appendix B***.

4.0 STORMWATER REQUIREMENTS

4.1 WATERSS

FDOT traditionally uses stormwater management strategies including conveyance, exfiltration, infiltration, retention, and detention systems. Though these solutions have been effective in treating runoff from FDOT's highways, non-traditional stormwater management solutions can produce greater environmental benefits for Florida's waters, often at less cost than purchasing ROW to build stormwater management ponds.

After examining both traditional and innovative approaches to stormwater solutions, FDOT intends to enhance its stormwater management processes to provide the flexibility to include and champion innovative stormwater solutions. With these significant additions to existing Department stormwater solutions and processes, the Department has rebranded this initiative as the Watershed Approach to Evaluate Regional Stormwater Solutions (WATERSS). This process was initially used to investigate the opportunity for non-traditional solutions for the treatment and attenuation of the stormwater runoff from this corridor.

Since this corridor is predominantly urban in nature and falls within the Wakulla Springs Basin Management Action Plan it was decided that the WATERSS process would be followed to

determine if the project would benefit from non-traditional stormwater management solutions. Data collected for the WATERSS evaluation is included in ***Appendix C***.

4.1.1 External Coordination and Public Involvement

AtkinsRéalis and Kimley Horn conducted field investigations and stakeholder meetings to look for innovative watershed opportunities to address stormwater runoff from the S.R. 20/S.R. 366 (Pensacola Street) widening. Our team investigated the following entities:

- Northwest Florida Water Management District (NWFWMD)
    - Environmental Resource Permits (ERPs); GIS Permit Database
- City of Tallahassee Stormwater
- Leon County Public Works
- FDOT District 3 Maintenance, National Pollutant Discharge Elimination System (NPDES) Coordinator
- Private stakeholders (Hamilton Park Industrial Park)

While these efforts did not result in any WATERSS opportunities being carried forward into the design phase, the WATERSS exploratory efforts and further investigation into Hamilton Park Stormwater Management Facility (SWMF) are documented in the following sections for knowledge transfer in the future.

4.1.1.1 NWFWMD ERP

For the limits of the project from Capital Circle Southwest east to the Munson Slough bridge, our team explored the possibility of utilizing existing ponds constructed as part of the Capital Circle SW widening project in 2010. The FDOT Nina Pond at the intersection of Pensacola Street and Nina Road is a dry retention pond where, depending on groundwater levels, could be deepened for additional storage and hydraulic feasibility. This is explored further in Section 4.2.

4.1.1.2 Meeting with City of Tallahassee

A meeting was held with representatives of the City of Tallahassee Stormwater Team. The result of this meeting was a lead to investigate the Hamilton Industrial Park SWMF as a potential candidate for a regional facility. Meeting minutes can be found in ***Appendix C.***

4.1.1.3 Meeting with Leon County Public Works

A meeting was held via Teams on July 7, 2023. Our team discussed the project with Ms. Anna Padilla with Leon County Public Works. At the time of the meeting, Ms. Padilla was not aware of any water quality or cooperative initiatives that would be mutually beneficial to the County and FDOT. Meeting minutes can be found in ***Appendix C.***

4.1.1.4 FDOT District 3 Maintenance, NPDES Coordination Team

A Teams meeting was held with Karen Snyder who is working with District 3 to maintain MS4 and NPDES records for DOT owned facilities. Our team followed up with the FDOT Lake Munson water quality data, but according to the City of Tallahassee, the portion of Munson Slough closest to the project location is meeting water quality standards and there is not a desire to pursue a water quality project at this location. Meeting Minutes for this call are included in ***Appendix C***.

4.1.1.5 Hamilton Industrial Park Stormwater Management Facility (SWMF)

While this site meets pond sizing criteria and is hydraulically feasible, FDOT chose to not move forward with the Hamilton Industrial Park stormwater facility as an option for stormwater treatment and attenuation for the Pensacola Street Widening PD&E project. Due to its private ownership, FDOT is uncertain of the perpetual existence of the entity owning the SWMF as well as the ability to ensure the permitted status of the proposed improvements. FDOT is also not interested in maintaining storage volume allocations and yearly reporting for this facility. For these reasons, this option was removed from the pond siting alternatives evaluation. Please see email documentation in ***Appendix C.***

Since the WATERSS process did not present alternate stormwater treatment solutions, traditional stormwater calculations were performed to estimate ROW requirements for pond site locations.

4.2 Traditional Treatment Type Assumptions

4.2.1 Western Project

It is assumed that the western portion of the corridor from the high of the bridge (assumed to be in the center) to the west will be treated in the existing stormwater ponds Delta 1 and Nina. The intersection with Capital Circle SW was previously widened and currently drains to Delta Pond 1. It has been confirmed that this pond has the capacity to continue to serve this portion of the project and no alterations will be required.

The design calculations and drainage maps for existing Nina Pond were checked for capacity for the widened section for this study. It was determined that the existing drainage area to Nina Pond does not include the runoff from the existing bridge since it is currently sloped back towards Munson Slough. The permitted pond data was used to develop an ICPR model

to replicate the as-built condition of Nina Pond and to determine if it had adequate volume to accommodate the new lanes being evaluated in this study. Nina Pond was designed for a treatment volume of 1.125 inches of runoff from the drainage area as required by the City of Tallahassee. The S.R. 20/ S.R. 366 R/W for the original design was assumed to be 3.94 acres as shown in the capacity accounting record for the pond. The total treatment volume required for Nina Pond was calculated to be 0.83 ac-ft and the provided treatment volume was determined to be 1.11 ac-ft.

Calculations were performed for this study to determine if Nina Pond has the capacity to treat and attenuate the additional area (0.82 ac) proposed in this study without any alterations. While the pond had treatment capacity, the assumption was that the runoff from the high point of the bridge would be conveyed to Nina Pond through a storm sewer system. The assumptions showed that a 3-foot sump would need to be constructed in the bottom of the pond for the storm sewer system to be able to discharge into the pond bottom. SHWT depths were checked to ensure that the pond would still be able to function as a dry retention pond. These calculations and existing Nina Pond documentation can be found in ***Appendix D***.

4.2.2 Eastern Project

Based on the high groundwater along the adjacent properties, wet detention ponds are expected during the design phase for the eastern side of the corridor and are assumed for this evaluation. The purpose of this evaluation is to estimate ROW requirements for stormwater ponds. The topography, soil conditions and wetland coverage do not vary substantially from one potential pond site to the next; therefore, it is reasonable to use a single approach to estimate stormwater pond requirements.

4.2.2.1 Separation of Offsite Waters

In an effort to provide the most cost-efficient and effective method for water quality treatment in FDOT stormwater management systems, in 2012 HB 599 was enacted to create a provision for alternate stormwater treatment for offsite flows which flow directly to FDOT linear projects.

Based on the Guidance provided by Florida Department of Environmental Protection (FDEP) on the "Implementation of the Statutory Provision for Treatment of Offsite Flows" The Department of Transportation is not responsible for the abatement of pollutants and flows entering stormwater management systems from offsite sources that would otherwise normally discharge to, or in the direction of, the FDOT project area. FDOT has four options in dealing with the offsite flows.

1) Bypass offsite flows around the projects treatment system

2) Accept offsite flows and treat the entire flow

3) Accept offsite flows and treat only the project

4) Accept offsite flows and partially treat the offsite area

FDEP supports allowing comingling if the treatment system utilizes wet detention, since in all cases there is an overall environmental benefit. They also support comingling for retention treatment systems when the offsite flows provide equal or greater nutrient loading when compared to the project loadings. In these cases, FDEP will not require further analysis as long as the ERP design requirements for the runoff from the project area are met.

However, when the offsite lands that flow into the FDOT dry retention system are undeveloped or unimproved, the water quality at the downstream points of discharge from the comingled system may be worse than if the flow was simply bypassed. These cases will need to be evaluated to ensure that environmental protection is not diminished.

For the purpose of this study, it was assumed that offsite flows will be bypassed around the treatment system. Ground elevations and estimated depth to the ground water have severely restricted pond locations and increased the proposed pond sizes. Bypassing offsite flows and minimizing pond size to the greatest extent was determined to be an appropriate approach.

4.2.2.2 Pond Sizing Criteria

The NRCS method was used to calculate pre-development and post development runoff volumes. The increase in runoff volume between pre-development and post development conditions was used to determine the volume required for attenuation of the design storm event. The NWFWMD rules dictate the use of the 25-year, 24-hour design storm event. Since FDOT requires the critical storm event up to the 100-year frequency, the 100-year, 24-hour rainfall depth was used to calculate the required attenuation volume.

The analysis is strictly a volumetric analysis for the purpose of this report. The maximum design stage is limited to the low edge of pavement elevation (LEOP) in the basin minus 1 foot for freeboard. It is assumed that the pond will be adjacent to the road, therefore the top of the treatment volume is constrained to the low point in the road minus the base clearance. The base clearance is one (1) foot for urban sections. These criteria were used to establish the available depth for the treatment and attenuation as illustrated below:

Available depth for treatment and attenuation = LEOP – SHWT elevation – one (1) foot of freeboard.

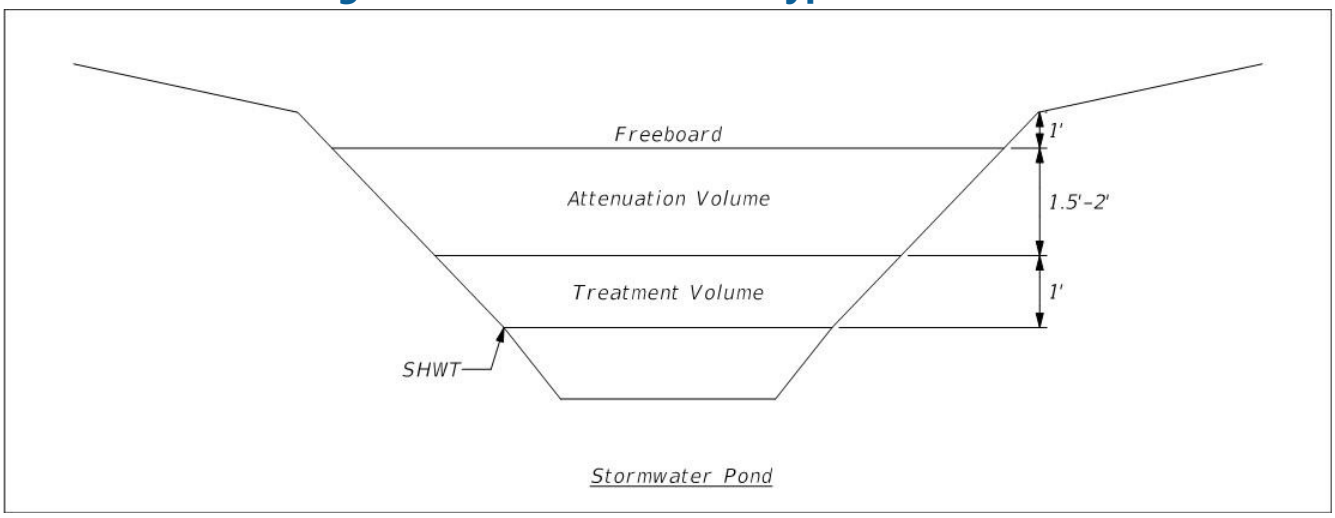
Since the freeboard depth is equal to the base clearance it is assumed that this criterion will also meet the base clearance requirements.

Assumptions for estimating pond sizing are as follows:

- The runoff from the entire eastern portion of the project within the proposed ROW will be conveyed to a single stormwater pond for treatment and attenuation.
- The treatment volume is based on treating the entire ROW and the volume is stacked one foot above the SHWT.
- Offsite areas will be routed to bypass the pond.
- The attenuation volume is assumed to stack 1.5 ft to 2 ft above the treatment volume which is typical of wet detention ponds in flat and gently sloping terrain as found along the project.
- This yields a berm height of 4 ft above the SHWT to accommodate the treatment volume, attenuation volume and 1 ft of freeboard.
- 15-foot maintenance berm sloped 10:1 toward the pond bottom will be provided.
- 1:4 side slopes from the top of the bank to the pond bottom will be provided.
- 1-foot of freeboard measured from the inside edge of the maintenance berm is required.
- Based on preliminary wetland investigations, there appears to be sufficient upland areas to situate pond sites. Therefore, this report assumes the ponds will not substantially impact wetland areas.
- Room will be provided for the planting of visual buffers if necessary and/or to create interesting pond shapes per section 5.4.4.2 of the Drainage Manual.
- A 10% contingency was added to each pond alternative size to account for limited site-specific data.

A more thorough pond siting effort, comparing different pond sites for each roadway basin, will be required in the design phase of this project. Calculations to determine pond ROW areas are included in ***Appendix D***.

Figure 4-1 Wet Pond Typical Section



5.0 FLOODPLAINS

The Federal Emergency Management Agency (FEMA) identifies flood hazards, assesses flood risks, and provides accurate data to guide stakeholders in taking effective mitigation actions which would increase public safety. A review of the FEMA Flood Insurance Rate Maps (FIRM) for the project area indicates that the S.R. 20/S.R. 366 corridor crosses the 100-year Type AE Floodway for Munson Slough. FEMA has determined the Base Flood Elevations (BFE's) in this floodplain.

The regulatory requirements will be reviewed under the Environmental Resource Permit through the NWFWMD. The storage and conveyance of floodways and floodplains must not be altered so as to adversely impact the off-site storage and conveyance capabilities. Since this project is considered a traversing work and the proposed bridge will continue to span the floodway, no floodplain impacts are anticipated for this project.

6.0 CONCLUSIONS

The analysis performed in this study has concluded that stormwater treatment and attenuation can be achieved through 3 pond site locations.

1) The intersection with Capital Circle SW will be conveyed and treated in Delta Pond 1 to maintain current drainage patterns.

2) The segment of the project between Capital Circle SW and the crest of the bridge to the west will be collected and conveyed to the existing Nina Pond. A 3-foot sump will need to be added to Nina Pond to provide adequate fall on the storm sewer pipe from

the roadway to the infall to the pond. The pond will continue to provide the level of treatment as originally permitted through FDEP.

3) The eastern segment of the project from the crest of the bridge to Appleyard Drive will be collected and conveyed to a single wet detention pond. Offsite runoff will bypass the proposed pond. A preliminary pond size was determined assuming the pond would be adjacent to the roadway and located close to the outfall to Munson Slough. Based on the assumptions made for the configuration of the pond a minimum pond area of 2.72 acres will be required for the proposed east side pond. If a single parcel of adequate size is not available, the contributing area will need to be divided and conveyed to separate pond locations.

In addition to reviewing pond sizing and locations, FEMA flood zones were reviewed. It was determined that the proposed bridge would span Munson Slough and no impacts to the floodway are anticipated.

APPENDICES

A. Drainage Basins and Topographic Maps

B. Soils Information

C. WATERSS Data Collection

D. Volume Calculations and Capacity Accounting

APPENDIX A

Drainage Basins and Topographic Maps





Land Information

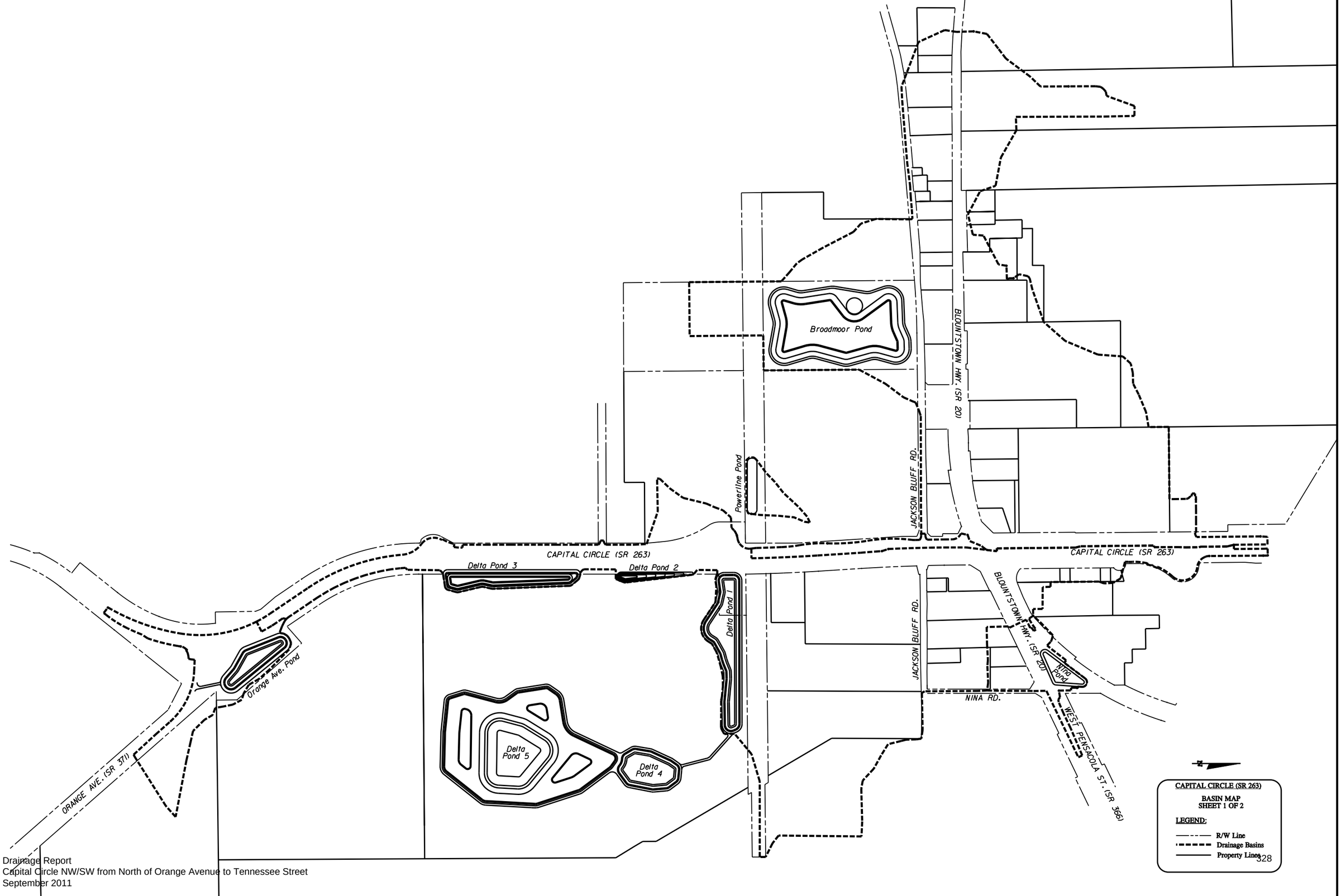
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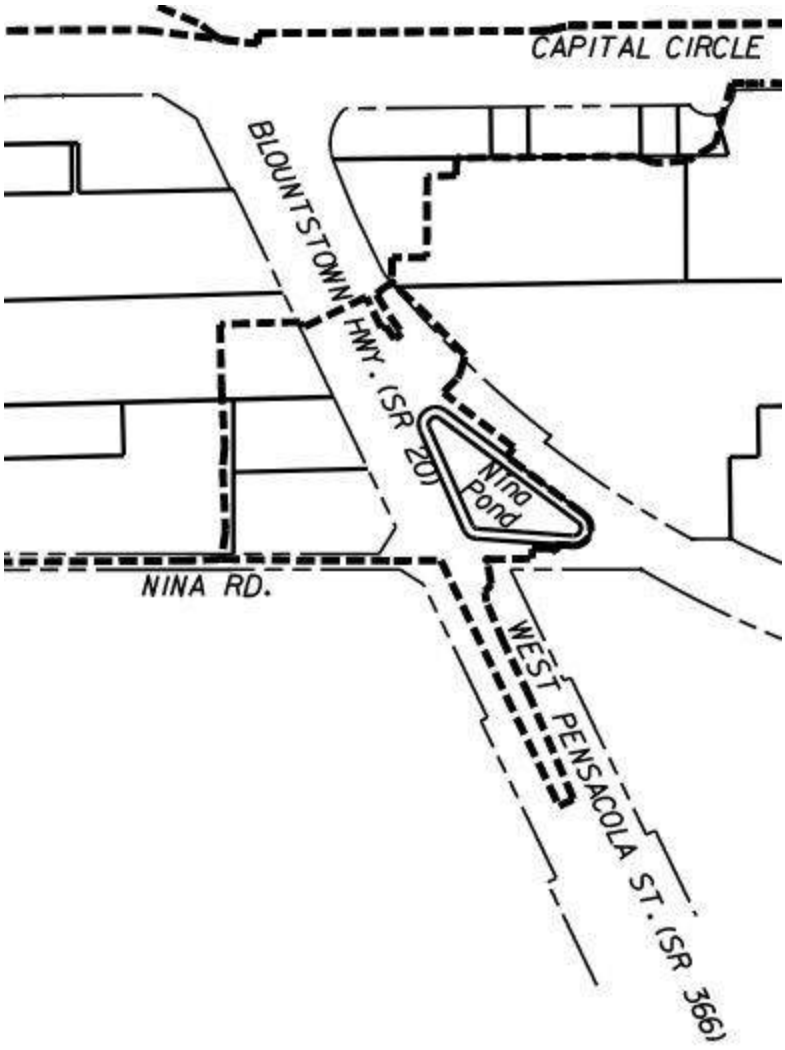
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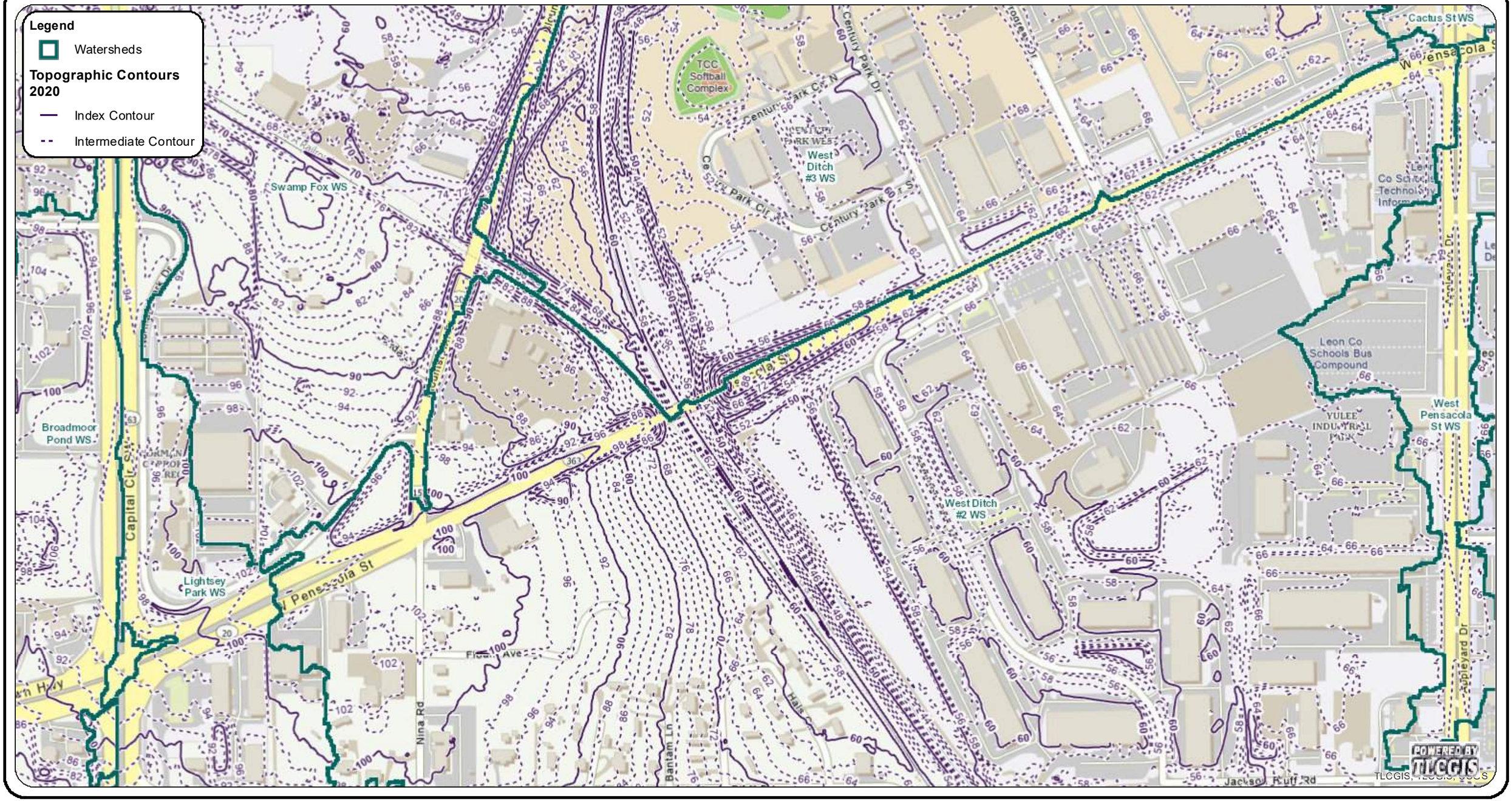
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Tallahassee/Leon County GIS

Scale:	Management Information Services Leon County Courthouse 301 S. Monroe St, P3 Level Tallahassee, Fl. 32301 850/606-5504 http://www.tlcgis.org
Not To Scale	
Date Drawn:	
January 27, 2024	


Broadmoor Pond
BLOUNTSTOWN HWY. (SR 20)
Powerline Pond
JACKSON BLUFF RD.
CAPITAL CIRCLE (SR 263)
Delta Pond 3
Delta Pond 2
Delta Pond 1
Orange Ave. Pond
ORANGE AVE. (SR 371)
Delta Pond 5
Delta Pond 4
JACKSON BLUFF RD.
BLOUNTSTOWN HWY. (SR 20)
Nina Pond
NINA RD.
WEST PENSACOLA ST. (SR 366)
CAPITAL CIRCLE (SR 263)
BASIN MAP
SHEET 1 OF 2
LEGEND:
R/W Line
Drainage Basins
Property Lines


CAPITAL CIRCLE
BLOUNTSTOWN HWY. (SR 20)
Nina Pond
NINA RD.
WEST PENSACOLA ST. (SR 366)



Land Information

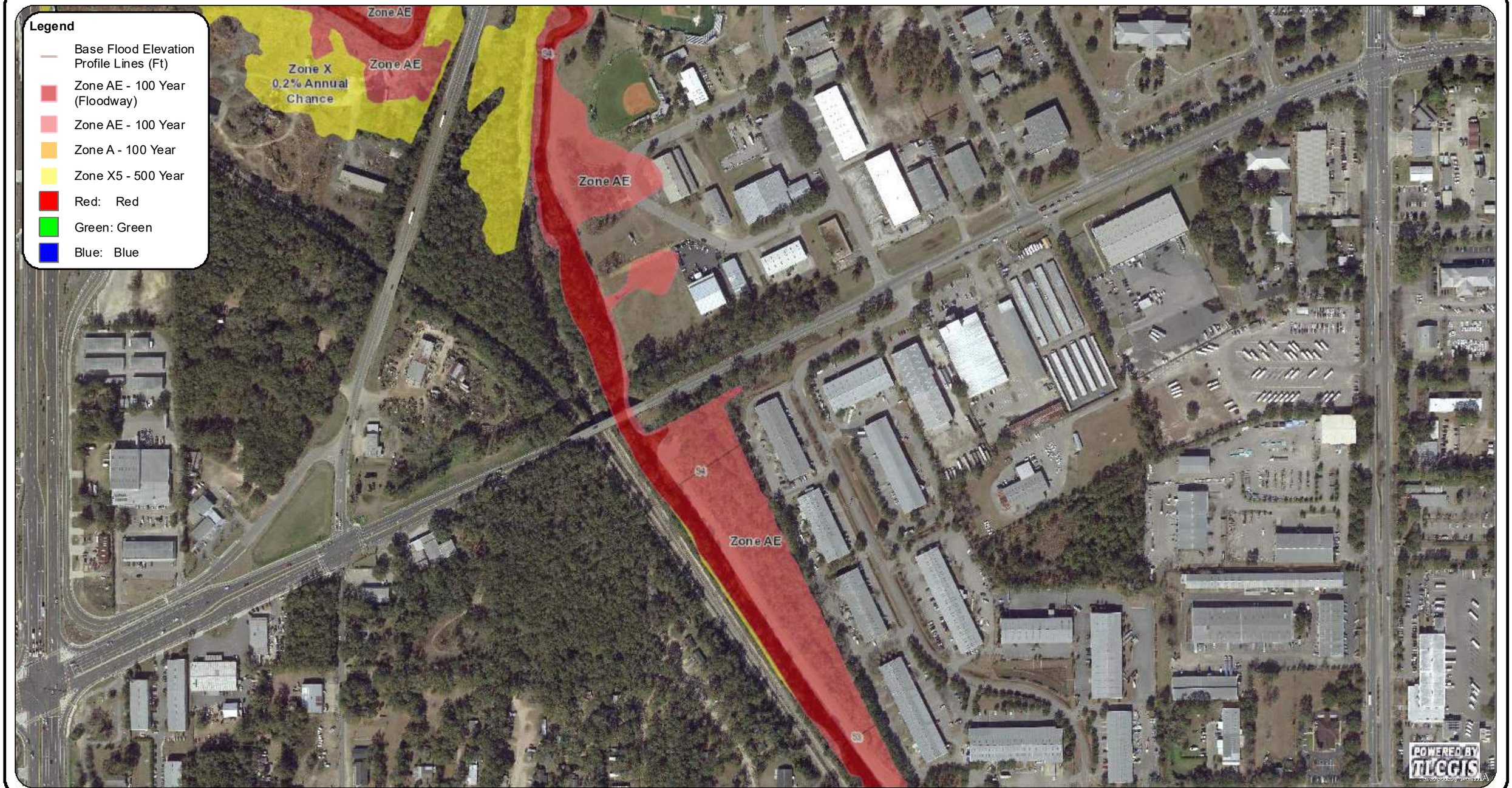
DISCLAIMER

This product has been compiled from the most accurate source data from Leon County, the City of Tallahassee, and the Leon County Property Appraiser's Office. However, this product is for reference purposes only and is not to be construed as a legal document or survey instrument. Any reliance on the information contained herein is at the user's own risk. Leon County, the City of Tallahassee and the Leon County Property Appraiser's Office assume no responsibility for any use of the information contained herein or any loss resulting therefrom.

N

Tallahassee/Leon County GIS

Scale:	Management Information Services Leon County Courthouse 301 S. Monroe St, P3 Level Tallahassee, Fl. 32301 850/606-5504 http://www.tlcgis.org
Not To Scale	
Date Drawn:	
January 27, 2024	



Natural Features Map

DISCLAIMER

This product has been compiled from the most accurate source data from Leon County, the City of Tallahassee, and the Leon County Property Appraiser's Office. However, this product is for reference purposes only and is not to be construed as a legal document or survey instrument. Any reliance on the information contained herein is at the user's own risk. Leon County, the City of Tallahassee and the Leon County Property Appraiser's Office assume no responsibility for any use of the information contained herein or any loss resulting therefrom.

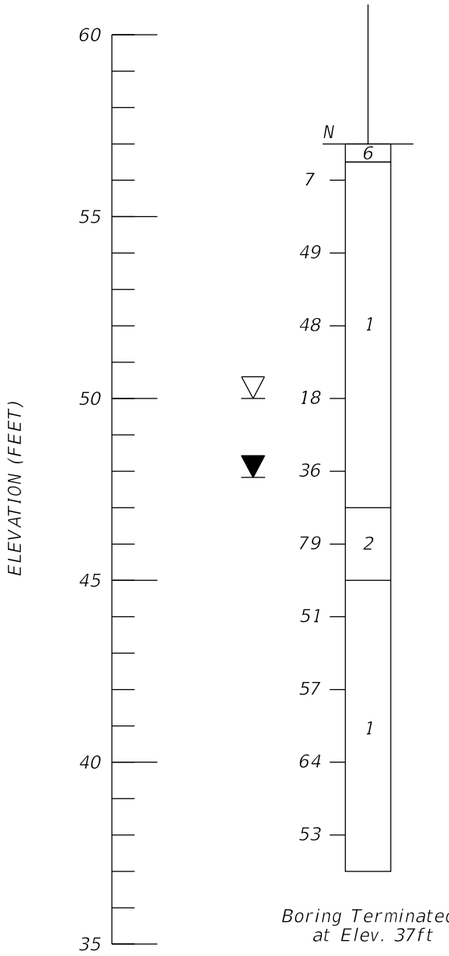
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Tallahassee/Leon County GIS

Scale:	Management Information Services Leon County Courthouse 301 S. Monroe St, P3 Level Tallahassee, Fl. 32301 850/606-5504 http://www.tlcgis.org
Not To Scale	
Date Drawn:	
November 15, 2022	

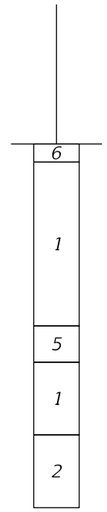
APPENDIX B
Soils Information

BOR # PB-1
REF. TBD
STA. TBD
OFF. TBD
LATITUDE. 30°26'20.78"N
LONGITUDE. 84°20'46.66"W
ELEV. 57'
DATE. 10/12/2023
DRILLER. L.Schott
HAMMER. Safety
RIG. Portable Tripod



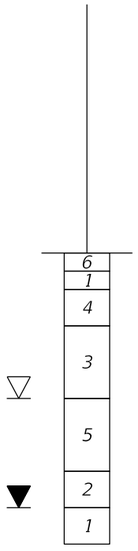
Boring Terminated
at Elev. 37ft

BOR # PB-2
REF. TBD
STA. TBD
OFF. TBD
LATITUDE. 30°26'19.41"N
LONGITUDE. 84°20'45.97"W
ELEV. 57'
DATE. 10/12/2023
DRILLER. L.Schott
HAMMER. N/A
RIG. Hand Auger

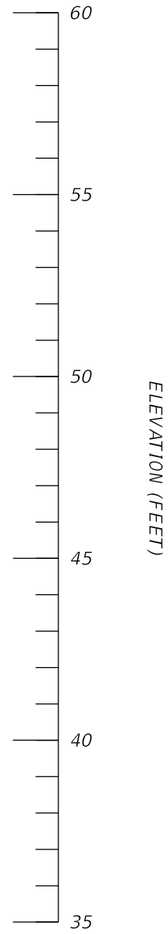


Boring Terminated
at Elev. 47ft
GNE

BOR # PB-3
REF. TBD
STA. TBD
OFF. TBD
LATITUDE. 30°26'20.58"N
LONGITUDE. 84°20'45.16"W
ELEV. 54'
DATE. 10/12/2023
DRILLER. L.Schott
HAMMER. N/A
RIG. Hand Auger



Boring Terminated
at Elev. 46ft



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			GENERALIZED SOIL PROFILES	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	BRETT H. HARBISON, P.E. LICENSE NUMBER: P.E. NO.: 74679 MESKEL & ASSOCIATES ENGINEERING 3728 PHILIPS HIGHWAY, SUITE 208 JACKSONVILLE, FLORIDA 32207	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		5
					SR 20	LEON	219820-2-22-01		

10/19/2023 11:35:23 AM Marlon
C:\Worksets\FDOT\0067-0005\geotechnical\RPTBRD01.dgn

Soil Map—Leon County, Florida
(SR 20 Corridor)



Map Scale: 1:7,900 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 100 200 400 600

Feet
0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Leon County, Florida
Survey Area Data: Version 21, Aug 24, 2023

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

Date(s) aerial images were photographed: Jan 6, 2021—Jan 16, 2021

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
3	Alpin sand, 0 to 5 percent slopes	12.3	30.5%
45	Sapelo fine sand	3.6	8.8%
49	Urban land	24.5	60.7%
Totals for Area of Interest		**40.4**	**100.0%**


84° 21' 19" W
84° 20' 5" W
30° 26' 48" N
30° 26' 6" N
754100
754300
754500
754700
754900
755100
755300
755500
755700
755900
3371300
3371100
3370900
3370700
3370500
3370300
3370100
38
38
5
49
45
3
20
366
263
Appleyard
Appleyard Dr
Progress Dr
Bayberry Ln
Driveway
Munson Slough
Ur2133
Soil Map may not be valid at this scale.
Map Scale: 1:9,020 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 100 200 400 600
Feet
0 400 800 1600 2400
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Alpin sand, 0 to 5 percent slopes	A	34.1	9.9%
5	Blanton fine sand, 0 to 5 percent slopes	A	57.8	16.8%
38	Pamlico-Dorovan complex	B/D	3.2	0.9%
45	Sapelo fine sand	B/D	58.6	17.0%
49	Urban land		191.2	55.4%
Totals for Area of Interest			**344.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

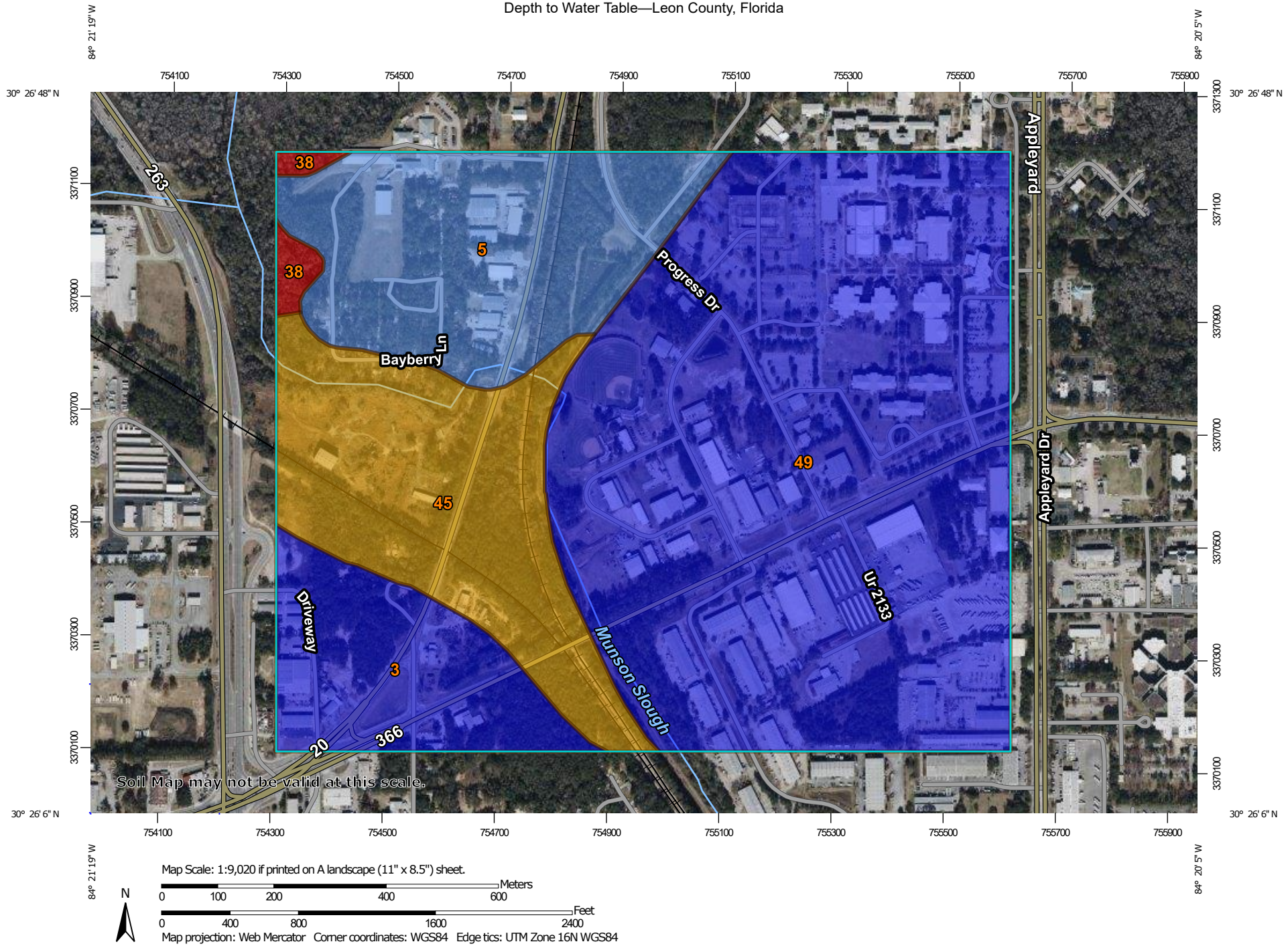
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Depth to Water Table—Leon County, Florida



Map Scale: 1:9,020 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
3	Alpin sand, 0 to 5 percent slopes	>200	34.1	9.9%
5	Blanton fine sand, 0 to 5 percent slopes	168	57.8	16.8%
38	Pamlico-Dorovan complex	0	3.2	0.9%
45	Sapelo fine sand	46	58.6	17.0%
49	Urban land	>200	191.2	55.4%
Totals for Area of Interest			**344.9**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

APPENDIX C

WATERSS Data Collection



Pensacola Street PDE WATERSS

PM – Project Manager – Tori

DC – District Champion – Donald Rogers

DE – Drainage Engineer – Natalie Zierden

Stormwater Data Collection using the Environmental Screening Tool/ Leon County GIS

ETDM Levels

Existing Land Use

Future Land Use

FDEP Springs Priority Focus Area – Wakulla PFA1

Water Quality

EPA

USEPA Impaired Waters with TMDL (Black Swamp – Lake Munson)

USEPA 303(D) Listed Impaired – Lake Bradford

USEPA Established TMDLs

Godby Ditch – Lake Munson/Fred George Sink – Phosphorus, Total

Central Drainage Ditch – Lake Munson/Fred George Sink – Nitrogen, Total

FDEP and FDOT

Adopted Total Maximum Daily Loads – Lake Munson/Fred George Sink – Fecal Coliform

Waters Not Attaining Standards (WNAS) – Munson Slough – Lead, Metals – Cannot be delisted

Godby Ditch – Fecal Coliform, Bacteria

Basin Management Action Plans (BMAP) – Wakulla Spring

Verified Impaired Florida Waters – Godby Ditch – Fecal Coliform

Munson Slough – Lead, Metals

Monitoring

USEPA Water Quality Monitoring –

Rain Gage 2 at Wayne Colony Plant

West Drainage Ditch at Pensacola St

West Ditch Trib at Pensacola St

West Drainage Ditch at Jackson Bluff Rd

West Drainage Ditch at Yulee St

West Drainage Ditch at Chipley St

Jail Pond Inflow

West Branch Gum Creek at NWFWMD Gage DS Cap Cir

FDEP (WIN) Monitoring Locations

Gum Creek Station 4 Below Dam at Gum Swamp

Godby Ditch Merchants Ct

FDEP (WIN) Flowing Waters – Munson Slough

Rare Species Habitat– Priority 6

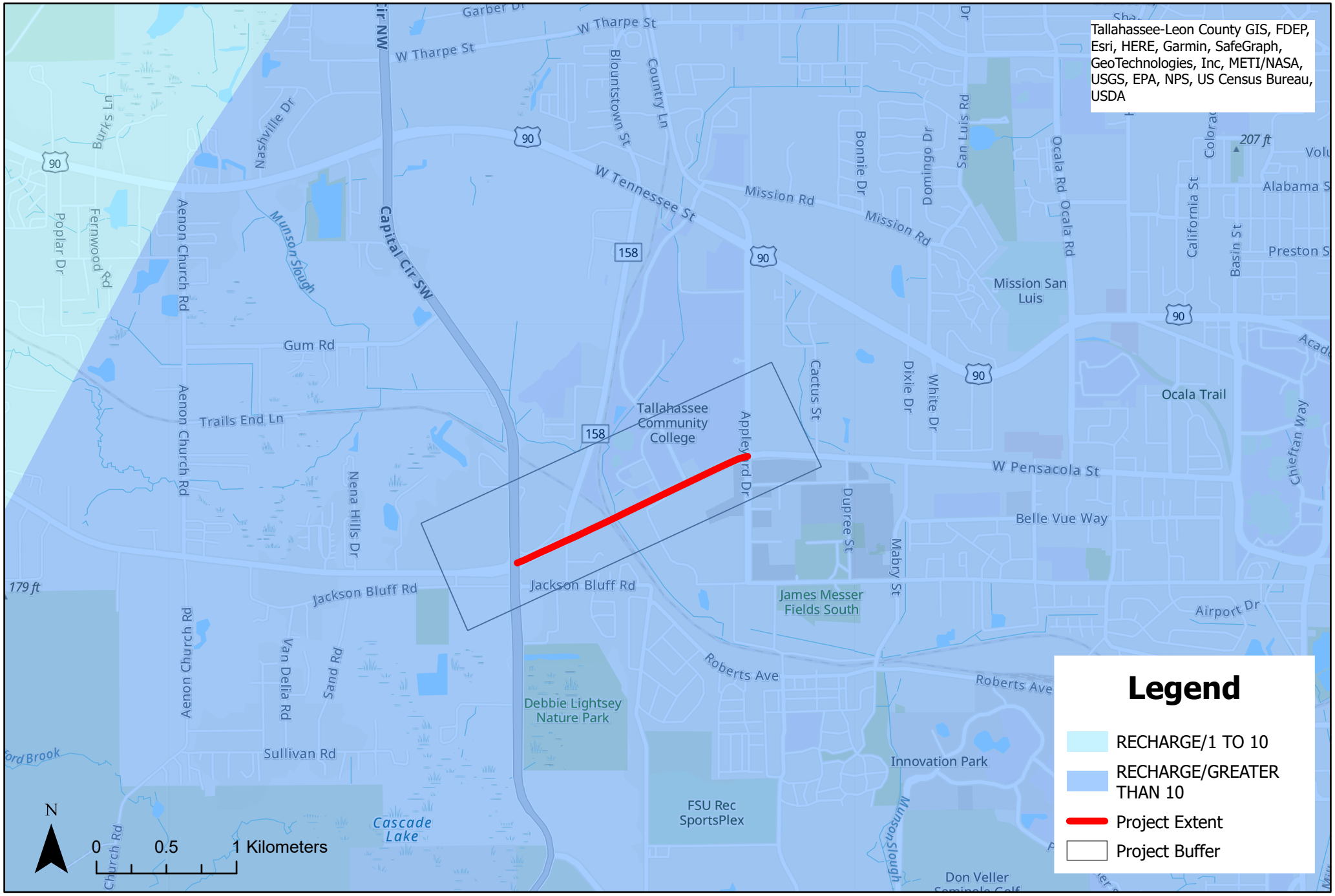
Conservation

WATERSS Data Report



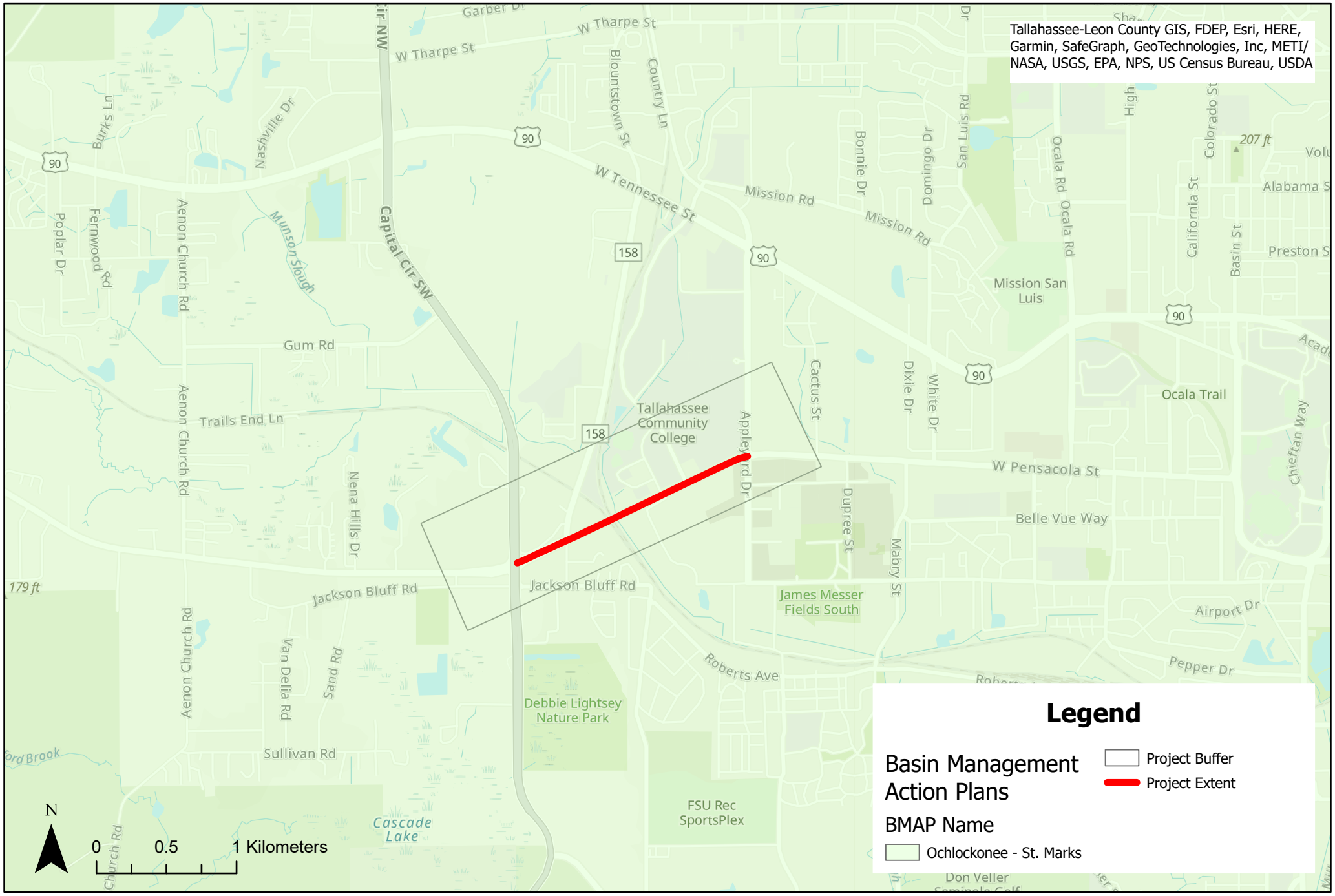
Pensacola Street PD&E

Figure 1: Aquifer Recharge Rate Map



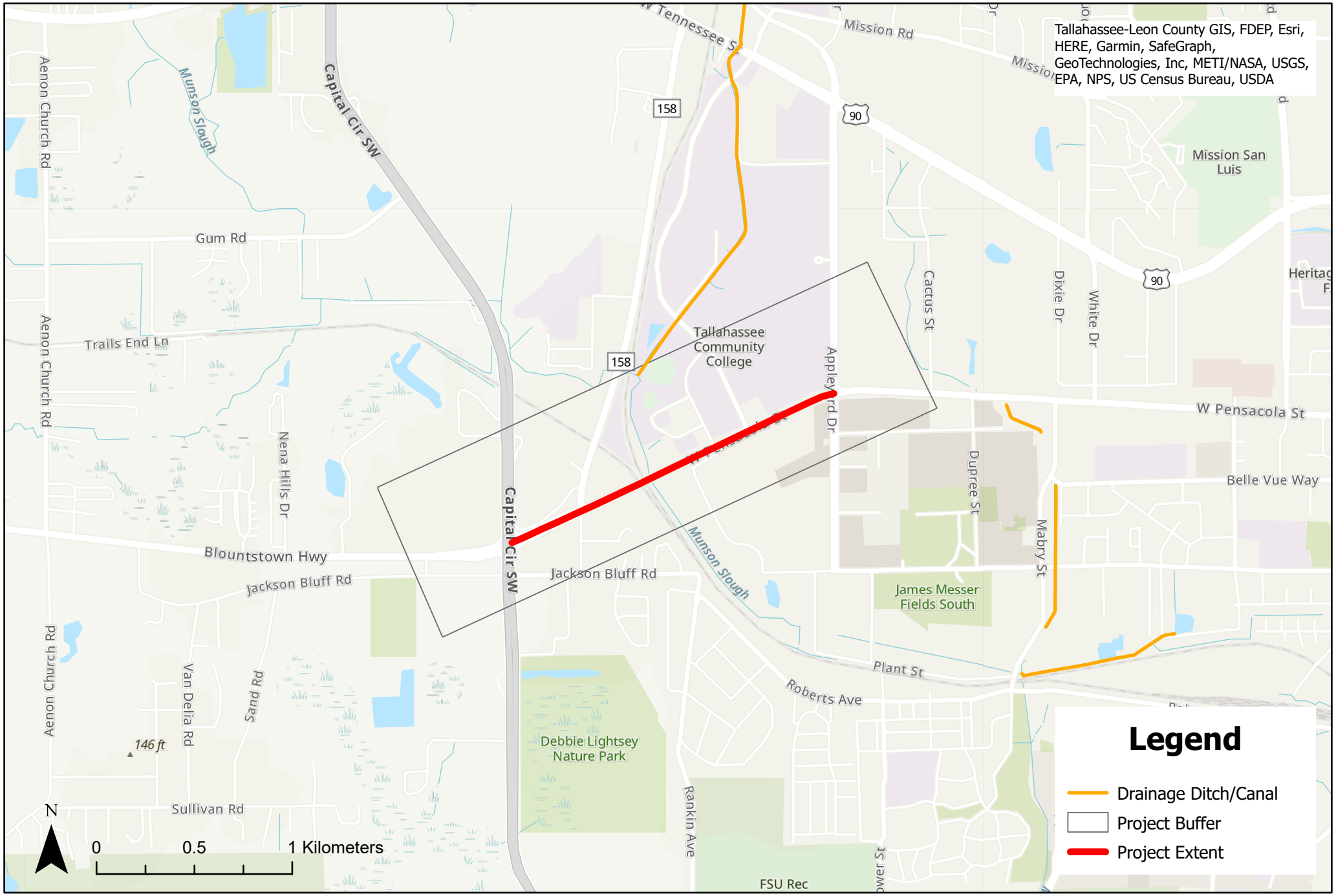
Pensacola Street PD&E

Figure 2: Basin Management Action Plan Map



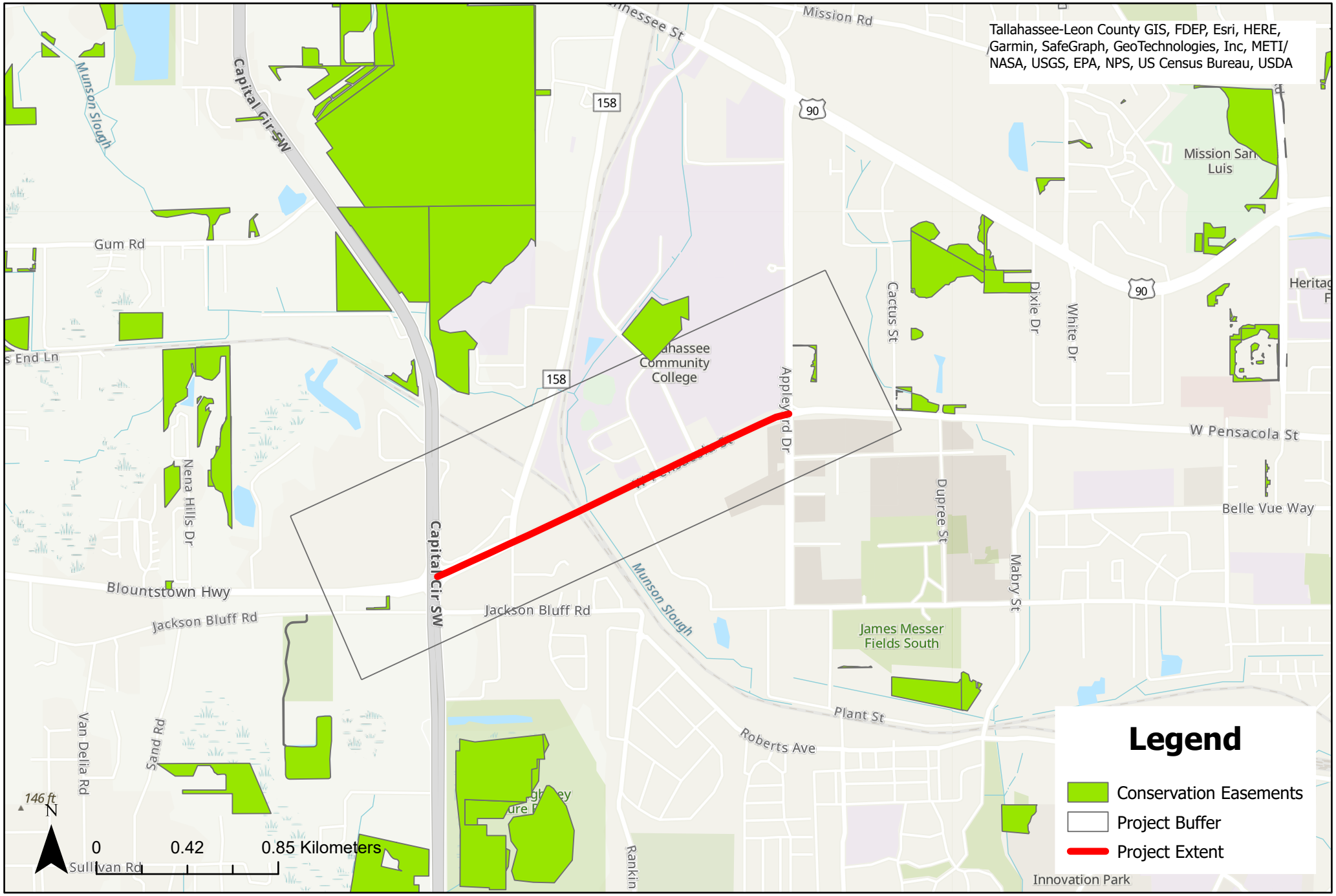
Pensacola Street PD&E

Figure 3: Canal Map



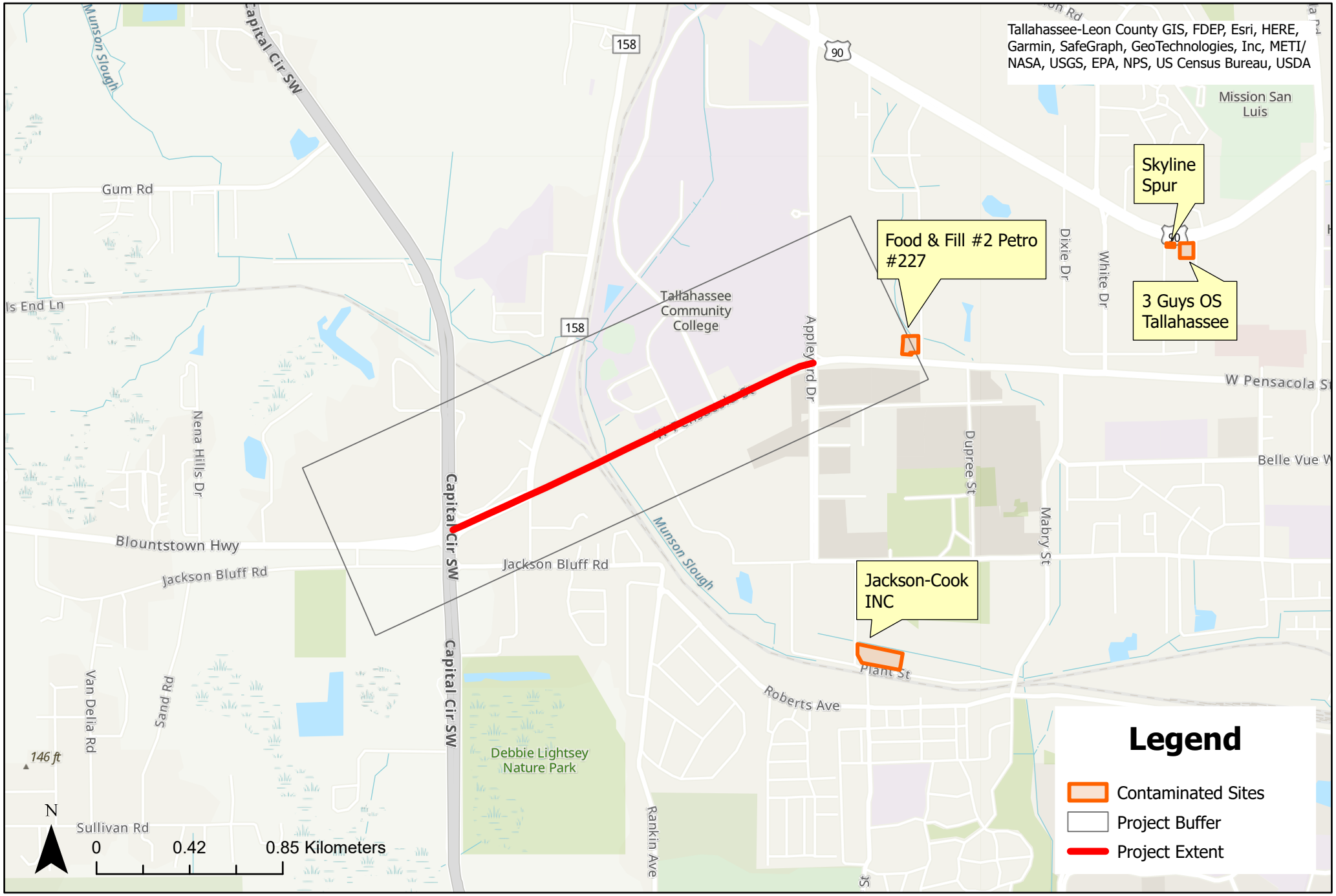
Pensacola Street PD&E

Figure 4: Conservation Easements



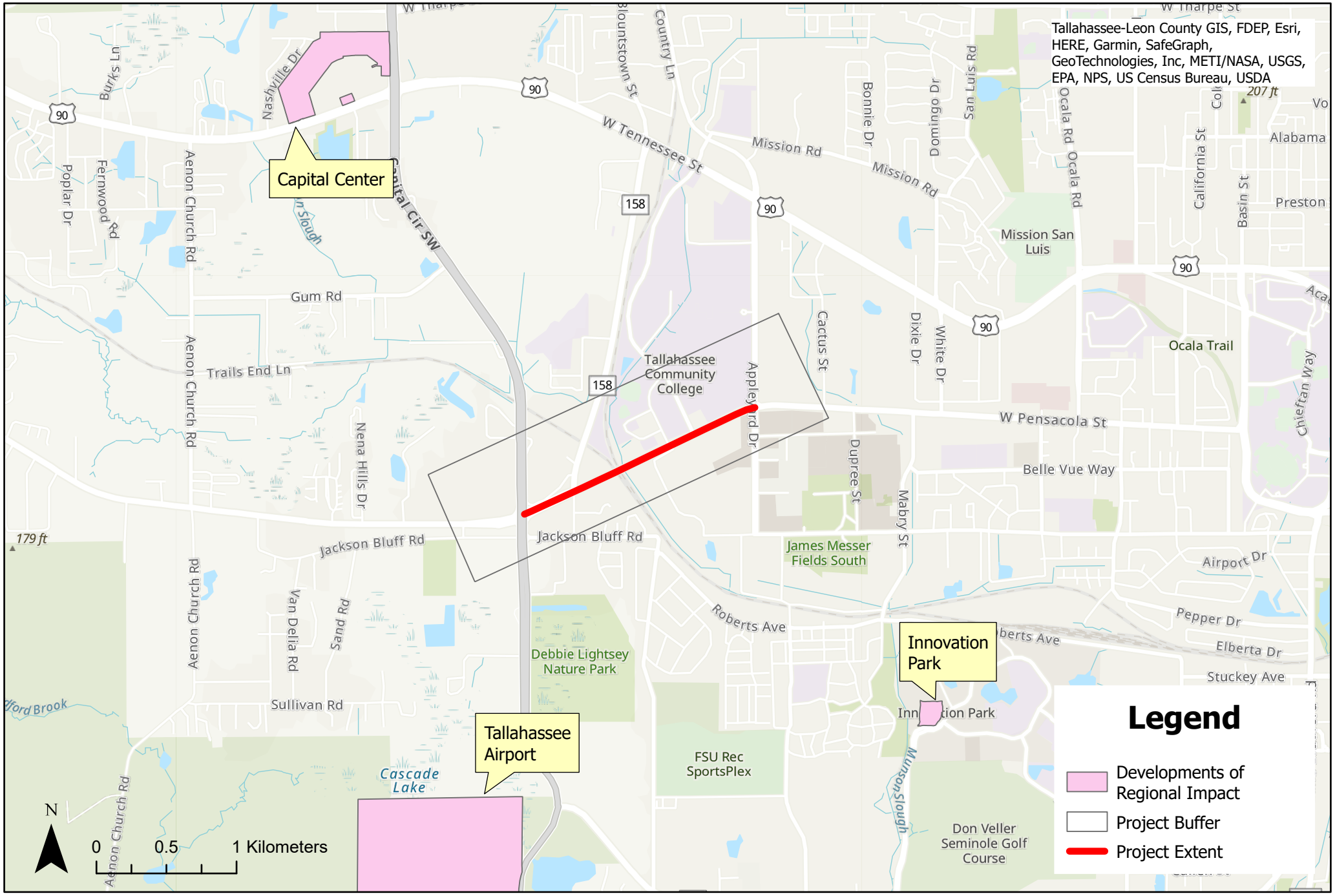
Pensacola Street PD&E

Figure 5: Contaminated Sites



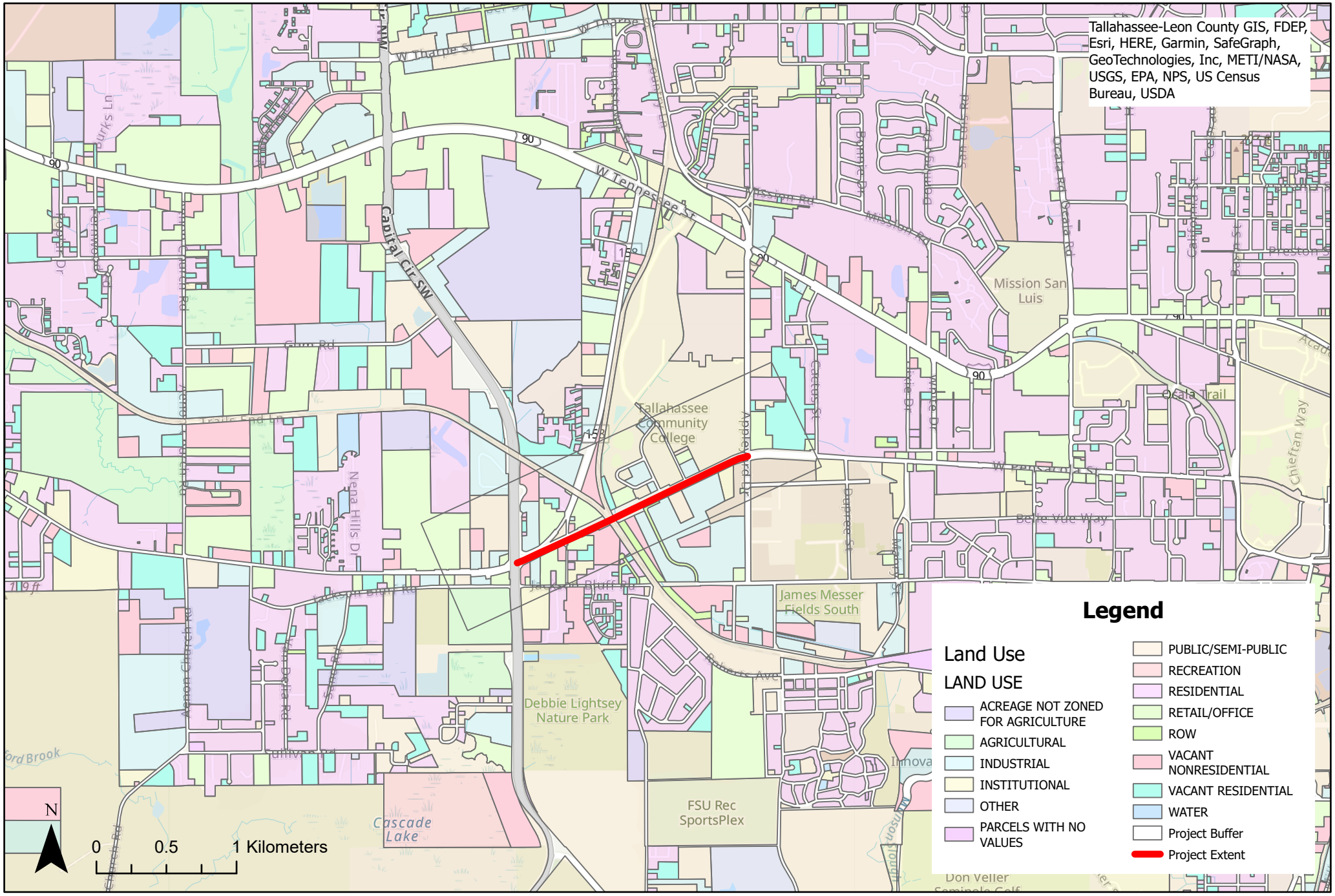
Pensacola Street PD&E

Figure 6: Developments of Regional Impact



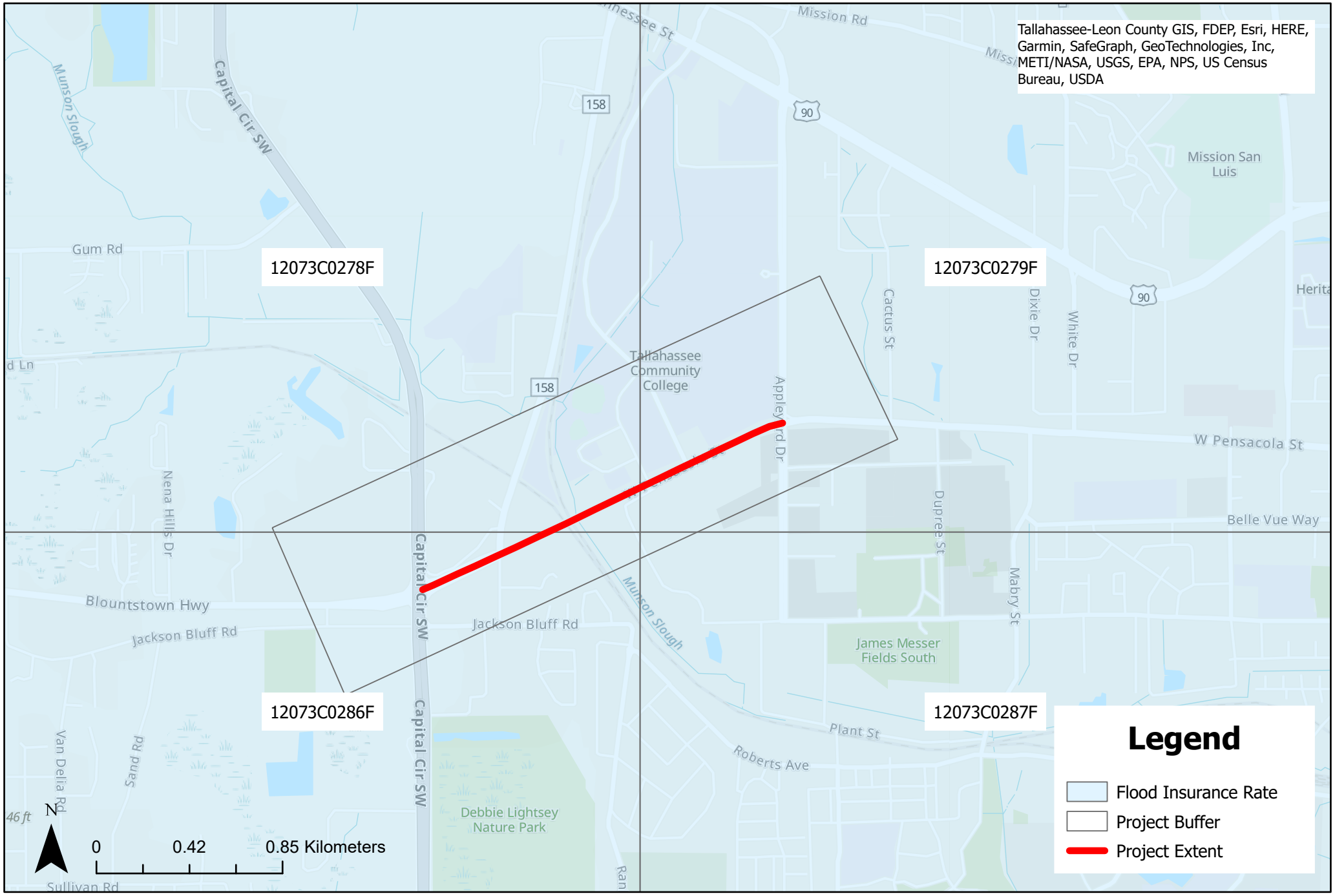
Pensacola Street PD&E

Figure 7: Existing Land Use



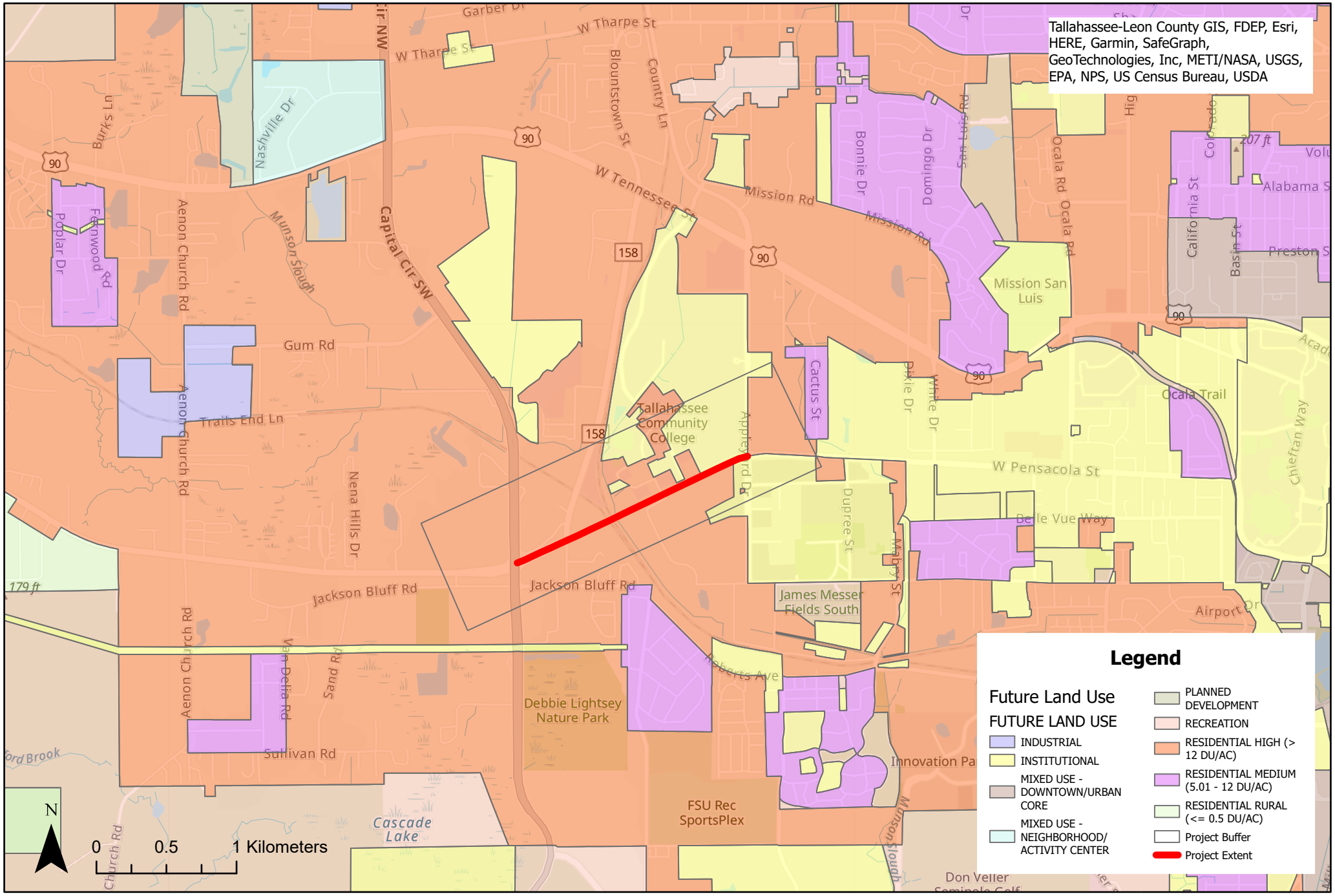
Pensacola Street PD&E

Figure 8: Flood Insurance Rate Map



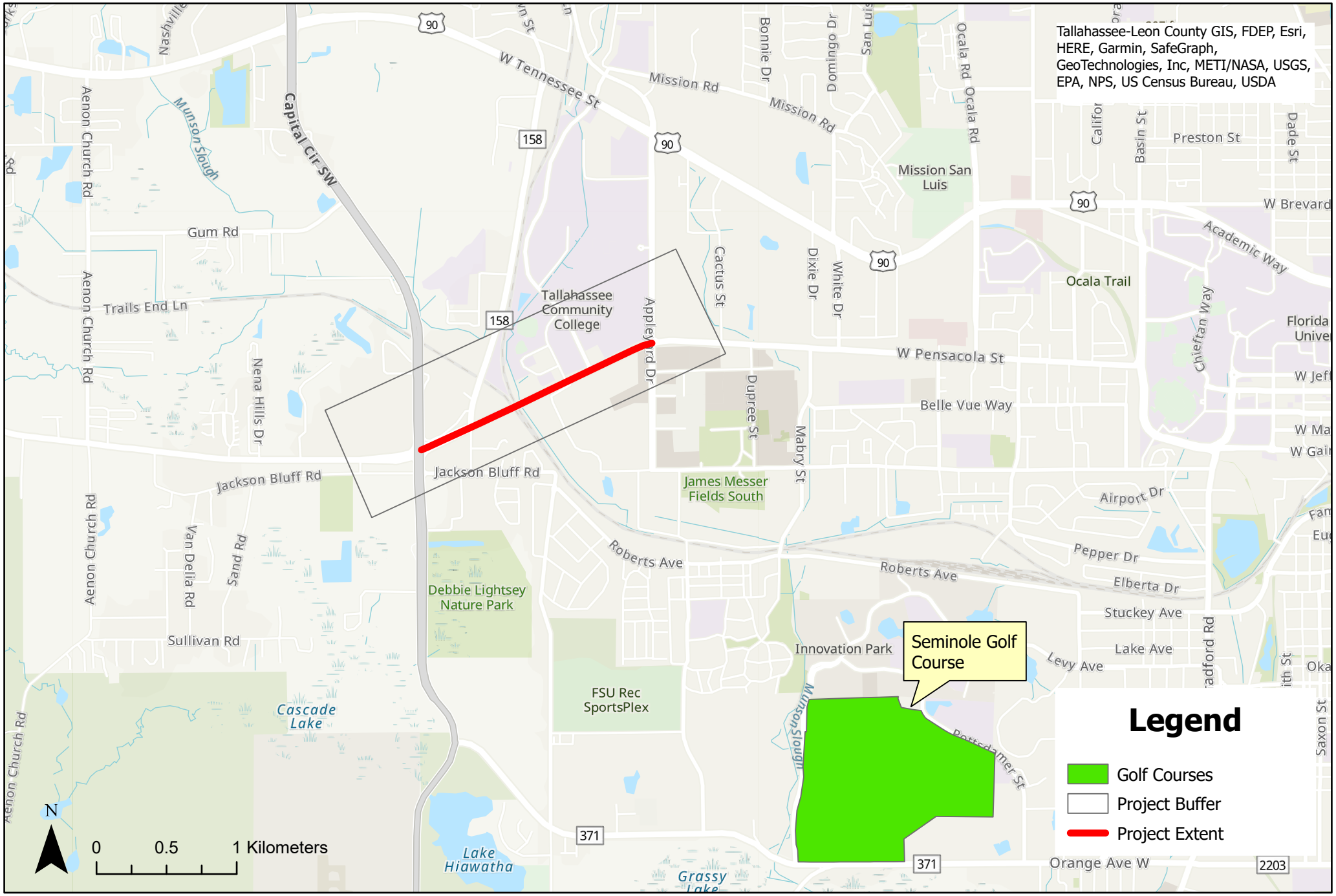
Pensacola Street PD&E

Figure 9: Future Land Use Map



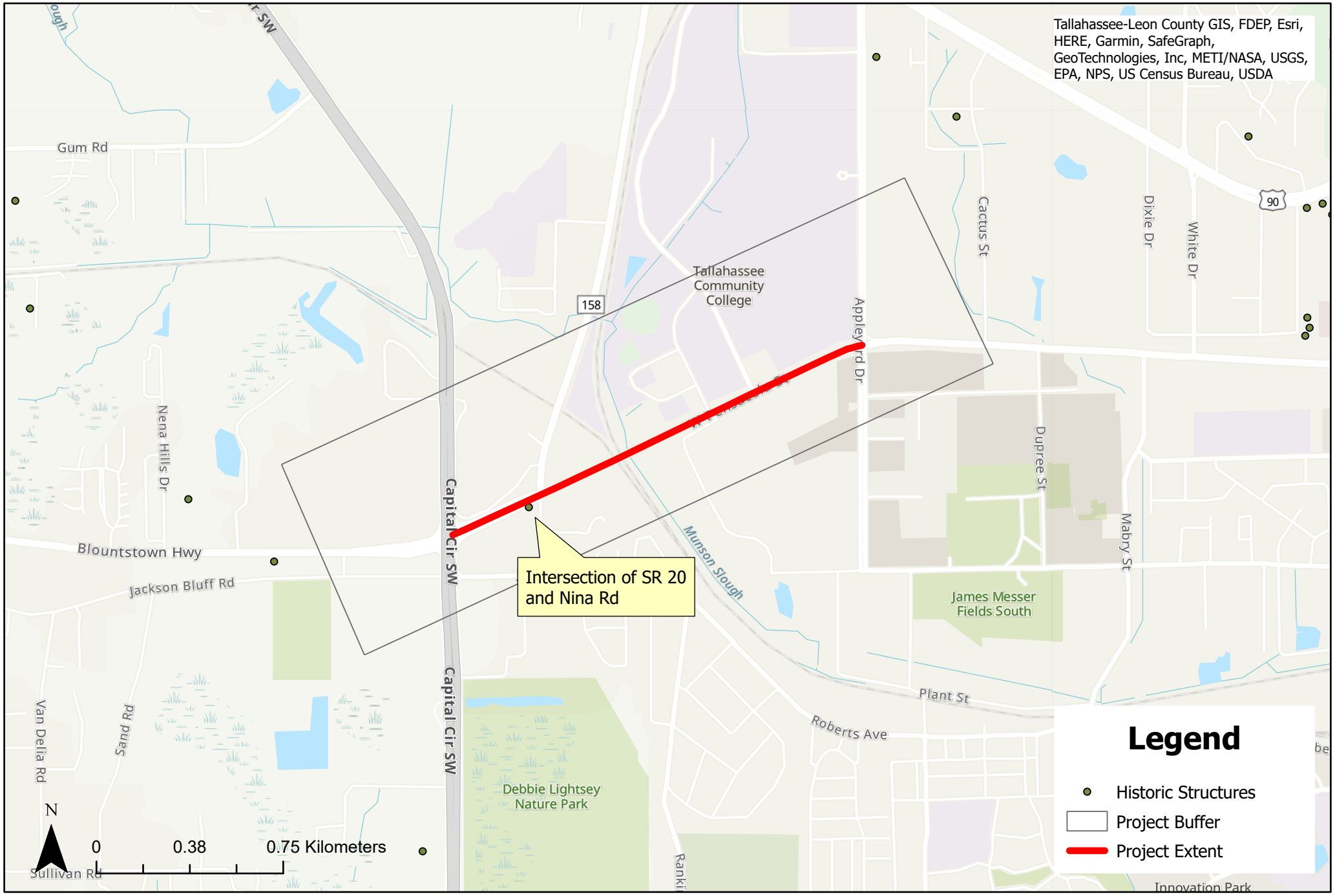
Pensacola Street PD&E

Figure 10: Golf Courses



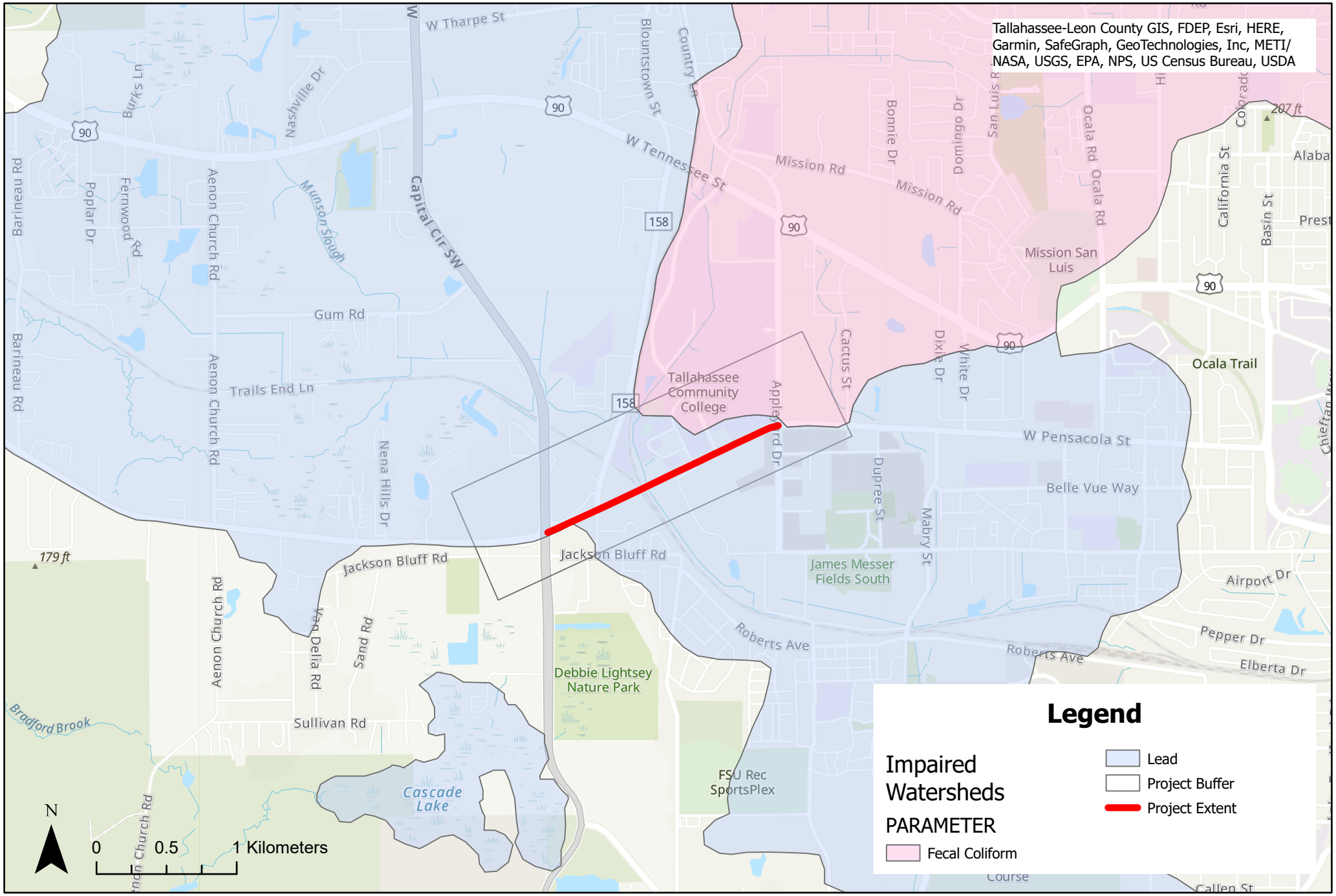
Pensacola Street PD&E

Figure 11: Historic Structures



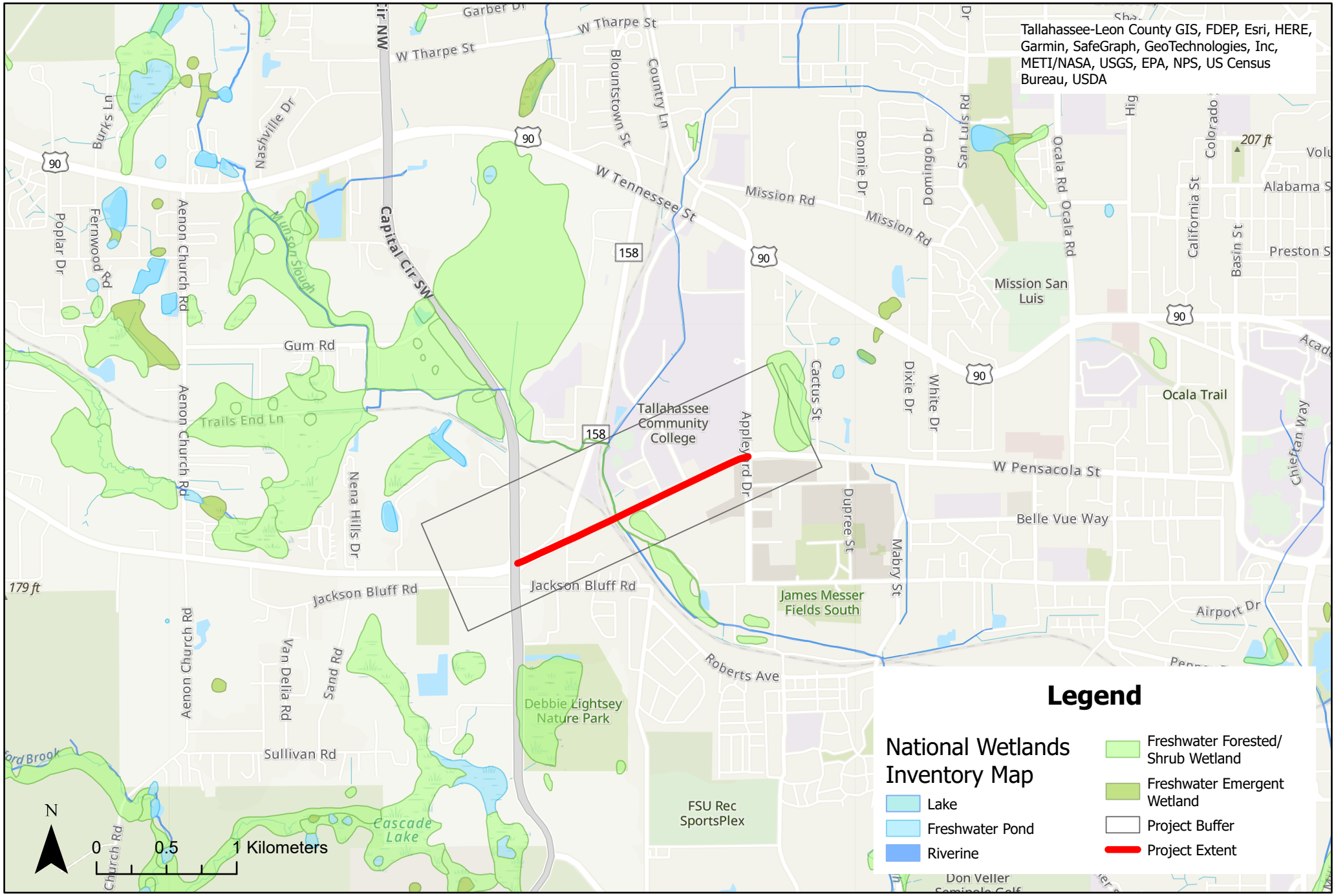
Pensacola Street PD&E

Figure 12: Impaired Watersheds



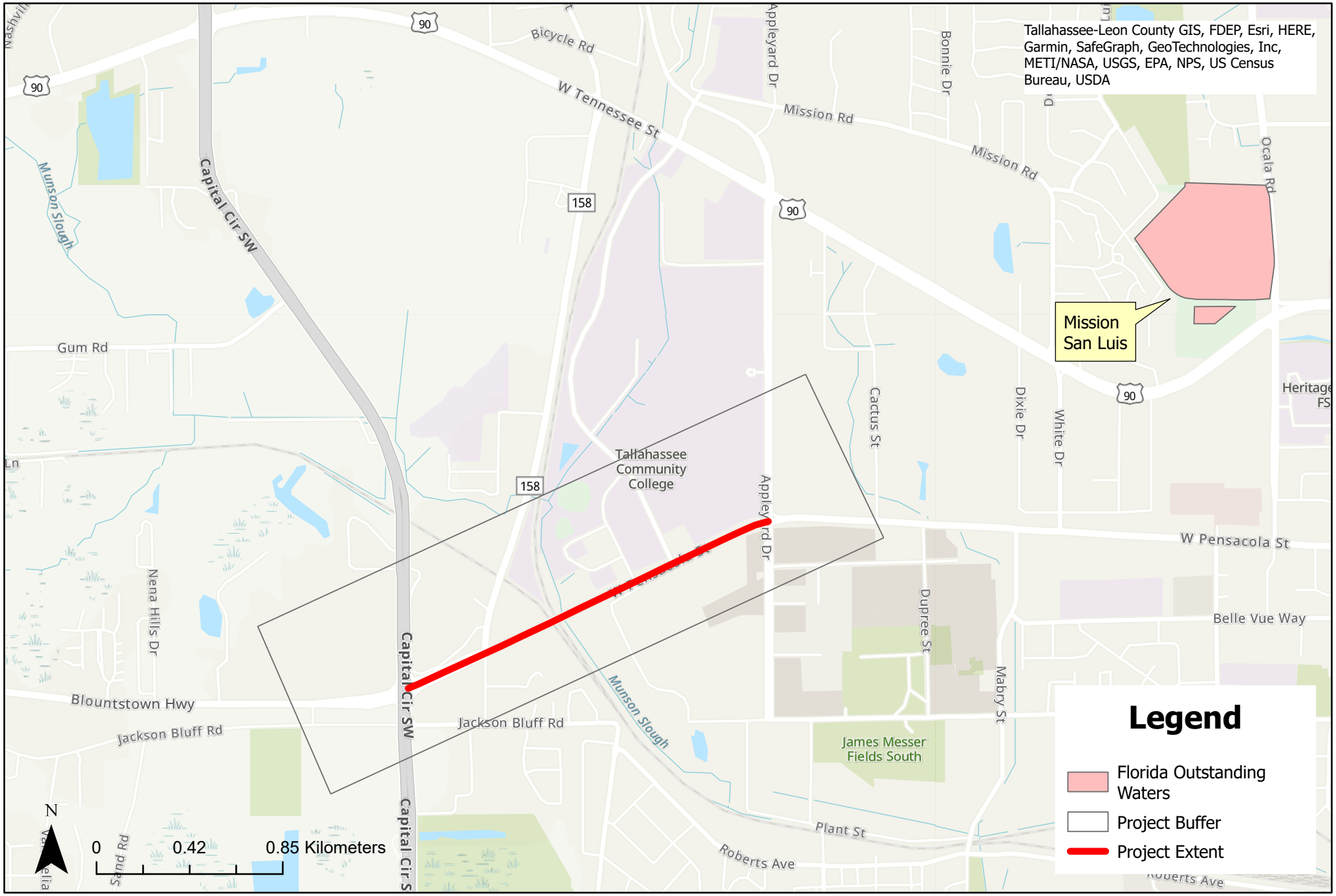
Pensacola Street PD&E

Figure 13: National Wetlands Inventory Map



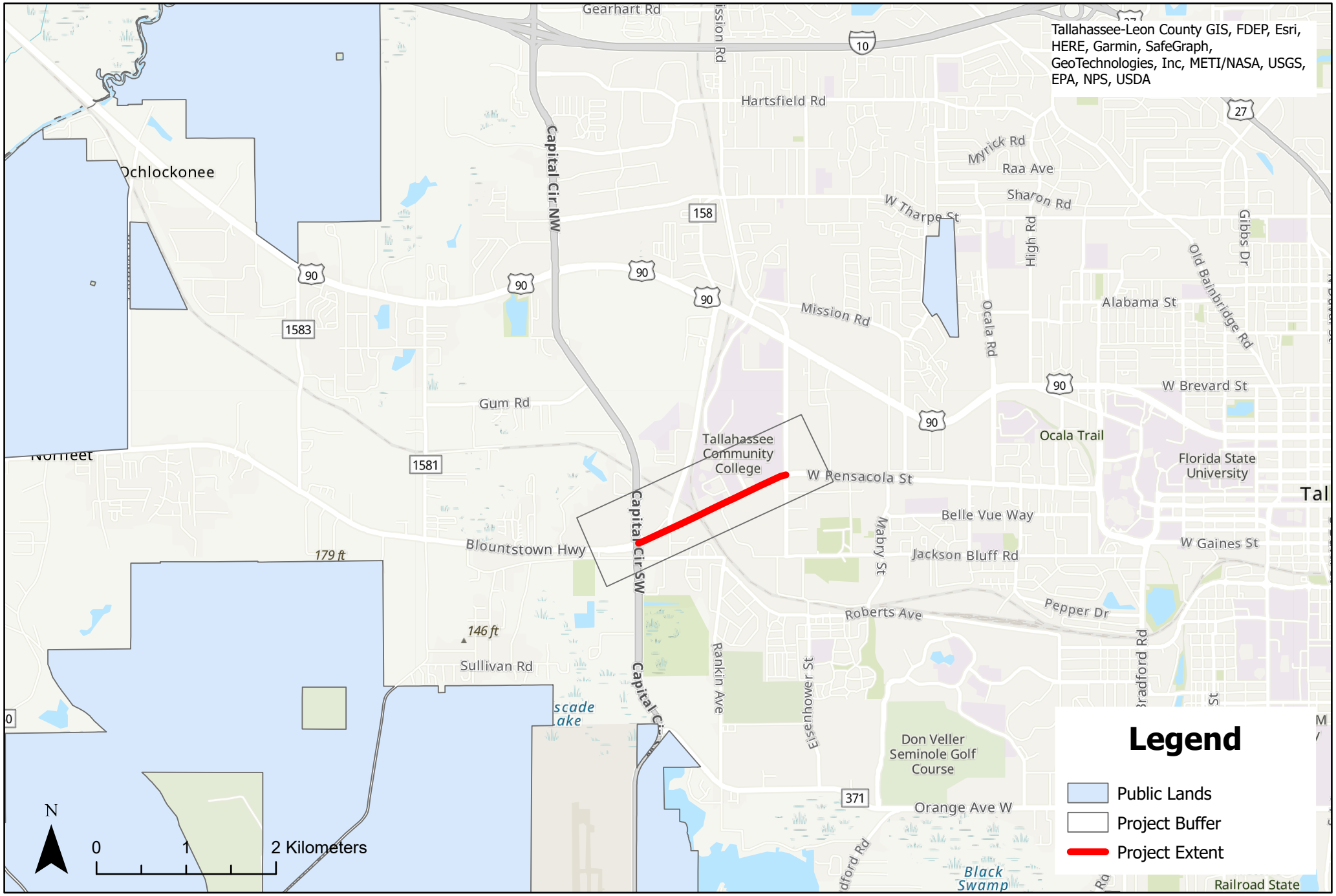
Pensacola Street PD&E

Figure 14: Outstanding Florida Waters



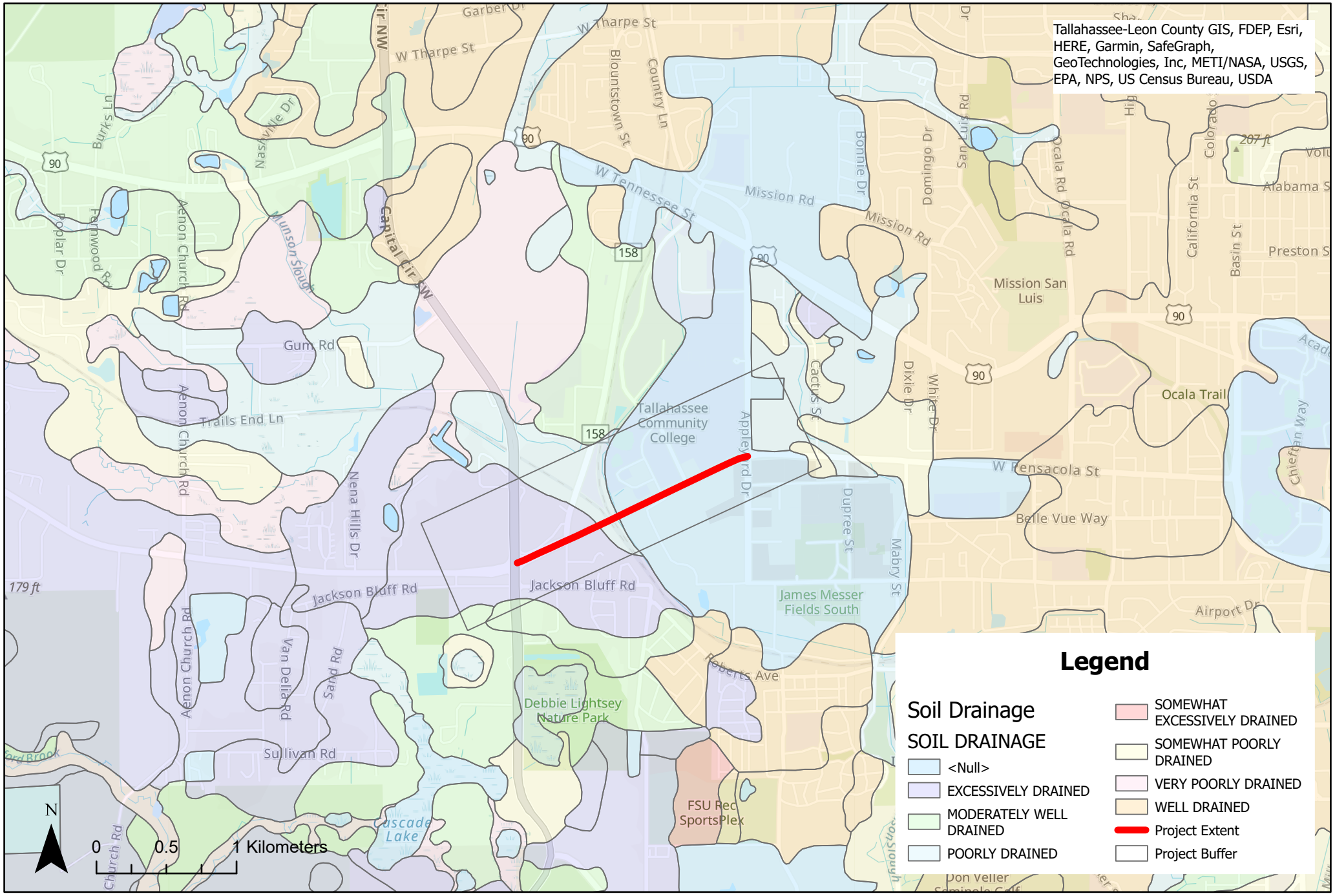
Pensacola Street PD&E

Figure 15: Public Lands Map



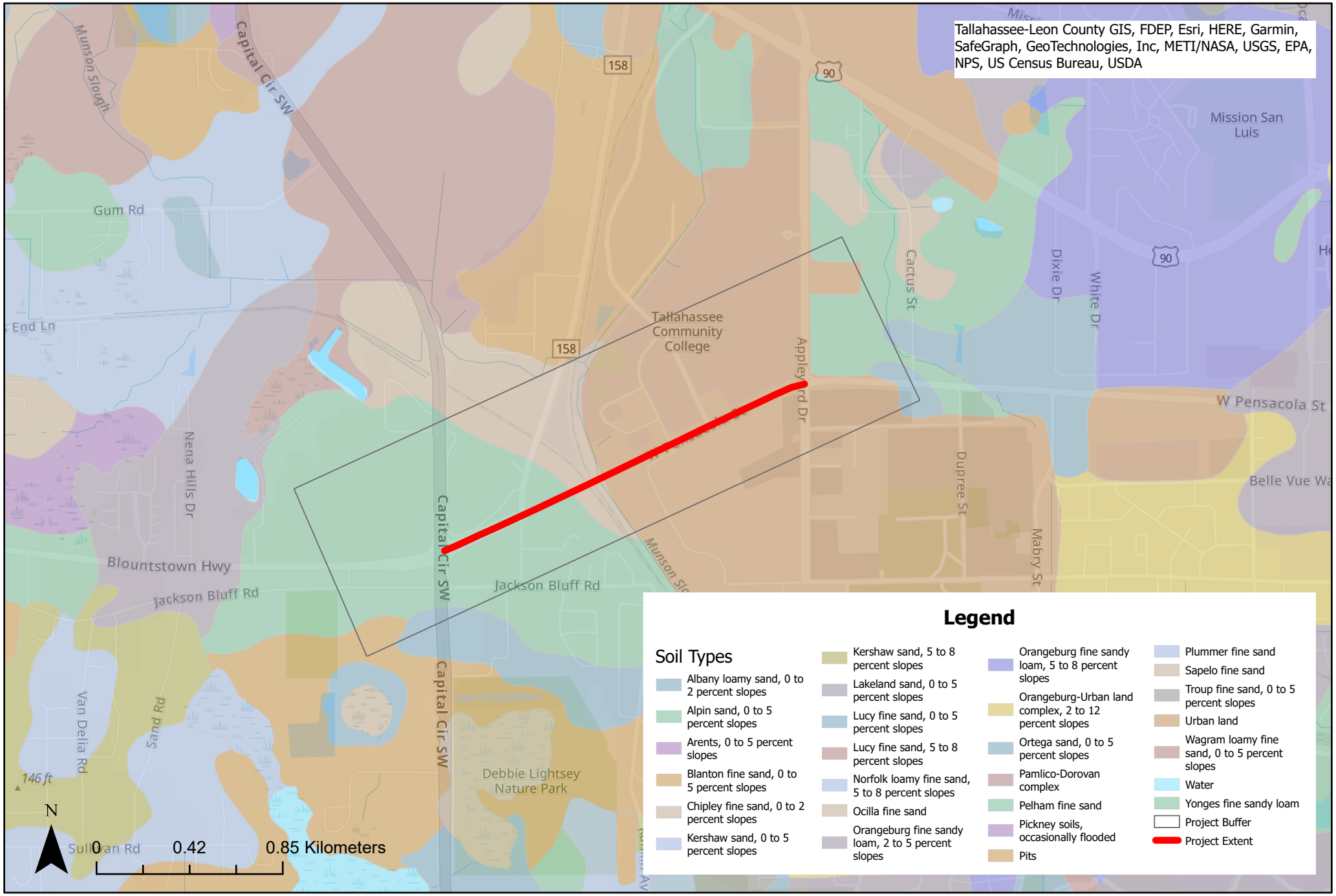
Pensacola Street PD&E

Figure 16: Soil Drainage



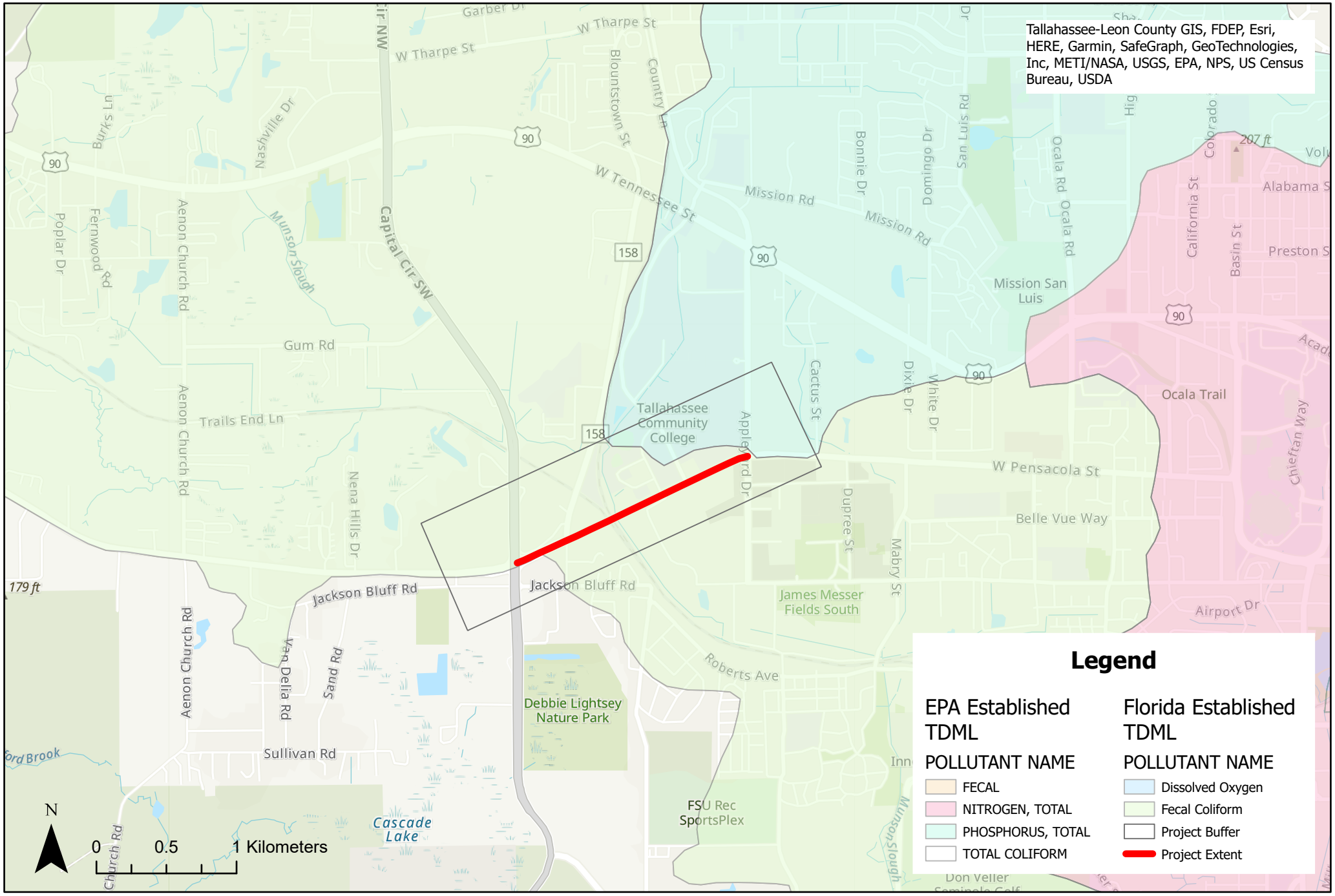
Pensacola Street PD&E

Figure 17: Soil Types



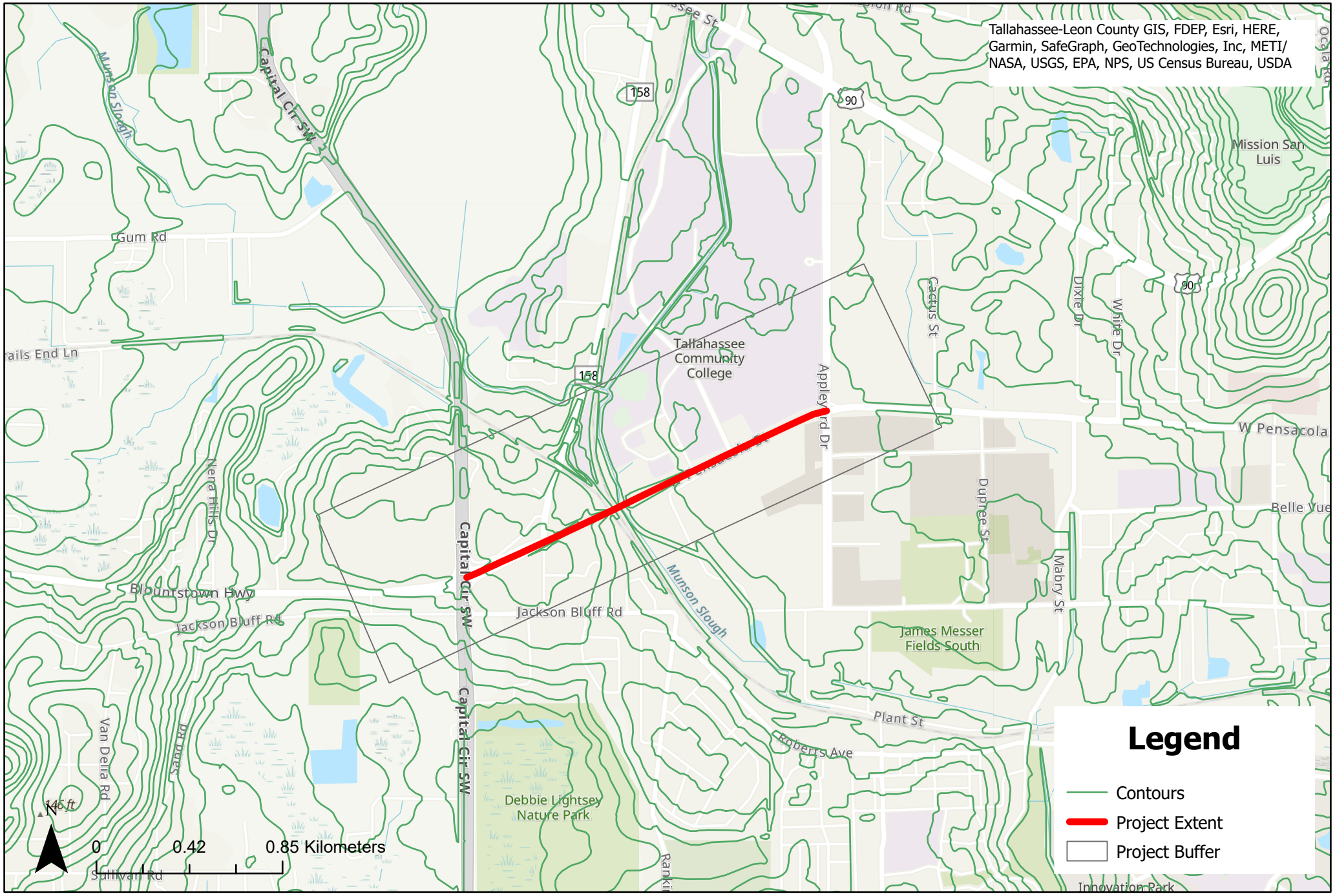
Pensacola Street PD&E

Figure 18: Total Maximum Daily Loads



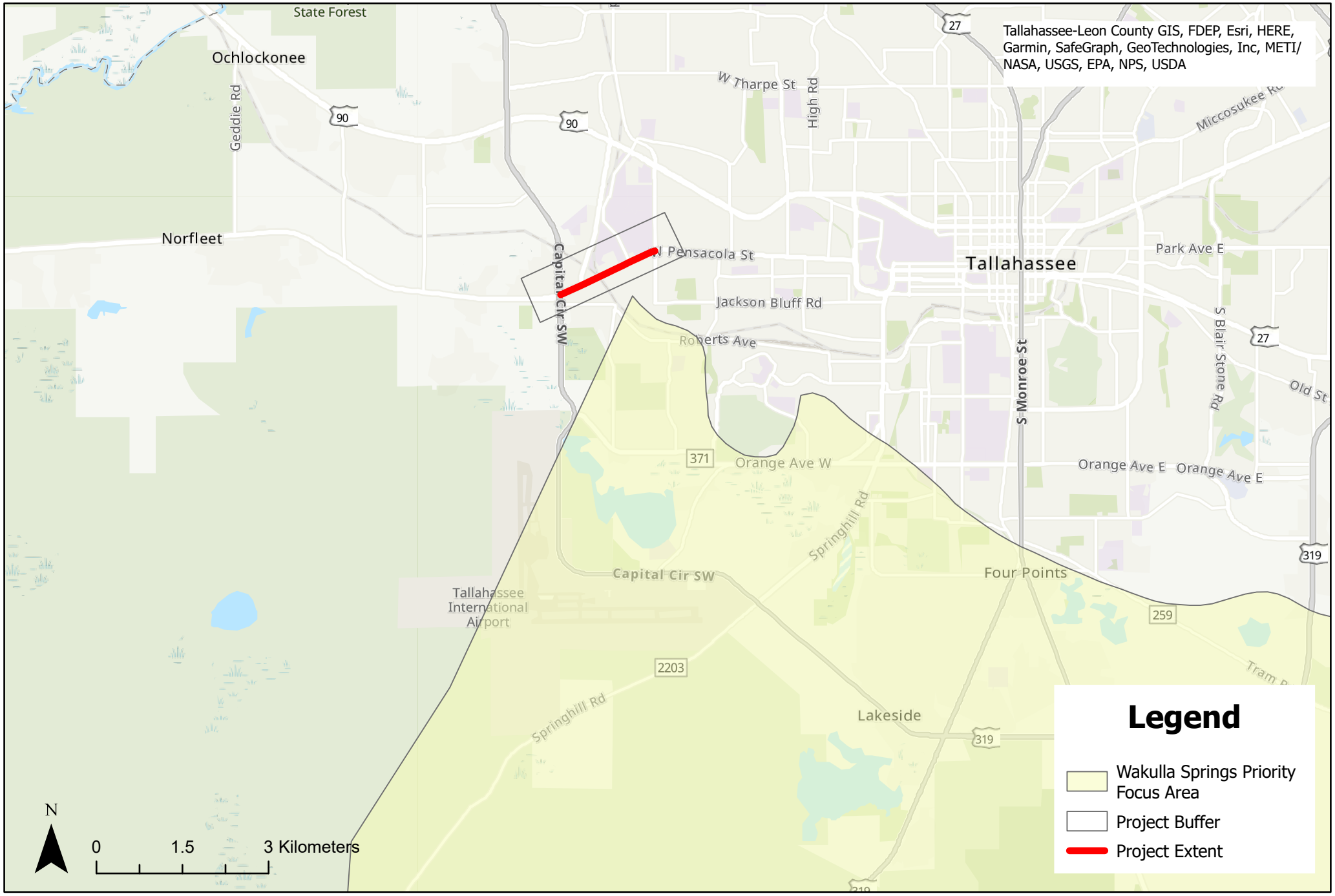
Pensacola Street PD&E

Figure 19: Topographic Map



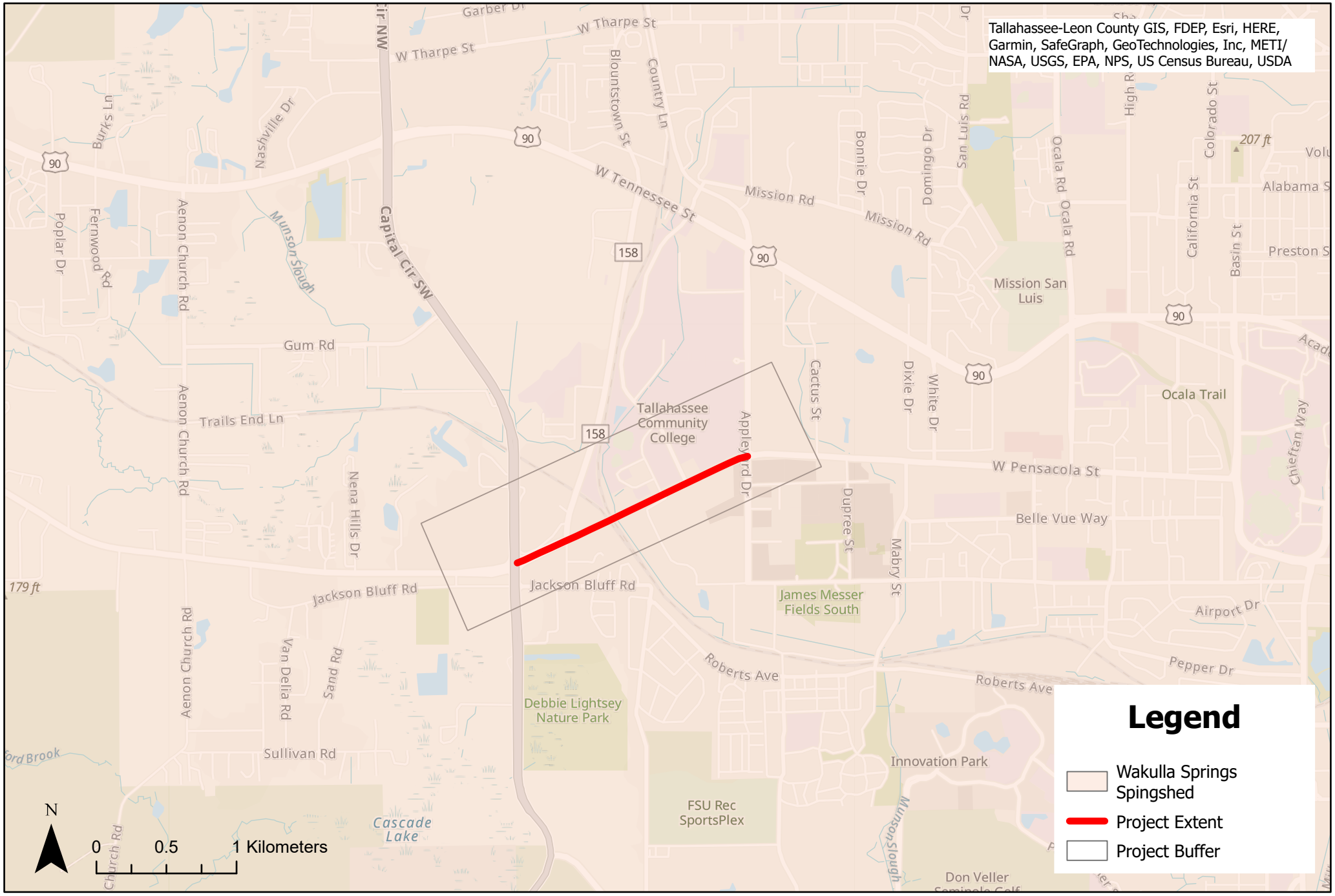
Pensacola Street PD&E

Figure 20: Wakulla Springs Priority Focus Area



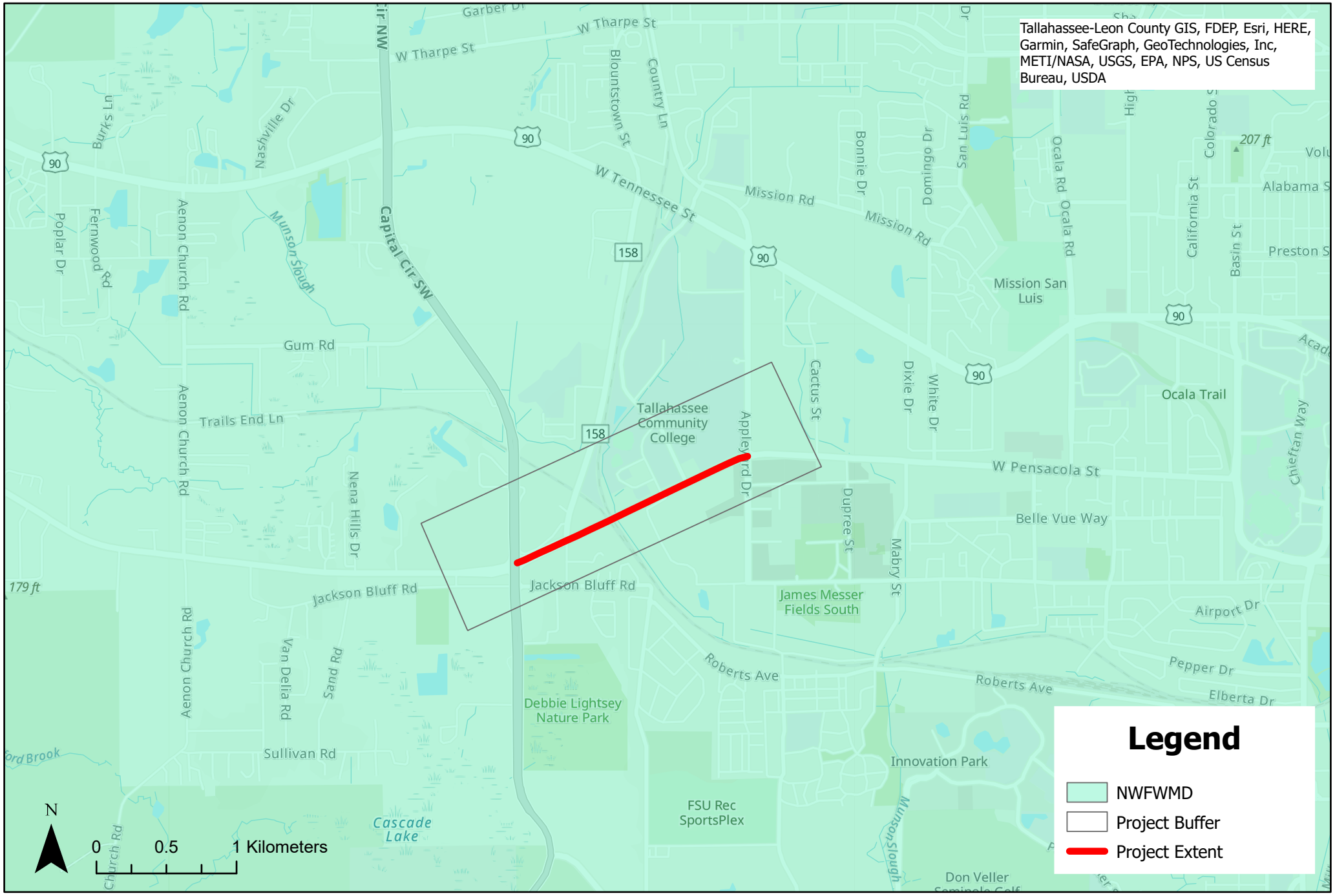
Pensacola Street PD&E

Figure 21: Wakulla Springs Springshed



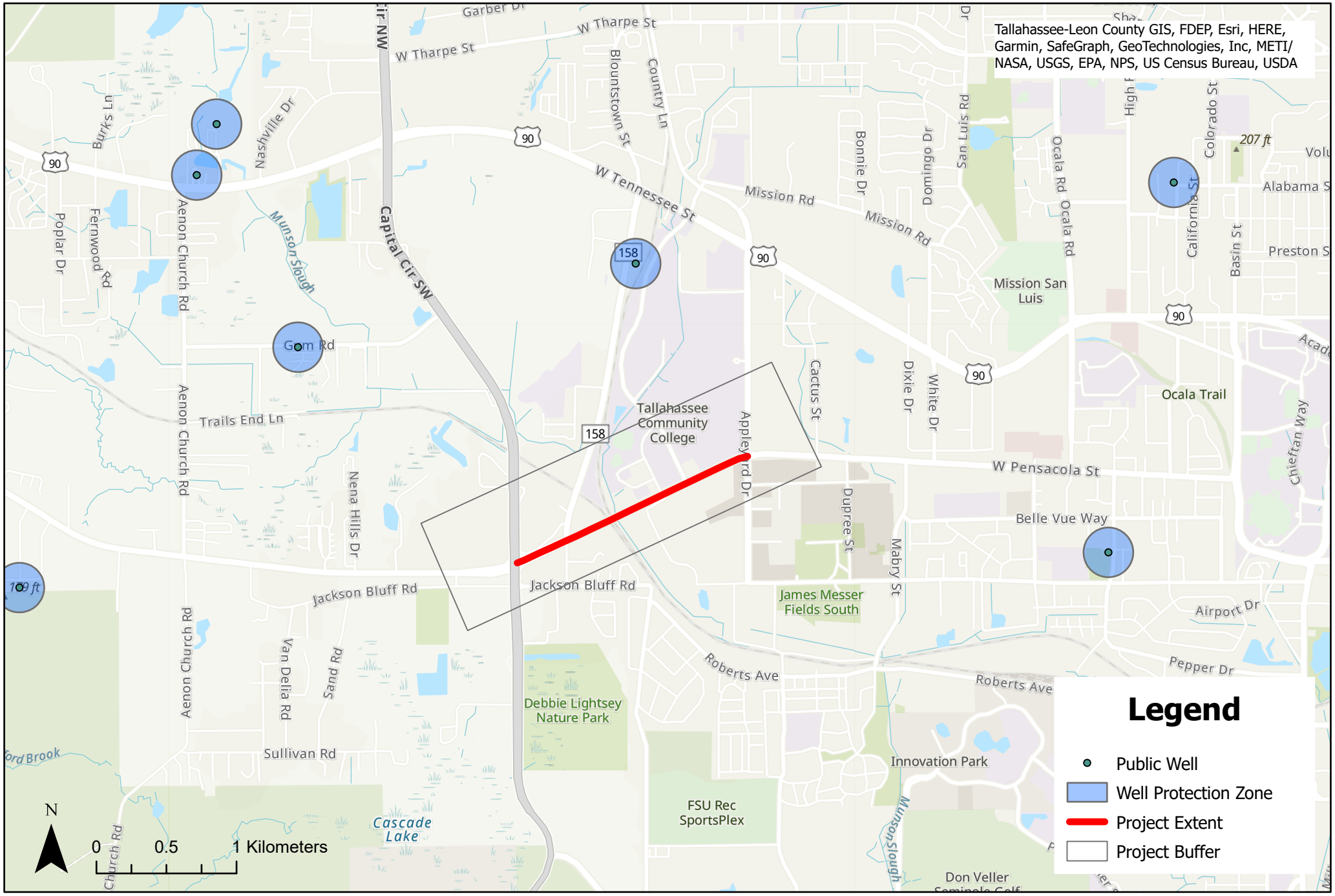
Pensacola Street PD&E

Figure 22: Water Supply Planning Regions



Pensacola Street PD&E

Figure 23: Well Protection Zone Map



WATERSS Coordination and Meeting Minutes



Meeting with City of Tallahassee

Outcome: The result of this meeting was a lead to investigate the Hamilton Industrial Park SWMF as a potential candidate for a regional facility. This is discussed further below under #4.

Teams Meeting, Monday July 24, 2023 2:00-3:00 PM

Attendees: Donald Rogers, Mark Heidecker, Jason Smith, Natalie Zierden, Katey Earp

Project Area: PD&E Study for widening Pensacola Street from 4- to 6-lanes from Capital Circle to Appleyard.

Meeting Notes:

- Mark is working on a Citywide Master Plan for Water Quality;
- Flooding sign at TCC location is likely a remnant sign. The City does have a Capital Improvement Program with a dozen or so problem areas. *Jason will check to see if any of these problem areas align with the project area and look at repetitive flood concerns database.*
- Private pond located just south of the Hamilton Park Drive. Could this pond be expanded to accommodate direct discharge from Pensacola Street, into the ditch, then routed through an expanded pond before discharging back into the ditch. FEMA (through NWFWMD) is updating risk maps for the entire west ditch. *Natalie, Katey & Donald to schedule a future field visit.*
- Could the Nina Pond get deeper? Natalie will look at the design data again.
- Does the City have any needs for stormwater reuse, irrigation, or harvesting. *Jason – not at this time*.
- Does the City have a need for any downstream conveyance improvement? *Jason- nothing beyond general maintenance at this time.*

Leon County Public Works

Outcome: Our team discussed the project with Ms. Anna Padilla with Leon County Public Works. At the time of the meeting, Ms. Padilla was not aware of any water quality or cooperative initiatives that would be mutually beneficial to the County and FDOT.

Teams Meeting, Monday July 7, 2023

Attendees: Anna Padilla, Natalie Zierden, Katey Earp

Project Area: PD&E Study for widening Pensacola Street from 4- to 6-lanes from Capital Circle to Appleyard

FDOT District 3 Maintenance, NPDES Coordination Team

Outcome: Our team followed up with the FDOT Lake Munson water quality data, but according to the City of Tallahassee, the Munson Slough closest to the project location *is* meeting water quality standards and there is not a desire to pursue a water quality project at this location.

Teams Meeting, Monday June 8, 2023; 2:00-3:00 PM

Attendees: Karen Snyder, Natalie Zierden, Katey Earp

Project Area: PD&E Study for widening Pensacola Street from 4- to 6-lanes from Capital Circle to Appleyard.

Meeting Notes:

1. Karen is contracted with FDOT D3 for NPDES in Leon County watersheds under District 3 Maintenance's NPDES Contract.
2. Karen has basic facility inspection forms for the SAMS facilities under their purview. The Leon County stormwater facilities were inspected in 2021 and the next inspections are due in September 2024.
3. This PD&E project discharges to Lake Munson Slough, which is north of Lake Munson.
    a. *Karen, do you have any pollutant loading information for this area?*
    b. Yes, CCSW, Gum Creek. On behalf of D3 Maintenance, RES has been tasked to prepare a pollutant loading analysis for the Leon County Phase I MS4 based on major outfalls. In addition, we have prepared a specific pollutant loading analysis for Lake Munson prioritized WBIDs for the Leon County Phase I MS4 Annual Report. This is currently under review with FDEP as Windle Tharp (D3 NPDES Coordinator) mentioned.
    c. Loadings are per WBID area for TP and BOD. The analysis per Lake Munson WBID 807 and WBID 807D does provide loading for TN, TP, BOD, TSS, Total Cu, and Total Zn. Please note the Lake Munson WBID 807C does not include any FDOT right of way within the WBID.
4. *Natalie to send a project area of our PD&E study.*
5. Natalie, PD&E will look at Nina Pond for possible expansion.

Hamilton Industrial Park Stormwater Management Facility (SWMF)

Outcome: While this site meets pond sizing criteria and is hydraulically feasible, FDOT chose to not move forward with the Hamilton Industrial Park stormwater facility as an option for stormwater treatment and attenuation for the Pensacola Street Widening PD&E project. Due to its private ownership, FDOT is uncertain of the perpetual existence of the entity owning the SWMF as well as the ability to ensure the permitted status of the proposed improvements. FDOT is also not interested in maintaining storage volume allocations and yearly reporting for this facility. For these reasons, this option was removed from the pond siting alternatives evaluation. Please see email documentation.

The information below provides documentation of the WATERSS investigation into the Hamilton Industrial Park stormwater facility.

Field inspection performed on August 2nd, 2023.

Attendees: Donald Rogers, Natalie Zierden, Katey Earp

Parcel search information
Site: Hamilton Park Industrial Park
Managed by: The Williams Group, Tallahassee, FL
Contact: Johanna Money, Property Manager
Email: johanna@williamsgroupcre.com
Phone: (850) 545-1674

Katey Earp (AtkinsRéalis) spoke with Johanna Money, the Williams Group property manager for the Hamilton Industrial Park Complex. Ms. Money sent over the Hamilton Park City of Tallahassee operating permit for the SWMF (EMP#88-0186) and indicated via phone/email that her organization would be willing to discuss a joint-use regional SWMF.

According to the EMP#88-0186 the Hamilton Park property requires 10.57 ac-ft of capacity to meet its permitting requirements with the City of Tallahassee. The drainage easement parcels shown in Figure 2 and Figures 3a and 3b below, total 10.63 acres based on the Leon County Property Appraiser website. Both parcels contain FEMA floodplain and floodways, as shown in Figure 4 below, which would need to be modeled further to understand if the water quality and quantity could be accommodated without negatively impacting the floodplain stages. Further stormwater calculations and floodplain investigations were not completed due to the uncertainty of the management of the joint use pond in perpetuity.

CITY OF TALLAHASSEE
RECEIVED
DEC 1 8 1996
Environmental Services Division

Attachment A

HAMILTON PARK
SWMF Capacity Accounting Record, AMENDED
(Lot #3)

	Parcel	Area ac	Impervious %	Impervious ac	Capacity ac-ft	Const. Impervious %	Const. Impervious ac	Capacity Used ac-ft	Remaining Capacity ac-ft
Lot	1	1.77	75	1.33	0.68	0.00	0.00	0.00	0.68
	2	1.70	75	1.28	0.66	75	1.28	0.66	0.00
	3	***1.70***	***75***	***1.28***	***0.66***	***74.6***	***1.27***	***0.66***	***0.00***
	4	3.00	75	2.25	1.16	0.00	0.00	0.00	1.16
	5	2.26	75	1.70	0.87	0.00	0.00	0.00	0.87
	6	2.26	75	1.70	0.87	0.00	0.00	0.00	0.87
	7	3.08	75	2.31	1.19	0.00	0.00	0.00	1.19
	8	2.33	75	1.75	0.90	0.00	0.00	0.00	0.90
	9	2.17	75	1.63	0.84	0.00	0.00	0.00	0.84
SWM Facilities		10.97	25	2.74	1.42	25	2.74	1.42	0.00
Hamilton Park Dr.		3.14	50	1.57	0.81	45	1.41	0.72	0.09
Jackson Bluff Rd.		1.97	50	0.99	0.51	25	0.49	0.26	0.25
	Totals	36.35	56.40	20.50	10.57	16.29	5.92	3.06	7.51

I hereby certify that the above capacity accounting record, as on file with the City Environmental Services Division's Stormwater Compliance Section, has been updated by me or a project representative under my responsible charge to reflect constructed impervious calculations for Lot #3 based upon the As-Built drawing prepared by Gary G. Allen, P.S.M. and are true and correct to the best of my knowledge, information and belief.

Figure 1: Capacity Accounting Record for Hamilton Park SWMFs (EMP#88-0186)

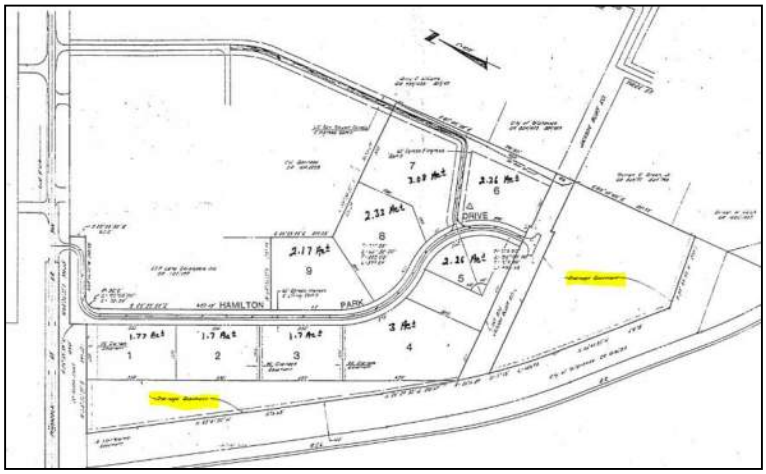
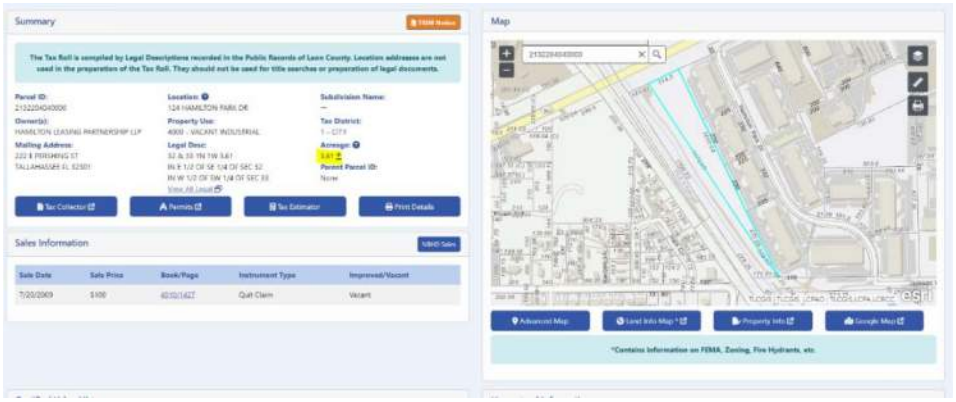
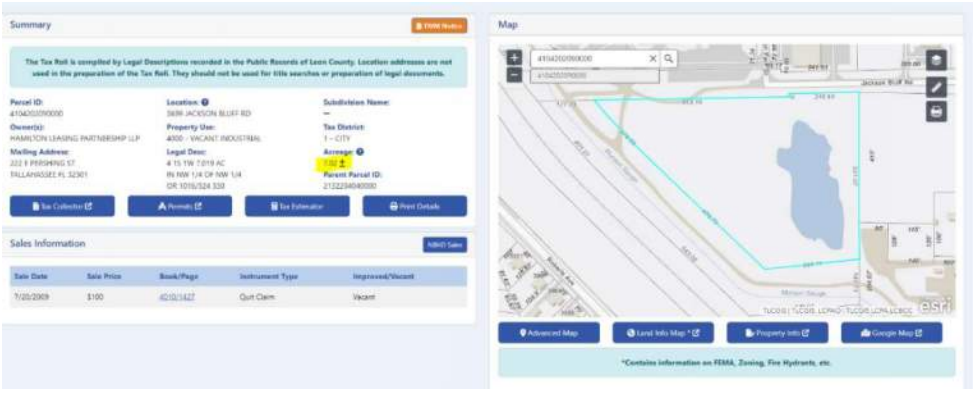


Figure 2: Permit Sitemap of Drainage Easements for Hamilton Park SWMFs (EMP#88-0186)





Figures 3 (a) (b): Hamilton Park parcel sites from the Leon County – Tallahassee GIS Map.



Figure 4: Floodplain and floodway across the parcels for Hamilton Park.

Zierden, Natalie (Betz-Zierden)

From: Rogers, Donald <Donald.Rogers@dot.state.fl.us>
Sent: Tuesday, November 7, 2023 6:13 PM
To: Zierden, Natalie (Betz-Zierden)
Subject: RE: Pensacola St PDE

Categories: External

Yes, your understanding of the Departments decision is correct.

From: Zierden, Natalie (Betz-Zierden) <Natalie.Zierden@kimley-horn.com>
Sent: Tuesday, November 7, 2023 2:26 PM
To: Rogers, Donald <Donald.Rogers@dot.state.fl.us>
Subject: Pensacola St PDE

EXTERNAL SENDER: Use caution with links and attachments.

It is my understanding that the Department is choosing to not move forward at this time with the existing regional facility as an option for stormwater treatment and attenuation for the Pensacola Street Widening PD&E project. Knowing that this is an existing regional facility that is owned by a private entity (Hamilton Leasing Partnership LLC), the Department is uncertain of the perpetual existence of the entity owning the SWMF as well as the ability to ensure the permitted status of the proposed improvements. In addition, the Department is not interested in maintaining storage volume allocations and yearly reporting for this facility. For these reasons, this option will be removed from the alternatives evaluated as we move forward with pond siting initiatives.

Please reply with any comments or concurrence. This email will be added to the drainage report as documentation of the alternatives.

Thanks!

Natalie Betz Zierden, P.E.
Kimley-Horn | 2619 Centennial Boulevard, Suite 200, Tallahassee, FL 32308
Direct: 850 583 5650 | Mobile: 850 559 4095 | www.kimley-horn.com

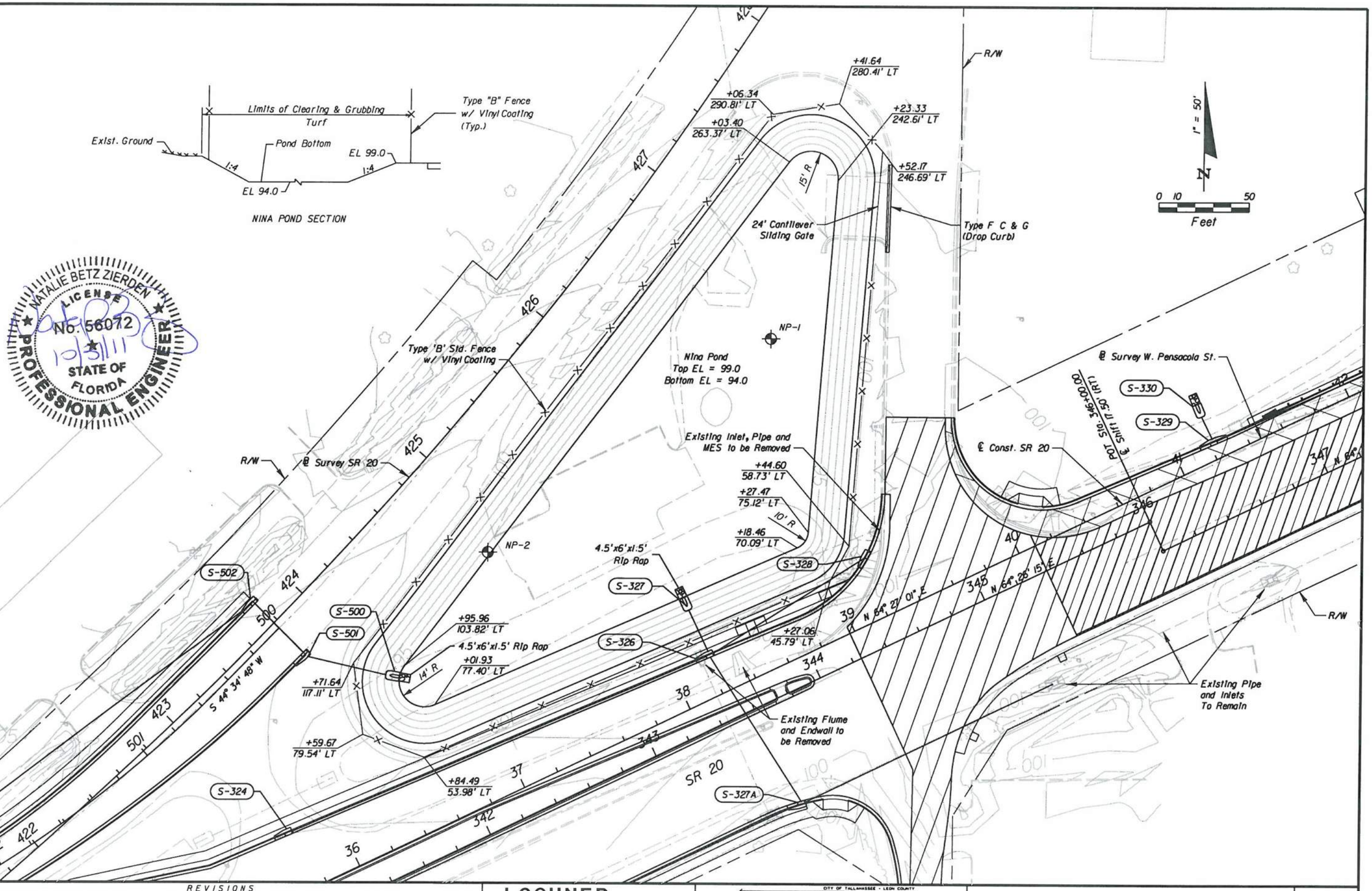
Celebrating 16 years as one of FORTUNE's 100 Best Companies to Work For

APPENDIX D

Volume Calculations and Capacity Accounting

Existing Nina Pond Documentation





NATALIE BETZ ZIERDEN
LICENSE
No. 56072
STATE OF FLORIDA
PROFESSIONAL ENGINEER
10/31/11

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

LOCHNER
2940 EAST PARK AVENUE, SUITE 200
TALLAHASSEE, FLORIDA 32301
FBPR CERTIFICATE OF AUTH. # 894
NATALIE BETZ ZIERDEN, P.E. # 56072

CITY OF TALLAHASSEE • LEON COUNTY
BLUEPRINT 2000 & BEYOND
INTERGOVERNMENTAL AGENCY

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
263	LEON	415782-7-58-01 415782-8-58-01

RETENTION POND
NINA POND

SHEET NO. 349

mwoodard 10/31/2011 2:09:27 PM H:\Projects_V8\800\415782358\01\roadway\rdwydr\planrd126.dgn

TREATMENT VOLUME CALCULATIONS

The treatment volume information is determined in this section. The pond area at certain stages was determined using Microstation. The volumes were determined by using the average end area method between the intermediate stages and summing to get the total volumes.

Table 5-1 Treatment Volume Calculations

Nina Pond	**Stage**	**Area**	**Volume**
Bottom of Pond	94	0.68	0
	95	0.76	0.72
Weir Elevation	95.5	0.80	1.11
Delta Pond	**Stage**	**Area**	**Volume**
Top of Perm Pool	37	7.48	0
Break Elevation	37.5	8.09	3.89
Weir Elevation	38.5	8.74	12.31
Broadmoor Pond	**Stage**	**Area**	**Volume**
Top of Perm Pool	36.4	8.17	0
Break Elevation	36.9	8.59	4.19
Weir Elevation	37.9	8.86	12.90

Gum Road Pond	**Stage**	**Area**	**Volume**
Top of Perm Pool	51.0	0.74	0
Break Elevation	51.5	0.81	0.39
Weir Elevation	52.5	0.87	1.23
Swamp Fox Pond	**Stage**	**Area**	**Volume**
Bottom of Pond	53.5	0.21	0
Weir Elevation	55.5	0.32	0.53

LOCHNER
H.W. LOCHNER, INC.

COMP. BY NBZ
CHK. BY:
DATE: 07/08/11
SHEET NO 1 of 1
JOB NO.: 1800

Subject: SR 263
Volume Required for Nina Pond Treatment

	Area sq ft		CN
pavement	177725		98
grass	64904		45
Pond	47480		100
Total		6.7 Acres	86

Dry detention with filtration (percolation)

V=1.125/12*A

Volume= 0.62 acre-ft.

BluePrint Desired Amount

V=1.5/12*A

Volume= 0.83 acre-ft.

Nina Pond Drainage Areas Capacity Accounting Record				
Parcel ID	Parcel Area (ac.)	Impervious Area (ac.)	Pervious Area (ac.)	Drainage Area (ac.)
21-32-20-431-000-0	6.21	0.01	0.03	0.04
21-32-20-422-000-0	2.59	0.14	0.00	0.14
21-32-20-421-000-0	1.11	0.00	1.11	1.11
21-32-20-417-000-0	0.77	0.70	0.07	0.77
21-32-20-424-000-0	3.13	0.58	0.08	0.66
S.R. 20 R.O.W.		3.74	0.20	3.94
TOTAL		**5.17**	**1.49**	**6.66**

Proposed Nina Pond Modifications



Kimley»Horn

Kimley-Horn & Assoc

COMP. BY: ZTB
CHK. BY: NHL
DATE: 10/23
JOB NO.: 148846003

Project: Pensacola St PD+E District 3 - NINA Pond
Dry Detention Volume

Pond 1B	**- Stage-Storage Table**				
Stage	Area	Area	Inc. Vol.	Sum Vol.	Remarks
(feet)	(sf)	(ac)	(ac-ft)	(ac-ft)	
94.00	29621	0.68	0.00	0.00	Pond Bottom
95.00	33105	0.76	0.72	0.72	
96.00	36590	0.84	0.80	1.52	
97.00	40075	0.92	0.88	2.40	
98.00	43995	1.01	0.96	3.36	
99.00	47480	1.09	1.05	4.41	Pond Berm

Basin 1B	**Post**	**- Calculate Weighted Runoff Coefficient**		
Land Type		Acres +/-	C	Ac * C
Grass		1.76	0.20	0.35
Paved streets and roads		4.63	0.95	4.40
SWMF,Water		1.09	1.00	1.09
Total Ac / Weighted C		**7.48**		**0.78**

Calculate Treatment Volume		
Drainage Area, A	7.48	Acres
Minimum Treatment Volume, V_T = (A * 1.5 in. runoff) / 12 in/ft	0.94	Ac-Ft
Minimum Treatment Volume Elevation =	95.30	
Treatment Volume Elevation, EL_{T1}	95.30	
Provided Treatment Volume =	0.96	Ac-Ft

used as available retention for WQ calcs.

Kimley»Horn

Kimley-Horn and Assoc

COMP. BY:	ZTB
CHK. BY:	NHL
DATE:	10/23
JOB NO.:	148846003

Project: Pensacola St PD+E District 3 - Current NINA Pond

Pre-Post Comparison

Storm Event	**Flow**			
FDOT	Node: Pre (cfs)	Node: Post (cfs)	Pre - Post (cfs)	
002yr-001hr	2.03	0.00	2.03	
002yr-002hr	2.62	0.00	2.62	
002yr-004hr	3.03	0.00	3.03	
002yr-008hr	3.13	0.00	3.13	
002yr-024hr	1.12	0.00	1.12	
005yr-001hr	3.30	0.00	3.30	
005yr-002hr	3.84	0.00	3.84	
005yr-004hr	4.60	0.00	4.60	
005yr-008hr	5.06	0.03	5.03	
005yr-024hr	1.92	0.00	1.92	
010yr-001hr	4.45	0.00	4.45	
010yr-002hr	4.93	0.00	4.93	
010yr-004hr	5.71	0.50	5.21	
010yr-008hr	6.16	1.03	5.13	
010yr-024hr	2.47	0.00	2.47	
025yr-001hr	6.00	0.00	6.00	
025yr-002hr	6.31	0.02	6.29	
025yr-004hr	7.44	2.26	5.18	
025yr-008hr	8.10	2.77	5.33	
025yr-024hr	2.99	0.99	2.00	
100yr-001hr	8.37	0.36	8.01	
100yr-002hr	9.00	2.69	6.31	
100yr-004hr	10.02	4.90	5.12	
100yr-008hr	10.58	5.58	5.00	
100yr-024hr	4.26	2.17	2.09	

Kimley-Horn and Assoc

COMP. BY:	ZTB
CHK. BY:	NHL
DATE:	10/23
JOB NO.:	148846003

Project: Pensacola St PD+E District 3 - Excavated NINA Pond
Pre - Post Comparison

Storm Event	Flow			
FDOT	Node: Pre (cfs)	Node: Post (cfs)	Pre - Post (cfs)	
002yr-001hr	2.03	0.00	2.03	
002yr-002hr	2.62	0.00	2.62	
002yr-004hr	3.03	0.00	3.03	
002yr-008hr	3.13	0.00	3.13	
002yr-024hr	1.12	0.00	1.12	
005yr-001hr	3.30	0.00	3.30	
005yr-002hr	3.84	0.00	3.84	
005yr-004hr	4.60	0.24	4.36	
005yr-008hr	5.06	0.48	4.58	
005yr-024hr	1.92	0.00	1.92	
010yr-001hr	4.45	0.00	4.45	
010yr-002hr	4.93	0.20	4.73	
010yr-004hr	5.71	1.36	4.35	
010yr-008hr	6.16	2.07	4.09	
010yr-024hr	2.47	0.42	2.05	
025yr-001hr	6.00	0.00	6.00	
025yr-002hr	6.31	1.38	4.93	
025yr-004hr	7.44	3.57	3.87	
025yr-008hr	8.10	4.12	3.98	
025yr-024hr	2.99	1.79	1.20	
100yr-001hr	8.37	1.10	7.27	
100yr-002hr	9.00	4.04	4.96	
100yr-004hr	10.02	6.37	3.65	
100yr-008hr	10.58	6.95	3.63	
100yr-024hr	4.26	3.01	1.25	

Excavated Nina Pond Invert Calculation	
Description	Elevation
Existing Nina Pond Bottom	94.00
Inlet Elevation at West End of Bridge	98.53
Pipe Invert Elevation at Bridge	94.2
Distance from Bridge Inlet to Pond Outfall	1000.00
Pipe Invert in at Pond	91.2
Sump Depth at Pond	-2.80

East Basin Pond Sizing



Curve Number and Runoff Volume Calculation (FDOT 100YR/24HR)

Basin Pensacola East:

Pre-Condition Curve Number Calculation

Land Use Description	Soil Map Unit	Hydrologic Group	Area		CN	Product
Impervious Roadway	--	--	3.69	acres	98	361
Sod/Grass	Urban Land	A	6.85	acres	39	267
Additional ROW			0.00	acres	39	0
Pond Site			2.47	acres	39	96
		.	13.00	acres		725

Pre-Condition Composite Curve Number: 55.7

Pre-Condition Runoff Volume Calculation

100-yr/24-hr Rainfall Depth (P) = 13.00 IN
CN = 55.7
Drainage Area (A) = 13.00 AC
Potential maximum retention after runoff begins (S) and S is:
(S) = 1000/CN-10 = 7.94 IN
Runoff Depth (Q) = (P-0.2S)^2/(P+0.8S) = 6.73 IN
Pre-Condition Runoff Volume (V_{PRE}) = A x Q = 7.29 AC-FT

Post-Condition Curve Number Calculation

Land Use Description	Soil Map Unit	Hydrologic Group	Area		CN	Product
Impervious Roadway	--	--	6.21	acres	98	609
Sod/Grass	Urban Land	A	4.32	acres	39	168
		Subtotal:	10.53	acres		
Pond Impervious	--	--	1.21	acres	100	121
Pond Pervious	Urban Land	A	1.26	acres	39	49
		Totals:	13.00	acres		948

Post-Condition Composite Curve Number: 72.9

Post-Condition Runoff Volume Calculation

100-yr/24-hr Rainfall Depth (P) = 13.00 IN
CN = 72.9
Drainage Area (A) = 13.00 AC
Potential maximum retention after runoff begins (S) and S is:
(S) = 1000/CN-10 = 3.72 IN
Runoff Depth (Q) = (P-0.2S)^2/(P+0.8S) = 9.40 IN
Post-Condition Runoff Volume (V_{POST}) = A x Q = 10.19 AC-FT

Required Attenuation Volume = V_{POST} - V_{PRE} = 2.90 AC-FT

Pond 1: Wet Pond

Treatment Volume Calculation

Drainage Area =	13.00	Acres
Treatment Volume Required =	1.0	Inch
Treatment Volume Required =	1.08	Acre-Feet

Pond Size Estimation

Soil Data

NRCS Soils at Pond Site: 49-Urban Land

Average High Water Depth = 5.0 Ft (From Geotechncial Report)

Pond Vertical Constraints		
Roadway Edge of Pavement Low Elevation =	64.0	Feet
Average Existing Ground Elevation at Pond Site =	55.0	Feet
Seasonal High Water Table Elevation at Pond Site =	50.0	Feet
Available Depth for Treatment and Attenuation =	14.0	Feet
Actual Depth of Treatment and Attenuation =	3.0	Feet

Pond Elevations		
Bottom of Treatment Volume Elevation =	54.0	Feet
Top of Treatment Volume Elevation =	54.9	Feet
Top of Attenuation Volume Elevation =	57.0	Feet
Proposed Bottom of Berm Elevation =	58.0	Feet
Proposed Top of Berm Elevation =	59.5	Feet

Pond Size		
Square Dimension at Bottom of Treatment Depth =	230	Feet
Square Dimension at Top of Treatment Depth =	237	Feet
Square Dimension at Top of Attenuation Depth =	254	Feet
Square Dimension Bottom of Berm =	262	Feet
Square dimension at top berm =	292	Feet
Outside pond dimensions (including tie-down) =	328	Feet

Minimum Total Area Required = 2.72 Acres (10% SAFETY FACTOR)

Stage-Storage Calculation

Elevation	Area	Area	Incremental Volume	Total Volume	Total Volume	REMARKS
(ft)	(sf)	(ac)	(cf)	(cf)	(ac-ft)	
54.00	52900	1.21	0	0	0.00	
54.90	56264	1.29	49124	49124	1.13	*Top of TV*
57.00	64516	1.48	126819	175943	4.04	*Top of AV*
58.00	68644	1.58	66580	242523	5.57	*Bottom of Berm*

Required Treatment Volume =	1.08	Acre-Feet	
Provided Treatment Volume =	**1.13**	**Acre-Feet**	✓
Required Attenuation Volume =	2.90	Acre-Feet	
Provided Attenuation Volume =	**2.91**	**Acre-Feet**	✓

Provided N load removed	56.74 kg/yr	125.1 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	6.744 kg/yr	
Total P post load	9.323 kg/yr	
Target P load reduction	80 %	
Target P discharge load	1.865 kg/yr	
Percent P load reduction	84 %	
Provided P discharge load	1.47 kg/yr	3.24 lb/yr
Provided P load removed	7.852 kg/yr	17.315 lb/yr