STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TECHNICAL REPORT COVERSHEET

650-050-38
ENVIRONMENTAL
MANAGEMENT
08/22

PRELIMINARY POND SITING REPORT ADDENDUM

Florida Department of Transportation

District One

SR 29

Limits of Project: from South of CR 846 to SR 29 Bypass Junction

Collier County, Florida

Financial Management Number: 417540-1

ETDM Number: 3752

Date: March 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.

Kenneth D Yinger Date: 2024.03.20 16:21:36-04'00'

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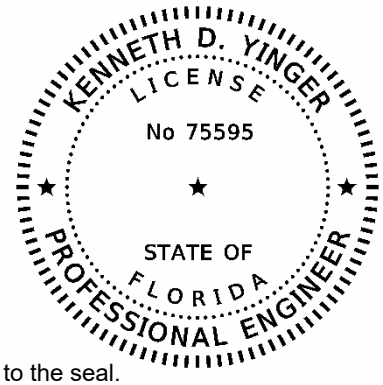

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EXECUTIVE SUMMARY

A Project Development and Environment (PD&E) Public Hearing was held on November 15, 2018, to present the Preferred Alternative and provide the public with the opportunity to review project documents and provide comments. Refinements to the Preferred Alternative have been made to meet the FDOT Design Manual (FDM) requirements and include the identification of stormwater management facilities (SMF), necessary to accommodate stormwater runoff. This Pond Siting Report Addendum supplements the Preliminary Pond Siting Report dated August 2018 and specifically addresses the design refinements for the project.

Refer to **Appendix A** for updated concept plans**.**

The proposed new signalized intersection at CR 846 and the proposed intersection at Gopher Ridge Road have been revised to roundabouts at these locations. The proposed right-of-way (ROW) requirement previously varied from 108 feet to 200 feet and has been increased to varying from 144 feet to 250 feet. The two 11-foot travel lanes in each direction have been increased to 12-foot travel lanes in each direction from CR 846 to Gopher Ridge Road. The 6-foot sidewalk and 7-foot buffered bicycle lanes in each direction have been replaced with 12-foot shared use paths from CR 846 to Gopher Ridge Road. Twelve-foot shared use paths have been added to both sides of the corridor from Gopher Ridge Road to the SR 29 Bypass Junction. As a result of criteria updates, the proposed design speeds, ranging from 45-50 miles per hour (mph), have been updated and range from 45-55 mph. Three SMFs have been identified. The three proposed SMFs will require approximately 22 acres of offsite right-of-way. Stormwater runoff will be conveyed to the proposed SMFs by an open drainage system within the existing mainline right-of-way.

Pond alternatives were selected based on the following characteristics:

- Hydrology
- Hydraulics
- Potential hazardous materials contamination
- Potential wetland impacts and mitigation costs
- Potential impacts to threatened and endangered (T&E) species
- Potential impacts to culturally significant property
- Estimated construction costs
- Estimated right-of-way (R/W) costs

All elevations presented are in the North American Vertical Datum of 1988 (NAVD 88). The conversion from National Geodetic Vertical Datum of 1929 (NGVD 29) to NAVD 88 is (-)1.41 feet, with NAVD 88 being the lower of the two elevations.

Generally, the approach includes reviewing two offsite pond alternatives per stormwater basin. Wet detention offsite stormwater ponds are the selected method of stormwater management for the project. Wet detention was chosen due to the predominantly poorly drained soils and high seasonal high groundwater table. Several meetings with stakeholders were held to evaluate the possibility of regional options. Multiple regional options were explored, however, at this time a regional option is currently not being studied. Further consideration of a regional pond approach will be given during the design phase.

Table ES-1 summarizes the recommended pond alternatives.

Due to the significant impacts associated with the current FEMA maps it was determined that a “cup for cup” approach would not be included for this project. Instead, it was decided that floodplain modeling would be the preferred method for providing a pre- vs post-condition analysis and determining the need for floodplain compensation. A floodplain analysis will be provided during the design phase.

Table ES- 1 - Recommended Pond Alternatives

Basin	SMF Site	Pond Area[1] (ac)	Wetland Mit. Costs	Const. Costs Estimate	R/W Costs Estimate	Total Costs
501	501B	5.55	$18,221	$1,459,110	$220,000	$1,697,331
502	502A	9.72	$14,098	$2,632,770	$350,000	$2,030,858
503	503B	13.00	$0	$3,761,250	$425,000	$3,729,110

1. Pond Area represents the right-of-way needed for proposed ponds, including berms, grading, outfall, etc.

TABLE OF CONTENTS

APPENDICES

1.0 GENERAL INFORMATION

1.1 INTRODUCTION

A Project Development and Environment (PD&E) Public Hearing was held on November 15, 2018, to present the Preferred Alternative and provide the public with the opportunity to review project documents and provide comments. Refinements to the Preferred Alternative have been made to meet the FDOT Design Manual (FDM) requirements and include the identification of stormwater management facilities (SMF), necessary to accommodate stormwater runoff. This Pond Siting Report Addendum supplements the Preliminary Pond Siting Report dated August 2018 and specifically addresses the design refinements for the project.

Refer to **Appendix A** for updated concept plans**.**

The proposed new signalized intersection at CR 846 and the proposed intersection at Gopher Ridge Road have been revised to roundabouts at these locations. The proposed right-of-way (ROW) requirement previously varied from 108 feet to 200 feet and has been increased to varying from 144 feet to 250 feet. The two 11-foot travel lanes in each direction have been increased to 12-foot travel lanes in each direction from CR 846 to Gopher Ridge Road. The 6-foot sidewalk and 7-foot buffered bicycle lanes in each direction have been replaced with 12-foot shared use paths from CR 846 to Gopher Ridge Road. Twelve-foot shared use paths have been added to both sides of the corridor from Gopher Ridge Road to the SR 29 Bypass Junction. As a result of criteria updates, the proposed design speeds, ranging from 45-50 miles per hour (mph), have been updated and range from 45-55 mph. Three SMFs have been identified. The three proposed SMFs will require approximately 22 acres of offsite right-of-way. Stormwater runoff will be conveyed to the proposed SMFs by an open drainage system within the existing mainline right-of-way.

Pond alternatives were selected based on the following characteristics:

- Hydrology
- Hydraulics
- Potential hazardous materials contamination
- Potential wetland impacts and mitigation costs
- Potential impacts to threatened and endangered species
- Potential impacts to culturally significant property
- Estimated construction costs
- Estimated right-of-way (ROW) costs

All elevations presented are in the North American Vertical Datum of 1988 (NAVD 88). The conversion from National Geodetic Vertical Datum of 1929 (NGVD 29) to NAVD 88 is (-)1.41 feet, with NAVD 88 being the lower of the two elevations.

1.2 PROJECT LOCATION AND DESCRIPTION

This project is located in unincorporated Collier County, Florida northeast of the City of Immokalee. It is within Sections 28, 33 and 34, Township 46 S, Range 29 E and Section 3 and 4, Township 47 S, Range 29 E, and has a geographical location of approximately 26°25'50.7"N 81°25'15.1"W. Please refer to **Appendix A** for the project location map

1.3 TYPICAL SECTIONS

From County Road 846 E to Gopher Ridge Road, the proposed new alignment typical section consists of a four-lane divided roadway with 12-foot travel lanes in each direction separated by a 22-foot raised median and 12-foot shared use paths in each direction. A closed drainage system with curb and gutter in this segment will collect stormwater runoff. This typical section will require 144 feet of right-of-way for the roadway, plus right-of-way for stormwater ponds.

From Gopher Ridge Road to the connection back to SR 29, the proposed new alignment typical section consists of a four-lane divided roadway with 12-foot travel lanes in each direction separated by a 30-foot raised median and a 12-foot shared use path in each direction. Roadside ditches will handle stormwater runoff. This typical section will require 200 feet of right-of-way for the roadway, plus right-of-way for stormwater ponds. The intersection of SR 29 and CR 846 is included in FPID 417540-4 and will not be included in this project. Please refer to **Appendix B** for the proposed typical sections.

1.4 SOILS CHARACTERISTICS

Based on a review of the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey of Collier County, Florida, much of the project corridor consists of nearly level, poorly drained soils. Refer to **Appendix A** for a NRCS soil map of the corridor. Generally, the natural Seasonal High Groundwater Table (SHGWT) is at depths of 9 to 18 inches below the natural grade within the project limits. Please refer to **Appendix G** for a NRCS 'depth to water' table exhibit of the corridor.

In addition to reviewing the NRCS information, field geotechnical data were collected for the corridor. SHGWT estimates were collected along the roadway corridor and proposed pond alternatives. In general, the results of the field tests were consistent with NRCS estimates. Refer to **Appendix G** for the roadway and pond SHGWT estimates.

1.5 FLOODPLAIN INFORMATION

The entire project is within the 100-year base floodplain designated as Zone AH, which is the flood insurance rate zone that corresponds to areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from FEMA detailed hydraulic analyses are shown at selected intervals within this zone. The base flood elevation ranges from elevation of 32 feet just north of CR 846 to elevation of 35.0 feet north of Heritage Blvd. According to the Collier County maintenance staff, SR 29 has not experienced any overtopping or flooding problems. Refer to **Appendix A** for the FEMA flood map for the 100-year floodplain boundaries for this project with effective floodplain elevations.

2.0 DRAINAGE RESOURCE INFORMATION

2.1 MEETINGS

There have been multiple meetings during the development of the PSR to aid the selection of pond sites. The meetings have included many stakeholders for the area and address different aspects of the stormwater management approach for the corridor. This project is one single design segment within a string of design segments along SR 29. As such, coordination amongst multiple segments was conducted to develop regional alternatives. Multiple regional options were explored, however, at this time a regional option is currently not being studied. Further consideration of a regional pond approach will be given during the design phase. In addition to corridor meetings several meetings were scheduled with FDOT and local stakeholders to aid in the development of pond site selection. Please refer to **Appendix K** for the meeting minutes.

2.2 RUNOFF CURVE NUMBERS

Runoff curve numbers (CN) were obtained from the FDOT Design Guide, Table B-7, which prescribes recommended CN values based on land use and hydrologic soil group (HSG) from the NRCS soil survey. Where soils with dual classifications (i.e. A/D, B/D) are encountered, HSG D is used in determining a CN value. Composite CN calculations were performed for each pond alternative, within the preliminary pond sizing calculations in **Appendix C**.

2.3 RAINFALL INTENSITY DATA

A rainfall depth of 9.24 inches is used these calculations, based on the 25-year, 3-day rainfall hyetographs found in the Environmental Resources Permit Applicant's Handbook Volume II for use within the Geographic Limits of the South Florida Water Management District.

2.4 RESOURCES FOR ANALYSIS

The resources used for this PSR included the following:

- FDEP Statewide Stormwater Environmental Resource Permit, Applicant's Handbook Vol. I (10/2013)
- FDEP Statewide Stormwater Environmental Resource Permit, Applicant's Handbook Vol. II, SFWMD (10/ 2013)
- NRCS Soil Survey for Collier County (websoilsurvey.nrcs.usda.gov)
- FEMA Flood Insurance Rate Maps
- Straight Line Diagram (SLD) for SR 29 in Collier County, Florida
- FDOT Drainage Manual (2024)
- FDOT Drainage Design Guide (2024)
- Collier County Floodplain Management Plan (2015)
- Stormwater Management Basin Map, Collier County, Florida (June 2015)
- Collier County Surface Water Canal System Facilities Geographic Information Systems Web Map
- Cultural Resource Assessment Survey Addendum (February 2024)
- Contamination Screening Evaluation Report Addendum (March 2024)
- Natural Resource Evaluation (July 2018)
- Natural Resource Evaluation Addendum (September 2021)
- USFWS RAI Response (December 2023)

3.0 EXISTING DRAINAGE CHARACTERISTICS

3.1 EXISTING DRAINAGE CONDITIONS

The topography along SR 29 is relatively flat with elevations ranging from a low of approximately 31.25 feet at the beginning of the study area north of CR 846 to a high of approximately 36 feet in the vicinity of Heritage Blvd. Drainage along the existing corridor is accomplished through the collection and conveyance by open roadside ditches, side drains, and man-made canals. Excess stormwater runoff is drained south to the SR 29 Canal that ultimately flows south to the everglades.

There are four FDEP waterbody identification (WBIDs) numbers within the project area. The project is primarily located in the Immokalee Basin. Please refer to **Table 1** for a list of WBIDs, and **Appendix A** for a map showing the location of each WBID. The existing land-use of the proposed corridor primarily consists of open pasture, woodlands, and agriculture row crops. The area's primary drainage conveyance is via ditch/canal system. The Madison Avenue Ditch is located west of the proposed corridor and drains stormwater runoff to the south, before intersecting the Immokalee Main Canal just south of Gopher Ridge Road. The Immokalee Main Canal continues flowing south until it discharges to a concrete box culvert under the existing SR 29 roadway and eventually discharges into the SR 29 Canal. Please refer to **Appendix A** showing the primary drainage features according to the Collier County Stormwater Management Map.

Table 1 – WBID Basins

WBID Number	WBID Name
3278W	Silver Strand
3278L	Immokalee Basin
3278T	Okaloacoochee Slough
3278E	Cow Slough

A portion of the proposed corridor traverses an area of existing actively managed orange groves. This area has a closed irrigation system and drainage system that considerably alters the natural drainage patterns. However, it was determined that the internal drainage system discharges directly into the Immokalee Main Canal. Therefore, for the purposes of this analysis, no additional attenuation would be considered. For additional delineation of flow patterns within the area please see the Drainage Map included in **Appendix A**.

3.2 SEASONAL HIGH GROUNDWATER TABLE ELEVATIONS

On-site soil borings and the NRCS Soil Survey for Collier County were used in determining the estimated SHGWT depths for each pond alternative. The preliminary pond soils report in **Appendix G** describes these determinations in detail.

3.3 EXISTING STORMWATER MANAGEMENT

This segment of SR 29 traverses vacant open land, wooded, and agricultural land (citrus groves). There are no formal stormwater management facilities associated with the vacant open and wooded land. The citrus groves have been designed to convey runoff into wetlands where stormwater is allowed to reside before being discharged via outfall structures.

4.0 PROPOSED DRAINAGE DESIGN

4.1 STORMWATER MANAGEMENT DESIGN APPROACH

The design assumption is that proposed stormwater will be collected and separated from off-site water and directed to stormwater management facilities. As discussed in **Section 3.1**, much of the existing stormwater runoff outfalls to, and is conveyed by existing man-made ditches and canals. While the project essentially has a single outfall for the entirety of the project, it was necessary for practical purposes to segment the corridor into smaller basins. There are several locations where cross conveyance allows off-site flow to traverse the proposed roadway alignment. It is necessary to maintain these conveyance paths, and as such, they will become an impediment to the infrastructure necessary for the onsite stormwater management system. Therefore, these conveyance paths have been used to establish smaller basins for the purpose of stormwater management. It should also be noted that the proposed project is adjacent to concurrent design segments. Basin limits have been established at both the begin and end project limits to be consistent with the adjacent segments. Please see **Table 2** below for a list of roadway basin delineations and **Appendix A** showing the basin limits on the Drainage Map.

Table 2 – Proposed Roadway Basin Limits

Basin Name	Begin Basin Station	End Basin Station
501	996+50	1039+90
502	1039+90	1082+00
503	1082+00	1135+50

Wet detention offsite stormwater ponds are the selected method of stormwater management for the project. Wet detention was chosen due to the predominantly poorly drained soils and seasonal depths to groundwater ranging from 9 to 18 inches below the existing grade.

Several meetings with stakeholders were held to evaluate the possibility of regional options. Multiple options were explored for the corridor. The meeting notes and exhibits can be found in **Appendix K**. However, at this time a regional option is currently not being studied and any further analysis will be included in the Final PSR if an option is determined to be feasible and needs to be further explored.

4.2 DRAINAGE DESIGN CRITERIA

4.2.1 PRESUMPTIVE WATER QUALITY

The Environmental Resource Permit Applicant's Handbook (AH) Volume II for South Florida Water Management District (SFWMD) and the FDOT Stormwater Management Facility Handbook are the primary guides used for the analysis presented in this PSR. Wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater. Please refer to **Appendix C** for the treatment volume calculations, which are included with the pond sizing calculations.

4.2.2 IMPAIRED WATERBODY RULE

Systems discharging to a waterbody that has been identified as impaired by the Florida Department of Environmental Protection (FDEP) pursuant to 403.067, F.S. shall be designed in accordance with the procedures in Appendix E of the Environmental Resource Permit Applicant's Handbook Volume II for use within the Geographic Limits of the South Florida Water Management District. Chapter 62-303, F.A.C describes impaired water bodies. Water bodies that have been assessed and determined impaired by the FDEP due to pollutant discharges are included on the "Verified List" adopted by FDEP Secretarial Order. The WBID and any respective impairment is summarized in **Table 3**. As noted in **Section 3.1**, the project primarily outfalls to the Immokalee Basin (WBID 3278L) and eventually flows south to Silver Strand (WBID 3278W). Neither WBID is impaired for nutrients. However, during the initial kickoff it was discussed that preliminary nutrient loading calculations would

be analyzed for the preferred alternatives. The intent of the calculations would be to provide a preliminary estimate of any potential additional treatment needed to meet net improvement. Please refer to **Appendix E** for the nutrient loading calculations.

Table 3 – WBID Impairments

WBID Number	WBID Name	Impairment(s)
3278W	Silver Strand	Metals (Iron)
3278L	Immokalee Basin	None
3278T	D Slough	None
3278E	Cow Slough	Bacteria (E. Coli)

4.2.3 WATER QUANTITY

A storm event of a 3-day duration and 25-year return frequency is used to compute off-site discharge rates. Please refer to **Appendix A** for the figure showing the corresponding project location and rainfall depth for the SFWMD. A rainfall depth of 10.15 inches is used in these calculations, based on the 25-year, 3-day storm event. Runoff curve numbers (CN) were obtained from the FDOT Design Guide, Table B-7.

4.2.4 TAILWATER ELEVATIONS

The analysis presented in this PSR evaluates the tailwater from two aspects.

1. Static tailwater – the tailwater elevation that will be sustained following the storm event. The static tailwater elevation will typically be the normal pool elevation of a wetland outfall or the normal water surface elevation in a ditch or riverine outfall. This elevation is used to verify that the proposed control elevation will not be submerged by the tailwater. Static tailwater elevations are provided in **Appendix D**.

2. Peak tailwater – the tailwater elevation that is expected to occur at the time of the peak stage in the pond. The peak tailwater elevation is evaluated in the pond sizing calculations (refer to **Appendix C**) to identify if the weir will be submerged. The estimated friction loss (0.08% head loss assumed) expected to occur within the outfall is added to the peak tailwater elevation and compared to the weir elevation.

Static tailwater elevation determinations are discussed in detail in **Appendix D** and are not presented with the discussion on each basin. The peak tailwater elevation determinations are discussed for each basin in **Sections 4.3.1 through 4.3.3**.

4.2.5 CONTROL ELEVATIONS

For wet detention systems, the establishment of the seasonal high ground water table (SHGWT) elevation helps to establish the control elevation of pond. The treatment pond control elevation is an important factor in establishing the required size of a pond and provides the lower constraint for the water quality and quantity volumes. In addition to establishing the lower design constraint for the pond site, the selected control elevation needs to ensure a positive discharge to the receiving outfall. In general, the approach was to select the lowest obtained SHGWT within the pond site. In some instances, it was necessary to deviate from this value and engineering judgement was used in determining the need to consider a pond liner. Based on experience with the SFWMD, minor deviations from the SHGWT have not been challenged. Refer to pond sizing calculations in **Appendix C** and geotechnical boring data in **Appendix D** for site SHGWT elevations and selected control elevations.

4.2.6 POND CONFIGURATION

Several design assumptions have been applied in accordance with the FDOT Drainage Design Guidelines to aid in the development of preliminary alternatives. The following criteria have been used to ensure an adequate site.

- Maintenance berm:
  - 20 foot width
  - Inside edge of maintenance berm to provide 1 foot of freeboard above DHW
  - Inside radius of 30 foot for maintenance vehicles
- Side Slopes:
  - 1:4 pond side slopes to the bottom
  - 1:4 pond berm tie down slopes
- Pond depth:
  - 6 foot below the control elevation
  - No littoral zone

It is important to note the project is located within five miles of an airport, therefore criteria outlined in the FDOT Drainage Manual Section 5.4.1.5 Aviation should be applied to this project. Criteria includes the need to minimize the wildlife attractant characteristics of the pond. Mitigation techniques typically include hardening and steepening of the side slopes. A conservative approach of maintaining 1:4 pond side slopes was used to develop the pond sites, but this approach will need to be revisited during the design phase of the project.

4.2.7 FLOODPLAIN COMPENSATION

ERP AH Volume II for SFWMD, Section 3.3 states that "no net encroachment into the floodplain, between the average wet season water table and that encompassed by the 100-year event, which will adversely affect the existing rights of others, will be allowed." The entire project is within the 100-year base floodplain designated as Zone AH, which is the flood insurance rate zone that corresponds to areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from detailed hydraulic analyses are shown at selected intervals within this zone.

Due to the significant anticipated impacts associated with the current FEMA maps it was determined that a "cup for cup" approach would not be included for this project. Instead, it was decided that floodplain modeling would be the preferred method for demonstrating no adverse impacts to the existing rights of others and the size and need for floodplain compensation sites. The floodplain analysis will be analyzed during the design phase.

4.3 SMF EVALUATIONS AND RECOMMENDATIONS

This section presents the evaluation results for each basin. All pond alternatives presented in this PSR are hydraulically and cost feasible and are located on separate parcels, and each with sole ownership, where feasible. Generally, the approach includes reviewing two offsite pond alternatives per stormwater basin.

Sections 4.3.1 through 4.3.3 discuss each basin in detail. Each section has a summary table that includes general data about each pond alternative, including location, elevation data, potential environmental impacts, and costs. The preliminary pond sizing calculations (**Appendix C**) and pond alternative maps (**Appendix A**) provide additional details regarding the pond siting and sizing analysis.

Environmental Analyses

Environmental analyses were performed for each pond alternative, including archaeological and historical investigations, preliminary contamination screenings, evaluation of potential impacts to threatened and endangered species, and estimates of potential wetland impacts.

Each alternative was given a high, medium, or low impact level for archaeological, historical, contamination, and

threatened and endangered species. Refer to **Appendix J** for the Cultural Resource Assessment Survey (CRAS) Addendum (February 2024) for the pond sites alternatives. Refer to **Appendix I** for the Contamination Screening Evaluation Report (CSER) Addendum (March 2024) for the pond site alternatives. Refer to **Appendix H** for the Pond Siting Wetland Evaluation memorandum for the pond site alternatives impacts. Instead of a high/medium/low ranking for wetlands and other surface waters, the potential impact area for each pond was quantified and the amount of functional loss units (FLU) estimated. These FLUs were multiplied by a wetland credit cost to determine the total cost of wetland impacts for each pond site alternative. Refer to the original Natural Resource Evaluation (July 2018), Natural Resource Evaluation Addendum (September 2021), and USFWS RAI Response (December 2023) for threatened and endangered species impacts.

Construction Cost Estimates

Construction cost estimates were prepared to estimate the costs that are unique to each alternative. These costs include items such as fencing, sod, inflow/outfall pipes, pipe, pond liners, any additional costs associated with deeper or upsized pipes, and the earthwork required to construct the pond. The unit costs used for the construction cost were based on the latest FDOT 12-month moving area average unit costs for Area 10 (Collier County). Please refer to **Appendix F** for the pond alternatives construction cost estimates.

R/W Cost Estimates

R/W cost estimates were prepared by the Department for each offsite alternative, the summary of which is included with the pond construction costs in **Appendix F**. The R/W costs were prepared according to FDOT cost estimating procedures and consider all easements necessary for the pond.

4.3.1 BASIN 501 POND ALTERNATIVES

Basin 501 includes SR-29 from north of CR-846 (Sta. 996+50.00) to approximately 150 feet south of Gopher Ridge Road (Sta. 1039+90.00). The basin serves 14.35 acres of the proposed roadway R/W. This basin will convey stormwater flow via a closed drainage system. The proposed roadway grade will maintain the minimum longitudinal slope (0.3%) and require various grade breaks to minimize earthwork. The design will create various sag locations within the basin with the general basin sloping to the south. The lowest sag is located at Sta. 1002+50. The pond alternatives for this basin all outfall to the Immokalee Main Canal located west of the proposed roadway.

SMF 501A

SMF 501A is a 3.86-acre wet detention pond located east of SR 29 from approximately Sta. 1006+00 to Sta. 1010+00. The site is located on one parcel owned by Collier County within property maintained by the Immokalee Regional Airport. The average existing ground of the site is at an approximate elevation of 31.00 feet, with an estimated SHGWT elevation of 29.20 feet. The site will outfall to an adjacent outfall ditch for the Immokalee Regional Airport before discharging to the Immokalee Main Canal. The site includes a low ranking for both historical and contamination impacts, archaeological impacts rank as medium, and threatened and endangered species rank as high. There are no wetlands impacts and 0.49 acres of other surface water impacts. The total cost, including construction and mitigation, is approximately $1,550,530. It should be noted that since the development of this project, Collier County is currently developing the site to serve other needs of the County.

SMF 501B

SMF 501B is a 5.55-acre wet detention pond located west of SR 29 from approximately Sta. 1025+00 to Sta. 1037+00. The site is located on two parcels, one owned by Collier County and one owned by the Immokalee Regional Airport. The average existing ground of the site is at an approximate elevation of 34.25 feet, with an estimated SHGWT of elevation 30.00 feet. The control elevation is set 0.5 feet below the site SHGWT. Based on the proximity of the site to Immokalee Main Canal, which serves as the pond outfall, it was determined that the minor lowering of the SHGWT was negligible, and a pond liner would not be considered for this site. The site includes a low ranking for both historical and contamination impacts, archaeological impacts rank as medium, and threatened and endangered species rank as high. There are no wetland impacts and 0.14 acres of other surface water impacts. The total cost, including construction and mitigation, is approximately $1,697,331.

SMF 501C

SMF 501C is a 4.31-acre wet detention pond located east of SR 29 from approximately Sta. 1035+00 to Sta. 1039+00. The site is located within property maintained by the Immokalee Regional Airport. The average existing ground of the site is at an approximate elevation of 32.00 feet, with an estimated SHGWT elevation of 30.70 feet. To ensure the site is hydraulically feasible it is necessary to lower the site SHGWT through the use of a pond liner. The site will outfall to the Immokalee Main Canal. The site includes a low ranking for archaeological, historical and contamination impacts. The threatened and endangered species impacts rank as high. There are 0.20 acres of wetland impacts and 0.01 acres of other surface water impacts. The total cost, including construction and mitigation, is approximately $2,059,927.

Table 4 - Basin 501 Pond Alternatives

	SMF-501A	SMF-501B	SMF-501C
Treatment Method	Wet Detention	Wet Detention	Wet Detention
Pond Area (R/W needed, in ac)	3.86	5.55	4.31
Pond Location (Sta. / Offset)	1006+00 – 1010+00 / RT	1025+00 – 1037+00 / LT	1035+00 – 1039+00 / RT
Estimated Ground Elevation (ft)	31.00	34.25	32.00
Proposed LEOP Elevation (ft)	33.24	33.24	33.24
Estimated SHGWT/Control Elevation (ft)	29.20	30.00	28.70
Estimated DHW (ft)	31.20	31.10	30.50
Treatment Depth (ft)	1.00	0.80	1.00
Archaeological Impacts	Medium	Medium	Low
Historical Impacts	Low	Low	Low
Contamination Impacts	Low	Low	Low
T&E Impacts	High	High	High
Wetland / OSW Impacts (ac)	0.0 / 0.49	0.0 / 0.14	0.20 / 0.01
Wetland Mitigation Costs	$65,170	$18,221	$27,797
Construction Costs Estimate	$1,255,360	$1,459,110	$1,842,130
No. of Impacted Parcels	1 (P)	2 (P)	1 (P)
ROW Costs Estimate	$230,000	$220,000	$190,000
Total Costs	$1,550,530	$1,697,331	$2,059,927
Selection Ranking	3	1	2

RECOMMENDATION: SMF-501B is the recommended alternative for Basin 501 based on the pond location, cost, and environmental impacts. As previously noted, SMF-501A is located within the Immokalee Regional Airport property and is anticipated to be developed by the County.

4.3.2 BASIN 502 POND ALTERNATIVES

Basin 502 includes SR-29 from 150 south of Gopher Ridge Road (Sta. 1039+90.00) to Sta. 1082+00.00. The basin serves 19.33 acres of the proposed roadway R/W. This basin will convey stormwater flow via an open drainage system. The low point within the basin is located at Sta. 1042+40. The pond alternatives from this basin all outfall to the Madison Avenue Ditch located west of the proposed roadway.

SMF 502A

SMF 502A is a 5.58-acre wet detention pond located west of SR 29 from approximately Sta. 1050+00 to Sta. 1062+00. The site is located within a single property currently used for agriculture purposes. The average existing ground of the site is at an approximate elevation of 31.50 feet, with an estimated SHGWT elevation of 30.00 feet. The site will outfall to Madison Avenue Ditch before discharging to the Immokalee Main Canal. The site includes a low ranking for both archaeological and historical impacts, contamination impacts rank as medium, and threatened and endangered species rank as high. There are no wetland impacts and 0.11 acres of other surface water impacts. The total cost, including construction and mitigation, is approximately $2,030,858.

SMF 502B

SMF 502B is a 5.47-acre wet detention pond located west of SR 29 from approximately Sta. 1064+00 to Sta. 1073+00. The site is located within a single property currently used for agriculture purposes. The average existing ground of the site is at an approximate elevation of 32.00 feet, with an estimated SHGWT elevation of 31.00 feet. The control elevation is set 0.5 feet below the site SHGWT. The site will outfall to Madison Avenue Ditch before discharging to the Immokalee Main Canal. The site includes a low ranking for both archaeological and historical impacts, contamination impacts rank as medium, and threatened and endangered species rank as high. There are no wetland impacts and 0.85 acres of other surface water impacts. The total cost, including construction and mitigation, is approximately $2,020,545.

Table 5 - Basin 502 Pond Alternatives

	SMF-502A	SMF-502B
Treatment Method	Wet Detention	Wet Detention
Pond Area (R/W needed, in ac)	5.58	5.47
Pond Location (Sta. / Offset)	1050+00 – 1062+00 / LT	1064+00 – 1073+00 / LT
Estimated Ground Elevation (ft)	31.50	32.00
Proposed LEOP Elevation (ft)	34.71	34.71
Estimated SHGWT/Control Elevation (ft)	30.00	31.00
Estimated DHW (ft)	31.60	32.50
Treatment Depth (ft)	0.70	0.70
Archaeological Impacts	Low	Low
Historical Impacts	Low	Low
Contamination Impacts	Medium	Medium
T&E Impacts	High	High
Wetland / OSW Impacts (ac)	0.0 / 0.11	0.0 / 0.85
Wetland Mitigation Costs	$14,098	$112,385
Construction Costs Estimate	$1,666,760	$1,563,160
No. of Impacted Parcels	1 (P)	1 (P)
ROW Costs Estimate	$350,000	$345,000
Total Costs	$2,030,858	$2,020,545
Selection Ranking	1	2

RECOMMENDATION: SMF 502A is the recommended alternative for Basin 502 based on lower environmental impacts and tailwater elevation when compared to other alternatives.

4.3.3 BASIN 503 POND ALTERNATIVES

Basin 503 includes SR-29 from Sta. 1082+00.00 to Sta. 1135+50.00. The basin serves 24.56 acres of the proposed roadway R/W. This basin will convey stormwater flow via an open drainage system. The low point within the basin is located at Sta. 1121+50. The pond alternatives from this basin all outfall to the Madison Avenue Ditch located west of the proposed roadway.

SMF 503A

SMF 503A is a 6.80-acre wet detention pond located east of SR 29 from approximately Sta. 1083+00 to Sta. 1090+00. The site is located within a single undeveloped parcel. The average existing ground of the site is at an approximate elevation of 33.00 feet, with an estimated SHGWT elevation of 31.80 feet. The site will outfall to Madison Avenue Ditch before discharging to the Immokalee Main Canal. The site includes a low ranking for historical, archaeological, and contamination impacts. The threatened and endangered species impacts rank as high. There are 1.36 acres of wetland impacts and no other surface water impacts. The total cost, including construction and mitigation, is approximately $3,026,708.

SMF 503B

SMF 503A is a 11.11-acre wet detention pond comprised of two cells in anticipation of future roadway connectivity located west of SR 29 from approximately Sta. 1082+00 to Sta. 1105+00. The site is located within a single undeveloped parcel. The average existing ground of the site is at an approximate elevation of 34.00 feet, with an estimated SHGWT elevation of 32.00 feet. The site will outfall to Madison Avenue Ditch before discharging to the Immokalee Main Canal. The site includes a low ranking for historical, archaeological, and contamination impacts. The threatened and endangered species impacts rank as high. There are wetlands or other surface water impacts. The total cost, including construction and mitigation, is approximately $3,729,110.

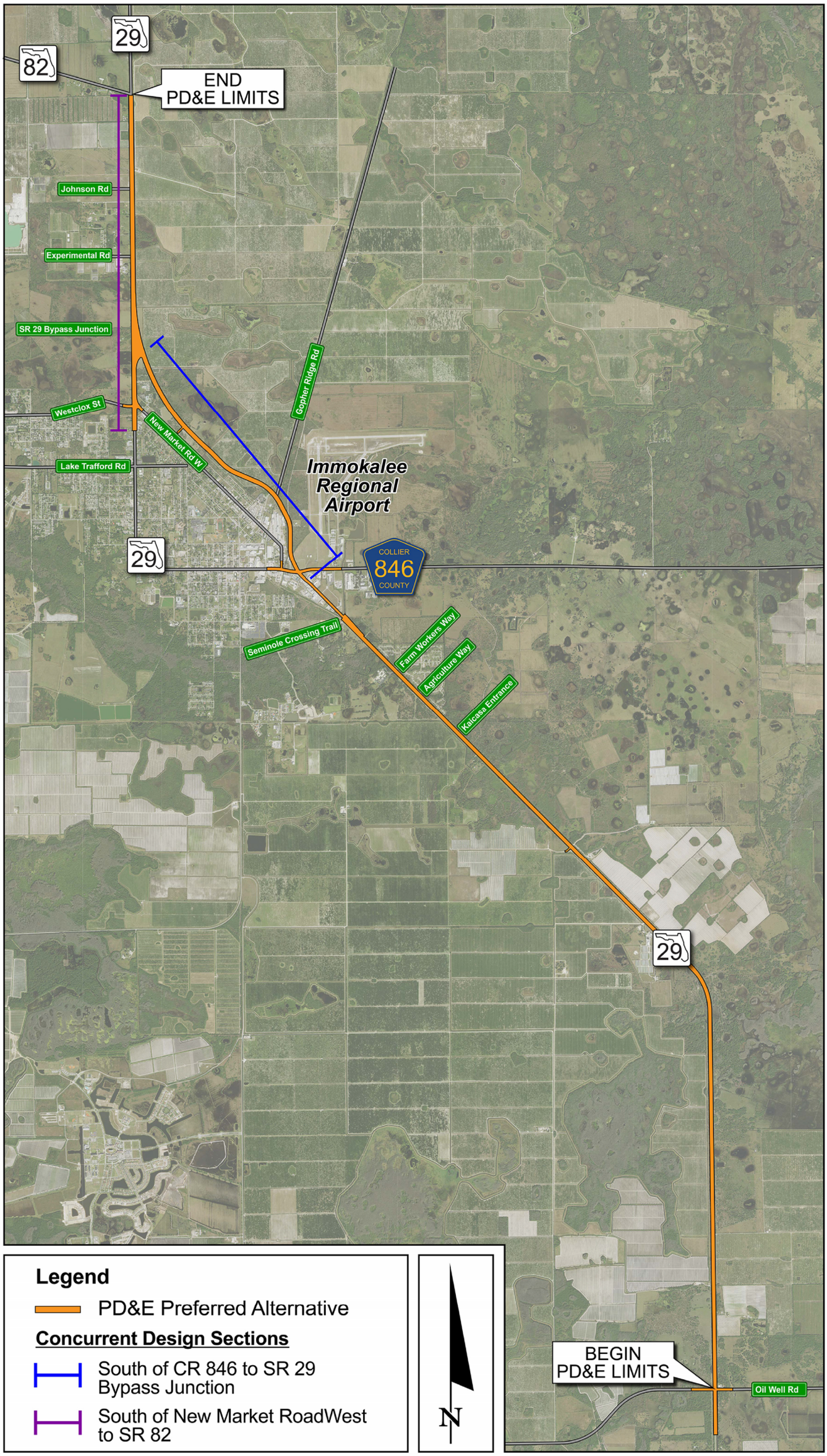
Table 6 - Basin 503 Pond Alternatives

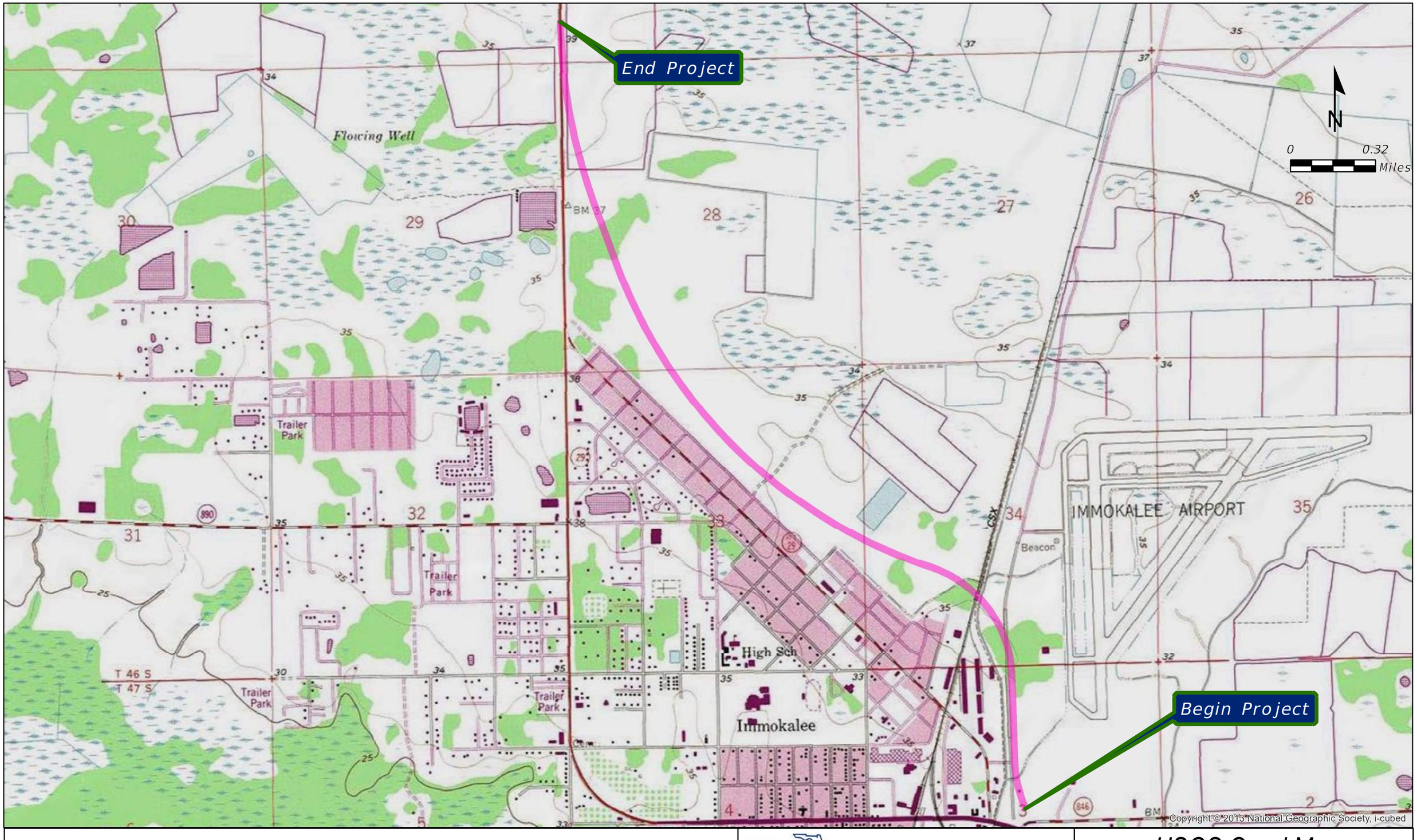
	SMF-503A	SMF-503B
Treatment Method	Wet Detention	Wet Detention
Pond Area (R/W needed, in ac)	6.80	11.11
Pond Location (Sta. / Offset)	1083+00 – 1090+00 / RT	1082+00 – 1105+00 / LT
Estimated Ground Elevation (ft)	33.00	34.00
Proposed LEOP Elevation (ft)	36.22	36.22
Estimated SHGWT/Control Elevation (ft)	31.80	32.00
Estimated DHW (ft)	33.55	34.00
Treatment Depth (ft)	0.60	0.60
Archaeological Impacts	Low	Low
Historical Impacts	Low	Low
Contamination Impacts	Low	Low
T&E Impacts	High	High
Wetland / OSW Impacts (ac)	1.36 / 0.0	0.0 / 0.0
Wetland Mitigation Costs	$180,348	$0
Construction Costs Estimate	$2,561,360	$3,304,110
No. of Impacted Parcels	1 (P)	1 (P)
ROW Costs Estimate	$285,000	$425,000
Total Costs	$3,026,708	$3,729,110
Selection Ranking	2	1

RECOMMENDATION: SMF 503B is the recommended alternative for Basin 503 based on lower environmental impacts.

Appendix A

Exhibits


29
82
END
PD&E LIMITS
Johnson Rd
Experimental Rd
SR 29 Bypass Junction
Westclox St
New Market Rd W
Lake Trafford Rd
Gopher Ridge Rd
Immokalee
Regional
Airport
29
COLLIER
846
COUNTY
Seminole Crossing Trail
Farm Workers Way
Agriculture Way
Kaicasa Entrance
29
BEGIN
PD&E LIMITS
Oil Well Rd
Legend
PD&E Preferred Alternative
Concurrent Design Sections
South of CR 846 to SR 29
Bypass Junction
South of New Market RoadWest
to SR 82
N



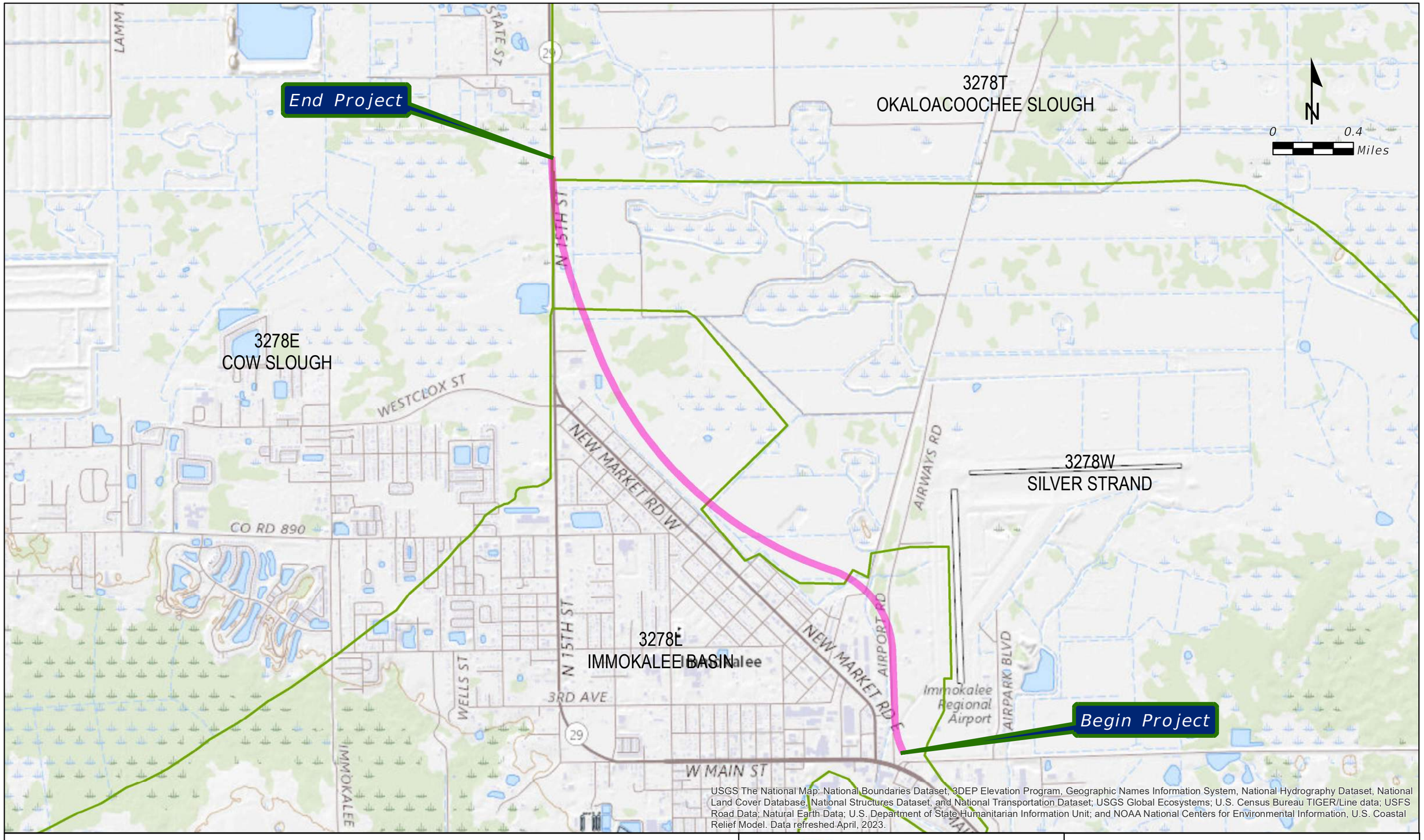
FDOT

USGS Quad Map

SR 29 - From CR 846 to N. of New Market Rd. W.

FPID: 417540-5-52-01

Date: 2/8/2024



FDOT

WBID Map

SR 29 - From CR 846 to N. of New Market Rd. W.

FPID: 417540-1-52-01 *Date: 2/8/2024*

NOTES TO USERS

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

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

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

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

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

The **projection** used in the preparation of this map was Florida State Plane east zone (FIPSZONE 0901). The **horizontal datum** was NAD 83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

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

Base map information shown on this FIRM was derived from multiple sources. This information was compiled from Collier County Government (2003, 2008, 2009), U.S. Bureau of Land Management (2005), 3001, Inc. (2004), NOAA/National Geodetic Survey (2008), and U.S. Geological Survey (2009) at a scale of 1:24,000.

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

Contact the **FEMA Map Information eXchange** at **1-877-FEMA MAP** (1-877-336-2627) for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/

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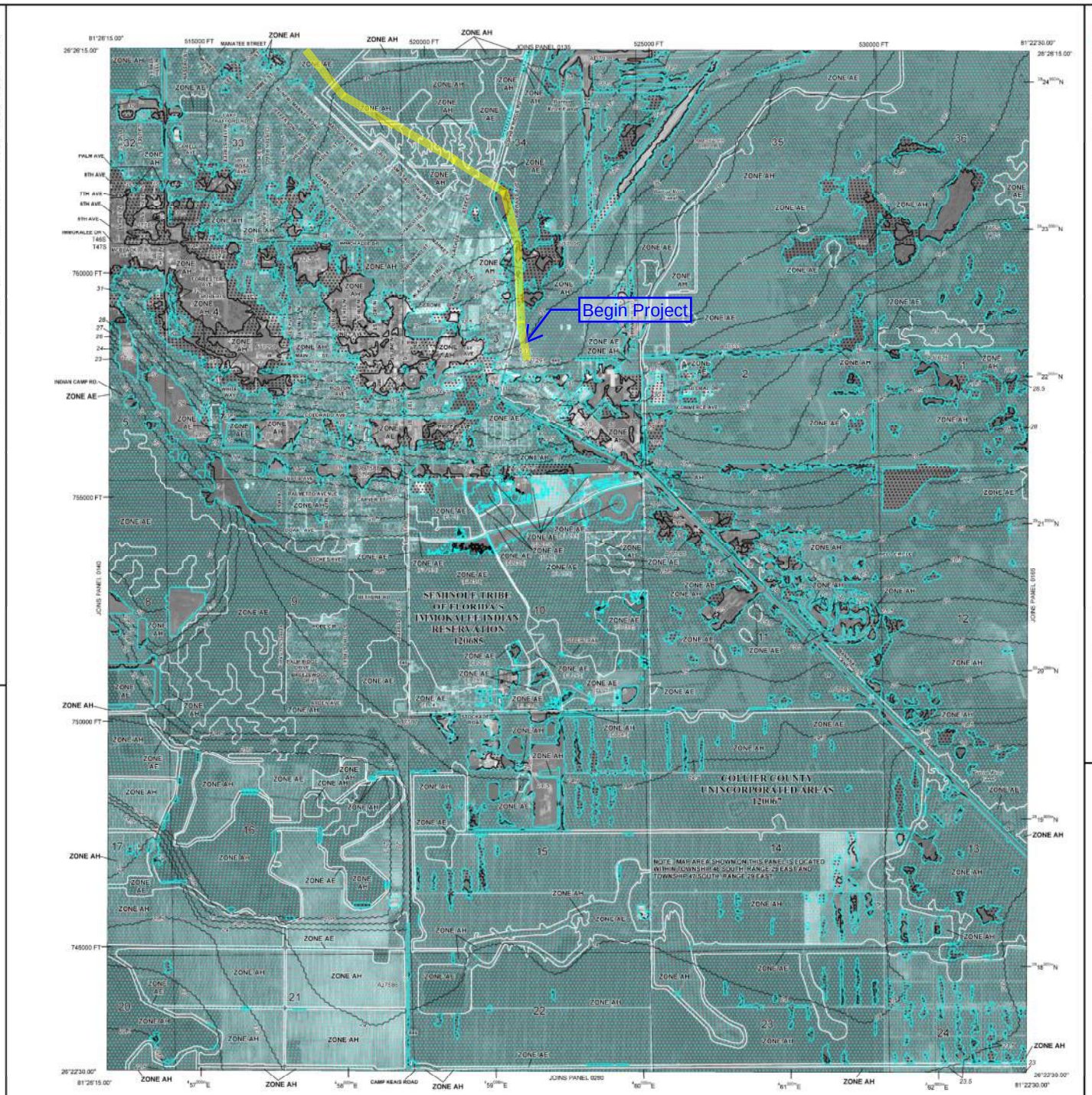

LEGEND

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

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

ZONE A No Base Flood Elevations determined.

ZONE AE, AE Base Flood Elevations determined.

ZONE AH, AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 Base Flood Elevation line and value; elevation in feet*
(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A Cross section line
23 — 23 Transect line
97°07'30" 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4277000mN 1000-meter Universal Transverse Mercator grid values, zone 17
6000000 FT 5000-foot grid values: Florida State Plane coordinate system, east zone (FIPSZONE 0901),Lambert Conformal Conic projection
DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 River Mile

MAP REPOSITORY
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
November 17, 2005

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
May 16, 2012 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to update roads and road names, to update the effects of wave action, to reflect revised shoreline, to reflect updated topographic information, and to modify Coastal Barrier Resources Areas and Otherwise Protected Areas.

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

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

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0145H

FIRM
FLOOD INSURANCE RATE MAP
COLLIER COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 145 OF 1225
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLLIER COUNTY	120067	0145	H
SEMINOLE TRIBE OF FLORIDA	120685	0145	H

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

MAP NUMBER
12021C0145H

MAP REVISED
MAY 16, 2012

Federal Emergency Management Agency

NOTES TO USERS

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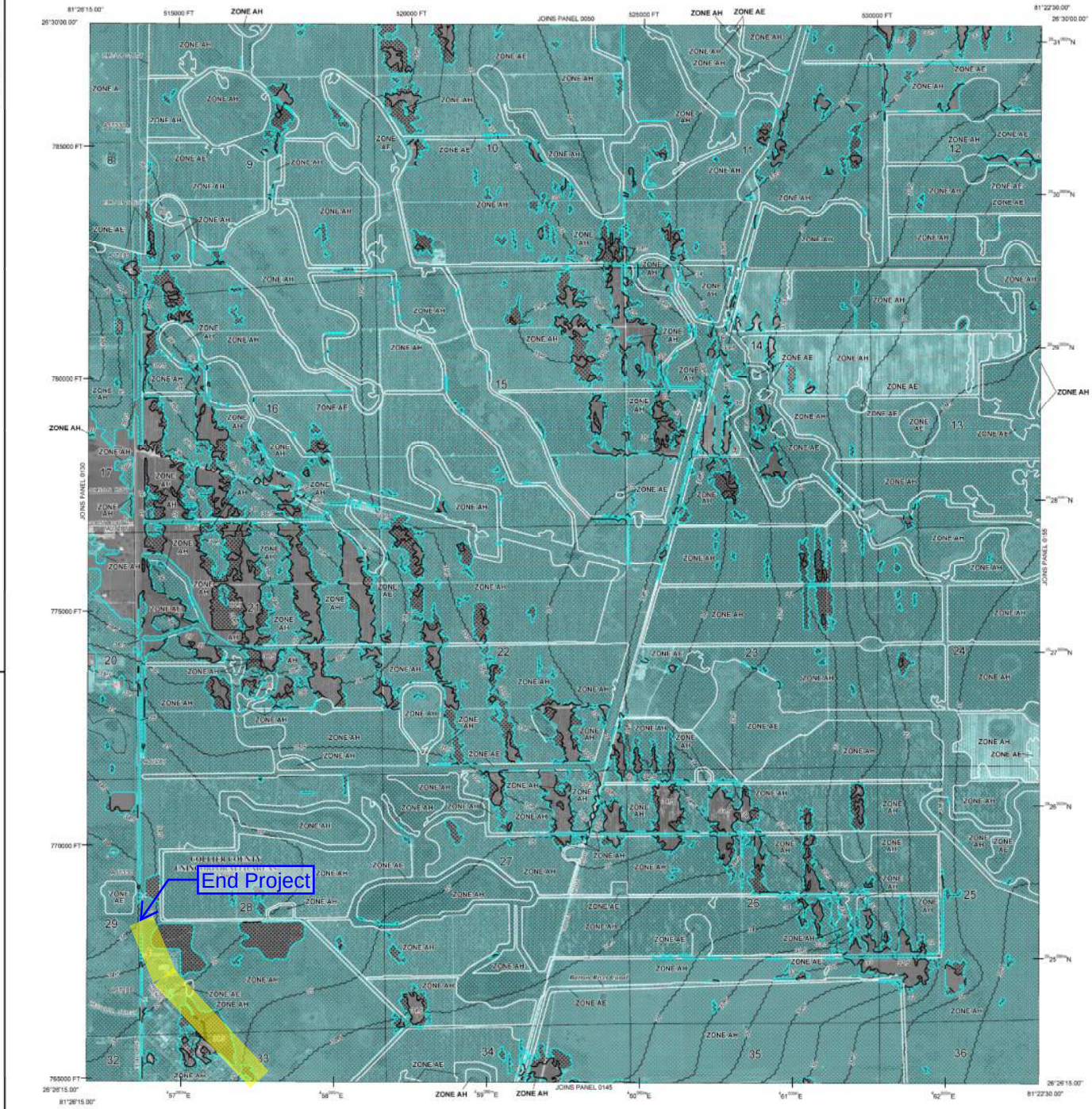

LEGEND

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ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

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0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 Base Flood Elevation line and value; elevation in feet*
(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

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DX5510 Bench mark (see explanation in footer to Users section of this FIRM panel)
M1.5 River Mile

MAP REPOSITORY
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
November 17, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
May 16, 2012 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to update roads and road names, to update the effects of wave action, to reflect revised shoreline, to reflect updated topographic information, and to modify Coastal Barrier Resources Areas and Otherwise Protected Areas.

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MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0135H

FIRM
FLOOD INSURANCE RATE MAP
COLLIER COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 135 OF 1225
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLLIER COUNTY	120067	0135	H

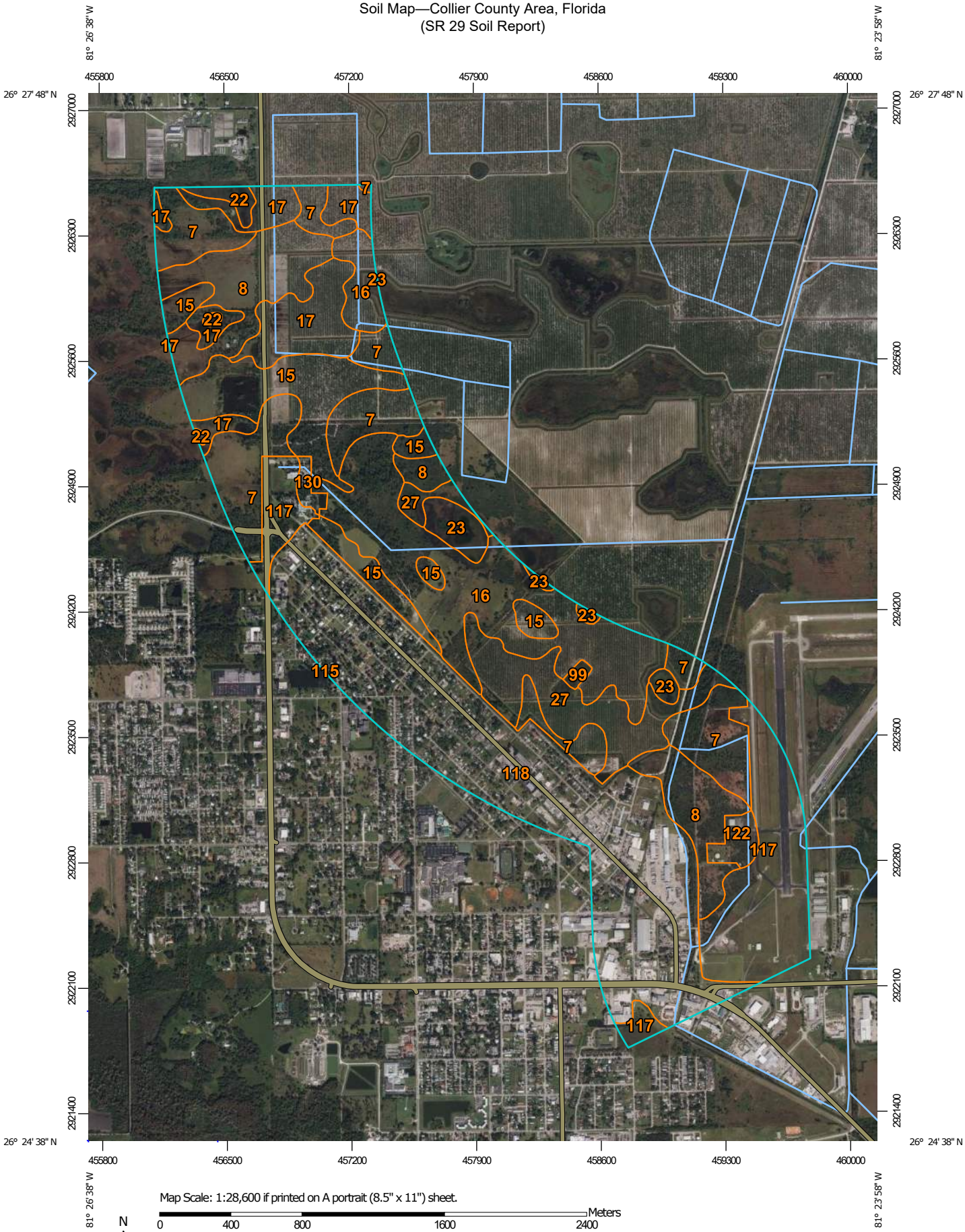
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12021C0135H

MAP REVISED
MAY 16, 2012

Federal Emergency Management Agency

Soil Map—Collier County Area, Florida
(SR 29 Soil Report)



Map Scale: 1:28,600 if printed on A portrait (8.5" x 11") sheet.

N

0 400 800 1600 2400 Meters

0 1000 2000 4000 6000 Feet

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Collier County Area, Florida
Survey Area Data: Version 17, Aug 28, 2023

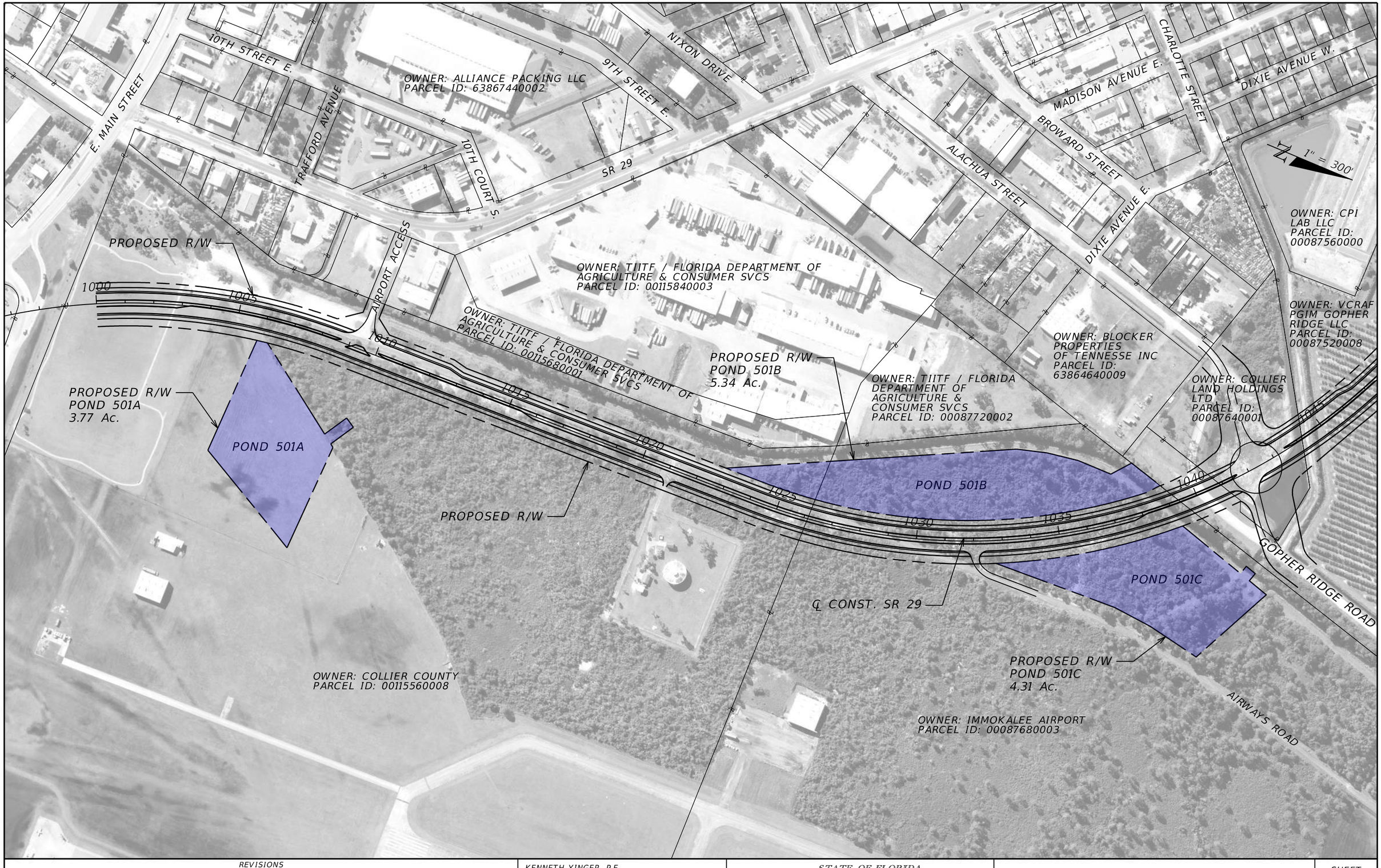
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 14, 2021—Nov 23, 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
7	Immokalee fine sand, 0 to 2 percent slopes	224.7	13.3%
8	Myakka fine sand, 0 to 2 percent slopes	157.9	9.3%
15	Pomello fine sand, 0 to 2 percent slopes	145.0	8.6%
16	Oldsmar fine sand, 0 to 2 percent slopes	242.1	14.3%
17	Basinger fine sand, 0 to 2 percent slopes	111.8	6.6%
22	Chobee, Winder, Gator soils, frequently ponded, 0 to 1 percent slopes	11.6	0.7%
23	Holopaw-Okeelanta, frequently ponded, assocaition, 0 to 1 percent slopes	29.5	1.7%
27	Holopaw fine sand, 0 to 2 percent slopes	105.9	6.2%
99	Water	3.4	0.2%
115	Holopaw-Basinger-Urban land complex, 0 to 2 perent slopes	0.1	0.0%
117	Immokalee fine sand-Urban land complex, 0 to 2 percent slopes	176.9	10.4%
118	Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes	463.4	27.4%
122	Myakka fine sand-Urban land complex, 0 to 2 percent slopes	15.0	0.9%
130	Pomello fine sand-Urban land complex, 0 to 2 percent slopes	7.1	0.4%
Totals for Area of Interest		**1,694.4**	**100.0%**



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

KENNETH YINGER, P.E.
P.E. LICENSE NUMBER 75595
PATEL, GREENE & ASSOCIATES, LLC
12570 TELECOM DRIVE
TEMPLE TERRACE, FL 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-01

POND 501 EXHIBIT

SHEET NO.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

KENNETH YINGER, P.E.
P.E. LICENSE NUMBER 75595
PATEL, GREENE & ASSOCIATES, LLC
12570 TELECOM DRIVE
TEMPLE TERRACE, FL 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-01

POND 502 EXHIBIT

SHEET NO.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

JEFFERSON AVENUE W.

GLADES STREET

HENDRY STREET

INDIAN RIVER STREET

JACKSON STREET

KISSIMMEE STREET

SR 29

LEE STREET

MANATEE STREET

NASSAU STREET

OKEECHOBEE STREET

MADISON AVENUE E.

OWNER: COLLIER LAND HOLDINGS LTD
PARCEL ID: 00087480009

OWNER: COLLIER LAND HOLDINGS LTD
PARCEL ID: 00087480009

OWNER: VCRAF PGIM GOPHER RIDGE LLC
PARCEL ID: 00087440007

POND 503B

PROPOSED R/W

1070 1075 1080 1085 1090 1095 1100 1105 1110 1115

PROPOSED R/W
POND 503B
11.11 Ac.

1" = 300'

℄ CONST. SR 29

POND 503A

PROPOSED R/W

PROPOSED R/W
POND 503A
6.80 Ac.

OWNER: VCRAF PGIM GOPHER RIDGE LLC
PARCEL ID: 00087440007

OWNER: CDC LAND INVESTMENTS INC
PARCEL ID: 00083000001

OWNER: CDC LAND INVESTMENTS INC
PARCEL ID: 00068640004

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

KENNETH YINGER, P.E.
P.E. LICENSE NUMBER 75595
PATEL, GREENE & ASSOCIATES, LLC
12570 TELECOM DRIVE
TEMPLE TERRACE, FL 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-01

POND 503 EXHIBIT

SHEET NO.

STRUCTURE NO.	DESIGN FLOOD 2% PROB. 50-YR FREQ.		BASE FLOOD 1% PROB. 100-YR FREQ.		GREATEST FLOOD 0.2% PROB. 500-YR FREQ.		OVERTOPPING FLOOD		
	DISCHARGE	STAGE	DISCHARGE	STAGE	DISCHARGE	STAGE	DISCHARGE	STAGE	FREQUENCY
CD-1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
CD-2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
CD-3	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
CD-4	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

1"=500'

DATUM: NAVD 88

1. PIPE END
   INV (15" RCP) = 29.57
2. PIPE END
   INV (15" RCP) = 28.88
3. ENDWALL
   N INV (30" RCP) = 26.01
   S INV (30" RCP) = 26.11
4. ENDWALL
   N INV (30" RCP) = 26.51
   S INV (30" RCP) = 26.64
5. ENDWALL
   W INV (60" CMP) = 23.77
   E INV (60" CMP) = 23.85
6. ENDWALL
   W INV (60" CMP) = 24.59
   E INV (60" CMP) = 24.53
7. SIDEDRAIN (12"x18" RCP)
   N INV = 32.89
   S INV = 32.88
8. PIPE ENDS (3 PIPES)
   N INV (72" CMP) = 25.17
   CENTER INV (48" CMP) = 24.49
   S INV (48" CMP) = 23.91
9. PIPE ENDS (3 PIPES)
   N INV (72" CMP) = 25.24
   CENTER INV (48" CMP) = 25.00
   S INV (48" CMP) = 24.19
10. PIPE (15" CMP)
    N INV = 25.07
    S INV = 25.60
11. ENDWALL
    INV (24" CMP) = 26.91
12. SIDEDRAIN (15" RCP/CMP)
    SW INV = 28.57
    NE INV = 28.05
13. SIDEDRAIN (18" RCP)
    SW INV = 27.11
    NE INV = 27.85
14. SIDEDRAIN (36" CMP)
    SW INV = 28.52
    NE INV = 27.09
15. SIDEDRAIN (36" CMP)
    SW INV = 26.95
    NE INV = 27.62
16. SIDEDRAIN (36" CMP)
    SW INV = 27.40
    NE INV = 27.19
17. SIDEDRAIN (15" RCP)
    NW INV = 29.59
    SE INV = 29.83
18. ENDWALL
    INV (36" CMP) = 29.00
19. PIPE END
    INV (36" CMP) = 28.80
20. ENDWALL
    INV (24" CMP) = 29.37
21. PIPE END
    INV (24" CMP) = 29.18
22. PIPE (15" PVC)
    NE INV = 27.65
    SW INV = 27.54
23. SIDEDRAIN (15" CMP)
    NW INV = 30.11
    SE INV = 30.12
24. SIDEDRAIN (15" CPP)
    NW INV = 30.12
    SE INV = 30.00
25. SIDEDRAIN (15" CMP)
    NW INV = 30.32
    SE INV = 30.31
26. SIDEDRAIN (18" CMP)
    NW INV = 30.66
    SE INV = 30.46
27. SIDEDRAIN (12" DIP)
    NW INV = 31.33
    SE INV = 31.38
28. SIDEDRAIN (18" CMP)
    NW INV = 30.86
    SE INV = 30.84
29. SIDEDRAIN (18" CMP)
    NW INV = 31.03
    SE INV = 30.95
30. SIDEDRAIN (18" CMP)
    NW INV = 31.35
    SE INV = 31.39
31. PIPE END
    INV (15" CMP) = 31.38
32. INLET
    NW INV (15" CMP) = 31.56
    SE INV (15" CMP) = 31.45
33. PIPE END
    INV (15" CMP) = 31.78
34. SIDEDRAIN (15" CMP)
    NW INV = 31.80
    SE INV = 31.93
35. SIDEDRAIN (18" RCP)
    NW INV = 31.95
    SE INV = 31.88
36. SIDEDRAIN (15" CMP)
    NW INV = 32.12
    SE INV = 32.26
37. ENDWALL
    INV (29"x45" RCP) = 28.60
38. ENDWALL
    INV (29"x45" RCP) = 28.52
39. SIDEDRAIN (12" DIP)
    NW INV = 31.99
    SE INV = 30.28
40. SIDEDRAIN (12" DIP)
    NW INV = 31.99
    SE INV = 32.02
41. SIDEDRAIN (15" CMP)
    NW INV = 32.45
    SE INV = 32.39
42. SIDEDRAIN (15" CMP)
    NW INV = 33.02
    SE INV = 32.95
43. INLET
    GRATE EL = 34.80
    NE INV (24" CMP) = 30.13
    SW INV (24" CMP) = 30.15
44. PIPE END
    INV (24" CMP) = 29.93
45. SIDEDRAIN (15" CMP)
    NW INV = 33.98
    SE INV = 33.91
46. SIDEDRAIN (12" RCP)
    NW INV = 33.60
    SE INV = 33.83
47. SIDEDRAIN (2-30" CMP)
    NW INV = 29.03
    SE INV = 29.16
48. SIDEDRAIN (12" CMP)
    NW INV = 34.37
    SE INV = 34.33
49. PIPE END
    INV (12" CMP) = 35.55
50. INLET
    GRATE EL = 35.32
    SE INV (12" CMP) = 33.98
    NW INV (12" CMP) = 34.01
51. PIPE END
    INV (12" CMP) = 35.48
52. SIDEDRAIN (12" CMP)
    NW INV = 34.52
    SE INV = 34.63
53. SIDEDRAIN (12" CMP)
    NW INV = 34.44
    SE INV = 34.49
54. SIDEDRAIN (18" CMP)
    NW INV = 34.10
    SE INV = 33.96
55. SIDEDRAIN (18" CMP)
    NW INV = 33.79
    SE INV = 33.79
56. SIDEDRAIN (18" CMP)
    NW INV = 34.20
    SE INV = 34.20
57. SIDEDRAIN (18" CMP)
    NW INV = 34.59
    SE INV = 34.44
58. SIDEDRAIN (18" CMP)
    NW INV = 34.75
    SE INV = 34.52
59. SIDEDRAIN (18" CMP)
    NW INV = 35.51
    SE INV = 35.53
60. SIDEDRAIN (18" CMP)
    NW INV = 35.81
    SE INV = 35.64
61. SIDEDRAIN (15" CMP)
    NW INV = 34.61
    SE INV = 34.74
62. SIDEDRAIN (15" CMP)
    NW INV = 33.91
    SE INV = 33.95
63. SIDEDRAIN (15" CMP)
    NW INV = 34.04
    SE INV = 33.93

ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
KENNETH D. YINGER, P.E. LICENSE NUMBER: 75595 PATEL, GREENE & ASSOCIATES, LLC 12570 TELECOM DRIVE TEMPLE TERRACE, FL 33637	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	DRAINAGE MAP	
	SR 29	COLLIER	417540-5-52-01		26

ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
TREVOR J. HAWKINS, P.E. LICENSE NUMBER: 73047 PATEL, GREENE & ASSOCIATES, LLC 12570 TELECOM DRIVE TEMPLE TERRACE, FL 33637	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	ROADWAY PLAN-PROFILE	
	SR 29	COLLIER	417540-5-52-01		23

ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLAN-PROFILE	SHEET NO.
TREVOR J. HAWKINS, P.E. LICENSE NUMBER: 73047 PATEL, GREENE & ASSOCIATES, LLC 12570 TELECOM DRIVE TEMPLE TERRACE, FL 33637	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
	SR 29	TAYLOR	417540-5-52-01		24

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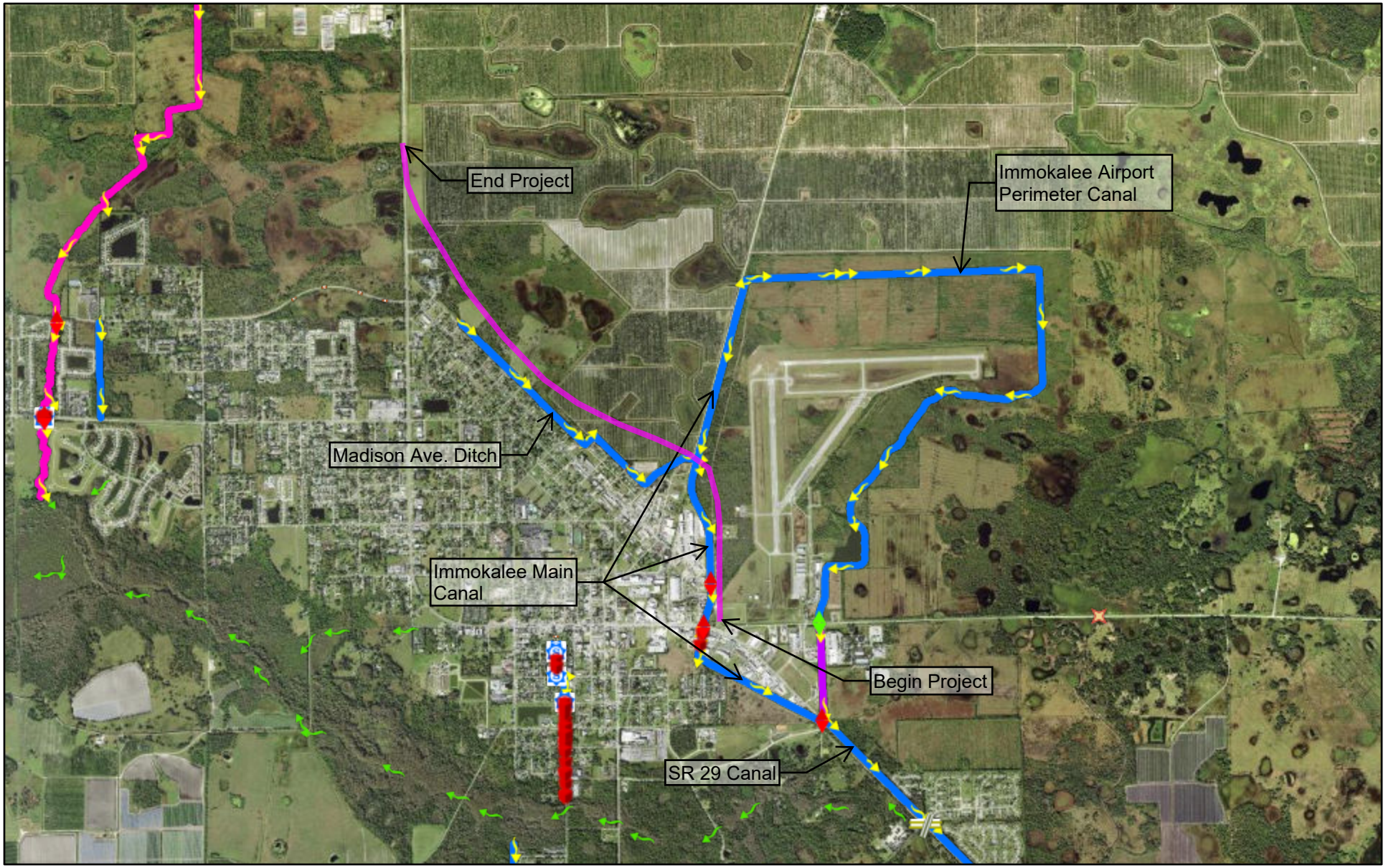
ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLAN-PROFILE	SHEET NO.
TREVOR J. HAWKINS, P.E. LICENSE NUMBER: 73047 PATEL, GREENE & ASSOCIATES, LLC 12570 TELECOM DRIVE TEMPLE TERRACE, FL 33637	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
	SR 29	COLLIER	417540-5-52-01		25

Collier County Stormwater Management Facilites



10/8/2023

1:47,728

0 0.35 0.7 1.4 mi

0 0.5 1 2 km

Collier county GMD, State of Florida, Maxar

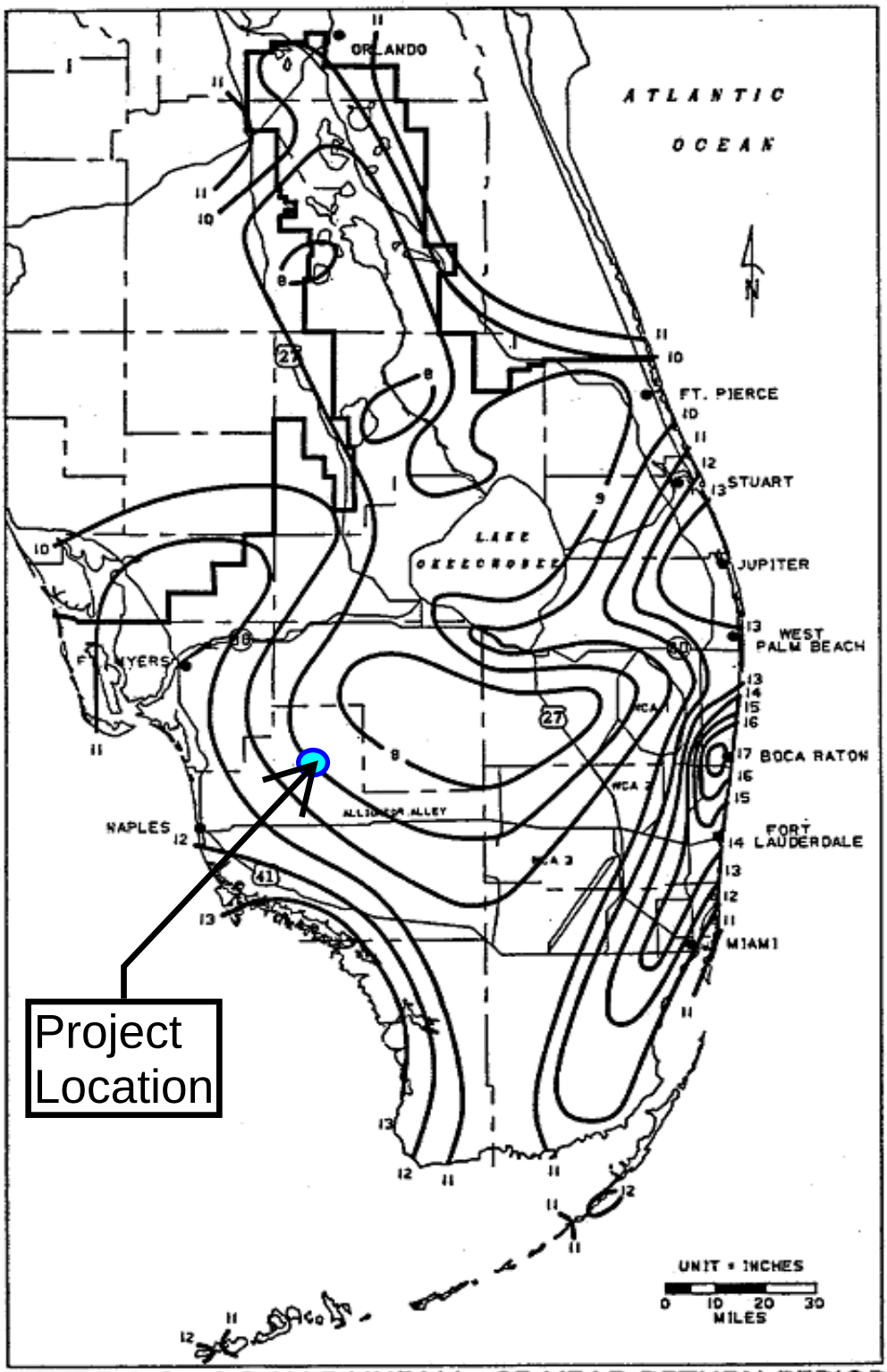


FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

Appendix B

Proposed Typical Section

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

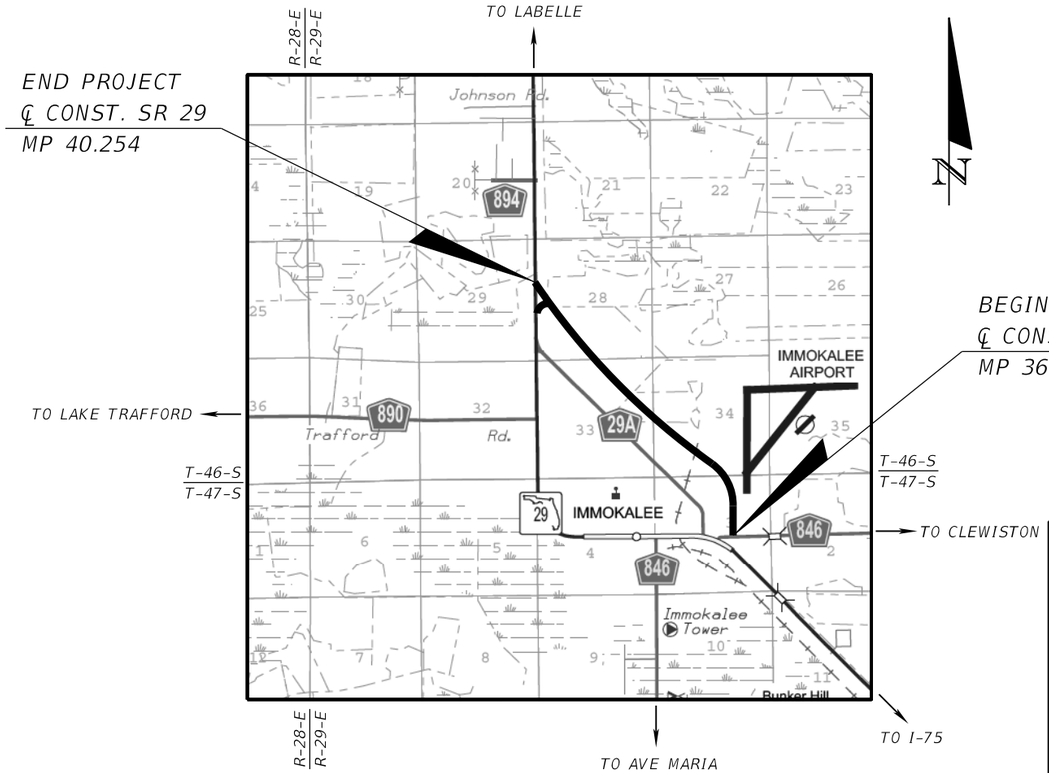
TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 417540-5-52-01

COLLIER COUNTY (03080)

STATE ROAD NO. 29

FROM CR 846 E TO N OF NEW MARKET ROAD N



APPROVED BY:

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

TREVOR J. HAWKINS
LICENSE
No 73047
STATE OF FLORIDA
PROFESSIONAL ENGINEER

ON THE DATE ADJACENT TO THE SEAL

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

PATEL, GREENE AND ASSOCIATES, PLLC
12570 TELECOM DRIVE
TEMPLE TERRACE, FLORIDA 33637
TREVOR J. HAWKINS, P.E. NO. 73047

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

TYPICAL SECTION PACKAGE

TYPICAL SECTION CONCURRENCE

FDOT DISTRICT DESIGN ENGINEER

FDOT DISTRICT STRUCTURES DESIGN ENGINEER

FHWA TRANSPORTATION ENGINEER

DESIGN SPEED AND POSTED SPEED CONCURRENCE:

FDOT DISTRICT TRAFFIC OPERATIONS ENGINEER

FDOT DISTRICT DESIGN ENGINEER

CONTEXT CLASSIFICATION CONCURRENCE:

FDOT DISTRICT INTERMODAL SYSTEMS DEVELOPMENT MANAGER

SHEET NO.

1

12/13/2019 10:23:57 AM

PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	(X)	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
( )	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
(X)	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

( ) NATIONAL HIGHWAY SYSTEM
(X) STRATEGIC INTERMODAL SYSTEM
( ) STATE HIGHWAY SYSTEM
( ) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
(X) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

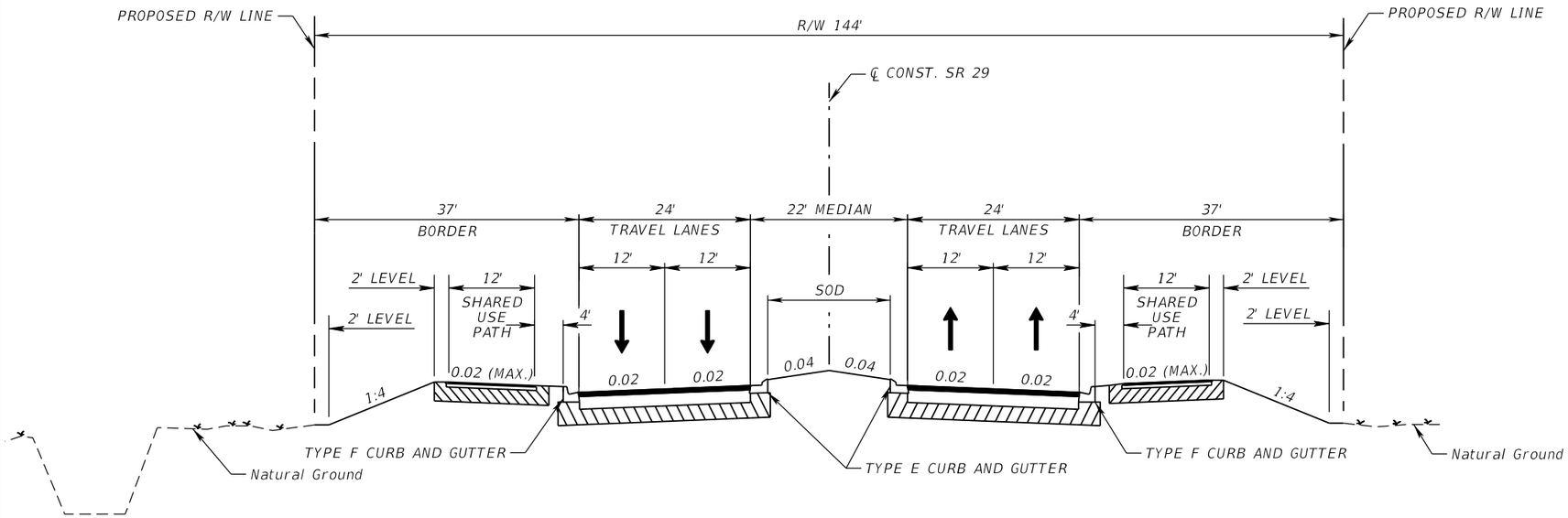
CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

BASE CLEARANCE VARIATION

TYPICAL SECTION No. 1



TYPICAL SECTION NO. 1
SR 29
MP 36.770 TO MP 37.684

TRAFFIC DATA

CURRENT YEAR= 2020 AADT = 21000
ESTIMATED OPENING YEAR = 2025 AADT = 25000
ESTIMATED DESIGN YEAR = 2045 AADT = 41000
K = 9% D = 59% T = 16% (24 HOUR)
DESIGN HOUR T = 8%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH

NOT TO SCALE

FINANCIAL PROJECT ID	SHEET NO.
417540-5-52-01	2

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/13/2019 10:24:30 AM

PROJECT CONTROLS

CONTEXT CLASSIFICATION

( ) C1 : NATURAL
( ) C2 : RURAL
( ) C2T : RURAL TOWN
(X) C3R : SUBURBAN RES.
( ) C3C : SUBURBAN COMM.
( ) C4 : URBAN GENERAL
( ) C5 : URBAN CENTER
( ) C6 : URBAN CORE
( ) N/A : L.A. FACILITY

FUNCTIONAL CLASSIFICATION

( ) INTERSTATE
( ) FREEWAY/EXPWY.
(X) PRINCIPAL ARTERIAL
( ) MINOR ARTERIAL
( ) MAJOR COLLECTOR
( ) MINOR COLLECTOR
( ) LOCAL

HIGHWAY SYSTEM

( ) NATIONAL HIGHWAY SYSTEM
(X) STRATEGIC INTERMODAL SYSTEM
( ) STATE HIGHWAY SYSTEM
( ) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

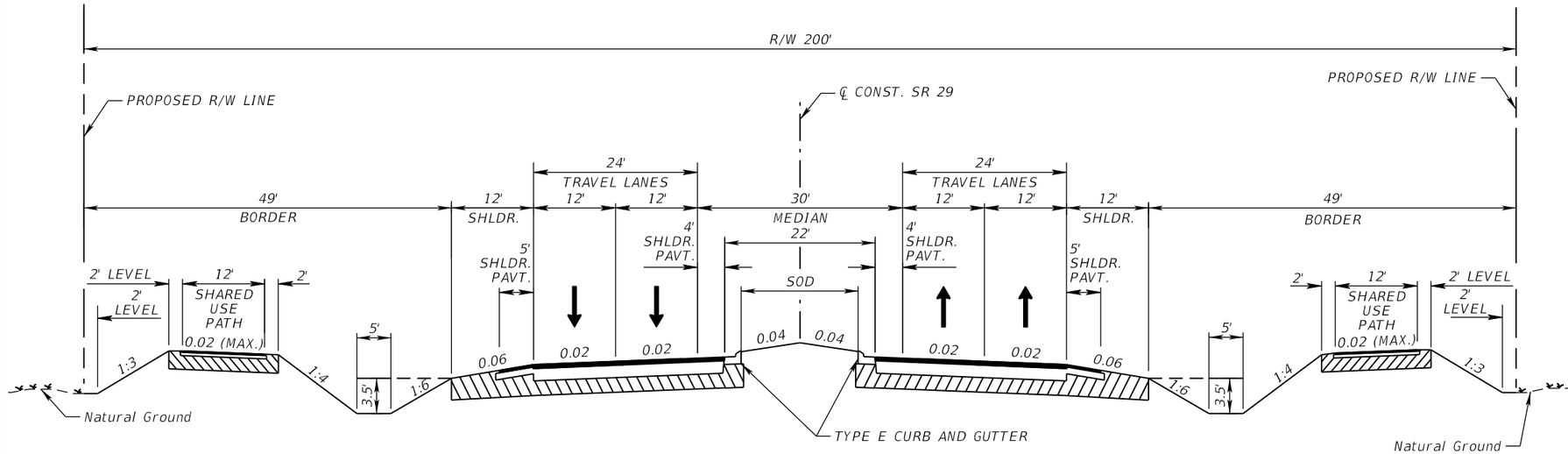
( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
(X) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 2



TYPICAL SECTION NO. 2
SR 29
MP 37.684 TO MP 40.254

TRAFFIC DATA

CURRENT YEAR= 2020 AADT = 21000
ESTIMATED OPENING YEAR = 2025 AADT = 25000
ESTIMATED DESIGN YEAR = 2045 AADT = 41000
K = 9% D = 59% T = 16% (24 HOUR)
DESIGN HOUR T = 8%
DESIGN SPEED = 50 MPH / 55 MPH
POSTED SPEED = 50 MPH / 55 MPH

NOT TO SCALE

FINANCIAL PROJECT ID	SHEET NO.
417540-5-52-01	3

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/13/2019 10:24:48 AM

Appendix C

Preliminary Pond Size Calculations

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501
SMF Name: SMF 501-A

BASIN CALCULATIONS

	Pre	***Post***
From Station	996+50	996+50
To Station	1039+90	1039+90
Basin Length	4340.00 ft	4340.00 ft
R/W to R/W Width	144.00 ft	144.00 ft
Total Area	14.35 ac	14.35 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
Contingency		0%	0.00 ft	
			0.00 ft	
		Impervious Area	0.00 ac	

Post-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	12.00 ft	4	48.00 ft	
Shoulder Gutter	4.00 ft	2	8.00 ft	
Type E C&G	2.50 ft	2	5.00 ft	
Shoulder	4.00 ft	0	0.00 ft	
Sidewalk	12.00 ft	2	24.00 ft	
Type F C&G	2.25 ft	2	4.50 ft	
Contingency		1%	0.72 ft	
			90.22 ft	
		Impervious Area	8.99 ac	

TREATMENT CALCULATIONS (FOR SFWMD CRITERIA)

Treatment Type (choose)	Wet Detention
Runoff Treatment	1.00 in.
Area to be Treated - Developed Project	14.35 ac
Treatment Volume required (1.0" runoff)	**1.20 ac-ft**
Runoff Treatment	2.50 in.
Area to be Treated - Impervious area	8.99 ac
Treatment Volume required (2.5" runoff)	**1.87 ac-ft**

Total Imp. Area	Add'l DCIA	Collected DCIA	Total R/W
8.99 ac	8.99 ac	0.00 ac	14.35 ac

Treatment Volume required (greater of 1" and 2.5" runoff)	**1.87 ac-ft**
Treatment Volume from existing sources (treatment types must match)*	**0.00 ac-ft**
Total Treatment volume required	**1.87 ac-ft**

*referenced from Existing Treatment and Storage Summary. 0.00 ac-ft if not applicable

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	Zone 4
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	10.15 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
14.35 ac	2.99 ac	17.34 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		1.72 ac
Gravel Roads	D	0.35 ac
Wetland/Water	D	0.08 ac
Wood/Forest (Poor cover)	D	10.69 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space		4.50 ac

CN Calculations

Soil Types (provide)	Myakka (8)	Immokalee (117)	Immokalee (118)	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Good >75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	58%	25%	17%	*Open Space CN*
CN	80	80	80	80

	Area	*CN*	*Weighted CN*
Roadway	1.72 ac	98	9.72
Gravel Roads	0.35 ac	91	1.84
Wetland/Water	0.08 ac	100	0.46
Wood/Forest (Poor cover)	10.69 ac	83	51.17
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	4.50 ac	80	20.76
		CN_{pre} =	83.9

SCS Method for Attenuation Volume:

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

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

S_{pre} = 1.91 in.
Q_{pre} = 8.17 in.
Pre-development runoff volume = **11.80 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
14.35 ac	2.99 ac	17.34 ac

Total Area to be attenuated for	HSG		
Roadway		8.99 ac	
Gravel Roads	D	0.00 ac	
Wetland/Water	D	2.39 ac	*80% of total pond area*
Wood/Forest (Poor cover)	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Open Space Composite		5.96 ac	

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	8.99 ac	98	50.81
Gravel Roads	0.00 ac	91	0.00
Wetland/Water	2.39 ac	100	13.79
Wood/Forest (Poor cover)	0.00 ac	83	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	5.96 ac	80	27.49
		CN_{post} =	92.1

SCS Method for Attenuation Volume:

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

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

S_{post} = 0.86 in.
Q_{post} = 9.19 in.
Post-development runoff volume = **13.28 ac-ft**

Attenuation volume required (Post-Pre) **1.47 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501
SMF Name: SMF 501-A

POND SITE CONSTRAINTS

DHW Estimate

Approx. Low edge of pavement elevation	33.24 ft	LEOP @ STA. 1002+50
Approx. hydraulic clearance from LEOP	1.00 ft	
Additional HGL base on distance from LEOP to pond	0.40 ft	Assume 0.10% slope @ 400'
Maximum DHW	31.84 ft	

Control Estimate

Seasonal High Ground Water Table EL. (SHGWT)	29.20 ft	See Appendix D
Tailwater Elevation	26.82 ft	See Appendix D
Selected Control Elevation	29.20 ft	

Pond Components	*Stage* (ft)	*Area* *(ac)*	*Delta Storage* *(ac-ft)*	*Sum Storage* *(ac-ft)*
Inside Edge of Maintenance Berm	32.20	2.37	2.31	6.59
Design High Water	31.20	2.25	2.20	4.27
Treatment Weir	30.20	2.14	2.08	2.08
Control Elevation	29.20	2.02		
Pond Bottom	23.20	1.39	10.23	

Treatment Volume Required =	**1.87 ac-ft**
Treatment Volume Provided =	**2.08 ac-ft**
Attenuation + Treatment Volume Required =	**3.34 ac-ft**
Attenuation + Treatment Volume Provided =	**4.27 ac-ft**

% Contingency = 28%

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501
SMF Name: SMF 501-B

BASIN CALCULATIONS

	Pre	***Post***
From Station	996+50	996+50
To Station	1039+90	1039+90
Basin Length	4340.00 ft	4340.00 ft
R/W to R/W Width	144.00 ft	144.00 ft
Total Area	14.35 ac	14.35 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
Contingency		0%	0.00 ft	
			0.00 ft	
		Impervious Area	0.00 ac	

Post-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	12.00 ft	4	48.00 ft	
Shoulder Gutter	4.00 ft	2	8.00 ft	
Type E C&G	2.50 ft	2	5.00 ft	
Shoulder	4.00 ft	0	0.00 ft	
Sidewalk	12.00 ft	2	24.00 ft	
Type F C&G	2.25 ft	2	4.50 ft	
Contingency		1%	0.90 ft	
			90.40 ft	
		Impervious Area	9.01 ac	

TREATMENT CALCULATIONS (FOR SFWMD CRITERIA)

Treatment Type (choose)	Wet Detention
Runoff Treatment	1.00 in.
Area to be Treated - Developed Project	14.35 ac
Treatment Volume required (1.0" runoff)	**1.20 ac-ft**
Runoff Treatment	2.50 in.
Area to be Treated - Impervious area	9.01 ac
Treatment Volume required (2.5" runoff)	**1.88 ac-ft**

Total Imp. Area	Add'l DCIA	Collected DCIA	Total R/W
9.01 ac	9.01 ac	0.00 ac	14.35 ac

Treatment Volume required (greater of 1" and 2.5" runoff)	**1.88 ac-ft**
Treatment Volume from existing sources (treatment types must match)*	**0.00 ac-ft**
Total Treatment volume required	**1.88 ac-ft**

*referenced from Existing Treatment and Storage Summary. 0.00 ac-ft if not applicable

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	Zone 4
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	10.15 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
14.35 ac	4.01 ac	18.36 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		1.72 ac
Wetland/Water	D	0.08 ac
Gravel Roads	D	0.25 ac
Wood/Forest (Poor cover)	D	12.30 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space		4.01 ac

CN Calculations

Soil Types (provide)	Myakka (8)	Immokalee (117)	Immokalee (118)	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Good >75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	58%	25%	17%	*Open Space CN*
CN	80	80	80	80

	Area	*CN*	*Weighted CN*
Roadway	1.72 ac	98	9.18
Wetland/Water	0.08 ac	100	0.44
Gravel Roads	0.25 ac	91	1.24
Wood/Forest (Poor cover)	12.30 ac	83	55.60
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	4.01 ac	80	17.47
		CN_{pre} =	83.9

SCS Method for Attenuation Volume:

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

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

S_{pre} = 1.91 in.
Q_{pre} = 8.17 in.
Pre-development runoff volume = **12.49 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
14.35 ac	4.01 ac	18.36 ac

Total Area to be attenuated for	HSG		
Roadway		9.01 ac	
Wetland/Water	D	3.21 ac	*80% of pond area*
Gravel Roads	D	0.25 ac	
Wood/Forest (Poor cover)	D	3.57 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Open Space Composite		2.32 ac	

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	9.01 ac	98	48.09
Wetland/Water	3.21 ac	100	17.47
Gravel Roads	0.25 ac	91	1.24
Wood/Forest (Poor cover)	3.57 ac	83	16.14
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	2.32 ac	80	10.12
		CN_{post} =	93.1

SCS Method for Attenuation Volume:

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

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

S_{post} = 0.75 in.
Q_{post} = 9.31 in.
Post-development runoff volume = **14.24 ac-ft**

Attenuation volume required (Post-Pre) **1.74 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501
SMF Name: SMF 501-B

POND SITE CONSTRAINTS

DHW Estimate		
Approx. Low edge of pavement elevation	33.24 ft	LEOP @ STA. 1002+50
Approx. hydraulic clearance from LEOP	1.00 ft	
Additional HGL base on distance from LEOP to pond	1.13 ft	Assume 0.05% slope @ 2,250'
Maximum DHW	31.12 ft	
Control Estimate		
Seasonal High Ground Water Table EL. (SHGWT)	30.00 ft	See Appendix D
Tailwater Elevation	26.52 ft	See Appendix D
Selected Control Elevation	29.52 ft	Assume minor lowering of Control El / Positive outfall available

Pond Components	*Stage* (ft)	*Area* *(ac)*	*Delta Storage* *(ac-ft)*	*Sum Storage* *(ac-ft)*
Inside Edge of Maintenance Berm	32.10	2.89	2.79	6.81
Design High Water	31.10	2.68	2.08	4.03
Treatment Weir	30.30	2.52	1.95	1.95
Control Elevation	29.50	2.35		
Pond Bottom	23.50	1.25	10.80	

Treatment Volume Required =	**1.88 ac-ft**
Treatment Volume Provided =	**1.95 ac-ft**
Attenuation + Treatment Volume Required =	**3.62 ac-ft**
Attenuation + Treatment Volume Provided =	**4.03 ac-ft**

% Contingency = 11%

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501
SMF Name: SMF 501-C

BASIN CALCULATIONS

	Pre	***Post***
From Station	996+50	996+50
To Station	1039+90	1039+90
Basin Length	4340.00 ft	4340.00 ft
R/W to R/W Width	144.00 ft	144.00 ft
Total Area	14.35 ac	14.35 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
Contingency		1%	0.00 ft	
			0.00 ft	
		Impervious Area	0.00 ac	

Post-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	12.00 ft	4	48.00 ft	
Shoulder Gutter	4.00 ft	2	8.00 ft	
Type E C&G	2.50 ft	2	5.00 ft	
Shoulder	4.00 ft	0	0.00 ft	
Sidewalk	12.00 ft	2	24.00 ft	
Type F C&G	2.25 ft	2	4.50 ft	
Contingency		1%	0.72 ft	
			90.22 ft	
		Impervious Area	8.99 ac	

TREATMENT CALCULATIONS (FOR SFWMD CRITERIA)

		Total Imp. Area	Add'l DCIA	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	1.00 in.	8.99 ac	8.99 ac	0.00 ac	14.35 ac
Area to be Treated - Developed Project	14.35 ac				
Treatment Volume required (1.0" runoff)	**1.20 ac-ft**				
Runoff Treatment	2.50 in.				
Area to be Treated - Impervious area	8.99 ac				
Treatment Volume required (2.5" runoff)	**1.87 ac-ft**				

Treatment Volume required (greater of 1" and 2.5" runoff)	**1.87 ac-ft**
Treatment Volume from existing sources (treatment types must match)*	**0.00 ac-ft**
Total Treatment volume required	**1.87 ac-ft**

*referenced from Existing Treatment and Storage Summary. 0.00 ac-ft if not applicable

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	Zone 4
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	10.15 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
14.35 ac	3.28 ac	17.63 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		1.72 ac
Wetland/Water	D	0.08 ac
Gravel Roads	D	0.25 ac
Wood/Forest (Poor cover)	D	13.25 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space		2.33 ac

CN Calculations

Soil Types (provide)	Myakka (8)	Immokalee (117)	Immokalee (118)	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Good >75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	58%	25%	17%	*Open Space CN*
CN	80	80	80	80

	Area	*CN*	*Weighted CN*
Roadway	1.72 ac	98	9.56
Wetland/Water	0.08 ac	100	0.45
Gravel Roads	0.25 ac	91	1.29
Wood/Forest (Poor cover)	13.25 ac	83	62.38
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	2.33 ac	80	10.57
		CN_{pre} =	84.3

SCS Method for Attenuation Volume:

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

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

S_{pre} = 1.87 in.
Q_{pre} = 8.21 in.
Pre-development runoff volume = **12.06 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
14.35 ac	3.28 ac	17.63 ac

Total Area to be attenuated for	HSG		
Roadway		8.99 ac	
Wetland/Water	D	2.62 ac	*80% of pond area*
Gravel Roads	D	0.25 ac	
Wood/Forest (Poor cover)	D	3.44 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Open Space Composite		2.33 ac	

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	8.99 ac	98	49.97
Wetland/Water	2.62 ac	100	14.88
Gravel Roads	0.25 ac	91	1.29
Wood/Forest (Poor cover)	3.44 ac	83	16.20
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	2.33 ac	80	10.55
		CN_{post} =	92.9

SCS Method for Attenuation Volume:

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

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

S_{post} = 0.76 in.
Q_{post} = 9.29 in.
Post-development runoff volume = **13.64 ac-ft**

Attenuation volume required (Post-Pre) **1.59 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 501
SMF Name: SMF 501-C

POND SITE CONSTRAINTS

DHW Estimate		
Approx. Low edge of pavement elevation	33.24 ft	LEOP @ STA. 1002+50
Approx. hydraulic clearance from LEOP	1.00 ft	
Additional HGL base on distance from LEOP to pond	1.63 ft	Assume 0.05% slope @ 3,250'
Maximum DHW	30.61 ft	
Control Estimate		
Seasonal High Ground Water Table EL. (SHGWT)	30.70 ft	See Appendix D
Tailwater Elevation	26.52 ft	See Appendix D
Selected Control Elevation	28.70 ft	Assume lowering of Control El / Positive outfall available / Liner needed

Pond Components	*Stage* (ft)	*Area (ac)*	*Delta Storage (ac-ft)*	*Sum Storage (ac-ft)*
Inside Edge of Maintenance Berm	31.50	2.55	2.48	6.59
Design High Water	30.50	2.41	1.88	4.11
Treatment Weir	29.70	2.30	2.23	2.23
Control Elevation	28.70	2.16		
Pond Bottom	22.70	1.44	10.80	

Treatment Volume Required =	**1.87 ac-ft**
Treatment Volume Provided =	**2.23 ac-ft**
Attenuation + Treatment Volume Required =	**3.46 ac-ft**
Attenuation + Treatment Volume Provided =	**4.11 ac-ft**

% Contingency = 19%

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 502
SMF Name: SMF 502-A

BASIN CALCULATIONS

	Pre	***Post***
From Station	1039+90	1039+90
To Station	1082+00	1082+00
Basin Length	4210.00 ft	4210.00 ft
R/W to R/W Width	200.00 ft	200.00 ft
Total Area	19.33 ac	19.33 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
Contingency		1%	0.00 ft	
			0.00 ft	
		Impervious Area	0.00 ac	

Post-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	12.00 ft	4	48.00 ft	
Shoulder Gutter	4.00 ft	2	8.00 ft	
Type E C&G	2.50 ft	2	5.00 ft	
Shoulder	5.00 ft	2	10.00 ft	
Sidewalk	12.00 ft	2	24.00 ft	
Type F C&G	2.25 ft	0	0.00 ft	
Contingency		1%	0.76 ft	
			95.76 ft	
		Impervious Area	9.26 ac	

TREATMENT CALCULATIONS (FOR SFWMD CRITERIA)

		Total Imp. Area	Add'l DCIA	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	1.00 in.	9.26 ac	9.26 ac	0.00 ac	19.33 ac
Area to be Treated - Developed Project	19.33 ac				
Treatment Volume required (1.0" runoff)	**1.61 ac-ft**				
Runoff Treatment	2.50 in.				
Area to be Treated - Impervious area	9.26 ac				
Treatment Volume required (2.5" runoff)	**1.93 ac-ft**				

Treatment Volume required (greater of 1" and 2.5" runoff)	**1.93 ac-ft**
Treatment Volume from existing sources (treatment types must match)*	**0.00 ac-ft**
Total Treatment volume required	**1.93 ac-ft**

*referenced from Existing Treatment and Storage Summary. 0.00 ac-ft if not applicable

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 502

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	Zone 4
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	10.15 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
19.33 ac	4.21 ac	23.54 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		0.00 ac
Wetland/Water	D	0.30 ac
Ag-Straight Row (Good)	C	23.24 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space		0.00 ac

CN Calculations

Soil Types (provide)	Holopaw (27)	Immokalee (7)	Myakka (8)	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Good >75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	67%	21%	12%	*Open Space CN*
CN	80	80	80	80

	Area	*CN*	*Weighted CN*
Roadway	0.00 ac	98	0.00
Wetland/Water	0.30 ac	100	1.27
Ag-Straight Row (Good)	23.24 ac	85	83.92
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	0.00 ac	80	0.00
		CN_{pre} =	85.2

SCS Method for Attenuation Volume:

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

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

S_{pre} = 1.74 in.
Q_{pre} = 8.33 in.
Pre-development runoff volume = **16.33 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 502

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
19.33 ac	4.21 ac	23.54 ac

Total Area to be attenuated for	HSG		
Roadway		9.26 ac	
Wetland/Water	D	3.37 ac	*80% of pond area*
Ag-Straight Row (Good)	C	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Open Space Composite		10.91 ac	

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	9.26 ac	98	38.55
Wetland/Water	3.37 ac	100	14.31
Ag-Straight Row (Good)	0.00 ac	85	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	10.91 ac	80	37.08
		CN_{post} =	89.9

SCS Method for Attenuation Volume:

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

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

S_{post} = 1.12 in.
Q_{post} = 8.92 in.
Post-development runoff volume = **17.50 ac-ft**

Attenuation volume required (Post-Pre) **1.17 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 502
SMF Name: SMF 502-A

POND SITE CONSTRAINTS

DHW Estimate		
Approx. Low edge of pavement elevation	34.71 ft	LEOP @ STA. 1042+40
Approx. hydraulic clearance from LEOP	1.00 ft	
Additional HGL base on distance from LEOP to pond	0.55 ft	Assume 0.05% slope @ 1,100'
Maximum DHW	33.16 ft	
Control Estimate		
Seasonal High Ground Water Table EL. (SHGWT)	30.00 ft	See Appendix D
Tailwater Elevation	27.94 ft	See Appendix D
Selected Control Elevation	30.00 ft	

Pond Components	*Stage* (ft)	*Area* *(ac)*	*Delta Storage* *(ac-ft)*	*Sum Storage* *(ac-ft)*
Inside Edge of Maintenance Berm	32.60	3.27	3.18	7.89
Design High Water	31.60	3.09	2.71	4.71
Treatment Weir	30.70	2.93	2.00	2.00
Control Elevation	30.00	2.80		
Pond Bottom	24.00	2.00		

Treatment Volume Required =	**1.93 ac-ft**
Treatment Volume Provided =	**2.00 ac-ft**
Attenuation + Treatment Volume Required =	**3.10 ac-ft**
Attenuation + Treatment Volume Provided =	**4.71 ac-ft**

% Contingency = 52%

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 502
SMF Name: SMF 502-B

SPREADSHEET MODIFIED FOR USE WITH ORD AND SWFMD CRITERIA

	Pre	***Post***
From Station	1039+90	1039+90
To Station	1082+00	1082+00
Basin Length	4210.00 ft	4210.00 ft
R/W to R/W Width	200.00 ft	200.00 ft
Total Area	19.33 ac	19.33 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
Contingency		1%	0.00 ft	
			0.00 ft	
		Impervious Area	0.00 ac	

Post-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	12.00 ft	4	48.00 ft	
Shoulder Gutter	4.00 ft	2	8.00 ft	
Type E C&G	2.50 ft	2	5.00 ft	
Shoulder	5.00 ft	2	10.00 ft	
Sidewalk	12.00 ft	2	24.00 ft	
Type F C&G	2.25 ft	0	0.00 ft	
Contingency		1%	0.76 ft	
			95.76 ft	
		Impervious Area	9.26 ac	

TREATMENT CALCULATIONS (FOR SFWMD CRITERIA)

		Total Imp. Area	Add'l DCIA	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	1.00 in.	9.26 ac	9.26 ac	0.00 ac	19.33 ac
Area to be Treated - Developed Project	19.33 ac				
Treatment Volume required (1.0" runoff)	**1.61 ac-ft**				
Runoff Treatment	2.50 in.				
Area to be Treated - Impervious area	9.26 ac				
Treatment Volume required (2.5" runoff)	**1.93 ac-ft**				

Treatment Volume required (greater of 1" and 2.5" runoff)	**1.93 ac-ft**
Treatment Volume from existing sources (treatment types must match)*	**0.00 ac-ft**
Total Treatment volume required	**1.93 ac-ft**

*referenced from Existing Treatment and Storage Summary. 0.00 ac-ft if not applicable

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 502

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	Zone 4
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	10.15 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
19.33 ac	4.13 ac	23.46 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		0.00 ac
Wetland/Water	D	0.58 ac
Ag-Straight Row (Good)	C	22.88 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space		0.00 ac

CN Calculations

Soil Types (provide)	Holopaw (27)	Immokalee (7)	Myakka (8)	
Open Space type (choose)	Open Space (Good >75%)	Open Space (Good >75%)	Open Space (Good >75%)	
HSG (choose)	D	D	D	*Composite*
Percentage Basin (provide)	67%	21%	12%	*Open Space CN*
CN	80	80	80	80

	Area	*CN*	*Weighted CN*
Roadway	0.00 ac	98	0.00
Wetland/Water	0.58 ac	100	2.47
Ag-Straight Row (Good)	22.88 ac	85	82.90
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	0.00 ac	80	0.00
		CN_{pre} =	85.4

SCS Method for Attenuation Volume:

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

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

S_{pre} = 1.71 in.
Q_{pre} = 8.35 in.
Pre-development runoff volume = **16.32 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 502

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
19.33 ac	4.13 ac	23.46 ac

Total Area to be attenuated for	HSG		
Roadway		9.26 ac	
Wetland/Water	D	3.30 ac	*80% of pond area*
Ag-Straight Row (Good)	C	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Open Space Composite		10.90 ac	

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	9.26 ac	98	38.68
Wetland/Water	3.30 ac	100	14.08
Ag-Straight Row (Good)	0.00 ac	85	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	10.90 ac	80	37.16
		CN_{post} =	89.9

SCS Method for Attenuation Volume:

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

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

S_{post} = 1.12 in.
Q_{post} = 8.92 in.
Post-development runoff volume = **17.44 ac-ft**

Attenuation volume required (Post-Pre) **1.11 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 502
SMF Name: SMF 502-B

POND SITE CONSTRAINTS

DHW Estimate

Approx. Low edge of pavement elevation	34.71 ft	LEOP @ STA. 1042+40
Approx. hydraulic clearance from LEOP	1.00 ft	
Additional HGL base on distance from LEOP to pond	1.15 ft	Assume 0.05% slope @ 2,300'
Maximum DHW	32.56 ft	

Control Estimate

Seasonal High Ground Water Table EL. (SHGWT)	31.40 ft	See Appendix D
Tailwater Elevation	28.33 ft	See Appendix D
Selected Control Elevation	31.00 ft	Assume minor lowering of Control El / Positive outfall available

Pond Components	*Stage* (ft)	*Area (ac)*	*Delta Storage (ac-ft)*	*Sum Storage (ac-ft)*
Inside Edge of Maintenance Berm	33.50	3.20	3.11	7.45
Design High Water	32.50	3.02	2.36	4.34
Treatment Weir	31.70	2.88	1.98	1.98
Control Elevation	31.00	2.76		
Pond Bottom	25.00	1.76		

Treatment Volume Required =	**1.93 ac-ft**
Treatment Volume Provided =	**1.98 ac-ft**
Attenuation + Treatment Volume Required =	**3.04 ac-ft**
Attenuation + Treatment Volume Provided =	**4.34 ac-ft**

% Contingency = 43%

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 503
SMF Name: SMF 503-A

BASIN CALCULATIONS

	Pre	***Post***
From Station	1082+00	1082+00
To Station	1135+50	1135+50
Basin Length	5350.00 ft	5350.00 ft
R/W to R/W Width	200.00 ft	200.00 ft
Total Area	24.56 ac	24.56 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
Contingency		1%	0.00 ft	
			0.00 ft	
		Impervious Area	0.00 ac	

Post-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	12.00 ft	4	48.00 ft	
Shoulder Gutter	4.00 ft	2	8.00 ft	
Type E C&G	2.50 ft	2	5.00 ft	
Shoulder	5.00 ft	2	10.00 ft	
Sidewalk	12.00 ft	2	24.00 ft	
Type F C&G	2.25 ft	0	0.00 ft	
Contingency		1%	0.76 ft	
			95.76 ft	
		Impervious Area	11.76 ac	

TREATMENT CALCULATIONS (FOR SFWMD CRITERIA)

		Total Imp. Area	Add'l DCIA	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	1.00 in.	11.76 ac	11.76 ac	0.00 ac	24.56 ac
Area to be Treated - Developed Project	24.56 ac				
Treatment Volume required (1.0" runoff)	**2.05 ac-ft**				
Runoff Treatment	2.50 in.				
Area to be Treated - Impervious area	11.76 ac				
Treatment Volume required (2.5" runoff)	**2.45 ac-ft**				

Treatment Volume required (greater of 1" and 2.5" runoff)	**2.45 ac-ft**
Treatment Volume from existing sources (treatment types must match)*	**0.00 ac-ft**
Total Treatment volume required	**2.45 ac-ft**

*referenced from Existing Treatment and Storage Summary. 0.00 ac-ft if not applicable

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 503

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	Zone 4
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	10.15 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
24.56 ac	5.77 ac	30.33 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		0.00 ac
Wood/Forest (Poor cover)	A	3.36 ac
Wood/Forest (Poor cover)	D	17.27 ac
Wetland/Water	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space		9.70 ac

CN Calculations

Soil Types (provide)	Pomello (15)	Oldsmar (16)		
Open Space type (choose)	Open Space (Good >75%)	Open Space (Good >75%)	Open Space (Good >75%)	
HSG (choose)	A	D	D	*Composite*
Percentage Basin (provide)	0%	100%	0%	*Open Space CN*
CN	39	80	80	80

	Area	*CN*	*Weighted CN*
Roadway	0.00 ac	98	0.00
Wood/Forest (Poor cover)	3.36 ac	45	4.99
Wood/Forest (Poor cover)	17.27 ac	83	47.26
Wetland/Water	0.00 ac	100	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	9.70 ac	80	25.59
		CN_{pre} =	77.8

SCS Method for Attenuation Volume:

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

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

S_{pre} = 2.85 in.
Q_{pre} = 7.38 in.
Pre-development runoff volume = **18.66 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 503

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
24.56 ac	5.77 ac	30.33 ac

Total Area to be attenuated for	HSG		
Roadway		11.76 ac	
Wood/Forest (Poor cover)	A	0.00 ac	
Wood/Forest (Poor cover)	D	0.00 ac	
Wetland/Water	D	4.62 ac	*80% of pond area*
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Open Space Composite		13.95 ac	

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	11.76 ac	98	38.00
Wood/Forest (Poor cover)	0.00 ac	45	0.00
Wood/Forest (Poor cover)	0.00 ac	83	0.00
Wetland/Water	4.62 ac	100	15.22
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	13.95 ac	80	36.81
		CN_{post} =	90.0

SCS Method for Attenuation Volume:

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

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

S_{post} = 1.11 in.
Q_{post} = 8.93 in.
Post-development runoff volume = **22.57 ac-ft**

Attenuation volume required (Post-Pre) **3.91 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 503
SMF Name: SMF 503-A

POND SITE CONSTRAINTS

DHW Estimate		
Approx. Low edge of pavement elevation	36.22 ft	LEOP @ STA. 1121+50
Approx. hydraulic clearance from LEOP	1.00 ft	
Additional HGL base on distance from LEOP to pond	1.65 ft	Assume 0.05% slope @ 3,300'
Maximum DHW	33.57 ft	
Control Estimate		
Seasonal High Ground Water Table EL. (SHGWT)	31.80 ft	See Appendix D
Tailwater Elevation	30.00 ft	See Appendix D
Selected Control Elevation	31.80 ft	

Pond Components	*Stage* (ft)	*Area* *(ac)*	*Delta Storage* *(ac-ft)*	*Sum Storage* *(ac-ft)*
Inside Edge of Maintenance Berm	34.55	4.95	4.87	12.98
Design High Water	33.55	4.78	5.39	8.11
Treatment Weir	32.40	4.59	2.72	2.72
Control Elevation	31.80	4.49		
Pond Bottom	25.80	3.55	24.12	

Treatment Volume Required =	**2.45 ac-ft**
Treatment Volume Provided =	**2.72 ac-ft**
Attenuation + Treatment Volume Required =	**6.36 ac-ft**
Attenuation + Treatment Volume Provided =	**8.11 ac-ft**

% Contingency = 28%

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 503
SMF Name: SMF 503-B

BASIN CALCULATIONS

	Pre	***Post***
From Station	1082+00	1082+00
To Station	1135+50	1135+50
Basin Length	5350.00 ft	5350.00 ft
R/W to R/W Width	200.00 ft	200.00 ft
Total Area	24.56 ac	24.56 ac

Pre-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
	0.00 ft	0	0.00 ft	
Contingency		1%	0.00 ft	
			0.00 ft	
		Impervious Area	0.00 ac	

Post-development Impervious Areas (choose)	Width	Number	Total Width	Notes
Travel Lanes	12.00 ft	4	48.00 ft	
Shoulder Gutter	4.00 ft	2	8.00 ft	
Type E C&G	2.50 ft	2	5.00 ft	
Shoulder	5.00 ft	2	10.00 ft	
Sidewalk	12.00 ft	2	24.00 ft	
Type F C&G	2.25 ft	0	0.00 ft	
Contingency		1%	0.76 ft	
			95.76 ft	
		Impervious Area	11.76 ac	

TREATMENT CALCULATIONS (FOR SFWMD CRITERIA)

		Total Imp. Area	Add'l DCIA	Collected DCIA	Total R/W
Treatment Type (choose)	Wet Detention				
Runoff Treatment	1.00 in.	11.76 ac	11.76 ac	0.00 ac	24.56 ac
Area to be Treated - Developed Project	24.56 ac				
Treatment Volume required (1.0" runoff)	**2.05 ac-ft**				
Runoff Treatment	2.50 in.				
Area to be Treated - Impervious area	11.76 ac				
Treatment Volume required (2.5" runoff)	**2.45 ac-ft**				

Treatment Volume required (greater of 1" and 2.5" runoff)	**2.45 ac-ft**
Treatment Volume from existing sources (treatment types must match)*	**0.00 ac-ft**
Total Treatment volume required	**2.45 ac-ft**

*referenced from Existing Treatment and Storage Summary. 0.00 ac-ft if not applicable

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 503

ATTENUATION CALCULATIONS

Will attenuation be necessary? (choose)	Yes
Zone (choose)	Zone 4
Frequency (choose)	25-yr
Time (choose)	72-hr
Precipitation Depth	10.15 in.

Pre-development Conditions

R/W Area	Pond Area	Total Area
24.56 ac	8.78 ac	33.34 ac

Total Area to be attenuated for (choose)	HSG	
Roadway		0.00 ac
Wood/Forest (Poor cover)	A	9.08 ac
Wood/Forest (Good cover)	D	15.40 ac
Wetland/Water	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Gravel Roads	D	0.00 ac
Open Space		8.86 ac

CN Calculations

Soil Types (provide)	Pomello (15)	Oldsmar (16)		
Open Space type (choose)	Open Space (Good >75%)	Open Space (Good >75%)	Open Space (Good >75%)	
HSG (choose)	A	D	A	*Composite Open*
Percentage Basin (provide)	0%	100%	0%	*Space CN*
CN	39	80	39	80

	Area	*CN*	*Weighted CN*
Roadway	0.00 ac	98	0.00
Wood/Forest (Poor cover)	9.08 ac	45	12.26
Wood/Forest (Good cover)	15.40 ac	77	35.57
Wetland/Water	0.00 ac	100	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	8.86 ac	80	21.26
		CN_{pre} =	69.1

SCS Method for Attenuation Volume:

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

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

S_{pre} = 4.48 in.
Q_{pre} = 6.24 in.
Pre-development runoff volume = **17.33 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 503

ATTENUATION CALCULATIONS (CONT.)

Post-development Conditions

R/W Area	Pond Area	
24.56 ac	8.78 ac	33.34 ac

Total Area to be attenuated for	HSG		
Roadway		11.76 ac	
Wood/Forest (Poor cover)	A	0.00 ac	
Wood/Forest (Good cover)	D	0.00 ac	
Wetland/Water	D	7.02 ac	*80% of Pond area*
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Gravel Roads	D	0.00 ac	
Open Space Composite		14.56 ac	

CN Calculations	*Area*	*CN*	*Weighted CN*
Roadway	11.76 ac	98	34.57
Wood/Forest (Poor cover)	0.00 ac	45	0.00
Wood/Forest (Good cover)	0.00 ac	77	0.00
Wetland/Water	7.02 ac	100	21.07
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Gravel Roads	0.00 ac	91	0.00
Open Space	14.56 ac	80	34.93
		CN_{post} =	90.6

SCS Method for Attenuation Volume:

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

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

S_{post} = 1.04 in.
Q_{post} = 9.00 in.
Post-development runoff volume = **25.00 ac-ft**

Attenuation volume required (Post-Pre) **7.67 ac-ft**

Patel, Greene & Associates, LLC

Designed By: ENS
Date: 2/7/2024
Checked By: KY
Date: 2/9/2024

Subject: FPID 417540-5-52-01, SR 29 from CR 846 E to N of New Market Road N
Description Pond Sizing Calculations
Basin: Basin 503
SMF Name: SMF 503-B

POND SITE CONSTRAINTS

DHW Estimate		
Approx. Low edge of pavement elevation	36.22 ft	LEOP @ STA. 1121+50
Approx. hydraulic clearance from LEOP	1.00 ft	
Additional HGL base on distance from LEOP to pond	0.90 ft	Assume 0.05% slope @ 1,800'
Maximum DHW	34.32 ft	
Control Estimate		
Seasonal High Ground Water Table EL. (SHGWT)	32.00 ft	See Appendix D
Tailwater Elevation	30.00 ft	See Appendix D
Selected Control Elevation	32.00 ft	

Pond Components	*Stage* (ft)	*Area (ac)*	*Delta Storage (ac-ft)*	*Sum Storage (ac-ft)*
Inside Edge of Maintenance Berm	35.00	6.60	6.44	18.33
Design High Water	34.00	6.27	8.46	11.89
Treatment Weir	32.60	5.82	3.43	3.43
Control Elevation	32.00	5.62		
Pond Bottom	26.00	3.12	26.22	

Treatment Volume Required =	**2.45 ac-ft**
Treatment Volume Provided =	**3.43 ac-ft**
Attenuation + Treatment Volume Required =	**10.12 ac-ft**
Attenuation + Treatment Volume Provided =	**11.89 ac-ft**

% Contingency = 18%

Appendix D

SHW/TW Support

Patel, Greene and Associate, LLC
SR 29 from CR 846 E to N of New Market Road N
FPID 417540-5-52-01
SHGWT/TW Determination

Designed by: ENS
Date: 2/7/2024
Checked by: KY
Date: 2/9/2024

Geotech. Boring No.	Ground Surface Elev.	Depth Below Ground Surface	SHGWT (ft) (Geotech Borings)	Proposed SHGWT (ft)	Remarks
501-A					
HA-2	30.7	1	29.7	29.2	Lowest SHGWT Used
HA-6	33.4	3	30.4		
PHA-7	30.8	1	29.8		
PHA-8	30.7	1.5	29.2		
501-B					
HA-5	31.5	1.5	30	29.5	Lowest SHGWT lowered by 0.5'
HA-6	33.4	3	30.4		
HA-7	33.2	2.5	30.7		
HA-8	34.3	3.5	30.8		
PHA-5	32.8	2	30.8		
PHA-6	33.7		30.7		
501-C					
HA-9	32.2	1.5	30.7	28.7	Proposed Liner
502-A					
HA-11	31.4	0.5	30.9	30.0	Lowest SHGWT Used
HA-12	32.3	1.5	30.8		
HA-13	31.0	1.0	30.0		
502-B					
HA-14	32.4	1	31.4	31	Lowest SHGWT Lowered by 0.4'
HA-15	32.4	1	31.4		
503-A					
PHA-1	33.4	1.5	31.9	31.8	Lowest SHGWT Used
PHA-2	32.3	0.5	31.8		
503-B					
HA-20	34	2	32	32.0	Lowest SHGWT Used
PHA-3	34.6	1.5	33.1		
PHA-4	34.5	1.5	33		

Patel, Greene and Associate, LLC

SR 29 from CR 846 E to N of New Market Road N

FPID 417540-5-52-01

SHGWT/TW Determination

Designed by: ENS

Date: 2/7/2024

Checked by: KY

Date: 2/9/2024

Pond Name	Tailwater Condition	Control Elevation (ft)	Static Tailwater Elevation (ft)	Remarks
501-A	Canal	29.2	26.82	PSHW1 (environmental seasonal high). Crown pipe at upstream is 26.64'
501-B	Canal	29.5	26.52	PSHW5 (environmental seasonal high)
501-C	Canal	28.7	26.52	PSHW5 (environmental seasonal high)
502-A	Canal	30	27.94	Interpolated value between PSHW2 and PSHW4
502-B	Canal	31	28.33	PSHW4 (environmental seasonal high)
503-A	Canal	31.8	30	Madison Avenue Ditch ORD contours
503-B	Canal	32	30	Madison Avenue Ditch ORD contours

Appendix E

Nutrient Loading Calculations

BMP ANALYSIS FOR S.R. 29

Pond 501B		Pond 502A		Pond 503B		Total	
Pre	Post	Pre	Post	Pre	Post	Pre	Post
N (kg/yr)	N (kg/yr)	N (kg/yr)	N (kg/yr)	N (kg/yr)	N (kg/yr)	N (kg/yr)	N (kg/yr)
18.736	31.17	19.83	32.74	11.06	37.6	49.626	101.51
P (kg/yr)	P (kg/yr)	P (kg/yr)	P (kg/yr)	P (kg/yr)	P (kg/yr)	P (kg/yr)	P (kg/yr)
0.935	1.837	0.343	1.791	0.192	1.732	1.47	5.36

Complete Report (not including cost) Ver 4.3.5

Project: SR 29 from CR 846 to New Market Road Basin 501
Date: 2/21/2024 10:08:12 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Transportation Basin 14.8 Ac	Catchment 1 + 1
Rainfall Zone	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	52.00	52.00

Pre-Condition Landuse Information

Landuse	Rangeland/Parkland: TN=1.150 TP=0.055	User Defined Values
Area (acres)	18.36	0.44
Rational Coefficient (0-1)	0.16	0.16
Non DCIA Curve Number	80.00	80.00
DCIA Percent (0-100)	0.00	0.00
Nitrogen EMC (mg/l)	1.150	1.190
Phosphorus EMC (mg/l)	0.055	0.160
Runoff Volume (ac-ft/yr)	12.889	0.309
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	18.276	0.453
Phosphorus Loading (kg/yr)	0.874	0.061

Post-Condition Landuse Information

Landuse	User Defined Values	
Area (acres)	18.36	0.00
Rational Coefficient (0-1)	0.59	0.01
Non DCIA Curve Number	80.00	37.80
DCIA Percent (0-100)	62.20	0.00
Wet Pond Area (ac)	4.01	0.00
Nitrogen EMC (mg/l)	1.190	0.000
Phosphorus EMC (mg/l)	0.160	0.000
Runoff Volume (ac-ft/yr)	36.651	0.000
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	53.777	0.000
Phosphorus Loading (kg/yr)	7.230	0.000

Catchment Number: 1 Name: Transportation Basin 14.8 Ac

Project: SR 29 from CR 846 to New Market Road Basin 501
Date: 2/21/2024

Wet Detention Design

Permanent Pool Volume (ac-ft)	10.800
Permanent Pool Volume (ac-ft) for 31 days residence	3.113
Annual Residence Time (days)	108
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	18.36
Contributing Area (acres)	14.350
Non-DCIA Curve Number	80.00
DCIA Percent	62.20
Rainfall Zone	Florida Zone 1
Rainfall (in)	52.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	66
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	88
Provided TP Treatment Efficiency (%)	75

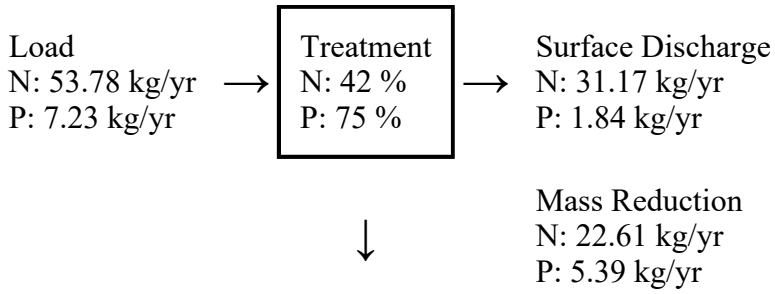
Media Mix Information

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

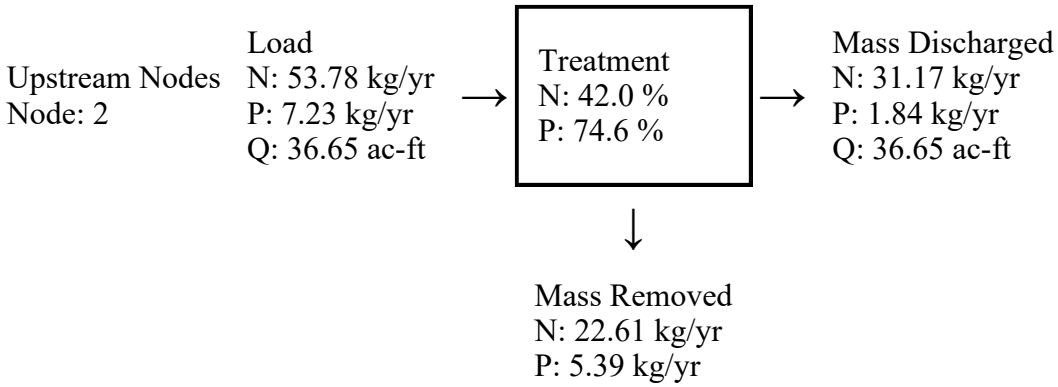
Groundwater Discharge (Stand-Alone)

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

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Catchment Number: 2 Name: Catchment 1 + 1

Project: SR 29 from CR 846 to New Market Road Basin 501
Date: 2/21/2024

None Design

Watershed Characteristics

Catchment Area (acres)	0.00
Contributing Area (acres)	0.000
Non-DCIA Curve Number	37.80
DCIA Percent	0.00
Rainfall Zone	Florida Zone 1
Rainfall (in)	52.00

Surface Water Discharge

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

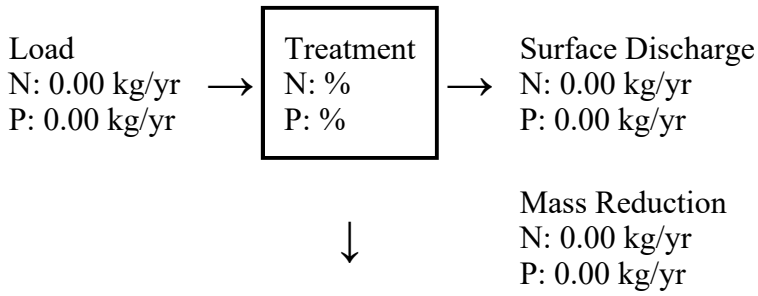
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	0.000
Media P Reduction (%)	0.000

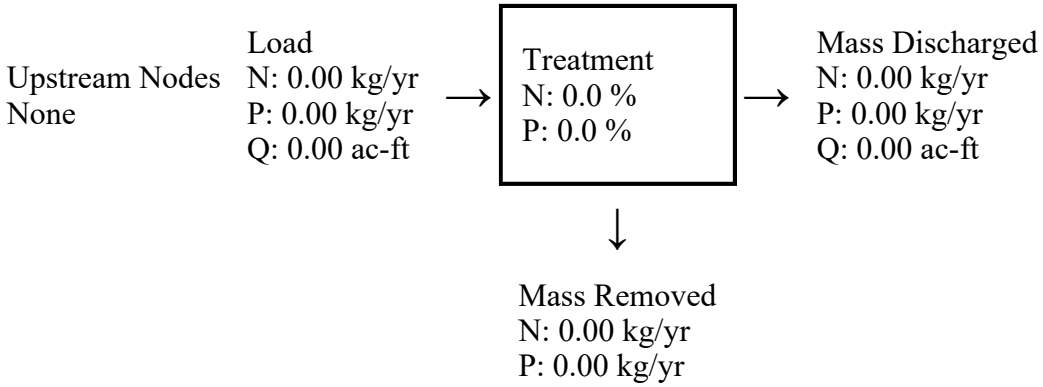
Groundwater Discharge (Stand-Alone)

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

Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: SR 29 from CR 846 to New Market Road Basin 501

Date:2/21/2024

Analysis Type: Net Improvement
BMP Types:
Catchment 1 - (Transportation Basin 14.8 Ac) Wet Detention
Catchment 2 - (Catchment 1 + 1) None
Based on % removal values to the nearest percent

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

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge		
Total N pre load	18.73 kg/yr	
Total N post load	53.78 kg/yr	
Target N load reduction	65 %	
Target N discharge load	18.73 kg/yr	
Percent N load reduction	42 %	
Provided N discharge load	31.17 kg/yr	68.73 lb/yr
Provided N load removed	22.61 kg/yr	49.85 lb/yr

Phosphorus

Surface Water Discharge		
Total P pre load	.935 kg/yr	
Total P post load	7.23 kg/yr	
Target P load reduction	87 %	
Target P discharge load	.935 kg/yr	
Percent P load reduction	75 %	
Provided P discharge load	1.837 kg/yr	4.05 lb/yr
Provided P load removed	5.394 kg/yr	11.894 lb/yr

Complete Report (not including cost) Ver 4.3.5

Project: 502 A
Date: 2/21/2024 10:11:17 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	502	Catchment 1 + 1
Rainfall Zone	Florida Zone 4	Florida Zone 4
Annual Mean Rainfall	52.00	52.00

Pre-Condition Landuse Information

Landuse	Undeveloped - Wet Flatwoods: TN=1.213 TP=0.021	Undeveloped - Wet Flatwoods: TN=1.213 TP=0.021
Area (acres)	16.52	7.02
Rational Coefficient (0-1)	0.13	0.13
Non DCIA Curve Number	80.00	80.00
DCIA Percent (0-100)	0.00	0.00
Nitrogen EMC (mg/l)	1.213	1.213
Phosphorus EMC (mg/l)	0.021	0.021
Runoff Volume (ac-ft/yr)	9.306	3.955
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	13.919	5.915
Phosphorus Loading (kg/yr)	0.241	0.102

Post-Condition Landuse Information

Landuse	User Defined Values	
Area (acres)	23.54	0.00
Rational Coefficient (0-1)	0.46	0.00
Non DCIA Curve Number	80.00	29.90
DCIA Percent (0-100)	48.00	0.00
Wet Pond Area (ac)	4.21	0.00

Nitrogen EMC (mg/l)	1.190	0.000
Phosphorus EMC (mg/l)	0.160	0.000
Runoff Volume (ac-ft/yr)	38.732	0.000
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	56.831	0.000
Phosphorus Loading (kg/yr)	7.641	0.000

Catchment Number: 1 Name: 502

Project: 502 A
Date: 2/21/2024

Wet Detention Design

Permanent Pool Volume (ac-ft)	14.400
Permanent Pool Volume (ac-ft) for 31 days residence	3.290
Annual Residence Time (days)	136
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	23.54
Contributing Area (acres)	19.330
Non-DCIA Curve Number	80.00
DCIA Percent	48.00
Rainfall Zone	Florida Zone 4
Rainfall (in)	52.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	76
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	97
Provided TP Treatment Efficiency (%)	77

Media Mix Information

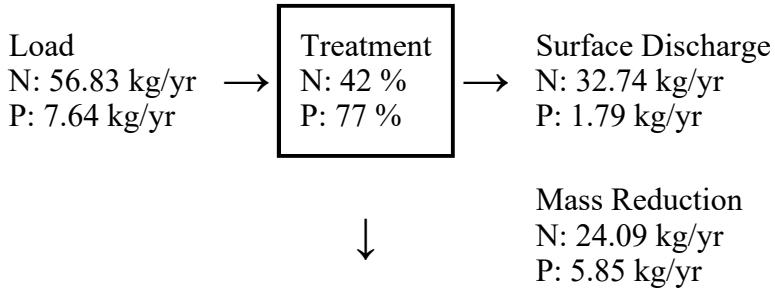
Type of Media Mix	Not Specified
Media N Reduction (%)	

Media P Reduction (%)

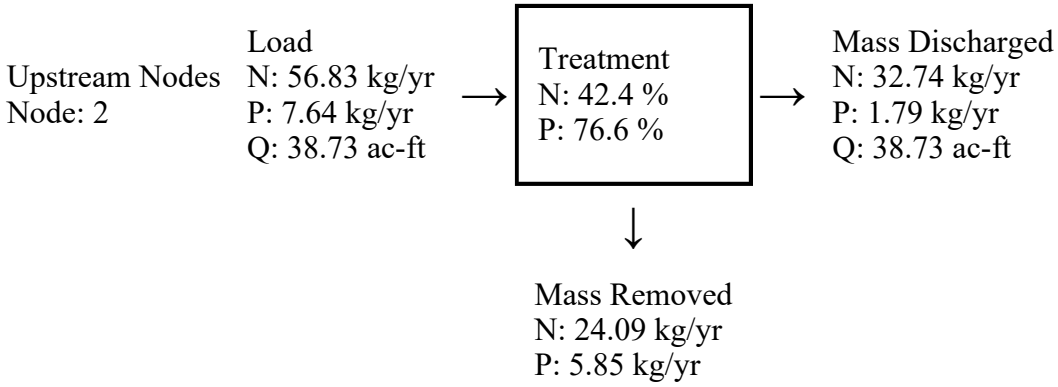
Groundwater Discharge (Stand-Alone)

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

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Catchment Number: 2 Name: Catchment 1 + 1

Project: 502 A
Date: 2/21/2024

None Design

Watershed Characteristics

Catchment Area (acres)	0.00
Contributing Area (acres)	0.000
Non-DCIA Curve Number	29.90
DCIA Percent	0.00
Rainfall Zone	Florida Zone 4
Rainfall (in)	52.00

Surface Water Discharge

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

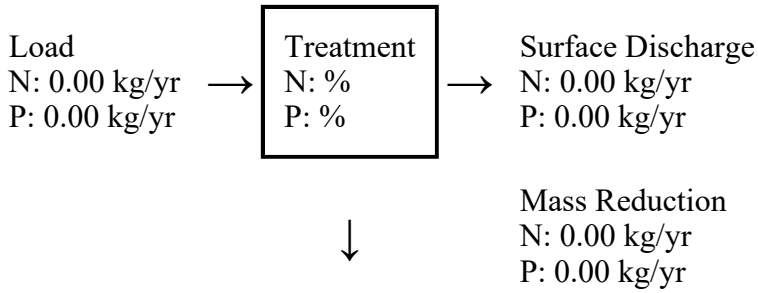
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	0.000
Media P Reduction (%)	0.000

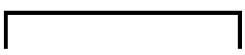
Groundwater Discharge (Stand-Alone)

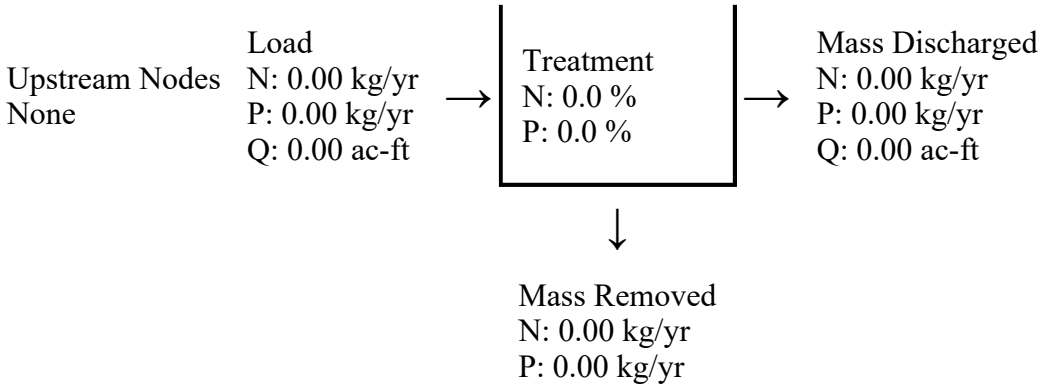
Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)





Summary Treatment Report Version: 4.3.5

Project: 502 A

Analysis Type: Net Improvement Date:2/21/2024

BMP Types:

Catchment 1 - (502) Wet Detention
Catchment 2 - (Catchment 1 + 1)

None

Based on % removal values to the nearest percent

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Catchment 1

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge		
Total N pre load	19.83 kg/yr	
Total N post load	56.83 kg/yr	
Target N load reduction	65 %	
Target N discharge load	19.83 kg/yr	
Percent N load reduction	42 %	
Provided N discharge load	32.74 kg/yr	72.2 lb/yr
Provided N load removed	24.09 kg/yr	53.11 lb/yr

Phosphorus

Surface Water Discharge	
Total P pre load	.343 kg/yr
Total P post load	7.641 kg/yr

Target P load reduction	96 %	
Target P discharge load	.343 kg/yr	
Percent P load reduction	77 %	
Provided P discharge load	1.791 kg/yr	3.95 lb/yr
Provided P load removed	5.85 kg/yr	12.899 lb/yr

Complete Report (not including cost) Ver 4.3.5

Project: 503
Date: 2/21/2024 10:13:19 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	503	Catchment 1 + 1
Rainfall Zone	Florida Zone 4	Florida Zone 4
Annual Mean Rainfall	52.00	52.00

Pre-Condition Landuse Information

Landuse	Undeveloped - Wet Flatwoods: TN=1.213 TP=0.021	Undeveloped - Wet Flatwoods: TN=1.213 TP=0.021
Area (acres)	33.24	0.10
Rational Coefficient (0-1)	0.05	0.05
Non DCIA Curve Number	64.00	64.00
DCIA Percent (0-100)	0.00	0.00
Nitrogen EMC (mg/l)	1.213	1.213
Phosphorus EMC (mg/l)	0.021	0.021
Runoff Volume (ac-ft/yr)	7.375	0.022
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	11.030	0.033
Phosphorus Loading (kg/yr)	0.191	0.001

Post-Condition Landuse Information

Landuse	User Defined Values	
Area (acres)	33.34	0.00
Rational Coefficient (0-1)	0.42	0.00
Non DCIA Curve Number	64.00	29.90
DCIA Percent (0-100)	48.00	0.00
Wet Pond Area (ac)	8.78	0.00

Nitrogen EMC (mg/l)	1.190	0.000
Phosphorus EMC (mg/l)	0.160	0.000
Runoff Volume (ac-ft/yr)	44.861	0.000
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	65.823	0.000
Phosphorus Loading (kg/yr)	8.850	0.000

Catchment Number: 1 Name: 503

Project: 503
Date: 2/21/2024

Wet Detention Design

Permanent Pool Volume (ac-ft)	26.220
Permanent Pool Volume (ac-ft) for 31 days residence	3.810
Annual Residence Time (days)	213
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	33.34
Contributing Area (acres)	24.560
Non-DCIA Curve Number	64.00
DCIA Percent	48.00
Rainfall Zone	Florida Zone 4
Rainfall (in)	52.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	83
Provided TN Treatment Efficiency (%)	43
Required TP Treatment Efficiency (%)	98
Provided TP Treatment Efficiency (%)	80

Media Mix Information

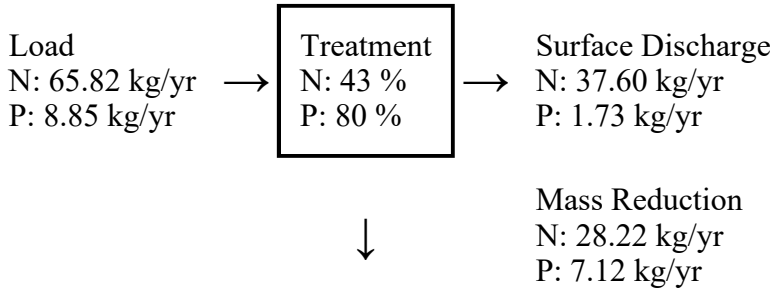
Type of Media Mix	Not Specified
Media N Reduction (%)	

Media P Reduction (%)

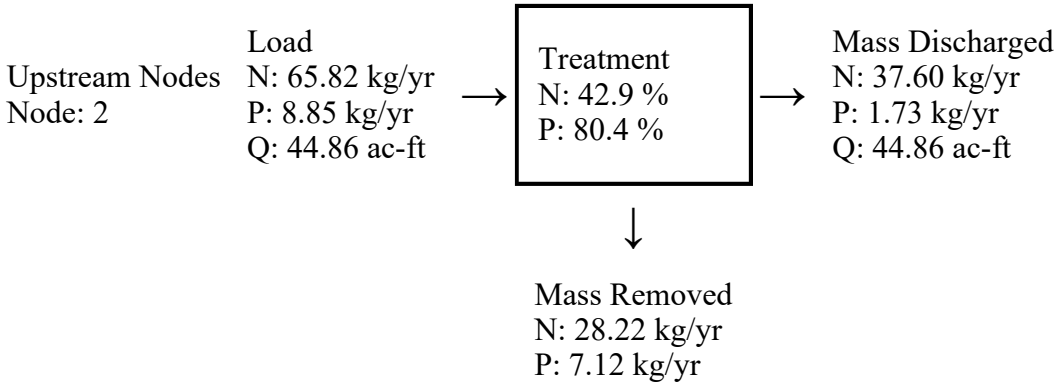
Groundwater Discharge (Stand-Alone)

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

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Catchment Number: 2 Name: Catchment 1 + 1

Project: 503
Date: 2/21/2024

None Design

Watershed Characteristics

Catchment Area (acres)	0.00
Contributing Area (acres)	0.000
Non-DCIA Curve Number	29.90
DCIA Percent	0.00
Rainfall Zone	Florida Zone 4
Rainfall (in)	52.00

Surface Water Discharge

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

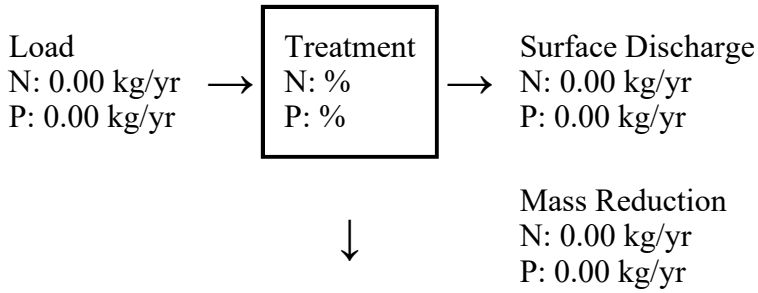
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	0.000
Media P Reduction (%)	0.000

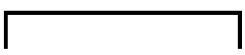
Groundwater Discharge (Stand-Alone)

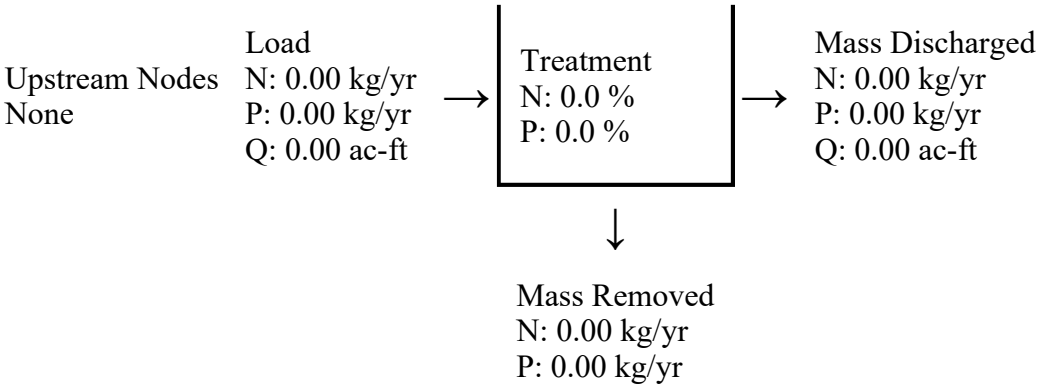
Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)





Summary Treatment Report Version: 4.3.5

Project: 503

Analysis Type: Net Improvement Date:2/21/2024

BMP Types:

Catchment 1 - (503) Wet Detention
Catchment 2 - (Catchment 1 + 1)

None

Based on % removal values to the nearest percent

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Catchment 1

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge		
Total N pre load	11.06 kg/yr	
Total N post load	65.82 kg/yr	
Target N load reduction	83 %	
Target N discharge load	11.06 kg/yr	
Percent N load reduction	43 %	
Provided N discharge load	37.6 kg/yr	82.92 lb/yr
Provided N load removed	28.22 kg/yr	62.22 lb/yr

Phosphorus

Surface Water Discharge	
Total P pre load	.192 kg/yr
Total P post load	8.85 kg/yr

Target P load reduction	98 %	
Target P discharge load	.192 kg/yr	
Percent P load reduction	80 %	
Provided P discharge load	1.732 kg/yr	3.82 lb/yr
Provided P load removed	7.118 kg/yr	15.695 lb/yr

Appendix F

Estimated Pond Costs

FPID 417540-4-52-01, SR 29 from S of Agriculture Way to CR 846 E
Offsite Pond Construction Cost Estimate

SMF 501-A					
Pay Item No.	**Description**	**Unit**	**Quantity**	**Unit Cost[1]**	**Total Cost**
110-1-1	CLEARING AND GRUBBING	AC	3.86	$ 33,017.94	$ 127,449.25
120-1	REGULAR EXCAVATION[2]	CY	23,393	$ 36.87	$ 862,499.91
120-6	EMBANKMENT[2]	CY	1,580	$ 43.27	$ 68,366.60
425-1-559	INLET, DT BOTTOM, TYPE E, MODIFY	EA	1	$ 14,199.46	$ 14,199.46
430-175-136	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 36" S/CD	LF	110	$ 295.34	$ 32,487.40
430-982-138	MITERED END SECTION, OPTIONAL ROUND, 36" C/D	EA	1	$ 8,295.09	$ 8,295.09
570-1-2	PERFORMANCE TURF, SOD	SY	6,292	$ 4.44	$ 27,936.48
				Subtotal:	**$ 1,141,234.19**
	Contingency	LS	1	10%	$ 114,123.42
				TOTAL:	**$ 1,255,357.61**

SMF 501-B					
Pay Item No.	**Description**	**Unit**	**Quantity**	**Unit Cost[1]**	**Total Cost**
110-1-1	CLEARING AND GRUBBING	AC	5.55	$ 33,017.94	$ 183,249.57
120-1	REGULAR EXCAVATION[2]	CY	28,410	$ 36.87	$ 1,047,476.70
120-6	EMBANKMENT[2]	CY	0	$ 43.27	$ -
425-1-559	INLET, DT BOTTOM, TYPE E, MODIFY	EA	1	$ 14,199.46	$ 14,199.46
430-175-136	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 36" S/CD	LF	85	$ 295.34	$ 25,103.90
430-982-138	MITERED END SECTION, OPTIONAL ROUND, 36" C/D	EA	1	$ 8,295.09	$ 8,295.09
570-1-2	PERFORMANCE TURF, SOD	SY	10,842	$ 4.44	$ 48,136.70
				Subtotal:	**$ 1,326,461.42**
	Contingency	LS	1	10%	$ 132,646.14
				TOTAL:	**$ 1,459,107.56**

SMF 501-C					
Pay Item No.	**Description**	**Unit**	**Quantity**	**Unit Cost[1]**	**Total Cost**
110-1-1	CLEARING AND GRUBBING	AC	4.31	$ 33,017.94	$ 142,307.32
120-1	REGULAR EXCAVATION[2]	CY	28,056	$ 36.87	$ 1,034,424.72
120-6	EMBANKMENT[2]	CY	0	$ 43.27	$ -
425-1-559	INLET, DT BOTTOM, TYPE E, MODIFY	EA	1	$ 14,199.46	$ 14,199.46
430-175-136	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 36" S/CD	LF	75	$ 295.34	$ 22,150.50
430-982-138	MITERED END SECTION, OPTIONAL ROUND, 36" C/D	EA	1	$ 8,295.09	$ 8,295.09
531-1-100	IMPERMEABLE POND LINER	SY	17,714	$ 24.00	$ 425,136.00
570-1-2	PERFORMANCE TURF, SOD	SY	6340	$ 4.44	$ 28,151.38
				Subtotal:	**$ 1,674,664.47**
	Contingency	LS	1	10%	$ 167,466.45
				TOTAL:	**$ 1,842,130.92**

Notes:
Note 1 - Statewide average unit cost unless otherwise noted
Note 2 - Market Area 10 used for earthwork

[1]Unit prices are from the latest FDOT 12-month moving area average unit costs (Area 10 Collier), where available. Rounded up to the nearest $1.

FPID 417540-4-52-01, SR 29 from S of Agriculture Way to CR 846 E
Offsite Pond Construction Cost Estimate

SMF 502-A					
Pay Item No.	**Description**	**Unit**	**Quantity**	**Unit Cost[1]**	**Total Cost**
110-1-1	CLEARING AND GRUBBING	AC	5.58	$ 33,017.94	$ 184,240.11
120-1	REGULAR EXCAVATION[2]	CY	30,830	$ 36.87	$ 1,136,702.10
120-6	EMBANKMENT[2]	CY	2,510	$ 43.27	$ 108,607.70
425-1-559	INLET, DT BOTTOM, TYPE E, MODIFY	EA	1	$ 14,199.46	$ 14,199.46
430-175-136	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 36" S/CD	LF	75	$ 295.34	$ 22,150.50
430-982-138	MITERED END SECTION, OPTIONAL ROUND, 36" C/D	EA	1	$ 8,295.09	$ 8,295.09
570-1-2	PERFORMANCE TURF, SOD	SY	9,244	$ 4.44	$ 41,045.14
				Subtotal:	**$ 1,515,240.09**
	Contingency	LS	1	10%	$ 151,524.01
				TOTAL:	**$ 1,666,764.10**

SMF 502-B					
Pay Item No.	**Description**	**Unit**	**Quantity**	**Unit Cost[1]**	**Total Cost**
110-1-1	CLEARING AND GRUBBING	AC	5.47	$ 33,017.94	$ 180,608.13
120-1	REGULAR EXCAVATION[2]	CY	27,846	$ 36.87	$ 1,026,682.02
120-6	EMBANKMENT[2]	CY	3,087	$ 43.27	$ 133,574.49
425-1-559	INLET, DT BOTTOM, TYPE E, MODIFY	EA	1	$ 14,199.46	$ 14,199.46
430-175-136	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 36" S/CD	LF	60	$ 295.34	$ 17,720.40
430-982-138	MITERED END SECTION, OPTIONAL ROUND, 36" C/D	EA	1	$ 8,295.09	$ 8,295.09
570-1-2	PERFORMANCE TURF, SOD	SY	9,002	$ 4.44	$ 39,970.66
				Subtotal:	**$ 1,421,050.25**
	Contingency	LS	1	10%	$ 142,105.02
				TOTAL:	**$ 1,563,155.27**

Notes:
Note 1 - Statewide average unit cost unless otherwise noted
Note 2 - Market Area 10 used for earthwork

[1]Unit prices are from the latest FDOT 12-month moving area average unit costs (Area 10 Collier), where available. Rounded up to the nearest $1.

FPID 417540-4-52-01, SR 29 from S of Agriculture Way to CR 846 E
Offsite Pond Construction Cost Estimate

SMF 503-A					
Pay Item No.	**Description**	**Unit**	**Quantity**	**Unit Cost[1]**	**Total Cost**
110-1-1	CLEARING AND GRUBBING	AC	6.8	$ 33,017.94	$ 224,521.99
120-1	REGULAR EXCAVATION[2]	CY	49,319	$ 36.87	$ 1,818,391.53
120-6	EMBANKMENT[2]	CY	2,486	$ 43.27	$ 107,569.22
425-1-559	INLET, DT BOTTOM, TYPE E, MODIFY	EA	1	$ 14,199.46	$ 14,199.46
430-175-136	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 36" S/CD	LF	400	$ 295.34	$ 118,136.00
430-982-138	MITERED END SECTION, OPTIONAL ROUND, 36" C/D	EA	1	$ 8,295.09	$ 8,295.09
570-1-2	PERFORMANCE TURF, SOD	SY	8,422	$ 4.44	$ 37,391.90
				Subtotal:	**$ 2,328,505.20**
	Contingency	LS	1	10%	$ 232,850.52
				TOTAL:	**$ 2,561,355.72**

SMF 503-B					
Pay Item No.	**Description**	**Unit**	**Quantity**	**Unit Cost[1]**	**Total Cost**
110-1-1	CLEARING AND GRUBBING	AC	11.15	$ 33,017.94	$ 368,150.03
120-1	REGULAR EXCAVATION[2]	CY	64,566	$ 36.87	$ 2,380,548.42
120-6	EMBANKMENT[2]	CY	2,844	$ 43.27	$ 123,059.88
425-1-559	INLET, DT BOTTOM, TYPE E, MODIFY	EA	1	$ 14,199.46	$ 14,199.46
430-175-136	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 36" S/CD	LF	60	$ 295.34	$ 17,720.40
430-982-138	MITERED END SECTION, OPTIONAL ROUND, 36" C/D	EA	1	$ 8,295.09	$ 8,295.09
570-1-2	PERFORMANCE TURF, SOD	SY	20,667	$ 4.44	$ 91,760.59
				Subtotal:	**$ 3,003,733.87**
	Contingency	LS	1	10%	$ 300,373.39
				TOTAL:	**$ 3,304,107.26**

Notes:
Note 1 - Statewide average unit cost unless otherwise noted
Note 2 - Market Area 10 used for earthwork

[1]Unit prices are from the latest FDOT 12-month moving area average unit costs (Area 10 Collier), where available. Rounded up to the nearest $1.

Appendix G
Geotechnical

SUMMARY OF PRELIMINARY SEASONAL HIGH GROUNDWATER TABLE ESTIMATES
SR 29 FROM CR 846 TO NEW MARKET ROAD
COLLIER COUNTY, FLORIDA
FPID NO.: 417540-5-32-01
TEST LAB PROJECT NO: 19-5004

Boring Name	Boring Location[1]		Boring Depth	Date Recorded	Ground Elevation[2]	Measured Groundwater Table		USDA Soil Survey		Estimated SHGWT[5]	
	Northing	Easting	(feet)		(feet, NAVD)	Depth[3] (feet)	Elevation (feet, NAVD)	Map Symbol	Estimated SHGWT[4] Depth (feet)	Depth[3] (feet)	Elevation (feet , NAVD)
ROADWAY BORINGS											
HA-1	758173.23	522302.32	5.0	11/27/2019	30.9	5.0	25.9	117	0.5-1.5	1.5	29.4
HA-2	758653.11	522243.94	5.0	11/27/2019	30.7	5.0	25.7	117	0.5-1.5	1.0	29.7
HA-3	759137.42	522068.82	5.0	11/27/2019	32.2	GNE	GNE	118	0.5-1.5	2.0	30.2
HA-4	759655.89	522109.26	5.0	11/27/2019	33.1	GNE	GNE	8	0.5-1.5	2.5	30.6
HA-5	760148.48	522012.16	5.0	11/27/2019	31.5	GNE	GNE	118	0.5-1.5	1.5	30.0
HA-6	760648.76	522109.79	5.0	11/27/2019	33.4	GNE	GNE	8	0.5-1.5	3.0	30.4
HA-7	761105.75	521891.83	5.0	11/27/2019	33.2	GNE	GNE	8	0.5-1.5	2.5	30.7
HA-8	761590.04	521754.78	5.0	11/27/2019	34.3	GNE	GNE	8	0.5-1.5	3.5	30.8
HA-9	761955.05	521364.26	5.0	11/27/2019	32.2	5.0	27.2	8	0.5-1.5	1.5	30.7
HA-10	762262.30	520997.28	5.0	11/27/2019	30.6	3.5	27.1	27	0.3-1.5	0.5	30.1
HA-11	762365.96	520490.24	5.0	11/27/2019	31.4	4.5	26.9	27	0.3-1.5	0.5	30.9
HA-12	762659.51	520079.90	5.0	11/27/2019	32.3	5.0	27.3	7	0.5-1.5	1.5	30.8
HA-13	762801.54	519583.55	5.0	11/27/2019	31.0	4.0	27.0	27	0.3-1.5	1.0	30.0
HA-14	763131.32	519194.24	5.0	11/27/2019	32.4	5.0	27.4	7	0.5-1.5	1.0	31.4
HA-15	763312.11	518721.78	5.0	11/27/2019	32.4	5.0	27.4	27	0.3-1.5	1.0	31.4
HA-16	763684.12	518371.27	5.0	11/27/2019	31.7	4.5	27.2	27	0.3-1.5	0.5	31.2
HA-17	763941.66	517929.35	5.0	11/27/2019	31.6	4.5	27.1	118	0.5-1.5	0.5	31.1
HA-18	764338.88	517584.18	5.0	11/27/2019	33.8	GNE	GNE	16	0.5-1.5	2.5	31.3
HA-19	764619.42	517225.09	5.0	12/2/2019	33.7	GNE	GNE	16	0.5-1.5	2.0	31.7
HA-20	765040.80	516912.17	5.0	12/2/2019	34.0	GNE	GNE	16	0.5-1.5	2.0	32.0
HA-21	765373.13	516515.50	5.0	12/2/2019	34.3	GNE	GNE	15	0.5-1.5	2.0	32.3
HA-22	765817.84	516286.01	5.0	12/2/2019	35.4	GNE	GNE	16	0.5-1.5	3.0	32.4
HA-23	766183.43	515938.43	5.0	12/2/2019	35.0	GNE	GNE	16	0.5-1.5	2.5	32.5
HA-24	766666.36	515751.13	5.0	12/2/2019	34.2	GNE	GNE	16	0.5-1.5	2.0	32.2
HA-25	767055.39	515444.11	5.0	12/2/2019	34.6	GNE	GNE	16	0.5-1.5	3.0	31.6
HA-26	767535.65	515271.63	5.0	12/2/2019	34.9	GNE	GNE	15	0.5-3.5	3.5	31.4
HA-27	767945.74	514994.24	5.0	12/2/2019	35.0	GNE	GNE	15	0.5-3.5	3.0	32.0
HA-28	768437.08	514867.11	5.0	12/2/2019	35.1	GNE	GNE	15	0.5-3.5	2.5	32.6
HA-29	768885.85	514634.70	5.0	12/2/2019	35.6	GNE	GNE	7	0.5-1.5	3.0	32.6
HA-30	769363.18	514558.21	5.0	12/2/2019	35.2	GNE	GNE	15	0.5-3.5	2.5	32.7
HA-31	769848.39	514354.13	5.0	12/2/2019	33.5	5.0	28.5	17	0.3-1.5	1.0	32.5
HA-32	770351.81	514333.14	5.0	12/2/2019	33.4	4.5	28.9	17	0.3-1.5	0.5	32.9
HA-33	770840.13	514172.66	5.0	12/2/2019	34.1	GNE	GNE	8	0.5-1.5	1.5	32.6

SUMMARY OF PRELIMINARY SEASONAL HIGH GROUNDWATER TABLE ESTIMATES
SR 29 FROM CR 846 TO NEW MARKET ROAD
COLLIER COUNTY, FLORIDA
FPID NO.: 417540-5-32-01
TEST LAB PROJECT NO: 19-5004

Boring Name	Boring Location[1]		Boring Depth	Date Recorded	Ground Elevation[2]	Measured Groundwater Table		USDA Soil Survey		Estimated SHGWT[5]	
	Northing	Easting	(feet)		(feet, NAVD)	Depth[3] (feet)	Elevation (feet, NAVD)	Map Symbol	Estimated SHGWT[4] Depth (feet)	Depth[3] (feet)	Elevation (feet , NAVD)
HA-34	771328.42	514193.78	5.0	12/2/2019	32.7	5.0	27.7	8	0.5-1.5	0.5	32.2
HA-35	771873.42	514091.47	5.0	12/2/2019	36.7	GNE	GNE	8	0.5-1.5	4.0	32.7
HA-36	772317.62	514150.13	5.0	12/2/2019	34.0	5.0	29.0	17	0.3-1.5	1.5	32.5
HA-37	772832.73	514074.77	5.0	12/2/2019	36.4	GNE	GNE	17	0.3-1.5	3.5	32.9
HA-38	773333.56	514165.99	5.0	12/2/2019	33.6	4.5	29.1	117	0.5-1.5	1.0	32.6
HA-39	773802.01	514054.75	5.0	12/2/2019	36.0	GNE	GNE	117	0.5-1.5	ND	ND

(1) Boring location provided by McKim&Creed

(2) Boring elevation provided by McKim&Creed using the NAVD 1988 Datum

(3) Depth below existing grades at time of field exploration

(4) Seasonal high groundwater table depth presented in the Soil Survey of Collier County, Florida published by the USDA/NRCS

(5) Seasonal high groundwater table depth estimated based on soil stratigraphy, measured groundwater levels from the borings, the Soil Survey of Collier County published information and past experience with similar soil conditions

(6) GNE = Groundwater Not Encountered within the depth of the boring performed

(7) ND = SHGWT could not be determined due to disturbed soil conditions

TEST LAB INC.
GEOTECHNICAL & MATERIALS
ENGINEERING, TESTING & INSPECTION

March 11, 2022

Patel, Greene & Associates, PLLC
12570 Telecom Dr.
Temple Terrace, Florida 33637

Attention: Mr. Trevor J. Hawkins, P.E.
Mr. Kenneth Yinger, P.E.

RE: Geotechnical Exploration - Pond Siting Considerations
SR 29 from CR 846 E to New Market Road
Collier County, Florida
FPID: 417540-5
Test Lab Project No: 19-5004

Gentlemen:

Test Lab, Inc. (Test Lab) has completed geotechnical services to support the pond siting considerations at the above referenced project. A total of eight (8) hand auger borings were completed to estimate Seasonal High Groundwater Table (SHGWT). The depths of these borings ranged from approximately 3 to 5 feet below existing grade. In addition, a total of eight (8) Standard Penetration Test (SPT) borings were completed to evaluate the soil composition and depth of the confining layer for the pond design considerations. The depths of SPT borings were each 25 feet below existing grade. The boring locations and elevations were established by the project surveyor and are presented on the **Boring Location Plan Sheets**.

In general, the subsurface conditions encountered in the borings consisted predominantly of sandy soils (A-3/A-2-4), silty sand/silty-clayey sand/clayey sand (A-2-4), and clayey sand (A-2-6) within the boring depths. Secondary constituents encountered in the borings included rootlets, cemented sand, and trace phosphates. More details regarding subsurface conditions encountered at each boring location are presented on the attached **Soil Profiles Sheets.**

The SHGWT level at each hand auger boring was estimated based on a review of the soil stratigraphy within the samples recovered, groundwater levels observed, USDA Soil Survey information and the surrounding topography. The SHGWT was estimated to range from ½-foot to 3 feet below existing grade. The estimated SHGWT levels at the boring locations are presented on the attached **Soil Profiles Sheets.**

When reviewing the provided groundwater information, it should be noted that groundwater levels tend to fluctuate during periods of prolonged drought and extended rainfall and may be affected by man-made influences.

A confining layer is considered a layer that impedes the flow of water. The depth of the surface of the confining layer was found to range from 4 to 8 feet below grade. Strata 2 and 4 are materials consistent with the confining layer.

Test Lab appreciates the opportunity to be a part of this project. If you have any questions about this report, or if we can be of further service to you, please do not hesitate to contact our office.

Sincerely,

Test Lab, Inc.
4112 West Osborne Avenue, Tampa, Florida
Certificate of Authorization No. 1450

IGOR KRATSER LICENSE No 73129 STATE OF FLORIDA PROFESSIONAL ENGINEER

Connie A. Johnson-Gearhart, P.E.
Geotechnical Engineer
Florida License No. 69013

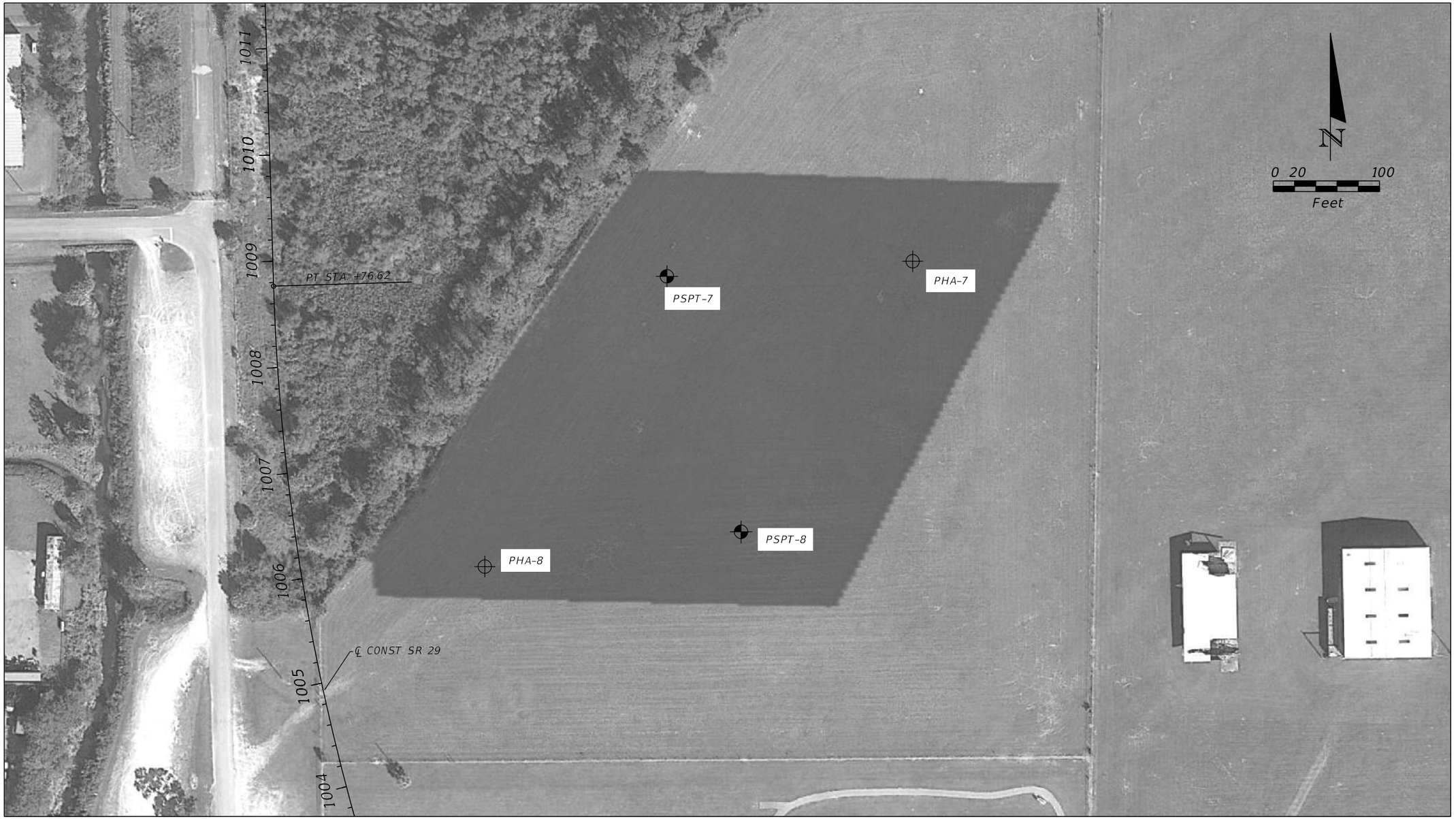
Igor (Igon) Kratser, P.E.
Senior Geotechnical Engineer
Florida License No. 73129

This item has been digitally signed and sealed by Igor (Igon) Kratser, P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Attachments: Boring Location Plan and Soil Profile Sheets 1 through 7

BORING LOCATION PLAN



LEGEND

- APPROXIMATE SPT BORING LOCATION
- APPROXIMATE HAND AUGER BORING LOCATION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. LICENSE NUMBER 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

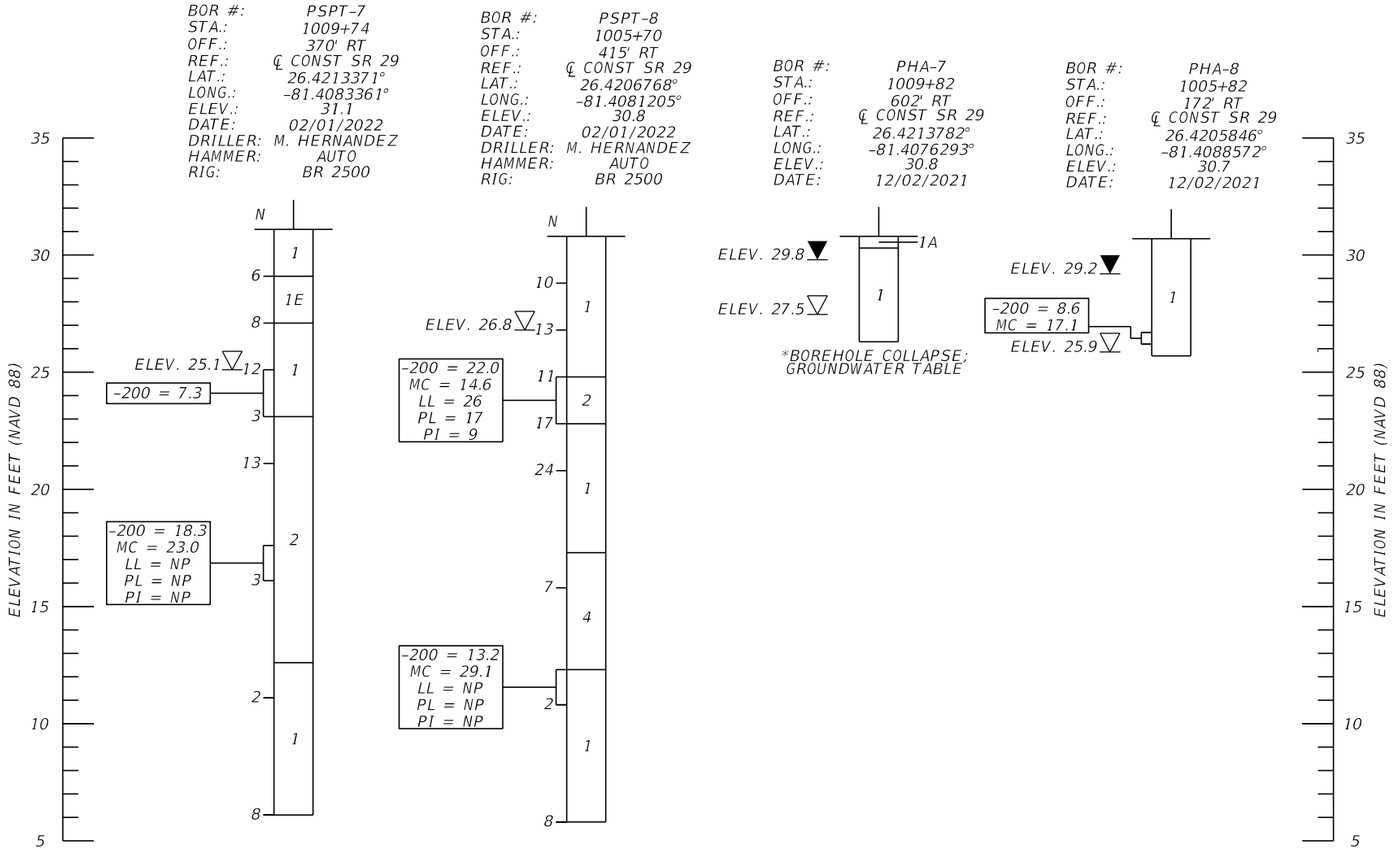
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-1

BORING LOCATION PLAN

SHEET NO. 1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT (BLOWS/FT.)
VERY LOOSE	LEES THAN 3
LOOSE	3 TO 8
MEDIUM DENSE	8 TO 24
DENSE	24 TO 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT (BLOWS/FT.)
VERY SOFT	LEES THAN 1
SOFT	1 TO 3
FIRM	3 TO 6
STIFF	6 TO 12
VERY STIFF	12 TO 24
HARD	GREATER THAN 24

LEGEND

1	GRAY TO LIGHT GRAY TO PALE YELLOW TO WHITE TO VERY DARK GRAY TO DARK BROWN TO BROWN TO YELLOWISH-BROWN TO DARK GRAYISH-BROWN TO DARK REDDISH-BROWN POORLY GRADED SAND TO SAND WITH SILT (A-3/A-2-4)
2	PALE BROWN TO GRAY TO DARK BROWN TO REDDISH-BROWN TO VERY DARK GRAY SILTY SAND TO SILTY, CLAYEY SAND TO CLAYEY SAND (A-2-4)
3	GRAYISH-BROWN TO DARK GRAY SAND WITH SILT AND LIMEROCK FRAGMENTS AND/OR CLAY LENSES (STABILIZED SUBGRADE) (A-1-B/A-3)
4	LIGHT GRAY TO PALE BROWN TO BLUISH-GRAY CLAYEY SAND (A-2-6)
5	WEATHERED LIMESTONE
A	WITH ROOTLETS
B	WITH SMALL CLAY LENSES
C	WITH LIMEROCK FRAGMENTS
D	WITH TRACE TO MINOR ORGANICS
E	WITH CEMENTED SAND
F	WITH TRACE PHOSPHATES
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND/OR LABORATORY TESTING
LL	LIQUID LIMIT (%)
PL	PLASTIC LIMIT (%)
PI	PLASTICITY INDEX (%)
MC	MOISTURE CONTENT (%)
NP	NON PLASTIC
℄	CENTERLINE OF CONSTRUCTION
ELEV. 28.9	GROUND SURFACE ELEVATION (NAVD 88) AT TEST LOCATION
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
GNE	GROUNDWATER TABLE NOT ENCOUNTERED
▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUND WATER TABLE

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. LICENSE NUMBER 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-1

SOIL PROFILE(S)

SHEET NO. 2

BORING LOCATION PLAN

LEGEND

APPROXIMATE SPT BORING LOCATION

APPROXIMATE HAND AUGER BORING LOCATION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. LICENSE NUMBER 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-1

BORING LOCATION PLAN

SHEET NO. 3

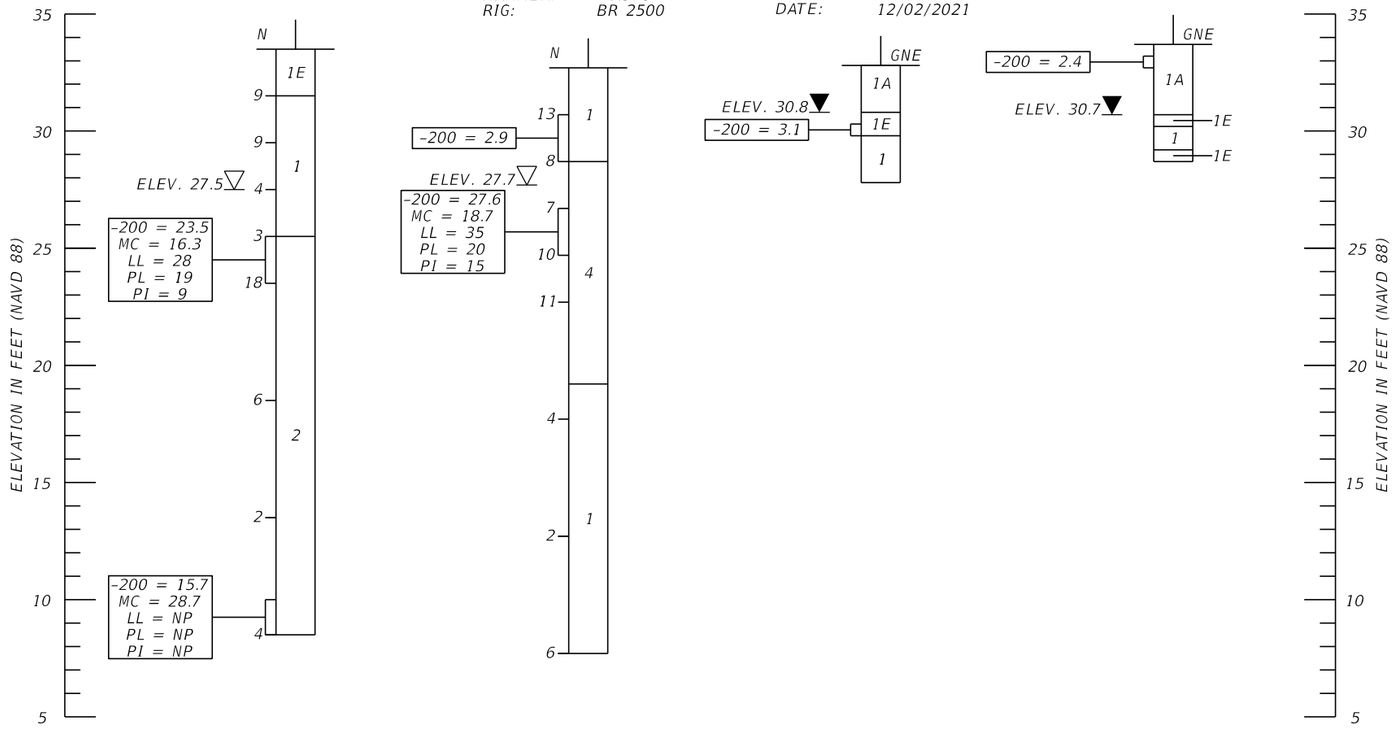
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

BOR #: PSPT-5
STA.: 1023+81
OFF.: 104' LT
REF.: ℄ CONST SR 29
LAT.: 26.4254362°
LONG.: -81.4099365°
ELEV.: 33.5
DATE: 02/03/2022
DRILLER: M. HERNANDEZ
HAMMER: AUTO
RIG: BR 2500

BOR #: PSPT-6
STA.: 1031+80
OFF.: 319' LT
REF.: ℄ CONST SR 29
LAT.: 26.4272424°
LONG.: -81.4110179°
ELEV.: 32.7
DATE: 02/03/2022
DRILLER: M. HERNANDEZ
HAMMER: AUTO
RIG: BR 2500

BOR #: PHA-5
STA.: 1028+19
OFF.: 144' LT
REF.: ℄ CONST SR 29
LAT.: 26.4265506°
LONG.: -81.4102085°
ELEV.: 32.8
DATE: 12/02/2021

BOR #: PHA-6
STA.: 1035+23
OFF.: 196' LT
REF.: ℄ CONST SR 29
LAT.: 26.4281344°
LONG.: -81.4111061°
ELEV.: 33.7
DATE: 12/02/2021



	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT (BLOWS/FT.)
VERY LOOSE	LEES THAN 3
LOOSE	3 TO 8
MEDIUM DENSE	8 TO 24
DENSE	24 TO 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT (BLOWS/FT.)
VERY SOFT	LEES THAN 1
SOFT	1 TO 3
FIRM	3 TO 6
STIFF	6 TO 12
VERY STIFF	12 TO 24
HARD	GREATER THAN 24

LEGEND

1	GRAY TO LIGHT GRAY TO PALE YELLOW TO WHITE TO VERY DARK GRAY TO DARK BROWN TO BROWN TO YELLOWISH-BROWN TO DARK GRAYISH-BROWN TO DARK REDDISH-BROWN POORLY GRADED SAND TO SAND WITH SILT (A-3/A-2-4)
2	PALE BROWN TO GRAY TO DARK BROWN TO REDDISH-BROWN TO VERY DARK GRAY SILTY SAND TO SILTY, CLAYEY SAND TO CLAYEY SAND (A-2-4)
3	GRAYISH-BROWN TO DARK GRAY SAND WITH SILT AND LIMEROCK FRAGMENTS AND/OR CLAY LENSES (STABILIZED SUBGRADE) (A-1-B/A-3)
4	LIGHT GRAY TO PALE BROWN TO BLUISH-GRAY CLAYEY SAND (A-2-6)
5	WEATHERED LIMESTONE
A	WITH ROOTLETS
B	WITH SMALL CLAY LENSES
C	WITH LIMEROCK FRAGMENTS
D	WITH TRACE TO MINOR ORGANICS
E	WITH CEMENTED SAND
F	WITH TRACE PHOSPHATES
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND/OR LABORATORY TESTING
LL	LIQUID LIMIT (%)
PL	PLASTIC LIMIT (%)
PI	PLASTICITY INDEX (%)
MC	MOISTURE CONTENT (%)
NP	NON PLASTIC
℄	CENTERLINE OF CONSTRUCTION
ELEV. 28.9	GROUND SURFACE ELEVATION (NAVD 88) AT TEST LOCATION
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
GNE	GROUNDWATER TABLE NOT ENCOUNTERED
▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUND WATER TABLE

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. LICENSE NUMBER 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-1

SOIL PROFILE(S)

SHEET NO. 4

BORING LOCATION PLAN

LEGEND

- APPROXIMATE SPT BORING LOCATION
- APPROXIMATE HAND AUGER BORING LOCATION

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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TAMPA, FL 33614

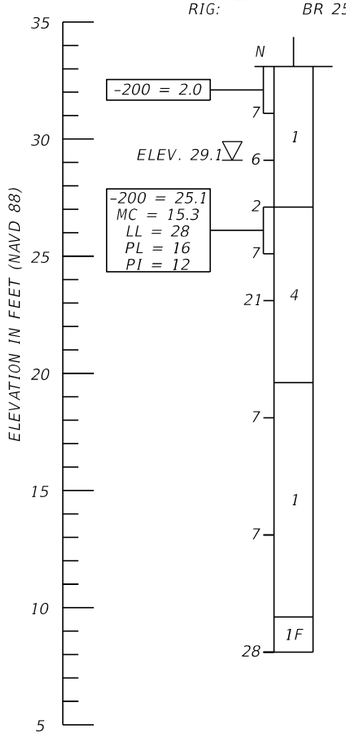
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-1

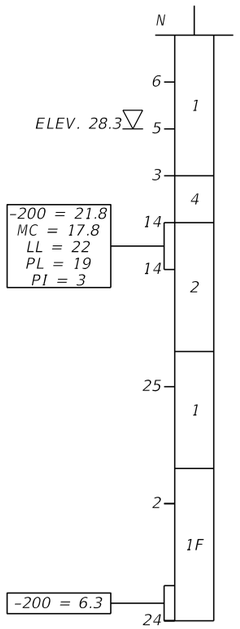
BORING LOCATION PLAN

SHEET NO. 5

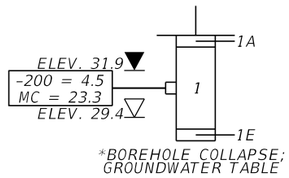
BOR #: PSPT-1
STA.: 1088+51
OFF.: 434' RT
REF.: ℄ CONST SR 29
LAT.: 26.4370676°
LONG.: -81.4232569°
ELEV.: 33.1
DATE: 02/02/2022
DRILLER: M. HERNANDEZ
HAMMER: AUTO
RIG: BR 2500



BOR #: PSPT-2
STA.: 1083+63
OFF.: 205' RT
REF.: ℄ CONST SR 29
LAT.: 26.4357378°
LONG.: -81.4226406°
ELEV.: 32.3
DATE: 02/02/2022
DRILLER: M. HERNANDEZ
HAMMER: AUTO
RIG: BR 2500

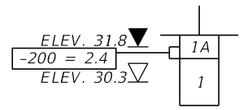


BOR #: PHA-1
STA.: 1088+60
OFF.: 174' RT
REF.: ℄ CONST SR 29
LAT.: 26.4365600°
LONG.: -81.4238171°
ELEV.: 33.4
DATE: 12/02/2021

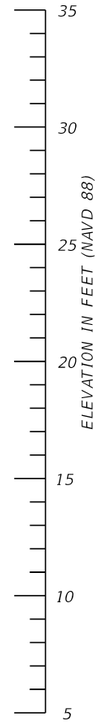


*BOREHOLE COLLAPSE; GROUNDWATER TABLE

BOR #: PHA-2
STA.: 1083+87
OFF.: 386' RT
REF.: ℄ CONST SR 29
LAT.: 26.4361614°
LONG.: -81.4223397°
ELEV.: 32.3
DATE: 12/02/2021



*BOREHOLE COLLAPSE; GROUNDWATER TABLE



	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT (BLOWS/FT.)
VERY LOOSE	LEES THAN 3
LOOSE	3 TO 8
MEDIUM DENSE	8 TO 24
DENSE	24 TO 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT (BLOWS/FT.)
VERY SOFT	LEES THAN 1
SOFT	1 TO 3
FIRM	3 TO 6
STIFF	6 TO 12
VERY STIFF	12 TO 24
HARD	GREATER THAN 24

LEGEND

1	GRAY TO LIGHT GRAY TO PALE YELLOW TO WHITE TO VERY DARK GRAY TO DARK BROWN TO BROWN TO YELLOWISH-BROWN TO DARK GRAYISH-BROWN TO DARK REDDISH-BROWN POORLY GRADED SAND TO SAND WITH SILT (A-3/A-2-4)
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LL	LIQUID LIMIT (%)
PL	PLASTIC LIMIT (%)
PI	PLASTICITY INDEX (%)
MC	MOISTURE CONTENT (%)
NP	NON PLASTIC
℄	CENTERLINE OF CONSTRUCTION
ELEV. 28.9	GROUND SURFACE ELEVATION (NAVD 88) AT TEST LOCATION
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
GNE	GROUNDWATER TABLE NOT ENCOUNTERED
▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUND WATER TABLE

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TAMPA, FL 33614

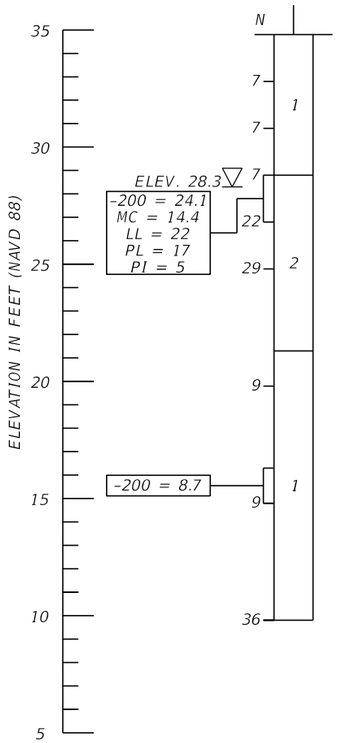
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-1

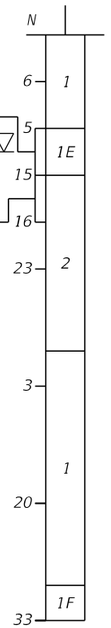
SOIL PROFILE(S)

SHEET NO. 6

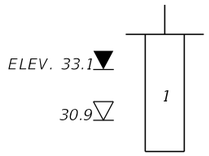
BOR #: PSPT-3
STA.: 1098+50
OFF.: 282' LT
REF.: ℄ CONST SR 29
LAT.: 26.4376685°
LONG.: -81.4269270°
ELEV.: 34.8
DATE: 02/02/2022
DRILLER: M. HERNANDEZ
HAMMER: AUTO
RIG: BR 2500



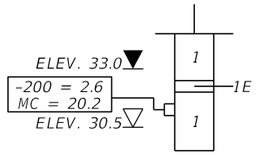
BOR #: PSPT-4
STA.: 1084+16
OFF.: 261' LT
REF.: ℄ CONST SR 29
LAT.: 26.4348509°
LONG.: -81.4236808°
ELEV.: 33.0
DATE: 02/02/2022
DRILLER: M. HERNANDEZ
HAMMER: AUTO
RIG: BR 2500

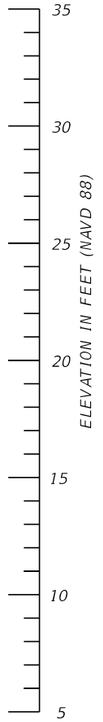


BOR #: PHA-3
STA.: 1103+52
OFF.: 206' LT
REF.: ℄ CONST SR 29
LAT.: 26.4389021°
LONG.: -81.4277422°
ELEV.: 34.6
DATE: 12/02/2021



BOR #: PHA-4
STA.: 1090+33
OFF.: 237' LT
REF.: ℄ CONST SR 29
LAT.: 26.4360701°
LONG.: -81.4250665°
ELEV.: 34.5
DATE: 12/02/2021





	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT (BLOWS/FT.)
VERY LOOSE	LEES THAN 3
LOOSE	3 TO 8
MEDIUM DENSE	8 TO 24
DENSE	24 TO 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT (BLOWS/FT.)
VERY SOFT	LEES THAN 1
SOFT	1 TO 3
FIRM	3 TO 6
STIFF	6 TO 12
VERY STIFF	12 TO 24
HARD	GREATER THAN 24

LEGEND

1	GRAY TO LIGHT GRAY TO PALE YELLOW TO WHITE TO VERY DARK GRAY TO DARK BROWN TO BROWN TO YELLOWISH-BROWN TO DARK GRAYISH-BROWN TO DARK REDDISH-BROWN POORLY GRADED SAND TO SAND WITH SILT (A-3/A-2-4)
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LL	LIQUID LIMIT (%)
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NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
GNE	GROUNDWATER TABLE NOT ENCOUNTERED
▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUND WATER TABLE

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

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P.E. LICENSE NUMBER 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 29	COLLIER	417540-5-32-1

SOIL PROFILE(S)

SHEET NO. 7

United States Department of Agriculture

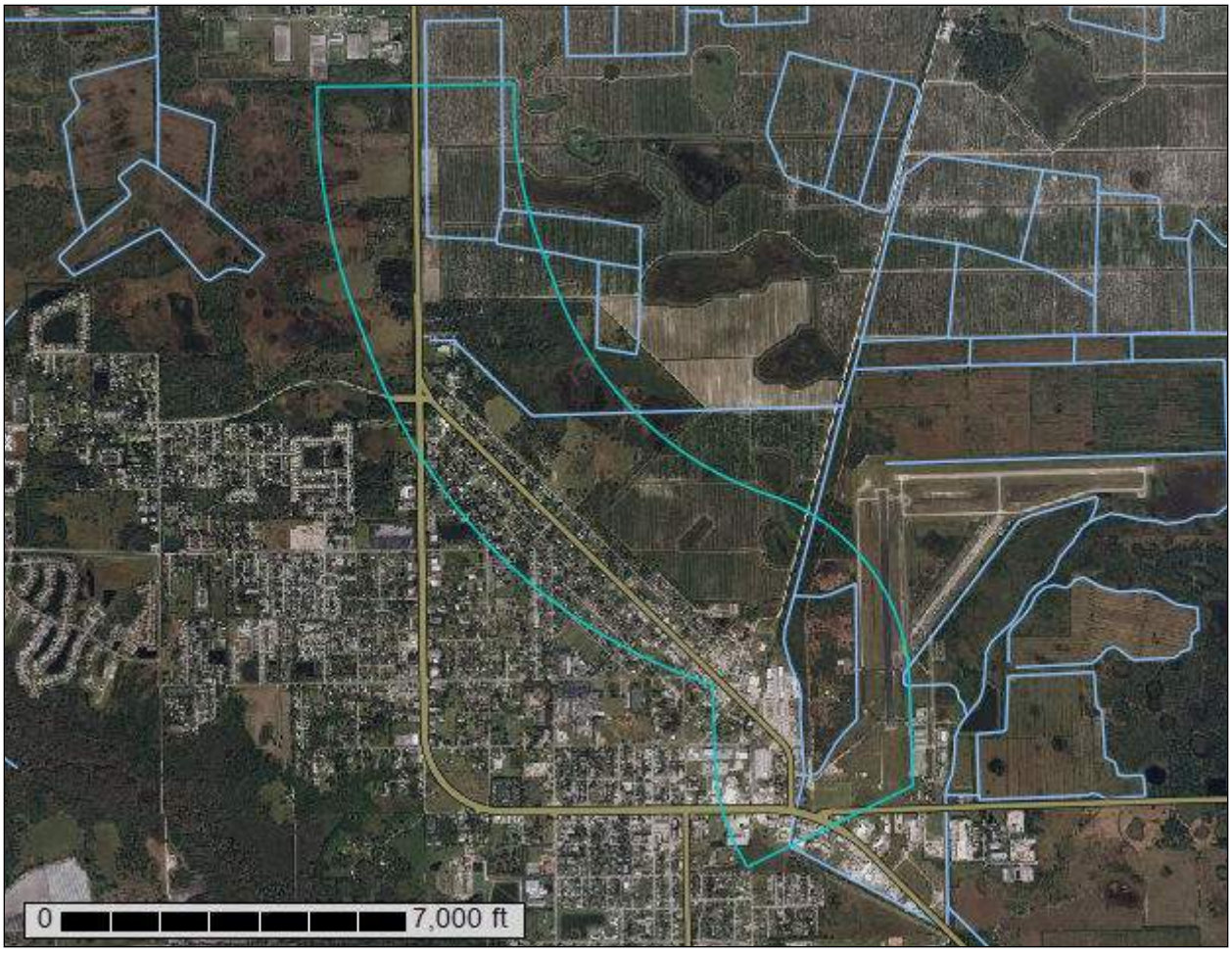
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Collier County Area, Florida

SR 29 Soil Report



October 7, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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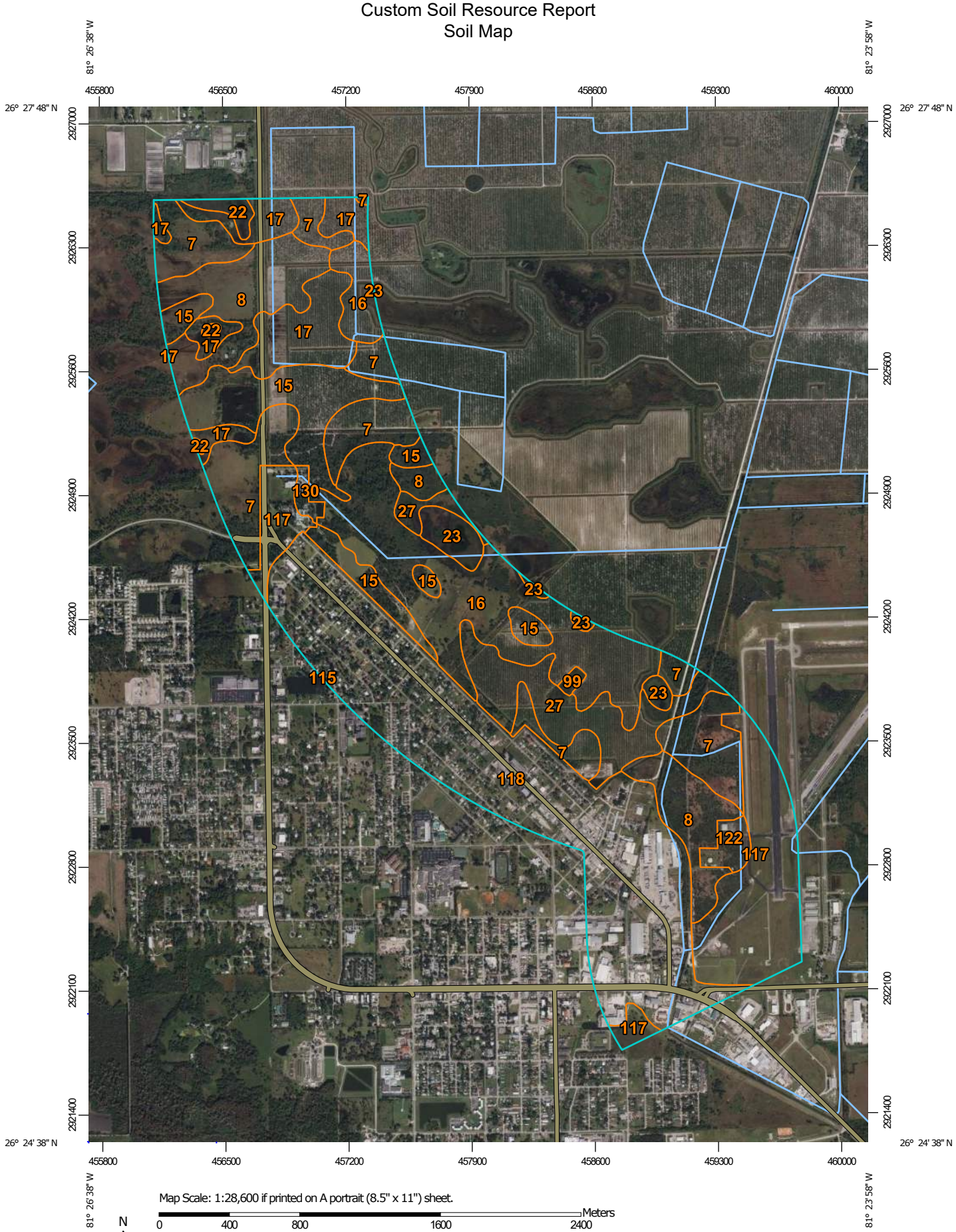
Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Collier County Area, Florida
Survey Area Data: Version 17, Aug 28, 2023

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

Date(s) aerial images were photographed: Nov 14, 2021—Nov 23, 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
7	Immokalee fine sand, 0 to 2 percent slopes	224.7	13.3%
8	Myakka fine sand, 0 to 2 percent slopes	157.9	9.3%
15	Pomello fine sand, 0 to 2 percent slopes	145.0	8.6%
16	Oldsmar fine sand, 0 to 2 percent slopes	242.1	14.3%
17	Basinger fine sand, 0 to 2 percent slopes	111.8	6.6%
22	Chobee, Winder, Gator soils, frequently ponded, 0 to 1 percent slopes	11.6	0.7%
23	Holopaw-Okeelanta, frequently ponded, assocaition, 0 to 1 percent slopes	29.5	1.7%
27	Holopaw fine sand, 0 to 2 percent slopes	105.9	6.2%
99	Water	3.4	0.2%
115	Holopaw-Basinger-Urban land complex, 0 to 2 perent slopes	0.1	0.0%
117	Immokalee fine sand-Urban land complex, 0 to 2 percent slopes	176.9	10.4%
118	Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes	463.4	27.4%
122	Myakka fine sand-Urban land complex, 0 to 2 percent slopes	15.0	0.9%
130	Pomello fine sand-Urban land complex, 0 to 2 percent slopes	7.1	0.4%
Totals for Area of Interest		**1,694.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named

according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Collier County Area, Florida

7—Immokalee fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2s3lk
Elevation: 0 to 130 feet
Mean annual precipitation: 42 to 68 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Immokalee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 35 inches: fine sand
Bh - 35 to 54 inches: fine sand
BC - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)

Hydric soil rating: No

Minor Components

Basinger

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Pomello

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Wabasso

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Placid

Percent of map unit: 1 percent
Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Jenada

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave

Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Slough (R155XY011FL)
Hydric soil rating: Yes

8—Myakka fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2s3lg
Elevation: 0 to 130 feet
Mean annual precipitation: 42 to 56 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Myakka

Setting

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

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 20 inches: fine sand
Bh - 20 to 36 inches: fine sand
C - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Minor Components

Basinger
Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Wabasso
Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Cassia
Percent of map unit: 3 percent
Landform: Rises on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Immokalee
Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Satellite

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces, rises on marine terraces
Landform position (three-dimensional): Tread, talf, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

15—Pomello fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzw1
Elevation: 0 to 110 feet
Mean annual precipitation: 42 to 60 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Pomello

Setting

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

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 42 inches: fine sand
Bh - 42 to 54 inches: fine sand
B/C - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Minor Components

Duette

Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Immokalee

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Jonathan

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, tread, rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)

Hydric soil rating: No

Tavares

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces, hills on marine terraces, flatwoods on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, side slope, tread, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

16—Oldsmar fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sm4t
Elevation: 0 to 100 feet
Mean annual precipitation: 44 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Oldsmar

Setting

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

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 35 inches: fine sand
Bh - 35 to 50 inches: fine sand
Btg - 50 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained

Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Minor Components

Malabar

Percent of map unit: 5 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Nettles

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Basinger

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Cypress lake

Percent of map unit: 2 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Pineda

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

17—Basinger fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svym
Elevation: 0 to 100 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Basinger

Setting

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

Typical profile

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

Cg - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Myakka

Percent of map unit: 6 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pompano

Percent of map unit: 4 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Immokalee

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Placid

Percent of map unit: 4 percent
Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Anclote

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

22—Chobee, Winder, Gator soils, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2y9fd
Elevation: 0 to 50 feet
Mean annual precipitation: 43 to 55 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 355 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Chobee and similar soils: 31 percent
Gator and similar soils: 28 percent
Winder and similar soils: 26 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chobee

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy marine deposits

Typical profile

A - 0 to 13 inches: fine sandy loam
Btg - 13 to 68 inches: sandy clay loam
Ckg - 68 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Forage suitability group: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G155XB345FL)
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G155XB345FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Description of Gator

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave

Parent material: Herbaceous organic material over sandy and loamy marine deposits

Typical profile

Oa - 0 to 25 inches: muck
Cg1 - 25 to 40 inches: fine sandy loam
Cg2 - 40 to 65 inches: fine sandy loam
Ckg3 - 65 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very high (about 14.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Description of Winder

Setting

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

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 15 inches: fine sand
Btg/E - 15 to 18 inches: sandy loam
Btg - 18 to 50 inches: sandy clay loam
Ckg - 50 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Forage suitability group: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G155XB345FL)
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G155XB345FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Pineda

Percent of map unit: 8 percent
Landform: Depressions on marine terraces, drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear, concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Riviera

Percent of map unit: 7 percent
Landform: Depressions on marine terraces, drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear, concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

23—Holopaw-Okeelanta, frequently ponded, assocaition, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2y0j6
Elevation: 0 to 40 feet
Mean annual precipitation: 46 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 360 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Holopaw, limestone substratum, and similar soils: 48 percent
Okeelanta and similar soils: 42 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holopaw, Limestone Substratum

Setting

Landform: Depressions on flats on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Parent material: Sandy and loamy marine deposits over limestone

Typical profile

A - 0 to 5 inches: fine sand
Eg - 5 to 57 inches: fine sand
Btg - 57 to 62 inches: fine sandy loam
2R - 62 to 72 inches: bedrock

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 50 to 79 inches to lithic bedrock
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Description of Okeelanta

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy marine deposits

Typical profile

Oa - 0 to 20 inches: muck
Cg - 20 to 52 inches: fine sand
Ckg - 52 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 5 percent
Landform: Depressions on flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Gator

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

27—Holopaw fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2vbpd
Elevation: 0 to 130 feet
Mean annual precipitation: 4 to 62 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

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

Description of Holopaw

Setting

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

Typical profile

A - 0 to 6 inches: fine sand
Eg - 6 to 42 inches: fine sand
Btg - 42 to 60 inches: fine sandy loam
Cg - 60 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 6 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Oldsmar

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Cypress lake

Percent of map unit: 3 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Riviera

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

99—Water

Map Unit Composition

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

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

115—Holopaw-Basinger-Urban land complex, 0 to 2 perent slopes

Map Unit Setting

National map unit symbol: 2y0j7
Elevation: 0 to 40 feet
Mean annual precipitation: 45 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 360 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Holopaw and similar soils: 32 percent
Basinger and similar soils: 28 percent
Urban land: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holopaw

Setting

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

Typical profile

A - 0 to 6 inches: fine sand
Eg - 6 to 42 inches: fine sand
Btg - 42 to 60 inches: fine sandy loam
Cg - 60 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Description of Basinger

Setting

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

Parent material: Sandy marine deposits

Typical profile

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

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Description of Urban Land

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Brynwood

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Myakka

Percent of map unit: 3 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Oldsmar

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Basinger

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: No

Pineda, limestone substratum

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Holopaw

Percent of map unit: 2 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip

Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: No

117—Immokalee fine sand-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2x9fx
Elevation: 0 to 130 feet
Mean annual precipitation: 44 to 56 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Immokalee and similar soils: 45 percent
Urban land: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 35 inches: fine sand
Bh - 35 to 54 inches: fine sand
BC - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Basinger

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Pomello

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Wabasso

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Placid

Percent of map unit: 2 percent
Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Immokalee

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Jenada

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Slough (R155XY011FL)
Hydric soil rating: Yes

118—Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2y0j8
Elevation: 0 to 50 feet
Mean annual precipitation: 45 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 360 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Immokalee and similar soils: 32 percent
Oldsmar, limestone substratum, and similar soils: 28 percent
Urban land: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 35 inches: fine sand
Bh - 35 to 54 inches: fine sand
BC - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Description of Oldsmar, Limestone Substratum

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits over limestone

Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 34 inches: fine sand
Bh - 34 to 49 inches: fine sand
Btg - 49 to 60 inches: sandy clay loam
2R - 60 to 70 inches: bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 79 inches to lithic bedrock
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Flatwoods on marine terraces

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

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Basinger

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Holopaw

Percent of map unit: 4 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Pineda, limestone substratum

Percent of map unit: 3 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Immokalee

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Oldsmar, limestone substratum
Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

122—Myakka fine sand-Urban land complex, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2x9ch
Elevation: 0 to 130 feet
Mean annual precipitation: 42 to 61 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Myakka and similar soils: 45 percent
Urban land: 38 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myakka

Setting
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Sandy marine deposits

Typical profile
A - 0 to 6 inches: fine sand
E - 6 to 20 inches: fine sand
Bh - 20 to 36 inches: fine sand
C - 36 to 80 inches: fine sand

Properties and qualities
Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Basinger

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Wabasso

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf

Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Cassia

Percent of map unit: 3 percent
Landform: Rises on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Immokalee

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Myakka

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Satellite

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces, rises on marine terraces
Landform position (three-dimensional): Tread, talf, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

130—Pomello fine sand-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2x9g0
Elevation: 0 to 150 feet
Mean annual precipitation: 42 to 68 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Pomello and similar soils: 45 percent
Urban land: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pomello

Setting

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

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 42 inches: fine sand
Bh - 42 to 54 inches: fine sand
B/C - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Immokalee

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Duette

Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Jonathan

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve, tread, rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Tavares

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces, flatwoods on marine terraces, hills on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, side slope, tread, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

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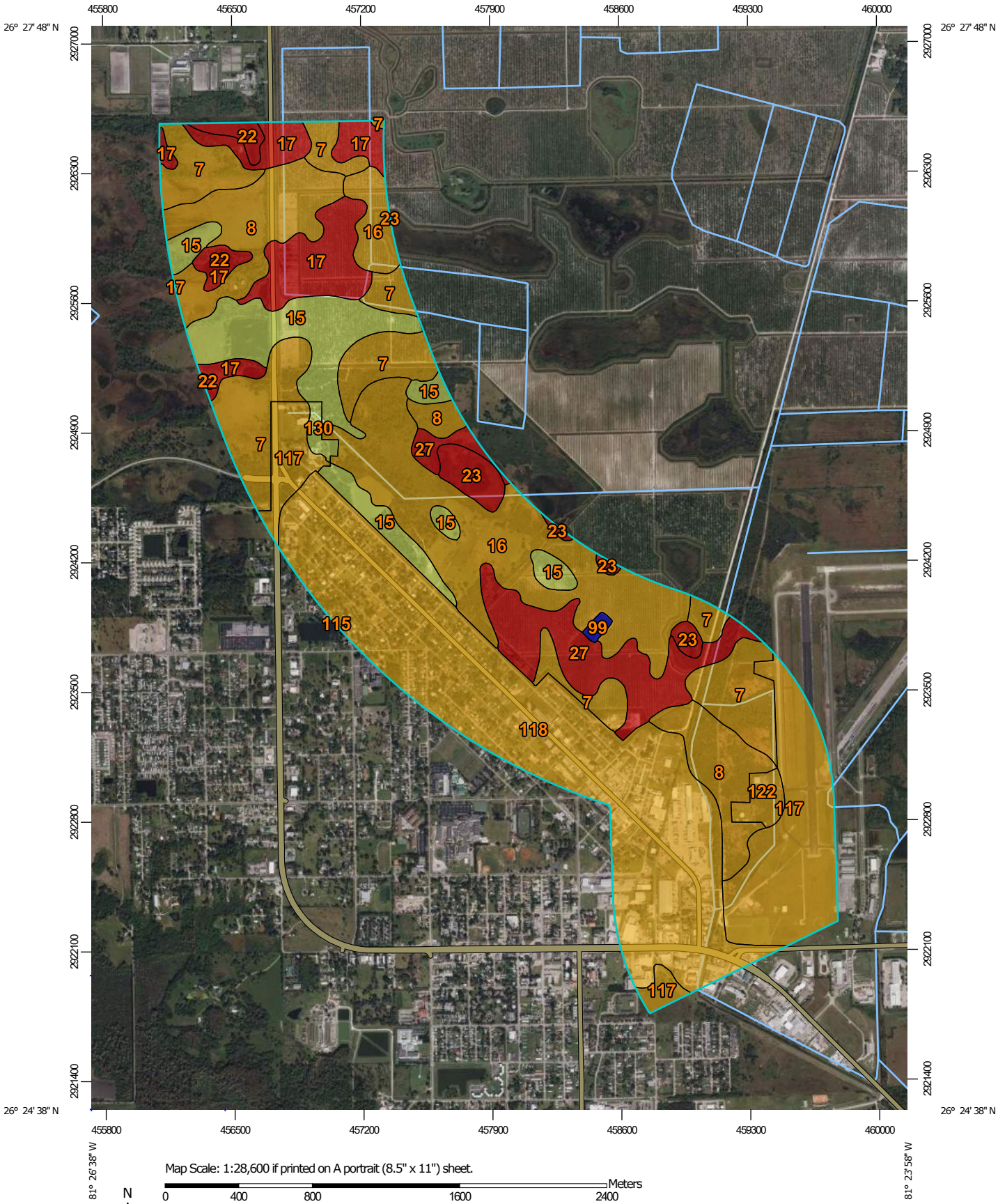
Depth to Water Table—Collier County Area, Florida
(SR 29 Soil Report - Water Depth)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

Soil Survey Area: Collier County Area, Florida
Survey Area Data: Version 17, Aug 28, 2023

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

Date(s) aerial images were photographed: Nov 14, 2021—Nov 23, 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.

Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
7	Immokalee fine sand, 0 to 2 percent slopes	31	224.7	13.3%
8	Myakka fine sand, 0 to 2 percent slopes	31	157.9	9.3%
15	Pomello fine sand, 0 to 2 percent slopes	76	145.0	8.6%
16	Oldsmar fine sand, 0 to 2 percent slopes	31	242.1	14.3%
17	Basinger fine sand, 0 to 2 percent slopes	15	111.8	6.6%
22	Chobee, Winder, Gator soils, frequently ponded, 0 to 1 percent slopes	0	11.6	0.7%
23	Holopaw-Okeelanta, frequently ponded, assocaition, 0 to 1 percent slopes	0	29.5	1.7%
27	Holopaw fine sand, 0 to 2 percent slopes	15	105.9	6.2%
99	Water	>200	3.4	0.2%
115	Holopaw-Basinger-Urban land complex, 0 to 2 perent slopes	0	0.1	0.0%
117	Immokalee fine sand-Urban land complex, 0 to 2 percent slopes	30	176.9	10.4%
118	Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes	30	463.4	27.4%
122	Myakka fine sand-Urban land complex, 0 to 2 percent slopes	30	15.0	0.9%
130	Pomello fine sand-Urban land complex, 0 to 2 percent slopes	76	7.1	0.4%
Totals for Area of Interest			**1,694.4**	**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

Hydrologic Soil Group and Surface Runoff

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

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 four hydrologic soil groups are:

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.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff–Collier County Area, Florida			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
7—Immokalee fine sand, 0 to 2 percent slopes			
Immokalee	90	Very high	B/D

Hydrologic Soil Group and Surface Runoff–Collier County Area, Florida			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
8—Myakka fine sand, 0 to 2 percent slopes			
Myakka	85	Very high	A/D
15—Pomello fine sand, 0 to 2 percent slopes			
Pomello	85	Negligible	A
16—Oldsmar fine sand, 0 to 2 percent slopes			
Oldsmar	85	Very high	A/D
17—Basinger fine sand, 0 to 2 percent slopes			
Basinger	80	Negligible	A/D
22—Chobee, Winder, Gator soils, frequently ponded, 0 to 1 percent slopes			
Chobee	31	Negligible	C/D
Gator	28	Negligible	C/D
Winder	26	Negligible	C/D
23—Holopaw-Okeelanta, frequently ponded, assocaition, 0 to 1 percent slopes			
Holopaw, limestone substratum	48	Negligible	A/D
Okeelanta	42	Negligible	A/D
27—Holopaw fine sand, 0 to 2 percent slopes			
Holopaw	85	Very high	A/D
99—Water			
Water	100	—	—
115—Holopaw-Basinger-Urban land complex, 0 to 2 perent slopes			
Holopaw	32	Negligible	A/D
Basinger	28	Negligible	A/D
Urban land	25	Very high	—
117—Immokalee fine sand-Urban land complex, 0 to 2 percent slopes			
Immokalee	45	Very high	B/D
Urban land	40	Very high	—
118—Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes			
Immokalee	32	Very high	B/D
Oldsmar, limestone substratum	28	Very high	A/D
Urban land	25	Very high	—
122—Myakka fine sand-Urban land complex, 0 to 2 percent slopes			
Myakka	45	Very high	A/D
Urban land	38	Very high	—

Hydrologic Soil Group and Surface Runoff–Collier County Area, Florida			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
130—Pomello fine sand-Urban land complex, 0 to 2 percent slopes			
Pomello	45	Negligible	A
Urban land	40	Very high	—

Data Source Information

Soil Survey Area: Collier County Area, Florida
Survey Area Data: Version 17, Aug 28, 2023

Appendix H
Environmental

Pond Siting Wetland Evaluation

FPID: 417540-1
SR 29 From S. of CR 846 to SR 29 Bypass Junction, Collier County

1.0 METHODOLOGY

The purpose of this document is to provide an evaluation of the seven (7) pond site alternatives associated with Segment 5 of the corridor and includes land use, soils, wetland/surface water involvement, and potential impacts to these elements. The locations of the pond site alternatives evaluated for this segment are presented in **Appendix A - Figure 1.**

As part of the pond site alternatives evaluations, the following information was reviewed to characterize habitat features and land use patterns within the pond site alternatives:

- U.S. Geological Survey (USGS) 7.5-minute Topographical Quadrangle Map, Immokalee, FL, 2021;
- U.S. Department of Agriculture, Natural Resource Conservation Service, *Web Soil Survey of Collier County, Florida.* (https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx);
- Florida Department of Transportation (FDOT), *Florida Land Use, Cover and Forms Classification System Handbook* (FLUCFCS) (Third edition, 1999);
- U.S. Fish and Wildlife Service (FWS), *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, *et al.,* 1979);
- Florida Department of Environmental Protection (FDEP), Map Direct Gateway (https://ca.dep.state.fl.us/mapdirect/); and
- U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey of Collier County, Florida, Issued 1998.

2.0 SOILS

Seven (7) different soil types are located within the pond site alternatives, one (1) of which is classified as hydric according to the NRCS Web Soil Survey. The location of the soil types within the pond sites is provided in **Appendix A - Figure 2. Table 1** below provides the soil types, hydric classification, depth to the seasonal high-water table and description of each soil type located within the pond site alternatives. The town of Immokalee and all proposed pond sites are located in the Immokalee Rise Province geomorphic feature in the Everglades District according to the Soil Survey of Collier County.

Table 1: Soil Types within the Pond Site Alternatives[1]

Soil Name	Hydric (Yes/No)	Depth to Seasonal High-Water Table	Description
7: Immokalee fine sand, 0 to 2 percent slopes	No	6 to 18 inches	Found on flatwoods on marine terraces; poorly drained, high runoff class; South Florida flatwoods
8: Myakka fine sand	No	6 to 18 inches	Found on drainageways on flatwoods on marine terraces; poorly drained; very high runoff class, South Florida flatwoods
15: Pomello fine sand, 0 to 2 percent slopes	No	18 to 42 inches	Found on knolls and ridges on marine terraces; somewhat poorly drained; negligible runoff class, Sand Pine Scrub
16: Oldsmar fine sand, 0 to 2 percent slopes	No	6 to 18 inches	Found on flatwoods on marine terraces; poorly drained; very high runoff class; South Florida Flatwoods
27: Holopaw fine sand, 0 to 2 percent slopes	Yes	3 to 18 inches	Drainageways and flats on marine terraces; poorly drained; very high runoff class; slough, sandy soils on flats of mesic/hydric lowlands
117: Immokalee fine sand-Urban land complex, 0 to 2 percent slopes	No	6 to 18 inches	Found on flatwoods on marine terraces; poorly drained; very high runoff class; South Florida flatwoods
118: Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes	No	6 to 18 inches	Found on flatwoods on marine terraces; poorly drained; very high runoff class; South Florida Flatwoods

[1] NRCS Web Soil Survey

3.0 EXISTING LAND USE AND VEGETATIVE COVER

Based on in-house and literature reviews, twelve (12) land use/vegetative cover types were identified within the pond site alternatives (see **Appendix A - Figure 3**). All vegetative habitats and land uses within the pond site alternatives were classified using the *Florida Land Use, Cover and Forms Classification System* (FLUCFCS) (FDOT 1999). Wetland and surface water habitats were also classified using the *U.S. Fish and Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et. al., 1979). **Table 2** below summarizes the acreage of each land use/ vegetative cover type within the pond site alternatives.

4.0 WETLANDS AND OTHER SURFACE WATERS (OSW)

Two different wetland/other surface water (OSW) types are found within the pond site alternatives: Streams and Waterways (510) and Freshwater Marshes (641). Streams and Waterways (510) are located within Pond Sites 501B (OSW 1), 501C (OSW 1), 502A (OSW 2), and 502B (OSW 2 and OSW 3) and Freshwater Marshes (641) are located within Pond Sites 503A (WL 1) and 501C (WL 2).

Table 2: Existing Land Use/Vegetative Cover Types within Pond Site Alternatives

FLUCFCS[1] Classification/Description	USFWS Classification[2]
Uplands	
190: Open Lands	N/A
190: Open Land/811: Airports	N/A
211: Improved Pastures	N/A
212: Unimproved Pastures	N/A
221: Citrus Groves	N/A
411: Pine Flatwoods	N/A
411/421: Pine Flatwoods/Xeric Oak	N/A
421: Xeric Oak	N/A
422: Brazilian Pepper	N/A
425: Temperate Hardwood	N/A
434: Hardwood-Conifer Mixed	N/A
Wetlands and Other Surface Waters (OSW)	
510: Streams and Waterways	R2UB4Fx[3]
641: Freshwater Marshes	PEM1F[4]

[1]FLUCFCS: Florida Land Use, Cover and Forms Classification System, FDOT, 1999.

[2] USFWS: U.S. Fish and Wildlife Service, Wetlands and Deepwater Classification, February 2019; Cowardin et al ,1979; N/A: Not Applicable

[3] R2UB4Fx: Riverine, Lower Perennial, Unconsolidated Bottom, Organic, Semipermanently Flooded, Excavated

[4] PEM1F: Palustrine, Emergent, Persistent, Semipermanently Flooded

The locations of the wetlands and surface waters within the pond site alternatives are provided in **Appendix A - Figure 4.** Descriptions of the wetlands and other surface waters within each pond alternative are provided in **Section 5: Pond Site Alternative Descriptions** below. The 8-digit Hydrologic Unit Code (HUC 8) basin boundaries are provided in **Appendix A - Figure 5.** All pond sites are located within the East Collier Cumulative Impact Basin and are depicted in **Appendix A - Figure 6.**

5.0 POND SITE ALTERNATIVES DESCRIPTIONS

Each of the pond sites were assigned a High, Moderate, Low, or None ranking based on their probability of wetland or surface water occurrence in the site. A high ranking indicates that over 50% of the area is classified as a wetland or surface water, or the pond is expected to impact a wetland or surface water. A moderate ranking indicates that the pond site is 50% to 25% covered by wetlands and surface waters. A low ranking indicates that the pond site contains less than 25% coverage by wetlands and surface waters. A none ranking indicates that the pond site contains no wetlands or surface waters. **Table 3** below provides the name of each pond and the size of ponds in acres. Descriptions of each pond site alternative are provided below.

Table 3: Pond Site Alternatives

Pond Site Name	Size of Pond Site in Acres
501A	3.77
501B	5.34
501C	4.31
502A	5.58
502B	5.47
503A	6.80
503B	11.11

5.1 POND SITE ALTERNATIVES DESCRIPTIONS

POND SITE 501A

Pond Site 501A is located east of Airways Road on the Immokalee Regional Airport property at the southern end of the alignment. This pond site is approximately 3.77 acres in size. The soil type mapped within this pond site consists of 117: Immokalee fine sand-Urban land complex, 0 to 2 percent slopes (non-hydric). Based on aerial photographs, the area appears to be comprised of Open Land/Airports (FLUCFCS 190/811) which contains sandy soils and the northern connection will impact a forested area (FLUCFCS 434-Hardwood-Conifer Mixed). This pond site is located within the East Collier Florida Water Management (WMD) Cumulative Impact Basin and the HUC 52: Big Cypress Swamp Basin. The northern portion of this pond site is part of the Immokalee Airport Upland Preserve (Immokalee Airport Conservation easement), which is owned by Collier County and managed by the FFWCC. Wetland and OSW involvement has been determined to be **none**.

POND SITE 501B (Recommended)

Pond Site 501B is approximately 5.34 acres in size and is located on the west side of Airways Road at the southern end of the alignment. The soil types mapped within this pond site consist of 118: Immokalee-Oldsmar, limestone substratum-Urban land complex 0 to 2 percent slopes (non-hydric) and 8: Myakka fine sand, 0 to 2 percent slopes (non-hydric). Based on aerial photographs, the area appears to be comprised of palmetto scrub prairie (FLUCFCS 421: Xeric Oak). The western connection on the north side of the pond crosses a canal (FLUCFCS 510: Streams and Waterways) and Temperate Hardwoods (FLUCFCS 425). This pond site is located within the East Collier Florida Water Management (WMD) Cumulative Impact Basin and the HUC 52: Big Cypress Swamp Basin. The entirety of this pond is located within the Immokalee Airport Upland Preserve (Immokalee Airport Conservation easement), which is owned by Collier County and managed by the FFWCC. Wetland and OSW involvement has been determined to be **high.**

POND SITE 501C

Pond 501C is located north of Pond 501B between Alachua Street/Gopher Ridge Road to the west and Airways Road to the east. The pond site is approximately 4.31 acres in size. Soil types mapped within this pond consist of 7: Immokalee fine sand, 0 to 2 percent slopes (non-hydric) and 8: Myakka fine sand, 0 to 2 percent slopes (non-hydric). Based on aerial photographs, the area appears to be comprised of palmetto scrub prairie (FLUCFCS 421: Xeric Oak) with a small portion of Freshwater Marsh (FLUCFCS 641) located

at the northern end of the pond site. The western connection on the north side of the pond site crosses a canal (FLUCFCS 510: Streams and Waterways) that is connected to a series of canals to the west by concrete culverts. This pond site is located within the East Collier Florida Water Management (WMD) Cumulative Impact Basin and the HUC 52: Big Cypress Swamp Basin. The entirety of this pond is located within the Immokalee Airport Upland Preserve (Immokalee Airport Conservation easement), which is owned by Collier County and managed by the FFWCC. Wetland and OSW involvement has been determined to be **high.**

POND SITE 502A (Recommended)

Pond 502A is centrally located in the alignment northeast of Calle Amistad. The pond is approximately 5.58 acres in size. The soil types mapped within this pond consist of 7: Immokalee fine sand, 0 to 2 percent slopes (non-hydric), 27: Holopaw fine sand, 0 to 2 percent slopes (hydric), and 118: Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes (non-hydric). Based on aerial photographs, the area appears to be comprised of an active citrus grove (FLUCFCS 221). The pond site connects to a forested canal system on the southwest corner (FLUCFCS 510: Streams and Waterways) with Brazilian pepper (FLUCFCS 422) and cabbage palm trees at the top of bank. This pond site is located within the East Collier Florida Water Management (WMD) Cumulative Impact Basin and the HUC 52: Big Cypress Swamp Basin. Wetland and OSW involvement has been determined to be **high.**

POND SITE 502B

Pond 502B is centrally located in the alignment northeast of Calle Amistad, Flagler Street, and Madison Avenue West. The pond is approximately 5.47 acres in size. The soil types mapped within this pond consist of 7: Immokalee fine sand, 0 to 2 percent slopes (non-hydric), 27: Holopaw fine sand, 0 to 2 percent slopes (hydric), and 118: Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes (non-hydric). Based on aerial photographs, the area appears to be comprised of an active citrus grove (FLUCFCS 221). The pond site is located adjacent to a canal system on the southwest corner (FLUCFCS 190: Open Land and FLUCFCS 510: Streams and Waterways) and overlaps the canal system in the central portion of the pond site. The top of bank of the canal system consists of Brazilian pepper, saw palmetto, and cabbage palm. This pond site is located within the East Collier Florida Water Management (WMD) Cumulative Impact Basin and the HUC 52: Big Cypress Swamp Basin. Wetland and OSW involvement has been determined to be **high**.

POND SITE 503A

Pond 503A is located in the northern portion of the alignment northeast of Pond 503B and Madison Avenue West. The pond is approximately 6.80 acres in size. The soil types mapped within this pond site consist of 16: Oldsmar fine sand, 0 to 2 percent slopes (non-hydric) and 27: Holopaw fine sand, 0 to 2 percent slopes (hydric). Based on aerial photographs, the area appears to be comprised of Improved Pastures (FLUCFCS 211), Unimproved Pastures (FLUCFCS 212), and Freshwater Marshes (FLUCFCS 641). This pond site is located within the East Collier Florida Water Management (WMD) Cumulative Impact Basin and the HUC 52: Big Cypress Swamp Basin. Wetland and OSW involvement has been determined to be **high.**

POND SITE 503B (Recommended)

Pond 503B is located southwest of Pond 503A and northeast of Madison Avenue West. The pond is approximately 11.11 acres in size. The soil types mapped within this pond consist of 15: Pomello fine sand, 0 to 2 percent slopes (non-hydric), 16: Oldsmar fine sand, 0 to 2 percent slopes (non-hydric), and 118: Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes (non-hydric). Based on aerial photographs, the area appears to be comprised of Improved Pastures (FLUCFCS 211), Unimproved Pastures (FLUCFCS 212), and Pine Flatwoods/Xeric Oak (FLUCFCS 411/ 421) habitats. The northeastern portion of the pond contains upland scrub habitat (FLUCFCS 421: Xeric Oak) while the eastern and central sides of the pond are comprised of Pine Flatwoods (FLUCFCS 411) with pine tree species and saw palmetto. This pond site is located within the East Collier Florida Water Management (WMD) Cumulative Impact Basin and the HUC 52: Big Cypress Swamp basin. Wetland and OSW involvement has been determined to be **none**.

6.0 ENVIRONMENTAL IMPACT SUMMARY OF ALTERNATIVES

Wetlands and surface waters were reviewed and classified for each pond site alternative using online resources. Each site was given a High, Moderate, Low or None rating based on potential presence of wetlands and surface waters. Wetlands and surface water boundaries should be delineated in the field and verified during field reviews with regulatory agencies during permitting.

To determine the costs associated with each pond site alternative, mitigation costs for proposed wetland impacts were analyzed. The proposed direct impact acres for each wetland or surface water system were multiplied by the UMAM delta to determine the functional loss for each system. Secondary impacts are not included but will be assessed during design and permitting. A summary of functional loss for wetlands and other surface waters is provided in **Table 4** below.

Table 4: Wetland and OSW Mitigation Cost Summary

Pond Site Alternative	Wetland Impacts (Direct) (Acres)	OSW Impacted (Acres)	Delta	Functional Loss[1]	Mitigation Costs (Wetlands)[2]
501A	-	0.490	0.70	0.343	$65,170.00
501B[3]	-	0.137	0.70	0.096	$18,221.00
501C	0.200	0.009	0.70	0.146	$27,797.00
502A[3]	-	0.106	0.70	0.074	$14,098.00
502B	-	0.845	0.70	0.592	$112,385.00
503A	1.356	-	0.70	0.949	$180,348.00
503B[3]	-	-	-	-	$0.00
Total	**1.556**	**1.587**	**-**	**2.200**	**$418,019.00**
***Total for Recommended Ponds**	**0.000**	**0.243**	**-**	**0.170**	**$32,319.00**

[1]Assumes a score of 7 for Location and Landscape Support, a 7 for Water Environment and a 7 for community structure for a delta of 0.70.
[2] Assumes $190,000.00 per dual federal and state freshwater herbaceous credit
[3] Recommended Pond

8.0 REFERENCES

Florida Department of Environmental Protection (FDEP). Map Direct. Mitigation Bank Service Area Map Application (Map Direct Gallery (state.fl.us)).

FDEP. Statewide Land Use Land Cover (Florida Department of Environmental Protection Geospatial Open Data (state.fl.us)).

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FDOT. Florida Land Use, Cover and Forms Classification System Handbook, 3rd Edition (FDOT 1999).

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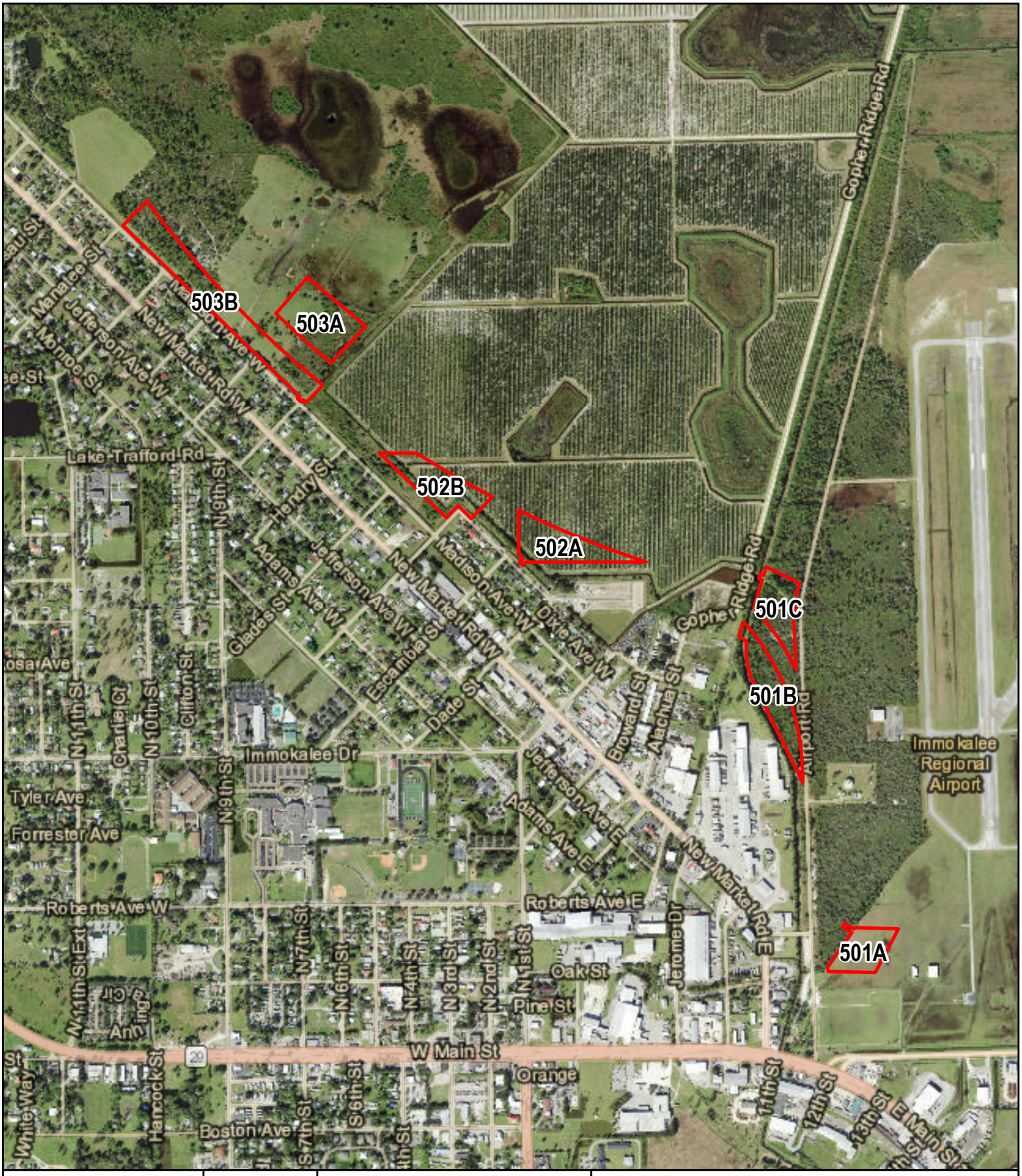
U.S.D.A., Natural Resources Conservation Service, Soil Survey of Collier County, Florida, Issued 1998.

U.S. Fish and Wildlife Service (USFWS), Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, *et. al*. 1979), 2019.

USFWS. National Wetlands Inventory. Wetlands Online Mapper. (January 2022). (Wetlands Mapper | U.S. Fish & Wildlife Service (fws.gov)).

U.S. Geological Survey (USGS) 7.5-minute Topographical Quadrangle Map, Immokalee, FL, 2021.

Appendix A: Report Figures



Legend

Pond Sites

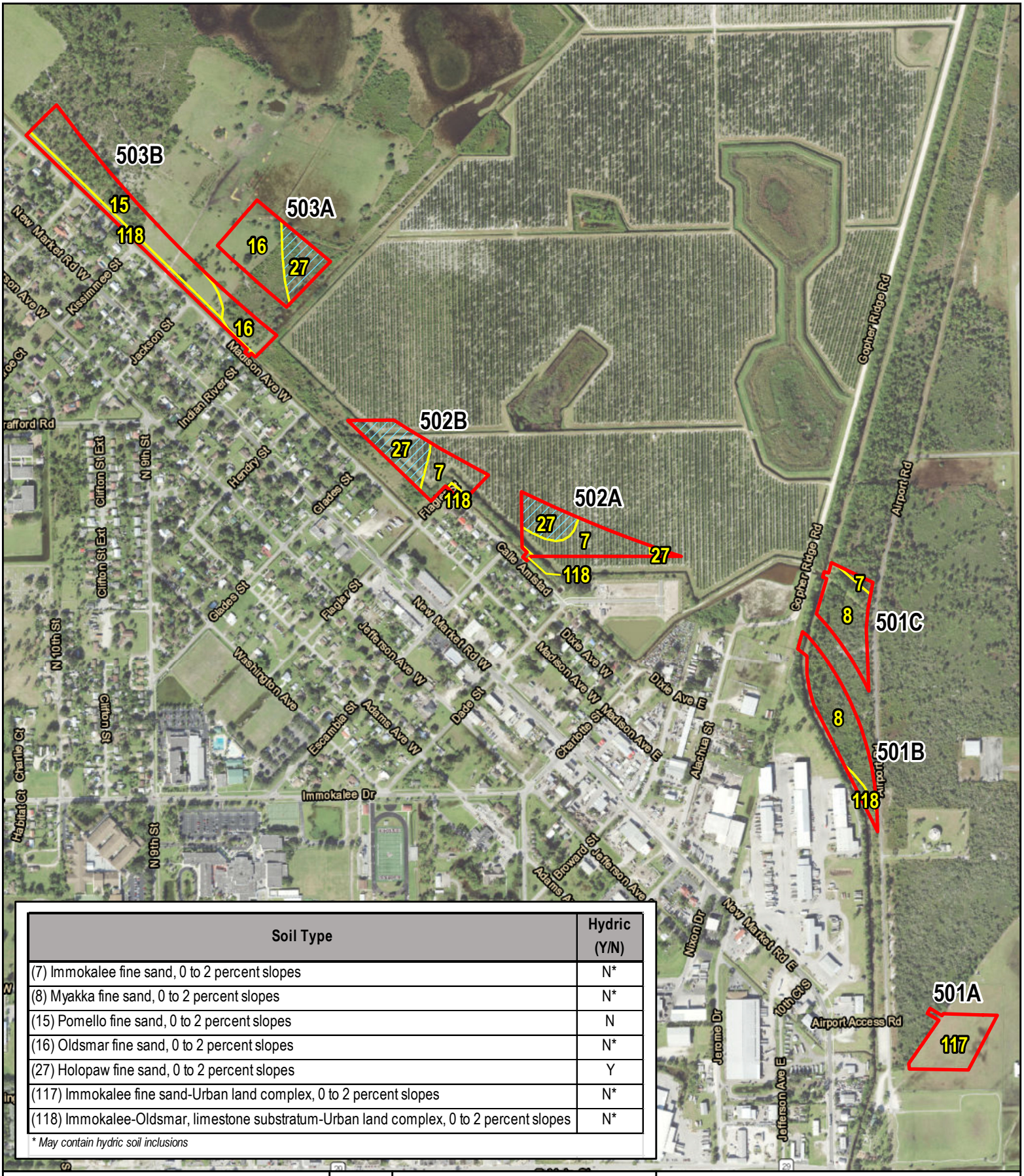
N

Scale: 1:15,000
Date: 08/28/2023

0 750 1,500 3,000 Feet

Figure 1: Pond Site Alternatives Map

SR 29 from CR 846 to New Market Road
FPID 417540-5-32-01
Florida Department of Transportation, D1



Soil Type	Hydric (Y/N)
(7) Immokalee fine sand, 0 to 2 percent slopes	N*
(8) Myakka fine sand, 0 to 2 percent slopes	N*
(15) Pomello fine sand, 0 to 2 percent slopes	N
(16) Oldsmar fine sand, 0 to 2 percent slopes	N*
(27) Holopaw fine sand, 0 to 2 percent slopes	Y
(117) Immokalee fine sand-Urban land complex, 0 to 2 percent slopes	N*
(118) Immokalee-Oldsmar, limestone substratum-Urban land complex, 0 to 2 percent slopes	N*

** May contain hydric soil inclusions*

Legend

- Pond Site Alternatives
- NRCS Soil Boundaries
- Hydric Soil Overlay

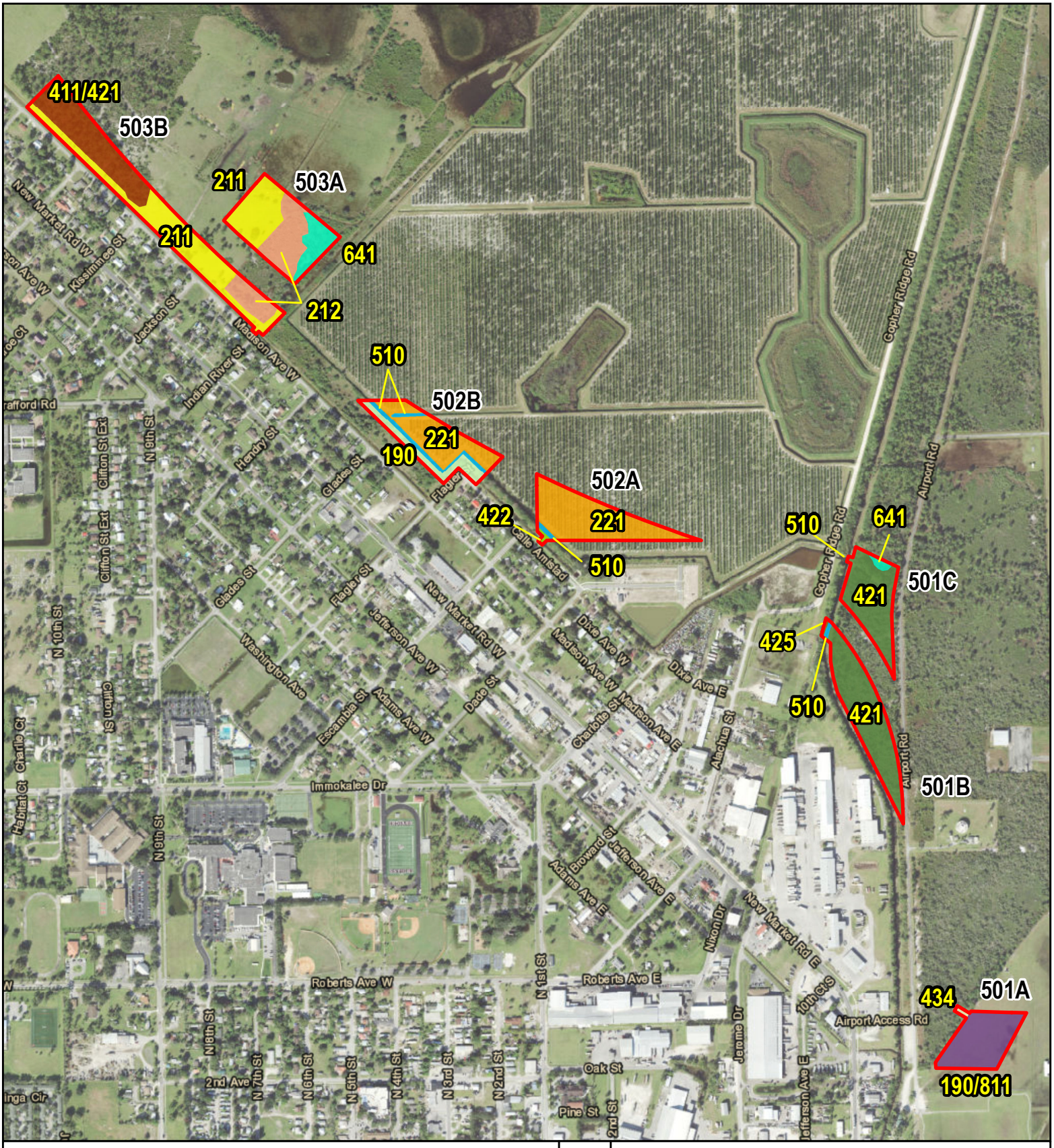
N

Sources: USDA NRCS
Scale: 1:12,000
Date: 10/9/2023

0 500 1,000 2,000 Feet

Figure 2: NRCS Soils Map

SR 29 from CR 846 to New Market Road
FPID 417540-5-32-01
Florida Department of Transportation, D1



Legend

- Pond Site Alternatives

Land Use and Vegetative Cover Types

- (190) Open Land
- (190/811) Open Land/Airports
- (211) Improved Pastures
- (212) Unimproved Pastures
- (221) Citrus Groves
- (411/421) Pine Flatwoods/Xeric Oak
- (421) Xeric Oak
- (422) Brazilian Pepper
- (425) Temperate Hardwood
- (434) Hardwood - Conifer Mixed
- (510) Streams and Waterways
- (641) Freshwater Marshes

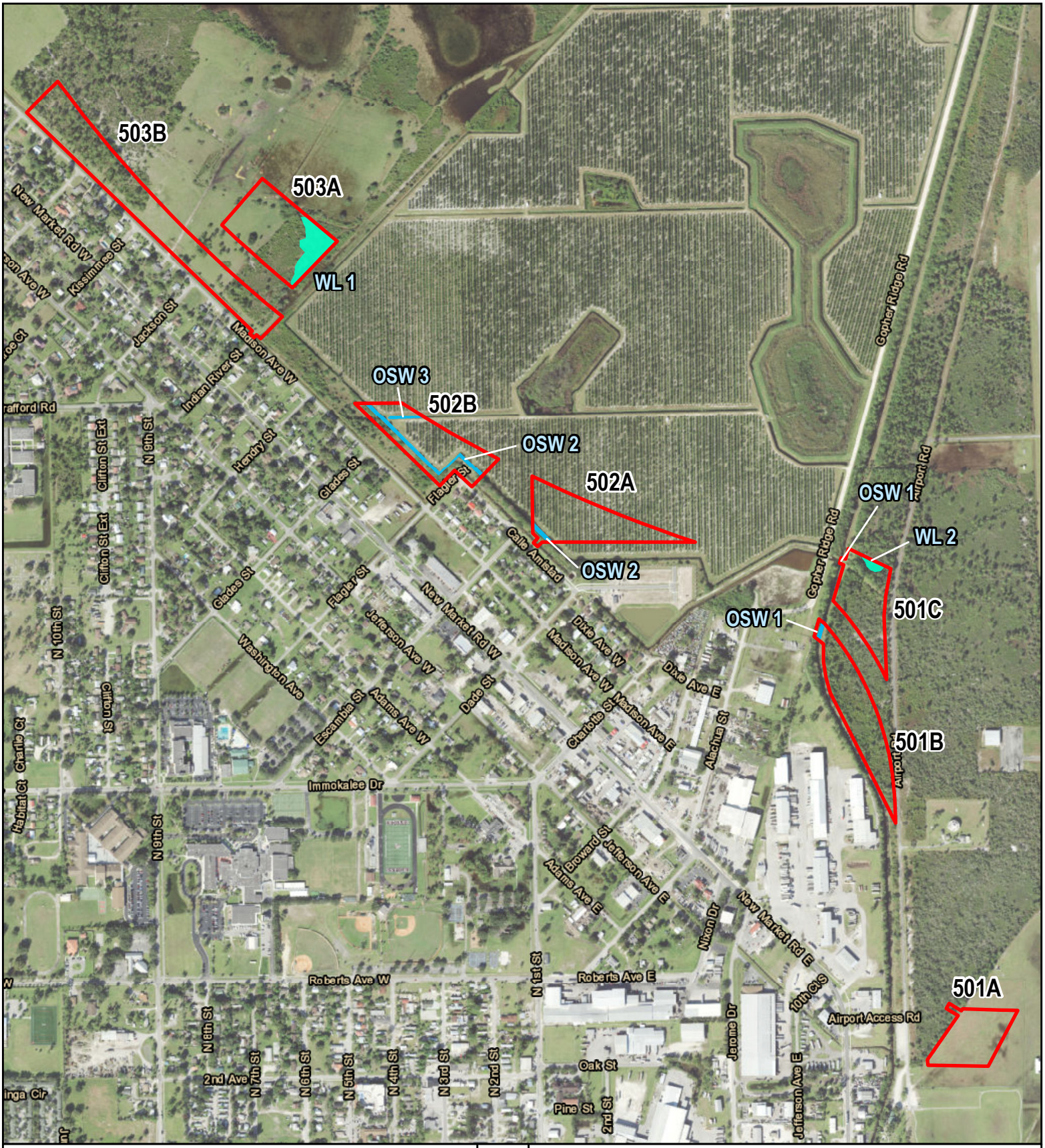
N

Figure 3: Land Use and Vegetative Cover Map

SR 29 from CR 846 to New Market Road
FPID 417540-5-32-01
Florida Department of Transportation, D1

Sources: FDOT, SFWMD
Scale: 1:12,000
Date: 10/9/2023

0 500 1,000 2,000 Feet



Legend

Pond Site Alternatives

Land Use and Vegetative Cover Types

(510) Streams and Waterways

(641) Freshwater Marshes

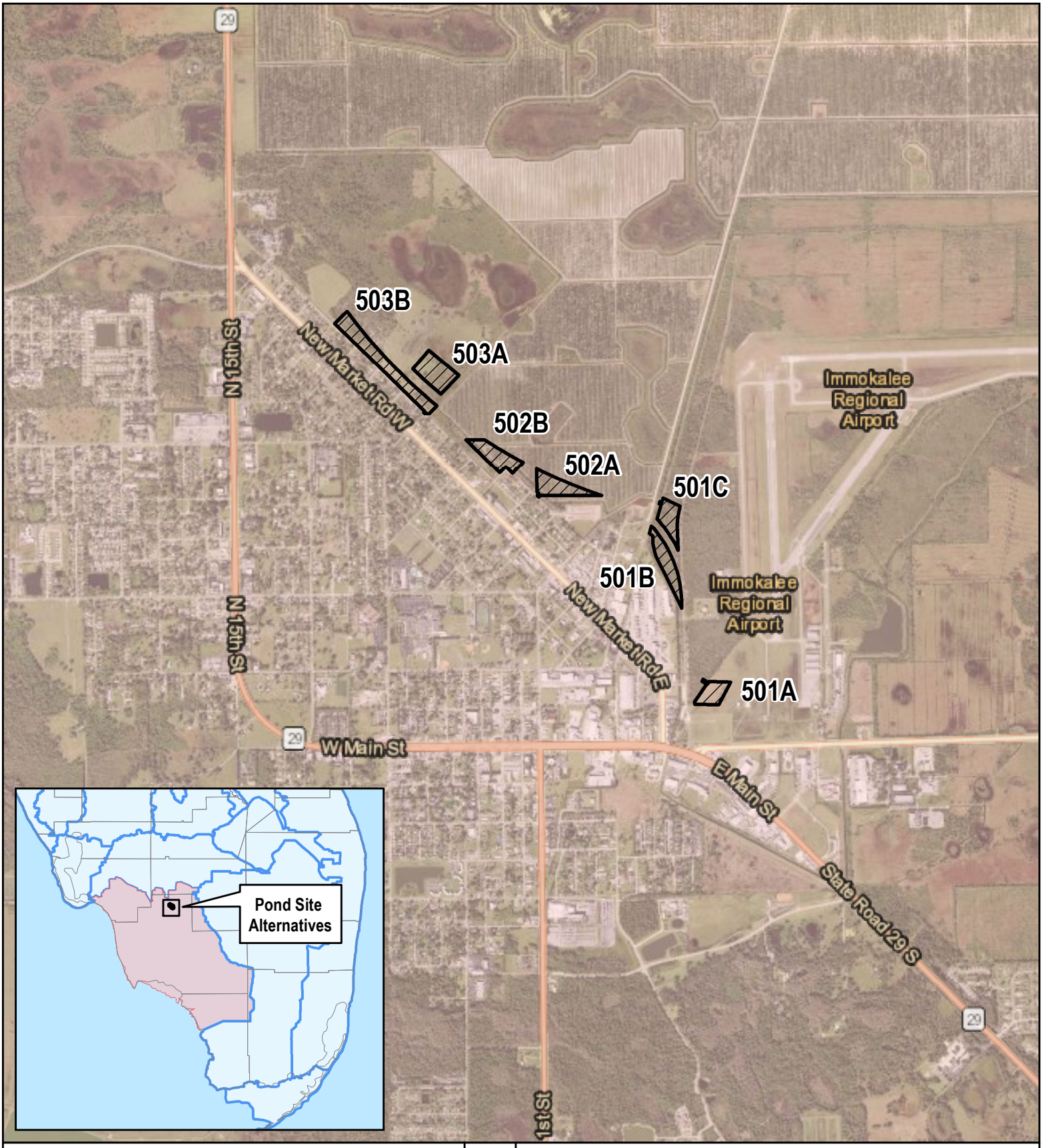
N

Figure 4: Wetlands and Other Surface Waters Map

SR 29 from CR 846 to New Market Road
FPID 417540-5-32-01
Florida Department of Transportation, D1

Sources: FDOT, SFWMD
Scale: 1:12,000
Date: 10/9/2023

0 500 1,000 2,000 Feet



Legend

Pond Site Alternatives

Hydrologic Unit Code (HUC 8) Basin Areas

Big Cypress Swamp

Other HUC Basins

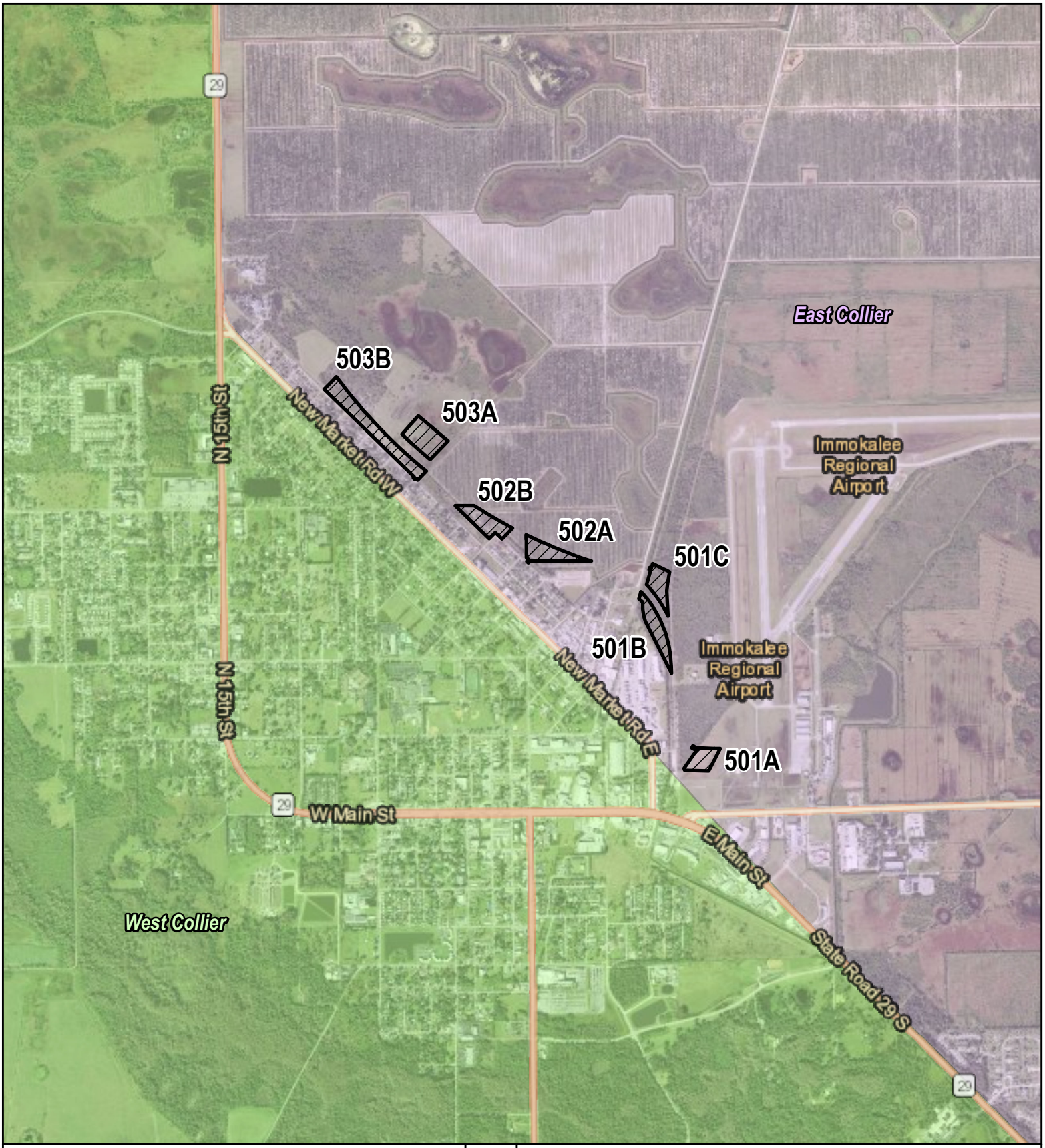
N

Figure 5: HUC 8 Basin Boundaries

SR 29 from CR 846 to New Market Road
FPID 417540-5-32-01
Florida Department of Transportation, D1

Sources: FDOT, SFWMD
Scale: 1:30,000
Date: 10/9/2023

0 0.25 0.5 1 Miles



Legend

Pond Site Alternatives

Cumulative Impact Basins

East Collier

West Collier

N

Figure 6: SFWMD Cumulative Impact Basins

SR 29 from CR 846 to New Market Road
FPID 417540-5-32-01
Florida Department of Transportation, D1

Sources: FDOT, SFWMD
Scale: 1:30,000
Date: 10/9/2023

0 0.25 0.5 1 Miles

Survey Point Feature List Report

Report Created: Thursday, March 05, 2020
Time: 8:23:32 AM

Project: Survey
Units: Imperial

Point Name	Description	Northing	Easting	Elevation	Feature Definition
PWL1	WL 1-1	761963.19	520773.94	0	WLPT
PWL2	WL 1-2	761990.02	520813.63	0	WLPT
PWL3	WL 1-3	762020.13	520857.14	0	WLPT
PWL4	WL 1-4	762052.12	520918.68	0	WLPT
PWL5	WL 1-5	762064.54	520971.21	0	WLPT
PWL6	WL 1-6	762048.59	521005.52	0	WLPT
PWL7	WL 1-7	762032.65	521038.09	0	WLPT
PWL8	WL 1-8	761991.63	521052.06	0	WLPT
PWL9	WL 1-9	761960.04	521020.91	0	WLPT
PWL10	WL 1-10	761914.02	520992.19	0	WLPT
PWL11	WL 1-11	761897.25	520924.96	0	WLPT
PWL12	WL 1-12	761885.10	520876.05	0	WLPT
PWL13	WL 1-13	761898.95	520835.13	0	WLPT
PWL14	WL 1-14	761906.03	520809.19	0	WLPT
PWL15	WL 1-15	761931.08	520783.33	0	WLPT
PWL16	POND 1	769646.43	514440.90	0	WLPT
PWL17	POND 2	769664.01	514403.36	0	WLPT
PWL18	POND 3	769666.79	514352.97	0	WLPT
PWL19	POND 4	769653.22	514302.96	0	WLPT
PWL20	POND 5	769603.26	514319.05	0	WLPT
PWL21	POND 6	769591.23	514384.26	0	WLPT
PWL22	POND 7	769606.66	514447.02	0	WLPT
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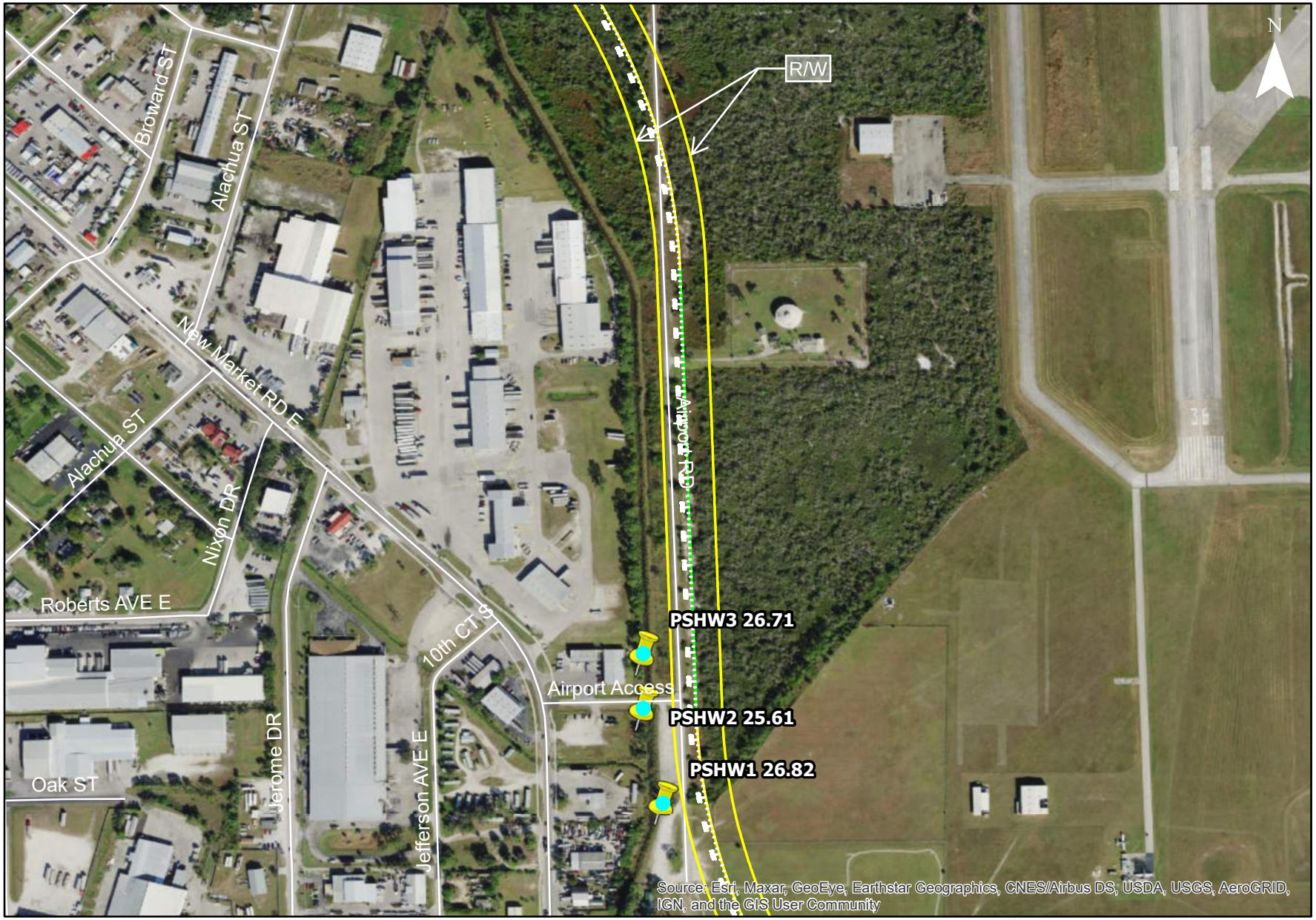
PSHW2	CANAL 1 SHW #2	759066.08	521994.64	25.61	WLPT
PSHW3	CANAL 1 SHW #3	759139.78	521994.43	26.71	WLPT
PSHW4	CANAL 1 SHW #4	762901.96	519008.41	28.33	WLPT
PSHW5	CANAL 1 SHW #5	762238.36	521638.35	26.52	WLPT
PSHW6	CANAL 2 SHW #1	762267.24	521190.74	26.88	WLPT
PSHW7	CANAL 3 SHW #1	762290.21	521144.17	27.88	WLPT
PSHW8	CANAL 3 SHW #2	762288.39	520355.44	28.56	WLPT
PSHW9	CANAL 3 SHW #3	763942.89	517802.19	28.91	WLPT
PSHW10	CANAL 3 SHW #4	764037.06	517892.63	28.76	WLPT
PSHW11	CANAL 4 SHW #1	763262.51	518576.15	28.87	WLPT
PSHW12	CANAL 4 SHW #2	763261.61	518543.61	29.08	WLPT
PSHW13	CANAL 5 SHW #1	768453.76	514621.46	30.04	WLPT
PSHW14	CANAL 5 SHW #2	768491.71	514628.77	30.19	WLPT
PSHW15	CANAL 6 SHW #1	771490.20	514264.51	30.61	WLPT
PSHW16	CANAL 6 SHW #2	771541.58	514258.12	30.50	WLPT

NOTE: FIELD LOCATIONS PERFORMED BY PARTY CHIEF B. PORTER ON 11-14-2019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R/W
Broward ST
Alachua ST
New Market RD E
Alachua ST
Nixon DR
Roberts AVE E
Oak ST
Jerome DR
Jefferson AVE E
10th CT S
Airport Access
Airport Rd
PSHW3 26.71
PSHW2 25.61
PSHW1 26.82
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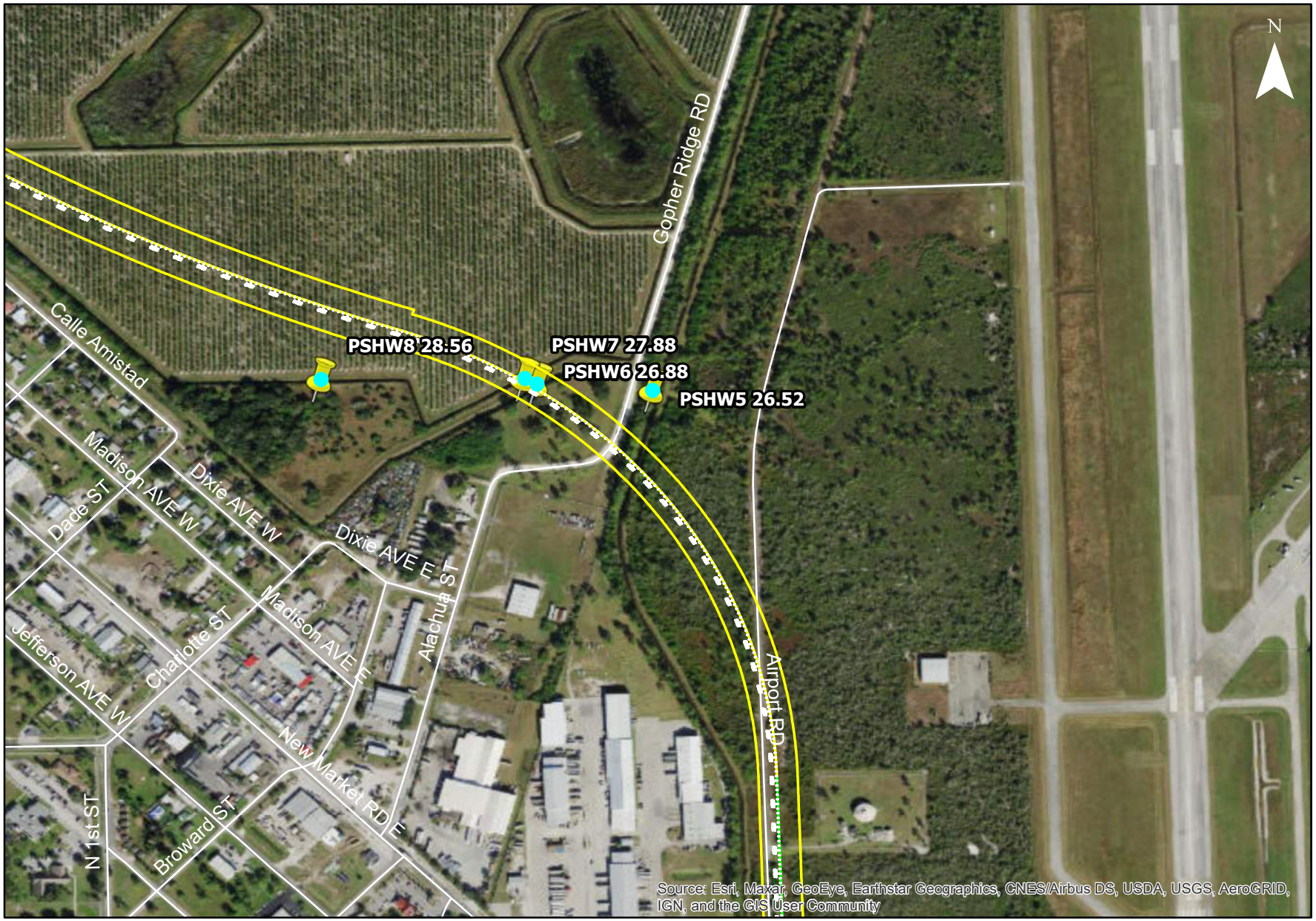
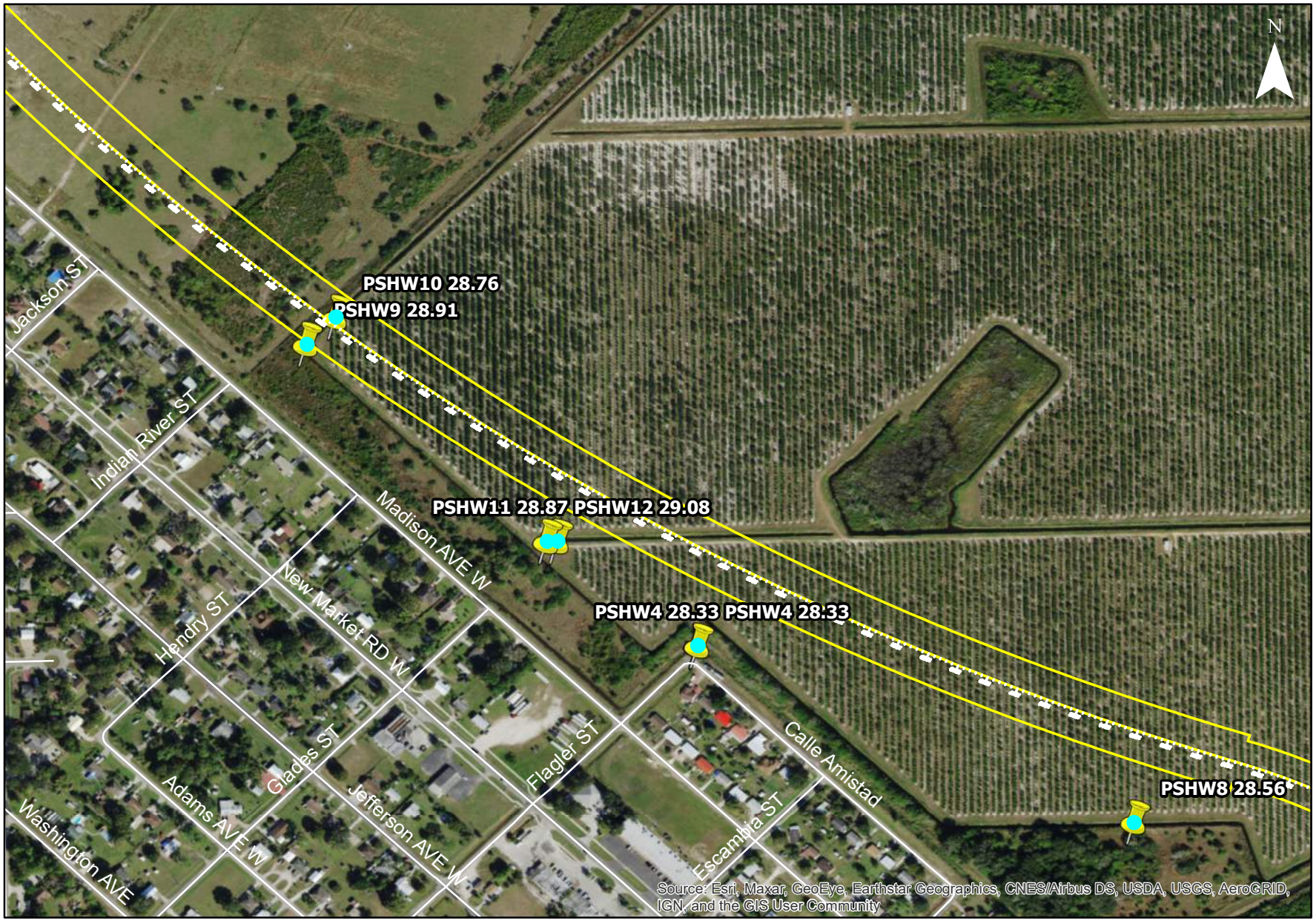

N
Gopher Ridge RD
PSHW8 28.56
PSHW7 27.88
PSHW6 26.88
PSHW5 26.52
Calle Amistad
Madison AVE W
Dade ST
Dixie AVE W
Dixie AVE E
Alachua ST
Madison AVE E
Charlotte ST
Jefferson AVE W
New Market RD E
Airport RD
N 1st ST
Broward ST
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


N
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PSHW12 29.08
PSHW4 28.33
PSHW4 28.33
PSHW8 28.56
Jackson ST
Indian River ST
Hendry ST
Madison AVE W
New Market RD W
Glades ST
Flagler ST
Calle Amistad
Escambia ST
Adams AVE W
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Washington AVE
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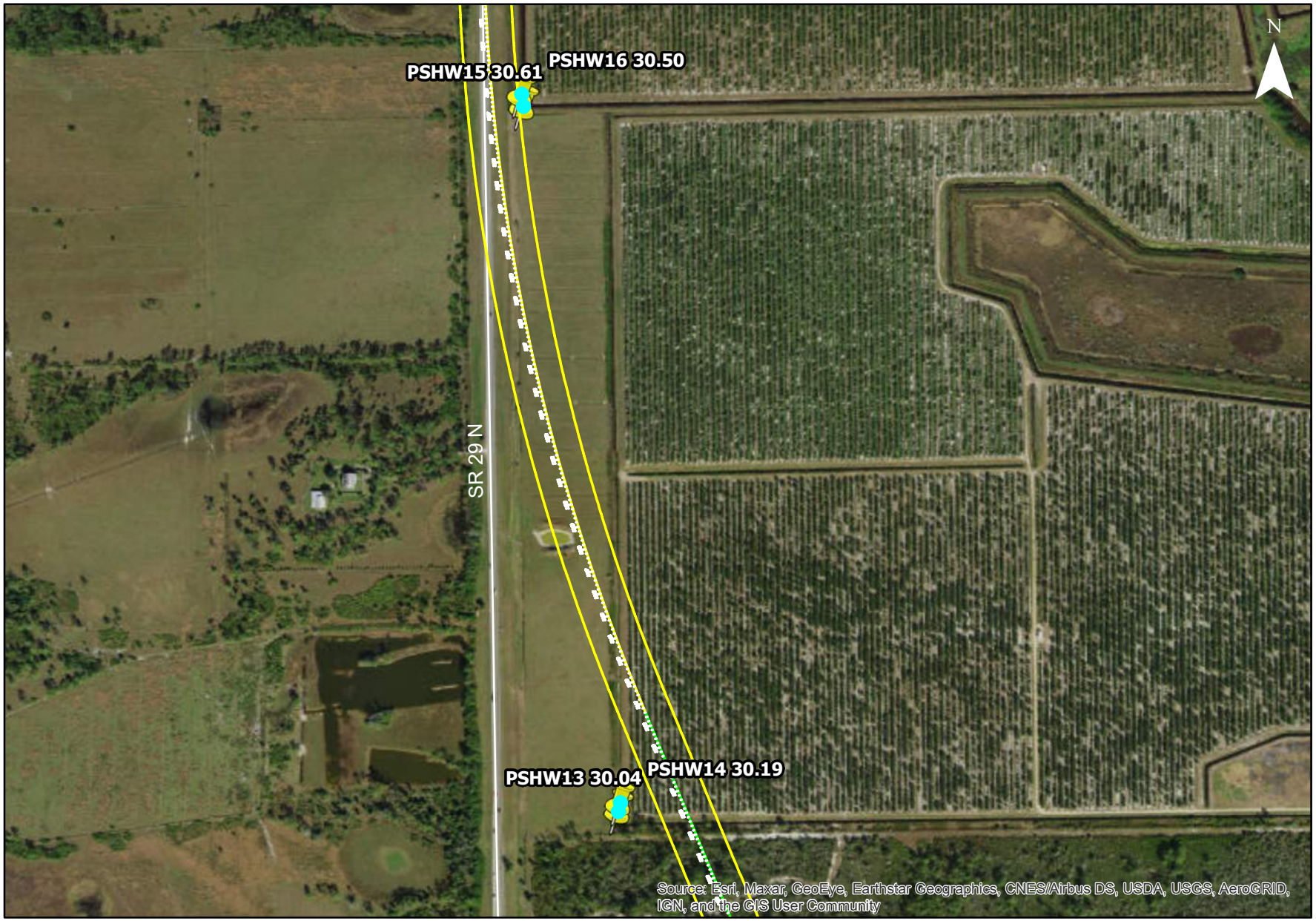
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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix I
Contamination

The Contamination Screening Evaluation Report Addendum (March 2024) can be found under separate cover.

Appendix J
Cultural

The Cultural Resources Assessment Survey Addendum Report (February 2024) can be found under separate cover.

Appendix K
Correspondence

MEETING MINUTES

Project Number: 417540-1 thru 417540-5 and 434490-1
Project Description: SR 29 Corridor Improvements
Meeting Name: SR 29 Regional Treatment Partnering Meeting No. 1
Date/Time: 5.13.2019 – 10:00 AM
Location: FDOT – D1 SWAO
Minutes Prepared By: PGA

Attendees:
See Attached Sign-in Sheets

Exhibits: See attached.

The following notes reflect our understanding of the discussions and decisions made at this meeting. If you have any questions, additions, or comments, please contact us. We will consider the minutes to be accurate unless written notice is received within 5 working days of the date issued.

Meeting Minutes:

1. **Introductions**
    a. The meeting began with brief introductions
2. **FDOT's planned improvement projects**
    a. PD&E Study: 417540-1 - SR 29 North of Oil Well Road (Study on-going)
        i. Design Segments:
        ii. 417540-2 – SR 29 from Oil Well Road to Sunniland Nursery Road
        iii. 417540-3 – SR 29 from Sunniland Nursery Road to Agricultural Way
        iv. 417540-4 – SR 29 from Agricultural Way to CR 846 E
        v. 417540-5 – SR 29 from CR 846 E to New Market Road
    b. PD&E Study: 434490-1 - SR 29 from I-75 (Alligator Alley) to Oil Well Road (underway)
3. **Basin overview of proposed projects**
    a. The noted design segments are all within the Silver Strand Basin.
    b. The flow is carried from north to south via the Barron River Canal that is adjacent to SR 29 on the east side of the roadway.
4. **Regional stormwater treatment opportunities**
    Several opportunities were discussed amongst the stakeholders to provide regional stormwater treatment for the corridor. Below is a list of specific opportunities discussed and key highlights for each
    a. Repurpose existing borrow pits south of Oil Well Road
        i. This would locate the regional facility furthest downstream to capture and treat the maximum amount of the stormwater runoff
        ii. Per Russell Priddy, the borrow pits east of SR 29 are currently being used as a high-end fishing camp and would not be ideal
        iii. The borrow pits west of SR 29 are potentially available, but culverts or a bridge would be needed to cross SR 29 and considerations for crossing the powerline easement along the west side of SR 29
        iv. The Eastern Collier Habitat Conservation Plan (HCP) is within this area west of SR 29

v. The HCP was recently updated and is expected to be finished in September
vi. The quadrants at the intersection of SR 29 and Oil Well Road are currently slated for development

b. Pregnant Snake
i. This would involve widening of the Barron canal along SR 29 to provide treatment of the stormwater.
ii. Ditch blocks and/or gates would be required to provide the required treatment and attenuation
iii. The land owners expressed concerns with this option since the burden would likely be on a single landowner
iv. There is the potential that the canal widening could be implemented at several locations along the canal
v. The widened canal option may be more difficult to maintain since equipment would have difficulty reaching the middle.

5. Permitting and water quality

a. SWFWMD district staff agreed that the regional approach would be acceptable for providing stormwater treatment
b. The hydraulics of any regional system would need to be explored to ensure no adverse impact
c. The department will develop a model to help demonstrate no adverse impact
d. The downstream end of the basin is considered an Outstanding Florida Water (OFW) and direct discharges require an additional 50% of the required treatment volume to be provided.
e. It was discussed that a single permit may be obtained for the regional facility in which water quality credits would be created. Each design segment would then modify the permit to deduct the water quality credits needed for each segment.

6. Cost sharing opportunities

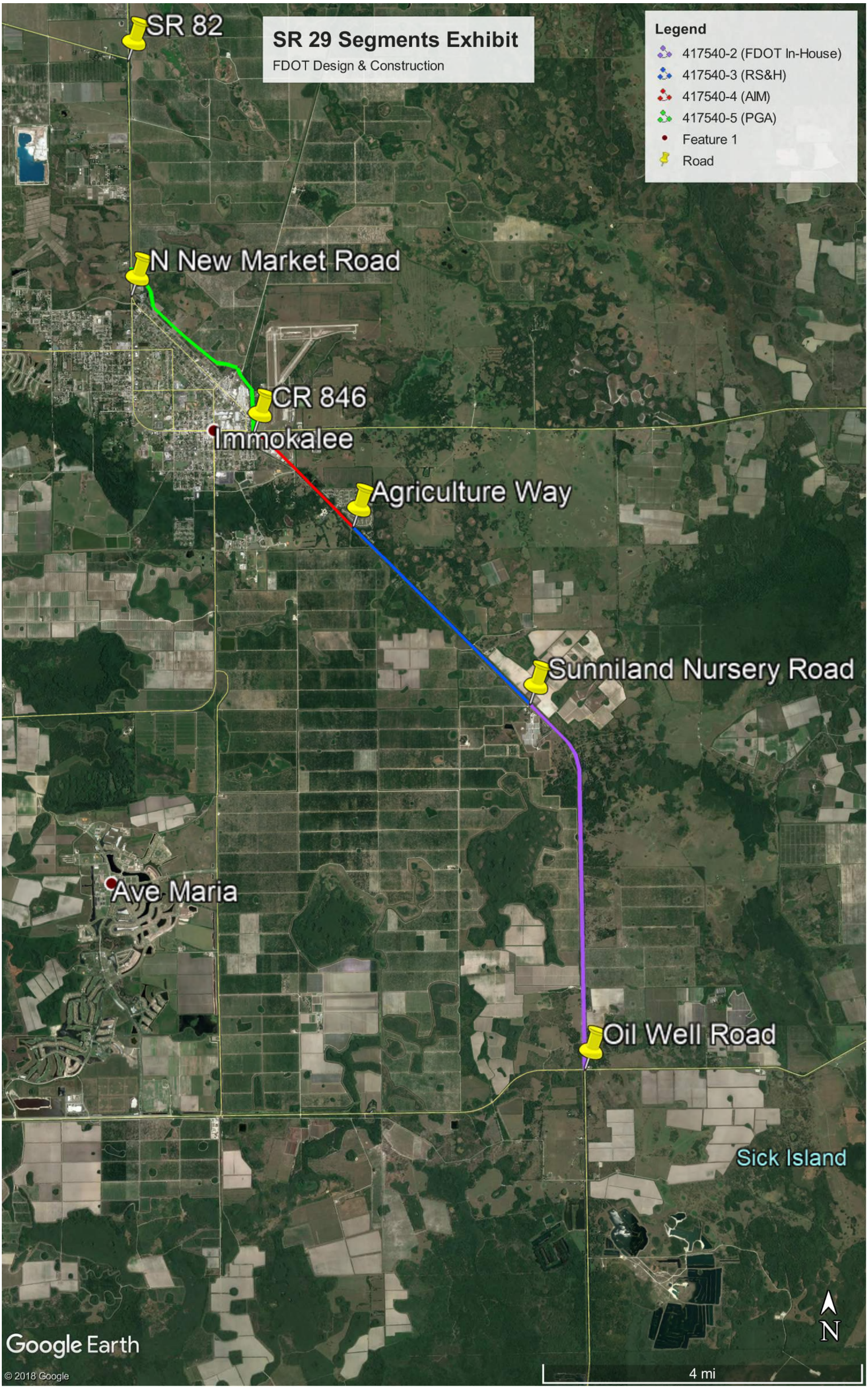
a. The goal of the regional treatment is to create Win-Win-Win opportunities for all of the stakeholders.
b. FDOT is capable of providing initial capital cost to develop and construct a regional facility, but prefers the local government or other stakeholders participate in the maintenance of the facilities (regional treatment pond and Barron River Canal)
c. FDOT suggested a special taxing district or water control district could be created to provide funding for the maintenance of the regional facility and canals
i. The land owners expressed concern that the burden would be unfairly placed upon them.
ii. It was noted that the Immokalee area would be expected to participate since this area is part of the basin. Additionally, as the land owners hope to develop their land, the burden would be transferred to the new owners.
iii. The landowners are potentially open to this framework depending on the structure of the water control district/special taxing district and level of participation of all stakeholders
iv. It was noted that maintenance of the Barron Canal had been in flux for several years, until Collier County recently received easements and accepted responsibility for the maintenance of the canal.

7. Miscellaneous discussions

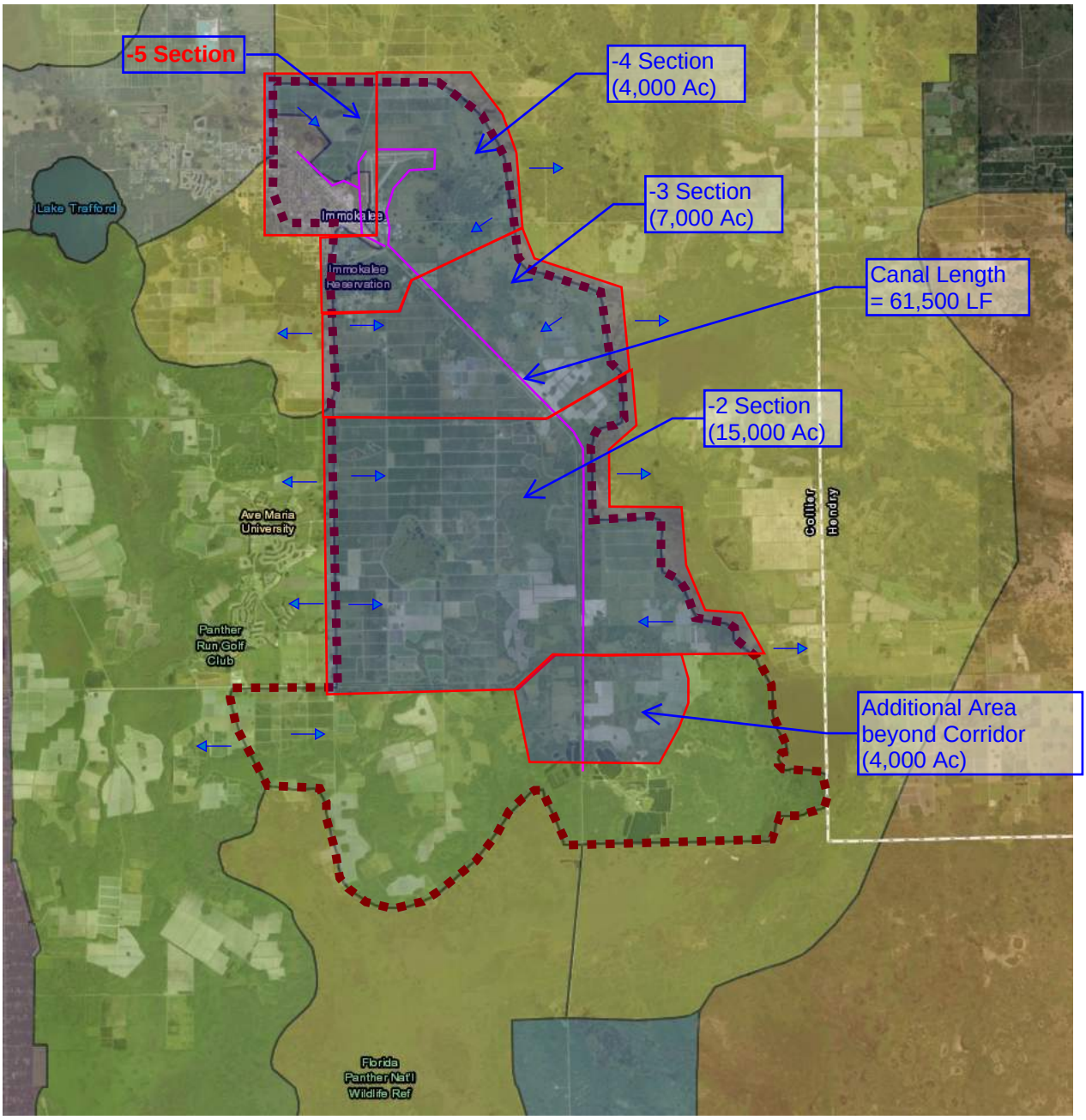
a. FEMA Floodplain
i. Collier County stated that current FEMA maps will be revised based on updated LIDAR
ii. The current model used to develop flood stages is based on a proprietary 2D surface water model
iii. Brent expressed concerns current trends in regional watershed modeling and inquired if the County had plans to ensure long term efficiency and vitality to the regional modeling.
b. County regional option within Immokalee
i. The County was exploring a potential regional pond for flood relief within the Immokalee area and to provide water quality
ii. This site was located at the confluence of the Madison Avenue Ditch and Eutopia Canal
iii. FDOT identified this site as a potential option for partnering

iv. This site is currently proposed for development and the County/FDOT will need to explore other locations

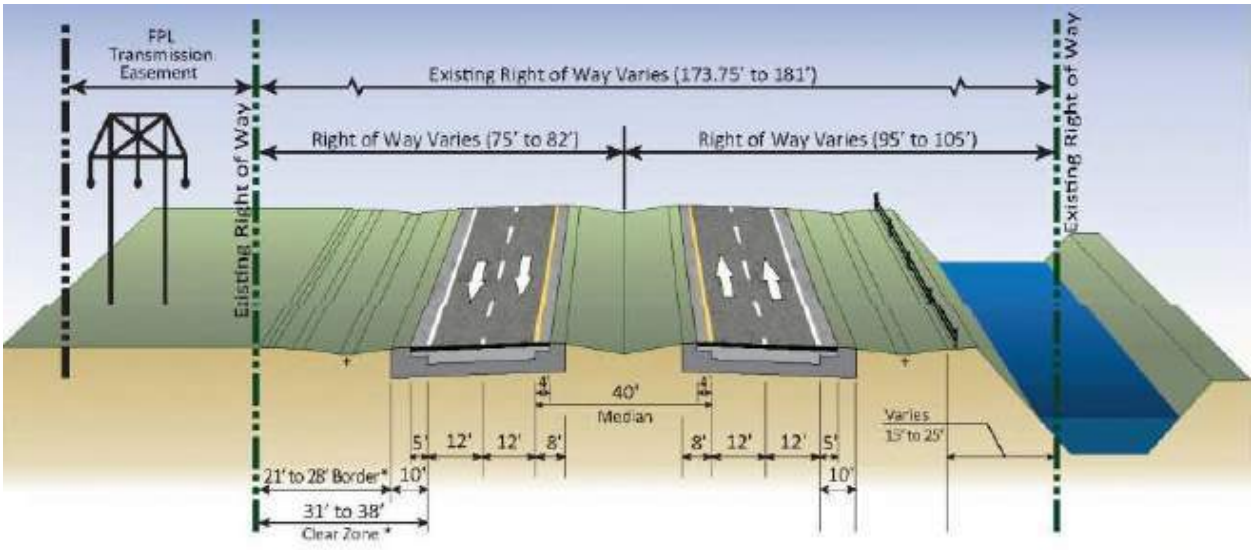
c. Other County improvements
    i. The County is currently exploring other options to alleviate the flooding within Immokalee
        1. The County is exploring rerouting flow from Eutopia Canal to the north and east of the airport
        2. The county is currently designing the bridges along CR 846 to accommodate the additional flow
d. Canal maintenance
    i. The county recently received drainage easements to maintain the SR 29 Canal
    ii. Access to the canal needs to be considered
    iii. The canal accumulates a lot a floating debris (trash) and any improvements should include considerations for trash removal.


SR 29 Segments Exhibit
FDOT Design & Construction
Legend
417540-2 (FDOT In-House)
417540-3 (RS&H)
417540-4 (AIM)
417540-5 (PGA)
Feature 1
Road
SR 82
N New Market Road
CR 846
Immokalee
Agriculture Way
Sunniland Nursery Road
Ave Maria
Oil Well Road
Sick Island
N
Google Earth
© 2018 Google
4 mi

SR 29 BASIN OVERVIEW

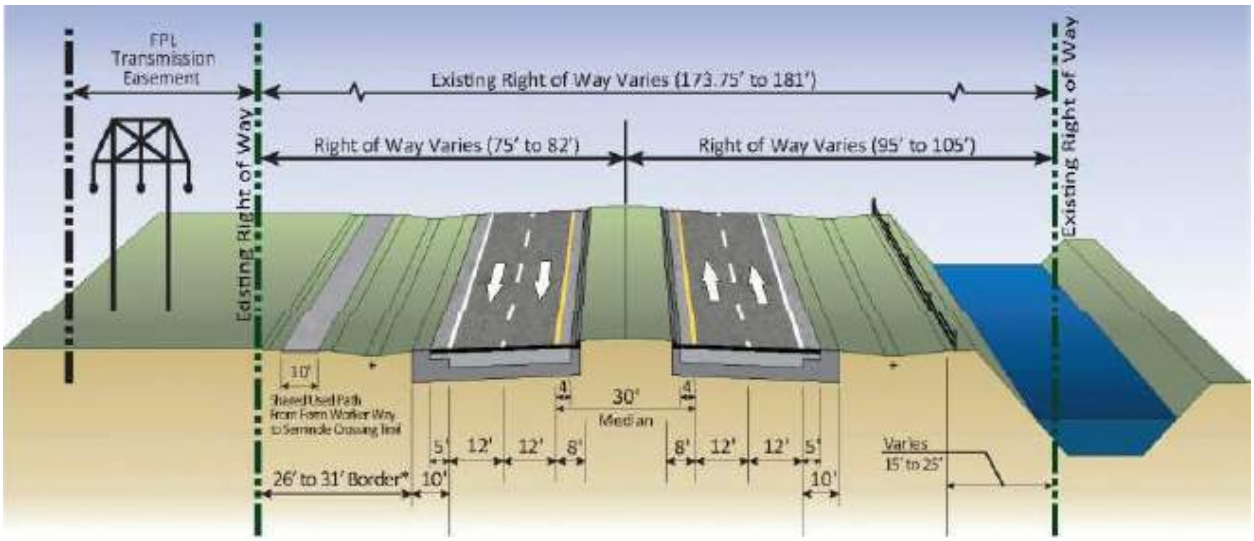


SR 29 ROADWAY TYPICAL SECTIONS



* Clear Zone and Border Width Require Design Variations
\+ DBI if warranted

SEGMENTS: **417540-2 (FDOT IN-HOUSE)**, **417540-4 (RS&H)**, **417540-4 (AIM)**



* Border Width Requires Design Variation
\+ DBI, as warranted

SEGMENTS: **417540-4 (AIM)**

* 10' Border Width Requires Design Variation Where Constrained by 100' Existing ROW

SEGMENTS: **417540-4 (AIM), 417540-5 (PGA)**

SEGMENTS: **417540-5 (PGA)**

SR 29 Regional Treatment Partnering Meeting

5/13/2019

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Tom Jones		Barron Collier		Tjones@barroncollier.com
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Christian Spilker	CA	COLLIER ENTERPRISES	(239) 261-4455	[redacted]@COLLIERENTERPRISES.COM

List of Call-in Attendees:
Alan Eldridge
Amy Perez
Gabriela Garcia
Bradley Jackson
Jerry Kurtz
Kaylene Johnson
Laura Layman
Lisa Koehler
Rob Myers
Robert Garrigues
Melissa Roberts
Scott Ellis

MEETING MINUTES

Project Number: 417540-1 thru 417540-5 and 434490-1
Project Description: SR 29 Corridor Improvements
Meeting Name: SR 29 Regional Treatment Partnering Meeting No. 2
Date/Time: 2.11.2020 – 10:00 AM
Location: FDOT – D1 SWAO
Minutes Prepared By: PGA

Attendees:
See Attached Sign-in Sheets

The following notes reflect our understanding of the discussions and decisions made at this meeting. If you have any questions, additions, or comments, please contact us. We will consider the minutes to be accurate unless written notice is received within 5 working days of the date issued.

Meeting Minutes:

1. **Introductions**
    a. The meeting began with brief introductions
2. **FDOT's planned improvement projects – FDOT provided a status update on the current planned projects. A detailed account of the items discussed are listed below.**
    a. PD&E Study: 417540-1 - SR 29 North of Oil Well Road (LDCA expected in March)
    b. PD&E Study: 434490-1 - SR 29 from I-75 (Alligator Alley) to Oil Well Road (PD&E phase)
    c. Design Segments (-2 to -5) Updates:
        i. Survey Status
            1. Survey Complete
            2. Canal Survey still outstanding (March)
        ii. Typical Sections Approved
            1. There were brief discussions for the approved typical sections and the components of the typical sections
            2. Several local landowners present noted the significant use of bicycles south of Immokalee along SR 29 and Oil Well Road
        iii. Upcoming Major Milestones
            1. Line & Grade Meetings (Summer 2020)
            2. Pond Siting Report (Fall 2020)
            3. Floodplain Model
                a. The development of the floodplain model will utilize ICPR V4
                b. It was discussed that the floodplain would focus on the Immokalee Area and Barron River Canal, but could be expanded to incorporate offsite areas if needed
                c. It was requested that local landowners / agriculture operators provide input in development of the exact drainage basin for the Barron River Canal
                d. The private landowners stated they would be willing to share existing data and provide input
                e. The county is currently not managing any gage data for this area

f. The County stated that there is wide range of flow depths experienced in the Barron River Canal
g. There was discussion about the installation of a data logger to aid in the calibration of the model
    i. The FDOT does not have a system in place for installing and collecting this information
h. Russell Priddy noted that the Barron River Canal will breach the east side of the canal bank at times of high flow

3. **Regional stormwater treatment opportunities – The FDOT prepared some potential options for regional treatment for review at the meeting. See Attachment 1 for potential options reviewed during the meeting. A discussion for each option is detailed below.**
    a. Option 1 – Borrow Pits
        i. This option involves using the existing borrow pits west of SR 29 and south of Oil Well Road
        ii. Tom Jones stated that there is currently a Collier family house located west of this proposed option
        iii. Tom Jones also stated that the area west of SR 29 is proposed for personal use
        iv. Brent explained that a bridge or culvert would be proposed on SR 29 to allow for the diversion of the Barron River Canal water into the borrow pits
        v. Brent explained some options about the discharging the regional pond to the south
            1. One option was to allow natural sheet flow to the wetlands in the southwest, which was not favorably received by the property owner representatives
            2. Another option was discussed that would require a ditch outfall that would connect south to the Panther Refuge
        vi. There was concern about accepting “dirty” water into the borrow pits and concerns about sheet flow discharges
        vii. Russell Priddy briefly discussed the potential of using some of the borrow pits to the east of SR 29 located at the southern end of his property
            1. The borrow pit evaluated was about 20 acres
            2. Russell mentioned that the OK slough comes in from the east and that the borrow pit could discharge south to OK slough and to Big Cypress National Preserve
    b. Option 2 - Pregnant Snake
        i. This option involves providing a series of smaller sites along the eastside of the Barron River Canal
        ii. Brent explained that this option has the benefit of “treating as we” go thus helping with permitting requirements
        iii. There was concern about the impacts these options may have on the developable property
        iv. These ponds could be adjusted to accommodate future development and perhaps used to accept adjacent stormwater runoff from future developments
        v. The landowner representatives asked for specific locations and they may request areas to avoid
    c. Option 3 – North Site
        i. This option is located just south of Immokalee and would likely not provide the required treatment for the entire corridor and would have to be used in combination with other alternatives
        ii. This option would be located downstream of the confluence of two canals that exit the Immokalee area
    d. Option 4 – Southwest Florida Comprehensive Plan
        i. This option was identified as part of larger study by SFWMD and USACE
        ii. This is currently not an active project per recent correspondence with SFWMD and USACE
        iii. There is a potential of involving additional partners to achieve the goal of regional treatment

4. **Cost sharing opportunities**
    a. FDOT is interested in providing initial capital cost to develop and construct a regional treatment facility, but prefers other stakeholders participate in the maintenance of the facilities
    b. The County is concerned that funds are limited for maintenance of the canal
    c. A special taxing district or water control district could be created to provide funding for the maintenance of the regional facility and canals
        i. This option was not well received amongst the landowners
5. **Miscellaneous discussions**
    a. Canal Maintenance
        i. The County has now received the easements to perform maintenance of the Barron River Canal
            1. The County is currently developing boat ramps to allow for equipment to maintain the Barron River Canal
            2. Russell requested that the County coordinate with him about the exact location of proposed boat ramps
    b. -5 PGA (PGA Segment)
        i. There was concern on exact alignment on the SR 29 corridor
        ii. PGA mentioned that there is a preferred corridor alignment identified in the PD&E study
        iii. A separate meeting will be scheduled to discuss the particulars of the -5 alignment
    c. Landowner coordination
        i. It was discussed that moving forward that landowners would be open to meet or coordinate with individual segments for proposed improvements within their property

6. **Action Items**
    a. PGA to schedule a meeting with the landowners to discuss the alignment within the -5 segment
    b. PGA to coordinate with landowners to help define the drainage basin for the Barron River Canal
    c. PGA to coordinate with landowners / agricultural operations within the area to define offsite drainage
    d. The County to coordinate the placement of the boat ramps within the Barron River Canal
    e. FDOT will coordinate with the County and SFWMD about the placement of data logger within the Barron River Canal

SIGN-IN SHEET

Project Number: 417540-1 thru 417540-5
Project Description: SR 29 Corridor Improvements
Meeting Name: SR 29 Regional Treatment Partnering Meeting No. 2
Date/Time: 2.11.2020 – 10:00 AM
Location: FDOT – D1 SWAO

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FDOT

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Alan Eldridge — ASE — Faller, Davis & Associates — aeldridge@fallerdavis.com

FDOT

SIGN-IN SHEET

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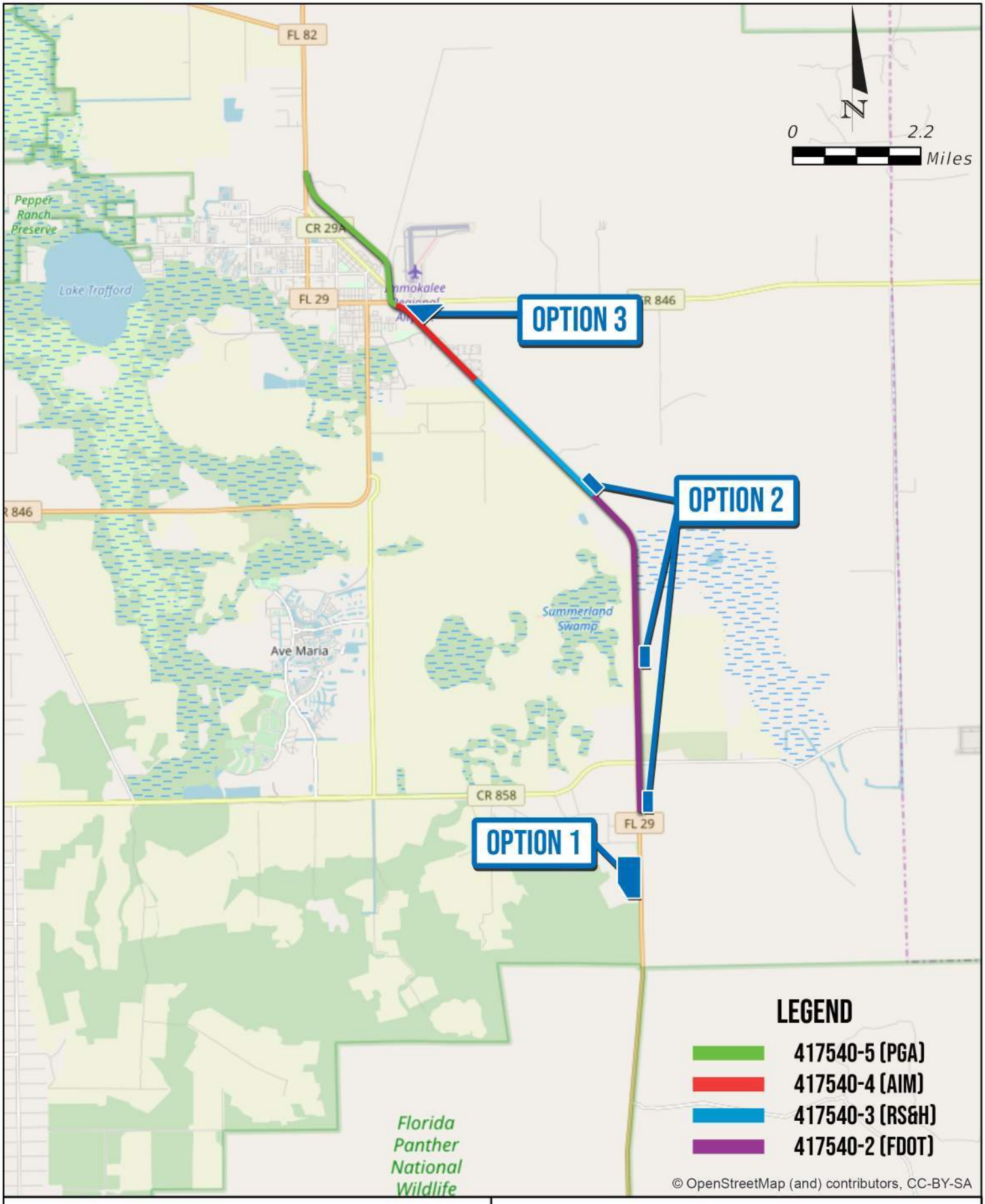
Attachment 1



FDOT

SR 29 Regional Option Overview

REGIONAL OPTION 1 - BORROW PITS

CANAL

29

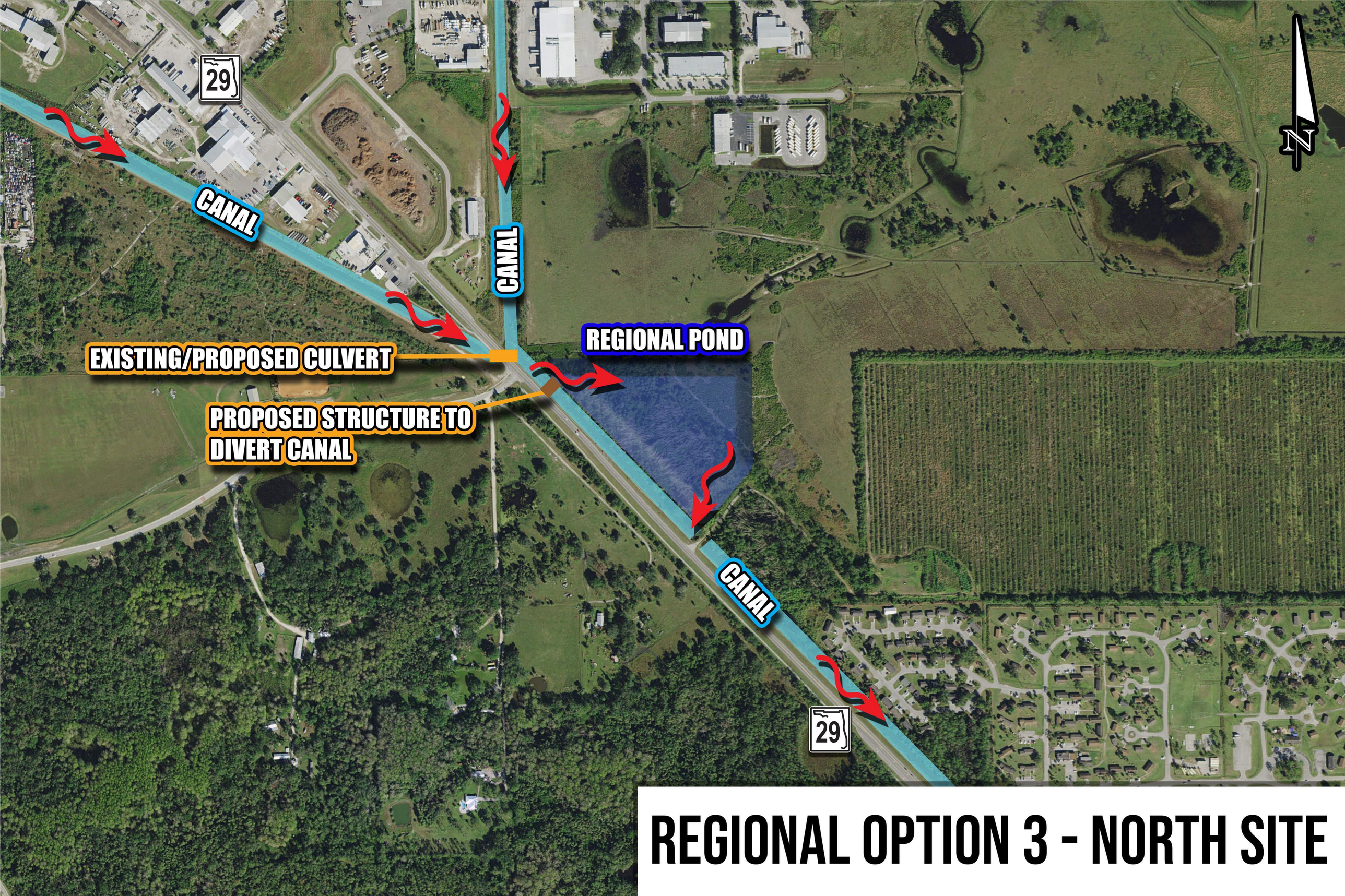
PROPOSED STRUCTURE TO DIVERT CANAL

REGIONAL POND

N

CANAL

REGIONAL OPTION 2 - PREGNANT SNAKE



REGIONAL OPTION 3 - NORTH SITE

SOUTHWEST FLORIDA COMPREHENSIVE WATERSHED PLAN

a habitat quilt tied by THREADS OF WATER reconnecting a sustainable landscape

SWFCWP

Table ES-1. The 13 Functional Groups in the Southwest Florida Comprehensive Watershed Plan

FG #	Functional Group Name	Total # of Individual Projects within FG	Tier 1 Projects	Tier 2 Projects	Tier 3 Projects	Full Footprint (Acres)	Rough Order of Magnitude Cost Estimate (Detailed Field Work and Design Needed for Construction Cost Estimates)	Location	Restoration Intent / Qualitative Benefits Description	Potential NFS*
6	SR 29 / Barron River Flow-way Restoration	7	3	4	0	15,595	$279,270,000	Extends from Immokalee in northern Collier County south to the Gulf of Mexico as a narrow band through the center of the County along SR 29.	Reduce SR 29 Canal drainage impacts with a mix of weirs and canal plugs that will restore hydrologic and fire regimes in adjacent portions of Big Cypress National Preserve, Florida Panther National Wildlife Refuge, Fakahatchee Strand Preserve State Park, and Everglades National Park, as well as the biological connectivity between and productivity within these lands and their downstream estuaries.	Tier 1: SWFWMD, FDEP Tier 2: FWCC, FDACS, (State Forest Service) DOI, NPS, FDOT
56	Yucca Pens	8	6	2	0	14,548	$149,470,000	Covers 14,500 acres, located in northwestern Lee County, bordered by Gator Slough Canal to the south, Lee County / Charlotte County line to the north, US 41 to the east and Burnt Store Road (CR 765) to the west.	Restore sheetflow in the largest remaining hydric pine flatwoods west of US 41, reduce damaging flows to Matlacha Pass and contribute to a wildlife corridor between Charlotte Harbor and Lake Okeechobee.	Tier 1: SWFWMD, FDEP Tier 2: FWCC, FDACS, (State Forest Service)
70	Coastal Fakahatchee	8	5	1	2	50,524	$57,920,000	South central Collier County extending from just north of I-75, south to the Gulf of Mexico.	Improve sheet flow from within Fakahatchee Strand to Everglades National Park and through Picayune Strand to Ten Thousand Islands National Wildlife Refuge.	Tier 1: SWFWMD, FDEP Tier 2: FWCC, FDACS, (State Forest Service) DOI, NPS, ENP Tier 3: Naples Pathways Coalition, River of Grass Greenway, Lee County, Arthur R. Marshall Foundation & Florida Environmental Institute
34	Estero Creeks and Headwater Flow-ways	38	21	8	9	47,899	$2,132,760,000	Lee County, bordered to the north by the Caloosahatchee River watershed, to the west by San Carlos and Estero Bays, and to the south by the Lee County line, extending inland east of I-75 to the Corkscrew Watershed Functional Group (5).	Restore and protect headwater and tributary flows to Florida's first aquatic preserve, the Estero Bay Aquatic Preserve, while connecting the inland Corkscrew Swamp (5) and Tidal Caloosahatchee (29T) Functional Groups.	Tier 1: SWFWMD, FDEP Tier 2: FWCC Tier 3: Charlotte Harbor National Estuary Program, Fri of Estero Bay.
73	South Caloosahatchee Ecoscape	7	5	2	0	29,641	$779,380,000	Narrow corridor extending east, west and south of LaBelle, bordered on the north by the Caloosahatchee River and south by the Okaloacoochee Slough Functional Group (11).	Protect the Florida panther dispersal corridor connecting primary southwest Florida panther habitat across the southern portion of the Caloosahatchee watershed to northern dispersal areas; restore hydrology and plant communities along this corridor.	Tier 1: SWFWMD, FDEP Tier 2: FWCC, FDACS, (State Forest Service) DOI, NPS, ENP
29 T	Tidal Caloosahatchee Creeks	53	4	14	35	105,446	$149,780,000	Includes oxbows and tidal creeks entering the Caloosahatchee River and estuary from the northwest corner of Cape Coral and extending east to the S-79 navigation lock, including numerous creeks on the north side of the Caloosahatchee River and Billy Creek, Orange River and its tributaries on the south side of the Caloosahatchee River.	Restore natural hydrology, water quality and habitat continuity of major tidal tributaries and recreate a series of oxbows to slow flows and provide littoral habitat in the tidal portion of the Caloosahatchee River.	Tier 1: SWFWMD, FDEP Tier 2: FWCC, FDACS, (State Forest Service) DOI, NPS, ENP Tier 3: Naples Pathways Coalition, River of Grass Greenway, Lee County, Arthur R. Marshall Foundation & Florida Environmental Institute
29 F	Freshwater Caloosahatchee Creeks	55	6	43	6	248,448	$375,380,000	At the intersection of the Glades, Lee and Hendry counties along both the north and south sides of the Caloosahatchee River with S-79 navigation lock as the western boundary and the city of LaBelle approximating the eastern boundary.	Restore natural hydrology, water quality and habitat continuity of major tributaries and recreate a series of oxbows to slow flows and provide littoral habitat in the freshwater portion of the Caloosahatchee River.	Tier 1: SWFWMD, FDEP Tier 2: FWCC, FDACS, (State Forest Service) DOI, NPS, ENP Tier 3: Naples Pathways Coalition, River of Grass Greenway, Lee County, Charlotte Harbor NEP
15	Belle Meade Flow-way	13	11	2	0	49,932	$2,055,800,000	Southwestern Collier County, includes a large swath of land extending from I-75 south to US 41, bordered to the east by the Picayune Strand Restoration Project and to the west by CR 951.	Restore hydrologic and fire regimes; control a severe invasion of exotic vegetation in a major flow-way; protect a large area of important habitat for wading birds and wide-ranging wildlife.	Tier 1: SWFWMD, FDEP Tier 2: FWCC, FDACS, (State Forest Service)
28	Babcock Ranch	6	6	0	0	119,338	$2,806,550,000	At the intersection of the Lee, Charlotte, and Glades counties north of the Caloosahatchee River along the boundary between the Caloosahatchee River watershed and watersheds outside the SWFCWP study area to the north.	Secure a connection between Cecil Webb Wildlife Management Area and the North Caloosahatchee Ecoscape Functional Group (41) in the east-west corridor from Charlotte Harbor to Lake Okeechobee, including Telegraph Swamp.	Tier 1: SWFWMD, FDEP

SR 29 BARRON RIVER FLOWWAY RESTORATION

STATEMENT OF INTENT

Reduce SR 29 Canal drainage impacts with a mix of weirs and canal plugs that will restore hydrologic and fire regimes in adjacent portions of Big Cypress National Preserve, Florida Panther National Wildlife Refuge, Fakahatchee Strand Preserve State Park, and Everglades National Park. In addition, restore the biological connectivity between, and productivity within these lands and their downstream estuaries.

GEOGRAPHIC LOCATION

The SR 29/Barron River Flow-way Restoration functional group (FG) extends from Immokalee in northern Collier County south to the Gulf of Mexico as a narrow band through the center of the county along SR 29.

ENVIRONMENTAL CONCERNS

This landscape was originally dominated by hydric pine flatwoods and herbaceous wetlands, with cypress wetlands becoming more widespread to the south. Near the coast, the freshwater wetlands graded first into brackish herbaceous marshes and then dense mangrove forests in the Ten Thousand Islands. Shallow overland water flows occurred for much of the wet season and into the dry season in the deeper strands and sloughs, generally moving in a south-southwesterly direction. As a result of development, much of the original landscape in the northern portion of this area has been converted to intensive agriculture, drained via the SR 29 canal. Much of the southern portion of the area remains ecologically intact and has been brought into public ownership for conservation purposes. Although under conservation ownership, overdrainage and channelization of flows associated with the SR 29 Canal and the subsequent loss of natural sheet flow have negatively impacted the Florida Panther National Wildlife Refuge (FPNWR), Fakahatchee Strand Preserve State Park (FSPSP), Big Cypress National Preserve (BCNP), and Everglades National Park (ENP). Disruption of the local hydrology has led to changes in both plant and animal communities, as well as the natural fire regime. The canal has caused groundwater drawdowns in the adjacent public lands, potentially out to a mile from the canal during drier periods. Existing canal structures, in varying states of repair, are ineffectual in maintaining groundwater levels. Culverts and bridges along SR 29, although adequate to protect the road from flooding, are not sufficiently frequent to allow equalization of shallow surface water levels on most of the lands along each side of the road. Wildlife mortality is also a major concern in this area due to high speed traffic on SR 29. Due to its location in a tidally influenced area, this FG is likely to be impacted by climate change (refer to **Section 2**).

ENVIRONMENTAL SOLUTIONS

Hydrologic restoration would be achieved primarily through alterations to the SR 29 Canal. Overdrainage of lands north of the conservation lands would be addressed through the installation of step-down weirs at approximately 0.5 to 1 foot topographic contour intervals along the canal. The primary advantage of the weirs is increased dry season groundwater levels and aquifer recharge without increasing flooding. Increased groundwater levels reduce fire hazards during dry periods due to the higher moisture content of soils and vegetation, and would also buffer against freeze damage to tropical vegetation and agricultural crops during winter cold spells. To restore sheetflow through the conservation lands, the SWFCWP proposes filling at least 50% of the SR 29 canal with a series of long plugs placed in locations that would promote flows though the historic sloughs. Maintenance of existing levels of flood control north of the filled portion of the canal would be achieved by construction of a pump station and spreader system at the north end of the FPNWR and BCNP, similar to those currently being constructed as part of the Picayune Strand Restoration Project. The spreader system, coupled with improved conveyance under SR 29, would facilitate the rapid reestablishment of sheetflow below the pump station. In addition, construction of wildlife crossings at key locations along SR 29 and CR 858 would significantly reduce mortality of the larger, wide-ranging mammals in this area.

IMPLEMENTATION STRATEGY

This FG is designed to restore the area's natural hydrologic and fire regimes, which are the dominant natural ecological processes sustaining the landscape. This will involve restoration of hydrologic and landscape connectivity between the FPNWR, FSPSP, BCNP, and ENP, which in turn will facilitate overland sheetflows, the elimination of point discharges to the Ten Thousand Islands, a more natural fire regime, and help to minimize the occurrence of exotic species. The parks provide refuge to numerous unique and/or listed species, including the Everglades mink and a large number of species of orchids and bromeliads, all of which are expected to benefit from the implementation of the recommended components. Several wide-ranging large mammals will particularly benefit from the landscape connectivity provided by this FG. The primary importance of the SR 29 Barron River Flow-way Restoration is to reconnect conservation lands on the two sides of SR 29. In addition, to the benefits associated with improved hydrologic and fire regimes as a result of filling the canal in these areas and the elimination of point discharges to the coastal waters, a reduced level of development along this corridor will facilitate wildlife movements across this connector and control of invasive native and exotic vegetation within the FG as well as on adjacent public lands.

IMAGES

Clockwise from top left: Great blue heron and young (*Ardea herodias*), courtesy of Kevin T. Edwards, Charlotte County; Looking south along the SR 29 Canal, courtesy of Ali Rezaie, U.S. Army Corps of Engineers; Florida panther (*Puma concolor coryi*) in the Florida panther NWR, courtesy of Larry W. Richardson; String lily (*Crinum americanum*), courtesy of Jean McCollom, Florida Fish and Wildlife Conservation Commission. Bottom: Aerial view of flatwoods and hardwood hammock plant communities and agricultural lands in the vicinity of the SR 29 Canal, courtesy of Angie Dunn, U.S. Army Corps of Engineers.

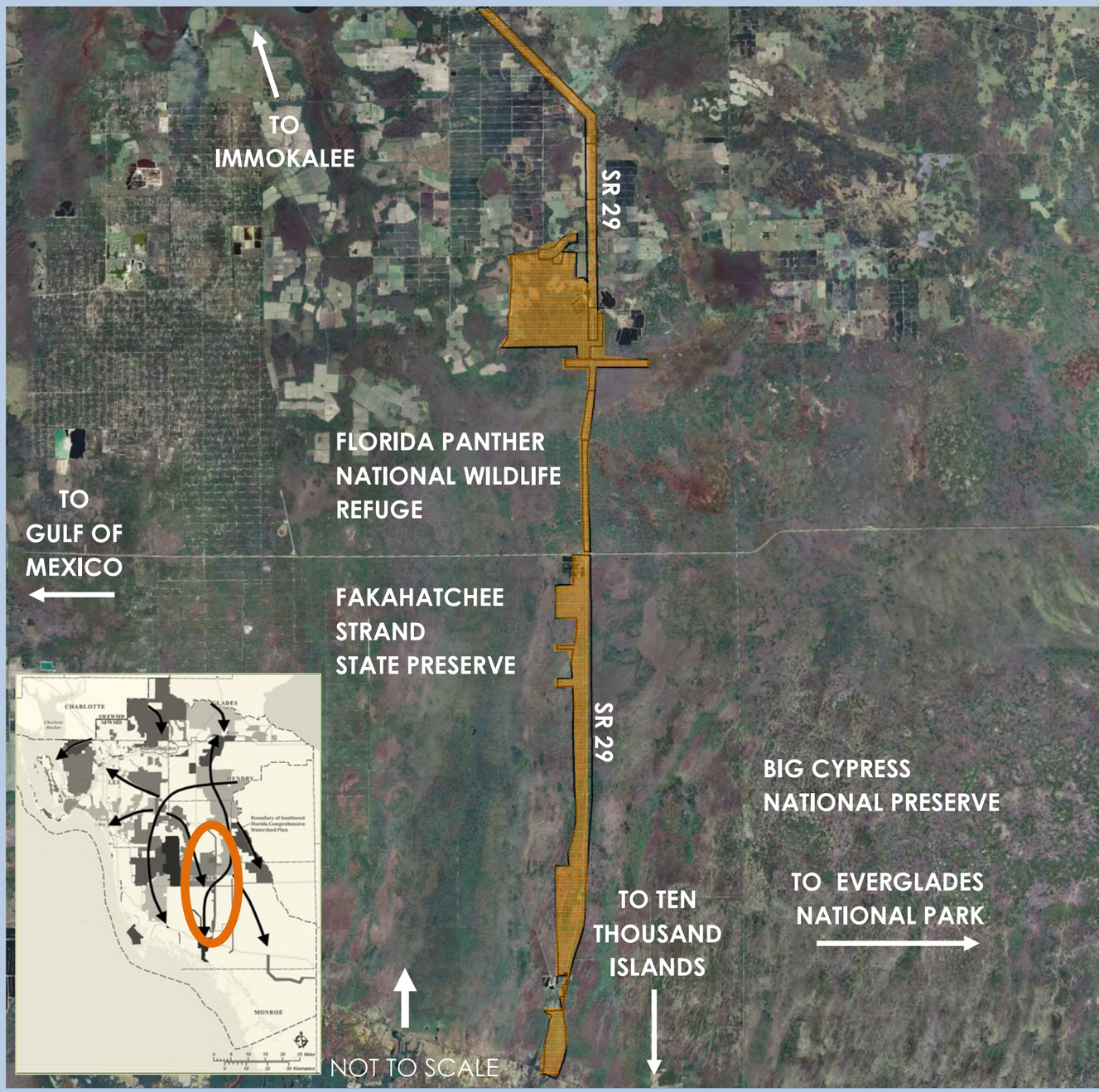


TABLE 9-1: FUNCTIONAL GROUP SUMMARY

FG #	TITLE	FULL FOOTPRINT (ACRES)	BARE FOOTPRINT, EXCLUDING AGRICULTURAL AND URBAN LANDS (ACRES)	LOCATION	RESTORATION INTENT
6	SR 29 / Barron River Flow-way Restoration	15,595	15,595	Extends from Immokalee in northern Collier County south to the Gulf of Mexico as a narrow band through the center of the county along SR 29.	Reduce SR 29 Canal drainage impacts with a mix of weirs and canal plugs that will restore hydrologic and fire regimes in adjacent portions of Big Cypress National Preserve, Florida Panther National Wildlife Refuge, Fakahatchee Strand Preserve State Park, and Everglades National Park, as well as the biological connectivity between and productivity within these lands and their downstream estuaries.
56	Yucca Pens	14,548	14,548	Covers 14,500 acres, located in northwestern Lee County, bordered by Gator Slough Canal to the south, Lee County / Charlotte County line to the north, US 41 to the east and Burnt Store Road (CR 765) to the west.	Restore sheetflow in the largest remaining hydric pine flatwoods west of US 41, reduce damaging flows to Matlacha Pass, and contribute to a wildlife corridor between Charlotte Harbor and Lake Okeechobee.
70	Coastal Fakahatchee	50,524	13,234	South central Collier County extending from just north of I-75, south to the Gulf of Mexico.	Improve sheet flow from within Fakahatchee Strand to Everglades National Park and through Picayune Strand to Ten Thousand Islands National Wildlife Refuge.
34	Estero Creeks and Headwater Flow-ways	47,899	44,973	Lee County, bordered to the north by the Caloosahatchee River watershed, to the west by San Carlos and Estero Bays, and to the south by the Lee County line, extending inland east of I-75 to the Corkscrew Watershed Functional Group (5).	Restore and protect headwater and tributary flows to Florida's first aquatic preserve, the Estero Bay Aquatic Preserve, while connecting the inland Corkscrew Swamp (5) and Tidal Caloosahatchee (29T) Functional Groups.
73	South Caloosahatchee Ecoscape	29,641	29,641	Narrow corridor extending east, west and south of LaBelle, bordered on the north by the Caloosahatchee River and south by the Okaloacoochee Slough Functional Group (11).	Protect the Florida panther dispersal corridor connecting primary southwest Florida panther habitat across the southern portion of the Caloosahatchee watershed to northern dispersal areas; restore hydrology and plant communities along this corridor.
29T	Tidal Caloosahatchee Creeks	105,446	10,731	Includes oxbows and tidal creeks entering the Caloosahatchee River and estuary from the northwest corner of Cape Coral and extending east to the S-79 navigation lock, including numerous creeks on the north side of the Caloosahatchee River and Billy Creek, and Orange River and its tributaries on the south side of the Caloosahatchee River.	Restore natural hydrology, water quality and habitat continuity of major tidal tributaries and recreate a series of oxbows to slow flows and provide littoral habitat in the tidal portion of the Caloosahatchee River.
29F	Freshwater Caloosahatchee Creeks	248,448	11,343	At the intersection of the Glades, Lee, and Hendry counties along both the north and south sides of the Caloosahatchee River with S-79 navigation lock as the western boundary and the City of LaBelle approximating the eastern boundary.	Restore natural hydrology, water quality, and habitat continuity of major tributaries and recreate a series of oxbows to slow flows and provide littoral habitat in the freshwater portion of the Caloosahatchee River.
15	Belle Meade Flow-way	49,932	49,932	Southwestern Collier County includes a large swath of land extending from I-75 south to US 41, bordered to the east by the Picayune Strand Restoration Project and to the west by CR 951.	Restore hydrologic and fire regimes; control a severe invasion of exotic vegetation in a major flow-way; protect a large area of important habitat for wading birds and wide-ranging wildlife.
28	Babcock Ranch	119,338	119,338	At the intersection of the Lee, Charlotte, and Glades counties north of the Caloosahatchee River along the boundary between the Caloosahatchee River watershed and watersheds outside the SWFCWP study area to the north.	Secure a connection between Cecil Webb Wildlife Management Area and the North Caloosahatchee Ecoscape Functional Group (41) in the east-west corridor from Charlotte Harbor to Lake Okeechobee, including Telegraph Swamp.
11	Okaloacochee Slough	184,848	137,198	Originates in western Hendry County in a low gap on a ridgeline dividing the Caloosahatchee and Big Cypress Swamp watersheds, extending south through central Collier County to Fakahatchee Strand and other smaller strands flowing to the Ten Thousand Islands and Gulf of Mexico.	Restore the largest headwaters flow-way of the Big Cypress Swamp; protect one of the largest expanses of intact pine flatwoods and herbaceous wetlands remaining in southwest Florida; create a landscape corridor between the South Caloosahatchee Ecoscape Functional Group (73) and Big Cypress Swamp.

Attachment 2

Support Information

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

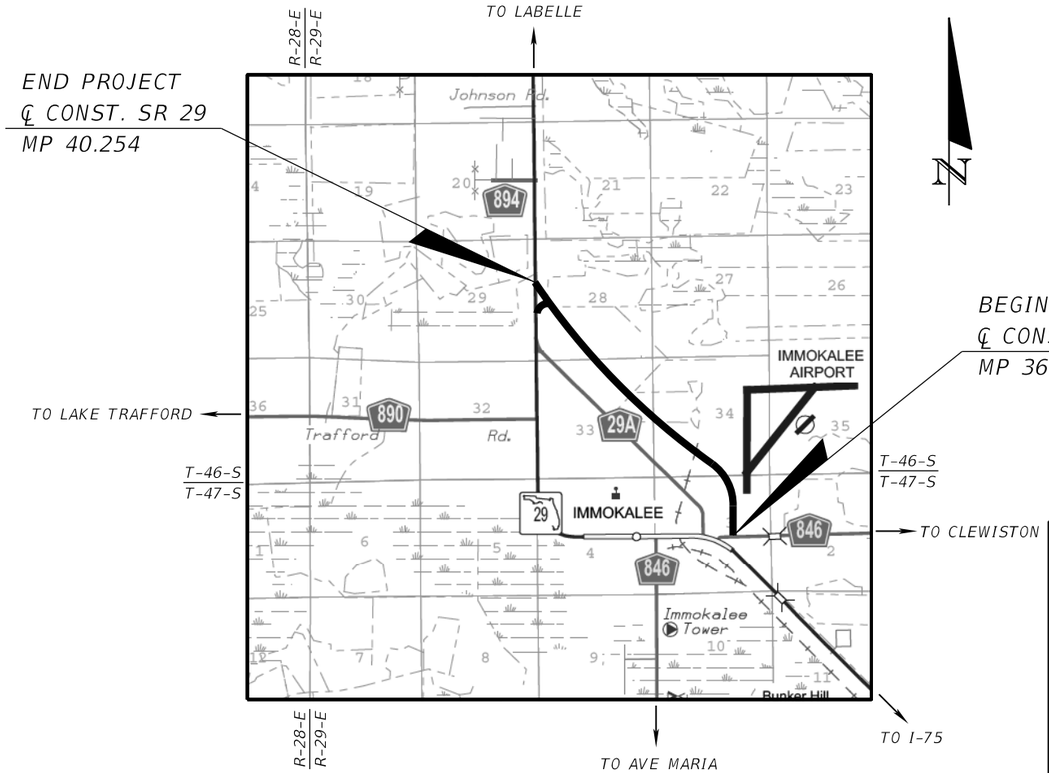
TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 417540-5-52-01

COLLIER COUNTY (03080)

STATE ROAD NO. 29

FROM CR 846 E TO N OF NEW MARKET ROAD N



APPROVED BY:

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

TREVOR J. HAWKINS
LICENSE
No 73047
STATE OF FLORIDA
PROFESSIONAL ENGINEER

ON THE DATE ADJACENT TO THE SEAL

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PATEL, GREENE AND ASSOCIATES, PLLC
12570 TELECOM DRIVE
TEMPLE TERRACE, FLORIDA 33637
TREVOR J. HAWKINS, P.E. NO. 73047

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TYPICAL SECTION PACKAGE

TYPICAL SECTION CONCURRENCE

FDOT DISTRICT DESIGN ENGINEER

FDOT DISTRICT STRUCTURES DESIGN ENGINEER

FHWA TRANSPORTATION ENGINEER

DESIGN SPEED AND POSTED SPEED CONCURRENCE:

FDOT DISTRICT TRAFFIC OPERATIONS ENGINEER

FDOT DISTRICT DESIGN ENGINEER

CONTEXT CLASSIFICATION CONCURRENCE:

FDOT DISTRICT INTERMODAL SYSTEMS DEVELOPMENT MANAGER

SHEET NO.

1

12/13/2019 10:23:57 AM

PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	(X)	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
( )	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
(X)	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

( ) NATIONAL HIGHWAY SYSTEM
(X) STRATEGIC INTERMODAL SYSTEM
( ) STATE HIGHWAY SYSTEM
( ) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
(X) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

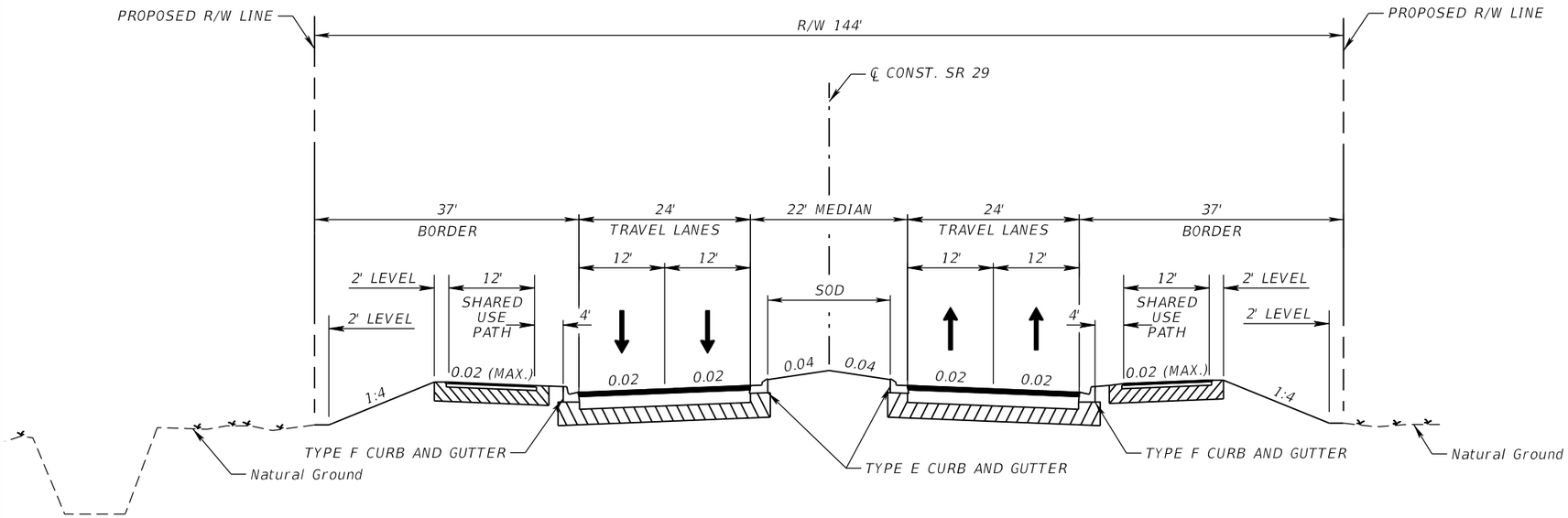
CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

BASE CLEARANCE VARIATION

TYPICAL SECTION No. 1



TYPICAL SECTION NO. 1
SR 29
MP 36.770 TO MP 37.684

TRAFFIC DATA

CURRENT YEAR= 2020 AADT = 21000
ESTIMATED OPENING YEAR = 2025 AADT = 25000
ESTIMATED DESIGN YEAR = 2045 AADT = 41000
K = 9% D = 59% T = 16% (24 HOUR)
DESIGN HOUR T = 8%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH

NOT TO SCALE

FINANCIAL PROJECT ID	SHEET NO.
417540-5-52-01	2

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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( ) C2T : RURAL TOWN
(X) C3R : SUBURBAN RES.
( ) C3C : SUBURBAN COMM.
( ) C4 : URBAN GENERAL
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( ) FREEWAY/EXPWY.
(X) PRINCIPAL ARTERIAL
( ) MINOR ARTERIAL
( ) MAJOR COLLECTOR
( ) MINOR COLLECTOR
( ) LOCAL

HIGHWAY SYSTEM

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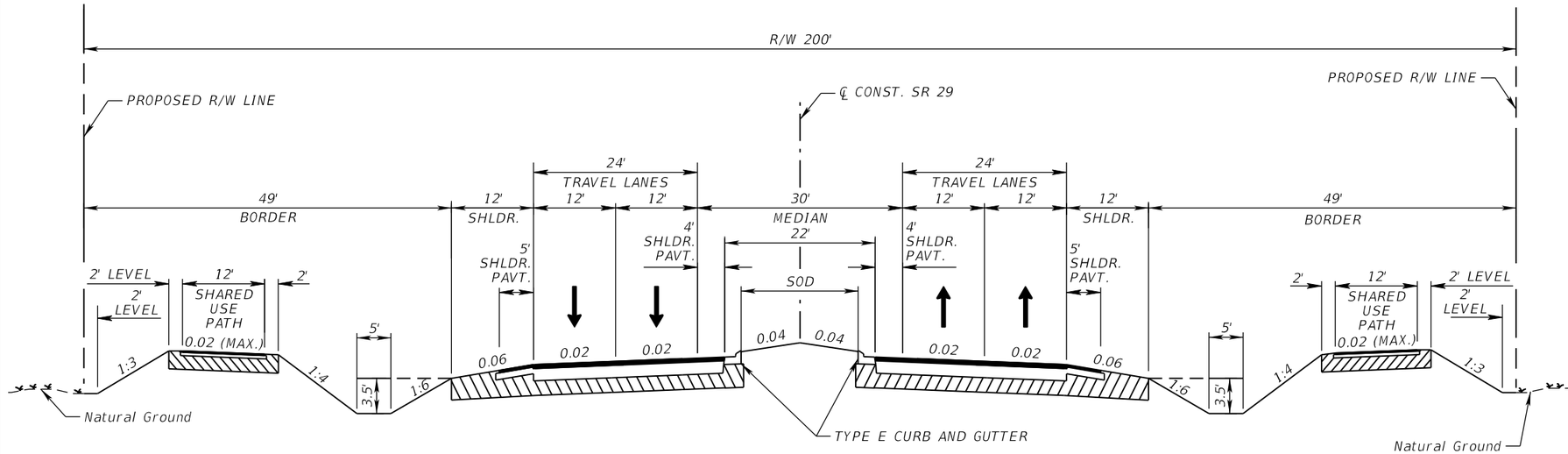
POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 2



TYPICAL SECTION NO. 2
SR 29
MP 37.684 TO MP 40.254

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ESTIMATED DESIGN YEAR = 2045 AADT = 41000
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DESIGN HOUR T = 8%
DESIGN SPEED = 50 MPH / 55 MPH
POSTED SPEED = 50 MPH / 55 MPH

NOT TO SCALE

FINANCIAL PROJECT ID	SHEET NO.
417540-5-52-01	3

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STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

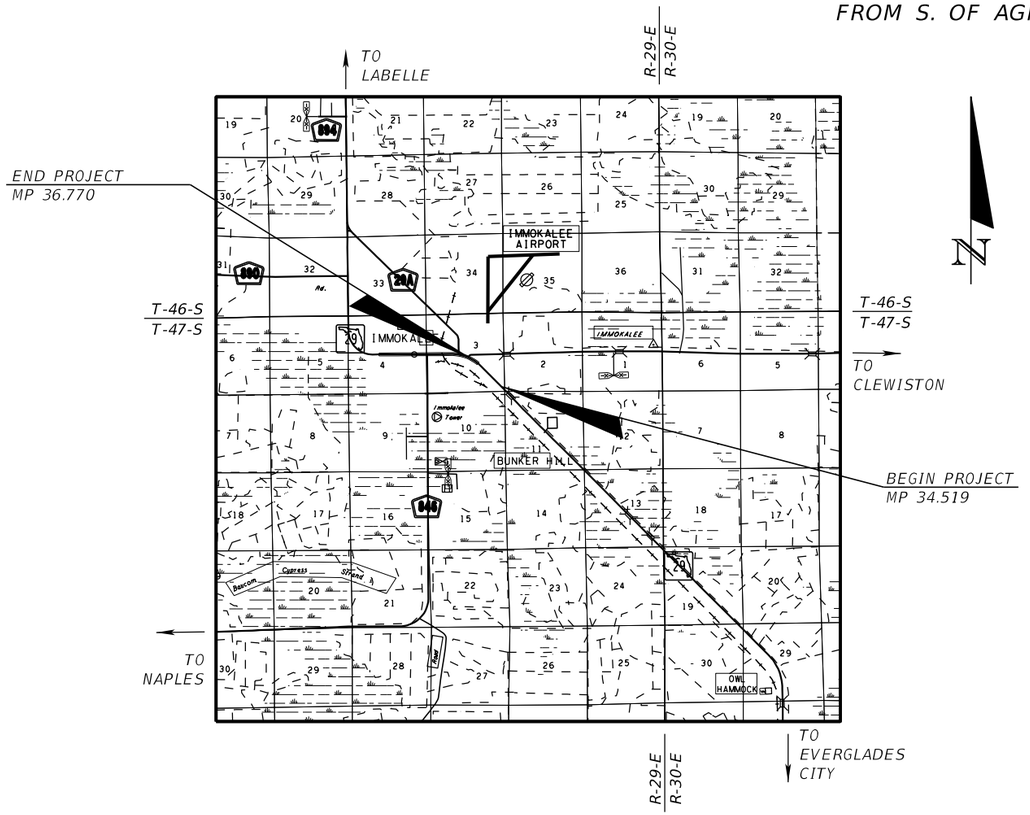
TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 417540-4-52-01

COLLIER COUNTY (03080)

STATE ROAD NO. 29

RECONSTRUCTION OF SR 29 FROM 2-LANE TO 4-LANE
FROM S. OF AGRICULTURE WAY TO CR 846 E



APPROVED BY:

DAJANA GIBSON
LICENSE
No 76206
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

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AIM ENGINEERING & SURVEYING, INC.
3802 CORPOREX PARK DRIVE, STE. 225
TAMPA, FLORIDA 33619
TELEPHONE (888) 627-4144
CERTIFICATE OF AUTHORIZATION NO. 3114

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TYPICAL SECTION PACKAGE

TYPICAL SECTION CONCURRENCE

FDOT DISTRICT DESIGN ENGINEER

FDOT DISTRICT STRUCTURES DESIGN ENGINEER

FHWA TRANSPORTATION ENGINEER

DESIGN SPEED AND POSTED SPEED CONCURRENCE:

FDOT DISTRICT TRAFFIC OPERATIONS ENGINEER

FDOT DISTRICT DESIGN ENGINEER

CONTEXT CLASSIFICATION CONCURRENCE:

FDOT DISTRICT INTERMODAL SYSTEMS DEVELOPMENT MANAGER

SHEET NO.
1

1/3/2020 3:51:15 PM

PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
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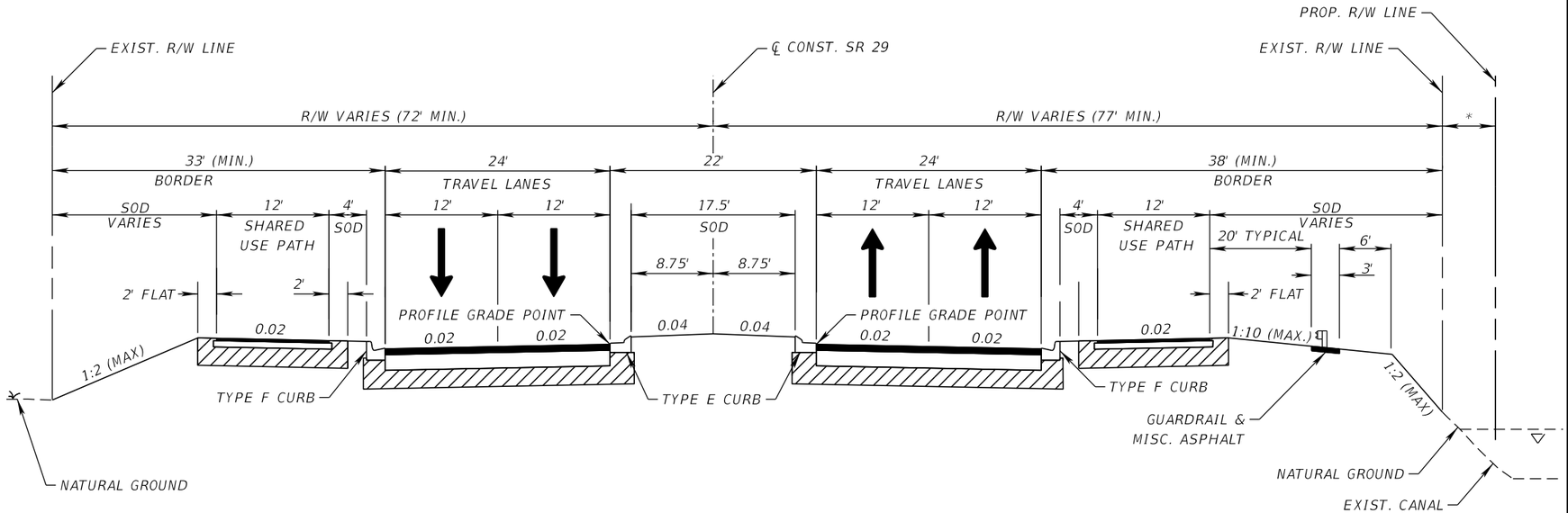
POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 1



SR 29
MP 34.519 TO MP 36.096

* PROP R/W VARIES FROM MP 36.000 TO MP 36.069 THROUGH TRANSITION

NOT TO SCALE

TRAFFIC DATA

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ESTIMATED OPENING YEAR = 2026 AADT = 15,900
ESTIMATED DESIGN YEAR = 2046 AADT = 34,000
K = 9.0% D = 58.5% T = 18.3% (24 HOUR)
DESIGN HOUR T = 9.15%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
417540-4-52-01	2

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

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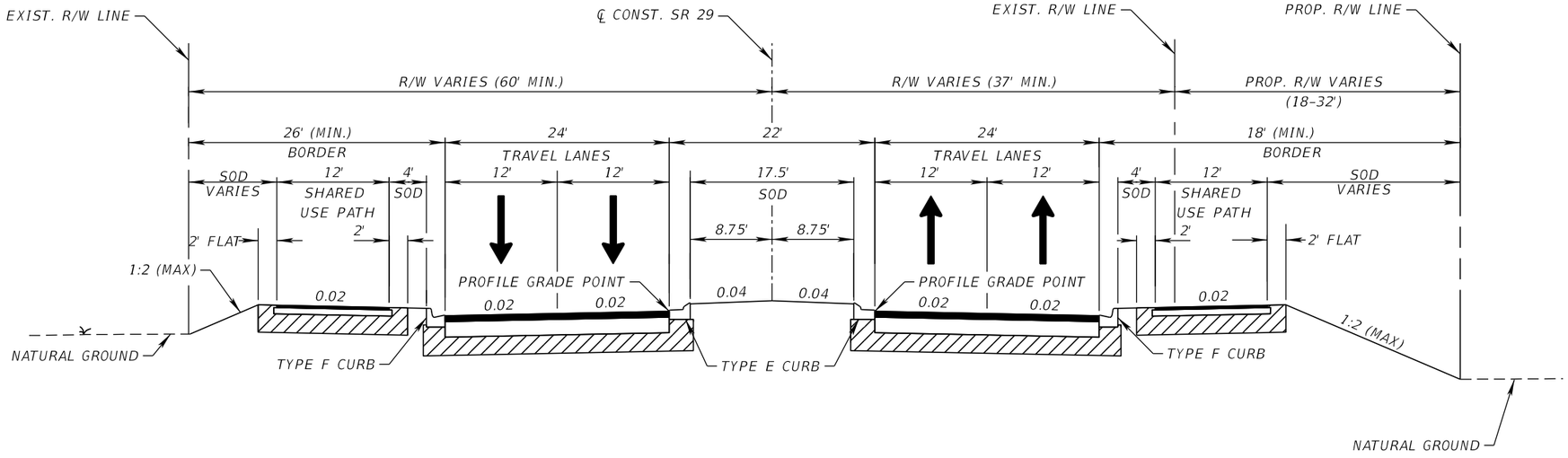

SR 29
MP 36.096 TO MP 36.770

NOT TO SCALE

TRAFFIC DATA

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417540-4-52-01	3

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MEETING MINUTES

Project Number: 417540-2 thru 417540-6
Project Description: SR 29 Corridor Improvements
Meeting Name: SR 29 Drainage Kickoff Meeting
Date/Time: 3.9.2020 – 1:30 PM
Location: FDOT – D1 HQ
Minutes Prepared By: RS&H, AIM, PGA, & FDA

Attendees:
See Attached Sign-in Sheets

The following notes reflect our understanding of the discussions and decisions made at this meeting. If you have any questions, additions, or comments, please contact us. We will consider the minutes to be accurate unless written notice is received within 5 working days of the date issued.

Meeting Minutes:
In general, the meeting followed the prepared agenda. Discussion points have been added in ***bold italics*** below to highlight the discussions on each topic

1. **Introductions**
    a. The meeting began with brief introductions

2. **Design Criteria**
    a. County Basin Criteria

We need confirm there is no special basin criteria with SFWMD at the Pre-App. It was discussed that we would not follow the local County Criteria unless it became necessary as part a larger agreement to develop regional solutions which would involve asking for relief from SFWMD design criteria. At this time, design segments will not need to follow the local county criteria for the Pond Siting Report.

    b. SFWMD Criteria
        a. Water Quantity
            i. Open Basin – 25yr/72hr
    c. Water Quality
        a. 1" over project / 2.5" over impervious (whichever is greater)
        b. 2.5" over additional impervious

The criteria of 2.5" over additional impervious will control for most segments where the PGL will not be adjusted and there is no proposed reconstruction of the existing lanes. However, a portion of the reconstructed -4 Segment and the -5 Segment may need to follow the criteria for new construction (whichever is greater of 1" over project area or 2.5" over impervious area). It was discussed that for the PSR phase the more conservative criteria would be used. At the Pre-App we will need to confirm with the WMD the exact criteria to be used for the design phase.

    d. Nutrient loading vs. presumptive treatment
        a. 3278W - Silver Strand (-2, -3, -4, -5) – Impaired for Iron
        b. 3278E – Cow Slough (-6) – Not impaired

The Silver Strand WBID has recently been delisted for nutrients. Although it is currently delisted, we will still evaluate the net improvement required. The approach discussed for the PSR was to size the ponds first with the presumptive criteria and then analyze the basin for net improvement. The additional net improvement that is provided in the ponds could offset other projects in the area or reduce the size of the regional pond. Therefore, FDOT wants the calculations included in the analysis.

    e. OFW – Considered for regional only

The Panther Refuge area south of Oil Well Road is considered an OFW. The regional option discharging to the south would need to consider this impairment and address the criteria. All other options, including smaller postage stamp ponds, for other segments will not need to evaluate the OFW criteria during the PSR.

3. **Floodplain Approach**
    b. PGA scoped to model the floodplain, -5 segment to the south
        i. Two Models
            1. North Model for Immokalee Area
            2. South Model for area south of Bridge Culvert on -4 Segment
    c. -2, -3, -4 Quantify Impacts
    d. FDA scoped to analyze offsite FPC alternatives and model the impacts on the -6 segment

The existing conditions model was currently planned on being available by Fall of 2020. However, based on the timeline discussions below and other segments needing this information for design it was determined that this task will need to be accelerated. The model development will need to be moved forward to the Summer of 2020.

4. **PSR Approach**
    a. -4, -5, & -6 Segments scoped to evaluate offsite ponds and regional alternative
        i. Segment based naming convention for offsite ponds
            1. Ex – 201, 202 (FDOT in-house)
            2. PSR options would follow a similar format (201A, 201B, 201C)
            3. FDOT will review and accept the pond site locations prior to clearances being conducted
    b. -6 Segment evaluating regional option for Lake Trafford
    c. -2, -3 Segments evaluating regional only
    d. FDOT evaluating regional option for corridor
        i. PGA assisting the department with regional efforts
    e. PSR Approach moving forward
        i. -4, -5, & -6 Segments proceed to evaluate offsite ponds
        ii. -6 Segment evaluate regional option with Lake Trafford (different basin)
        iii. -3, -4, & -6 Hold exploring regional until FDOT corridor options are explored

A brief update on the regional options was discussed based on the latest developments with the stakeholders. An approach moving forward was discussed for analyzing the regional options for the PSR. For the PSR efforts each segment should evaluate their segment and all segments draining to the segment.

- ***RS&H (-3 Segment) will evaluate providing a regional option that will treat the -3, -4, & -5 Segments. The regional option will consist of a "pregnant snake" approach along the canal to the east.***
- ***AIM (-4 Segment) will evaluate providing a regional option that will treat the -4 & -5 Segments. The regional option will consist of evaluating an option that is located east of SR 29 at the confluence of the canals just south of Immokalee.***
- ***PGA will evaluate providing a regional option that will treat the -2, -3, -4, & -5 Segments. The regional options will consist of evaluating an option that is located south of Oil Well Road within the borrow pits.***
- ***Each regional option will be sized based on the presumptive water quality volume. For this calculation, the contributing area is assumed to be from R/W to R/W and the presumptive volume will be based on the worst-case scenario. It is anticipated that the outfall control structure will consist of a long weir and a shallow treatment depth to minimize hydraulic impacts within the Barron River Canal. Net improvement calculations could include both the offsite and onsite contributing areas. The PSR analysis will include onsite contributing area only (R/W to R/W).***
- ***Additional coordination with the County is necessary to determine their needs and timeline of modifications to the canal systems. Also, there is a potential for partnering between the County and FDOT on this approach.***

- ***For consistency, a single spreadsheet would be developed, and each segment would provide the on-site contributing area data required for their segment. Once all information is received, PGA will calculate storage volumes and distribute spreadsheet back to each segment to ensure that all segments are using consistent on-site information for all upstream segments to develop the individual regional pond analysis.***
- ***Once regional pond sizing has been complete, segments will submit sizing information back to PGA for inclusion into a corridor wide regional summary document.***

5. **Timeline of Segments**
    a. -3 Segment
        i. L&G – July 2020
        ii. PSR – May 2020
        iii. Phase I – Aug 2020
    b. -4 Segment
        iv. L&G – April/May 2020
        v. PSR – Summer 2020
        vi. Phase I – Sept 2020
    c. -5 Segment
        vii. L&G - August 2020
        viii. PSR – Fall 2020
    d. -6 Segment
        ix. L&G – August 2020
        x. PSR – Fall 2020

The timeline for all segments was reviewed and there were no concerns. It was noted that segments vary in funding for R/W and construction and there is flexibility in the schedule currently. It was mentioned that if dates adjust that we update the advanced project schedule accordingly.

6. **Permitting Approach**
    a. Single pre-app for the corridor / Date to be determined
    b. Additional discussions regarding the approach to corridor permitting will occur as the project progresses. There is a potential if the regional approach moves forward, a single permit will be obtained for this and then each segment will modify the permit to document how much of the pond is being utilized. This would be for stormwater only.
    c. A Regional approach to the wetland/species impacts and required mitigation will also be evaluated to determine if there is an effective approach for the corridor.
    d. Since not all segments are currently funded for construction, there is the potential to delay species surveys and permit submittals past Phase IIR to reduce the likelihood of needing to repeat species surveys and having issued permits sit on the shelves for extended periods prior to the start of construction. Each consultant needs to keep FDOT apprised on when they will conduct the surveys. A “Go/No Go” for permitting date could be included in the schedule. Consideration of potential funding needs to be considered due to certain surveys are only allowed during specific times of the year.
    e. Nicole Monies indicated that some mitigation funds will be available in 2021
    f. -3 Segment
        a. Permitting
            i. New Individual SFWMD ERP
            ii. USACE SAJ-92
            iii. Multiple mitigation banks available with PHU credits
        b. Wildlife
            i. One wildlife feature proposed to be located south of Milton’s Canal
            ii. Caracara surveys anticipated January 2021, depending on schedule of Phase II plans
            iii. Florida bonneted bat surveys anticipated Spring 2021 (depending on schedule of Phase II plans)

iv. Panther habitat analysis for PHU credits.

g. -4 Segment
   a. Permitting
      i. Major Modification to SFWMD Permit No. 11-00968-S
      ii. Individual Dredge and Fill Permit from USACE
      iii. Multiple mitigation banks available that also provide PHU credits
   b. Wildlife
      i. No proposed wildlife crossing features
      ii. Gopher tortoise and caracara surveys
      iii. Florida bonneted bat habitat assessment – need for SA to account for new consultation guidelines released October 2019 – Coordination with Gwen has started, and she will provide guidance.
      iv. Panther habitat analysis for PHU credits

h. -5 Segment
   a. Permitting
      i. New Individual SFWMD ERP
      ii. Individual Dredge and Fill from USACE
      iii. Mitigation banks: Big Cypress, Panther Island. PHU's included with wetland credits
   b. Wildlife
      i. No proposed wildlife crossings
      ii. GTs, caracara, Florida scrub jay, Florida bonneted bat surveys (Spring 21)
      iii. Minimize loss of scrub jay habitat, but not avoidable
      iv. Panthers: Minor impacts to secondary zone; Need habitat analysis for PHU credits.

i. -6 Segment
   a. Permitting
      i. New Individual SFWMD ERP
      ii. Individual Dredge and Fill from USACE
      iii. Mitigation banks: Corkscrew, Big Cypress, Panther Island, Jack's Branch
   b. Wildlife
      i. No proposed wildlife crossings
      ii. GTs, caracara, Florida scrub jay, Florida bonneted bat
      iii. Keep ponds out of scrub jay habitat
      iv. Panthers: in secondary zone; no documented panther usage; provide PHUs for impacts in secondary zone

7. <u>Action Items</u>

a. Schedule Pre-App meetings
b. Develop framework regional approach for all segments
c. Include Sergio/Segment 2 into Corridor drainage discussions

SIGN-IN SHEET

Project Number: 417540-3 thru 417540-6
Project Description: SR 29 Corridor Improvements
Meeting Name: SR 29 Corridor Drainage Kickoff Meeting
Date/Time: 3.09.2020 – 1:00 PM
Location: FDOT – D1 HQ – Executive RM

NAME	INITIALS	REPRESENTING	EMAIL ADDRESS
Sergio Figueroa	sf	FDOT	Sergio.Figueroa2@dot.state.fl.us
Brent Setchell	BS	FDOT	Brent.Setchell@dot.state.fl.us
Nicole Monies	NMM	FDOT	Nicole.Monies@dot.state.fl.us
Kenny Yinger	KY	PGA	Kenny.Yinger@patelgreene.com
Robert Garrigues		RS&H	Robert.Garrigues@rsandh.com
Dawn Ratican	DMR	AIM	dratican@aimengr.com
Alan Eldridge	ASE	FDA	aeldridge@fallerdavis.com
Kaylene Johnson		FDOT	Kaylene.Johnson@dot.state.fl.us
Sean Pugh	Phone	FDOT	Sean.Pugh@dot.state.fl.us
Richard Howard		FDOT	Richard.Howard@dot.state.fl.us
Christopher Speese		FDOT	Christopher.Speese@dot.state.fl.us
Amber Haygood		FDOT	Amber.Haygood@dot.state.fl.us
William Whidden		FDOT	William.Whidden@dot.state.fl.us
Niki Cribbs		FDA	ncribbs@fallerdavis.com
Sean Curran	SPC	PGA	Sean.Curran@patelgreene.com
Justin Christensen	JC	AIM	JChristensen@aimengr.com

FDOT

SIGN-IN SHEET

NAME	INITIALS	REPRESENTING	EMAIL ADDRESS
TREVOR HAWKINS	TH	PGA	TREVOR.HAWKINS@PATERGREENE.COM
Shannon Ladd	SL	FDA	sladd@fallerdavis.com
LOGAN BARILE	LTB	FDA	lbarile@fallerdavis.com
RICHARD (MOSE) HOWARD	RH	FDOT PROJ. MGT. / GEC	RICHARD.HOWARD@DOT.STATE.FL.US
Nicole Cribbs	NC	FDA	ncribbs@fallerdavis.com

MEETING MINUTES

Project Number: 417540-5
Project Description: SR 29 Corridor Improvements
Meeting Name: Immokalee Drainage Improvements
Date/Time: 4.16.2020 – 3:00 PM
Location: Go-To Meeting
Minutes Prepared By: PGA

Attendees:
Brent Setchell (FDOT)
Sergio Figueroa (FDOT)
Kaylene Johnson (FDOT)
Gerald Kurtz (Collier County)
Robert Wiley (Collier County)
Dawn Ratican (AIM)
Trevor Hawkins (PGA)
Eddie Giese (PGA)
Kenny Yinger (PGA)

The following notes reflect our understanding of the discussions and decisions made at this meeting. If you have any questions, additions, or comments, please contact us. We will consider the minutes to be accurate unless written notice is received within 5 working days of the date issued.

Meeting Minutes:

1. **Introductions**
    a. The meeting began with brief introductions
2. **Regional alternatives recap and discussion of preferred options**
    a. There was a brief recap of the regional options discussed at the last Regional Partnering Meeting (2/11/20)
        i. Option 1: Borrow pits south of Oil Well Road
        ii. Option 2: Pregnant Snake along SR 29 corridor
        iii. Option 3: Site located just south of Immokalee at the confluence of the SR 29 Canal and Dry Gulch Creek
    b. Collier County preferred a combination of Option 1 and Option 3
        i. Option 1 has the potential to reduce flow, minimize contaminants, and vegetation downstream
        ii. Option 3 has the potential to aid flood relief within Immokalee and aid in the removal of debris
            1. Debris within canal systems is a maintenance issue that negatively impacts the hydraulics of the storm system within Immokalee
3. **Discussions on cost sharing**
    a. FDOT's role in cost participation
        i. FDOT is interested in contributing through funding of upfront capital cost for improvements
            1. Capital cost could include canal expansion / modification, storm system infrastructure, and regional stormwater treatment facilities
        ii. FDOT does not prefer to maintain the facilities and prefers the County to maintain these facilities
    b. County's role in cost participation
        i. The County is open to the idea of providing maintenance if there is an overall benefit for the County

c. The County discussed current efforts and challenges to maintain the SR 29 Canal
    i. The SR 29 Canal can only be maintained by boat or using spray treatment
        1. There is general discouragement with using spray treatment
    ii. The County is in the process of working with outside maintenance contractors with specialized equipment to help with the maintenance of the SR 29 Canal
        1. Albert English (Collier County Road Maintenance Director) is leading up this effort for the County
d. The County stressed the importance of ensuring that the SR 29 corridor improvements will not make the maintenance of the SR 29 Canal more difficult
    i. The County generally prefers to perform maintenance activities from behind the guardrail at the top of bank
    ii. FDOT is willing to assist the County in identifying solutions to ensure maintainability of the SR 29 Canal
        1. Cross sections can be provided of the SR 29 corridor segments adjacent to the canal
        2. FDOT to coordinate with Albert English about the space requirements of the maintenance equipment and activities to ensure future maintainability of the SR 29 Canal

4. Discussions on drainage improvement within the Immokalee area and alignment implications

a. The County gave a brief overview of some options currently being explored to help provide flood relief of the Immokalee area
    i. Option 1: Expansion of the ditch that runs up and around the airport before draining south under CR 846 and connection with the SR 29 Canal
    ii. Option 2: Expansion of the existing Eutopia Canal that drains south towards the intersection of SR 29 and CR 846 and diverting a portion of the flow east along the north side of CR 846 and discharging to the bridge just east of Airpark Boulevard
b. FDOT explained that they are currently developing the line & grade for the segment of SR 29 within this area and any expansion of the Eutopia Canal would need to be coordinated prior to the development of the line & grade to allow for adequate space
c. The County explained that the Eutopia Canal bottom width would need to be expanded to 40 feet to provide additional capacity for flood relief of Immokalee
d. The County's preferred side slope of the canal would be 1:3
e. FDOT inquired about the need to have a separate area to maintain the Eutopia Canal or if the proposed shared use path could be used to perform maintenance activities
f. County stated that maintenance activities could be performed from the shared use path
g. FDOT noted that additional pavement design may need to be considered if the County anticipates using the shared use path for maintenance activities
h. The County noted that they have already had a preliminary discussion with airport personnel about the requirements for Option 1 and the airport was receptive to the idea
i. FDOT stated that they have received input from the landowners, but have not coordinated with the airport yet
j. The County stated that they would help coordinate a meeting with FDOT, County, and airport staff
k. Dawn Ratican noted the existing double barrel box culvert under SR 29 serving the Eutopia Canal changes to a single barrel box culvert downstream. Dawn suggested that with FDOT's planned roadway improvements the double barrel cross drain be replaced with a single barrel.
l. The County agreed with this approach since it was unlikely the single barrel could ever be upsized in the future.

5. Discussions on current off-site improvements at SR 29 / Gopher Ridge Rd.

a. Based on recent coordination with FDOT and landowners about the alignment FDOT has learned that there is currently a proposed County pond that has the potential to be impacted by the future SR 29 corridor
b. FDOT would prefer to coordinate the proposed County pond and SR 29 alignment to avoid potential conflicts

c. The County noted that they currently in the process of developing a purchase agreement and could incorporate an alignment as part of the documentation to eliminate the conflict
d. FDOT stated that based on input from the landowners / developers that current alignment has some potential impact to the planned development just west of the County pond and requested that FDOT explore options to minimize or eliminate the impact
e. The County agreed that a minor adjustment east would better facilitate the County pond also
f. FDOT will coordinate internally to determine the ability to adjust the alignment at this location and for the Eutopia Canal and provide the County with an updated Alignment for coordination of the County pond's final location

6. **Discussions on resource sharing**
   a. FDOT stated they have completed survey of the corridor and are willing to share if the county needs any data for their in-house projects
   b. FDOT is interested in using gage data to calibrate any modeling efforts in the area
   c. The County noted that they currently do not have any gage data for this area, but will research the feasibility

7. **Action Items**
   a. FDOT to coordinate with Albert English and the County on maintenance needs for SR 29 Canal access
   b. County / FDOT to schedule a meeting with the airport to discuss SR 29 alignment and drainage improvements within Immokalee
   c. PGA to work with FDOT to determine the potential for adjustments to the alignment to accommodate the expanded Eutopia Canal and future County pond
   d. PGA to provide updated alignment to County to aid in minimizing conflicts with planned County pond
   e. County to determine feasibility to providing data loggers along SR 29 Canal for measuring stage

MEETING MINUTES

Project Number: 417540-1 thru 417540-5
Project Description: SR 29 Corridor Improvements
Meeting Name: SR 29 Regional Treatment Options
Date/Time: 5.12.2020 – 10:00 AM
Location: Go-To Meeting
Minutes Prepared By: PGA

Attendees:
Tom Jones (Barron Collier)
Brent Setchell (FDOT)
Sergio Figueroa (FDOT)
Trevor Hawkins (PGA)
Kenny Yinger (PGA)

The following notes reflect our understanding of the discussions and decisions made at this meeting. If you have any questions, additions, or comments, please contact us. We will consider the minutes to be accurate unless written notice is received within 5 working days of the date issued.

Meeting Minutes:

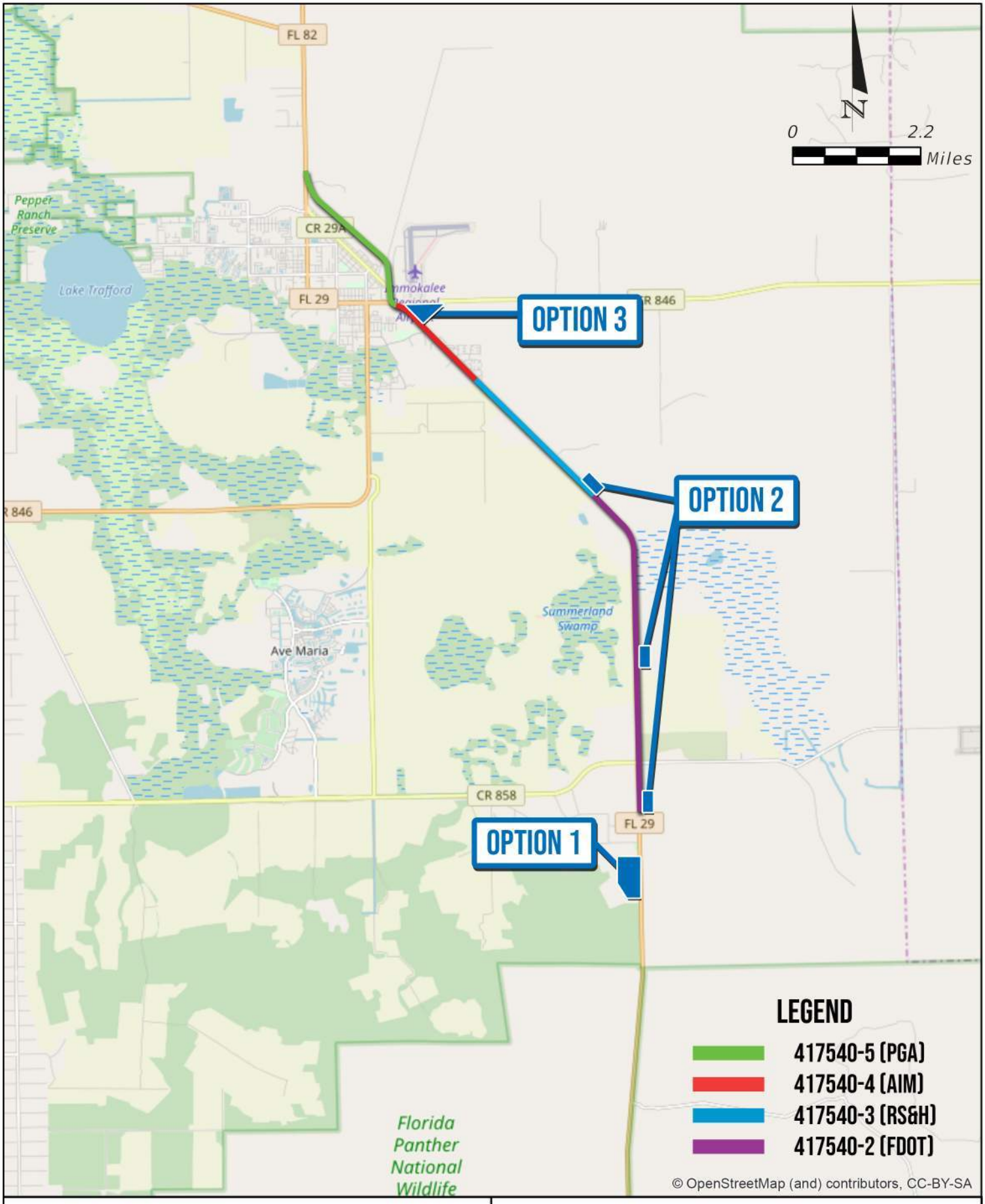
1. **Introductions**
    a. The meeting began with brief introductions
2. **There was brief recap of the Regional Options discussed at the last Regional Treatment Stakeholder Meeting.**
    a. Option 1: Borrow pits south of Oil Well Road
    b. Option 2: Pregnant Snake along SR 29 corridor
    c. Option 3: Site located just south of Immokalee at the confluence of the SR 29 Canal and Dry Gulch Creek
3. **Discussions for Option 3**
    a. Tom Jones stated that there are several parcels within the area just south of Immokalee that have a potential to provide regional treatment and listed below are items discussed for each parcel
        i. Parcel 1 (See attached)
            1. Triangle shaped parcel just west of SR 29 and south of the SR 29 Canal
            2. Access to this parcel is from southeast side of the parcel
            3. The parcel is not directly connected to the SR 29 Canal as is there is a narrow parcel that runs along the canal that is still owned by CSX
            4. The site is approximately 30 acres
        ii. Parcel 2 (See attached)
            1. Triangle further to northwest located just south of the bend in the SR 29 Canal
            2. Access is from 13th St. SE
            3. The site is approximately 12 acres
        iii. Parcel 3 (See attached)
            1. Parcel just east of SR 29 at the confluence of the Airport outfall Canal and SR 29 Canal
            2. Access to this parcel is from SR 29
            3. There is an old cattle dipping vat located on this parcel
                a. The site has been remediated and closed out with FDEP

4. The area of east of SR 29 is approximately 30 acres
5. The portion west of SR 29 was not discussed

iv. The area east of SR 29 is the most ideal location due to the proximity with the confluence of the Airport outfall Canal and the SR 29 Canal
   1. Parcel 3 also aligns with the County's plan to provide flood relief within the Immokalee downtown area
      a. The County is proposing to divert flows from the Eutopia Canal east along CR 846 E and join with Airport outfall Canal
      b. This design approach will allow flow to avoid the constriction at box culvert under SR 29
   2. Opportunities were also discussed for a regional option within the parcel being designed to accommodate future development or stormwater runoff from any planned development
      a. Currently the parcel is not planned for development, but consideration will be given for this if the design opportunities develop for this parcel

4. Discussions for Option 1

a. Tom stated there is the potential to use the site identified at the last Regional Treatment Stakeholder Meeting
   i. This option involves using the existing borrow pits west of SR 29 and south of Oil Well Road
   ii. Tom Jones stated that there is currently a Collier family house located west of this proposed option and access will need to be maintained depending on the development of the site
   iii. There is a private residence located at the south end of the site
   iv. The option to outfall the pond to allow natural sheet flow to the wetlands in the southwest was discussed
      1. This option is still not preferred until details of the sheet flow can be provided
      2. Future options for this site will consider options for discharging back to the SR 29 Canal



FDOT

SR 29 Regional Option Overview

REGIONAL OPTION 1 - BORROW PITS

CANAL

29

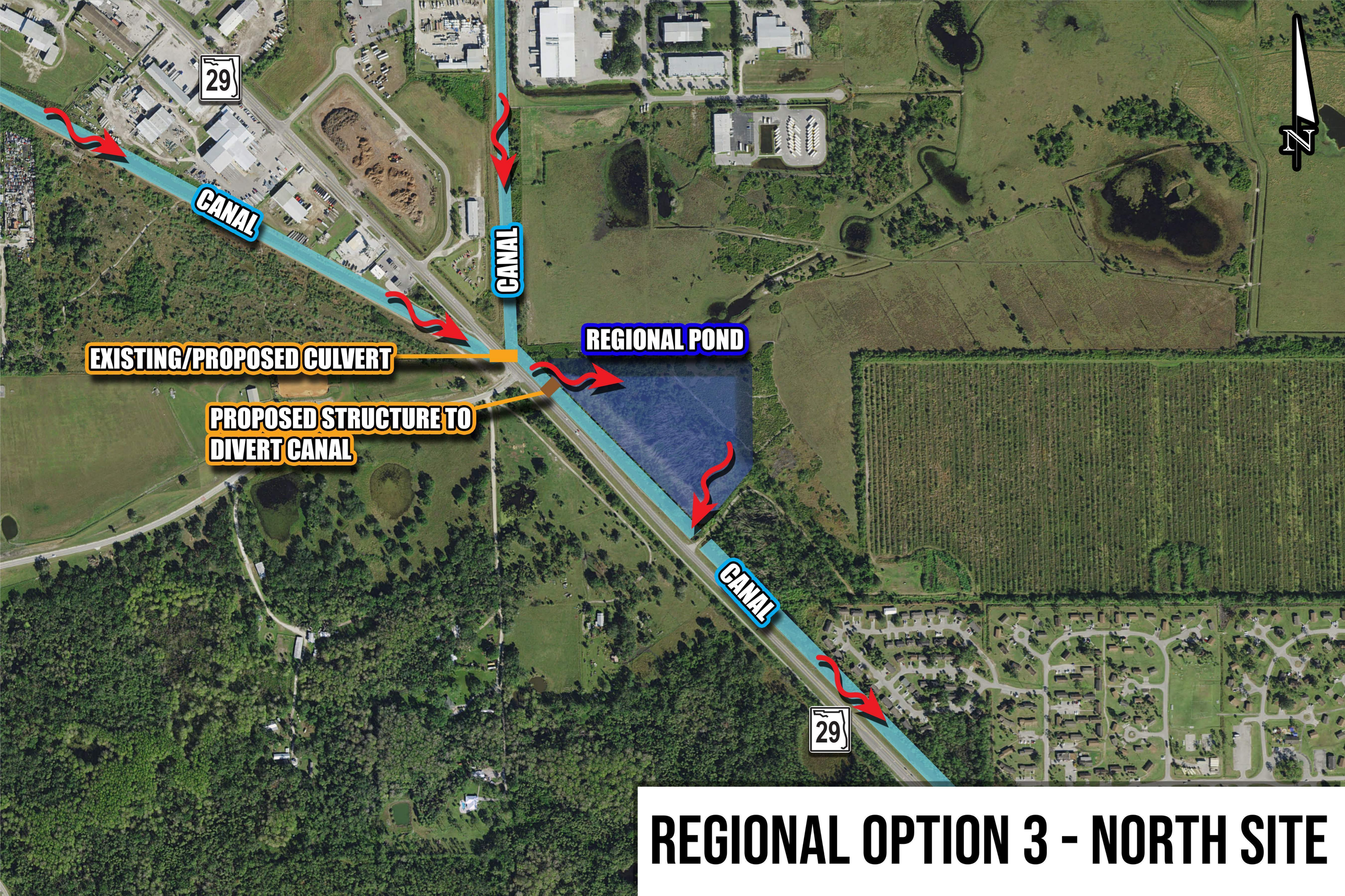
PROPOSED STRUCTURE TO DIVERT CANAL

REGIONAL POND

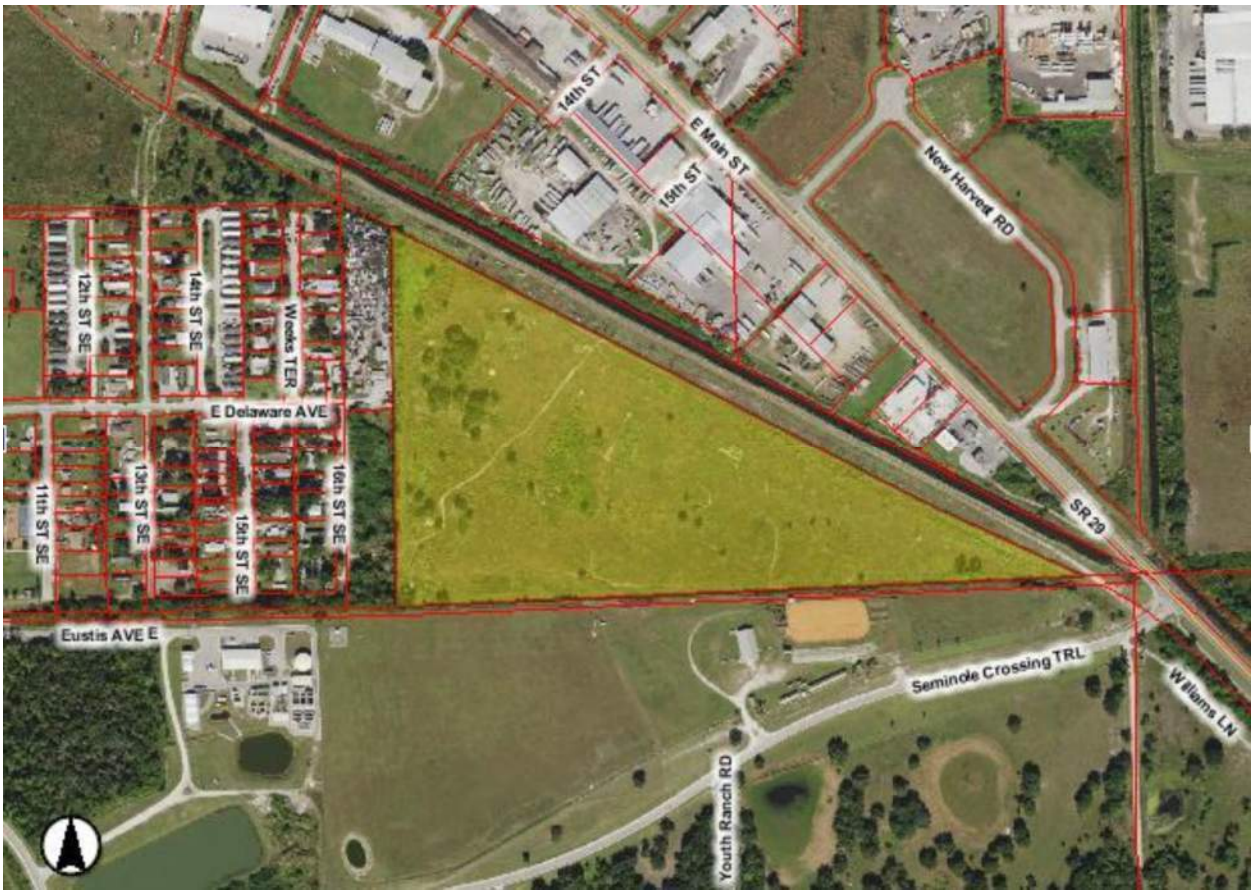
N

CANAL

REGIONAL OPTION 2 - PREGNANT SNAKE



REGIONAL OPTION 3 - NORTH SITE


14th ST
E Main ST
15th ST
New Harvest RD
12th ST SE
14th ST SE
Weeks TER
E Delaware AVE
13th ST SE
15th ST SE
16th ST SE
11th ST SE
SR 29
Eustis AVE E
Seminole Crossing TRL
Williams LN
Youth Ranch RD

Parcel 1


E Main ST
CR 846 E
Jerome DR
New Market RD E
11th ST
12th ST
13th ST
14th ST
15th ST
Rose AVE
Price AVE
School DR
12th ST SE
14th ST SE
Weeks TER
E Delaware AVE
E Delaware AVE
Gaunt ST
Jones ST
11th ST SE
13th ST SE
15th ST
16th ST SE

Parcel 2


Seminole Crossing TRL
W Blome LN
SR 29
Elm Hammock CIR
Edenfield WAY
Amos CT

Parcel 3

MEETING MINUTES

Project Number: 417540-5
Project Description: SR 29 Corridor Improvements
Meeting Name: SR 29 Regional Pond vs Offsite Ponds Meeting
Date/Time: 9.14.2020 – 10:00 AM
Location: Teams Meeting
Minutes Prepared By: PGA

Attendees:
Sean Pugh (FDOT)
Brent Setchell (FDOT)
Kevin Ingle (FDOT)
Jennifer Marshall (FDOT)
Kaylene Johnson (FDOT)
Trevor Hawkins (PGA)
Kenny Yinger (PGA)
Eddie Giese (PGA)
Adah Shair (PGA)
Dawn Ratican (AIM)
Justin Christensen (AIM)
Dajana Gibson (AIM)

The following notes reflect our understanding of the discussions and decisions made at this meeting. If you have any questions, additions, or comments, please contact us. We will consider the minutes to be accurate unless written notice is received within 5 working days of the date issued.

Meeting Minutes:

1. **Introductions**
    a. The meeting began with brief introductions

2. **Regional Alternative Option vs. Traditional Offsite Ponds**
    a. A review was provided of the alternatives:
        i. Regional Option: Realign/Expand the canal along the new Segment of SR 29 and provide a regional pond within the -4 Segment
        ii. Offsite Alternative: County to Expand the canal around the perimeter of the airport and FDOT would provide traditional offsite ponds for the -4 & -5 Segment

3. **Cost Estimate Discussion**
    a. Brent suggested removing the cost of canal realignment if the offsite alternative option is to be constructed
    b. Brent suggested reviewing the canal excavation pay-item and unit cost
    c. Brent noted that the regional option would reduce the amount of onsite embankment
        i. To address this issue considered placing a premium on the embankment
        ii. Review the -4 & -5 Segment as to understand the earthwork balance for the project

4. **Additional Discussion**
    a. Brent asked the how the regional options performs for the flooding areas within Immokalee
        i. PGA stated that currently the 40' canal bottom as requested by the County would address those concerns
    b. Brent stated the hydraulic analysis would need to be completed to better understand the hydraulic impacts for each alternative and to evaluate the hydraulic performance for the regional site
    c. A portion of the -4 Segment would be downstream of the current regional alternative
        i. It was discussed that there would be the potential to provide the regional option and smaller site downstream to maximize the water quality benefit
        ii. This would be discussed with the WMD
    d. As part of the intersection improvements a remnant parcel would be required and is currently being used as an offsite pond

5. **PD&E Discussion**
    a. Jennifer Marshall explained the PD&E is expected to be signed off in December 2021
        i. PSR documents will need to be in draft until the PD&E is completed
        ii. There is ongoing field work so any PSR analysis would need to consist of desktop reviews only
        iii. Include EMO staff with any discussions with the FAA
6. **Action Items**
    a. Review and update cost estimate
    b. Provide hydraulic analysis for alternative analysis

Submittal Report

Financial Project:	417540-5-52-01	Submittal Type:	POND SITING REPORT
Submittal Phase:	INITIAL	Submittal Staff Type:	CONSULTANT
Received Date:	10/16/2023	Response Due Date:	11/27/2023
Grace Period:	0	District:	FIRST
Status:	CLOSED	Create Date:	10/16/2023
Create User Id:	RD158PS	Last Update:	10/16/2023
		Last Update User Id:	RD158PS

Description:

DRAFT Pond Siting Report:

This is notice that the DRAFT Pond Siting Report has been uploaded in ERC for review and comment.

FPID # 417540-5-52-01

The DRAFT PSR can be found in the ERC under the Documents tab and at:
\\Dotsd1cadd\erp\41754055201\DraftPSR

Threads:

Name	Assignment	Due Date	Status	Comments
Benjamin Shepherd	REVIEWER	11/20/2023	ACTIVE	8

No	Status	Current Holder	Reference	Categories
14	RESPONSE ACCEPTED			ENVIRONMENTAL PERMITS

Created By	Created On	Version	Delegate For
Benjamin Shepherd	11/20/2023	1	

The FDOT Permit Section requests that the roadway plans, and other relevant documents (e.g., Drainage report) submitted for permits, be signed and sealed by all necessary EOR.

KENNETH YINGER	11/27/2023	1	

Acknowledged. The plans and other relevant documents submitted for inclusion in the permit applications will be signed and sealed by the appropriate EORs.

Benjamin Shepherd	12/1/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
15	RESPONSE ACCEPTED			ENVIRONMENTAL PERMITS

Created By	Created On	Version	Delegate For
Benjamin Shepherd	11/20/2023	1	

Once plans and drainage calculations are ready, please contact Nicole Monies or Brent Setchell to place this project on FDOT's regularly scheduled pre-app meetings with the regulatory agencies.

KENNETH YINGER	11/27/2023	1	

We cannot start permitting until the PD&E Study has been completed. We will coordinate the pre-application meetings with Nicole Monies and Brent Setchell when we are cleared to begin assembling the permit applications.

Benjamin Shepherd	12/1/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
16	RESPONSE ACCEPTED			ENVIRONMENTAL PERMITS

Created By	Created On	Version	Delegate For
Benjamin Shepherd	11/20/2023	1	

The next meetings with SFWMD are scheduled for December 13, 2023; and January 24 and February 28, 2024.

The next meeting dates with FDEP are scheduled every other Monday, starting on November 13, 2023.

KENNETH YINGER	11/27/2023	1	

We cannot start permitting until the PD&E Study has been completed. We will coordinate the pre-application meetings with Nicole Monies and Brent Setchell when we are cleared to begin assembling the permit applications.

Benjamin Shepherd	12/1/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
17	RESPONSE ACCEPTED			ENVIRONMENTAL PERMITS

Created By	Created On	Version	Delegate For
Benjamin Shepherd	11/20/2023	1	

At the upcoming pre-application meeting(s), be ready to discuss the following information as applicable:

a. A summary of the project and proposed work
b. Plans or representation of proposed work (e.g., .kmz file)
c. Drainage calculations and methods
d. Floodplain impacts and compensation
e. Wetland/Surface water impacts and proposed mitigation
f. Species impacts and proposed mitigation
g. Existing permit(s)
h. Proposed permit(s)

KENNETH YINGER	11/27/2023	1	

We will be ready to discuss these items.

Benjamin Shepherd	12/1/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
18	RESPONSE ACCEPTED			ENVIRONMENTAL PERMITS

Created By	Created On	Version	Delegate For
Benjamin Shepherd	11/20/2023	1	

Please confirm if a PHU analyses are required for the pond site alternatives (Table 5 of Environmental Report), given these sites are located outside of the panther focus area.

KENNETH YINGER	11/27/2023	1	

The USFWS' Biological Opinion has not been completed yet so we are unsure if the PHU analysis will be required for the pond sites. Although not in the panther focus area, several of the pond sites are within orange groves where panthers have been previously documented. Once we review the BO from the USFWS, we can update the Environmental report as needed.

Benjamin Shepherd	12/1/2023	1	

Typically, the need for a PHU analysis is known prior to issuance of a BO because the need for and/or amount of PHU credits will be part of the BO. Please coordinate with the FDOT EMO Section (Jeff James) to determine if they have had discussions with USFWS on the need for a PHU analysis in the preferred pond sites.

No	Status	Current Holder	Reference	Categories
19	RESPONSE ACCEPTED			ENVIRONMENTAL PERMITS

Created By	Created On	Version	Delegate For
Benjamin Shepherd	11/20/2023	1	

Tables 4, 5, and 6 in the Draft PSR include environmental mitigation cost estimates and impact level rankings. Please update the cost estimates and rankings as more current wildlife survey results become available. Information provided in the Environmental Report (Appendix H) suggests that species-specific surveys have not occurred since the PD&E study in 2018. The occurrence of a listed species (e.g., caracara nest) can dramatically affect mitigation costs.

KENNETH YINGER	11/27/2023	1	

The USFWS' Biological Opinion has not been completed yet, but we have verbal confirmation that additional species surveys will not be required. Once we review the BO from the USFWS, we can update the Environmental report as needed.

Benjamin Shepherd	12/1/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
20	RESPONSE ACCEPTED			ENVIRONMENTAL PERMITS

Created By	Created On	Version	Delegate For
Benjamin Shepherd	11/20/2023	1	

Florida scrub-jays were observed during the 2018 PD&E study, and their habitat may be impacted by several pond site alternatives (Table 6 in the Environmental Report). Please identify the conservation bank(s) that can provide the appropriate mitigation credits for the proposed scrub-jay impacts.

KENNETH YINGER	11/27/2023	1	

The USFWS' Biological Opinion has not been completed yet, but we have verbal confirmation that additional species surveys will not be required. The project area is not covered by a conservation bank. Alternative mitigation is being coordinated with the wildlife agencies and will be confirmed in the final BO. Once we review the BO from the USFWS, we can update the Environmental report as needed.

Benjamin Shepherd	12/1/2023	1	

Please coordinate with the FDOT Permit Section (Nicole Monies) to discuss the scrub-jay mitigation alternatives, which may require additional funding and/or monitoring and maintenance.

No	Status	Current Holder	Reference	Categories
21	RESPONSE ACCEPTED			ENVIRONMENTAL PERMITS

Created By	Created On	Version	Delegate For
Benjamin Shepherd	11/20/2023	1	

The proposed pond site alternatives do not impact > 5 ac of suitable wood stork foraging habitat. Please confirm if the entire project (roadway, pond sites, floodplain comp sites) will impact > 5 ac of suitable wood stork foraging habitat, necessitating a biomass analysis and potential mitigation. Note that some wetland mitigation bank credits in the area offer short- or long- hydroperiod wood stork credits with their wetland mitigation credits. Any shortfall would need to be considered in the cost evaluation.

KENNETH YINGER	11/27/2023	1	

The entire project area is not anticipated to impact > 5 acres of suitable foraging habitat for the wood stork. This will be confirmed once we are cleared to complete field assessment activities, including wetland delineations.

Benjamin Shepherd	12/1/2023	1	

Response Accepted & Comment Closed

Name	Assignment	Due Date	Status	Comments
Brent Setchell	LEAD REVIEWER	11/13/2023	ACTIVE	2

No	Status	Current Holder	Reference	Categories
1	RESPONSE ACCEPTED			DRAINAGE

Created By	Created On	Version	Delegate For
Brent Setchell	10/27/2023	1	

For SMF 503, Pond A is substantially cheaper than Pond B. Additionally, Table 6 shows that they have the same treatment depth but Pond B is +4 acres larger than Pond A. The linear nature of Pond A will make it more inefficient but I wouldn't expect a 4 acre difference. Please review and adjust as appropriate.

KENNETH YINGER	11/27/2023	1	

Additional acreage is a result of anticipating additional sidestreet connections that will result in multiple cells for the pond. Additional language will be added to the narrative to discuss this assumption.

Brent Setchell	11/29/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
2	RESPONSE ACCEPTED			DRAINAGE

Created By	Created On	Version	Delegate For
Brent Setchell	10/27/2023	1	

Pond 502A appears to leave an uneconomic remainder along the canal. It appears this pond could be reconfigured to avoid leaving a skinny strip of groves between the pond and the canal.

KENNETH YINGER	11/27/2023	1	

There is only one property owner for this basin within the orange groves. It is anticipated if either option (502A or 502B) is selected then the remaining orange groves would be "damaged" out. We will coordinate with the PD&E team to evaluate utilizing this uneconomic remainder in lieu of other areas and finalize our proposed design. Although it is not clear in the figure, there is also a "secondary" canal that is being used for draining offsite site water (including permitted facilities) that will need to remain. We will coordinate internally and revise accordingly.

Brent Setchell	11/29/2023	1	

Response Accepted & Comment Closed

Name	Assignment	Due Date	Status	Comments

Dawn Ratican	LEAD REVIEWER	11/13/2023	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Jeffrey James	LEAD REVIEWER	11/13/2023	ACTIVE	0*
JOHN LITTLEFIELD	REVIEWER	11/13/2023	ACTIVE	7

No	Status	Current Holder	Reference	Categories
7	RESPONSE ACCEPTED		Table of Contents	DRAINAGE

Created By	Created On	Version	Delegate For
JOHN LITTLEFIELD	11/13/2023	1	

Introduction is misspelled.

KENNETH YINGER	11/27/2023	1	

Agree, text will be corrected.

JOHN LITTLEFIELD	11/27/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
8	RESPONSE ACCEPTED			DRAINAGE

Created By	Created On	Version	Delegate For
JOHN LITTLEFIELD	11/13/2023	1	

The PSR indicates that only two pond options are provided for each basin at this time and that a regional alternative will be provided if feasible. If a viable regional alternative is not available, the analysis should consider a third alternative for each basin.

KENNETH YINGER	11/27/2023	1	

The scope requires analysis of two offsite alternatives and a regional alternative. The regional alternative is still an option, but has not been allowed to proceed due to the inability to coordinate with local stakeholders. No additional alternatives will be explored until this is resolved or as negotiations for the selected sites fail. The alignment bisects several large single ownership entities. Therefore, additional alternatives provide little value until direct negotiations with the landowner dictate.

JOHN LITTLEFIELD	11/27/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
9	RESPONSE ACCEPTED			DRAINAGE

Created By	Created On	Version	Delegate For
JOHN LITTLEFIELD	11/13/2023	1	

Please add North Arrow to Project Location Map and other Exhibits in Appendix A.

KENNETH YINGER	11/27/2023	1	

Agree, north arrows will be added.

JOHN LITTLEFIELD	11/27/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
10	RESPONSE ACCEPTED		Floodplain Information	DRAINAGE

Created By	Created On	Version	Delegate For
JOHN LITTLEFIELD	11/13/2023	1	

The report states the base flood elevation reaches an elevation of 34.5 feet, but the FEMA FIRM shows the base flood elevation is 35 feet in the northern portion of the project.

KENNETH YINGER	11/27/2023	1	

Agree. The text will be revised to state the base flood elevation of 35 feet.

JOHN LITTLEFIELD	11/27/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
11	RESPONSE ACCEPTED		CN Calculations	DRAINAGE

Created By	Created On	Version	Delegate For
JOHN LITTLEFIELD	11/13/2023	1	

Land use for the corridor includes forested areas, wetlands, canals, etc., but the CN Calculations assume all open space area in the pre-development condition. The open space CN values for the pre-development condition may result in overly conservative attenuation calculations. Please include CN values more indicative of the existing condition in the Final PSR.

KENNETH YINGER	11/27/2023	1

Agree. The CN values will be reviewed and updated to more closely match the land use values.

JOHN LITTLEFIELD	11/27/2023	1

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
12	RESPONSE ACCEPTED		Pond Calculations	DRAINAGE

Created By	Created On	Version	Delegate For
JOHN LITTLEFIELD	11/13/2023	1	

Calculations show several of the pond alternatives have DHW stages that are well below the max allowable DHW (0.64 feet at 501-A; 1.56 feet at 502-A; 0.72 feet at 503-B). Each alternative provides treatment and attenuation volumes that exceed the required volumes by 10 to 22%. Most of the alternatives have favorable tailwater conditions, but only Pond 501-B and 502-B incorporate a SHGWT that lowers the control elevation to take advantage of the favorable tailwater. Please consider eliminating some of the conservativism for the pond alternatives for the Final PSR.

KENNETH YINGER	11/27/2023	1

The contingency is intended to provide conservativism due to the limited availability of information. The conservativism will be removed during the design phase of the project and/or when more information is available.

JOHN LITTLEFIELD	11/27/2023	1

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
13	RESPONSE ACCEPTED			DRAINAGE

Created By	Created On	Version	Delegate For
JOHN LITTLEFIELD	11/13/2023	1	

Section 4.3.2 and 4.3.3 show that SMF 502A and SMF 503B are the preferred alternatives for Basin 502 and 503, respectively. However these alternatives do not have the lowest overall cost. Please provide additional narrative in the report to justify the selection of each preferred pond alternative.

KENNETH YINGER	11/27/2023	1

Additional justification for SMF 502A and SMF 503B will be provided in the report.

JOHN LITTLEFIELD	11/27/2023	1

Response Accepted & Comment Closed

Name	Assignment	Due Date	Status	Comments
Karina Della Sera	LEAD REVIEWER	11/13/2023	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
KENNETH YINGER	LEAD DESIGNER	11/27/2023	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Kimberly Warren	REVIEWER	11/13/2023	ACTIVE	2

No	Status	Current Holder	Reference	Categories
5	RESPONSE ACCEPTED			ENVIRONMENTAL MANAGEMENT OFF.

Created By	Created On	Version	Delegate For
Kimberly Warren	11/13/2023	1	

General formatting: Please replace this page with the Technical Report Cover Page, Form No. 650-050-38 (per Part 2, Ch. 11, Sub section 11.4.3.2, PD&E Manual). The font within the body of the document should be black font.

Trevor Hawkins	11/27/2023	1	

Noted.

Kimberly Warren	11/29/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
6	RESPONSE ACCEPTED			ENVIRONMENTAL MANAGEMENT OFF.

Created By	Created On	Version	Delegate For
Kimberly Warren	11/13/2023	1	

Please the attached for comments.

Trevor Hawkins	11/27/2023	1	

Noted.

Kimberly Warren	11/29/2023	1	

Response Accepted & Comment Closed

Name	Assignment	Due Date	Status	Comments
Kisan Patel	LEAD REVIEWER	11/13/2023	ACTIVE	0*

Name	Assignment	Due Date	Status	Comments
Nicole Monies	LEAD REVIEWER	11/13/2023	ACTIVE	0*

Name	Assignment	Due Date	Status	Comments
Ramasamy Venkatesan	REVIEWER	11/13/2023	ACTIVE	2

No	Status	Current Holder	Reference	Categories
3	RESPONSE ACCEPTED			GEOTECH/MATERIALS

Created By	Created On	Version	Delegate For
Ramasamy Venkatesan	11/7/2023	1	

The boring naming convention may confuse, if there are larger number of borings for the project. SPT/Auger Borings having similar numbers in a pond.

Trevor Hawkins	11/27/2023	1	

Pond borings (SPT/Auger Borings) have been designed with a “P” prefix to avoid any confusion with the roadway boring numbers. No change proposed

Ramasamy Venkatesan	11/27/2023	1	

Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
4	RESPONSE ACCEPTED			GEOTECH/MATERIALS

Created By	Created On	Version	Delegate For
Ramasamy Venkatesan	11/7/2023	1	

This is not my area of expertise, put consider this as generic comment. Typically ponds tend to attract birds. Not sure how busy this regional airport is and how far away the operations are. Typically, bird activity is an hazard for airports.

Trevor Hawkins	11/27/2023	1	

During the design phase of the project we will coordinate with the aiport / FDOT to determine if FAA guidelines will be applied to these sites. However, typical mitigation measures include hardening and steepening of the pond side slopes. At this phase of the project it was determined to assume a 1:4 side slope. Discussion is included in Section 4.2.6 of the report.

Ramasamy Venkatesan	11/27/2023	1	

Response Accepted & Comment Closed

Name	Assignment	Due Date	Status	Comments
Sean Pugh	IN-HOUSE PROJECT MANAGER	11/13/2023	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Tammy Kreisle	LEAD REVIEWER	11/13/2023	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Trevor Hawkins	CONSULTANT PROJECT MANAGER	11/27/2023	ACTIVE	0